Item 7. Municipal Regional Stormwater NPDES Permit – Municipalities and Flood Management Agencies in Alameda County, Contra Costa County, San Mateo County, Santa Clara County, and the Cities of Fairfield, Suisun City, and Vallejo in Solano County

Appendix D

Staff Report

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October 7, 2009

Staff Report

Significant Issues Associated with the Final Tentative Order for the Municipal Regional Stormwater Permit

In this report we summarize the most significant issues surrounding the Final Tentative Order for the Municipal Regional Stormwater Permit (MRP), and how we have addressed these issues.

The key issues include:

- Costs of Compliance with new requirements
- New and Re-Development Treatment Measures – Provision C.3
- Water Quality Monitoring – Provision C.8
- Trash Load Reduction – Provision C.10
- Mercury and PCBs Controls – Provisions C.11 and C.12
- Exempted and Conditionally Exempted (Non-Stormwater) Discharges – Provision C.15

Costs of Compliance

The overriding concern expressed by the Permittees is the cost of compliance with requirements in the MRP that different than those in their existing permits. We continue to acknowledge that new resources will be needed and recognize that even small increases in costs are a challenge in the current economic climate. Even under better economic circumstances, the Permittees' ability to generate additional resources is constrained by Proposition 218. We also acknowledge that effective urban runoff management will require federal and State assistance above and beyond the level of revenue that can be generated at the local level. We remain committed to assisting the Permittees in seeking such federal and State assistance.

In preparing the Final Tentative Order, we continued to balance cost concerns with (1) the legal mandate to reduce pollutants in urban runoff to the maximum extent practicable and to effectively prohibit non-stormwater discharges to storm drains, and (2) the need to implement adopted TMDLs that call on the Permittees to effectively manage their contributions to exceedances of water quality standards. Unfortunately, urban runoff is the most significant source (or pathway) of pollutants causing impairment or threat of impairment of waters in the Region.

We considered all the comments on the December 2007 Tentative Order and February 2009 Revised Tentative Order (previous tentative orders) and further eliminated or minimized any requirements in the MRP that may have limited water quality benefit relative to their costs. In response to comments, we also extended implementation timeframes to allow adequate opportunity to plan for any increased efforts and costs. Requirements that pose the most significant new costs are deferred for two to four years after permit adoption.

Nonetheless, as noted above, we recognize that all new requirements in the MRP will be difficult to meet without either new revenue sources or more efficient use of existing revenue sources. New revenue sources will likely never be pursued until there are permit requirements creating the need. The Permittees have been aware of aspects of all the anticipated new requirements for two or more years, but, until they have actually been "required", have not necessarily pursued or been able to generate new revenue sources. While we are optimistic that recent and projected federal increases to the State Revolving Fund will be available to the Permittees via forgivable or subsidized loans and that State bond-funded grants will also be available to meet some short-term costs, we view this regionwide permit as an opportunity for all Permittees to more efficiently work together and with other stakeholders to use existing resources for effective urban runoff control.

New Development and Redevelopment - Provision C.3

Low Impact Development - Low Impact Development (LID) measures employ principles such as preserving and creating landscape features and minimizing imperviousness to mimic natural stormwater runoff and infiltration. This creates functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. LID measures include storing stormwater for reuse, conserving natural landscape hydrology by slowing and infiltrating runoff, and using biotreatment such as rain gardens, biotreatment swales, planter/tree boxes, and green roofs to remove pollutants, increase evapotranspiration and slow stormwater discharge.

LID is rapidly being established as the maximum extent practicable (MEP) standard for new and redevelopment stormwater treatment. Stakeholders are concerned about implementing LID measures, with questions about the limits of practicality on one end, and how far to "push the envelope" on the other. Two major municipal stormwater permits recently adopted in Southern California include extensive requirements for LID measures. The LID requirements in the Final Tentative Order become effective in 2011.

Current permits require comprehensive hydromodification control measures and treatment requirements based on hydraulic sizing design criteria, and have pushed the Permittees to rely primarily on landscape-based treatment measures. Unfortunately, we still find an over-reliance on treatment measures that do not meet the LID "maximum extent practicable" standard. To rectify this, and in response to robust stakeholder input, including that from the US EPA, the Final Tentative Order contains six key elements:

1. defines LID treatment measures, which includes biotreatment *only* when reuse, infiltration, and evapotranspiration are infeasible;
2. requires the Permittees to determine feasibility/infeasibility criteria for LID measures within the next 18 months. If infeasibility is demonstrated for reuse, infiltration, or evapotranspiration, biotreatment can be used;
3. requires that LID measures meet the hydraulic sizing standard;
4. requires 100% of stormwater runoff be treated with LID measures onsite in most instances;
5. allows an offsite mitigation and/or in-lieu fee system, called Alternate Compliance, for sites where LID measures onsite are infeasible; and
6. requires the Permittees to propose an LID treatment reduction credit system within one year for projects that have demonstrated environmental benefits (e.g., Brownfields, transit-oriented development, high density urban redevelopment) to allow a portion of the

stormwater runoff onsite to be treated by non-LID, or so-called "conventional", treatment measures.

Alternative Compliance – In response to concerns raised by the Permittees that Alternative Compliance via an offsite project or contribution to a regional project should not be limited to infill and redevelopment, and is especially useful for road-widening projects, the Final Tentative Order allows the opportunity for Alternative Compliance to all new and redevelopment projects. Additionally, to provide maximum flexibility for projects such as road widening or dense urban core redevelopment, the Final Tentative Order allows offsite treatment or in-lieu fees for up to 100% of the design storm volume. To ensure "equivalency" between onsite treatment and offsite treatment: (1) all offsite projects must provide LID treatment; (2) offsite LID treatment measures must provide hydraulically-sized treatment of an equivalent quantity of both stormwater runoff and pollutant loads; (3) in-lieu fees paid must be enough to provide hydraulically-sized treatment of an equivalent quantity of both stormwater runoff and pollutant loads; and (4) offsite LID treatment must achieve a net environmental benefit.

One stakeholder, the Natural Resources Defense Council (NRDC), objects to the 1:1 ratio leading to an equal volume of stormwater treated offsite and prefers a higher ratio be applied when treatment will be offsite. However, experience to date is that there are many barriers to implementing offsite treatment, which is already allowed, though rarely used, under current permits. Also, many projects for which onsite LID measures are difficult or more expensive to install are located in dense urban and redevelopment areas where cities want to encourage growth rather than impose additional costs. Given these factors and the Permittees' strong objections, we find a 1:1 ratio for offsite treatment to be appropriate.

Special Projects – Current permits contain an outright exemption from stormwater treatment for Brownfields, low- and moderate-income housing, senior housing, and transit-oriented development. In previous tentative orders, we preserved this exemption but added a requirement for minimum site design measures. In response to strong objections from NRDC, we have removed this exemption from treatment for these projects.

NRDC acknowledges that there is a subset of projects, referred to in the permit as "Special Projects," that merit special consideration. When considered at the watershed level, these types of projects, which may include "Smart Growth", high density, or transit-oriented development, can either reduce existing impervious surfaces or create less "accessory" impervious areas and vehicle travel-related pollutant impacts. For these projects, it would be appropriate to reduce the LID onsite treatment requirement to less than 100% of the site's stormwater runoff, while still requiring full treatment with conventional treatment measures. We met numerous times with US EPA, NRDC, the Homebuilders Association of Northern California (HBANC), and the Permittees to try to define the parameters of such a reduction (e.g., project types, amount of LID onsite treatment reduction credit, and total credit allowed). We also asked for input, with supporting information, from the Permittees, but were ultimately unable to resolve this issue.

Because this issue is unresolved, the Final Tentative Order requires the Permittees to submit a proposal that identifies (1) types of Special Projects with an estimate of the number and cumulative area of the potential projects; (2) the institutional barriers and/or technical site-specific constraints that justify the allowance for non-LID treatment measures onsite; (3) specific criteria for each type of project, such as size, location, and minimum densities; (4) specific water

quality and environmental benefits provided by these types of projects that justify the allowance for non-LID treatment measures onsite; (5) the LID treatment reduction credit for each type of project and justification for the proposed credits, including an estimate of the specific water quality benefit provided by each type of project proposed for LID treatment reduction credit; and (6) the total treatment reduction credit for Special Projects that may be characterized by more than one category and justification for the proposed total credit.

Consideration and approval of the Special Projects categories will be a public process and we will solicit input from NRDC, HBANC, the Permittees and other interested stakeholders.

Green Streets Pilot Projects – The February 2009 Revised Tentative Order replaced the road re-construction treatment requirement with a requirement for ten "Green Streets Pilot Projects". Properly designed and built "green streets" not only beautify the streets, have traffic calming effects, are safer for pedestrians and bicyclists, but can treat stormwater, reduce greenhouse gas emissions and increase carbon sequestration. The Permittees welcome the change but express the concern that it will be difficult to find ten projects that meet the proposed requirements. We expect Green Streets Pilot Projects eligible for funding via the Metropolitan Transportation Commission (MTC), State Revolving Fund loans, federal stimulus funding and other bond funds to meet the requirements.

In response to the Permittees' comments, the Final Tentative Order contains the following changes: (1) requires the ten pilot projects, as a whole instead of individually, to contain all the key MTC Green Streets design elements; (2) allows parking lot projects to count as long as they also treat street runoff; (3) requires at least two pilot projects in each of the following counties: Alameda, Contra Costa, San Mateo, and Santa Clara; (4) allows the full permit term for completion of the ten projects but with a reporting requirement by the 4th year to inform development of the next permit. The pilot projects are required to be hydraulically sized for both street and adjacent private/public property runoff, in order for the treatment to be adequate.

Water Quality Monitoring – Provision C.8

Monitoring Scope and Costs – The primary purpose of monitoring is to gather quantitative information to identify water quality problems associated with urban runoff and to determine whether management actions are effective at controlling urban runoff pollution. Ideally, we want to show that management actions are producing measurable and meaningful results. The Permittees have expressed concern with the costs of meeting the monitoring requirements, whereas other stakeholders have challenged the adequacy of the monitoring requirements.

Water Quality Monitoring requirements encompass five areas:

1. Participation in the Regional Monitoring Program or its equivalent;
2. Assessment of water quality status in creeks and waterways within the Permittees' jurisdictions on a rotating basis;
3. Assessment of long-term trends in water quality in representative creeks and waterways;
4. Identification of stressors or pollutant sources, investigation of treatment measures, and other special monitoring projects; and
5. Assessment of the loads of pollutants of concern to the Bay from urban runoff.

The status monitoring requirements are consistent with our own Surface Water Ambient Monitoring Program efforts to assess the physical, biological, and chemical conditions in creeks during the spring and dry weather. These monitoring requirements have been reduced with each tentative order. Water column sampling for metals and organic pollutants has been removed in favor of toxicity testing and sediment chemistry, which can integrate pollutant effects over time. Storm-event sampling was eliminated entirely from status monitoring. The total number of samples required has been greatly reduced, particularly for the more costly parameters, such as sediment toxicity. We also added flexibility to the selection of streams and monitoring locations and simplified pathogen sampling.

Similarly, we have added flexibility and reduced requirements for other monitoring elements, including the entire elimination of long-term monitoring for the smallest Permittees, Fairfield, Suisun City and Vallejo. The Permittees were most concerned about long-term trend monitoring, because of labor costs associated with sampling during rain events. We have combined long-term and pollutants of concern monitoring elements, as the Permittees requested, which should engender co-location of monitoring stations and reduce labor costs. We also adjusted monitoring reporting requirements to better reflect the timing and availability of monitoring results.

In short, we have looked at each monitoring requirement and reduced or eliminated as much as possible, while requiring adequate data to identify water quality problems associated with urban runoff. Overall monitoring costs, which we considered reasonable prior to these reductions, are further reduced in consideration of the severe economic conditions the Permittees face today.

Collaboration and Integration – The Final Tentative Order encourages and provides incentives to pursue regional collaboration that results in a comprehensive and consistent regional approach to monitoring. This also provides opportunity to coordinate and/or integrate the Permittees' monitoring efforts with those of others. For example, the Regional Monitoring Program is developing a strategy to monitor loads from local tributaries (including storm drains). By participating in a regional monitoring collaborative, the Final Tentative Order allows the Permittees more time and flexibility to implement monitoring requirements.

Trash Load Reduction – Provision C.10

In response to comments expressed at the May 2009 Board testimony hearing, we have clarified and simplified the trash reduction provision, and included a strong emphasis on trash load reduction. The revised provision requires each Permittee to reduce trash loading 40% by 2014, 70% by 2017, and achieve no trash impacts to receiving waters by 2022.

Short-Term Trash Load Reduction - The main thrust of this permit term is implementation of short-term trash load reduction actions to reduce trash loading 40% by 2014. The Permittees will have flexibility to meet load reductions using the most efficient, accountable measures of their choosing, including source control by adopting local restrictions on, for instance, single-use bags or litter-producing packaging. As long as the actions can be tied to an amount of trash prevented or removed from impacted waters, and the action is appropriately maintained, it can count towards the load reduction requirement.

Baseline Trash Load - A major challenge is the determination of the baseline trash load level that will serve as the basis of trash load reduction accounting. However, rather than mandating a specific method to determine baseline trash load levels, the Final Tentative Order allows the Permittees to self-determine them in a manner that is meaningful to them and reflects their knowledge of their drainage areas, including opportunity to exclude "clean" drainage areas that do not generate trash loads. We expect most Permittees will collaborate with others on development of standard methodologies that work for them and are acceptable to others.

Trash Reduction Costs – The Final Tentative Order substantially revises the initial trash reduction requirements in a manner that reduces overall costs and increases flexibility, while providing accountability. While many stakeholders want more trash capture and control in this permit term, we expect the phased load reduction approach will result in meaningful short-term reductions in trash discharges, and set the stage for efficient expansion of trash reduction actions, including trash capture, over the next permit term.

We recognize that trash reduction will require significant increases in stormwater management resources and, as noted above, that the Permittees' ability to generate additional resources is constrained by Proposition 218 and other factors. For example, we estimate that trash capture device requirements will cost nearly $28 million for installation, based on comparable efforts in the Los Angeles Region. Through the efforts of the San Francisco Estuary Partnership, working with the Permittees, $5 million of American Recovery and Reinvestment Act of 2009 funds has been secured to pay for early trash capture device installation. We will continue to work with the Permittees to make trash reduction a high priority for federal and State resources. We also expect the regional nature of the MRP will generate regional or potentially statewide solutions and revenue generating and sharing mechanisms.

Mercury and PCBs Controls– Provisions C.11 and C.12

Mercury and PCBs Control Actions and Costs – The mercury and PCBs control requirements begin to implement the urban stormwater runoff wasteload allocations set forth in the San Francisco Bay mercury and PCBs TMDLs adopted by the Board. The implementation plans adopted with each of the TMDLs calls for a phased implementation strategy, which results in permit requirements that reflect the current state of knowledge on mercury and PCBs controls. The strategy calls for implementation of controls via an iterative, permit term-based approach that leads to attainment of the allocations within 20 years (i.e., four permit terms).

We are challenged by limited knowledge of mercury and PCBs controls at this time. We do not currently know which controls are technically feasible and cost-effective**.** Consequently, this first permit requires implementation of pilot projects to evaluate mercury and PCBs controls in four action areas: cleanup and abatement of sources of mercury and PCBs (five projects); enhanced sediment removal via storm drain system operation and maintenance (five projects); retrofit of stormwater treatment units into existing storm drain systems (ten projects); and strategic diversion of dry weather and first-flush flows in storm drains to municipal wastewater systems (five projects). The knowledge and experience gained through pilot implementation will be used to determine the scope of implementation in subsequent permit terms that will result in timely pollutant load reductions.

We recognize that mercury and PCBs control actions will also require significant increases in stormwater management resources. The pilot studies that likely will cost several million dollars collectively over this permit term are intended to answer the bigger question of whether the full costs of mercury and PCBs controls will be tens or hundreds of millions of dollars. Similar to our trash discussion above, we will work with the Permittees to make mercury and PCBs control implementation a high priority for grant resources. We also expect some redirection or focus of existing street sweeping and inlet cleaning actions, or resources associated with those actions, to mercury and PCBs controls.

Collaboration and Integration – The mercury and PCBs pilot projects are designed to be implemented via a regional collaborative effort, and mercury is expected to be included in PCBs pilot projects rather than addressed in separate projects. While the Permittees have requested that we reduce the number of pilot projects in each action area to four, we maintain that the current proposed numbers are more appropriate. There is sufficient information available to allow the Permittees to identify five suitable locations to implement pilot projects for cleanup and abatement, enhanced operation and maintenance, and routing to wastewater systems, and ten suitable locations to pilot test retrofit of stormwater treatment units throughout the Region. We also expect integration of the different types of pilot projects in the same drainage area. In other words, we expect and encourage that specific pilot projects be designed to address multiple action areas. There are several types of treatment retrofits, so it is particularly important to have multiple instances of these types of solutions to gain timely knowledge and experience. The number of pilot projects corresponds to our need to learn about technical details, costs, benefits and feasibility.

To allow the Permittees more time to seek funding sources, the Final Tentative Order provides an additional year for many of the early-action (year one) actions.

Exempted and Conditionally Exempted (Non-Stormwater) Discharges – Provision C.15

This provision allows exemptions to the prohibition of non-stormwater discharges for classes of discharges that do not adversely affect water quality, and allows conditional exemptions for classes of discharges that do not adversely affect water quality if they are properly managed. The Permittees have expressed considerable concern with these requirements, particularly with monitoring and reporting of discharges of potable water. The challenge is that unmanaged discharges of such waters can be acutely toxic to fish and other aquatic life due to residual chlorine or chloramines and can cause erosion and sedimentation in the local creeks.

To ease the burden on the Permittees, we have:

1. Exempted single family homes' foundation drainage because it tends to be unpolluted;
2. Exempted pumped groundwater from drinking water aquifers because we have data showing that it is unpolluted;
3. Deleted the requirements for non-water purveyor Permittees to oversee third parties for potable water discharges, because we have issued and intend to continue issuing individual NPDES permits for potable water discharges;
4. Reduced the monitoring and reporting requirements for the water purveyor Permittees who discharge potable water; and

5. Restored the conditional exemption for residential car washing because washwater control is best approached through public outreach.

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Appendix E

Response to Comments on the December 14, 2007 Tentative Order

The Response to Comment Tables are arranged by the Provisions of the Final TO, with the exception of General and Legal Comments, which are placed at the end. C.1 comments are included in the Legal section.

Response to Comments on December 14, 2007 Tentative Order
Provision C.2. – Municipal Operations

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
C.2 – Municipal Operations - General						
SF Baykeeper	33	C.2	Add permit objective	The Permit should clearly state the objective of the provision (See San Diego's permit "[e]ach Co-permittee must implement a municipal program which meets the requirements of this section, prevents illicit discharges into the MS4, reduces municipal discharges of pollutants from the MS4 to the MEP, and prevents municipal discharges from the MS4s from causing or contributing to a violation of water quality standards. Los Angeles Regional Water Quality Control Board, Revised Tentative Order No, R9-2008-0001, p. 48 (December 12, 2007) (hereinafter "Draft Orange County Permit"). San Diego Region Regional Water Quality Control Board, Order No. R9-2007-0001, NPDES No. CA0108758, p. 32 (January 24, 2007) (hereinafter "San Diego Permit").	We agree.	The objective has been added to the beginning of the Municipal operations section. Additionally, each sub-provision contains a task description section.
Sunnyvale Att A	5	C.2	General	Prioritize the TO provisions, and provide phasing opportunities for modification to the existing permit to allow for budgetary considerations within the municipalities.	In response to this comment and others, street sweeping and storm drain inlet inspections and cleanup are removed from Provision C.2.	The provisions related to street sweeping and storm drain inlet/catch basin inspection and cleanup are entirely deleted from the TO.
Clayton, Hoffmeister, L	1	C.2, C.6, C.10	General Cost	Operational costs for three components, including street sweeping, commercial inspection, and drain and inlet special trash, go up for one city over each of the five years. Even in a stepped up or ramped up or phased in approach as the staff has suggested, there's still some real cost considerations there ... administration cost and management cost issues that go up as well, but I just wanted to capture kind of the three big ones that we could quantify.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
EPA Region 9	3	C.2, C4, C5, &C6	Support Comment	Support detailed BMP requirement. Elsewhere in the proposed permit, we are pleased to see that the permit includes detailed BMP requirements in many areas such as municipal maintenance, illicit discharges and industrial/commercial site controls. These requirements clarify MEP and improve the enforceability of the permit. Our municipal audits of recent years have identified lack of detailed requirements as a frequent	No response is needed to this comment.	Comment noted.

Response to Comments on December 14, 2007 Tentative Order
Provision C.2. – Municipal Operations

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				shortcoming in previously-issued MS4 permits in our Region.		
C.2.a – Street and Road Sweeping and Cleaning						
SF Baykeeper	34	C.2.a	Street swept %	Street Sweeping. Provision C.2.A.i does not specify what percentage of permittees' streets must be swept.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Woodside	1	C.2.a	Reporting	...Given the residential nature of the community, much of the roadside trash and leaf removal is handled by individual property owners as part of their individual property maintenance. Given these private efforts, Town staff does not know the exact volume or weight of materials removed to be reported.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
SMCWPPPAtt3-Table SouthSF Monte Sereno SCVURPPP Att A Sunnyvale Att A	6.1 7 1 3 1	C.2.a	Sweeping Frequency	• Not sure why the Water Board needs these maps and what it would do with them. Municipalities cannot afford to develop maps that have no purpose. SMCWPPP suggests that this proposed permit requirement be deleted. • The fact sheet does not describe the technical basis for sweeping high priority streets twice a month and what impact this frequency of sweeping will have on improving MS4 stormwater quality. For example, how does sweeping frequency impact water quality during the dry season? Twice a month sweeping may represent a significant increase for some municipalities. SMCWPPP recommends the deletion of this requirement and replacement with a requirement that allows municipalities to continue the currently allowed frequency of sweeping. • Most cities have already developed a	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

Response to Comments on December 14, 2007 Tentative Order
Provision C.2. – Municipal Operations

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				frequency of sweeping that meets local needs; it is unclear that there is a water quality benefit to making these changes. As described above, the permit should be modified to allow the current frequency of sweeping to continue. • Monte Sereno recommends the deletion of this requirement and replacement with a requirement that allows municipalities to continue the currently allowed frequency of sweeping per current performance standards and BMPs.		
Berkeley Contra Costa County Supervisors	2 21	C.2.a	Sweeping Private Streets & Parking Lots	Reference is made to public parking lots, which could be interpreted to mean publicly (or agency) owned parking lots, or privately owned parking lots for public use. The agencies cannot take on responsibility for sweeping privately owned facilities. Specify that the streets, roads, and parking lots included in sweeping operations are publicly owned facilities. ... Sweeping of private roads with public funds may not be legally permissible, as it would constitute a gift of public funds.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Councilmember of Concord – Hearing – Hoffmeister, L.	2	C.2.a	Prescriptive	On of the things that's brought up about trash and about street sweeping is that, you know, using the type of equipment inside a shopping center in a parking lot, a public lot, some of the issues are that you can't get sweepers to maneuver about inside these parking lots. There are bumper blocks. That's an area that maybe captures trash. There are other devices and other ways to do that. So again, being prescriptive is not realistic.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Santa Clara County	1	C.2.a	Sweeping Priority	The County staff is concerned with the map that identifies high, medium and low frequency sweeping areas. A map of the entire County's roads with the according sweeping frequency will probably be unreadable. We suggest that a list of the streets we provide medium and low sweeping frequencies be provided instead. To sweep every street, even at the lowest frequency, is very time consuming and costly. Reporting on our sweeping equipment and annual sweeper operator training information	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

Response to Comments on December 14, 2007 Tentative Order
Provision C.2. – Municipal Operations

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				was not previously provided and it will take time and effort to begin reporting. To implement this it requires a traffic study and additional signage on the roads. This is both time consuming and costly to perform		
Pleasanton Dublin	15 14	C.2.a	Parking restriction	There exist no city ordinances to remove in the path of street sweepers. Politically, the cities do not wish to take on this challenge which will create havoc in their communities. With the availability of their street sweeping schedule, the cities have not needed to, nor believe it is cost-effective to, post signs on streets for sweeping days. Installing sweeping day signs on all streets bears a significant unbudgeted additional capital and ongoing maintenance cost. It will cost about $100 per sign or $500,000 over the five-year permits to install about 5000 signs.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Oakley Moraga	14 14	C.2.a	Overlapping Requirements	C.10.c.i (1) requires enhanced trash management controls also be immediately implemented with at least weekly sweeping. In light of Board staff indicating skepticism about sweeping effectiveness, which requirement prevails, C.2.a or C.10.c.i (1)?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Oakley Oakley Moraga	15 155 15	C.2.a	Reporting	The reporting form indicates that the number would be street report curb mile, multiplied by the number of times swept. Is that the case or is it as we have been reporting? Similarly for volume, is it on an event basis, or total annual amount?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Oakley Moraga	16 16	C.2.a	Sweeping Frequency	Streets without curb and gutter should be exempted entirely.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

Response to Comments on December 14, 2007 Tentative Order
Provision C.2. – Municipal Operations

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
					very few exceptions, it is not optimized for stormwater pollutant removal.	
ContraCostaCnty – LierlyR	22	C.2.a	Cost effectiveness	We sweep all the curbed streets, public streets within the county. It costs about $200,000 a year. The MRP requires us to sweep all streets in the county. We have over 700 miles of rural roads that don't have curb and gutter. The benefit of sweeping those is minimal, and our cost would go from $200,000 to like over $2 million just for that one item alone.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
ContraCostaCnty – SwartzD	41	C.2.a	General	Implicit and perhaps unintentional requirements to develop legal authorities include those related to potentially requiring the sweeping of private roads and placement of storm drain markers on private storm drains. It may not be possible for jurisdictions to develop this sort of legal authority.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Oakley	156	C.2.a	Reporting	C.2.a requires reporting total roadway length swept at the curb "fee of parked cars." This unacceptable & unreasonable; there's no way an operator can keep a certifiable/provable number while trying to operate the sweeper.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Oakley	157	C.2.a	Reporting	We've been reporting the annual total volume of material collected during sweeping. We assume that is still the number sought.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Contra Costa Cnty Supervisors Clayton-Julie Pierce-Hearing	19 2	C.2.a	Sweeping frequency	There needs to be flexibility that allows alternative means of compliance. Increase in street sweeping will create financial burden. The County currently sweeps all	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO).	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from

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				publicly-maintained curbed streets once a month. The MRP will require a significant increase in sweeping area and frequency. The MRP requires that all public streets (curbed or not) and public parking lots (libraries, hospitals, offices, etc.) be swept. Due to the designs of many of these parking lots, our current trash collection services (including hand sweeping) performed by our General Services Department and Probation Department's Juvenile Work Program provide more effective pollution prevention, but would not meet the requirements of the MRP. Regenerated air sweeper is used to sweep all street monthly, whether that's good or bad is up to the scientists to determine. Clayton is mostly residential with a small commercial area. In addition to the monthly sweeping, the city crews pick up trash by hand. The proposed street sweeping requirements for weekly service citywide would quadruple our current costs to $148,000 a year. That's more than the cost of one police officer for a city with only 10 police officers.	Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	the Revised Tentative Order (TO).
Contra Costa Clean Water Program LTR	13	C.2.a	Sweeping Frequency	The TO street sweeping requirements are overly prescriptive and, as written, would require the sweeping of covered parking lots and all roads, including rural roads. The proposed requirements would also require the purchase of specific street sweeping equipment regardless of its intended use. Most municipalities in Contra Costa County implement effective street sweeping programs exceeding the minimum requirements. Given minimum expectations and reporting requirements, Permittees must continue to be provided the flexibility to optimize their sweeping programs.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
San Pablo	7	C.2.a	Sweeping Frequency	In case of heavy rain, street sweeping activities must be called off resulting in the City not meeting the increased sweeping frequencies. Make-up days are not effective since posted signage can not account for this and there would be too many parked cars on the usual non-	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

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				sweeping days. We request that safe harbor language be included in the permit to allow for these circumstances.	Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	
JamesRogerAttII	4.b	C.2.a & C.2.b	Prescriptive	If a municipality does what the Permit specifies and there is an ongoing exceedance of water quality standards or prohibitions, what can the RWQCB really do about it since they specified what was necessary for compliance?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
JamesRogerAttII	4.c	C.2.a & C.2.b	Cost effectiveness	The studies show that sweeping is ineffective in controlling trash discharged to receiving waters. Street sweeping studies show that sweeping results in poorer quality runoff than with upswept conditions. Street sweeping studies unless conducted under extremely controlled conditions indicate that there is minimal difference in the effectiveness of broom sweepers, the regenerative air and vacuum filter sweepers in removing particles <63 um so how can the staff rationalize requiring municipalities to spend $250,000-350,000 for a high efficiency street sweeper with $50,000 annual maintenance costs to address pollutants in runoff?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
JamesRogerAttII	4.d	C.2.a & C.2.b	Sweeping effectiveness	The effectiveness of street sweepers is affected by many factors, including sweeping frequency, type and condition of paved surfaces, rainfall depth and intensity, amount and distribution of street-dirt, parked cars, and methods of operation, ability to operate under wet street conditions and employment of different types of sweepers in tandem.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
JamesRogerAttII	4.e	C.2.a & C.2.b	Sweeping effectiveness	Trash, litter and sediments enter storm drain inlets from traffic created or natural wind and from the "snow plow effect" of street sweepers as well as storm water runoff making it difficult to quantify and characterize trash solely based on street surface loadings. The characteristics of street trash have significantly changed since the	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

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				NURP studies with increased amounts of plastics and styrofoam.	very few exceptions, it is not optimized for stormwater pollutant removal.	
JamesRogerAttII	4.f	C.2.a & C.2.b	Sweeping Effectiveness	Removal and capture of silt and clay size (<63-µm) particles has not been demonstrated using current street sweeping practices. Studies have shown an increase in these particles attributed to the removal of larger armoring particles, fugitive dust, recirculation and subsequent loss of fine particles and crushing of larger particles by sweeper brooms.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
JamesRogerAttII	4.g	C.2.a & C.2.b	Sweeping Frequency	Street sweeping frequency to be effective in reducing pollutants in storm water runoff in the Bay Area must occur on a weekly basis during the wet weather season must be at a frequency that is less than the interval between storm events which as about 8 days in the Bay Area.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
JamesRogerAttII	4.h	C.2.a & C.2.b	Prescriptive	The RWQCB staff should be encouraging, but not requiring or specifying in detail a more comprehensive approach for controlling solids and associated pollutants and controlling trash including a combination of public education, street sweeping, catch basin or storm drain cleaning, full capture devices/end of pipe treatment and receiving water cleanup.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
JamesRogerAttII	4.i	C.2.a & C.2.b	Sweeper Efficiency	Based on the 2007 USGS study, mechanical broom sweepers achieve a 5% reduction and higher efficiency sweeping can only achieve a 15% reduction.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
San Jose Att A	2	C.2.a, C.2.b, C.2.f	Completion Date	...The City requests a minimum period of two years to fully comply with these requirements.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO).	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from

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					Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	the Revised Tentative Order (TO).
JamesRogerAttIII Berkeley	2.1 3	C.2.a.i	Definition	Provision C.2. i.e. – High, medium and low traffic zones should be defined by average daily traffic. Recommend that low traffic zones as those with ADT < 1,000 medium 1000-5000 and large as >5000. Define "high-traffic", "medium-traffic", and "light-traffic" zones and should be coordinated with other uses throughout the TO and common usage in the Traffic Engineering profession.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Fremont Menlo Park	13 4	C.2.a.i	Sweeping Frequency	Fremont and Menlo Park recommend that each City to be allowed the flexibility to develop its own street sweeping plan or continue the current street sweeping frequency that meets local needs.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Berkeley ACCWP-Att1-Redline	7.1 1	C.2.a.i	Redline/Strikeout	The definition of high frequency areas is too broad and could obligate Permittees to frequently sweep areas that include the described land uses but do not accumulate high volumes of trash. Modify the language as follows: This designation shall include areas that consistently accumulated high volumes of trash, debris and other stormwater pollutants Street, road segments and public parking lots designated as high frequency and may include, ~~include at least, but are not limited to~~ high traffic zones, commercial and industrial districts, shopping malls, large schools, high-density residential dwellings, sport and event venues and plazas. ~~This designation shall include areas that consistently accumulated high volumes of trash, debris and other stormwater pollutants.~~	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Berkeley	7.2	C.2.a.i	Redline/Strikeo	Permittees shall identify and map all designated	In response to these comments and	The entire sub-Provisions C.2.a

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ACCWP-Att2-Questions ACCWP-Att1-Redline Contra Costa Cnty Supervisors Contra Costa Clean Water Program	2 2 20 4		ut	streets, roads, and public parking lots for sweeping frequency by ~~November 30, 2008~~ June 30, 2009. Change implementation date to August 1, 2009, for areas street sweeping in order to ramp up our existing sweeping/litter clean-up operations. Section C.2.a.ii. (1) - Should provision C.2.a.ii.(1) be adopted without the Program's proposed changes above, replace "by November 30, 2008" to "within 12 months of permit adoption".	others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Contra Costa Clean Water Program Berkeley	3 5	C.2.a.i	Sweeping Covered Parking Lot	Unnecessary to Require Sweeping of Covered Parking Lots - The proposed sweeping rules, as written, would also unnecessarily require sweeping of covered public parking lots, and could be interpreted to require sweeping of parking facilities used by the public but which are privately owned and maintained. Permittees do not have the authority to sweep privately owned parking facilities. Parking areas not exposed to rainfall need to be exempted from sweeping.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Orinda	1	C.2.a.i	Non-curbed	Provision C.2.a.i does not appear to include an exclusion for non-curbed streets. The MRP RO would effectively result in decreased sweeping of the downtown commercial area in order to re-allocate resources to meet the sweeping requirements for non-curbed streets.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Danville-Newell Arnerich-Hearing	1	C.2.a.i	Sweeping Frequency	Sweeping required in areas not high in trash. We sweep our streets monthly with weekly sweeping in our downtown commercial area where we find most of our trash. In the fall, we increase sweeping frequency in some areas to deal with leaf drop of the deciduous trees. The new MRP would require increased sweeping of high-traffic zones and arterial streets; however, in Danville these aren't our high trash areas.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Daly City	5	C.2.a.i	Definition	What standard is being used to define High Frequency, Medium Frequency and Low Frequency road standards? Define/clarify those	In response to these comments and others, these provisions are removed from the Revised Tentative Order	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related

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				standards.	(TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	requirements, are deleted from the Revised Tentative Order (TO).
Contra Costa Clean Water Program	1	C.2.a.i & C.2.a.ii	Sweeping Frequency	Section C.2.a.i. and C.2.a.ii. – Combine and change these two provisions as follows: "Permittees shall sweep all curbed streets and non-covered public parking lots owned, operated or maintained by the permittees on at least a monthly average unless an alternative schedule is proposed and approved by the Regional Board." An acceptable alternative to the minimum frequency proposed above would be the frequencies outlined in provision C.2.a.ii.(2) provided that Permittees would be allowed to determine high, medium and low priority areas, which may not always be consistent with specified traffic levels or land uses. ... The existing sweeping rules effectively establish a minimum level of sweeping while providing municipalities with the flexibility to prioritize areas and frequencies for sweeping to maximize pollutant removal. The proposed requirements are unnecessarily prescriptive and may result in increased sweeping in areas thought by Water Board staff to accumulate high levels of trash, but which in reality may not.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
JamesRogerAttIII	2.2	C.2.a.i(1)	Editorial	Provision C.2. a.i.(1)– Changes: a. "Other pollutants" to "sediments >75-µm". b. Delete "large" schools because virtually all schools are land uses associated with large amounts of trash.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Santa Clara County	2	C.2.a.ii	Leaf Removal	Will leaves be identified as pollutants? Implementing BMPs for reducing leaves from getting into the storm drain system is unreasonable.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO).	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from

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					Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	the Revised Tentative Order (TO).
Berkeley	4	C.2.a.ii(2)	Definition	Provision C.2.a.ii(2) includes the term "technically infeasible", without defining how this is to be determined. Define "technically infeasible".	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
ACCWP-Att2-Questions	3	C.2.a.ii(2)	Sweeping Frequency	Rural Roads should be excluded from the street sweeping requirement	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Contra Costa Clean Water Program	2	C.2.a.ii(2)	Technically infeasible	...Requiring enhanced trash/litter controls where street sweeping is technically infeasible will result in an unnecessary expenditure of public funds with little water quality benefit. For example, unincorporated Contra Costa County, with many miles of rural roads, estimates a 250% increase in its annual sweeping budget to comply with the proposed new rules.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Walnut Creek-Gwen Regalia-Hearing Clayton-Julie Pierce-Hearing	2 & 5 3	C.2.a.ii(2)	Sweeping Frequency	We have more frequent street sweeping in downtown and on the major arterial roads, to require more street sweeping in some areas is a waste of funds. More street sweeper on street will lead to air quality degradation with minimal environmental benefit.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
ACCWP-Att2-	4	C.2.a.iii	Reporting	How is this recording/reporting information going	In response to these comments and	The entire sub-Provisions C.2.a

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Questions				to be used by the Water Board?	others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Daly City	6	C.2.a.iii(3)	Editorial	Report on the public outreach … storm drains and creeks; and ??	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
C.2.b – Sweeping Equipment Selection and Operation						
Mayor of Menlo Park – Hearing – Fergusson, K.	3	C.2.b		Some quick points on operations, the street sweeping you've heard about is a serious concern. The street resurfacing exemption, we're facing a financial and legal nightmare if that's not extended.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
SCVURPPP Att A	91	C.2.b	Reporting Attachment L	• Page L-14 - Types of sweeper used- The MRP requires reporting on the sweeper type rather than sweeper name. The summary table provides the sweeper name. The type of sweeper (e.g., regenerative air, broom, etc.) will give more information regarding targeted pollutant removal effectiveness. • Page L-15 - Total Roadway length swept at the curb, free of parked cars- The MRP does not require the collection of this data point. In addition, it is highly impractical to collect this data point since a sweeper operator cannot stop sweeping to calculate the length of road which is free of parked cars. Recommend deleting this data point from the summary table.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

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				• Page L-15-Area of public parking lots swept- The MRP does not require the collection of this data point. In addition, it is not possible to collect this data point in square miles. It is possible to collect the total length (in miles) of parking lots swept. • Page L-16 - Sweeper maintenance record- What is the significance of collecting this item? The MRP does not require the collection of this data point. • Page L-20- Frequency of inspections (high accumulation areas) - Unclear why this frequency needs to be reported since the MRP requires an increase to twice a year. The identification of high accumulation areas is used to prioritize areas where BMPs or other trash and litter abatement actions should be instituted. • Page L-21- Pump station trash racks and oil absorbent booms inspection and maintenance frequency- Unclear why this frequency needs to be reported since the MRP requires inspection during or within 24 hours of significant storm events. • Page L-22 - Length of rural public roads in jurisdiction- Unclear why the total length (numeric value) of rural roads is relevant in the protection of water quality. General location within a jurisdiction maybe more appropriate. The MRP does not mention/require reporting the length of rural roads. Suggest deleting this data point from the summary table		
Daly City	9	C.2.b	Training	"Street sweeper operators shall be trained to enhance operations for water quality benefit." What are the specific learning points and objectives? What specific skill or knowledge is lacking?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Moraga	2	C.2.b, C.8	Implementation schedule	Compliance dates aren't coordinated. Items to be evaluated for implementation in one provision	The street sweeping requirements have been removed from TO. The	Compliance dates have been revised to phase and

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				are already mandated in another provision with an earlier implementation date, e.g.: • High efficiency sweepers • Parking restrictions • Diversion of dry weather & first flush flows	compliance dates have been revised for remaining provisions.	coordinate implementation
Oakley	71 & 88	C.2.b,C. 10.b & C.12.d	Overlapping Requirements	C.10.b overlaps with C.2.b and C.12.d. C.2.b makes curb clearing of vehicles an out reach item, but C.10 and C.12 make parking restrictions mandatory. Mandatory parking enforcement as a blanket requirement is unacceptable and should be left to the discretion of the local agency. We request that those provisions require outreach only due to multi-use housing and limited street parking sites. Also, the implementation and reporting dates need to be coordinated.	The TO does not require mandatory parking restrictions. Mandatory parking restrictions may be used as a trash reduction strategy for meeting the goals of provision C.10.	No changes made.
JamesRogerAttII	5	C.2.b.i	Sweeper efficiency	The Tentative Order indicates that regenerative air sweepers are effective in removing particulates less than 150-µm (medium sand). The USGS 2007 study conducted in Madison, Wisconsin reports that: Both regenerative-air and vacuum-assist sweepers slightly reduce particles greater than 250-µm and 500-µm respectively and broom sweeper reduce particles greater than 1,000-µm. All sweepers produced slight increases in the percentage of particles less than 125-µm. This study concluded that 'there is little probability that street sweeping, regardless of street-sweeper type, had any measurable effect on the quality of runoff." These results and conclusion raise significant questions regarding the Tentative Order's requirements that municipalities spend $250,000-350,000 for high efficiency street sweepers with $50,000 annual maintenance costs to address pollutants in runoff.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Brisbane SMCWPPPAtt3-Table SouthSF SCVURPPP Att A	7.1 6.1 7 4	C.2.b.i	Sweeper Efficiency/ cost	Municipalities need to consider all of their operational needs and local conditions when deciding on the purchase of street sweepers. Regenerative air sweepers are not good for all situations, especially for removing leaf-drop, and	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO).	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order

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Sunnyvale Att A Oakley Moraga ACCWP-Att2- Questions Alameda City Contra Costa Clean Water Program Millbrae Moraga Mayor Alameda City Millbrae-Robert Grottschalk- Hearing Albany	 2 17 17 5 4 5 4 7 5 4 & 5 2			it is not cost effective to use both broom and regenerative air sweepers. Besides, no studies demonstrate using regenerative air sweepers improve stormwater quality. In addition, mandating contract sweeper companies replace sweepers with a certain kind is outside the City's jurisdiction. If you are replacing your single sweeper, how does 75% work? The Water Board should encourage municipalities to consider the water quality benefits when purchasing new sweepers. (See study not included in the Findings: USGS Scientific Investigations Report 2007-5156, Evaluation of Street Sweeping as a Stormwater Quality Management Tool in Three Residential Basins in Madison, Wisconsin. http://pubs.usgs.gov/sir/2007/5156/#z). Revise the TO to encourages municipalities to consider purchasing regenerative air sweepers when purchasing new sweepers. The requirement for specific types of sweeping equipment should be removed as a permit condition until it is adequately demonstrated that water quality benefits are observed through the use of expensive, regenerative air sweepers. Municipalities could require contractors to use a certain type of sweeper when a contractor sweeps their roads, but they cannot control the contractor's overall purchase of equipment. Eliminate section C.2.b.i because it is Unnecessarily prescriptive and expensive requirement that 75% of replaced sweepers have the particulate removal performance of regenerative air sweeper or better. The specification of means of compliance violated Section 13360(a) of the Water Code. Unnecessarily prescriptive and presumes all local agencies either own and operate or exercise extensive control over contracted sweeping operations. Based on past experience, regenerative air sweepers are more maintenance intensive than	Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	(TO).

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				conventional broom sweepers, increasing costs and vehicle downtime. A regenerative air sweeper costs approximately $33,000 more than a comparable broom sweeper. The City already anticipates having to replace approximately two street sweepers over the term of the pending MRP. Thus, the estimated fiscal impact to the City over the term of the MRP for regenerative air sweeper purchase would be approximately $66,000 above the cost of direct replacement of the conventional broom sweepers. This does not include increased vehicle maintenance or downtime costs.		
Berkeley ACCWP-Att1-Redline	7.3 3	C.2.b.i	Redline/ Strikeout	The requirement for 75% of replaced street sweepers to have particulate removal of regenerative air sweepers or better does not give cities flexibility to use equipment that is most appropriate for specific applications. In some circumstances bush sweeper may be more effective than regenerative air sweepers even though the rate of particulate removal may be less. Modify the language as follows: At least 75% of the sweepers replaced during the Permit term shall have the particulate removal performance of regenerative air sweepers or better <u>unless the cities can demonstrate how an alternative sweeper is more effective for a specific application even though the rate of particulate removal may be less than that of a regenerative air sweeper.</u>	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Daly City	7	C.2.b.i	Sweeper Efficiency	The sweepers replaced during the Permit term shall have the particulate removal performance of regenerative air sweepers or better. High-performing sweepers are capable of removing fine particulates (i.e., particulates less than 150 microns)…Street sweeper operators shall be trained to enhance operations for water quality benefit. What is the particulate removal performance of regenerative air sweepers? We are not aware of	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

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				any street sweeper manufacturers that list fine particulates less than 150 microns in their equipment performance specifications. How will street sweepers be certified as high performing sweepers?		
Daly City	8	C.2.b.i	Fact Sheet Citation	o Fact Sheet - Provision C.2.b cites Article 121, Technical Note #103 from Watershed Protection Techniques. 3 (1): 601-604, New Developments in Street Sweeper Technology. In the article's summary, the author writes: "Additional wetfall research is needed to establish more representative pollutant removal efficiencies for street sweepers." Has this "additional wetfall research" been completed? If so, provide the correct citation for this additional research. o Fact Sheet - Provision C.2.b cites Article 121, Technical Note #103 from Watershed Protection Techniques. 3 (1): 601-604, New Developments in Street Sweeper Technology. This article was only available via purchase from the Center for Watershed Protection. Request attachment of cited articles. o Fact Sheet - Provision C.2.b cites the "Characterization of Portland's Storm Water Quality Using Simplified Particulate Transport Model (SIMPTM), the American Water Resources Association's National Symposium on Water Quality, Chicago, IL, November 6-10, 1994, Sutherland, Roger C. and Jelen, Seth L. 1994. The citation contained a link, http://www.worldsweeper.com/street/bestpractices. This article could not be located on the linked website.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Daly City	11	C.2.b.ii	Clarification Required	o "Provide annual training for street sweeper operators." What are the specific learning points and objectives of this annual training? What specific skill or knowledge is lacking?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

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Moraga Mayor	8	C.2.b.ii	Increase Cost	While the MRP's requirements on operator training and equipment operation will certainly affect the way contract operators perform, such an impact will be over the long term and will most certainly result in significantly increased costs to the local agency.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Palo Alto	5	C.2.b.ii	sweeping operation	•The permit requirement to verify the speed at which street sweepers are operated is unenforceable and of negligible benefit and should be deleted.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Daly City	10	C.2.b.ii	Clarification Required	Implementation Level – Permittees shall follow equipment design performance specifications to ensure that street sweeping equipment operates effectively and at the proper equipment design speed with appropriate verification; and is properly maintained. Provide annual training for sweeper operators. Vague. What is "appropriate verification" for ensuring that street sweeping equipment operates effectively and at the proper equipment design speed?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Contra Costa Clean Water Program	6	C.2.b.ii & C.2.b.iii	Prescriptive	The proposed language in provisions C.2.b.ii and C.2.b.iii is unnecessarily prescriptive, and will impose an unwarranted and costly additional administrative burden on municipal staff and its contractors. Replace and combine these two provisions as follows: 1. In the first full reporting year after Permit adoption, identify high, medium and low priority areas and an implementation schedule with respect to each. Annually identify any changes to each. 2. Maintain records of types of sweepers used and proper operation for each.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

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				3. Maintain records of swept curb miles and parking lots, volume or weight of materials removed, and verification of proper operation of equipment. 4. Maintain municipal staff training records. 5. Maintain a summary of seasonal leaf removal program efforts. 6. Maintain records concerning permittees public outreach efforts to improve sweeping efficiency. 7. Report information for items 3-6 (listed above) in summary form within Annual Report		
Daly City Oakley Moraga	18 12 12	C.2.b.iii	Reporting/ Training	...As mentioned in comments above for C.2.b.ii, what specific information would be acceptable in confirming rate or speed at which street miles are covered by sweeper operations? Without specific learning points and objectives to convey to street sweeper operators during training, it would be difficult to describe the method and effectiveness of sweeper operator training for enhanced water quality performance. Is it to be considered verification if training, maintenance and operating speed are confirmed from submitted written records? Will a written letter of certification from contract sweepers be acceptable?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Alameda City	19	C.2.b.iii	Reporting	...[T]he reporting requirement to document "Total roadway length swept at the curb, free of parked cars" (emphasis added) is impractical to implement. ...The City recommends that the RWQCB strike the expectation for local agencies to calculate the cumulative length of parked cars obstructing actual curb access.	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
Berkeley	6	C.2.b.iii	Reporting	Confirming and reporting on street sweeper rates and speeds is overly onerous. It is an example of a reporting requirement that would not improve water quality and diverts limited staff resources from far more productive activities. In Section C.2.b.iii, eliminate "Report on efficient street sweeping methods, including the manner of specifying and confirming rate or speed at	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).

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				which street miles are covered by sweeper operators."	for stormwater pollutant removal.	
Berkeley ACCWP-Att1-Redline	7.4 4	C.2.b.iii	Redline/Strikeout	Confirming and reporting on street sweeper rates/speeds is overly onerous. It is an example of a reporting requirement that would not improve water quality and diverts limited staff resources from far more productive activities. Delete: ~~Report on efficient street sweeping methods, including the manner of specifying and confirming rate or speed at which street miles are covered by sweeper operators.~~	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
ACCWP-Att2-Questions	6	C.2.b.iii	Reporting	How is this recording/reporting information going to be used by the Water Board?	In response to these comments and others, these provisions are removed from the Revised Tentative Order (TO). Street sweeping is an activity that all Permittees carry out currently, but with very few exceptions, it is not optimized for stormwater pollutant removal.	The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised Tentative Order (TO).
C.2.c – Street and Road Repair and Maintenance						
Central San	1	C.2.c		Street Road Repair and Maintenance Issue: The method of disposal of the residuals generated from this process activity is not identified. Disposal to the sanitary sewer system of concrete slurry or pavement cutting can contribute solids and pollutants that are not acceptable unless pretreated. CCCSD does allow these wastes to be discharged to the sanitary sewer provided that appropriate standards are met (e.g. pretreatment, obtain Special Discharge Permit (SDP) for larger projects). Recommendation: Add text to defer to the standards and approval authority of the sanitary sewer agencies' when instructing permittees to direct these wastewater-generating sources to the sanitary sewer.	The TO is revised to clarify that Permittees need to coordinate with local sanitary sewer authorities prior to disposal of wastes from such activities to sanitary sewer system.	The added language reads: *"Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer system is available for the wastewater generated from these activities provided that appropriate approvals and pretreatment standards are met. Permittees shall determine the proper disposal method for wastes generated from these activities. Permittees shall train their employees and/or specify in contracts about these proper capture and disposal methods for the wastes generated."*
SF Baykeeper	35	C.2.c	Vague	Street and Road Repair. Provision C.2.c needs to specify minimum BMPs and/or establish specific performance criteria. As written, it	BMPs for these maintenance activities are more subjective depending on the nature and location of the facilities.	Permittees are required to implement measures consistent with the BMPs

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				requires "appropriate" BMPs and "proper management" "to avoid discharges to storm drains."	Thus, it may not be appropriate to provide specific BMP menu that may limit the flexibility of using appropriate measures that fit the site condition. The permittees are required to implement BMPs as described in the California Stormwater Quality Association's Handbook for Municipal Operation.	described in the California Stormwater Quality Association's Handbook for Municipal Operation.
San Jose Att A	3	C.2.c, C.2.d, C.2.e	Editorial	The City requests the language for Provisions C.2.c.ii(1), C.2.d.i, and C.2.e.i.1 be consistent with the BASMAA Mobile Surface Cleaner Program that is referenced in the TO, and that the goal of implementing BMPs during maintenance as the "prevention of pollutant discharges" versus the prohibition of all wash waters to storm drains, which is sometimes impractical.	The TO is revised to clarify that the prohibition applies only to discharges of polluted wash water and non-stormwater discharges to storm drain inlets. The BASMAA Mobile Surface Cleaner Program is specifically referenced, and should be implemented to the extent that it results in the discharge of unpolluted water to the storm drain system. This approach will not cover all instances of such work, and further review by Permittees or the Water Board staff may be required for certain proposed operations.	C.2.d language revised to clarify discharge prohibition and usage of BASMAA Mobile Surface Cleaner Program.
SF Baykeeper, NRDC, & Clean Water Action	3	C.2.c.i	Vague	Places where the permit requires "appropriate" BMPs should be revised to include a BMP menu list of the minimum BMPs that must be implemented: C.2.c.i. Street and Road Repair and Maintenance: Asphalt/Concrete Removal, Cutting, Installation and Repair. "Permittees shall develop and implement appropriate BMPs at street and road repair and/or maintenance sites."	BMPs for these maintenance activities are more subjective depending on the nature and location of the facilities. Thus, it may not be appropriate to provide specific BMP menu that may limit the flexibility of using appropriate measures that fit the site condition. The permittees are required to implement BMPs as described in the California Stormwater Quality Association's Handbook for Municipal Operation.	Permittees are required to implement measures consistent with the BMPs described in the California Stormwater Quality Association's Handbook for Municipal Operation.
JamesRogerAttIII	2.3	C.2.c.ii(1)	Editorial	Provision C.2.c.ii.(1) – Change "avoid" to "prohibit".	The language and organization of C.2.C.ii has changed and this comment no longer directly applies. The word "avoid" was removed from the provision.	C.2.c.ii language revised.
Santa Clara County	3	C.2.c.ii(2	Dry Method	What is intended with proper management of	This section has been modified.	C.2.c. revised to provide more

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		)		concrete wastewaters? Are there going to be any new BMPS coming to address this issue? The County is also concerned with clean up spills using dry methods because of the high cost that is associated with this technique.	Permittees are required to implement BMPs in accordance with the California Stormwater Quality Association's Handbook for Municipal Operation. Permittees shall prevent the discharge of materials to the MS4 to the MEP	flexibility regarding specific methods while preventing discharges to the MS4.
Contra Costa Clean Water Program	7	C.2.c.ii(2)	Redline/ Strikeout	Add Reference to CASQA BMP Handbooks Add to the end of the last sentence of Provision C.2.c.ii (2) to read as "and/or the California Stormwater Quality Association's California BMP Handbook for Municipal Activities." Rationale for change: The California BMP Handbooks are a well recognized and readily available resource, and reflect the current state of water quality best management practices.	TO has been revised to incorporate the proposed comment.	See C.2.a.i for the revised TO language.
C.2.d – Sidewalk/Plaza Maintenance and Pavement Washing						
Brisbane SMCWPPPAtt3-Table Mountain View Palo Alto San Jose Santa Clara County SCVURPPP Att A Oakley Moraga	7.2 6.3 1 6 6 4 5 20 20	C.2.d	Sidewalk/plaza	Modify the TO to allow the discharge of washwaters to storm drains as described in BASMAA's BMPs for Mobile Surface Cleaner Program. Mountain View recommends a revision to this requirement stating that BASMAA's Mobile Surface Cleaner Program BMPs must be implemented during sidewalk and pavement washing operations. Furthermore, the City recommends revisions to clarify that the BMP for some types of cleaning operations may require collection of the wash water and disposal to the sewer, while wash water from other washing operations may discharge to the storm drain if BMPs are installed. Requiring San José to conduct this work only during the dry season will result in increased risk of system blockages and significant additional cost for storm preparation and response in the wet season. The total additional cost to meet this requirement as proposed is $650,000 per year.	The TO is revised to clarify that the prohibition applies only to discharges of polluted wash water and non-stormwater discharges to storm drain inlets. The BASMAA Mobile Surface Cleaner Program is specifically referenced, and should be implemented to the extent that it results in the discharge of unpolluted water to the storm drain system. This approach will not cover all instances of such work, and further review by Permittees or the Water Board staff may be required for certain proposed operations.	C.2.d language revised to clarify discharge prohibition and usage of BASMAA Mobile Surface Cleaner Program.
Central San	2	C.2.d	Sidewalk/plaza	Sidewalk/Plaza Maintenance and Pavement Washing Issue: CCCSD accepts the discharges from this process activity provided that the standards are met (e.g. pretreatment, obtain SDP). Using the sanitary sewer system for	The TO is revised to clarify that Permittees need to coordinate with local sanitary sewer authorities prior to disposal of wastes from such activities to sanitary sewer system.	The added language reads: *"Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer system is*

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				disposal is a more significant issue for other surfaces that could be cleaned by mobile washers (e.g. parking structures). The BASMAA Mobile Surface Cleaner Program BMPs allow sidewalk/plaza wash water to be discharged to the storm drain system if dry clean-up methods are used first and the water is screened (no mesh size specified) prior to discharge. This contradiction can cause confusion about proper management of wash water generated from cleaning these surfaces. Recommendation: Establish appropriate scope of activities that apply to this standard (e.g. include parking structures) and ensure that inconsistent standards are not set by referencing existing programs that do not meet the objective of the MRP.		*available for the wastewater generated from these activities provided that appropriate approvals and pretreatment standards are met. Permittees shall determine the proper disposal method for wastes generated from these activities. Permittees shall train their employees and/or specify in contracts about these proper capture and disposal methods for the wastes generated."*
Oakley Moraga	19 19	C.2.d	Compliance	Most mobile washing is done during late night hours, and the municipality is typically not informed of the washing schedule for private property. Does the Board require that night time policing activity include looking for and monitoring compliance of mobile washers? Is staff required to have late shift hours to have staff patrol to observe mobile washers, or does the Board have some specific activities to engage in to verify compliance?	Mobile washing business need license to operate within municipal jurisdiction. Permittees may specify stormwater compliance as one of the licensing conditional approval in order to insure that appropriate BMPs are implemented. Permittees shall determine if late night inspections are necessary to insure BMPs are properly implemented. We recognize that these businesses are difficult to regulate.	C.2.d language revised to clarify discharge prohibition and usage of BASMAA Mobile Surface Cleaner Program. Mobile business supervision has been moved to C.5 Illicit Discharge provision.
Oakley	158	C.2.d	Surface Cleaning Methods	Attachment L, C.2.d refers to BASMAA's "Pollution from Surface Cleaning, 7/1/96." This is outdated & doesn't require runoff diversion, only pre-dry sweeping or filtering of runoff.	Attachment L has been removed for the TO. Municipalities shall comply with the most updated BMPs in BASMAA or CASQA's handbooks for municipal operation.	Attachment L removed from the TO.
Contra Costa Clean Water Program Daly City Burlingame	8 13 1	C.2.d.i	Washwater Discharge	Allow Wash Water Discharge in Specific Circumstances. Section C.2.d.i - Replace "~~which prohibit the discharge of wash water to storm drains.~~ Permittees shall implement the BMPs included in…." with "consistent with". Rationale for change: This provision, as written, would prohibit all wash water from mobile cleaning, pressure wash operations, and	The TO The TO is revised to indicate that discharge of polluted wash water or non-stormwater to storm drain is prohibited. The BASMAA Mobile Surface Cleaner Program is specifically referenced, and should be implemented to the extent that it results in the discharge of unpolluted water to the storm drain system. This	The revised TO language is underlined. "Permittees shall implement, and require to be implemented, BMPs for pavement, washing, mobile cleaning, pressure wash operations in such locations as, parking lots and garages, trash areas, gas stations fueling

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				sidewalk and plaza cleaning from entering the stormwater system; however, BASMAA's Mobile Surface Cleaning Program allows wash water discharges to the storm drain in certain limited situations...	approach will not cover all instances of such work, and further review by Permittees or the Water Board staff may be required for certain proposed operations. language has to be self-standing and enforceable. Therefore, the TO is revised to indicate that discharge of polluted wash water or non-stormwater to storm drain is prohibited.	areas, and sidewalk and plaza cleaning, which prohibit the discharge of polluted wash water and non-stormwater to storm drains..."
C.2.e – Bridge and Structure Maintenance and Graffiti Removal						
Daly City	14.a	C.2.e	Discharge to storm drain	Bridge & Structure Maintenance & Graffiti Removal See Comment C.2.d.i. (i.e. The permit language should recognize the long standing practice of allowing some minor types of non-stormwater discharges when BMPs are used).	It is very difficult to classify between minor and major discharges. Multiple small discharges could also have significant impacts to water quality depending on the nature of pollutants and the sensitivity of the receiving water bodies. Thus, no discharge of polluted non-stormwater is allowed without properly removing pollutants of concern. If there are significant practicality issues for very minor discharges, these can be addressed case-by-case.	No change made.
Central San Santa Clara County	3 5	C.2.e	Graffiti removal	Bridge and Structure Maintenance and Graffiti Removal Issue: The method of disposal of the residuals generated from this process activity is not identified. Disposal of cleaning solutions should be prohibited from discharge to sanitary sewer. In addition, solids and potential metals from paint pigments should not be discharged to sanitary sewer. Recommendation: Identify that the residuals generated from this process activity need to be properly disposed. County staff is unaware of any BMPs for graffiti removal. How should pollutants be prevented from reentering storm or watercourses?	TO language is revised to clarify that discharges to the sanitary sewer require permission from the sanitary agency. See proposed language in the next column. Graffiti removal generated polluted wash waters may be disposed to landscaping where appropriate, or captured in absorbent or a wet vacuum for proper disposal.	*"Permittees shall determine the proper disposal method for wastes generated from these activities. Permittees shall train their employees and/or specify in contracts about these proper capture and disposal methods for the wastes generated. Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer is available for any wastewaters generated, and the necessary approvals and conditions."*
SF Baykeeper	36	C.2.e	Specify Appropriate BMPS	Bridge and Structure Maintenance and Graffiti Removal. Provision C.2.e should specify the minimum BMPs to be implemented.	Permittees will be able to implement pollutant control measures based on the needs and nature of their specific	No change is proposed.

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					maintenance activities after appropriate training, and using such guidance as the BASMAA Mobile Cleaner training materials, the CASQA BMP Handbooks, and other similar resources. Some of these work circumstances will require customized BMP solutions to prevent discharge of polluted non-stormwater.	
Oakley Moraga	21 21	C.2.e	Reporting	C.2.e requires reporting graffiti removal compliance. Is more required than the report in the Summary Table on page L-18?	Permittees are required to report compliance with the provision requirements.	Attachment L has been removed from the Revised TO.
JamesRogerAttIII	2.4	C.2.e.i(1)	Editorial	Provision C.2.e.i.(1) – Change to "implement BMPs to reduce to the maximum extent practicable discharge of wash water, sand blast material and paint drift to surface waters."	Permittees are required to implement BMPs to all provisions to the maximum extent practicable. The TO requires Permittees to implement BMPs for graffiti removal and prevent on-stormwater and wash water discharges to water ways or storm drains.	No changes made.
ConcordMayor Contra Costa Engineering Advisory Committee (CCCEAC)	8 6	C.2.e.i(1)	Bridges Retrofit	C.2.e.i(1) requires Permittees to prevent pollutant discharge from bridges. If this requires that all bridges be retrofitted, this is infeasible based on current budget restrictions.	The TO does not include bridge retrofit language.	No changes made.
SF Baykeeper, NRDC, & Clean Water Action Comment	4	C.2.e.i.	Vague	Places where the permit requires "appropriate" BMPs should be revised to include a BMP menu list of the minimum BMPs that must be implemented: C.2.e.i.(1). Bridge and Structure Maintenance and Graffiti Removal. "Permittees shall implement appropriate BMPs to prevent pollutant discharge from bridges and structural maintenance activities directly over water or into storm drains."	Permittees will be able to implement pollutant control measures based on the needs and nature of their specific maintenance activities after appropriate training, and using such guidance as the BASMAA Mobile Cleaner training materials, the CASQA BMP Handbooks, and other similar resources. Some of these work circumstances will require customized BMP solutions to prevent discharge of polluted non-stormwater.	No changes made.
JamesRogerAttIII	2.5	C.2.e.ii(1)	Editorial	Provision C.2.e.ii.(1) – Change "prevent" to "reduce to the maximum extent practicable".	Such maintenance activities are controllable, and Permittees need to implement pollution prevention measures to prevent debris and non-	No changes made.

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					stormwater discharges to storm drains and water ways.	
JamesRogerAttIII	2.6	C.2.e.ii(1)	Editorial	Provision C.2.e.ii.(1) – Change "protect" to "cover, berm or provide an equivalent BMP ".	Proposed language will not change the meaning or restriction of the requirement.	No changes made.
C.2.f – Catch Basin or Storm Drain Inlet Inspection and Cleaning						
SMCWPPPAtt3-Table	6.5	C.2.f	Add Language to TO	• The draft permit should have language added that the identification of inlets with high accumulations of trash/litter is for the purpose of identifying high trash and litter impact catchments per Provision c.10.a.i.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Moraga-KennedyF	49	C.2.f	Prescriptive	These streets get swept on a regular basis, but the inlets that you're going to see have not been cleaned ... The inlets that you're going to see have not been cleaned since September, so our question -- Well, it looks like somebody deliberately emptied their ashtray into one of our inlets, but our question becomes the rational of imposing prescriptive measures and trying to make that work in an economic fashion when you have that sort of situation.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Oakley	159	C.2.f	Reporting	C.2.f suggests in the "Comments", as an update, "the number of drain inlets that have been retrofit." The Permit requirement for C.2.f is to prioritize inlets not retro-fit. Retrofitting is a requirement of C.10.b.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11	The entire Provision C.2.f. has been deleted from the TO.

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					or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	
Contra Costa Flood Control	8	C.2.f	Maintenance Operations	The FC District constructs, owns, operates and maintains large regional drainage conveyance facilities. Maintenance services are performed for the FC District by the Contra Costa County Public Works Department (CCCPWD). CCCPWD provides appropriate staff training and performs the maintenance operations in accordance with the requirements of the RWQCB.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Pittsburg	1	C.2.f	Storm drain inlets	This requirement arbitrarily requires annual inspections and cleaning of all catch basins and storm drain inlets before the wet season. As written, this provision would require the City to fund the purchase of an additional vactor vehicle and to employ an additional storm vactor vehicle crew.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Suisun	5	C.2.f	Reporting	The city requests the deletion of the requirement to report on the inspection results at the transaction level. For Suisun City this	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If	The entire Provision C.2.f. has been deleted from the TO.

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				requirement would result in the recording of approximately 1,300 drop inlet inspection results each year for this Program. This excessive record keeping requirement would result in wasted public resources.	inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	
San Jose	2	C.2.f, C.3.b, C.4, C.8, C.10	Reporting	The draft Order that would be unreasonably costly and offer questionable returns in water quality benefit, including the following: • Treatment controls on trails and during road rehabilitation; • Shifting of storm drain inlet cleaning to dry season only; • Inspection of mobile businesses in the field; • Inspection of industrial facilities directly regulated by the Water Board; • Duplicative control measures for trash; • Monitoring and benchmarks for planned and unplanned potable water discharges; and, • Excessive data management and reporting. ... The aggregate of the proposed requirements do not reflect Water Board priorities and are too extensive to accomplish within a five-year permit term. The permit language is too prescriptive and does not provide municipalities with flexibility to implement their stormwater programs pragmatically and efficiently.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Central San	4	C.2.f.	Diversion to Sanitary Sewer	...Disposal of the aqueous phase of these residuals to the sanitary sewer is acceptable provided that significant contamination is not present (e.g. used oil dumping event contaminating solids in a catch basin, presence of pesticides). Solids should not be discharged to sanitary sewer.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the	The entire Provision C.2.f. has been deleted from the TO.

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					practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	
Alameda City Pittsburg	6 1	C.2.f.	Increase cost	Provision C.2.f requires the annual inspection and cleaning of all storm drain inlets and catch basins prior to the rainy season. The requirement for the City of Alameda to inspect and clean all storm drain facilities during the period May through October, would necessitate the purchase of at least three vactor trucks and the hiring of six additional full-time staff to operate this new equipment. The City recommends that this provision requirement should provide the City with the continued flexibility to perform actual cleaning efforts only where necessary based on inspection results. The estimated fiscal impact of the purchase of three additional vactor trucks would total approximately $630,000 for Alameda. For Pittsburg, the annual cost will be $300,000 or 38% increase of the current annual cost.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
FSSD/FairfieldSuisunURP – CullenK	74a	C.2.f.	Drain inlet inspections	There are DI inspections for each DI in the jurisdiction. It's unclear whether an inspection report is required for each DI inspection. If so, it's too onerous, too much paperwork for maintenance & public works folks. So clarify in the permit.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Los Gatos	3	C.2.f.	Storm drain	Regarding catch basin and storm drain inlet	In response to these comments, and	The entire Provision C.2.f. has

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			inlets	inspections, it would take the West Valley Cities backwards from their goal to ensure a clean storm drain system. Requiring that "Permittees shall annually inspect, before the wet season, all catch basins or storm drain inlets, and clean them to remove sediment, trash, litter, and other pollutants…", does not take into consideration a program that has successfully maintained clean systems on a biennial inspection/cleaning cycle. C.2.f. would require a 24-month task to be completed in four months (July to October); thereby necessitating three to four times the current number of staff to complete the work. The costs would be prohibitive without any benefit to water quality. We urge the Water Board to consider a less prescriptive method of attaining desired results. Allow permittees with sufficient data to develop a plan that identifies select storm drain structures for annual or semi-annual inspection and cleaning based on the quantity and type of debris found.	other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	been deleted from the TO.
Burlingame Daly City Menlo Park Millbrae Brisbane SMCWPPPAtt3-Table Mountain View San Jose San Jose Att A Santa Clara County SCVURPPP Att A Sunnyvale Att A Saratoga City Oakley Moraga San Jose – TovarM Fairfield City	2 14.b 5 5 7.3 6.5 2 4 4 6 6 3 1 22 22 61	C.2.f.i	Storm drain inlets	• Modify TO to limit inlet inspection and cleaning requirements to inlets municipalities own or operate and are part of the MS4 covered by the permit. Also, the language should be changed to only require inlet cleaning when an inspection shows cleaning is needed. • The TO allows the following alternative to the requirement for twice a year inlet inspections and maintenance: do what is required for compliance with Provision C.10.a.i (Trash Reductions). Modify the TO the use of other alternatives to this TO requirement as long as the alternatives help to lessen the accumulation of sediment, trash or debris. • To conduct this work only during the dry season will result in increased risk of system blockages and significant additional cost for storm preparation and response in the wet season. The total additional cost to meet this requirement as proposed is $650,000 per year.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.

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	14			Inspecting and providing records for all the storm drains in the county will be very difficult and generate a lot of additional work and cost. What is considered excessive sediment that would warrant increasing inspection and maintenance frequency for a specific storm drain? Will leaves be considered trash? For Fairfield/Suisun City, this requirement would result in the recording of approximately 4,000 drop inlet inspections each year for this Program. This excessive record keeping requirement would result in wasted public resources, and we request to be deleted.		
Berkeley ACCWP-Att1-Redline	7&7.5 5	C.2.f.i	Redline/ Strikeout	The requirement to inspect and maintain all inlets (regardless of ownership) would require Permittees to maintain inlets on private property. This is not feasible. Modify: Permittees shall annually inspect, before the wet season, all municipally owned catch basins or storm drain inlets, and clean them to remove….	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Danville Danville-Newell Arnerich-Hearing	5 2	C.2.f.i	Redline/ Strikeout	Requiring that all catch basins must be inspected and cleaned annually is excessive. This represents a 500% increase in the current service level, which has proven to be effective over the past 16 years of operating the Clean Water Program. Change ~~"all"~~ catch basins to be cleaned within one year to a requirement *to clean and inspect all catch basins on a minimum 3 year cycle*. Danville cleans and inspects 20 percent of our 5,000 catch basins annually. ... We have a program that we have proved to be effective. Let us continue that program.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets,	The entire Provision C.2.f. has been deleted from the TO.

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					primarily to prevent flooding.	
Contra Costa Clean Water Program	9	C.2.f.i & C.2.f.ii	Combine Provisions	Unnecessarily Prescriptive Sections C.2.f.i. and C.2.f.ii – Combine these two provisions and replace with the following: *1. Annually inspect, before the wet season, all catch basins and storm drain inlets for trash and accumulated debris and clean as appropriate.* *2. During inspections:* *a. Look for evidence of illicit discharges. Report evidence of illicit discharges to appropriate municipal representative(s) for follow-up in accordance with the "Illicit Discharge Detection and Elimination" provisions in C.5.* *b. Check for legibility of storm drain inlet markings and provide appropriate corrective action in accordance with provision C.7.a.* *c. Check for inlets and catch basins with high accumulation of trash. Conduct increased inspection and maintenance of problem areas in accordance with provision C.10.b.i.(1).* Justification for change: Water Board staff's proposed language is unnecessarily prescriptive and as a result confusing and poorly integrated with the other proposed provisions in the MRP (e.g., C.5 and C.10). The proposed language above is much clearer and concise, meets the intent of Water Board staff's language, and better integrates various provisions within the MRP. Should this proposed language not be acceptable to Water Board staff, the Program requests a detail response as to why this language is not acceptable.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
ACCWP-Att1-Redline	6	C.2.f.ii	Redline/ Strikeout	Storm drain cleaning should be done on an as needed basis … Modify the language as follows: (a) Inspect ~~and clean~~ storm drain inlets/catch basins, at least once per year before the rainy season <u>and clean as needed</u>	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain	The entire Provision C.2.f. has been deleted from the TO.

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					inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	
Daly City	15	C.2.f.ii (2)	Vague	..." The specific requirements "to increase inspection and maintenance frequency in problem areas, such as those that accumulate excessive sediment, trash and debris" are vague, subjective and lack specificity. What amount of material is "excessive sediment, trash and debris?"	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
Daly City	16	C.2.f.ii (3)	Clarification Required	o (3) In the course of inspection, identify storm drain inlets with high accumulations of litter/trash in Permittees' jurisdictions to prioritize areas where retrofit BMPs or other trash and litter abatement actions would be most effective in preventing trash and litter from entering storm drain systems. The results of this task shall be used in the prioritization and trash control requirements of Provision C.10. How do you define "high accumulations" of litter/trash?	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
San Jose Att A	5	C.2.f.ii(2) iii	Editorial	The City requests that this Provision be revised so that it is consistent with Provision C.7.a.ii which requires inspection of storm drain stencil legibility once per permit cycle.	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the	The entire Provision C.2.f. has been deleted from the TO.

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					practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	
JamesRogerAttIII	2.7	C.2.f.ii(3)	Editorial	Provision C.2.f.ii.(3) – Change to read "identify storm drain inlets or catch basins with more than three (3) inches accumulation ".	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
ACCWP-Att2-Questions	7	C.2.f.ii(3)	Reporting	This item should be removed from this section. This should be a one-time activity under C.10	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	The entire Provision C.2.f. has been deleted from the TO.
JamesRogerAttII	6	C.2.f.ii.2 (a) & (b)	Storm drain inlets	Provision C.2.f.ii.(2)(a) must require that inlets be inspected monthly and catch basins semiannually with one inspection during the month of September. Provision C.2.f.ii.(2)(b)	In response to these comments, and other comments elsewhere, this provision is deleted from the TO. If inlet cleaning proves to be a useful	The entire Provision C.2.f. has been deleted from the TO.

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				must require that catch basins be cleaned whenever 60% of the sump capacity is exceeded and during the month of September and inlets must be cleaned whenever the bottom has move than 4-inches of accumulated solids.	pollutant removal practice under the pilot investigations of provisions C.11 or C.12, Permittees may employ the practice in the future for stormwater benefit. To the extent trash capture devices are installed in storm drain inlets, more regular maintenance will be required to service those installations. Many Permittees currently clean storm drain inlets, primarily to prevent flooding.	
JamesRogerAttII	7	C.2.f.iii	Reporting	A requirement must be added to report the location of all catch basins and all inlets with standing water to the county mosquito abatement district.	The C.2.f prescriptive storm drain cleaning and reporting requirements have been removed	The entire Provision C.2.f. has been deleted from the TO.
San Jose Att A	6	C.2.f.iii	Editorial	The "shall report" phrase be changed to "shall summarize and report the data consistent with Attachment L."	The C.2.f prescriptive storm drain cleaning and reporting requirements have been removed	The entire Provision C.2.f. has been deleted from the TO.
ACCWP-Att2-Questions	8	C.2.f.iii	Reporting	What is the purpose of requiring municipalities to track and report on the cleaning of each catch basins?	The C.2.f prescriptive storm drain cleaning and reporting requirements have been removed	The entire Provision C.2.f. has been deleted from the TO.
FSSD	2	C.2.f.iii	Reporting	The District would strongly encourage the Water Board to not require the Permittees to record all inspections at the transaction level. Relief from this type of paperwork burden would allow Permittees to spend their time more effectively protecting water quality.	The C.2.f prescriptive storm drain cleaning and reporting requirements have been removed	The entire Provision C.2.f. has been deleted from the TO.
C.2.g – Stormwater Pump Stations						
Burlingame Millbrae SMCWPPPAtt3-Table Milpitas Palo Alto Santa Clara County SCVURPPP Att A Sunnyvale Att A	3 6 6.6 15 7 7 7 4	C.2.g	Pump Station	• The TO should be modified to only require that municipalities inspect stormwater pump stations that they own or operate. The fact sheet does not describe the technical basis for requiring inspections at a minimum frequency of four times per year. A particular pump station may not have water quality problems, and not justify 4x per year inspections. In addition, it is unclear what benefit there would be to provide the Water Board with information about the volume or mass of material removed from a particular pump station. SMCWPPP recommends that the permit avoid requirements to collect and report unnecessary information.	TO is revised to specify that Permittees will be responsible to provide inventory and perform inspection and maintenance of pump stations within their jurisdiction. The inspection frequencies have been reduced to twice a year. The TO language for this provision is revised in response to the comments received. See the proposed revisions. Please note that the monitoring requirement in this provision is focused	Inspect and collect dissolved oxygen (DO) data from all pump stations twice a year during the dry season between the months of July and October. Inspect pump stations in the first business day after ¼-inch within 24 hour or larger storm event. Such post-storm inspection and monitoring shall focus on trash and illicit discharge characteristics that

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				• The requirement for pump station maintenance during or within 24 hours of significant storm events is too inflexible. Municipalities have experience with how often these pump stations need to be maintained. SMCWPPP is unaware of any water quality problems that have been identified resulting from inadequate maintenance, and it recommends that this level of specificity is unnecessary to include in the permit. • The MRP requirements should make a distinction between maintenance operations and capital investment. Maintenance of the road and road culverts should not bear requirements commensurate with a large scale capital project. Replace "within 24 hours of significant storm event" with "within the next business day after a significant storm event." We do not believe this inspection warrants payment of double or triple overtime for our on-call field crews. It is not possible to "eliminate non-stormwater discharges" through operation, inspection, and maintenance of storm water pump stations, so delete this language from C.2.g.i. The County is proposing that there be three pump station inspections instead of four (fall, winter and spring). The County is also proposing that there is already a BMP that addresses inspecting trash racks and oil absorbent booms at pump station during or within 24 hours of a significant storm event and that it is not necessary to make this a regulation. It is essential that the new initiatives proposed in the TO be: (1) focused on identified receiving water quality problems, and (2) practical, understandable, within the control and jurisdiction of the municipal stormwater agencies, and allow for needed flexibility to cost-effectively solve water quality problems. C.2.g, C.11.f, C.12.d, and C.12.f has to be replaced with a single more integrated and effective requirement for the permittees to work with sanitary sewer authorities. Together with	on Dissolved Oxygen concentration. Other short-term and long-term monitoring requirements are addressed in the provisions for Pollutants of Concern in the Order.	may adversely affect receiving waters, including presence of odor, color, turbidity, and floating hydrocarbons. Remove debris and trash and replace oil absorbent booms, as needed.

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				BASMAA we are available to work with Water Board staff to develop specific permit language for the MRP that would specify parameters for this collaborative effort so as to ensure it is implemented. We are collectively willing to: 1) develop (Bay Area wide) an inventory of municipally owned stormwater pump stations, 2) characterize operations, 3) collect general water quality data sufficient to characterize potential water quality issues, and 4) identify criteria to evaluate potential solutions and to develop recommended guidance to prioritize and implement appropriate solutions. In the context of the collaborative and better informed approach, we are also willing, during the term of the permit, to initiate the identification of several additional pilot tests and work on developing a standard reporting format for O&M. • The City requests that the Water Board remove the debris quantification reporting requirement, as there is no support for it in the findings or as a water quality benefit.		
Bay Area Clean Water Agencies – Hearing – Pla, M. Contra Costa Clean Water Program LTR	1 3	C.2.g	Diversion to Sanitary Sewer	The Bay Area Clean Water Agencies is concerned about C.2, the diversions to sanitary sewers because it will enable us to meet our numerical and narrative water quality requirements. ... We believe that for the most part we -- well, we hope for the most part that most of our systems would be able to take dry weather urban runoff. They should be designed to do so, but we don't know that for sure. We have to actually take a look and do a hydraulic analysis and make sure we don't have some chokes in our systems that would cause sanitary sewer overflows somewhere else if we were to do that. But as far as taking wet weather runoff, that is going to be very, very site specific to make sure that we're not going to result in sanitary sewer overflows ... so that we're not trying to solve one problem and creating	Diversion of pump station discharges to sanitary sewer is removed from this provision. Dry weather and first flush diversions are addressed in the provisions for Pollutant of Concerns of the Order.	Diversion to sanitary sewer requirement is removed from this provision and included with the provisions for Pollutants of Concern.

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				another. We also want to make sure that if in fact we are going to be taking any kind of runoff into our systems that there's some kind of offset program, some kind of credit program created for our agencies for doing this. And we do believe that the San Francisco Southeast permit is an excellent model already there, already developed in this region for what we should be looking at for our NPDES permits for when it rains and when we look at taking that.		
Association of Governments of San Mateo County – Hearing – Napier, R.	1	C.2.g	Diversion to Sanitary Sewer	We believe the MRP should incorporate a stepwise approach to determine if there really are water quality problems at all pump stations and then allow municipalities the flexibility to determine the best way to deal with those problems rather than assuming diversion to the sanitary sewer is the most cost effective solution.	Diversion of pump station discharges to sanitary sewer is removed from this provision. Dry weather and first flush diversions are addressed in the provisions for Pollutant of Concerns of the Order.	Diversion to sanitary sewer requirement is removed from this provision and included with the provisions for Pollutants of Concern.
GCRCDAtt	8, 9, 10, 11, 12, 13, & 14	C.2.g, C.8	Non-stormwater Outfalls	The MRP does not adequately address non-stormwater outfalls that discharge water into waterways, including in multiple locations along Guadalupe River. The discharge from these outfalls have negative impacts to beneficial uses, such as sudden flow reduction strands fish, altering river water temperature especially during low flow periods creating negative impacts to salmonid spawning, egg incubation, hatching and rearing. The MRP needs to address these negative impacts and require they be eliminated or fully mitigated.	Many of the non-stormwater discharges should be controlled by provision C.15.. The pilot studies required in the provisions for Pollutants of Concern, and the various inspection provisions shall identify pollutant problem areas and require the implementation of appropriate control measures to control pollutant discharges to the maximum extent practicable.	No changes made.
Milpitas	10	C.2.g, C.8	Fact Sheet	Page 18 – How does observation of black-colored water discharges from the Alvarado pump station confirm that low dissolved oxygen in the slough was caused by urban runoff?	Only color cannot be used to distinguish the deficiency of DO in urban runoff. The best tool to measure DO deficiency is to measure, which is easily done on-site with the field monitoring equipment.	No changes made.

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JamesRogerAttII Contra Costa Clean Water Program	8 10	C.2.g.i	Pump Stations	It is unreasonable to require that existing pump stations comply with water quality standards. Last sentence should be changed to read "and to reduce the discharge of pollutants in the storm water discharges to the maximum extent practicable." Change ~~"comply with water quality standards"~~ to "the maximum extent practical in compliance with provisions in this order." to be consistent with State Board Order WQ 1999-05, which ties compliance with discharge prohibitions to the implementation of control measures.	The main purpose of the Order is to reduce pollutants from urban runoff with the ultimate goal to attain water quality standards in all receiving waters. In the implementation level, Permittees are required to check the DO concentration to be 3 mg/l or higher before discharging from pump stations to storm drains or other water ways to avoid discharge of polluted water that may impact receiving waters.	No changes made.
San Jose Att A	7	C.2.g.i	Pump Stations	The City requests the word "eliminate" be replaced with "reduce impact from" and, to note conditionally exempt discharges, contain the statement "consistent with Provision C.15."	The Permittees are not allowed to discharge non-stormwater discharges containing pollutants. The TO language is revised to clarify the statement while keeping the word "eliminate."	"… Permittees shall develop and implement measures to operate, inspect, and maintain these facilities to eliminate non-stormwater discharges containing pollutants,.."
Oakley	114	C.2.g.ii	Reporting	Attachment C.2g.ii & the Permit talk about reporting for items (1) - (3), but data is to be collected on dry weather and first flush flows. Should that not be reported here? The listing does not say if the information is to be submitted in hard copy or electronic. What is required?	Permittees are required to submit their annual reports in hard copy although they can also submit an electronic copy as a complementary. The reporting requirements for this provision are due with the annual reports.	No changes made.
JamesRogerAttIII	2.8	C.2.g.ii(1)	Editorial Comment Regarding Characteristics	Provision C.2.g.ii.(1) – Define "characteristics" in a footnote as "Land uses, catchment acres, design capacity, trash control design features, wet well size, depth of inlet and discharge pipes."	The purpose of the word 'characteristics" used in this context is for illicit discharge. The TO provided list of physical characteristics of the illicit discharges, such as odor, color, turbidity, and floating hydrocarbon presence.	No changes made.
JamesRogerAttIII	2.9	C.2.g.ii(2)	Editorial	Provision C.2.g.ii.(2) – Define or delete "water quality problems".	The phrase is deleted from the revised TO.	C.2.g.ii(2) language revised.
Contra Costa Clean Water Program	11	C.2.g.ii(2)	Pump Station Monitoring	Change ~~"but at least four times a year"~~ to "once before the wet season and once during the wet season".	The inspection requirement is reduced to twice a year during the dry season between months of July and October.	Specific language is given in the response for the first C.2. g. comment above.
San Jose Att A	8	C.2.g.ii(3)	Editorial	The City requests that the statement read "…within 24 hours *or next business day*…" so as not to incur unmerited costs.	TO is revised in response to this comment and other similar comments.	Specific language is given in the response for the first C.2. g. comment above.
Contra Costa Clean	12	C.2.g.ii(3	Redline/	Change C.2.g.ii.(3) to read: "(3) Inspect trash	TO is revised in response to this and	Specific language is given in

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Water Program FSSD	3	)	Strikeout	racks and oil absorbent booms at pump stations and remove debris in trash racks and replace oil absorbent booms, respectively, as needed." ...Prescribing (i.e., requiring) the inspection of trash racks and oil absorbent booms at each pump station during or within 24 hours of each significant storm event is without justification and would place, in most situations, an unnecessary and unwarranted burden on limited municipal public works staff. During storm events, Public Works staff is mobilized and ready to react to a variety of common emergencies (e.g., localized flooding, fallen trees, debris flows, etc…)...	other comments relevant to this provision.	the response for the first C.2. g. comment above.
JamesRogerAttII	9	C.2.g.ii(4)	Editorial	Suggest changing "first flush" to "first storm" of the year where predicted rainfall depth will exceed 0.25-inch.	TO language is revised specifying storm event that would trigger inspection.	Specific language is given in the response for the first C.2. g. comment above.
Contra Costa Clean Water Program	13	C.2.g.ii(4) & C.2.g.iii(2)	Overlapping Requirements	Sections C.2.g.ii.(4) and C.2.g.iii.(2) – Move these two provisions into provision C.8.e.iii. Referencing and including the implementation and reporting requirements (i.e., C.2.g.ii(4) and C.2.g.iii(2), respectively) related to the "Dry Weather Discharges & First Flush Investigations" required in provision C.8.e.iii in the standard provisions for operation and maintenance of municipal pump stations is unnecessarily duplicative and confusing.	The provision modified to streamline and avoid overlapping requirements.	C.2.g.ii language revised.
San Bruno-Larry Franzelle-Hearing	2	C.2.g.iii(1)	Increase cost	...San Bruno already inspects and maintains these pumps without compensation, but tracking the amount of waste and debris removed would require an additional cost of $120,000 for equipment and annual maintenance.	Tracking their inspection and trash and debris removal efforts, municipalities will be able to prioritize and target problem areas and eventually eliminate unnecessary cost allocation.	The reporting requirements in the TO have been revised.
JamesRogerAttII	10	C.2.g.iii(1)	Reporting	Both the volume and mass of materials removed must be reported to obtain an assessment of the type of material being quantified. Floatables captured in a CDS device ahead of a storm water pump station have been found to constitute about 8% of the volume, but only 0.6% of the mass of solids.	Under the revised TO, Permittees are required to keep records on-site and make them available upon request.	The reporting requirements in the TO have been revised.
ACCWP-Att2-Questions	9	C.2.g.iii(1)&(2)	Reporting	It is not a good use of resources for maintenance crews to be keeping track of how much trash they are removing from pump stations during a storm event, when their priority is to keep the	Tracking and keeping records of trash and debris removed from pump stations will eventually help Permittees to prioritize their efforts and allocate	The reporting requirements in the TO have been revised.

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				pump stations operating. What is the purpose of requiring this data to be collected and reported?	resources to more problem areas.	
Contra Costa County Supervisors	22	C.2.g/C. 11.f	Pump Station	POTWs may not allow diversion. It may not be possible to comply with the requirement to eliminate all non-stormwater discharges from the pump station. This provision (in conjunction with C.11.f) appears to imply that eliminating discharges of non-stormwater is to be accomplished by pumping to the sanitary sewer, which may not be accepted by the local Sanitary District.	The requirement for diversion has been removed from this provision and streamlined in the provisions for pollutants of concern.	Specific requirements for diversion removed from C.2
C.2.h – Rural Public Works Construction and Maintenance						
San Mateo County #1	1	C.2.h	Rural Roads	The draft permit should clarify the criteria which establish roads as problematic and requiring upgrades, allow local agencies to phase-in improvements by requiring that some improvements be made annually on problematic roads, and allow flexibility in the type of improvements constructed, so that individual site considerations and associated costs can be factored into the road improvement effort. The draft permit should be modified to eliminate the requirement that an agency continually police privately owned and maintained roads.	Under the current provisions permittees do have the ability to phase in improvements. Permittees must develop criteria for replacing problematic roads based many factors. The requirements of this provision include water quality related problems as a part of those criteria. Permittees have the flexibility to determine the appropriate methods for implementing water quality improvements. The TO does not require continual policing.	No changes made
SMCWPPPAtt3-Table Local Streets & Roads Working Group San Jose San Jose Att A SCVURPPP Att A CondordMayor Moraga Mayor CCCEAC	6.7 1 5 10 8 4 9 9	C.2.h	Rural Roads	• Municipalities covered under the permit should be responsible for implementing BMPs on rural roads that they own or operate. • There should not be fixed compliance dates in the permit, and that all dates be specified based on the permit adoption date. Thus, it is recommended that the BMPs should be indentified within one year of permit adoption and training on these BMPs be completed within two years of permit adoption. • Additional requirements should be conditioned to only apply where the additional maintenance and rehabilitation of stream crossings and culverts is needed and part of a MS4 owned or operated by a municipality covered under the permit. • Modify TO that requirements should only apply	• Permittees are responsible to maintain rural roads within their jurisdictions in a manner that does not cause pollution of stormwater runoff. • These requirements are not new to existing MS4 programs with rural infrastructures. Under the existing permit, Permittees of Alameda and Santa Clara Counties with rural roads have developed BMPs for maintenance activities. • Permittees without developed BMPs are required to develop and provide verification of their compliance three years after the adoption of the Order. In addition, some municipalities and special districts may seek a multi-year	No changes made.

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				to rural roads adjacent to streams and riparian habitat with a known MS4 related water quality problem. • Significant capital cost if the TO requires a rehabilitation program. The TO should make distinction between maintenance operations and capital improvement projects.	permit for projected rural road maintenance activities, such as culvert replacement, stream bank stabilization and bridge work. The TO provisions are intended to facilitate a simple process that will address pollutant issues that this work may create. • The intent of this provision is not to require capital improvement, but to implement BMPs when municipalities are conducting routine rural road maintenance and construction works in rural infrastructures.	
SF Baykeeper	38	C.2.h	Vague	Rural Public Works Construction and Maintenance. Provision C.2.h should identify minimum BMPs that must be implemented by permittees and contractors.	Projects that involve impacts to streams, wetlands, and riparian corridors are subject to site specific permits, such as Section 401 water quality certification from the Water Board and other agencies permits. BMPs for these maintenance activities are more subjective depending on the nature and location of the infrastructure. Thus, it may not be appropriate to provide specific BMP menu that may limit the flexibility of using appropriate measures that fit the site condition.	No change made.
GCRCDAtt	7	C.2.h	River/creek crossings	The MRP does not address the construction of creek and river crossings, or the problems they cause and no other sections of the MRP seem to address these problems ... Bridges and culvert openings must be adequately sized to allow a properly sized bankfull channel to pass unrestricted under the crossing and to drain an adequately sized floodplain.	The provision requirements are for rural public works construction and maintenance. Specific projects that directly involve water body alterations and impacts to wetlands are separately regulated under Section 401 water quality certification.	The TO language for this provision has been revised in response to these comments.
NRDC	20	C.2.h	Vague	• Street and Road Repair and Maintenance - Permittees must develop and implement "appropriate BMPs" to control debris and waste materials, and must "require proper management" of materials in order to "avoid discharge to storm drains." • Bridge and Structure Maintenance and Graffiti	Projects that involve impacts to streams, wetlands, and riparian corridors are subject to site specific permits, such as Section 401 water quality certification from the Water Board and other agencies permits. BMPs for these maintenance activities	No change made.

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				Removal • Rural Public Works Construction and Maintenance o Among other provisions, Permittees must implement BMPs that include: "[m]inimization of areas that are cleared and graded" to only that area necessary for active construction; "[m]inimization of exposure time" of areas of disturbed solid; "[p]reservation and protection of natural hydrologic features, riparian buffers, and corridors"; "[e]rosion prevention"; revegetation or landscaping "as early as feasible"; and implementation of advanced treatment for sediment removal, "if necessary," at sites that the Permittee determines to be "an exceptional threat to water quality." In many instances, the Draft Permit essentially directs the Permittees to develop their own permit, which will not be subject to public review or Board oversight. Further, the lack of performance standards and compliance measures could render these provisions useless if and when the Regional Board or the public ever needs to enforce them. Without a clear understanding of exactly what these sections require of the Permittees, the Board cannot determine that they result in the reduction of pollutants to the maximum extent practicable.	are more subjective depending on the nature and location of the infrastructure. Thus, it may not be appropriate to provide specific BMP menu that may limit the flexibility of using appropriate measures that fit the site condition. Permittees will report on BMP implementation in the annual report, if the measures implemented are not adequate the Water Board will take appropriate follow up actions.	
San Jose Att A	9	C.2.h	Why change	The City and SCVURPPP spent considerable time, effort, and funds developing the Performance Standard and Supporting Documents for Rural Public Works, Maintenance and Support Activities. The TO provides no basis for changing the existing standard, which was approved by the Water Board and has been successfully implemented in the City.	The main purpose of developing MRP is to create an "even playing field" because not all Permittees have developed BMPs for the rural road construction and maintenance activities. Most of the Provision C.2.h requirements are inherited from the existing Performance Standards of the MS4 programs, including SCVURPPP.	No changes made.
Contra Costa Clean Water Program	17	C.2.h	Increase cost	Water Board staff's well intended yet overly prescriptive language in this provision will have the unintended consequence of further exacerbating deferred rural road maintenance needs, which is in excess of 10 million dollars	• These requirements are not new to existing MS4 programs with rural infrastructures. Under the existing permits for Alameda and Santa Clara Counties, Permittees with rural roads	No changes made.

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				countywide.	have developed BMPs for maintenance activities. • Permittees without developed BMPs are required to develop and provide verification of their compliance three years after the adoption of the Order. In addition, some municipalities and special districts may seek a multi-year permit for projected rural road maintenance activities, such as culvert replacement, and stream bank stabilization and bridge work. The TO provisions are intended to facilitate a simple process that will address pollutant issues that this work may create. • The intent of this provision is not to require capital improvement, but to incorporate BMPs when municipalities are conducting routine rural road maintenance and construction works in rural infrastructures.	
Oakley Moraga	23 23	C.2.h.i	Impacts to Creek	Why should we have to notify the Board, Fish and Game, and the Corps if we need to do road maintenance - this seems to imply the elements of a new permit program so we can work on our own roads? What defines near a creek?	Only activities that involve alteration of water bodies and/or wetlands require pre-construction notification and approval from regulatory agencies, including Water Board, Fish and Game, the Corps, and other state and local agencies.	. No changes made.
Contra Costa Clean Water Program	14	C.2.h.i & C.2.h.ii	Combine Provisions	...The overly prescriptive language in provision C.2.h.i and C.2.h.ii requiring development and submittal of BMPs, training and technical assistance requirements, road maintenance priority criteria, etc… is unwarranted, in conflict with other agencies priorities and specifications, and will result in wasted effort and inefficient use of severely limited public funds for road maintenance with no additional water quality benefit... Combine Sections C.2.h.i & C.2.h.ii to read as follows: "Implement and require contractors to implement	The Permittees are required to develop and implement effective BMPs for erosion and sediment control measures during construction and maintenance of rural road and associated activities. The specific implementation levels of this provision will guide Permittees to develop the required minimum BMPs consistent with those in the CASQA Handbooks for on-site use by maintenance crews. Alameda and Santa Clara Counties	The reporting requirements have been reduced in the TO.

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				appropriate BMPs to the maximum extent practicable (MEP) during construction and post-construction of rural road construction and maintenance activities, particularly in or adjacent to stream channels or wetlands. Permittees shall always notify Water Board, the California Department of Fish and Game and the U.S. Army Corps of Engineers, where applicable, and obtain appropriate agency permits for rural public works activities before work in or near creeks and wetlands occurs."	have developed Rural Road BMP guidance. We would expect San Mateo and Contra Costa Counties to build on these existing efforts, and include information from other available guidance, particularly related to work around and in salmonid stream habitat.	
SF Baykeeper, NRDC, & Clean Water Action Comment	5	C.2.h.ii	Vague	Places where the permit requires "appropriate" BMPs should be revised to include a BMP menu list of the minimum BMPs that must be implemented: C.2.h.ii.(2)(2). Rural Public Works Construction and Maintenance. "Permittees shall develop and annually evaluate appropriate management practices for the following activities, which minimize impacts on streams and wetlands."	Projects that involve impacts to streams, wetlands, and riparian corridors are subject to site specific permits, such as Section 401 water quality certification from the Water Board and other agencies permits. BMPs for these maintenance activities are more subjective depending on the nature and location of the infrastructure. Thus, it may not be appropriate to provide specific BMP menu that may limit the flexibility of using appropriate measures that fit the site condition.	No change made.
Berkeley ACCWP-Att1-Redline	7.6 7	C.2.h.ii	Redline/ Strikeout	Most, if not all, jurisdictions have significant road maintenance backlogs due to inadequate funding. Requiring Permittees to divert funding from more urgent road maintenance needs to rural roads simply due to the proximity of such roads to streams and riparian habitat is not feasible nor is it an effective use of limited resources. Modify TO language: Permittees shall implement ... with water quality standards when rehabilitating or maintaining rural roads: (a) ~~Increase maintenance for~~ Modify rural roads adjacent to streams and riparian habitat to reduce erosion, replace damaging shotgun culvert, re-grade roads to slope outward, and install water bars; and (b) Rehabilitate existing ands design new	Comment accepted, and the TO is revised to incorporate the comments.	The provision is modified in response to the comment.

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				culverts and bridge crossings with measures to reduce erosion, provide fish passage and maintain natural stream geomorphology in a stable manner		
Contra Costa County Supervisors	24	C.2.h.ii	Clarification Required	Some of the language of this provision is unclear and requires further clarification including the pre-rainy season inspection program for rural roads (C.2.h.ii(2)(f)), increased maintenance on rural roads adjacent to streams and riparian habitat (C.2.h.ii(3)(a)), and the requirement for rehabilitation of existing culverts and bridge crossings(C.2.h.ii(3)(b)).	The provision is revised to clarify the specific requirements. The pre-rainy season inspection is required to repair damaged culverts or bridge crossings that are adjacent to streams to minimize further erosion and sediment transport to those streams.	C.2.h.ii language revised.
Contra Costa Clean Water Program	16	C.2.h.ii & C.2.h.iii	Rural Roads	Provisions C.2.h.ii and C.2.h.iii require development and submittal of BMPs for construction and post construction on rural roads. The California Stormwater Quality Association's (CASQA's) BMP Handbooks (i.e., Construction Handbook and Municipal Handbook) already identify specify stormwater quality BMPs for road maintenance and construction activities.	The Permittees are required to develop and implement effective BMPs for erosion and sediment control measures during construction and maintenance of rural road and associated activities. The specific implementation levels of this provision will guide Permittees to develop the required minimum BMPs consistent with those in the CASQA Handbooks for on-site use by maintenance crews. Alameda and Santa Clara Counties have developed Rural Road BMP guidance. We would expect San Mateo and Contra Costa Counties to build on these existing efforts, and include information from other available guidance, particularly related to work around and in salmonid stream habitat.	No change made.
Oakley Moraga	24 & 25 24&25	C.2.h.ii(1) & C.2.h.ii(2)	BMP guidance	C.2.h.ii. (1) requires the development of BMP's for erosion control during and after construction of rural roads. Has the Board certified, or does the Board plan to certify any existing BMP's as complying with the requirement? Absent guidance, how will agencies know what is wrong with current practices, and when their efforts have been spent profitably creating management practice documents?	See response to Contra Costa Clean Water Program Comment 16 above.	No change made.
Oakley	26	C.2.h.ii(2	Prioritization	Municipalities must prioritize a list of roads for	In addition to the pavement quality	No change made.

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Moraga	26	)(b)		repair based on the pavement condition index. If this is deviated from, the agency will lose its state roadway maintenance money for not complying with the legal requirements to receive that money.	index, Permittees shall also consider practices to minimize impacts on streams and wetlands. Including the criteria to prevent stream impacts should not preclude the receipt of State money.	
ACCWP-Att2-Questions AlamedaCo	10 & 11 3	C.2.h.ii(2)(b) & C.2.h.ii(2)(f)	Rural Roads	This requirement is unnecessary and counter productive, and should be removed. Municipalities have existing criteria in place for prioritizing road maintenance based on preserving infrastructure and protecting public safety.	In addition to the stated criteria, such as preserving infrastructure and protecting public safety, Permittees shall also consider practices to minimize impacts on streams and wetlands	No change made.
Oakley Oakley CCCEAC Contra Costa Co. Supervisors Contra Costa Clean Water Program Moraga	27 8 23 15 4 27	C.2.h.ii(3)(a)	Re-grading	C.2.h.ii (3) (a) requires the re-grading of the roadway section to "…slope outward…" The geometric design of roadways is dictated by the AASHTO "Policy on the Geometric Design of Highways and Streets". This sets forth the general roadway section recommendations for high point at the crown and 1.5 to 2% slope to the edge of pavement. It also calls for erosion control measures of a minimum of seeded topsoil. The cross section and the need for super-elevation in curves are further dictated by the Caltrans Highway Design Manual. These standards can not be varied from. Changing road slope only possible and safe if the road curved across the drainage resulting in a super-elevated road section, otherwise regrading the road to slope outward would result in a unsafe traffic condition. The following language should be added to the TO "where consistent with road engineering safety standards."	The TO is revised to add the suggested language.	Language revised in C.2.h.ii(e).
ACCWP-Att2-Questions	12	C.2.h.ii(3)(a)	Rural Roads	This requirement should be removed. What does "increase maintenance" mean? What is the baseline? How is this maintenance to be incorporated into existing road maintenance programs?	The phrase "need increased" is removed. However, Permittees have to identify and prioritize rural roads that need maintenance to minimize erosion and sediment transport during rainy season.	Phrase removed from C.2.h.ii.
CCCEAC	7	C.2.h.ii.(3)(b)	Rural Roads	Existing Site Conditions Limit Ability to Prevent Erosion and Improve Fish Passage During Maintenance Projects. ... Many roads have near vertical road cuts from when they were	Permittees are required not to create a migratory fish passage barrier, where migratory fish are present, or lead to stream instability when replacing old	No change made.

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				constructed many decades ago. It will be nearly impossible to control erosion and mudslides from these steep road cuts. Maintenance activities often include repairs to cross culverts. Adding a requirement to provide fish passage, erosion reduction and restoration of natural stream geomorphology will result in a much larger capital project rather than a simple maintenance project.	culverts or constructing new ones.	
San Jose Att A	11	C.2.h.iii(1)	Reporting	The City requests the reporting requirements be consistent with Attachment L.	Attachment L has been removed from the revised TO..	Attachment L has been removed from the revised TO
JamesRogerAttIII	2.1	C.2.h.iii(2)	Editorial	Provision C.2.h.iii.(2) – Clarify what is meant by "performance standards" or include the performance standards or delete since they have not been previously identified.	"Performance Standard" will be added to MRP's glossary.	Glossary revised.
C.2.i –Corporation Yard BMP Implementation						
Brisbane SMCWPPPAtt3-Table SCVURPPP Att A	7.4 6.8 9	C.2.i	Corporate Yard	• Modify the TO to require that municipalities use appropriate BMPs to control potential pollutant sources at corporation yards they own or operate, but not to prepare Stormwater Pollution Prevention Plans for facilities not subject to the State's General Industrial Activities Stormwater Permit. • The requirement for routine inspections should be allowed as part of City crews' regular activities, as crew members are typically in and out of the corporation yard multiple times a day, so formal inspections are unnecessary. • The TO should prohibit discharge of vehicle washwater to the storm drain system, but not require discharge to sanitary sewer if municipalities can develop alternative wash rack facilities that flow to vegetated areas or other areas that do not impact MS4 water quality. Brisbane's corporation yard does not have a sanitary sewer connection. • The TO should be revised to allow for an alternative for rural corporation yard facilities without accessible to sanitary sewers. The TO should allow wash waters to flow to vegetated areas or other areas that do not impact water quality.	Permittees are required to implement BMPs to corporation yards within their jurisdiction. A SWPP Plan is an appropriate site specific tool and is not limited to General Industrial Stormwater Permitted facilities. Facilities without access to sanitary sewer must have other treatment alternatives and discharge to vegetated area may be appropriate if operated properly.	No changes made.

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SF Baykeeper	37	C.2.i	Vague	Corporate yard BMP Implementation. Provision C.2.i should specify the minimum BMPs to be implemented.	The TO is revised to address the comment.	The additional TO language reads "…Each SWPPP shall incorporate all applicable BMPs that are described in the Caltrans Storm Water Quality Handbook Maintenance Staff Guide, May 2003, and its addenda."
Contra Costa County Supervisors	25	C.2.i	Clarification Required	At the start of this section "The requirements in this provision shall apply only to facilities that are not already covered under the State Board's Statewide Industrial Stormwater NPDES General Permit." This language implies that the County's three Corporation Yards (in Martinez, Richmond and Brentwood) do not have to comply with the requirements of this section, since they are already covered under the General Industrial NPDES Permit (due to their Motor Freight and Transportation Warehousing NAIC code). If the above-noted inference is correct, than this provision is acceptable.	Yes, the interpretation in the comment is correct.	No changes.
Central San	5	C.2.i.	Diversion to Sanitary Sewer	... Additional text to defer to the sewer agencies' standards and/or approval authority should be included whenever the MRP instructs the permittees to divert discharges from the stormwater system to the sanitary sewer system.	All diversions from stormwater system to sanitary sewer must be approved by local authorities prior to discharge.	No changes made.
JamesRogerAttIII	2.11	C.2.i.i (2)	Editorial	Provision C.2.i.i.(2) – Include a list of those facilities not covered by the SWRCB's general permit or refer to a specific section in the general permit to allow easy identification of those already covered.	No need to have a list of the facilities not covered by the SWRCB's general permit. Permittees will provide list of those facilities with the annual report when documenting their compliance.	No changes.
JamesRogerAttIII	2.12	C.2.i.ii(2)	Editorial	12. Provision C.2.i.ii.(2) – Changes: a. "Routinely" to "Weekly". b. "before the start of the rainy season" to "24-hours prior to a rainfall event predicted to be > 0.25-inch depth".	The on-site storm drain inlets collect limited runoff, and there will be routine oversight due to their proximity to daily workers.	No changes made.
San Jose Att A	12	C.2.i.ii(5)	Outdoor storage	Permittees should be allowed to determine the best and most cost efficient way of preventing pollution of stormwater runoff or run-on to storm drain inlets for each individual outdoor storage area.	The proposed implementation levels do not prevent Permittees to develop their own effective BMPs. That is the reason why the Order requires development of site specific SWPPP.	No changes made.
ACCWP Attny	2	C.2.i.ii.(3	Diversion to	...Provision C.2.i.ii.(3) requires all municipal	Diversion to sanitary sewer is required	Revised language indicating

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Provision C.2. – Municipal Operations

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
		), C.11.f., C.15.b.v. (c)	Sanitary Sewer	corporation yard vehicle and equipment wash areas to be plumbed to the sanitary sewer; Provision C.15.b.v.(c) requires new or remodeled swimming polls, hot tubs, spas and fountains to be connected to the sanitary sewer. The Tentative Order also contains many provisions that simply consider and encourage discharge to the sanitary sewers. The latter, however, which stops short of requiring discharges to POTWs, is more appropriate and would be within the legal control and authority of Permittees. The above-mentioned provisions that require Permittees to discharge urban stormwater flows to POTWs are beyond the control and authority of the Permittees. Most Permittees lack the legal authority to discharge these described flows to POTWs without the POTWs (separate legal entities) providing their consent. We request that provisions in the permit requiring stormwater flow be directed or diverted to the sanitary sewer be replaced with requirements to explore the feasibility of obtaining POTW cooperation and consent for such potential flow diversions.	only if feasible and approved by local sanitary sewer authorities. Specific revisions are made to the TO here and elsewhere in response to comments on diversion to sanitary sewer systems.	that diversion to sanitary sewer only were feasible and approved by local sewer agency.
JamesRogerAttII	11	C.2.i.ii.(5)	Storage areas	Outdoor storage areas must be covered and bermed to contain spilled materials as pollutant source control.	Usually the word “shall” rather than “must” is commonly used in Water Board orders, and for consistency, no change is recommended.	No changes made.
JamesRogerAttII	12	C.2.i.iii.	Spill Reporting	Reporting of spills of certain types of hazardous materials is required under state and federal law. This provision needs to reflect those requirements in addition to the annual reporting requirement. The submittal of reports of hazardous materials in an annual report does not provide any sense of urgency in addressing spills of hazardous materials.	Spill report and responses are addresses separately in Section C.5. The urgency of addressing hazardous spill and hazardous materials is also addressed by other Resource Agencies.	No changes made.
SMCWPPPAtt3-Table	6	Page 1 of TO	Editorial	• C/CAG does not own or operate an MS4 and should not be listed as a discharger. SMCWPPP recommends that the permit delete C/CAG as a discharger and add language stating that the San Mateo Countywide Water Pollution Prevention Program is a program of the	After reviewing the records and consultation with our in-house counsel, we removed the City/County Association of Governments of San Mateo County (C/CAG) from listing it as a Permittee. All members of C/CAG	C/CAG is taken out of the Order as a discharger or responsible party.

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				City/County Association of Governments of San Mateo County.	are listed as Permittees in the Order, and C/CAG does not own or operate unregulated municipal facility.	
SCVURPPP Att A	92	Table C.2.i	Reporting Attachment L	o Type of Operation - This column is not needed. Tracking inspection results from each specific corporation yard activity is burdensome since numerous activities are conducted. Tracking at this level of detail will increase: 1) the time needed to conduct an inspection; and 2) data collection and reporting requirements. The comments field will capture inspection result details and problematic locations. o Compliance Status- It is unclear why it is necessary to assign compliance status to describe inspection results. A better approach to indicate compliance is to report if any violations were noted. If so, provide a standardized description of the violation. The Program would prefer this approach because: 1) you have the ability to learn what	In general, reporting Attachment L is removed as an attachment from the revised TO. However, Permittees are required to report the results of annual inspections and any follow-up actions at all corporation yards.	The reporting requirement is revised to read as follows: "Permittees shall report the results of annual inspections and any follow-up actions at all corporation yards."

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Provision C.3. – New Development and Redevelopment

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Fremont - Cote, K	2	C.3.	Flexibility	With respect to flexibility, we agree with the comments on the C.3 enhanced requirements.	Comment noted.	None
GCRCD Att	15	C.3.a.	Performance Standard Implementation *MEP*	This Provision contains some very good requirements but who defines what adequate and the maximum extent practicable is?	WB staff determines compliance with the MRP based on our current understanding of what constitutes MEP.	None
CCCSD	6	C.3.a.i.(6)	Performance Standard Implementation *Site Design Measures (for all projects)*	The reference to "disconnecting roof downspouts" without identifying alternative management strategies for the water collected in the roof downspouts could create significant problems for CCCSD. This may serve as an incentive for some developers to connect roof leaders to the sanitary sewer system, a practice specifically prohibited by CCCSD and other sanitary sewer agencies.	We agree.	Provision C.3.a.i.(6) has been revised to require Permittees to encourage development projects to direct roof runoff to vegetated areas and not just to disconnect roof downspouts.
James, Roger Att II	13	C.3.a.i.(6)	Performance Standard Implementation *Site Design Measures (for all projects)*	• Requiring disconnection of downspouts for new and redevelopment projects and infiltration of stormwater into the highly expansive Group D soils that dominate much of the Bay Area does not recognize the potential for creating slides, serious structural problems, and litigation. These practices should not be undertaken unless a registered professional geotechnical engineer has reviewed and approved the overall site plan containing these measures. • It is inconsistent to allow roof runoff to planter boxes, swales and bioretention devices with underdrains that discharge to storm drains while insisting on disconnection of the roof leaders from storm drains. • The requirements for onsite infiltration should be delayed until site suitability criteria specific to the Bay Area's soils are developed.	Provision C.3.a.i.(6) does not require that all development projects disconnect roof downspouts. Rather, it encourages the inclusion of adequate site design measures that may include directing roof runoff to vegetated areas. It is implicit that these measures be taken only in suitable areas.	Provision c.3.a.i.(6) has been revised to clarify this intent.
Brisbane Menlo Park	8a 3b	C.3.a.i.(6)&(7)	Performance Standard	Add language to clarify that "all new development and redevelopment projects not	We agree.	Provisions C.3.a.i.(6)&(7) have been revised as

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
SCVURPPP Att A SMCWPPP Att 3	10 7a		Implementation *Site Design & Source Control Measures (for all projects)*	regulated by C.3" means all projects that are subject to Co-Permittee development project review. Otherwise this is a new requirement that extends to a much larger group of projects and would be a significant burden on municipal staff resources, as well as impossible to implement by July 1, 2008. Language changes are also needed to clarify that site design and source control measures are "encouraged" at these sites and not required.		requested.
James, Roger Att II	14	C.3.a.i.(7) Fact Sheet Provision C.3	Performance Standard Implementation *Source Control Measures (for all projects)*	The use of "maximum extent practicable" in the third line is an incorrect application of the MEP performance standard. The Tentative Order applies it to the "inclusion of source control measures" rather than "reduction of pollutants." Change both this Provision and the Fact Sheet (pages 20-21) to apply a correct application of MEP.	We agree.	Provision C.3.a.i.(7) has been revised as requested.
CCCSD	7	C.3.a.i.(7)	Performance Standard Implementation *Source Control Measures (for all projects)*	• This provision identifies discharges that are to be directed to the sanitary sewer without consideration of whether they would be acceptable to the sanitary sewer agencies. • Some of the water generating sources may not be acceptable for discharge to the sanitary sewer (e.g. passive drains from swimming pools, direct connections to divert fire sprinkler test water).	We agree.	Provision C.3.a.i.(7) has been revised to state that all source control measures that include connection to the sanitary sewer are subject to the local sanitary sewer agency's authority and standards.
Santa Clara Co	14	C.3.a.i.(7)	Performance Standard Implementation *Source Control Measures (for all projects)*	For sanitary sewer connections for swimming pools, does this include both public and private pools?	Yes, the reference to discharging swimming pool water to the sanitary sewer applies to both public and private pools.	None
Santa Clara Co	15	C.3.a.i.(7)	Performance Standard Implementation	What is intended by implementing source control measures for properly designed covers, drains and storage precautions for outdoor material storage areas, loading docks,	Source control measures for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling area should include providing proper cover	None

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			Source Control Measures (for all projects)	repair/maintenance bays and fueling areas?	from rain for these areas, proper storage precautions including secondary containment for spills, and proper drainage in these areas so that stormwater runoff is not drained directly to the storm sewer system but rather drained to the sanitary sewer, if allowed, or to a holding area and subsequent proper disposal.	
CCCWP	25	C.3.a.i.(8)	Performance Standard Implementation *General Plan Amendments*	The requirement to "revise, as necessary, General Plans to integrate water quality and watershed protection with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and practices" is both too sweeping and too vague.	The intent of Provision C.3.a.i.(8) is to require Permittees to review and revise as necessary their General Plans to reflect a more holistic approach to water quality and water supply as guided by Ahwahnee Water Principles for Efficient-Resource Land Use http://www.lgc.org/ahwahnee/h2o_principles.html.	None
Brisbane CCCWP	8a 25	C.3.a.i.(8)	Performance Standard Implementation *General Plan Amendments*	Under the current C.3. Provisions, General Plans were modified to integrate water quality and watershed protection principles. We recommend revision of this language to reflect the existing Provision C.3 requirement to ensure General Plans integrate water quality and watershed protection principles, but not specifically require implementation of Provision C.3.	We concur that the requirement to revise General Plans to implement Provision C.3. is redundant with Provision C.3.a.i.(1).	The requirement to revise General Plans to implement Provision C.3. has been deleted from Provision C.3.a.i.(8).
CCCEAC	26	C.3.a.i.(8) C.3.a.ii.	Performance Standard Implementation *Implementation Due Date*	Timetable for General Plan amendments is unrealistic. Change implementation (Provision C.3.a.ii.) to July 1, 2009.	We acknowledge that General Plan amendments may take more time.	As requested, the due date for General Plan revisions has been changed to allow an extra year.
James, Roger Att II	15, 16	C.3.a.i.(8) C.3.b.i	Performance Standard Implementation *General Plan*	Infiltration BMPs are prone to failure through clogging and there is growing concern and evidence that LID measures are not being maintained to sustain design infiltration capacities. A requirement for the maintenance	We concur that stormwater treatment systems should be maintained for the life of the project.	Provision C.3.h.iii. now requires all stormwater treatment systems and HM controls to be properly operated and

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			Amendments	of measures for the life of a project must be added to Provisions C.3.a.i.(8) and C.3.b.i. (Task Description).		maintained for the life of the project.
Brisbane Millbrae SMCWPPP Att 3	8a 7 7a	C.3.a.ii.	Performance Standard Implementation *Implementation Due Date*	Municipalities are required to begin implementing these performance standards by July 1, 2008. The Permit should allow an adequate period to phase in new requirements that are similar, but not identical to existing requirements. We recommend that the permit allow a two-year phase in period because of all of the other competing MRP requirements that municipalities need to meet.	With the exception of Provision C.3.a.i.(8), Provision C.3.a., as revised, specifies elements that should already be in place under the Permittees' current stormwater permits. As such, the "phase-in" period has already passed so the requirements should be effective as soon as the MRP is effective. We acknowledge that General Plan amendments may take more time.	None for Provision C.3.a.i.(1)-(7) but the due date for General Plan revisions (Provision C.3.a.i.(8)) has been changed to 1 year after the MRP effective date.
Friends of Five Creeks	1, 2	C.3.b. C.3.c. C.3.g.	Treatment Threshold & Hydromodification Management Threshold	• The TO assures that for the next five years – really seven – the Bay Area will not substantively deal with impacts of new development, redevelopment, and hydromodification. The too-high ceilings from the last permit essentially remain unchanged - 10,000 ft² triggers treatment requirements and one acre triggers hydromodification requirements. • There is no encouragement, positive or negative, of many of the alternative ways in which cities could reduce runoff pollution, such as programs to disconnect roof leaders or permeable-surface requirements. (A full list of these possibilities is part of the record of the committee that worked on Provision C.3.) • A few egregious loopholes are narrowed, and ceilings will be lowered for parking lots. But basically, BASMAA successfully stonewalled throughout the process of developing the MRP, refusing to consider changes and in the end, the staff gave in. • Send the TO back with instructions to significantly increase requirements to treat	• The MRP lowers the threshold from 10,000 to 5,000 ft² for special land use categories that potentially contribute more pollutants to the stormwater runoff. • We concur that the MRP should contain more specific requirements for site design measures.	Provision C.3.c.i.(2) has been revised to require all Regulated Projects to implement one or more LID site design measures that include disconnecting roof leaders and installing permeable surfaces.

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				runoff from new development, redevelopment, and hydromodification within this permit term.		
GCRCD Att	16	C.3.b.i.	Regulated Projects	Where is maximum extent practicable defined?	See Glossary.	None
Brisbane Burlingame Colma Menlo Park Pacifica San Mateo Co SMCWPPP Att 3 S San Francisco Sunnyvale Att A	8b 9, 10 3c, 7 3e 8 5c 7b 20c 6	C.3.b.i.(1)	Threshold *Reduction from 10,000 to 5000 ft² Special Land Use Categories only*	The Fact Sheet states that lowering the threshold to 5,000 ft² for special land use categories is considered MEP because the LA Water Board's Stormwater Permit included these land uses. But the LA permit lacks the MRP's additional site design and source control requirements for small sites and does not demonstrate a connection between size threshold and significant water quality improvement. The stormwater from these smaller projects can be adequately handled through the use of good site design and LID practices.	The 5000 ft² threshold for the identified special Land Use Categories in Provision C.3.b.i.(1) constitute MEP and are consistent with State Board guidance, court decisions, and other Water Boards' requirements. In the precedential decision contained in its WQ Order No. 2000-11, the State Board upheld the SUSMP (Standard Urban Stormwater Mitigation Plan) requirements issued by the Los Angeles Water Board's Executive Officer on March 8, 2000 and found that they constitute MEP for addressing pollutant discharges resulting from Priority Development Projects. The State Board re-affirmed that SUSMP requirements constitute MEP in their Order WQ 2001-15. Provision C.3.b.i.(1)'s requirement that development projects in the identified Special Land Use Categories that add and/or replace ≥ 5000 ft² of impervious surface shall install hydraulically sized stormwater treatment systems is consistent with the SUSMP provisions upheld by the State Board. Provision C.3.b.i.(1) is also consistent with Order Nos. R9-2002-1001 and 2001-01 issued by the San Diego Water Board, Order No. R4-2001-182 issued by the Los Angeles Water Board, and State Board's Order WQ 2003-0005 issued to Phase II MS4s. Under Order WQ 20003-0005, Phase II MS4s must apply the lower 5000 ft² threshold for requiring stormwater	None
Clayton, - Hoffmeister, L Emeryville, - Schultz Allen, P Pacifica Saratoga	2 2 8 2		Treatment Threshold *Reduction from 10,000 to 5000 ft² Special Land Use Categories only*	This Provision lowers the threshold to 5,000 ft² of impervious area in 3 years. This aggressive timetable does not allow Permittees enough time to adjust to the new enforcement and monitoring requirements and to gauge the effectiveness of the new requirements. The Board should wait until there is sufficient data on how effective the permit requirements are before requiring cities to impose them on smaller projects.		
Los Gatos	2	C.3.b.i.(1)		Lowering the threshold to 5,000 ft² in 3 years will be too large an undertaking for our agency to track. We need additional time to increase our capacity to meet current permit requirements. The lower 5000 ft² threshold should be considered for a future permit.		
ACCWP ACCWP - Scanlon, J ACFCD Zone 7 BASMAA	4b 98 1 77			Do not lower threshold for C.3 requirements from 10,000 to 5000 ft² for certain land uses because: • There is no analytical data supporting the reduction, which will not capture additional significant pollutants;		

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- Bicknell, J Berkeley Berkeley Att Table Concord Mayor Concord Cupertino Dublin Fremont Hayward Menlo Park Monte Sereno Mountain View Newark Oakland Pleasanton, - Wilson, R Pleasanton San Jose San Ramon Santa Clara City SCVURPPP SCVURPPP Att A	8, 9, 10 8 3 12 2 3 4,5 11 3b 3 4 4b 4 52 6 7 4, 6 5 4a 11	C.3.b.i.(1)	Treatment Threshold *Reduction from 10,000 to 5000 ft² Special Land Use Categories only*	• It causes an excessive administrative burden to municipalities to process plans, execute operation and maintenance agreements, and provide ongoing inspections, all for nominal water quality improvement; • Additional treatment devices put an administrative burden on Mosquito Abatement Districts to conduct mosquito inspection/suppression - Alameda County Mosquito Abatement District estimates 7 inspections/year for each treatment site; • Board staff's study concluded that projects of < 10,000 ft² impervious surface accounted for < 1% of total land development; it is a waste of scarce public resources to expend this great effort to capture the last 1% of total development; • It makes some small private and public improvement projects too costly to do, so that in some cases, impervious surfaces are retained instead of diminished.	treatment systems by April 2008. The MRP Tentative Order already allows three years from the MRP effective date for the Permittees to implement the lower 5000 ft² threshold, essentially 4 years later than the Phase II MS4s.	
Colma Livermore Menlo Park Pacifica S San Francisco San Mateo Co	3b 4 3d 8 20b 5b			The lower threshold for the special land use categories will result in a minimal increase in impervious surface requiring stormwater treatment. Based on studies that Board staff conducted and discussed at its 11/15/06 workshop, current permit requirements are capturing about 97% of all of the new/replaced impervious surface area in the cities studied.		
Alameda City	7			There is no analytical support for lowering the threshold. The estimated increase in annual municipal staffing to implement this new threshold oversight is approximately 25% of a full-time staff person.		
ACCWP - Scanlon, J	4a			• In 2003, Board staff proposed the 5000 ft² threshold. After a great deal of debate, it was		

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
ACCWP ACFCD Zone 7 CCCEAC Colma Danville Fremont Menlo Park Newark Oakland S San Francisco San Mateo Co San Pablo - Samkian, K San Pablo San Ramon Walnut Creek	98 1 11 3a 6, 7 4 3c 4a 2, 3 20a 5a 36 8 6 4	C.3.b.i.(1)	Treatment Threshold *Reduction from 10,000 to 5000 ft²* *Special Land Use Categories only*	agreed that the lower threshold would not be implemented. Board staff is now again attempting to insert the same requirement rejected in 2003. • The implementation of the current 10,000 ft² threshold for stormwater treatment and the HM requirements for flow are so recent that the full financial impact of these requirements on Permittees and the affects on water quality are still unknown, particularly since the number of installed treatment and HM systems and the corresponding operation and maintenance inspections required are expected to increase. • The MRP should not expand upon these regulations until their efficacy is demonstrated. Any changes in the threshold should be deferred until the next five-year permit term.		
Santa Clara City	5	C.3.b.i.(1)	Treatment Threshold *Reduction from 10,000 to 5000 ft²* *Special Land Use Categories only*	The 5000 ft² threshold will push some single-family home developments under the status of Regulated Projects. These projects are much more difficult to monitor and steer toward compliance because single-family homeowners that are applying for permits do not have a proficient level of knowledge regarding stormwater regulations.	Provision C.3.b.i.(1) does not apply to single-family home projects as described in this comment.	None
Livermore	4	C.3.b.i.(1)	Treatment Threshold *Reduction from 10,000 to 5000 ft²* *Special Land Use Categories only*	Implementation of effective treatment controls becomes significantly more difficult on small sites. If this requirement is included in the permit, Permittees (including Livermore) will likely choose to implement token, manufactured controls on small projects simply to meet the permit requirement, without regard to the effectiveness of the controls.	Provision C.3.e. provides alternative compliance options for sites that have space limitations. With regard to effectiveness, Provision C.3. requires that Permittees review projects to ensure the proposed stormwater treatment system(s) meet the hydraulic sizing criteria of Provision C.3.d. and are effective.	None
Mountain View	3	C.3.b.i.(1)	Treatment Threshold *Question*	Is supporting data available showing that reducing the impervious threshold to 5000 ft² for projects at special land use categories will improve water quality?	It is well documented that impervious surfaces contribute pollutants to stormwater runoff. Therefore, requiring treatment of impervious surfaces not	None

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					currently regulated will improve water quality, especially for those land use categories identified in Provision C.3.b.i.(1)(a), which are known to have a greater potential of contributing pollutants to stormwater runoff.	
GCRCD Attach	16	C.3.b.i.(1)	Treatment Threshold *Reduction from 10,000 to 5000 ft² Special Land Use Categories only*	• While a 10,000 ft² or more impervious surface threshold is a controversially acceptable provision for invoking LID management techniques as a starting point, it should be reduced to 5000 ft² for all development or redevelopment within 5 years. • There should also be at least a goal to reduce it to 2500 ft² in 10 years for all development and redevelopment, including single-family homes. • How much flash runoff is produced by 10,000 ft² and 5000 ft² of impervious surface in various size/intensity rain events?	• The MRP lowers the threshold to 5000 ft² in the third year of the permit for special land use categories that potentially contribute more pollutants to the stormwater runoff. • At the end of the MRP's permit term, we will be evaluating the adequacy of its impervious surface threshold. • We do not have enough information at this time to answer the question regarding flash runoff.	None
NRDC	21	C.3.b.i.(1)	Treatment Threshold *Reduction from 10,000 to 5000 ft² Special Land Use Categories only*	• The MRP contains weaknesses compared to other California Phase I permits: o San Diego's MS4 permit requires redevelopment projects, restaurants, hillside developments, parking lots, road projects, and retail gasoline outlets creating at least 5000 ft² to implement the required LID BMPs. o The latest draft Ventura County MS4 permit also uses the 5000 ft² threshold. • The MRP TO however applies a 10,000 ft² threshold. If the San Diego Water Board has already set a lower threshold in an approved permit and if the LA Water Board is poised to do so in its Ventura County permit, the MRP TO's threshold does not constitute the MEP standard. • In some cases, even the 5000 ft² threshold is	The MRP TO also establishes a 5000 ft² threshold for essentially the same land use categories as the other Water Board permits referenced in the comments. With regard to ESA areas, we consider the 5000 ft² threshold for certain land use categories, the 10,000 ft² threshold for all other development projects, and the required site design measures for small projects to be sufficiently protective at this time. We are currently in the lengthy process of designating beneficial uses to numerous water bodies that either are not in the current Basin Plan or are in the Basin Plan but have no beneficial uses designated. As a result, we anticipate that there will be additional Rare and Endangered Species (RARE)	None

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				too large. The San Diego MS4 permit regulates projects in environmentally sensitive areas (ESAs) that either create 2500 ft² of impervious surface or increase the total impervious area to more than 10% of its naturally occurring condition. The Ventura draft permit includes a similar provision. The MRP TO however does not include any such provision.	designations for water bodies all over the Bay area. In order to employ a lower regulatory threshold for ESAs, the catchment areas for each RARE water body would have to be mapped to determine specific areas where the 2500 ft² threshold will be applicable in each municipality, a tremendous undertaking requiring a great deal of time and resources and that cannot be done until the RARE designations are completed.	
CCCWP Contra Costa Co Supervisors Moraga Moraga, - Kennedy, F Moraga, - Kennedy, F BASMAA, - Bicknell J Mountain View Oakley San Pablo	27, 30, 32 3 28 47 48 80 3 28 9	C.3.b.i.(1) & C.3.b.i.(5)	Grandfathering or Pipeline Language *Private Regulated Projects*	Do not change when the new impervious surface threshold becomes applicable from the "application deemed complete" date to the project's "final discretionary approval" date because: • The "deemed complete" date already reflects considerable design effort and public agency review to address applicable codes, policies, and standards; • Final discretionary approval is given by the legislative body, a point where the project is frequently at the 40-60% construction drawing stage. • Environmental review must begin within 30 days of receipt of an application and can take up to a year. The threshold applicability date change proposed makes it likely that a project will be changed after completion of environmental reviews. • The change requires Permittees to modify conditions of approval for projects already given final conditions but not granted final approval, change existing guidance materials and create unnecessary confusion in the development community. • The change may require some private projects to redesign existing projects at significant	The Permit Streamlining Act requires public agencies to determine whether a permit application is complete within 30 days after receipt; if the public agency does not make this determination, the application is automatically deemed complete after 30 days. Data we have collected from audits and file reviews as well as reported to us by Permittees confirm that in many cases, the development permit applications have indeed not been reviewed for compliance with Provision C.3. requirements and yet have automatically been deemed complete 30 days after the application submittal date. Therefore, we feel the "deemed complete" date is too early in the permitting process for projects to be grandfathered and essentially exempted from the lower 5000 ft² threshold. Projects should be further along in the permitting process before they are granted this exemption from complying with new requirements.	Provision C.3.b.i.(1) has been revised to specify a date in-between the "application deemed complete" and "final discretionary approval" date that better reflects the point where staff-level agency review has already taken place. This identical language has been added to Provision C.3.c.ii. because the LID requirements in Provision C.3.i. are new and have an implementation date 1 year after the MRP effective date. The grandfathering language found in Provision C.3.b.i.(5) has been removed because it is no longer applicable.

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Provision C.3. – New Development and Redevelopment

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				expense and substantial re-budgeting of municipalities' current capital improvement programs. • This may not be consistent with the Permit Streamlining Act.		
CCCEAC CCCWP Concord Mayor Moraga, - Kennedy, F Moraga, - Kennedy, F Mountain View BASMAA, - Bicknell, J Contra Costa Co Supervisors Moraga Oakley	10 30, 32 3 47 48 3 80 28 29 29	C.3.b.i.(1) & C.3.b.i.(5)	Grandfathering or Pipeline Language *Public Regulated Projects*	Do not change when the impervious threshold becomes applicable to public works projects to "when funding has been committed and construction is scheduled to begin by 7/1/2010" (effective date of 5000 ft² threshold for certain land uses) because: • Public works projects frequently require multiple funding sources, each of which has its own rules for funding allocation, beyond funding commitment, that includes no work beginning before the source agency's approval. Projects can be held for years before design can begin, well after local agency funding commitments have been made. • Once design for a project commences, budgets have been set and committed to, so changes in requirements would be unreasonable and politically difficult to justify. • The change will dramatically increase the cost of projects that are designed, funded and scheduled, but fall between these two distinctions. • It may result in a reduction in road projects necessary for public safety, or cause severe delays and cost increases.	As for private projects, public projects should be far enough along in the design and approval process to warrant being grandfathered and essentially exempted from complying with the lower 5000 ft² threshold when it becomes effective. Grandfathering projects that only have funds committed by the new threshold's effective date as suggested in the comments is too early for the very reasons given in the comments; that is, projects can be held for years before design can begin, well after funding commitments have been made. However, we understand that Provision C.3.b.i.(1)'s application of the grandfathering exemption to projects that have construction scheduled to begin by the threshold effective date (or 2 years after the MRP effective date) may conversely be too late in the permitting process to implement new threshold requirements, particularly since this type of approval requires actions by city councils or boards of supervisors.	Provision C.3.b.i.(1) has been revised to allow the grandfathering exemption for projects that have construction set to begin within 1 year of the threshold effective date (or 3 years after the MRP effective date). This identical language has been added to Provision C.3.c.ii. because the LID requirements in Provision C.3.i. are new and have an implementation date 1 year after the MRP effective date. The grandfathering language found in Provision C.3.b.i.(5) has been removed because it is no longer applicable.
Brisbane Colma Daly City Menlo Park Pacifica S San Francisco	8b 4 18 3f 8 20d	C.3.b.i.(1)(a)(iv)	Regulated Projects *Parking Lots*	Parking lots that are covered (e.g., underground or a lower level in a parking structure) should not have to have stormwater treatment controls because there is no exposure. We request that covered parking lots be exempt from the requirements.	Provision C.3.b.i.(1)(a)(iv) was intended to apply only to uncovered parking lots and any uncovered levels of parking garages.	Provision C.3.b.i.(1)(a)(iv) has been revised to clarify this issue.

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San Mateo Co SCVURPPP Att SMCWPPP Att 3 Sunnyvale Att A	6 12 7b 7					
James, Roger Att II	17	C.3.b.i.(1)(c),(d)	Redevelopment Projects *50% Rule*	This Provision should be modified to clarify that the portion of the development that has impervious surface directly connected to a storm drainage facility must be considered and any impervious area that is not directly connected should receive special consideration if it is altered so that it is directly connected to a storm drainage facility.	This distinction is implicit in the requirements of this Provision.	None
ACCWP Att 2	13	C.3.b.i.(1)(c)-(d) C.3.b.i.(3)(a)-(b)	Redevelopment Projects *50% Rule*	• The special land use categories relate only to the following types of development: auto service facilities, retail gasoline outlets, restaurants and certain parking lots. However, the 50% rule applies to redevelopment projects where the previously existing development was not subject to Provision C.3. The 10,000 ft^2 threshold initially applies to these projects. The 5,000 ft^2 threshold kicks in on 7/1/10 for these special land use projects. Sections (c) & (d) of Provision C.3.b.i.(1) only apply to the categories listed in Section (a), which specifically includes the 10,000 ft^2 threshold; therefore, Sections (a)-(d) must be read together in this way so as to make reasonable sense of the Provision. • For other redevelopment projects not in one of the special land use categories, the 10,000 ft^2 threshold applies throughout the term of the permit. There is no reference in this section to the 5,000 ft^2 threshold. The 50% rule also applies where the existing development was not subject to Provision C.3. • Please confirm this is the correct interpretation or provide clarification.	Yes, this is the correct interpretation of these Provisions.	None

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ACCWP Att 2 San Pablo Contra Costa Co Supervisors	14 10 27	C.3.b.i.(1)(c)-(d) C.3.b.i.(3)(a)-(b)	Redevelopment Projects *50% Rule*	• Redevelopment projects are preferable to projects on previously undeveloped land because they encourage infill. The 50% rule conflicts with other regional policies aimed at reducing driving by encouraging redevelopment of Brownfields or vacant lots, which indirectly protects water quality by reducing airborne pollutants from entering waterways. • Instead of adding this burden to treat the not redeveloped parts of a site, the Water Board should provide incentives for redevelopment. • An exclusion from compliance with the 50% rule should be allowed for redevelopment projects where treatment of runoff from existing impervious surfaces is demonstrated to be infeasible. • Excluding such areas would have no effect on water quality.	The purpose of the 50% rule is to require stormwater treatment at projects where a substantial amount of impervious surface is being replaced. It is a means to address the pollutant loading from existing development and impervious surfaces when these sites are being redeveloped. The requirements of this Provision are consistent with the Permittees' current stormwater permits as well as stormwater permits statewide; therefore it is considered MEP. In situations where the site conditions render the treatment of existing impervious areas challenging or cost-prohibitive, Provision C.3.e. provides alternative means of compliance with Provision C.3.b.	None
CCCWP	26	C.3.b.i.(1)(c)-(d) & C.3.b.i.(3)(a)-(b)	Redevelopment Projects *50% Rule*	Clarify that the "50% rule" described in these Provisions apply only to projects exceeding the thresholds in C.3.b.i.(1) and C.3.b.i(3).	It is implicit that the "50% rule" which is tied to the portion of pre-project impervious surface that is altered only applies to redevelopment projects and therefore, only applies to Provisions C.3.b.i.(1) & (3) because Provisions C.3.bi.(2) &(4) only apply to new development and new roads.	None
San Jose Att A	13	C.3.b.i.(3)	Redevelopment Projects *Implementation Due Date*	We request that the date of July 1, 2008, be revised to "12 months after Permit adoption" to maintain consistency with Provision C.3.c.ii.	Unlike Provision C.3.c., the requirements of this Provision are consistent with what is required in the Permittees' current stormwater permits; therefore, a delayed implementation date is not warranted.	None
Santa Clara Co	8	C.3.b.i.(3)	Redevelopment Projects	Under the subdivision of other development projects we would like to express the concern on whether this provision would apply to parcel maps (subdivisions of 4 lots or less)? The County is concerned on how sections (2)	Yes, this provision applies to any development project where a parcel of land is divided into subdivisions, even one as small as dividing one lot into 2 lots, as long as 10,000 ft^2 or more of impervious is	None

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				through (5) are to be interpreted with respect to single home development associated with larger lots.	added and/or replaced.	
Santa Clara Co	10	C.3.b.i.(4)	Bike Lanes	Class I bikeways (separate bike paths not located within roadways) should be exempt from the proposed regulations, given the difficulty with providing appropriate stormwater treatment.	We concur that additional bike lanes and sidewalks do not translate directly to greater vehicular traffic and its associated pollutants. However, as with all roofs, the additional impervious surface from bike lanes and sidewalks do increase stormwater pollutants because of aerial deposition. Given that, we do recognize the greater benefit that bike lanes and sidewalks provide by encouraging less use of automobiles. Therefore, Provision C.3.b.i.(4) has been revised to remove the sized treatment requirement for bike lanes added to existing roads. Bike lanes constructed as part of new road projects must still be included in the impervious surface calculation for appropriately sizing required stormwater treatment systems. Provision C.3.b.i.(4) has also been revised to remove the sized treatment requirement for sidewalks added to existing roads; however the added sidewalks must be constructed to drain to adjacent vegetated areas or constructed with permeable surfaces. Given the common practice of putting sidewalks next to vegetated areas, this site design requirement should be easily achievable and will provide some reduction in runoff pollutants and flow. However, sidewalks constructed as part of new road projects must still be included in the impervious surface calculation for appropriately sizing required stormwater treatment system.	Provision C.3.b.i.(4) has been revised to remove the sized treatment requirement for bike lanes added to existing roads.
CCCEAC	12			Widening an existing road to allow for bike lanes should be exempt because of the overall net benefit to the public and the environment. If C.3. requirements are triggered by adding a bike lane, a city will likely not be able to afford adding the lane. Only new roads, where right-of-way, utilities and other key factors can be coordinated, should be subject to such requirements.		
ACCWP - Scanlon, J ACCWP ACFCD Zone 7 CCCEAC Colma Danville Fremont Menlo Park Newark Oakland S San Francisco San Mateo Co San Pablo - Samkian, K San Pablo San Ramon [1] Walnut Creek	4a 98 1 11 3a 6, 7 4 3c 4a 2, 3 20a 5a 36 8 6 4			In 2003, Board staff proposed the regulation of trails and bike lanes. After a great deal of acrimonious debate, it was agreed that this would not be implemented because it was deemed non-productive and not a good use of limited resources. Board staff is now again attempting to insert the same requirement rejected in 2003.		
Alameda Co BASMAA, - Bicknell, J	4 78			Do not require stormwater treatment for sidewalk and bicycle lane projects because: • Of negative impact on pedestrians, bicyclists,		

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Brisbane Burlingame CCWP CCCWP Letter Concord Mayor Contra Costa Co Supervisors Danville Lars Thomsen Local Streets & Rds Working Grp Martinez Moraga Oakley Pittsburg San Jose Att A San Pablo San Ramon Santa Clara City Santa Clara Co SMCWPPP Att 3	8b 11 28, 31 30 6 29 8 1 3 1 2 30 2 14 12 5 4 10 7b	C.3.b.i.(4) C.3.b.i.(4)	Bike Lanes and Sidewalks Bike Lanes and Sidewalks	and motorists by forcing reduction of services addressing public safety. • These projects reduce vehicle use and their regulation does not support clean water efforts. • It will cause these projects to be unaffordable and forfeit potential benefit to the environment and community. • Of significant financial burden on local jurisdictions who undertake these projects for public safety. • Benefits of providing bike lanes and pedestrian ways promote the goals of the Water and Air Boards. • The Water Board needs to look at the overall net benefit to the public and the environment as across the country, greater emphasis is being placed on increasing bicycle and pedestrian accessibility, encouraging physical fitness and reducing road congestion and energy consumption to improve air quality.		
Mountain View	4	C.3.b.i.(4)	Bike Lanes and Trails *Question*	Is supporting data available showing that requiring treatment BMPs on bike lane and trail projects will improve water quality?	It is well documented that impervious surfaces contribute pollutants to stormwater runoff. Therefore, requiring treatment of impervious surfaces not currently regulated will improve water quality.	None
Caltrans District 4	1	C.3.b.i.(4)	New Road Projects *Highways Definition*	The MRP TO includes references to "highways" or "highway projects." Define these terms to clarify that: • Caltrans is responsible for designing, constructing, managing, and maintaining the State highway system, including freeways, bridges, tunnels, Caltrans' facilities, and related properties. • Caltrans is regulated under NPDES Permit No. CAS000003 (ORDER NO. 99-06 – DWQ) for stormwater discharges from its highways,	We agree.	All references to highways and highway projects, which are Caltrans projects, have been deleted. Provision C.3.b.i.(4) has also been revised to specify that this provision does not apply to Caltrans road projects.

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				properties, facilities, and activities. • All references to "highways" or "highway projects" do not include Caltrans highways, properties, and facilities within the Water Board's jurisdiction.		
Cupertino	3	C.3.b.i.(4)	New Road Projects	We find it problematic that the MRP sets the C.3. applicability threshold for road projects at 10,000 ft² of newly created or replaced impervious surface.	The 10,000 ft² threshold for new road projects is consistent with what is already required in the Permittees' current stormwater permit.	None
GCRCD Att	16	C.3.b.i.(4)	Trails	Where is top of bank defined? The top of bank must be the top of the floodplain bank, not the active channel bank, as trails should not be built on a floodplain.	We concur that the top of bank is defined to be the top of the floodplain bank	None
Santa Clara Co	12	C.3.b.i.(4)	Trails	Stormwater runoff regulation addresses non-point source pollution, including pollutants from motor vehicles, such as motor oil. Clarify whether horse manure is considered a potential pollutant covered under this provision regulating new paved trails that include dirt shoulders to accommodate equestrians and horses.	Horse manure is considered a potential pollutant.	None
San Jose San Jose Att A San Jose Attny	8 14 3	C.3.b.i.(4)	Trails	San Jose is developing a plan for adding an additional 60 miles of trails in the next 15 years. Most of these trails are planned to be impervious, 12-feet wide (to meet funding source design specifications and ADA requirements), and within 50 feet of the top of bank. Swales or plantings for stormwater treatment is not possible because the trail land is typically not owned by San Jose and most of the trails require all available space to meet the 12-feet wide requirement. Switching to pervious materials will substantially increase the cost to build the trails by an estimated $60M. Requiring treatment works against the goal of providing non-vehicular commute options which are beneficial to water quality. Currently 40% of trail users in San Jose (Guadalupe River) use them to bicycle commute	We concur that impervious trails do not translate directly to greater vehicular traffic and its associated pollutants. However, as with all roofs, the additional impervious surface from impervious trails do increase stormwater pollutants because of aerial deposition. Given that, we do recognize the greater benefit that impervious trails provide by encouraging less use of automobiles. Therefore, Provision C.3.b.i.(4) has been revised to remove the sized treatment requirement for impervious trails > 10 ft wide or creekside; however the impervious trails must be constructed to drain to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from	Provision C.3.b.i.(4) has been revised to remove the sized treatment requirement for impervious trails > 10 ft wide or creekside; however the impervious trails must be constructed to drain to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks and towards the outboard side of levees.

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				to and from work.	creeks and towards the outboard side of levees. Given that trails are commonly constructed in parks and open space areas with a great deal of vegetation, this site design requirement should be easily achievable and will provide some reduction in runoff pollutants and flow.	
Avanzino, Marylou BASMAA, - Bicknell, J Bay Area Ridge Trail Council Brisbane Burlingame CCCWP Letter Chapman, Helen Guadalupe River Park & Gardens Heine, David Kangas, Chris Moraga Mountain View Mountain View, - Anderson, E San Jose Att A San Jose Attorney San Jose San Pablo San Pablo, - Samkian, K Santa Clara Co SCVURPPP SCVURPPP Att A SF Bay Trail Project Silicon Valley Bike Coalition SMCWPPP Att 3 Smith, Bern van de Water, Cor Willow Glen Nghborhd Assoc	1 78 1 8b 11 10 1 1 1 1 30 4 69 14 3 2, 8 12 36, 38 11 4c 13 1 1 7b 1 1 1			Do not require stormwater treatment for impervious trails ≥ 10,000 ft² and > 10 ft wide or creekside because: • It is too costly to install pervious trails and provide necessary maintenance; therefore, new requirement will "kill" currently proposed trail projects, including projects to connect existing trails; • Impervious trails do not have pollutants because very few vehicles will be traveling on them so they should be judged by a different standard from roads; • Lack of trails will cause people to use more cars, resulting in more pollution; • It will be a disincentive to continue efforts to expand trails along creeks, which have improved trash conditions because people can see the trash now as they get greater access to the creeks.		
Alameda City	27	C.3.b.i.(4)	Trails *Clarification of*	This Provision includes contiguous sidewalks, bicycle lanes, and creek-side impervious trails within the definition of New Road Projects	Lagoon-side and bayside trails should be treated the same as creekside trails	None

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			Applicability	subject to Provision C.3. Please clarify whether this definition also extends to lagoon-side and bayside trails.		
ACCWP - Scanlon, J ACCWP ACFCD Zone 7 CCCEAC CCCWP Colma Danville Fremont Menlo Park Newark Oakland S San Francisco San Mateo Co San Pablo - Samkian, K San Pablo San Ramon Walnut Creek	4a 98 1 11 29, 31 3a 6 - 8 4 3c 4a 2, 3 20a 5a 36 8 6 4	C.3.b.i.(5)	Road Expansion Projects	• In 2003, Board staff proposed the regulation of road construction projects; Board staff is now again attempting to insert the same requirements rejected in 2003. • Roadway widening or additional lanes are often required for safety, and funds are severely limited for these improvements. Application of stormwater treatment requirements to these projects would have a significant effect on municipalities' ability to execute these projects. It is typically not feasible to segregate drainage from new and old portions of the roadway, further complicating application of treatment controls to new portions.	The 10,000 ft² threshold for road expansion projects is consistent with what is already required in the Permittees' current stormwater permit which states that regulated projects include "any newly constructed paved surface used primarily for the transportation of automobiles, trucks, motorcycles, and other motorized vehicles." Any newly constructed paved surface includes new traffic lanes added during road widening projects. However, we have revised this provision to allow the widening of streets with sidewalks and bike lanes draining to adjacent landscaping and medians without triggering treatment requirements.	Provision C.3.b.i.(4) has been revised to exclude road widening projects that add sidewalks and bike lanes draining to adjacent landscaping, and medians. The language regarding road expansion projects has been deleted from Provision C.3.b.i.(5).
CCCEAC Concord Mayor Local Streets & Rds Wrking Grp Palo Alto San Pablo	11 5 2 8 11	C.3.b.i.(5)	Road Rehabilitation Projects	Existing pavement is often ground down to the gravel base to the select fill or native soil. C.3 language exempts routine re-paving but the scenario just described would trigger stormwater treatment requirements, negatively affecting the condition of city streets and under-funded road maintenance budgets.	Based on the numerous comments received, we acknowledge the logistical difficulties in retrofitting roads with stormwater treatment systems as well as the funding challenges facing municipalities in the Bay Area. Therefore, we have removed the requirements of Provision C.3.b.i.(5). But we are aware that some cities have or will have funding for "green streets" retrofit projects that will provide water quality benefits as well as meet broader community goals such as fostering unique and attractive streetscapes that protect and enhance neighborhood livability, serving to	We have replaced the road rehabilitation requirements of Provision C.3.b.i.(5) with a requirement for the completion of 10 pilot "green streets" projects by the Permittees within the first 4 years of the MRP. These projects must incorporate LID techniques pursuant to Provision C.3.c. and stormwater treatment
Saratoga Los Gatos	3 1			• Numerically sized stormwater treatment measures should be required only for projects replacing 50,000 ft² or more of an arterial road, rather than 10,000 ft². • This higher threshold should be coupled with BMPs, such as installation of a hydrodynamic separator or bioswale to serve an area form one intersection to another during street		

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				replacement work. • This threshold should not decrease in three years, as the threshold for other Regulated Projects will.	enhance pedestrian and bike access, and encouraging the planting of landscapes and vegetation that contributes to reductions in global warming. We have replaced the road rehabilitation requirements in Provision C.3.b.i.(5) with a requirement for the completion of 10 pilot "green streets" projects by the Permittees within the first 4 years of the MRP. These projects must incorporate LID techniques pursuant to Provision C.3.c. and stormwater treatment pursuant to Provision C.3.d. Because these are pilot projects, we have not specified a minimum or maximum size requirement. The only requirement is that the projects should be representative of the three different types of streets: arterial, collector, and local. The details of which cities will have these projects are to be determined by the Permittees.	pursuant to Provision C.3.d. Because these are pilot projects, we have not specified a minimum or maximum size requirement. The only requirement is that the projects should be representative of the three different types of streets: arterial, collector, and local. The details of which cities will have these projects are to be determined by the Permittees.
Alameda Co ACCWP BASMAA - Bicknell, J Belmont Berkeley Att Table Berkeley Brisbane CCCEAC CCCWP Letter CCCWP Colma Concord Concord Mayor Cupertino Danville Daly City Dublin Fremont Hayward Livermore Local Streets &Rds Working Grp Martinez Menlo Park Millbrae Monte Sereno Moraga Moraga Mayor Mountain View Mountain View, - Anderson, E Newark Oakland	5 5 78 6 9 11, 12 8b 11 9 29 6, 7 11 5 3 8 19 4 5, 6 12 6 2 1 3a 8 5 31 10 5 70 5 5	C.3.b.i.(5)	Road Rehabilitation Projects	Do not require stormwater treatment for road rehabilitation projects in the same footprint because: • Municipalities already lack sufficient funds to maintain roadway infrastructure; this will result in significant decreases in local road quality; • Right-of-way limitations and existing utilities prevent installation of treatment measures; • No flexibility or alternatives for these projects are provided in the MRP; • New right-of-way acquisitions may trigger environmental review; • Impervious surface is not increased so no additional pollution is generated; • New requirements will hamper future efforts to add "free right turn lanes" and "acceleration and deceleration lanes" for improved traffic movement, relieving traffic gridlock (which causes additional air pollution); • Typical street/traffic improvements will not be as feasible, increasing traffic delays causing increased stormwater pollutants from brake pad linings, fuel, oil and anti-freeze leaks, and from silt and broken pavement debris; • This may require new storm drain systems where none currently exist. • Re-grading the roads to divert water toward the medians instead of the storm drain could result in interference with other utilities.		

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Oakley Orinda Pacifica Pittsburg Pleasanton San Jose Att A San Jose Attorney San Jose San Leandro San Mateo Co San Pablo San Pablo, - Samkian, K San Ramon Santa Clara City SCVURPPP Att A SCVURPPP - Olivieri, A SMCWPPP Att 3 S. San Francisco Sunnyvale Att A Walnut Creek	31 2 8 3 7 15 3 2 1, 2 8 11 36, 37 5, 10 4 14 3 7b 20f 9 5					
Millbrae	8	C.3.b.i.(4)&(5)	New Road and Road Rehabilitation Projects	• Why are Caltrans new roadway projects exempted while municipalities must meet this requirement? • Caltrans roadway projects are typically much larger than our local roadway projects and create much more impervious surface. Exempting their projects is discriminating against local municipalities.	Caltrans road projects are regulated under a separate state-wide permit.	None
Mountain View	5	C.3.b.i.(5)	Road Expansion and Rehabilitation Projects *Question*	Is supporting data available showing that requiring treatment BMPs on road expansion and rehabilitation projects will improve water quality?	It is well documented that impervious surfaces contribute pollutants to stormwater runoff. Therefore, requiring treatment of impervious surfaces not currently regulated will improve water quality.	None

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Santa Clara Co	9	C.3.b.i.(5)	Road Expansion or Rehabilitation Projects	The definitions for road expansion or rehabilitation projects should refer to industry approved definitions for road status. Road expansion needs to meet AASHTO standards.	This is not necessary because Provision C.3.b.i.(5) has been deleted.	Provision C.3.b.i.(5) has been deleted.
ACCWP Att 2 Contra Costa Co Supervisors Pittsburg San Leandro	15 30 3 4	C.3.b.i.(5)	Road Rehabilitation Projects *Typographical Error*	It is unclear whether the intent of this Provision is to reduce the threshold, for requiring post-construction treatment for road expansion and rehabilitation projects, from 10,000 to 5,000 ft² of impervious surface.	The reference to a lower 5000 ft² threshold was a typographical error.	The reference to a lower 5000 ft² threshold has been removed from this Provision.
Contra Costa Co Supervisors	31	C.3.b.i.(5)(a)	Road Rehabilitation Projects	This language is not clear. It is assumed that "from the gravel base up" is inclusive of removal and replacement of the gravel base.	This clarification is not necessary because this portion of Provision C.3.b.i.(5) has been deleted.	This portion of Provision C.3.b.i.(5) has been deleted.
San Leandro	3	C.3.b.i.(5)(c)	Road Rehabilitation Projects *Duplicate Definitions*	This section appears to define Regulated Projects that are exclusively a sub-set of the Regulated Projects defined in Provision C.3.b.i.(5)(a). Duplicate definitions are extraneous and should be eliminated.	This is not necessary because this portion of Provision C.3.b.i.(5) has been deleted.	This portion of Provision C.3.b.i.(5) has been deleted.
Daly City	20	C.3.b.ii.	Regulated Projects *Database Development Implementation Due Date*	Clarify what the implementation date is, for the development of a database that will contain all the information listed under Reporting.	The database or equivalent tabular format required under Reporting (C.3.b.iv. in revised TO) shall be developed within 1 year of the Permit effective date.	Implementation date added to Provision C.3. b.iii. (in revised TO)
Burlingame Brisbane Cupertino SMCWPPP Att 3	13 8b 4 7b	C.3.b.iii.	Regulated Projects *Reporting*	The data collection and reporting requirements for Regulated Projects should be minimized to lessen the administrative burden.	The data collection and reporting requirements for Regulated Projects are consistent with what is already being reported by most Permittees under their current stormwater permits.	None
Moraga Oakley		C.3.b.iii.	Regulated Projects *Reporting*	This provision requires a number of data items that are do not seem relevant or necessary and will require the restructuring of databases already in use. Items that do not seem to add anything to the report but volume and are contained in the final approved Stormwater Control Plan which are to be part of the permanent file are: • Developer's name	• The Developer's name is important because we use the information and construction inspection data to identify exemplary as well as problem developers who may benefit from outreach or require enforcement. • As many subdivisions are built in phases over many years, the phase number distinguishes the phases as	The requirement to report the reviewing entity has been deleted from Provision C.3.b.v.(1)(k).

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				• Phase number • Source control measures • Site design measures • Hydraulic Design criteria, • Reviewing agency	distinct separate projects. • Source control, site design, and hydraulically sized treatment systems are required by Provisions C.3.c. and d. The reporting of this information for each project allows us to determine compliance with these Provisions. • We agree that the reviewing agency is an element that need not be reported.	
SCVURPPP Att A	93	C.3.b.iii. Attach L - Table C.3.b.	Regulated Projects *Reporting*	• Name of Developer - The name of the developer is not needed for compliance with Provision C.3; however this field could be tracked and placed within Table C.3.b. if absolutely necessary; • Project Watershed – The sample information included in this column is more detailed than the reporting requirements of C.3.b.iii. The MRP requires that the project watershed be provided, not the tributary or creek that urban runoff may flow to from the project. • Status of Project - Tracking the application submittal and construction completion dates is inconsistent with Provision C.3.b.iii.. Provision C.3.b.iii. only requires the reporting of the application, deemed complete, and project approval dates. Planning Departments do not track construction, so this would be burdensome and difficult. • HM Controls – Providing the reason why HM controls are not required is overly burdensome.	We concur with the comments regarding reporting of project watershed and status. However, we disagree with the comments asking to not report the Developers" names and the reasons HM Controls are not necessary: • The Developer's name is important because we use the information and construction inspection data to identify exemplary as well as problem developers who may benefit from outreach or require enforcement. • HM controls are required by Provision C.3.g. and source control, site design, and hydraulically sized treatment systems are required by Provisions C.3.c. and d. The reporting of this information for each project allows us to determine compliance with these Provisions.	Table C.3.b. has been revised to be consistent with the reporting requirements in Provision C.3.b.iv.
Santa Clara Co	13	C.3.b.iii.	Regulated Projects *Reporting*	Each agency is required to provide electronic reports for each regulated project in an Annual Reporting Table; however, it is unclear whether this procedural requirement would need to be included as part of an Initial Study and Mitigation Measures(s) for CEQA and NPDES permit compliance.	No, this is not the case.	None

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
James, Roger Att II	19	C.3.b.iii.(13)	Regulated Projects *Reporting Requirements*	Add "for the life of the project" after "maintenance." It is important to emphasize that maintenance of the control measures is long-term and for the life of the project.	We concur that stormwater treatment systems should be maintained for the life of the project.	Provision C.3.h.iii. now requires all stormwater treatment systems and HM controls to be properly operated and maintained for the life of the project.
James, Roger Att II	18	C.3.b.iii.(5)	Regulated Projects *Reporting Requirements*	Add "and directly impervious surface area" to the end of this Provision. This will allow a determination of how much change in impervious surface area contributing to runoff has occurred from pre-project conditions.	We agree that for redevelopment projects, both pre- and post-project total impervious surface area should be reported in order to determine the net impervious surface change for each Regulated Project. Additionally, this data will also allow us to determine if Provision C.3.b. was applied correctly by the Permittees.	Provision C.3.b.iv. has been revised to require reporting of the post-project impervious surface area in addition to the pre- project impervious surface area.
US EPA Region 9	1	C.3.c.	LID	In April 2007, US EPA entered into an agreement with several national organizations to promote green infrastructure/LID to improve stormwater quality management for MS4s. In January 2008, EPA published an action strategy for the new initiative. The strategy encourages green infrastructure/LID requirements in MS4 permits. We are trying to ensure that MS4 permits in our Region include appropriate and adequate requirements to for green infrastructure/LID in new development and redevelopment projects, as the effectiveness of vegetation-based treatment for stormwater is clearly superior[1] to conventional treatment (such as detention basins, drain inlet inserts); landscape-based treatment also has greater capacity to reduce the impact of spills. A wide range of other benefits of green	Comment noted.	None

[1] See for example the analysis prepared by Dr. Richard Horner entitled "Initial Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices ("LID") for the San Francisco Bay Area" submitted to the San Francisco Bay Regional Board by NRDC. A similar analysis was also submitted to the Los Angeles Regional Board by NRDC attached to comments on the proposed Ventura County MS4 permit of December 2006.

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				infrastructure/LID was identified in our action strategy. We have reviewed the green infrastructure/LID requirements in the proposed permit and except as noted below we believe they are appropriate for now. While the requirements for green infrastructure/LID in Part C.3.c are narrative, the issue is clearly emphasized in the permit. Further, the permit includes specific (and stringent) requirements on applicability in that they would apply to all new projects creating 10,000 ft^2 or more of impervious surface and (in the future) certain special categories of projects which create 5,000 ft^2 of impervious surface. As our green infrastructure/LID strategy is implemented we may have additional more specific recommendations concerning permit requirements and we would like to work with the Board concerning incorporation of such requirements in future permits or in existing permits via permit modifications.		
NRDC	2	C.3.c.	LID	The MRP TO does not translate the concepts of LID into objective performance measures or actual controls that meet the MEP standard or otherwise ensure compliance with water quality standards. Specifically, the following objective criteria represents the MEP standard and should be included in the MRP: A standard of 3% maximum allowable Effective Impervious Area (EIA) in all Regulated Projects, with a narrowly crafted alternative compliance provision for developments where severe site constraints, such as non-infiltrative soils, which render compliance with the 3% EIA limitation impossible.	We support the concepts of LID and acknowledge that the 3% EIA is a good goal to work towards. However, we are not convinced that it is an achievable standard for most of the Bay Area development projects because of the common occurrence of non-infiltrative soils.	None
				• We have been implementing LID to meet the	Contrary to the statements made in these	None

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CCCWP - Cloak, D CCCWP - Dalziel, T	1 2	C.3.c.	LID	treatment and flow control requirements since August 2006. To implement LID in Contra Costa County, we define small areas of the site. • NRDC's effective impervious area (EIA) concept does specify the ratio between the impervious area that's producing the runoff and the pervious area that's receiving it should be. We make that two to one. If the hydrograph modification management requirements apply, then it's one to one, so it's considerably better than NRDC's EIA proposal. • If there's not enough room to disperse runoff into pervious areas, we have these landscape-based treatment facilities. Runoff is treated very effectively by draining through 18 inches of a sandy soil before being collected in the bottom, which is necessary because of the clay soils. A similar arrangement can be put into a planter box, which can be located right next to buildings in dense urban areas. We now have probably 100 or so projects in progress. • MRP does not specify the source control measures required. But we have a system: if certain sources will be on the project site, then project must include certain source control BMPs. • So, the 19 Contra Costa Permittees are fully implementing LID now. Our criteria are better than what USEPA and NRDC propose. All this is being done under the current permit so you should keep the requirements the same. The MRP is troubling because it pretends to support LID but would make it very difficult for Contra Costa to do that. • We ask you to direct Board staff to encourage further progress with the approach that Contra Costa has been using.	comments, nothing in Provision C.3.c. precludes the Permittees in CCCWP from implementing their current program. If the Permittees implement CCCWP's program as described in these comments, they will meet the requirements of Provision C.3.c. Since the MRP is a regional permit, Provision C.3.c. is necessary to require LID implementation at Regulated Projects that are approved by other Permittees.	

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HBA - Foley-Gannon, E	8	C.3.c.	LID	We ask to participate in the further discussions on LID that are planned with USEPA and NRDC. We support LID development when it's done in a smart way. There can be unintended consequences and we would like to be able to offer our voice in that conversation.	We have met with HBA to discuss the MRP TO and LID requirements.	Changes have been made to Provisions C.3.b., c. and e.
SCVURPPP Att A	15	C.3.c.i.(1)-(2)	LID Source Control & Site Design	Regulated projects should only be required to implement source control and site design measures that are appropriate to the site conditions and type of developments. The language in these sections should be changed to require these measures "where applicable" (the Fact Sheet uses this language in describing this provision).	We consider the source control and site design measures listed to be baseline measures that must be included for each Regulated Project. It is implicit in the language as written that certain specific measures listed are applicable only to certain types of Regulated Projects.	Provision C.3.c.i.(1) has been re-organized to better identify those measures that may be applicable to certain types of Regulated Projects.
Daly City	23	C.3.c.i.(1)-(3) Fact Sheet	LID Source Control *Incorrect Reference*	Revise numbering in MRP Fact Sheet to reflect accurately, the sections referenced in the TO. Provisions C.3.c.i.(1)(3) is described in the MRP Facts Sheet as Provisions C.3.c.(ii)-(iv).	We agree	Appropriate changes have been made to the Fact Sheet.
CCCWP	33	C.3.c.i.(1)(a)	LID Source Control	Add the phrase "and if discharge to onsite landscaping is not a feasible option" at the end of the following sentence: "Minimization of stormwater pollutants. . . where allowed by the local sanitary sewer agency." Residents should have the option to use swimming pool discharge and fire sprinkler test water for irrigation where appropriate. The language in this Provision should be consistent with Provision C.3.a., except that such measures are only encouraged for non-regulated projects.	We agree	Provisions C.3.a.i.(7) and C.3.c.i.(1) have been revised accordingly.
Daly City	21	C.3.c.i.(1)(a)	LID Source Control	Include qualifying language regarding sanitary sewer connections: "The project applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific	We agree	Provision C.3.c.i.(1)(a) has been revised accordingly.

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				connection and discharge requirements."		
James, Roger Att II	20	C.3.c.i.(1)(a)	LID Source Control *MEP*	Change "minimization" to "Reduce to the maximum practicable" to be consistent with the use of MEP in storm water permits.	Minimization of stormwater pollutants implies reducing to the MEP.	None
James, Roger Att II	21	C.3.c.i.(1)(d)-(e)	LID Source Control *Landscaping*	Combine these to read "Implement the Model Water Efficient Landscape Ordinance (Division 2, Title 23, California Code of Regulations) and minimize the use of pesticides and fertilizers." This will allow support of a state program.	The intent of this Provision is to identify and require appropriate source control measures, not to require compliance with another state program.	None
Santa Clara Co	16	C.3.c.i.(1)(e)	LID *Source Control Requirements*	• Who should be responsible for and how should efficient irrigation systems be achieved? • How should landscaping that minimizes irrigation and runoff, promotes surface infiltration, and minimizes the use of pesticides and fertilizers be achieved and by who?	Regulated Project proponents are responsible for any irrigation systems as well as landscaping that they install. There are many products currently available, especially in these times of drought, that are considered efficient irrigation systems.	None
Brisbane SMCWPPP Att 3	8c 7c	C.3.c.i.(2)	LID Site Design	Some of the LID requirements are overly prescriptive: • There may be places, such as tidal areas or heavily urbanized areas where maintaining or replicating pre-development hydrologic regime is inappropriate. • In some locations where there is existing infrastructure, it may be better to promote denser development with more impervious surface to lessen urban sprawl than minimizing the impervious footprint. • These sections should be changed to require these types of measures "where applicable" (the fact sheet uses this language in describing this provision).	This Provision does not require the pre-development hydrologic regime to be maintained or replicated. In the case of denser development which in many cases includes multi-levels, we consider the "building compactly and up" instead of "building sparsely and out" can be considered as a way to minimize the impervious footprint. Given the broad interpretation available for the measures required in this Provision, we don't agree that the "where applicable" qualifier is necessary.	None
NRDC	4a	C.3.c.i.(2)	LID Site Design	The site design provisions are vague and indefinite and as such, they do not constitute the control measures required by law, will not reduce stormwater to the MEP, and cannot ensure the attainment of water quality standards. The	Requirements such as conserving natural areas and minimizing impervious footprint are source control and site design measures consistent with LID principles. However, requiring a specific percentage	Provision C.3.c.i.(2) has been revised to require each Regulated Project to implement at least one site design measure from

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				nebulous language includes: • "Conserve natural areas, to the extent feasible" - Feasibility is an open-ended concept allowing for wide variation among Permittees and developers; • "Minimize impervious footprint" - Without any objective standard, Permittees have no way to determine what constitutes "minimization." • "Drain a portion of impervious areas . . . into pervious areas" - A portion means only that each Regulated Projects must filter some part of stormwater discharge (any number from 1-99%). • "Construct a portion of walkways, trails, . . . with permeable surfaces." - What qualifies as a portion?	of area to conserve or limiting the size of the footprint for each Regulated Project is beyond the purview of a stormwater permit. Therefore, these requirements have been left in narrative form. But we do concur that the site design requirements with regard to draining a portion of the impervious area into pervious areas and constructing walkways with permeable surfaces should be more specific.	a list of six specific options.
NRDC	4c	C.3.c.i.(2)	LID Site Design	EPA strongly recommends in its Measurable Goals Guidance for Phase II Small MS4s that measurable goals include a "quantifiable target to measure progress toward achieving the activity or BMP." The MRP's site design requirements do not contain recommended or required activities, measurable goals, a means to assess BMP performance, progress, or achievement of purpose. The vaguely worded provision does not satisfy EPA regulations and guidance and are thus invalid under the Clean Water Act.	We concur that the site design requirements should be more specific.	Provision C.3.c.i.(2) has been revised to require each Regulated Project to implement at least one site design measure from a list of six specific options.
BASMAA - Bicknell, J	77	C.3.c.i.(2)	LID Site Design	We support the implementation of low impact development concepts, and in fact, our municipalities already require projects to include site design measures to protect water quality.	Comments Noted	None
Contra Costa Co Supervisors	32, 33	C.3.c.i.(2)	LID Site Design	• Add the following to the requirement to minimize impervious surface: "consistent with zoning and building regulations and good planning practices." We support "minimizing imperviousness" but the degree to which this	It is implicit that the requirements for	None

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				can be required varies. • More pervious paving materials are sometimes inconsistent with fire district regulations. The following proviso should be added: "where consistent with fire district requirements."	minimizing impervious surface and using pervious pavement material should be consistent with zoning, building, and fire district regulations. Therefore, the "qualifying" language is not necessary.	
Daly City	22	C.3.c.i.(2) Fact Sheet Finding C.3-2	LID Site Design	Clarify the threshold for minimization of the impervious footprint of a Regulated Project. Although Finding C.3-2 of the Fact Sheet states, "Neither Provision C.3. nor any of its requirements are intended to restrict or control local land use decision-making authority", these specific provisions are impractical for the majority of commercial and mixed-use zoned sites that allow for 100% lot coverage.		
NRDC	6	C.3.c.i.(2)	LID Site Design Requirements	The MRP's site design requirements are less specific than the South Orange County draft MS4 permit, which was recently rejected by the San Diego Water Board. Yet, that draft permit contained more detailed and specific site design BMPs than the MRP. US EPA Region 9's comments on the South Orange County draft permit recommended that the permit be revised to include LID provisions similar to those contained in the draft Ventura County permit, especially the Effective Impervious Area (EIA) limitation.	We concur that the site design and treatment requirements should be more specific and have made appropriate revisions. However, we have not included an EIA limitation similar to the draft Ventura County permit because it would be too restrictive. Given the variety of site conditions and constraints in the Bay Area and particularly the increased emphasis on urban redevelopment and compact building practices, we feel it necessary to preserve a certain amount of flexibility with regard to selection of treatment measures. Applying an aggressive EIA limitation would essentially force all development projects to install landscape-based treatment measures and in some cases, this is just not feasible because of right-of-way constraints or limited space. From our experience in reviewing development projects that apply for 401 certification, it seems most projects can readily include landscaped-based	Provision C.3.c.i.(2) has been revised to require each Regulated Project to implement at least one site design measure from a list of six specific options. Each Regulated Project must also consider and install treatment measures following a specified hierarchy so that as much stormwater runoff as possible is addressed through recycling and landscaped-based measures before vault-based measures can be considered. The revised TO requires any project proposing to install vault-based treatment for more than 50% of the total
US EPA Region 9	2	C.3.c.i.(2)(d) & (e)		The one concern we have with the LID requirements of the proposed permit is Part C.3.c.i.(2)(d) which requires "a portion" of impervious areas to be drained to a pervious area, and Part C.3.c.i.(2)(e) which similarly requires for walkways and trails, etc. that "a portion" of such areas be constructed with permeable surfaces. To ensure adequate enforceability and clarity of the permit, the permit needs to include a numeric value for the quantity of runoff which would be directed to pervious		

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				areas. We suggest a requirement such as proposed in the August 2007 draft Ventura County MS4 permit which limits the EIA of new developments to 5% of the total area of a project. We are not wedded to any particular numeric value; this could be determined based on local considerations, but the requirements should be expressed quantitatively to ensure clarity and enforceability.	treatment measures for at least 50% of the total Provision C.3.d. specified runoff. Therefore, the revised TO includes specific notification requirements for any project that proposes to install vault-based treatment systems to provide primary treatment for 10-50% of the total Provision C.3.d. specified runoff and Water Board EO approval requirements for any project proposing to install vault-based treatment for more than 50% of the total Provision C.3.d. specified runoff. Water Board Executive Officer approval of projects will ensure that vault-based systems are installed only at sites with site constraints that make landscaped-based measures truly infeasible. The notification requirements will identify cities that we may need to work more closely with to ensure that LID practices are implemented appropriately and to the full extent practicable.	Provision C.3.d. specified runoff to obtain the Water Board EO's approval. Also, Permittees must notify the Water Board Executive Officer of any projects that propose to install vault-based treatment systems to provide primary treatment for 10-50% of the total Provision C.3.d. prior to granting approval to the project.
NRDC	10b, 11 12, 18	C.3.c.i.(2)-(3)	LID Site Design & Stormwater Treatment	• Even if the Water Board could lawfully omit a 3% EIA limitation, the wholesale omission of any articulated standard is unlawful and inconsistent with the MEP standard. The MRP follows an approach that has been criticized in a Dec 2007 publication by the State Water Board, which observes that language similar to that contained in the MRP does not specify a "level of compliance." EPA Region 9 has criticized both the South Orange County Permit's and the Monterey SWMP's failure to "target identified priorities or establish measurable goals." Thus, the MRP must be revised to contain specific, binding, measurable goals. • Requiring a 3% maximum EIA generates the most significant water quality benefits and meets the MEP standard. Studies by Dr. Horner show that the 3% maximum EIA approach is feasible, practicable, cost effective, and can result in as much as 100% runoff capture onsite. Even in low infiltrative capacity areas (D soils), total runoff can be reduced by 40-79% through LID. • Watershed studies show that impervious cover > 3% harms ecosystems. MEP means choosing the most effective BMPs, such as LID, which can be rejected only if the alternative BMPs will serve the same purpose		

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				or if the rejected BMPs are technically infeasible or cost-prohibitive. The MRP Fact Sheet does not demonstrate technical infeasibility or cost-prohibitiveness.		
NRDC	13 - 16	C.3.c.i.(2)-(3)	LID Site Design & Stormwater Treatment	The MRP contains insufficient substance for the Water Board or the public to determine what requirements developers must meet. The elimination of the required Stormwater Management Plans (SWMPs), which implement specific BMPs and control measures, compounds this, Although the MRP purports to include sufficient detail so that SWMPs are no longer necessary, this level of detail has not been achieved, There is nothing to stop a Co-Permittee from "misunderstanding or misrepresenting its own stormwater situation and proposing a set of minimum measures for itself that would reduce discharges by far less than the MEP. For example, a Permittee could comply with C.3.c.i.(2)(d) by requiring that 2% of impervious surfaces drain to pervious areas, this would hardly constitute pollutant reduction to the MEP but it would satisfy the terms of the Permit.	The elimination of the requirement for SWMPs was a means to achieve consistency between the various Permittees' stormwater programs. By setting the standards that each Permittee must comply with in the MRP, we no longer require the exhaustive details of each that would be included in a SWMP. We have re-written and combined Provisions C.3.c.i.(2) and (3) so as to better direct Permittees to require Regulated Projects to implement LID measures for most of the stormwater runoff onsite.	Provision C.3.c.i.(2) has been revised to add notification and/or justification requirements for any Permittees approving vault-based stormwater treatment measures for 10-50% of the total Provision C.3.d. runoff. We are also requiring WB Executive Officer approval for any Regulated Project proposing vault based systems for > 50% of the total Provision C.3.d. runoff.
James, Roger Att II	22	C.3.c.i.(2)(d)(i)	LID Site Design	This is really a meaningless requirement because it fails to specify a specific amount of runoff that must be drained to a pervious area.	We agree	Provision C.3.c.i.(2) has been revised to require each Regulated Project to implement at least one site design measure from a list of six specific options.
James, Roger Att II	23	C.3.c.i.(2)(d)(ii)	LID Site Design	Substitute "slope stability and impact on structures for "other pertinent factors."	We agree	Provision C.3.c.i.(2)(d)(ii) has been revised accordingly.
Santa Clara Co	17	C.3.c.i.(2)(e)	LID *Site Design*	How is "low traffic area" defined? For example in Start at the Source not all parking lots are	"Low traffic areas" generically refers to areas where permeable road surfaces	None

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			Requirements	considered low traffic areas and pervious surfaces are not appropriate.	may be appropriate because of there is not the overriding concern about the ability of the surface to withstand constant use by motor vehicles.	
James, Roger Att II	24	C.3.c.i.(2)(e)	LID Site Design *Permeable Surfaces*	The use of permeable pavements will have limited applications in the Bay Area when the objective is to achieve treatment or flow control standards. The Bay Area's Group D soils will require installation of under drains with large gravel storage areas to achieve even marginal flow control. Applications will be also limited to flat areas or areas with minimal (<5%) slopes with 10-100 foot setbacks from structures. Permeable pavements require frequent, intense, and costly maintenance to effectively maintain porosity. Failures or clogging of permeable pavements require complete reconstruction. Water Board staff must require the development of siting and design criteria applicable to the Bay Areas soils and maintenance standards before endorsing the widespread implementation.	This Provision only lists permeable pavement as an option for site design measures. There are other options that the Regulated Projects can pick from.	Provision C.3.c.i.(2) has been revised to require each Regulated Project to implement at least one site design measure from a list of six specific options.
Contech - Lin, H	1 - 4	C.3.c.i.(3)	LID Stormwater Treatment	Do not impose the stormwater treatment system selection hierarchy because: • Many systems fit into multiple categories. • It will lead to administrative barriers and policies that accept "preferred systems" and disregard land use, expected pollutants, BMP effectiveness, site constraints, and maintenance requirements, resulting in selection of inappropriate systems. • It is not proven by scientific research and monitoring data, imposes a false distinction between public domain and proprietary systems, and infers that proprietary systems have inferior performance; • International BMP database provided data showing that media filters provided better	Landscape-based treatment for stormwater runoff is generally superior to vault-based treatment because landscape-based treatment can remove a broader range of pollutants in a more robust and redundant manner. Additionally, landscape-based treatment provides multiple environmental and economic benefits in addition to reducing impacts to water quality from pollutants, such as enhancing water supplies, cleaner air, reduced urban temperatures, increased energy efficiency, and other community benefits such as aesthetics, recreation, and wildlife area.	None

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				performance than biofilters (basically swales), in the analysis of many treatment systems for total suspended solids and total phosphorus. • Proprietary systems are tested extensively in the lab and field and manufactured consistently, but most public domain systems are designed and constructed by people with varying experience resulting in inconsistent performance levels. • It provides no incentive for industry to develop novel systems and discourages thorough analyses of site conditions and comprehensive approaches to achieve the low impact goal. • As an example, subsurface proprietary BMPs can be designed to provide superior treatment and volume controls on sites where trash removal, pollutants sequestration, and spill control is required. And they may be more effective in protecting wildlife, public health, aesthetics, and other uses of the overlaying land because these pollutants are stored out of contact with humans and the natural environment.		
James, Roger Att II	25	C.3.c.i.(3)	LID Stormwater Treatment	This misguided guidance fails to consider the potential of projects to augment or replace already scarce water supplies. The first priority must be given to projects augmenting, replacing, or replenishing domestic water supplies. This provision must be rewritten to reflect a hierarchy recognizing the State's current and future water supply needs. The Water Board should not be promoting the use of BMPs that require irrigation unless reclaimed water is applied.	We agree.	Provision C.3.c.i.(2) has been revised to place stormwater treatment systems that store for reuse and/or infiltrate at the top of the hierarchy.
Contech	2	C.3.c.i.(3)	LID Stormwater Treatment	Storm Water Panel Recommendations to the State Board on the feasibility of numeric effluent limits articulated the following deficiencies in post-construction stormwater management: the	Landscape-based treatment for stormwater runoff is generally superior to vault-based treatment because landscape-based treatment can remove a	None

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				lack of long term accountability for BMP performance, improper BMP design and selection, and a tendency to maintain BMPs only for aesthetic purposes. The panel recommended that BMPs be designed/selected "more rigorously with respect to the physical, chemical, and/or biological processes that take place within them." A program for the selection, design and implementation of treatment systems should be developed with these observations in mind. It would be much more effective to replace the "order of preference" with an outline for a performance based and design process focused approach where BMPs are selected based on providing the highest level of performance with assured operational feasibility.	broader range of pollutants in a more robust and redundant manner. Additionally, landscape-based treatment provides multiple environmental and economic benefits in addition to reducing impacts to water quality from pollutants, such as enhancing water supplies, cleaner air, reduced urban temperatures, increased energy efficiency, and other community benefits such as aesthetics, recreation, and wildlife area. This view is in line with USEPA and State Water Board recommendations for LID.	
CCCWP	34	C.3.c.i.(3)	LID Stormwater Treatment	• This Provision contains two widely overlapping categories: "Stormwater treatment systems that reduce runoff, store stormwater for beneficial reuse, and enhance infiltration to the extent that is practical and safe;" and "Multi-benefit natural feature stormwater systems, such as landscaped-based bioretention systems, vegetated swales, tree wells, planter boxes, and green roofs." These two categories should be combined into one category—bioretention, for example, meets the criteria in both categories. • Also, no current category describes conventional non-proprietary facilities, such as constructed wetlands, "dry" detention basins, and sand filters.	• The two categories should remain separate because natural feature stormwater systems commonly installed in the Bay Area contain under drains which prevents infiltration of the treated stormwater. • We concur that we do not currently have a category for conventional treatment systems.	Provision C.3.c.i.(2) has been revised to add conventional stormwater treatment systems to the hierarchy.
James, Roger Att II	29	C.3.c.i.(3)	LID Stormwater Treatment Requirements	Systems must not only be constructed to meet the requirements of C.3.d, but they must also be designed, operated and maintained to meet the requirements of C.3.d. These elements must be added to the provision.	It is implicit that if these systems are constructed to meet Provision C.3.d., they will be designed to meet Provision C.3.d. and will be operated and maintained so that they will continue to provide the C.3.d. required level of treatment.	None

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James, Roger Att II	26	C.3.c.i.(3)(a)	LID Stormwater Treatment	State precisely what is meant by "practical and safe." Otherwise this is a meaningless requirement. "Practical" should be changed to "meets design and siting criteria" and "safe" should be "compliance with water quality standards for protection of groundwater supplies".	We concur that these two terms as used in Provision C.3.i.(3)(a) are ambiguous.	Provision C.3.c.i.(2) has been revised to better define the specific tasks for selecting stormwater treatment systems so that LID measures are included in each Regulated Project.
James, Roger Att II	27	C.3.c.i.(3)(b)	LID Stormwater Treatment	The specification of tree wells in the MRP TO and vendor provided information on the Filterra system on the Water Board's website raises significant questions on whether the Water Board's staff is promoting a proprietary product. Significant questions have been raised on the reported pollutant removal rates of the Filterra system, given the high (100-inches/hour) infiltration rates. The technology is only accepted in Washington for short-term testing to verify performance claims. This fact and the lack of validation of vendor-supplied performance claims hardly warrant the endorsement given in the MRP TO not withstanding the Water Code's Section 13360 prohibition against the Water Board specifying compliance measures.	The phrase "tree well" under the multi-benefit natural feature stormwater treatment systems category is intended as a generic descriptive name for this type of bioretention unit, not as an endorsement of Filterra.	None
Daly City	24	C.3.c.ii.	LID Implementation *Due Date*	An implementation date of July 1, 2009, represents a very aggressive schedule, so we must question whether such a date is reasonable.	The July 1, 2009, implementation date represents a one-year time frame, which is reasonable considering that WB staff has been directing Permittees for years to require Regulated Projects to use LID measures as much as practicable. The specific implementation date in the final MRP Permit will be adjusted accordingly to be one year after Permit adoption.	None
San Jose Att A	16	C.3.c.ii.	LID Implementation *Due Date*	We request that the date of July 1, 2009, be revised to "12 months after Permit adoption."		None
James, Roger Att II	28	C.3.c.ii. C.3.c.iii. C.3.c.iv. Fact Sheet	LID Site Design & Stormwater	The references in the Fact Sheet to the corresponding MRP TO Provisions are out of synch and make it impossible to review, analyze	The requirement for site design measures and a preference for landscaped-based measures are consistent with LID	The Fact Sheet has been revised to correctly reference the applicable

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		Pages 22-23		and submit substantive comments. The discussions in these sections indicate that the Water Board is now requiring site design measures and specific treatment systems. This is a direct violation of Section 13360 of the Water Code. The discussion suggests that the required treatment systems address soluble pollutants; however, no data is presented to substantiate this or that the required systems address soluble pollutants or those soluble pollutants are pollutants of concern. The Water Board staff has demonstrated a most unusual bias against proprietary systems yet present no data or references to support their claims. The Water Board staff has during the period of implementing the storm water program recommended devices like catch basin inserts and then had to retract that endorsement once performance information was provided. Water Board staff has also used the water quality certification program to promote their favorite treatment systems such as swales. This must be avoided so that responsibility for meeting requirements lies with the Permittee and project applicant.	concepts and practices, which USEPA has identified as a permit requirement for MS4s. Landscape-based treatment for stormwater runoff is generally superior to vault-based treatment because landscape-based treatment can remove a broader range of pollutants in a more robust and redundant manner. Additionally, landscape-based treatment provides multiple environmental and economic benefits in addition to reducing impacts to water quality from pollutants, such as enhancing water supplies, cleaner air, reduced urban temperatures, increased energy efficiency, and other community benefits such as aesthetics, recreation, and wildlife area.	Provision numbers.
James, Roger Att II	30	C.3.d.i.(2)(c)	Numeric Sizing Criteria *Flow Hydraulic Design Basis*	Guidance is needed on the interpretation and application of the 0.2-inch per hour flow based criteria when sizing storm water treatment systems designed for small LID catchments where times of concentration are less than 5-minutes. It is not clear from the criteria if the intent is to design for storm events with an average storm intensity of 0.2 inch/hour or to design a system using a maximum uniform intensity of 0.2-inch/hour. The two are vastly different and produce BMPs that may be either slightly oversized or significantly undersized depending on which interpretation of	As the commenter states there is a safety factor of 2 added to the 85% percentile hourly annual rainfall data. This is a substantial storm intensity, and represents a optimization of the sizing of flow through stormwater treatment devices, but a fairly conservative optimization. This represents an inch of rain in a five hour period, which is a fairly infrequent rain event in this region. No requirement for size of LID or stormwater treatment catchment exists, but even if treatment is installed for small	None

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				the criteria is used. The 0.2 inch/hour criteria used by the Water Board is also contained in the CASQA BMP Handbooks and was developed in the San Diego Region which has significantly different rainfall depths, storm durations and number of annual events, but similar short-duration intensities to the Bay Area. It is based on 51-years of hourly rainfall data collected at the San Diego Airport rain gauge. They found that 85% of the storm events have an intensity that is less or equal to 0.1 inch/hour. That intensity was multiplied by two to provide a margin of safety to allow for the possibility that some rain which falls during an hour could have fallen in bursts of greater intensity than 0.1 inch/hour. Unfortunately many storm water BMP designs are now using these flawed criteria because it results in small land requirements. These BMPs are under designed by at least a factor of 4 and possibly as high as 10 when high infiltration rates are applied and will frequently bypass or scour accumulated solids. Apparently the RWQCB staff used the 0.2 inch/hour criteria simply because it was being used elsewhere and has not done any analysis on whether it is applicable to the Bay Area's different and wide variation in rainfall event characteristics.	catchments, this does not necessarily require design of treatment capacity for a smaller time of concentration sized to that catchment. The stormwater treatment measures are often designed with a small storage volume above the treatment area, which also serves to ameliorate the effects of short time frame variability in the intensity of rainfall. All in all, overflow of treatment systems designed to this rainfall flow standard will be acceptably infrequent in this region.	
Moraga Oakley	33 33	C.3.d.iii.	Numeric Sizing Criteria *Reporting Question*	This Provision requires reporting using the Summary Tables required for C.3.b.iii. Is there anything intended to be reported beyond the hydraulic sizing criteria of C.3.b.iii?	No	None
SCVURPPP Att SCVWD	16 7	C.3.d.iv.	Numeric Sizing Criteria *Infiltration Devices*	Because of the concern for protection of groundwater quality in the Santa Clara Basin, the MRP should clearly define "infiltration devices" to distinguish them from other infiltration measures that are desirable site design and treatment features, and recognize	• We agree that a definition of "infiltration devices" is needed. • We think the 100 foot setback from water supply wells is adequate given that there is language in the Provision requiring greater setbacks if	A definition of infiltration devices has been included in Provision C.3.d.iv. Provision C.3.d.iv. has also been revised to

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				that specific infiltration devices, such as dry wells, may have greater potential impacts to groundwater quality than others.		
SCVWD	7			Stormwater management actions that include recharge to groundwater should ensure adequate protection of groundwater. Address the following issues addressed: • The MRP sets a uniform 100 foot setback from water supply wells for infiltration devices. Conditions may exist that require even further setbacks. • Consider setbacks from Underground Storage Tanks (USTs) and septic tanks to avoid the leaching of contaminants into groundwater from them. • Place restrictions on infiltration projects on or near sites with known soil or groundwater contamination.	warranted. • We concur that there should be setbacks specified for underground storage tanks as well as septic tanks. • We concur that there should be restrictions on the use of infiltration devices at sites with known groundwater contamination.	include setback requirements for underground storage tanks and septic tanks.
ACFCD Zone 7	3-6	C.3.d.iv.	Numeric Sizing Criteria *Infiltration Devices*	• This Provision should be consistent with any standards established by the Water Board's Groundwater- Surface Water Interaction Committee. • Infiltration devices for groundwater management should be exempt from this Provision's requirements. • This Provision does not require monitoring or reporting of these infiltration devices. To ensure that they are not causing or contributing to the degradation of groundwater quality, monitoring requirements should be required. • A higher level of analysis should be considered before approval is given for the use of infiltration devices where background contamination exists and the percolation runoff could mobilize the contamination to a sensitive receptor or interfere with the natural	• It is understood that infiltration devices within the context of this Provision refer to their use for stormwater runoff treatment only. • For clarity, we will include a definition for infiltration devices. • Additional restrictions for placement of infiltration devices have been added.	Provision C.3.d.iv. has been revised include more restrictions on the use of infiltration devices.

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				attenuation processes of the contamination.		
Santa Clara Co	18	C.3.d.iv.	Numeric Sizing Criteria *Infiltration Devices*	How do you determine if infiltration devices will degrade groundwater quality? The County recommends that the Water Board create guidelines for installing stormwater treatment systems. What other methods can be used to treat stormwater prior to infiltration devices?	There are existing guidelines developed by the countywide programs. Other stormwater treatment systems can be installed in tandem with infiltration devices to provide prior treatment to the infiltration devices.	None
James, Roger Att II	31	C.3.d.iv.	Numeric Sizing Criteria *Infiltration Devices*	A Provision must be added implementing the requirements of the Safe Drinking Water Act UIC Program. This should include the following elements: • Define storm water BMPs that are deeper than wide as Class V injection wells and prohibit their use in wellhead protection designated sole source aquifer areas. • Prohibit the installation of Class V injection wells that receive auto motor vehicle waste. • Require owners of Class V Injection Well to register the well and file reports with USEPA Region 9.	• For clarity, we will include a definition for infiltration devices. • Additional restrictions for placement of infiltration devices have been added.	Provision C.3.d.iv. has been revised include more restrictions on the use of infiltration devices.
James, Roger Att II	32	C.3.d.iv.(2)	Numeric Sizing Criteria *Infiltration Devices*	This Provision is inadequate to assure protection of groundwater quality and does not implement the Shallow Drainage Well provisions of the Water Board's Basin Plan. Sections (a), (b) and (c) of this Provision need to be completely rewritten to provide a proactive program for protecting groundwater resources.	Additional restrictions for placement of infiltration devices have been added.	Provision C.3.d.iv. has been revised include more restrictions on the use of infiltration devices.
Moraga Oakley	34 33	C.3.d.iv.(2)(a)	Numeric Sizing Criteria *Infiltration Devices*	This Provision makes a change to the requirement for infiltration in that it now requires 2 feet of fine grained soil in the flow path. What is meant by fine grained soil, as soils that contain clays are fine grained but do not infiltrate well? It had been our understanding that the 10-foot separation was to create the necessary filtration bed. Does our standard of 18 inches of engineered soil and 5 in/hr infiltration rate still meet this requirement?	The two feet of fine grain soil serves to ensure adequate removal of pollutants. However, we agree that "fine grain soil" may describe clays, clearly not an appropriate soil type for infiltration devices. However, there is also a need to specify a maximum infiltration rate to ensure adequate removal of pollutants.	Provision C.3.d.iv.(2)(a) has been revised to specify "two feet of suitable soil to achieve a maximum 5 inches/hour infiltration rate for the infiltration system."

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Alameda City	20			This Provision requires "two feet of fine grain soil" in stormwater infiltration devices. This impractical specification may reduce the effectiveness of infiltration and create dysfunctional treatment structures.		
Silicon Valley Bike Coalition	1	C.3.e.	Alternative Compliance	The Section C.3.e. Alternative Compliance with Provision C.3.b. and d. appears not to apply to trails as written.	This section is intended for projects that may have difficulty with installing stormwater treatment systems because of site constraints, such as space limitations and underlying utilities. These site constraints are not applicable to trail projects.	None
HBA - Foley-Gannon, E	6, 7	C.3.e.	Alternative Compliance *Brownfields & Transit-oriented Development*	We agree with the basic designation of special projects where sizing requirements may not be applicable. • However, for brownfields, we don't understand why they have to have supplemental funds provided to qualify as a special project. • The same thing with the planned development projects; if you also include things for, not just existing development, but the existing transit-oriented development but also planned to encourage really smart regional planning. That's a concept that I think is somewhat missing.	• The "special projects" category is restricted to Brownfieds projects that receive subsidies to limit the number of projects. In urban areas, very large areas may potentially be classified as Brownfields. • This permit is not intended as a regional planning document.	None
SCVWD	8	C.3.e.	Alternative Compliance *Regional Projects*	• The District appreciates the provisions that allow for regional solutions. • We encourage the Water Board to develop grant funding programs and to work collaboratively with the District and other co-Permittees on developing regional solutions to stormwater peak flow attenuation., such as in-stream restoration projects or off-stream treatment and detention basins that could be funded, at least in part, through developer contributions. • Regional solutions represent an improvement	Comment noted.	None

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				over the proliferation of thousands of very small, individual onsite control systems that will ultimately lead to problems in the long term.		
NRDC	8	C.3.e.i.	Alternative Compliance	What qualifies as "alternative compliance," is vague and lacks performance standards. Infill projects < 1 acre and redevelopment projects could avoid installing onsite stormwater BMPs by providing "equivalent offsite treatment" or contributing "equivalent funds" to a "Regional Project." These options do not clearly state the required performance level. Alternative compliance projects may not be as effective at mitigating stormwater runoff and pollution since the Water Board does not maintain any oversight of project implementation and Regional Projects do not need to be completed until 3 years after construction of the exempted development and may pollute for 3 years without any mitigation. The Water Board and the public would have no means to judge whether the offsite mitigation projects performed adequately until 3 years after the development has been built. These loopholes do not constitute pollution reduction to the MEP.	Alternative compliance is a necessary option because there are projects where onsite treatment is just not feasible because of existing underground utilities, right-of-way constraints, and limited space. All offsite projects installed as alternative compliance are required to meet the same hydraulic sizing criteria (Provision C.3.d.) that onsite projects do. We have expanded operation and maintenance requirements to all offsite projects installed as alternative compliance. A longer timeframe for construction of Regional Projects is necessary because some beneficial projects require longer timeframes to plan, obtain funding from various sources, and construct.	Provision C.3.h. (Operation and Maintenance Requirements) has been revised to specifically apply to all offsite projects installed as alternative compliance.
Moraga Oakley	35 33	C.3.e.i.	Alternative Compliance *Restrictions*	C.3.e. limits alternative compliance to less than 1 acre as item (1). Item (4) seems to contradict item (1). What is intended?	The intention was to limit alternative compliance to infill development projects < 1 acre and redevelopment projects. However, this restriction has been lessened. See response for previous comment above.	Provision C.3.e.i. has been revised to incorporate HBA's definition of infill site and to allow alternative compliance for all infill sites.
HBA - Foley-Gannon, E SCVURPPP Att A CCCWP CCCWP Letter	5 18 35 11	C.3.e.i.(1)-(2)	Alternative Compliance *Restrictions*	The alternative compliance option should not be limited to new infill development projects < 1 acre and redevelopment projects only because: • Most projects will use onsite treatment because it is less expensive and the quickest	The alternative compliance option is intended primarily for redevelopment projects. In keeping with LID concepts, we expect new development projects to install mostly landscaped-based treatment	Provision C.3.e.i. has been revised to incorporate HBA's definition of infill site and to allow alternative

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Contra Costa Co Supervisor Daly City	34 25			route to project approval. • The limitation restricts the use of alternative compliance in rare instances where it is needed. • There may be some projects that don't meet the restrictions but for which it is necessary or preferable to use alternative compliance.	measures and to allocate the appropriate space for them because they do not have the site limitations of redevelopment. However, we acknowledge that new infill development in urban cores may have the same site constraints as redevelopment projects; therefore, we have removed the 1 acre cap on infill projects allowed alternative compliance and incorporated the definition of infill site proposed by HBA.	compliance for all infill sites.
Moraga Oakley	35 33	C.3.e.i.		C.3.e. limits alternative compliance to less than 1 acre as item (1). Item (4) seems to contradict item (1). What is intended?	The intention was to limit alternative compliance to infill development projects < 1 acre and redevelopment projects. However, this restriction has been lessened. See response for previous comment above.	Provision C.3.e.i. has been revised to incorporate HBA's definition of infill site and to allow alternative compliance for all infill sites.
SMCWPPP Att 3	7d	C.3.e.i.(1)-(2)	Alternative Compliance *Restrictions*	The Water Board should encourage new infill projects because of the multiple benefits compact development has on stormwater quality. The MRP should allow new infill projects greater than one acre to use site design treatment measures as a method of achieving alternative compliance.	The intent of alternative compliance is to provide treatment (in accordance with Provision C.3.d.) of an equivalent impervious area or pollutant loading at an offsite location or Regional Project. Using site design measures alone will not provide adequate treatment to satisfy this intent.	None
Concord Mayor CCCEAC	7 13	C.3.e.i. C.11.e.i.	Alternative Compliance & Pilot Projects for Mercury and PCBs	Provision C.3.e.i. allows alternative compliance for infill and redevelopment projects for stormwater treatment requirements. Provision C.11.e.i. (page 84) requires 10 onsite treatment systems for mercury reduction and Provision C.12.e.i. (page 89) also requires 10 onsite treatment systems for PCBs. Permittees should be allowed the flexibility to combine the utility of stormwater treatment facilities for both alternative compliance and treatment for pollutants of concern.	Alternative compliance projects mitigate for the lack of stormwater treatment onsite at Regulated Project sites. Having them also count as pilot projects for Provisions C.11. and C.12. would essentially be "double counting" and not meet the intent of the MRP requirements.	None

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San Leandro	29	C.3.e.i. Attach A Flowchart	Alternative Compliance *Attachment A Flowchart*	The flowchart for provision C.3.e has two paths leaving the box marked "Regulated Project", but neither path is labeled so there is no way to determine (on the flowchart) which path to take. We suggest adding labels to each path indicating which conditions would result in choosing that path.	We agree	The C.3.e. flowchart has been revised to clarify the conditions for the different paths given.
James, Roger Att III	3a	C.3.e.i.(1)-(2)	Alternative Compliance *Infill Development*	Change "already largely developed" to a percent of the urbanized area that is developed. Suggest that a figure of 75% built out.	We agree	This definition of infill development has been replaced with a more precise definition of infill site tied to the amount of development surrounding the Regulated Project.
James, Roger Att II	33, 34	C.3.e.i.(3) Footnote 1	Alternative Compliance *Maximizing Site Design Treatment Controls*	If diversion of roof downspouts is feasible and doesn't create site instability then diversion should be acceptable. This Provision should contain a minimum requirement of diverting at least 50% of the impervious area to a pervious area that is at least twice as large as the area being diverted in order to obtain an exemption.	The diversion of 50% of the impervious areas to pervious areas may not be feasible because of site constraints, such as the potential to create site instability, as mentioned in the comment.	None
NRDC	9	C.3.e.i.(3)	Alternative Compliance *Brownfields Transit-Oriented Development & Low-income Housing*	This section allows brownfields, low-income and senior housing, and transit-oriented developments to avoid hydraulic sizing criteria by "maximizing site design treatment controls." This means that these projects would only have to implement at least one of four vaguely defined "site design and/or treatment measures" that are not required to meet any performance standards. As for the LID provisions, there is no way to ensure that any of these alternative compliance options would be effective at reducing stormwater runoff and pollution. By explicitly waiving hydraulic sizing criteria, this section is almost certain to result in less than the federally mandated MEP standard of pollutant reduction. Yet there is nothing in the record to indicate why	The allowance of subsidized Brownfields, low-income housing and transit-oriented developments to maximize site design measures in lieu of installing hydraulically-sized treatment systems was included as an incentive in recognition of other water quality as well as societal benefits from these projects. For example, high-density infill, transit-oriented development projects in a highly developed urban core can reduce overall runoff pollutants by reducing overall vehicular traffic and associated pollutants and by concentrating growth in urban areas to reduce sprawl in outlying areas. Traffic commutes can be shortened and	None

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				these particular projects should not have to comply with otherwise applicable federal law. Exemptions from BMP requirements should be granted only where compliance is truly infeasible and where alternative compliance can be proven effective.	pedestrian activity increased when more people live in close proximity to mass transit systems, thus reducing automotive exhaust pollutants in stormwater runoff.	
James, Roger Att II	36	C.3.e.i.(3) and (4) Footnote 3 & 4	Alternative Compliance	Since the Water Board is encouraging disconnection of impervious surfaces and diverting runoff to pervious surfaces then it should recognize that existing developments may have already maximized site design controls.	Even if there are existing site design controls, the Regulated Project must identify and implement one additional site design measure to qualify for essentially an exemption from Provision C.3.d. treatment requirements.	None
James, Roger Att II	35	C.3.e.i.(3)(a)	Alternative Compliance *Brownfields*	The Water Board should not be encouraging infiltration on Brownfield sites unless geotechnical studies document that there is no potential for offsite migration of the contaminants that led to the designation of the site as a Brownfield. At best, the design, construction, operation, and long-term maintenance of infiltration BMPs on Brownfield sites will be a major costly challenge and infiltration BMPs must be avoided and certainly not encouraged.	This provision does not require nor encourage Brownfields to infiltrate stormwater onsite. Not all the listed site design treatment controls in Footnote 1 are based on infiltration.	None
Contra Costa Co Supervisors	35	C.3.e.i.(3)(b)	Alternative Compliance *Low-income Housing*	The referenced Government Code Section (65589.5(h)(3)) states, "housing for very low, low-, or moderate income households" means that at least 20% of the total units shall be sold or rented to lower income households, or 100% of the units shall be sold or rented to moderate-income households." The County recommends that this low income housing definition coincide with the California Redevelopment Law requirement of 15%, as stated under Government Code Section 33413 subdivision (b)(2)(i), which is consistent with the County's 15% Inclusionary Housing Ordinance requirement (Section 822-4.402(a) of the County Ordinance Code). The current language	The allowance of low-income housing to forego the hydraulic sizing criteria is a regulatory incentive in recognition of societal benefits from these projects. As such, it must be limited to developments that provide the highest percentage of low-income units; that is why we used the definition under Government Code Section (65589.5(h)(3).	None

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				provides something of a disincentive to provide affordable housing in accordance with County regulations. Modifying the percentage to meet existing California Redevelopment Law (and the County's current Inclusionary Housing requirement) may provide an incentive for developers to build affordable units.		
San Jose Attorney SMCWPPP Att 3	3 7d	C.3.e.i.(3)(d)	Alternative Compliance *Transit-Oriented Development*	Placing restrictions on the transit-oriented development option for alternative compliance is overly prescriptive, unsupported by evidence of water quality benefit, and not required by the Clean Water Act.	We worked closely with the Metropolitan Transportation Commission (MTC) to develop the TOD definition. The allowance of TODs to forego the hydraulic sizing criteria is a regulatory incentive and as such, it must be limited to developments that are taking steps to reduce vehicular use in a significant way; therefore, a limitation of one parking space per residential unit is appropriate. We met with MTC to discuss the comments received and at their request, we have added visitor parking restrictions to the TOD definition as well as included a statement that handicapped parking spaces are not subject to the parking maximums.	Provision C.3.e.i.(1)(d) has been revised to include a maximum for visitor parking equal to 10% of the total number of residential parking spaces and a clarification that handicapped parking spaces are not subject to the parking maximums.
Daly City Mountain View San Jose San Jose Att A San Leandro	26 6 9 17 5			• The TOD definition does not correlate with the definition employed by municipalities • Delete the reference to one parking space per residential unit • Replace the one parking space per residential unit with 1.5 because there is very little market for residential units with only one parking space.		
Contra Costa Co Supervisors	36	C.3.e.i.(3)(d)	Alternative Compliance *Transit-Oriented Development*	Land uses are subject to change after a project is established. This section should add language indicating that the parking ratios should be required for the designed occupancy. It will not be feasible to require that changes of lessees be required to maintain the same use (i.e. restaurant-occupied spaces be required to only be used as restaurants).	Since Provision C.3. is triggered only if impervious surface is created and/or replaced above the applicable threshold, it is implicit that the parking space ratio limits apply to the designed occupancy at the time the development is approved by the Permittee.	None
Daly City SCVURPPP Att A	27 19	C.3.e.i.(4)	Alternative Compliance *Offsite Projects Due Date*	Do not require offsite alternative compliance projects to be completed by the end of construction of the Regulated Projects: • It is difficult to control construction schedules and the offsite treatment facility may require a	We agree that a longer timeframe may be required for construction of offsite projects and a maximum construction time of 3 years after the construction of the Regulated Project can be allowed.	Provision C.3.e.i.(2) has

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				longer construction timeline than the Regulated Project. • Provide flexibility to allow applicants to sign agreements that they will work toward completion and have final Certificate of Occupancy of the Regulated Project tied to completion of the offsite facility to demonstrate compliance. • Allow offsite projects to be completed within 2-3 years after construction of the Regulated Projects.	However, to offset the untreated stormwater runoff from the Regulated Project that occurs while construction of the offsite project is taking place, the offsite project must be sized to treat an additional 10% of runoff for each year that it is delayed.	been revised to allow the extra time for construction of the offsite project.
ACFCD Zone 7 CCCWP SMCWPPP Att 3	2 36 7d	C.3.e.i.(4)	Alternative Compliance *Regional Projects Due Date*	The 3-year time requirement for constructing Regional Projects may prevent the implementation of some beneficial projects that require longer time horizons to plan, fund and construct. • Zone 7 recommends that the MRP require that by the end of the 3rd year after construction of the Regulated Project, the project proponent should have funds encumbered and already applied for the appropriate regulatory permits necessary for the Regional Project or stream restoration project. This will demonstrate a project proponent's good faith effort toward implementing the regional project or stream restoration. • CCCWP recommends that the following be added to the last sentence in this section: "however, the timeline for a Regional Project may be extended with Regional Board approval if the project is consistent with a Discharger's adopted drainage master plan or similar plan." • SMCWPPP recommends that the MRP state that the 3-year period is encouraged, but longer time periods, up to 10 years, may be allowed.	We agree that a longer timeframe may be required for Regional Projects; however, we think a maximum construction time of 5 years is adequate.	Provision C.3.e.i.(2) has been revised to allow up to 5 years for the construction of Regional Projects, subject to Water Board Executive Officer approval.

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BASMAA - Bicknell, J	77	C.3.e.i.(4)	Alternative Compliance *Offsite and Regional Projects*	We support flexible language for alternative compliance that allows developers to construct offsite or regional treatment measures that accomplish the same pollutant goals, pollutant load reduction goals or flow reduction goals as onsite measures.	Comment noted.	None
Contra Costa Co Supervisors	37	C.3.e.i.(4)(a) Footnote 3	Alternative Compliance *Equivalent Offsite Projects*	"Purchase and preservation, by deed instrument, of natural/pervious area" should be offered as an additional option for equivalent offsite treatment should be added, with an appropriate ratio of impervious area created to natural/pervious area preserved.	The intent of this Provision is to allow treatment of stormwater runoff from an equivalent area of impervious surface or the treatment of an equivalent pollutant loading or runoff volume at an offsite project. Preserving natural/pervious areas provides no treatment of stormwater runoff from impervious surfaces; therefore, it should not be included as an option	None
SCVURPPP SCVURPPP Att A Sunnyvale Att A	4 17 10	C.3.e.iii.(1)	Alternative Compliance *Existing Programs*	In implementing Santa Clara Program's 2001 NPDES stormwater permit, several Santa Clara County Permittees adopted Alternative Compliance programs after substantial dialogue with the Water Board Executive Officer and staff, and public noticing and hearing procedures before their respective city Councils. The MRP should be consistent with these already adopted programs and/or allow for their ongoing implementation under the MRP. No basis has been provided for invalidating established programs and this change provides no water quality benefit. We do not expect that alternative compliance will be a common technique but it is an important tool for some projects. We request that this provision allow existing alterative compliance programs to remain in effect.	The current Alternative Compliance Programs adopted by some of the Santa Clara municipalities are less stringent than what is proposed in the MRP. At the time they were approved by the Water Board's Executive Officer, it was understood that these programs would have to be revised to be in conformance with this Provision of the MRP. Alternative Compliance Programs should be consistent throughout the areas regulated by the MRP; otherwise, it would be unfair for Regulated Projects in one city to be exempted from treatment or allowed alternative compliance while identical Regulated Projects in a neighboring city are not. The existing programs must be rescinded or revised to be consistent with Provision C.3.e.	None
SMCWPPP Att 3	7d	C.3.e.iii.(1)	Alternative Compliance	There are no existing alternative compliance programs that SMCWPPP is aware of in San	Comment noted.	None

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			Existing Programs	Mateo County, so the proposed requirement to rescind or modify existing programs should not be an issue.		
Santa Clara Co	19	C.3.e.iv.	Alternative Compliance *Due Date for Ordinance/Legal Authority Changes*	The County is concerned there is not enough time to develop and submit the ordinance/legal authority and procedural changes needed to implement Provision C.3.e. by the 2008 Annual Report and proposes to have it implemented by 2009 instead.	This Provision does not require reporting by the 2008 Annual Report. It requires reporting, only for Permittees implementing Provision C.3.e., to be done in the Annual Report following the implementation date for the alternative compliance program.	None
Contra Costa Co Supervisors	55	C.3.f., C.3.g.	Alternative Certification of Stormwater Treatment Systems and Alternative Compliance	Since the activities that are precursors to implementation of Provisions C.6.e., C.3.f., and C.3.g. are not to be completed by November 30, 2008 (per Provisions C.6.a.ii.(3) and C.6.b.ii.(7) and are not to be reported until the October 2009 Annual Report (per Provisions C.6.a.iii. and C.6.b.iii.) implementation dates for Provisions C.6.e., C.3.f., and C.3.g., should not be required for at least one year after the precursor activities (recommended implementation date: July 1, 2010).	There seems to be an error in referencing Provisions C.3.f. and C.3.g. in this comment.	None
James, Roger Att II	37	C.3.f.i. C.3.g.	Alternative Certification *Licensing Requirements*	The certifications requirements should also apply to submittals under Provision C.3.g. Certification of the C.3.d. criteria and submittals under C.3.g. requires expertise in hydrologic analysis which is generally not taught to or an expertise architects and landscape architects. Water Board staff needs to determine whether the licensing requirements for these two professions require demonstration of expertise in hydraulic and hydrologic analysis and if it doesn't then they should be excluded form third party reviews.	The countywide programs have invested a great deal of resources into developing the methodology for designing HM controls and training the appropriate Permittee staff who will be reviewing the designs. An alternative certification program for the HM controls is not required at this time.	None
James, Roger Att II	38	C.3.f.ii.	Alternative Certification *Conflicts of Interest*	The Fact Sheet and provision only touch on the many conflicts that have developed form the implementation of the storm water program. Permittee's consultants that have developed storm water program requirements including	This Provision requires Permittees to make a reasonable effort to prevent any third party conflict of interest. It specifically calls out the conflict of interest situation described in the comment as an	None

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				recommended BMPs also serve as consultants to developers in designing projects to meet the Permittee's requirements while others promote ongoing studies rather than solutions. Rather than attempting to define all the potential conflicts of interest it will be better to allow individual professional integrity to prevail and when serious conflicts arise then the Department of Consumers Affairs should address the conflicts.	example. However, this Provision does not attempt to define all potential situations where there may be a conflict of interest.	
James, Roger Att III	3b	C.3.f.iiii.	Alternative Certification *Reporting*	Require that the name, qualifications professional registrations of the third party reviewer be submitted.	We consider this level of reporting detail to be excessive.	None
Walnut Creek	3b	C.3.g.	Hydromodification Management	The proposed changes occur before the Contra Costa Clean Water Program has had the opportunity to monitor and empirically evaluate HM effectiveness as required under the current permit.	We assume the Commenter is referring to changes addressed by other Contra Costa Permittees. Please see the responses to comments from CCCWP on Provision C.3.g.	Revisions proposed in response to more specific comments.
Mountain View	7	C.3.g.	Hydromodification Management *Phase Implementation*	Phase in HM requirements, allowing agencies to (1) develop a method to refine areas needing further study (pink areas on HM map); (2) modify Development Review Process; (3) inform staff & developers. Requirements would impact project costs (design/construct HM controls, most likely on-site retention ponds). Retention ponds reduce amount of land available for development, which also increases property prices.	The Commenter's Permit has contained HM requirements since 2005; the MRP TO represents a phasing-in of these requirements to now cover more projects. Thus, we disagree that further phasing is needed. Comments regarding cost & size of HM controls were addressed in our Response to Comments on Amendment of Permit Provision on New Development Treatment Measures, NPDES Permit CAS00297818, Oct. 2001.	None
James, Roger Att I	3	C.3.g.	Hydromodification Management *In-Stream Restoration*	Review HM requirements & consider recent studies. Given that a high % of Bay Area watersheds are built out & many have far greater than 25% impervious cover, it's questionable whether these requirements are the most cost effective way to prevent further deterioration or	While we agree that existing impervious cover continues negatively impact creeks, the purpose of these HM requirements is to take the first step in dealing with impervious surfaces: prevent large new developments from adding to these	None

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				improve creek habitat. In-stream restoration projects & large scale groundwater recharge projects that serve new & existing development in watersheds with greater than 25% impervious cover should receive much higher emphasis. Flood control districts should have a leadership role in this effort.	impacts. The Tentative Order does offer in-stream restoration projects as alternative compliance for runoff treatment.	
James, Roger Att I	4	C.3.g.	Hydromodification Management *Regional Consistency*	The recent analysis of HMP approaches identified strengths, weaknesses & errors in BAHM & Contra Costa County approaches that need to be resolved. Combine best elements of both after addressing weakness in the Contra Costa program; include in this permit; & apply throughout Bay Area. This would implement Water Board's Finding 9, Order No. R2.-2006-0050 issued to Contra Costa Permittees.	The Tentative Order allows improvements to be made in HM methodologies. We encourage cooperation & expect the best elements of the 2 approaches will be shared as HM methodologies improve. It is premature to combine the elements as suggested, because we are still learning the advantages of each approach. Also, we do not specify method of compliance in NPDES permits.	None
GCRCD Att	17b	C.3.g.	Hydromodification Management *Methodology*	How will pre-project runoff estimates be made & validated? Why not require pre-project runoff to be measured?	Pre-project runoff is estimated using a continuous model with 35-50 years of actual precipitation data. This is more accurate than measuring runoff over 1 or 2 years, because of the variability of runoff from year to year.	None
James, Roger Att II	39	C.3.g.i.	Hydromodification Management *Methodology*	The Water Board has made a point that directly connected impervious surface should be minimized, & has encouraged that impervious surfaces be disconnected & that runoff from impervious areas be discharged to pervious surfaces. Directly connected impervious surface generates runoff which is the concern to be addressed in the HMP. The phrase "directly connected" should be added just prior to the three "impervious surface" phrases. To refine this further the relative impervious or coefficient of runoff should be considered for impervious surface when determining the differences between pre and post project runoff conditions.	We disagree. We believe evidence shows impervious surface (directly connected or not) increases runoff flows and durations in a watershed. Indeed, the Commenter makes the same point in another comment about studies showing that a very small amount of impervious surface in a watershed increases erosion of creek beds & banks. We do not agree the phrase "directly connected" is important or appropriate in the HM Standard.	None

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GCRCD Att	17a	C.3.g.i.	Hydromodification Management *Threshold*	Cumulative runoff from multiple 1-acre or even ¼ -acre plots will, in all likelihood, destabilize streams & cause excessive erosion & deposition problems. Flash runoff from even a ¼ -acre of impervious surface will cause severe negative impacts on very small streams. At a minimum, require HM control for impervious surfaces ≤ 1/4-acre in five years.	Because the HM requirements are fairly new for many Permittees, we disagree that it is appropriate to reduce the applicable project size in this Permit term; we will look at this again in the next Permit term.	None
GCRCD Att	17c	C.3.g.ii.	Hydromodification Management *HM Standard*	C.3.g.ii states: "Stormwater discharges from HM Projects shall not cause an increase in erosion potential of the receiving stream over the pre-project (existing) condition." The pre-project (existing) channel condition isn't addressed. If the channel is nearly/already unstable, any increase in discharge will cause excessive erosion & make C.3.g.ii unattainable.	While we agree in general with these comments, the purpose of these HM requirements is to take the first step in dealing with impervious surfaces: prevent large new developments from adding to these impacts. The HM requirements are fairly new to most Permittees, and it is not yet appropriate to "ratchet down" the requirements; Permittees need to gain experience at the current level. Beyond this, we are working on a Stream Protection Policy to help this problem, & future Permit reissuances may also move in this direction.	None
GCRCD Att	17d			Most streams in Santa Clara Basin's urban area are unstable now, due to discharge from current impervious surfaces, channel encroachment & ill-advised channel modifications. To meet MRP goals, there must be an effort to reduce current stormwater discharge & associated erosive forces from all present development.		
NRDC	3	C.3.g.ii.	Hydromodification Management *HM Standard*	To objectively represent the MEP standard, include an HM standard that post-development peak flowrates & volumes shall not exceed the modeled peak flow rates/volumes of pre-European-settlement native land cover for all storms from the channel-forming event to the 100-yr frequency stream flow.	We agree that these comments make valid points & suggest ways to strengthen the HM requirements that may be worthy of consideration. We wish to move in the suggested direction over the next 5 years, & will consider these improvements in the next Permit term. Because HM requirements are fairly new for many	None
NRDC	17			Requiring "[i]ncreases in runoff flow & volume be managed so that post-project runoff shall not exceed estimated pre-project rates & durations..." is acceptable for new development, but not for infill & redevelopment. Pre-project rates & durations for infill & redevelopment sites are measurements that we want to avoid.		

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NRDC	18			Require HM Projects not to exceed pre-development runoff rates & durations. This would result in measurable progress, rather than institutionalizing detrimental stormwater practices. Thus, matching pre-development flows & durations is required to meet the MEP standard.	Permittees, we disagree that it is appropriate to strengthen the HM Standard at this time.	
CCCWP	19	C.3.g.ii.	Hydromodification Management *HM Standard*	Delete "Stormwater discharges from HM Projects shall not cause an increase in the erosion potential of the receiving stream over the pre-project (existing) condition." This language is problematic because there are various competing definitions of "erosion potential" circulating. For example, some definitions of "erosion potential" consider coarse sediment supply & others do not.	The term "erosion potential" is used as plain English, to indicate what the HM Standard is intended to achieve; it is not intended to be a technical term. We disagree that this introductory sentence will lead to confusion, because the HM Standard is spelled out clearly in the subsections that follow.	None
CCCWP	20	C.3.g.ii.(1)	Hydromodification Management *Range of Flows to Control*	Omit Contra Costa from this flow range requirement, because: (a) design criteria assumptions for our bioretention areas, planters, etc. are conservative; (b) anticipated distribution & types of HM controls in sites & watersheds makes application of low-flow criteria to any one facility less important; (c) our approach means more projects will have HM controls; (d) we don't have maps showing exempt areas; (e) a distributed approach provides an additional buffer against impacts to streams; (f) assumptions used to calculate pre-project runoff & facility performance haven't been verified by empirical evidence & our HMP includes monitoring to verify facility performance & changing designs if warranted. C.3.g.ii.(1) would reverse Board's 2006 decision & apply new criteria to design of HM controls. No rationale is given, nor any schedule proposed for complying with the change. Note the requirement that HM controls designed for a specific site (Option #3) must meet the low-flow standard, so this	We disagree that it is necessary to omit the Contra Costa Permittees from this requirement, which is the basic approach used in all counties. As the Commenter states, Contra Costa uses this standard in its "Option c" for site-specific design. We realize that Contra Costa's "Option b" flow-through planters and swales are not designed to control the specified low flows; these designs will continue to be allowed. After Contra Costa gains experience and conducts the required monitoring, design modifications may be required.	In C.3.g.ii.(1), add a sentence stating that Contra Costa IMPs are not required to meet the low-flow criterion.

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				requirement need not be repeated in Provision C.3.g.ii.(1).		
Santa Clara Co	21	C.3.g.ii.(1)	Hydromodification Standard *Range of Flows to Control Methodology*	What happens if the flow duration curve deviates above the pre-project flow duration curve by more than 10 percent over more than 10 percent of the length of the curve corresponding to the range of flows to control?	Then the HM control measure must be redesigned until the criteria are met. This is generally an iterative design process; it is repeated until the criteria are met.	None
CCCWP	21	C.3.g.ii.(3)	Hydromodification Management *Precipitation Data*	Delete "For sizing a particular site's HM control, the nearest rainfall data shall be used." In Contra Costa's approach, applicants adjust the sizing & underdrain flow rate of (HM control) facilities based on differences in mean annual precipitation. Mean annual precipitation is determined by locating the site on an isohyetal diagram.	We reviewed C.3.g.ii.(3) and determined that the sentence in question is not necessary.	Delete the sentence: "For sizing a particular site's HM control, the nearest rainfall data shall be used."
CCCWP	22	C.3.g.ii.(4)	Hydromodification Management *Calculating Post-Project Runoff*	C.3.g.ii.(4). Calculating Post-Project Runoff: Delete "Retention & detention units shall be considered impervious surfaces for the purposes of calculating post-project runoff. Pre- & post-project runoff shall be calculated and compared for the entire site, without separating or excluding areas that may be considered self-retaining." The clause eliminating credit for self-retaining areas would disallow the practice of directing downspouts to concave-graded landscaped areas as a means of HM control. The clause requiring comparison for the entire site would disallow use of distributed (HM control) facilities & would disallow Contra Costa's sizing factors approach.	Contra Costa's "Option c" (site-specific design of HM Controls) must comply with both clauses, as do projects across the Bay Area. For Contra Costa's Option b" (pre-designed IMPs), no similar calculations are required, so this part of the HM Standard would not affect use of IMPs. We disagree that directing downspouts will not be allowed; indeed, such practices can be effective in reducing overall site runoff.	In C.3.g.ii.(4) change the word "unit" to "basin" to be more specific and clear.
Moraga	36	C.3.g.ii.(4)	Hydromodification Management *Calculating Post-Project Runoff Methodology*	When calculating post-construction runoff, retention & detention units are to be considered as impervious surfaces. We recognize that a saturated surface is the same as an impervious surface. However, this does not apply in this case because the water that falls in the retention/detention device will be retained as if it	100% of rain falling onto a unit/pond takes up "space" in the pond. If the pond were considered pervious surface, a lesser % of the rainfall would be accounted for (some would infiltrate or evapotranspire on its way to the pond). Because some re/detention ponds can be large, it is	None

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				had fallen on pervious soils. Why is this restriction being imposed?	standard practice to specify that ponds be considered impervious for purposes of calculating site runoff volume.	
James, Roger Att II	40, 89	C.3.g.ii.(4)	Hydromodification Management *Calculating Post-Project Runoff Methodology*	Virtually all HM Controls will have standing water or highly saturated soils during storm events when flow controls such as orifices are included. Treatment-BMPs like planter boxes, swales with flat grades or check dams, & bioretention systems will have standing water during periods when short-duration rainfall intensities exceed 0.2-in/hr or infiltration rates fall below design rates. Amend C.3.g.ii.(4) to indicate that all storm water treatment & flow control BMPs shall be considered impervious surfaces. Put this in the glossary as well.	This comment is likely correct (see response above) for many HM Controls & Treatment BMPs, but not necessarily for all. Further evaluation is needed before making a global definition that all HM Controls & Treatment BMPs must be considered impervious for purposes of calculating site runoff.	None
CCCWP	23	C.3.g.ii.(5)	Hydromodification Management *Existing HM Control Requirements*	Delete "Where existing requirements are less stringent than this Permit's Provision C.3.g., this Provision C.3.g. prevails." "Less stringent" is subject to interpretation & would create confusion. Contra Costa's HMP was crafted & negotiated to balance a number of issues related to HM management. This sentence undermines that balance & puts Contra Costa at a disadvantage. For example, Contra Costa did not seek to exclude geographic areas from HMP implementation, but rather sought broad applicability while developing a user-friendly, easy-to-implement approach that would encourage implementation. This change undermines advantages of Contra Costa's approach but does not provide the same exemptions provided to other counties.	The sentence in question is intended to establish a hierarchy in case such questions arise. It is not intended to "undermine" any Permittee. In response to this comment, we propose to restate the hierarchy in a way that emphasizes that Permittees' HMPs are the primary source of requirements.	In C.3.g.ii.(5), rephrase & clarify the paragraph containing "Where existing requirements are less stringent than this Permit's Provision C.3.g., this Provision C.3.g. prevails."
James, Roger Att I	41	C.3.g.iii.(2)	Hydromodification Management *Regional HM controls*	Requiring HM source controls at each project participating in a regional project doesn't make sense if the regional project achieves the required controls in a more cost effective manner. It's a disincentive for participation in a	It appears the Commenter is confusing "HM source controls" (maximizing infiltration) with HM Controls (structural units to retain runoff). HM source controls are inherently cost effective, in that they	None

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				more cost-effective regional project. Remove the wording in parenthesis.	are included in a site design where possible to reduce the size of needed HM Control(s).	
James, Roger Att III	3a	C.3.g.iii.(3)	Hydromodification Management *Typographical Error*	Delete reference to specific staff.	A reference to staff in an earlier draft is not in the 12-14-07 Tentative Order. The Commenter must have an earlier version.	None
James, Roger Att III	3b	C.3.g.iv.(2)	Hydromodification Management *Reporting*	Delete "or method used to meet the HM Standard." It's redundant with (1).	We disagree. C.3.g.iv.(1) asks for type of HM control installed. C.3.g.iv.(2) asks for the calculation method.	None
James, Roger Att I	42	C.3.g.v.(2)(a)	Hydromodification Management *In-stream Restoration*	C.3.g.v.(2)(a): The note following bulleted items implies that a project that has been constructed could be required to retrofit BMPs if a creek where restored. This would be a huge incentive to fight any creek restoration efforts. A simple plan to eventually do something must not be the basis for determining whether HMP requirements are implemented. It must be a program & time schedule that would include financing commitments.	We disagree. The note in no way requires retrofitting. It provides Permittees an avenue to "rezone" an area that did not require HM controls into an area where future projects must install HM controls in order to protect a restored creek.	None
Santa Clara Co	20	C.3.g.iv.(2)	Hydromodification Management *Reporting*	The County is concerned with the new database system for reporting of HM projects & the time & energy it will require implementing the new system. Especially when we already have a reporting procedure.	No database system is required for reporting HM projects.	None
CCCWP	24	C.3.g. Attachment C	Contra Costa HM Requirements *Ten Acre Limit*	Section 1b: Delete "up to 10 acres." This restriction undermines Contra Costa's ability to implement its HMP. There is no basis, & similar restriction not proposed for other counties.	We agree that the 10-acre limitation is not necessary at this time.	Delete the phrase "up to 10 acres."
Contra Costa Co Supervisors, San Pablo	38 13			No basis is provided for disallowing use, for projects above 10 acres, of design procedure in CCCWP's C.3 Guidebook. If exclusion is retained, an effective date is necessary (7-1-10 at earliest).		
SMCWPPP Att1	5	C.3.g. Attachment E	San Mateo HM Requirements	The San Mateo Permittees propose several modifications to their HM Applicability Areas map, adding 213.8 acres and removing 193.2	We agree that the proposed map revisions should increase protection of several natural creeks while simplifying	Replace the HM Applicability Areas map in the San Mateo

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			HM Control Areas	acres for a modest net gain in HM Applicability area. The justification for each revision is presented in a table, attached.	compliance for Permittees.	Permittees' HM requirements with the revised map.
CCCWP	37	C.3.h.i.	Operation and Maintenance *"Safe Harbor" Language*	Add the following language from the existing stormwater permits to protect the Permittees from regulatory liability in the event State or federal agencies effectively prohibit them from conducting maintenance on treatment facilities: "The Dischargers are expected to work diligently and in good faith with the appropriate state and federal agencies to obtain any approvals necessary to complete maintenance activities for stormwater treatment measures. If the Dischargers have done so, and maintenance approvals are not granted, where necessary, the Dischargers shall be deemed by the Regional Board to be in compliance with this Provision."	We agree.	Provision C.3.h.i. has been revised to add the "safe harbor" language.
James, Roger Att II	43	C.3.h.i. – ii.	Operation and Maintenance *Infiltration Treatment Systems*	Significantly strengthen this Provision for infiltration BMPs so they are sustainable over a project's life. This provision needs to address the remaining four factors: • Verification that the BMP has been constructed as designed including as built drawings and field infiltration rate test. • Verification that the operation and maintenance plan has been developed and is implemented. • Rehabilitation – Determine whether system has failed and whether it has been rehabilitated or replaced. The Water Board should seek funding to perform an independent evaluation of the systems that have been in place more than five years to determine methods that could increase the treatment systems' sustainability and/or reduce the types of failures observed, and to determine compliance with the permit.	The purpose of each O&M inspection that a Permittee conducts is to verify the items listed in this comment. Some countywide stormwater programs have developed guidance documents for conducting inspections of many different types of stormwater treatment systems, including infiltration systems. These guidance documents identify problem areas typical for each type of stormwater treatment system. We concur with the recommendation for the WB to conduct an evaluation of the treatment systems that have been installed and will consider completing this during the next permit term.	None

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James, Roger Att II	44	C.3.h.i. – ii.	Operation and Maintenance *Infiltration Treatment Systems*	If the recommendations for strengthening Provision C.3.h. (see James, Roger Att II Comment #43 above) on the operation and maintenance of infiltration treatment systems) is not pursued then the following changes must be included in Provision C.3.b. – d: • C.3.b.i. must include both construction and rehabilitation elements. • C.3.b.ii.(1)(a) through (d) must also include responsibility for rehabilitation or replacement of the treatment facilities. • C.3.b.ii.(4) must also include construction and rehabilitation of the treatment facilities. • C.3.b.ii.(5) must require an inventory of all treatment facilities and HM controls that have been installed since issuance of the initial NPDES permit. • C.3.b.ii.(5)(g) – Compliance status needs to be defined and for infiltration systems it should be the presence of standing water 2-hours after a rainfall event. • C.3.b.ii.(6)(a) must require preparation and certification of "as built plans" and conducting infiltration tests • C.3.b.iii.(1) Compliance status bullet – Proper installation would have been verified through "as built plans." Infiltration testing can be used to partially verify the level of maintenance along with observations. • C.3.b.iii.(3) – It will be necessary to define compliance for each type of system installed. Systems that rely on Infiltration can use the presence of standing water at any time beyond two hours after a storm event as a basis for noncompliance.	The references to Provision C.3.b. – d. are incorrect. It seems the correct reference is to Provision C.3.h.i. & ii. This comment is similar to the previous comment, so the response is the same: The purpose of each O&M inspection that a Permittee conducts is to verify the items listed in this comment. Some countywide stormwater programs have developed guidance documents for conducting inspections of many different types of stormwater treatment systems, including infiltration systems. These guidance documents identify problem areas typical for each type of stormwater treatment system. We concur with the recommendation for the WB to conduct an evaluation of the treatment systems that have been installed and will consider completing this during the next permit term.	None
James, Roger Att II	46	C.3.h.i.	Single-Family Homes	Siting[2] (Attachment II-E) and design criteria[3]	Based on information from purveyors that	None

[2] EPA, Storm Water Technology Fact Sheet, Porous Pavement, September 1999, EPA 832-F-99-023

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			Permeable Pavements	(Attachment II-F) for use of permeable pavements have restrictions that limit the use of permeable pavements including setbacks from structures, slopes >5% and infiltration rates of soils beneath the stone reservoir that are less than 0.5-inch/hour unless installed with underdrains. Most of the Bay Area soils are Group D with infiltration rates <0.05-inch/hour or less than 10% of the design criteria. Studies at North Carolina State University[4] [5] (Attachment II-G and H) and WERF[6]on the effectives of permeable pavements installations with underdrains is marginal in controlling flow volumes, but will affect the peak if the systems is designed to achieve storage The Water Board must do a more thorough analysis on the appropriate application and feasibility of permeable pavements in the Bay Area before mandating its use. Frequent maintenance using very high efficiency vacuum sweepers is extremely important to prevent clogging. The City of Olympia has reported that the vacuums needed to meet this high efficiency are not readily available in the United States and cost $1 million.	install these systems, there are appropriate operation and maintenance procedures that have been identified to ensure they continue to operate correctly and efficiently. We are also aware of the concerns identified in this comment. Therefore, permeable pavement is included only as an option for satisfying this Provision's requirements.	
Santa Clara Co	22	C.3.h.ii.(2)	Operation and Maintenance *Coordination with Vector Control Agencies*	What is the intent of coordination with appropriate mosquito and vector control agency with jurisdiction to establish a protocol for notification of installed stormwater treatment systems and HM controls? Who would you notify?	The mosquito and vector control agencies have concerns any time there is ponded water. This requirement was included in response to their concerns. Mosquito and vector control agencies are generally delineated by counties; however it is every Permittees' responsibility to determine the appropriate local mosquito	None

[3] Puget Sound Action Team and Washington State University, Low Impact Development, technical Guidance Manual for Puget Sound. January 2005
[4] Collins, Hunt and Hathaway, Evaluation of Various Types of Permeable Pavements with Respect to Water Quality Improvement and Flood Control, 2007
[5] Bean and Hunt, NC State University Permeable Pavement Research: Water Quality, Water Quantity and Clogging, November 2005
[6] Water Environment Research Foundation, Performance and Whole Life Costs of Best Management Practices and Sustainable Urban Drainage Systems, Final Report 2005

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					and vector agency to contact.	
BASMAA - Bicknell, J Brisbane SCVURPPP Att A SMCWPPP Att 3	81 8d 20 7e	C.3.h.ii.(6)	Operation and Maintenance *Inspection Frequency*	The current permit requires Permittees to "inspect a subset of prioritized treatment measures for appropriate O&M, on an annual basis." What is the basis for significantly increasing the required level of effort, specifically that the number of inspections be a minimum of 20% of the total number (or all BMPs within 5 years)? As the number of installed BMPS increases over time, this will be an increasing burden to municipalities. In addition, what is the basis for a separate requirement for inspecting 20% of installed vault-based or proprietary systems? The process for prioritizing BMPs for inspection involves a consideration of many factors, including type of maintenance agreement, whether the owner is using a contractor to maintain the BMP, maintenance history, etc. The permit should continue to allow municipalities the flexibility on the types of BMPs inspected and the exact number of treatment controls inspected in a given year provided that the municipality has an effective program.	Requiring Permittees to inspect at least 20% of the installed stormwater treatment systems and HM controls ensures that they are inspected at least once every 5 years and all the inspections will not take place in the 5th year. This requirement serves to prevent failed or improperly maintained systems from going undetected until the 5th year. We have the additional requirement to inspect at least 20% of all installed vault-based systems because they require more frequent maintenance and problems arise when the appropriate maintenance schedules are not followed. Also, problems with vault systems may not be as readily identified by the projects' regular maintenance crews. Neither of these inspection frequency requirements interferes with the Permittees' current ability to prioritize their inspections based on the factors listed in the comments.	None
Sunnyvale Att A	11	C.3.h.ii.(6)(a)	Operation and Maintenance *Inspections of New Treatment Systems*	Requiring the inspection of all stormwater treatment devices within 45 days of their installation is arbitrary and does not reflect the reality of the way projects are constructed. Most stormwater BMPs do not become operational until after paving is complete at a site, which will impact the ability of the inspector to determine if there are potential problems with a BMP. The current one year after project completion timeframe should be maintained so that the entire project can be completed before the first post-construction inspection occurs, as often times there are other aspects of a project that will impact the stormwater treatment BMPs and their operation.	Requiring the inspection of stormwater treatment systems within 45 days of installation ensures that Permittees will verify that the correct systems have been installed. One year later is just too late to discover that a system has been incorrectly installed. Some Permittees currently have staff present during the entire installation process. Verification that these systems are operating properly will be addressed in follow-up inspections according to the schedule determined by individual Permittees and in accordance with	None

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					Provision C.3.h.ii.(6)(b)-(d).	
BASMAA - Bicknell, J Brisbane Daly City Santa Clara Co SCVURPPP Att A SMCWPPP Att 3	82 8d 28 24 21, 94 7e	C.3.h.iii. Attach L Table C.3.h.	Operation and Maintenance *Reporting*	• The reporting requirements for BMP O&M inspections are excessive. Submittal of a summary of the total number and types of BMPs inspected and categories of problems found should be sufficient to evaluate a Permittee's inspection program, and detailed records can be kept locally for review upon request. • Facility/Site Inspected and Responsible Party for Maintenance- The name of the responsible party is not needed to determine compliance or the effectiveness of an operation and maintenance verification program. It is mainly used to correspond with the responsible operator regarding inspection results. • Compliance Status - Reporting O&M inspection results is a better approach to indicate compliance because it shows if a treatment BMP is working as designed and maintained and municipalities have the ability to learn what inspection results are common to certain BMPs, determine the performance or effectiveness of a specific BMP, and measure a change in results over time. • Page L-28 - Request for Compliance Rates- Since any problem with a treatment BMP suggests non-compliance, providing compliance rates of the O&M verification program and specific stormwater treatment systems is not the best way to indicate BMP performance. A better approach to determine BMP performance and/or effectiveness is to report BMP O&M inspection results.	• This Provision and the associated Reporting Table C.3.h. requires only standard information that should be collected on each operation and maintenance inspection. We require this type of information to evaluate a Permittee's inspection and enforcement program and to determine compliance with the Permit. Summary data alone without facility-specific inspection findings does not allow us to determine whether Permittees are doing timely follow-up inspections at problematic facilities and taking appropriate enforcement actions. • We concur with the comments regarding compliance status and rates and appropriate revisions have been made.	Provision C.3.h.iv. has been revised and the references to compliance status have been changed to inspection findings or results. We have also removed the requirement for calculating compliance rates.
James, Roger Att II	45	C.3.i.i.	Detached Single-Family Homes	See Comment #13 regarding disconnecting downspouts. If this is required for all single-family homes even when an HMP is not	Provision C.3.i.i. does not require that all single-family home projects disconnect roof downspouts. Rather, it encourages	

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				required, then it will become a prime example of how far regulations have gone beyond reality and destroy whatever creditability the stormwater program has developed.	implementation of at lest one site design measure that may include directing roof runoff to vegetated areas. It is implicit that these measures be taken only in suitable areas.	
CCCEAC Concord Mayor	14 9	C.3.i.i.	Detached Single-Family Homes	Do not create stormwater runoff requirements for detached single-family homes because stormwater treatment has always been a requirement of development and not tied to building permits for single-family homes	Single-family homes contribute stormwater runoff pollutants and volume, just like any other development with impervious surfaces. Single-family homes are not automatically exempted from stormwater regulations. This Provision requires simple site design measures to reduce the runoff pollutants and volume from these homes.	None
BASMAA - Bicknell, J	77	C.3.i.i.	Detached Single-Family Homes	We support reasonable site design measures for single-family homes as well.	Comment noted.	None
San Jose Att A	18	C.3.i.i. Fact Sheet	Detached Single-Family Homes	Please add "discretionary" before the word "approvals" in the last sentence, to this and all other references to the Permittees' planning, building, and other comparable authority to be consistent with the intent expressed in the Fact Sheet.	The word "approvals" as used in this Provision is broad enough to include "discretionary approvals."	None
Brisbane	8e	C.3.i.i.	Detached Single-Family Homes *Infeasibility*	This provision does not provide any flexibility to municipalities in cases where lot scale BMPs are not feasible due to site specific constraints. Exemption language should be included for projects where it is infeasible to incorporate these types of BMPs. Limited infiltration capacity in soils may make these proposed BMPs not feasible and may cause drainage issues. Limit this requirement to single family homes adding or replacing over 10,000 ft^2 of impervious surface, as it is much more likely there will be adequate vegetated areas to direct runoff toward. For a 5,000 square foot lot that does complete build-out, there may be little to no vegetation, and often no driveways. Underdrain	Single-family homes in general have some sort of landscaping. This provision applies to projects that add and/or replace 5000 ft^2 of impervious surface. For those rare cases where the paved surfaces occupy the entire lot, this provision's requirement would provide the impetus for the single-family home to include more vegetated areas and consider impervious pavement for walkways or driveways. These options, when constructed properly, are not limited by native site conditions such as low infiltrating soils. However, we have added more options to the Provision, such as collection of	Provision C.3.i.i. has been revised to expand the three choices to six.

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				systems can significantly add to the cost of drainage systems, and often will not function properly to get stormwater into a gutter.	rainwater in cisterns or rain barrels.	
Burlingame	12	C.3.i.i.	Detached Single-Family Homes *Flexibility*	Provision C.3.i requires detached single-family home projects that create and/or replace 5,000 ft² or more of impervious surface to implement one or more stormwater lot-scale BMPs from a list of three (3) choices. The permit should provide more flexibility and allow this type of project to propose alternatives that are deemed appropriate to the site.	We concur	Provision C.3.i.i. has been revised to expand the three choices to six.
NRDC	21	C.3.i.i.	Detached Single-Family Homes *Threshold for Requirements*	The threshold of 5000 ft² for requiring site design measures at single-family homes is too high because few homes qualify (to be regulated) under this provision. Therefore, the threshold is effectively meaningless, even though it would be feasible to implement LID at much smaller home sites.	We concur.	Provision C.3.i.i.'s threshold of applicability for single-family homes has been lowered from 5000 ft² to 2500 ft².
Giberson	2	C.3.i.i.	Detached Single-Family Homes *Strengthen Requirements*	• Mandatory implementation of only one of the listed stormwater lot-scale BMPs leaves a great deal of potential runoff unregulated. Regulation should, at a minimum, require all listed BMPs. • Pervious concrete or pavers eventually become clogged, making this mitigation ineffective in the long term; • The MRP should give direction as to acceptable minimum distance(s) from the roof runoff or paved surface discharge point to the edge of the property, as a greater distance gives more protection from runoff. • Some cities are mostly single-family residential (e.g., Saratoga, Monte Sereno) with typically large residences of > 10,000 ft² being constructed. The exclusion in the MRP of these projects from treatment and HM requirements will result in large areas with	Site conditions may limit the number of site design measures that can be installed at a project so it would not be practicable to require implementation of all the listed BMPs. The purpose of the development of lot-scale measures by the Permittees is to provide guidelines to small projects and single-family homes for selecting and installing correctly the appropriate site design and treatment measures, including recommended design specifications. Requiring treatment and HM controls for detached single-family homes would impose additional requirements on municipalities with resource limitations already, particularly since homeowners will need more guidance from municipal staff. At this time, we consider requiring	None

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				significant streams significantly impacted by flows from these large projects, which contain untreated contaminants.	site design measures that reduce both runoff pollutants and flow is adequate.	
Giberson	3	C.3.i.v.	Detached Single-Family Homes *Countywide or Regional Standards*	Allowing Permittees to cooperatively develop countywide or regional standard specifications for lot-scale BMPs ignores the problems that exist where multi-jurisdictional groups, such as the Santa Clara Valley Water Resources Protection Collaborative, have promulgated standards for dealing with development affecting local waters, but the Permittees have not adopted these standards as mandatory.	The purpose of the development of lot-scale measures by the Permittees is to provide guidelines to small projects and single-family homes for selecting and installing correctly the appropriate site design measures and/or treatment measures to satisfy the requirements of this Provision. We expect that any guidelines cooperatively developed by the Permittees will also be adopted by them for implementation.	None
James, Roger Att II	47	C.3.j.i.	Impervious Surface Data for Small Projects	The data collection effort must include both impervious surface and that portion that is directly connected to a storm drainage system. This will allow an assessment of the feasibility of diverting impervious surfaces to pervious surfaces in small projects.	In response to comments received, the MRP TO no longer has data collection requirements for small projects.	Provision C.3.j. and its data collection requirements have been deleted
ACCWP ACCWP Att 2 BASMAA, - Bicknell, J Berkeley Berkeley Att Table Brisbane CCCWP Letter CCCWP Colma Concord Contra Costa Co - Supervisors Danville Daly City Menlo Park Monte Sereno	6 16, 17 79 10 11 8f 12 38 5, 7 6 39, 40 9 29, 31 3g 6	C.3.j.i.	Impervious Surface Data for Small Projects	Do not require pilot study to collect impervious surface data for 1000 - 10,000 ft² projects because: • Data collection will be labor intensive, create an additional tracking/reporting burden, and provide no water quality improvement benefit. • Board staff's analysis of the impervious surface data for those municipalities that collected it, concluded that projects with < 10,000 ft² of impervious surface accounted for less than 1% of the total land development. Do not waste limited public resources to capture the last 1% of total development. • The regulation of these small projects can be handled appropriately under the proposed	Based on the limited data that was provided to us by the cities that collect this information already, small projects contribute from <1% to 73% of the total impervious surface area added or replaced. Because many of these projects were single-family home projects, the December Tentative Order included Provision C.3.i., which required appropriate site design measures for any single-family home project creating and/or replacing ≥ 5000 ft² of impervious surface. In response to the Permittees' concerns about the administrative burden of	Provision C.3.j. has been deleted and Provision C.3.i. has been expanded to apply to all small projects creating and/or adding 2500 ft² to < 10,000 ft² of impervious surface and single-family homes creating or adding 2500 ft² or more of impervious surface. Provision C.3.i. has also been revised such that the list of site

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Newark Pacific San Mateo Co SCVURPPP SCVURPPP Att A SMCWPPP Att 3 South San Francisco Sunnyvale, - McCumby-Hyland, K Sunnyvale Att A	6 8 7 4b, 4d 22 7f 20e 71 8			permit's site design and source control requirements. • Board staff has not sufficiently explained how the data will be used to determine regulatory thresholds in the future. Board staff should remove this requirement, and instead, provide grant funds for someone to study the costs of C.3. compliance for small sites to determine if in fact the current thresholds are practicable	collecting impervious surface data for small projects and in line with the past data collected and our emphasis on LID techniques and goals, we feel it appropriate to extend the site design requirements of Provision C.3.i. to all small projects that create and/or replace 2500 ft² to <10,000 ft² and lower the applicability of this Provision to single-family homes adding and/or replacing ≥ 2500 ft² of impervious surface area as well.	design measures contains more options for projects to choose from. For consistency, this same list is identical to the one contained in Provision C.3.c.i.(2) and C.3.e.(1) - Footnote #6.
ACCWP Att 2	17	C.3.j.i.	Impervious Surface Data for Small Projects *Questions*	• What is the purpose of this study? What criteria will be used to revise the size threshold? • Is 90% capture of all new/redevelopment in the Region an appropriate criterion? • Will the Water Board evaluate the threshold based on the percent capture for the entire Region or municipality by municipality? • If the percent capture criterion is to be applied by each municipality, will some municipalities be able to increase their size threshold above 10,000 ft² if they meet the percent capture criterion at a higher threshold? • Why does the project watershed information need to be included in the pilot project?		
Daly City	30, 31	C.3.j.ii.	Impervious Surface Data for Small Projects *Due Date*	Clarify who is going to coordinate and fund effort to pull together the pilot study submittal Second, why craft a pilot study as an enforceable permit condition. Such a requirement begs an answer as it assumes such a study could in fact be crafted	In response to comments received, the MRP TO no longer has data collection requirements for small projects.	Provision C.3.j. and its data collection requirements have been deleted
SCVURPPP Att A	95	C.3.j.ii. Attach L Table C.3.j.	Impervious Data for Small Projects *Reporting*	Name of Responsible Party; Project Type; and Description – The name of the responsible party is not needed for compliance with Provision C.3. Project Watershed – The information provided within this column is inconsistent (e.g., overly detailed) with the MRP reporting requirement of		

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				C.3.b.iii. The MRP requires that the project watershed be provided NOT the tributary or creek that urban runoff may flow to from the project. Application Date and Project Approval Date (if known) - It is not necessary to provide the application submitted date. Tracking the application deemed complete date is the more useful way to track project approvals. The request to report/track the construction completed date is not necessary and inconsistent with the MRP reporting requirements of C.3.b.iii. In accordance with the MRP, the application date, application deemed complete date and project approval date are only required.		

[a] Refers to Provision Numbers contained in the Municipal Regional Stormwater Permit (MRP) Tentative Order dated December 14, 2007.
[b] Provision Numbers referenced are found in the Municipal Regional Stormwater Permit (MRP) revised Tentative Order dated February 11, 2009.

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Hayward CCCWP CCCoSup CCEngr Advisory DalyCity-NSMSan Berkeley San Jose FairfieldSuis-SewerDist	10 7 41A 15 44 14B 11 5	C.4.b.i	Permittees Should Not Be Required to Inspect NOI Facilities	Section C4b.i requires Permittees to inspect "Industrial facilities, as defined at 40 CFR 122.26 (b)(14)". These are NOI facilities permitted by the State. The State receives a fee to inspect these and should continue to do the inspections. Municipal staff does not have the expertise or resources to inspect industrial facilities. The inspections required by C.4.b.i may be duplicative of inspections that numerous other agencies are already mandated to conduct regularly, including environmental inspections (Dept. of Toxic Substances Control, Regional Water Quality Control Boards, Air Quality Management Districts) and public safety inspections (Fire Districts, Health Department).	The Permittees have a regulatory responsibility to inspect and obtain compliance by industrial and commercial sites with local storm water and urban runoff ordinances, regardless of the sites status with regard to the General Statewide Industrial Stormwater Permit. Please see the Fact Sheet and 40 CFR 122.26 references. The Regional Board has the responsibility to inspect and obtain compliance by facilities discharging storm water associated with industrial activity covered under the statewide General Industrial Stormwater Permit. The regulations call for this redundancy or overlap of jurisdictions for industrial and commercial site stormwater inspection and control. The Regional Board staff has always worked with the Permittees in partnership to obtain compliance by these sites. With inspections conducted by Permittees, many can be inspected to determine if their site poses a threat to water quality. The Regional Board can assist with those sites that are not in compliance and resistant to escalated regulatory response by the Permittees, to ensure that water quality problems are addressed. Inspections conducted by other public agencies do not remove the permittees' responsibility to insure compliance with local ordinances and the municipal stormwater permit requirements. Opportunities for collaboration with other agencies, both local and State, for efficiency are currently being implemented by many Permittees currently.	No changes made.
CCCoSup DalyCity-NSMSan SCVURPPP ATT A SouthSF	41B 38 24B 6C	C.4.b.ii	Determining Coverage Under General Industrial Permit	Considerable judgment is needed to determine which facilities need coverage under the state's Industrial General Permit. The Water Board staff is in the best position to make decisions about which businesses require coverage under this permit. Municipalities have been willing to forward information about businesses that might need to obtain Industrial General Permit coverage when Water Board staff has	Ultimately, the Water Board will make the determination if coverage is needed under the State's General Industrial Stormwater Permit. This provision requires Permittees to notify business that they may need coverage under the permit and refer the names of non-filers to the Water Board.	No changes made.

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				requested this type of information.		
CCCWP	43	C.4.c.iii.(4)	Enforcement of State General Permit Not Responsibility of Permittees	Permittees identify and will continue to identify and report to Regional Board staff a list of potential "non-filers" (i.e., industrial facilities that are known or suspected to require coverage under the State's General Industrial Permit" but have not filed a "Notice of Intent" with the State Water Resources Control Board.) Follow-up and enforcement of the State's General Industrial Permit is the responsibility of the State and Regional Water Boards.	The MRP does not require permittees to enforce the State's General Industrial Stormwater Permit. Permittees must only enforce the requirements of local stormwater and urban runoff ordinances. It is the responsibility of the State to conduct enforcement and follow up of violations of the General Industrial Permit.	No changes made.
Berkeley ACCWP Newark Alameda Co	14B 7C 7C 6C	C.4	Should Not Be Required to Inspect all General Industrial Permit Facilities Every Year	It is not appropriate to require inspections of all General Industrial Permit facilities every year. Some of these facilities have a very low likelihood of contributing to stormwater pollution.	We agree with this comment. Inspections should be conducted on a frequency appropriate to the threat to water quality.	The Permit language has been revised. Permittees will now rank industrial and commercial sites commensurate with the threat to water quality to determine the inspection frequency
San Jose Attny	4B	C.4	Shift in Responsibility Not Tied to Water Quality	Similarly, the shift in responsibility to local agencies for businesses now regulated by the Regional Board is not tied to improving water quality, but simply to shifting the costs of regulation from the state to municipalities.	The Water Board is not shifting responsibility to the permittees. The permittees are required to inspect industrial /commercial facilities to prevent stormwater pollution to their MS4s under the CWA. The MRP does not expand responsibility beyond what is already required under Federal Law.	No changes made.
Martinez	3	C.4	Staff Not Qualified to Conduct State Inspections	Currently selected industrial facilities in Martinez require NPDES permits from the State. The proposed MRP requires cities to inspect the facilities for compliance with their NPDES Permits. The City of Martinez does not have the staff or expertise to perform these State inspections. Nor does the City does not have the revenue stream to hire consultants to conduct these States inspections. The City requests this burden not be shifted to cities. We recommend this inspection function remain the	The MRP does not require permittees to enforce the State's General Industrial Stormwater Permit. Permittees must only enforce the requirements of local stormwater and urban runoff ordinances. It is the responsibility of the State to conduct enforcement and follow up of violations of the General Industrial Permit.	No changes made.

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				responsibility of the State.		
CCCoSup	42	C.4.b.i	Permittees Can Not Cite Violations of State Permit	It is not entirely clear whether the intent of C.4.b.ii(3)(d), C.4.b.ii(4)(d) and C.4.c.iii(4) is to require local jurisdictions to cite NOI / State General Industrial Permit facilities that have been reported in violation". The County does not have the authority to cite violations of a State permit. We only inspect and enforce local stormwater regulations (the County Ordinance).	We agree. The County is not required to enforce the State's General Industrial Permit. Permittees are only required to enforce violations of local stormwater and urban runoff ordinances in compliance with the MRP. Permittees are also required to notify businesses that they may need coverage under the General Industrial Permit and refer those facilities to the Water Board.	No changes made.
Oakley	37A	C.4.b	Fees Collected by the State Should Be Directed to Permittees	C.4.b requires that Permittees inspect all commercial industrial facilities, including the "NOI" facilities covered by the State Industrial Permit. Some portion of the fee collected by the State must be diverted to local agencies or reimbursement established to compensate for performing these activities for the State.	The MRP does not require permittees to enforce the State's General Industrial Stormwater Permit. Permittees must only enforce the requirements of local stormwater and urban runoff ordinances in compliance with the MRP. Even though a commercial industrial facility has coverage under the State's General Industrial Permit, it does not absolve permittees from enforcing compliance with local ordinances and preventing polluted discharges to their MS4.	No changes made.
CCCoSup	10	C.4.b	Inspection of Facilities already Regulated by State Agencies	With this MRP in place, the County will be required to significantly increase its oversight of the business community even though multiple agencies are already mandated to perform regular environmental inspections (Department of Toxic Substances Control, Regional Water Quality Control Boards, Air Quality Management District's) and public safety inspections (Fire Districts, Health Department). Currently, the responsibility (and established fees) for inspection of businesses that are issued waste discharge requirements lies with the RWQCBs.	The County is only required to inspect facilities to determine compliance with local urban runoff and stormwater ordinances. The inspections conducted by other agencies are to enforce their respective regulations. The County is not required to enforce Water Board regulations.	No changes made.
Milpitas	11	C.4.b	Fact Sheet Does Not Support Municipalities Regulating Industrial Sources	Page 32 – The conclusion that USEPA supports municipalities regulating industrial sites and sources that are already covered by an NPDES permit is not demonstrated by the cited paragraphs from the Federal Register. The first paragraph only requires that the municipalities obtain a stormwater permit and that such permit contain controls for discharges from industrial	This interpretation is not correct. The MRP is not requiring permittees to enforce State General or Individual permits. It is only requiring permittees to prevent polluted runoff from commercial/industrial sources that drain to the MS4 to the MEP by enforcing local stormwater and urban runoff ordinances in accordance with the provisions of the MRP.	No changes made.

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				activity. Although passively voiced, the statement that general and individual permits will comply with the municipal permit controls makes it implicitly clear that only the State, as the general or individual permit issuer, has the ability and therefore the responsibility to make the industrial permittees comply with the municipal permit conditions. The second paragraph states only that municipalities have "an important role in source identification" for industrial dischargers with separate permits. "Important role" is clearly less than "responsible." The State is responsible for industrial sites that are, or should be, regulated by a general or individual permit. This is reasonable and fair because the State collects the permit fees for these sites and does not remit any of these fees to the municipalities.		
Oakley	37B	C.4.b	Will State provide training in General Industrial Permit?	Will the State provide training for local agencies in the enforcement of the State General Permit requirements?	Permittees will not be enforcing the requirements of the State's General Permit. No training is needed.	No changes made.
Oakley	37C	C.4.b	Which version of State General Permit to be used in enforcement?	The State website shows the 1997 Permit and an apparent draft 2003 version. Which version is to be used in enforcement?	Permittees will not be enforcing the requirements of the State's General Permit. The only permit that is currently valid is the 1997 permit. The 2003 permit is still in draft form and has not been adopted.	No changes made.
Oakley	37d	C.4.b	Will State Provide updated lists of NOIs?	Will the State provide updated lists of NOI's directly to the cities as they are covered under the Permit or will the cities have to search through State websites, as in the past, to find the information?	The Water Board will provide assistance, if necessary.	No changes made.
Central San	18	C.4.b.ii(1)(c)	Modify Language and Allow Regional Collaboration for Mobile Sources	Issue: A variety of mobile sources are identified that do have a potential to generate and discharge pollutants to the storm drain systems. However, under the structure of the MRP, these mobile sources are treated as independent operations that would require individual	The section on mobile businesses has been modified and moved to Section C.5 Illicit Discharge Control. Permittees are not required to inspect all mobile businesses within their jurisdiction. Under the revised requirements, permittees will develop a program to reduce	The provisions for mobile sources have been moved to C5. Permittees are no longer required to inspect all mobile

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				oversight by each permittee. These mobile sources could feasibly work in all jurisdictions of a county. In Contra Costa County with 19 cities and the unincorporated areas, an individual mobile service provider could be subject to 20 different inspections for each cycle (annually, every three years, every five years depending on the frequency that is established). In almost all cases, a mobile service provider can be engaged at the same frequency as a fixed facility source and so requiring all jurisdictions to treat mobile sources independently will result in significant duplication of effort. Recommendation: This requirement should enable regional coverage of regulating (both inspections and enforcement) this type of mobile service provider. Countywide coordination and information sharing would be needed to successfully implement this strategy.	discharges from mobile businesses to the MEP. The program will include development of BMPs for various types of mobile businesses, the development of enforcement strategy that targets the unique characteristics of mobile businesses, conduct outreach and education targeted to mobile businesses, and conduct inspections of mobile businesses as needed	sources under C.4. The new provision allows for regional collaboration in development of BMP requirements, enforcement action information, and education.
DalyCity-NSMSan Palo Alto Alameda SouthSF Sunnyvale Atta Mountain View San Jose Palo Alto – BobelP San Jose – TovarM	37 9 11 6D 12 8 10 1 62	C.4.b.ii.(1)c	Problems Inspecting Mobile Sources	Under the structure of the MRP, mobile sources are treated as independent operations that would require individual oversight by each permittee. Mobile business operations may not generate water quality impacts at their home base and often operate on a regional scale with activities occurring in multiple jurisdictions is also problematic and impractical to try to locate active operations of many mobile business types. Inspecting businesses both at a fixed commercial base and in the field is too time consuming and not realistic.	The section on mobile businesses has been modified and moved to Section C.5 Illicit Discharge Control. Permittees are not required to inspect all mobile businesses within their jurisdiction. Under the revised requirements, permittees will develop a program to reduce discharges from mobile businesses to the MEP. The program will include development of BMPs for various types of mobile businesses, the development of enforcement strategy that targets the unique characteristics of mobile businesses, conduct outreach and education targeted to mobile businesses, and conduct inspections of mobile businesses as needed.	The provisions for mobile sources have been moved to C5. Permittees are no longer required to inspect all mobile sources under C.4. The new requirements include development of BMPs, outreach and education targeted to mobile businesses, and inspections as needed.
CCCWP SCVURPPP AttA Alameda	41 24C 9	C.4.b.i	Move Mobile Sources to Illicit Discharge	The Tentative Order requires the inspection of mobile sources with both a fixed base and field activities in their jurisdictions. Mobile sources are very difficult to track, specifically if they are based out of another jurisdiction. Therefore, we request that the requirement to inspect mobile businesses be removed. Outreach to these	The section on mobile businesses has been modified and moved to Section C.5 Illicit Discharge Control. Under the revised requirements, permittees will develop a program to reduce discharges from mobile businesses to the MEP. The program will include development of BMPs for various types of mobile businesses,	The provisions for mobile sources have been moved to C5

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				business to provide best management practices, and enforcement response when illegal discharges are identified is the most efficient way to address these businesses.	the development of enforcement strategy that targets the unique characteristics of mobile businesses, conduct outreach and education targeted to mobile businesses, and conduct inspections of mobile businesses as needed	
Alameda	10	C.4.b.i	Deal with Mobile Businesses Regionally Using BASMAA Program	The City also recommends that the RWQCB work at the regional business level to require certification programs similar to the BASMAA mobile surface cleaners program for the types of mobile businesses of concern. The estimated increase in annual municipal staffing to implement this provision for inspections is approximately 5% of a full-time staff person.	Under the revised Tentative Order, permittees have the option of collaborating regionally to establish BMPs and conduct education and outreach to mobile businesses. The section on mobile businesses has been modified and moved to Section C.5 Illicit Discharge Control. Permittees are not required to inspect all mobile businesses within their jurisdiction. Under the revised requirements, permittees will develop a program to reduce discharges from mobile businesses to the MEP. The program will include development of BMPs for various types of mobile businesses, the development of enforcement strategy that targets the unique characteristics of mobile businesses, conduct outreach and education targeted to mobile businesses, and conduct inspections of mobile businesses as needed	The new provision allows for regional collaboration in development of BMP requirements, enforcement action information, and education
Alameda	8	C.4.b.i	Allow Permittees Flexibility to Allocate Resources for Mobile Sources	The specification that the fixed business bases of a set list of mobile business operation types are subject to industrial and commercial discharge control inspections may place unneeded burden on staff resources. Mobile business operations may not generate water quality impacts at their home base. Mandatory inspection efforts at business locations, not posing a stormwater quality threat, are a poor use of limited inspector staff time and will not provide practical benefit. Local agencies should have the discretion and flexibility to determine what business locations are priorities for stormwater inspection efforts.	The section on mobile businesses has been modified and moved to Section C.5 Illicit Discharge Control. Permittees are not required to inspect all mobile businesses within their jurisdiction. Under the revised requirements, permittees will develop a program to reduce discharges from mobile businesses to the MEP. The program will include development of BMPs for various types of mobile businesses, the development of enforcement strategy that targets the unique characteristics of mobile businesses, conduct outreach and education targeted to mobile businesses, and conduct inspections of mobile businesses as needed.	The new provision requires enforcement as needed. Inspections are no longer mandatory but development of BMP requirements, an enforcement strategy, and education are required.
San Leandro	6 6A	*C.4.b.ii.(1)*	Mandating Inspection	The required inspection frequency for particular categories of industrial and commercial facilities	Under the proposed requirements, permittees have the flexibility to classify industrial and	The permit language has been modified.

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SouthSF Berkeley Alameda Co Newark ACCWP	13 6A 7A 7A		Frequency on Business Type Too Prescriptive	is too prescriptive and is not appropriate. If inspection frequencies are arbitrarily set, inspection resources are unnecessarily directed to conduct fieldwork that does not contribute to protecting water quality. The MRP should not be used to establish minimum across the board inspection frequencies. Agencies must have flexibility to allocate resources and prioritize inspection frequencies based on the individual characteristics and operational parameters specific to each commercial or industrial business.	commercial facilities within their jurisdiction as high, medium, low priority, or no exposure based on their knowledge of the characteristics of the facilities and the MS4 system. The Permittees' classification of an industrial and commercial facility will determine the inspection frequency.	The inspection frequency will be determined by the permittees on the basis of the industrial or commercial site's potential for water quality impact.
Berkeley Alameda Co ACCWP Newark Alameda Co-SeeryS	15 6B 7B 7B 76	C.4.b.ii	Remove SARA Title III Facilities	Of particular concern is the requirement to inspect SARA Title III, Landfills and General Industrial Permit facilities every year. SARA Title III facilities include, those with inert compressed gas on site in quantities over reporting thresholds (i.e., 200 scf). This may include such benign facilities as a gift shop with a helium cylinder for filling party balloons, its only "industrial" activity. To require annual inspections based on the presence of a compressed gas cylinder, in this example, would be a waste of public resources and contrary to common sense.	Permittees are only required to inspect these facilities commensurate with the threat to water quality. The frequency of inspection will be established by the permittee based on the potential threat to water quality.	The specific requirements for inspection of SARA Title III facilities have been removed.
DalyCity-NSMSan	36	C.4.b.ii (1)(a)(ii)	Remove Close Landfills From Inspection Requirements	Request elimination of inspecting operating and closed landfills since the Water Board has an existing program for controlling those discharges	Permittees are only required to inspect these facilities commensurate with the threat to water quality. The frequency of inspection will be established by the permittee based on the potential threat to water quality.	The specific requirements for inspection of closed landfills have been removed.
DalyCity-NSMSan SouthSF	35A 6B	C.4.b.i	Clarify Facilities Required to Inspect	Businesses to be inspected should be limited to ones that discharge to a MS4 that is owned or operated by the municipality that has coverage under the permit similar to what is described in the fact sheet.	The permittee is responsible for inspecting all facilities with the potential for discharge to the MS4.	No changes made.
CCCWP	40	c.4.b.i	Modify List of Facilities Required to Inspect	Insert "*may*" in "*Types of businesses to be inspected may include the following:*" and/or eliminate the following from list of "types of business" Permittees would be required to	We agree. This section has been modified and the provision language now refers to businesses that have a reasonable likelihood to be a source of pollution.	The section has been modified and the provision language now refers to

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				inspect: C.4.b.ii(1)(a)(i): Industrial facilities covered under the State Board's General Industrial Stormwater NPDES Permit C.4.b.ii.(1)(a)(ii): Operating and closed landfills C.4.b.ii(1)(a)(iii): Facilities subject to SARA Title III C.4.b.ii(1)(a)(iv): Hazardous-waste treatment, disposal, storage and recovery facilities C.4.b.ii(1)(c)(i through xi): Mobile Sources *Rationale for deletions*: Items 1-4 above goes beyond the intent and appropriate scope of a municipal-level business inspection program. Municipal inspection programs and staff are not equipped or trained to evaluate and regulate the operations of these types of industries. Other State agencies (i.e., State and Regional Water Boards, Air Quality Management Districts, Department of Toxic Substance Control, Integrated Waste Management Board, etc...) have regulatory authority, expertise, and resources required to properly inspect these types of facilities. It is not appropriate to delegate this State responsibility on local government without adequate funding and resources		businesses that have a reasonable likelihood to be a source of pollution.
Central San	20	C.4.c.iii	Can a Service Provider Maintain Inspection Records?	Issue: The requirement for the permittees to maintain adequate records of inspections, follow-up work, and enforcement actions is reasonable. The MRP as drafted is not clear that a service provider such as CCCSD (other POTWs do provide inspections services in order to comply with the commercial/industrial inspection program) can maintain records on behalf of permittees under a Service Agreement. Recommendation: No change may be needed to the MRP language provided that the RWQCB allows other agencies providing inspection and enforcement services on behalf of the	If a service provider is contracted by a permittee to provide inspection services, they may keep the records for the permittee. The permittee will be responsible for retrieving these records and providing them to the Water Board in a timely manner as needed upon request.	No changes made.

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				permittees to maintain records for the inspection and enforcement actions provided that the same public and agency access to these records is available.		
San Leandro San Jose San Jose Attny Sunnyvale Atta	10 12 4D 13	C.4.c(iii)	Reporting and Recordkeeping Overly Burdensome	Reporting for the annual report is being greatly expanded to include too much detail on enforcement actions and violation histories. Would result in the reporting of inspections for thousands of facilities, in detail, each year, for just this program element with no demonstrable water quality benefit. We request that the draft Annual Report Form in Attachment L be removed from the Tentative Order, and instead a reporting form should be developed after the permit is adopted to reflect what is actually included in the permit.	Reporting requirements have been significantly reduced in the proposed requirements. Permittees are required to maintain detailed inspection records and a tracking database, although the information will be reported in summary form in the annual report. The inspection records and tracking database shall be supplied to the Water Board upon request to verify compliance with the permit inspection requirements and the Permittees' Enforcement Response Plan.	The reporting requirements have been reduced to summary tables and statistics showing the results of the inspection activities and follow-up. Permittees will keep complete inspection records in a database for review by Water Board staff upon request.
SCVURPPP AttA	25B	C.4.c	Alternative Means to Comply With Recordkeeping Requirements	The requirements for electronic databases of inspections in various Tentative Order provisions should be consistent with each other and allow the flexibility of using alternative means of recordkeeping to document compliance with local municipal stormwater ordinances	We agree.	The permit language regarding databases for C4,C5,and C6 requires a database or equivalent tabular system.
DalyCity-NSMSan	32	C.4.a.i (1)(b)	Change Notification Requirements	odify the last sentence about notifying the Water oard. Does the Water Board want to get involved nd track every cleanup response? The Water oard staff should not be notified of extended batement time frames unless it requests this nformation. Recommend that to streamline the mplementation of the permit; this should be odified to read as follows: "the Permittee shall otify the Water Board when requested by the ater Board of extended time frame..."	We agree. This section has been modified and the requirements for notifying the Water Board have been removed. Permittees are expected to keep adequate and complete records justifying the rationale when the clean up does not occur before the next rain event or exceeds 10 business days.	The specific language referred to in the comment has been removed and replaced with a requirement for violations to be corrected before the next rain event or within 10 business days.
Livermore CCCWP SCVURPPP AttA DalyCity-NSMSan	7 39 25A 33	C.4.a	ERP Overly Prescriptive	The permit is overly restrictive in dictating the enforcement response that municipalities must take in response to violations. Agencies should be able to choose the appropriate enforcement	We agree. The ERP requirements have been modified and the prescriptive provisions have been replaced with a performance standard regarding the correction of violations before the	The prescriptive ERP requirements have been removed. Permittees must

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				response for their jurisdiction instead of being required to issue citations for given violations. The important factor should be the time in which the violation is corrected. Whether an agency chooses to gain compliance through education or punitive enforcement is no concern of Board staff. This requirement should be revised to specify a time-frame for compliance and leave the method up to individual agencies.	next rain event or within ten business days. The means and methods of achieving compliance may be determined by the permittee.	develop an ERP that leads to effective site management and has the ability to meet the performance standards for violation correction in the MRP.
CCCWP San Leandro DalyCity-NSMSan SouthSF SCVURPPP AttA	8 9 43 6F 25D	C.4.c(ii)	3 Year Window Too Prescriptive and Violates State Law	Maintaining a three year rolling window for repeat offenses is too prescriptive and inappropriate. There is no justifiable need to create this over burdensome and complicated system for tracking and reporting across this multiyear timeframe. These provisions also mandate prescriptive and inflexible enforcement procedures, which are in conflict with state law. For example, Water Board staff is requiring a 3-year rolling window for progressive enforcement. State law only allows such action for a period of one-year.	The requirement for 3 year rolling window for progressive enforcement has been removed from the permit.	The 3 year rolling window for progressive enforcement requirement has been removed.
San Leandro Dublin Pleasanton	7 5 8	C.4.c	ERP Overly Burdensome	The proposed permit requires development of a formalized Emergency Response Plan (ERP) for use with business inspections, spill responses, other business processes and additional record keeping, and reporting. In addition, included in the more aggressive ERP are requirements to adopt by ordinance, escalating penalties for noncompliance. The City's current spill response and business inspection practices are effective, and adoption of additional formal measures would provide no incremental benefit to water quality. This additional requirement would only add to funding requirements for additional record keeping with no significant benefit for enhancing urban runoff water quality.	The prescriptive requirements for ERP development have been removed. Permittees are still required to develop an ERP, although in many cases existing inspection plans, response protocols, and enforcement policies will meet the permit requirements.	The prescriptive ERP requirements have been removed. Permittees must develop an ERP that leads to effective site management and has the ability to meet the performance standards for violation correction in the MRP.
Central San	19	C.4.b.ii.(4)	Inspection	As written, the Tentative Order proposes a very	Under the proposed requirements, permittees	The inspection

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Hayward SCVURPPP AttA CCCWP	9 24A 6		Frequency Too Prescriptive	prescriptive business inspection program that does not allow for flexibility based on local agency experience. The language should allow Co-permittees to have flexibility in what types businesses are inspected and the frequency of inspections. Businesses to be inspected should be limited to ones that discharge to a MS4 that is owned or operated by the municipality that has coverage under the permit similar to what is described in the fact sheet.	have the flexibility to classify industrial and commercial facilities within their jurisdiction as high, medium, low priority, or no exposure based on their knowledge of the characteristics of the facilities and the MS4 system. The Permittees' classification of an industrial and commercial facility will determine the inspection frequency.	frequency requirements have been removed. Permittees will set the inspection frequency based on professional judgment and knowledge of the MS4 system
Belmont DalyCity-NSMSan FairfieldSuis-SewerDist	7 34 4	C.5	Extend Implementation Date	Section C.4, C.5 and C6 require implementation of new procedures, ordinances and development of Legal Authority. Timelines for implementation are too short. Completion of these tasks will require development and research of appropriate code language, coordination with other agencies, training of staff, and public outreach. Timelines for implementation need to be extended.	The timelines for implementation of new ordinances and legal authority have been removed from the permit. Permittees are expected to have the necessary authority to respond to discharges in compliance with the provisions of the MRP. If adequate legal authority is not available to control discharges as required in the MRP, permittees must update ordinances immediately and notify the Water Board regarding sites that they can not bring into compliance.	The specific timelines for legal authority and the development of the ERP have been removed.
SFBaykeeper ACCWP Attny	40 8	C.4.b	Facility Inspection Requirements Unclear	Provision C.4.b.ii. does not clearly state whether every business that falls into the listed categories must be inspected or whether only businesses in those categories that could reasonably cause or contribute to a violation of water quality standards should be inspected.	The language in the permit has been revised. Each permittee shall inspect all commercial and industrial facilities that reasonably contribute to the pollution of stormwater runoff. The frequency of inspection shall be determined at the permittees discretion.	Only businesses that could reasonably cause stormwater runoff pollution, illicit discharge or contribute to a violation of receiving water quality standards should be inspected. Permittees use best professional judgment to prioritize facilities as high, medium, and low potential 8threat.
Baykeeper	2	C.4.b	Require Specific BMP Implementation	As compared to previous MS4 permits issued by this Regional Board, this draft Permit makes progress towards eliminating vagueness and	We are using an approach based on outcomes. The permittees are required to develop an enforcement response plan which will detail	No changes made

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			at Industrial and Commercial Sites	limiting permittee discretion. Many sections, however, still need substantial improvements. Specifically, we strongly recommend the use of BMP menus as the Los Angeles Regional Water Quality Control Board ("LA Regional Board") has done in the draft Ventura permit. For example, the commercial and industrial inspection provisions of the draft Ventura permit require that inspections ensure implementation of at least seven specific BMPs at restaurants, ten BMPs at retail gasoline outlets, and ten BMPs at automotive service facilities.	appropriate responses and enforcement actions. Instead of specifying specific BMPs, we have included a performance standard for violation correction. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered.	
Baykeeper	6	C.4.b	Vague Language Regarding BMP Implementation	Places where the permit requires "appropriate" BMPs should be revised to include a BMP menu list of the minimum BMPs that must be implemented: C.4.b. Industrial and Commercial Inspections. "Inspections shall include but not be limited to the following: (a) Prevention of stormwater runoff pollution or illicit discharge by implementing appropriate BMPs to the MEP."	We are using an approach based on outcomes. The permittees are required to develop an enforcement response plan which will detail appropriate responses and enforcement actions. Instead of specifying specific BMPs, we have included a performance standard for violation correction. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered.	No changes made
San Leandro SCVURPPP AttA	8 25C	C.4.c.(i)(1)	Violation Categories Too Prescriptive	The requirements for an ongoing discharge may be overly restrictive if the discharge does not pose a significant threat to water quality. The SCVURPPP suggests that the language be modified to allow inspectors to use their judgment. The up-to-45-day response to threatened discharge should be made more flexible because some threats are more serious than others, and businesses should not be inspected if they do not pose at least some threat to discharge. The SCVURPPP suggests that the Tentative Order be changed	The specific violation categories have been removed. We are using an approach based on outcomes. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered.	The specific violation categories have been removed and replaced with a performance standard regarding compliance.
SCVURPPP AttA SouthSF	23A 6E	C.4.a	Clarify Definition of A Discharger Under Permit	The SCVURPPP recommends that the proposed requirements in the Tentative Order regarding violation responses be clarified such	We agree. Permittees are only required to enforce local municipal stormwater and urban runoff ordinances.	No changes made.

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				that these are violations of local municipal stormwater ordinances. In addition, Tentative Order Footnote 9 should further clarify that to be a discharger for purposes of this permit, the discharge must flow to an MS4 owned or operated by a municipality covered by the permit.	The MRP refers to dischargers as industrial commercial sites which could reasonably be considered to cause or contribute to pollution of stormwater runoff. Permittees must determine if discharges threaten or impact the municipal conveyance and respond accordingly.	
San Mateo Co, Casey D	88	C.4	Increased Inspection Frequency Financial Burdensome	The proposed permit will significantly add to the list of facilities that are required to be inspected, such facilities such as the mobile washers, landscapers, pool cleaners, kennels, cemeteries, town gardens will all now be required to be inspected. Those are currently not on our inventory nor do I believe they're on anyone else's inventory. So for whoever gets tasked with doing these inspections will have to create a whole new database, have to go all the way out there for the first time to do these inspections. It will cost a lot more than the $55 that environmental health charges. An example of how much we feel these costs could reach is your State Water Board charges the -- about $700 a year for the more than 100 businesses in San Mateo that are covered under the industrial general permit for stormwater discharge. Now we could in clean conscience charge these mobile cleaners $700 to do these types of inspections. Like I said, we wouldn't get inside the door and it would be counterproductive.	The language in the permit has been revised. Each permittee shall inspect all commercial and industrial facilities that reasonably contribute to the pollution of stormwater runoff. The frequency of inspection shall be determined at the permittees discretion.	Only businesses that could reasonably cause stormwater runoff pollution, illicit discharge or contribute to a violation of receiving water quality standards should be inspected. Permittees use best professional judgment to prioritize facilities as high, medium, and low potential 8threat.
DalyCity-NSMSan	42	C.4.c.i(6)	Change Language in Provision	The word "all" must be deleted to avoid permit double jeopardy. Section should simply read: The Permittee's ERP shall incorporate appropriate enforcement options, in a reasonable progression.	This section of the MRP has been revised and the language is no longer in the permit.	ERP requirements have been revised to provide more flexibility.
Alameda	28	C.4	Is Expanding Inspection Categories Justified?	The specification that additional business categories are subject to industrial and commercial discharge control inspections does not appear to be based on any evidence that	The language in the permit has been revised. Each permittee shall inspect all commercial and industrial facilities that reasonably contribute to the pollution of stormwater runoff. The frequency	Only businesses that could reasonably cause stormwater runoff pollution, illicit

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				existing inspection practices are inadequate or that inspecting additional business categories would result in measurable improvements to water quality. We understand the State currently receives funding to conduct a select subset of these assessments and suggest that an analysis of the water quality benefits and the costs associated with these state activities be analyzed to determine if expanding this activity is justified.	of inspection shall be determined at the permittees discretion.	discharge or contribute to a violation of receiving water quality standards should be inspected. Permittees use best professional judgment to prioritize facilities as high, medium, and low potential threat.
Alameda	29	C.4	Allow more time to complete ERPs	The prescriptive violation categorization specifications of the Enforcement Response Plan (ERP) described in C.4.c. and C.5.b., as well as C.6.b., will require the ACCWP member agencies to restructure and/or rewrite our facility inspection procedures, facility report forms, and inspection report database system. The implementation timeline described in these provisions to develop the ERP should be revised to no earlier than June 30, 2009.	The specific date for revising the ERP has been removed. We are using an approach based on outcomes. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered.	The specific date for development of ERP has been removed.
San Leandro	11	C.4	Costly training, should be biennial	Increasing mandated staff training by two also doubles the cost and draws twice the resources away from field-based task implementation. After over 15 years of program implementation to have the MRP prescribe such basics is counterproductive and unnecessary. It also removes flexibility that has been used in the past to provide training or education to targeted audiences, such as the commercial property owners workshop hosted by the ACCWP a few years ago. Proposed Resolution: Remove the designated frequency of inspection by business type. Require that all businesses with a potential to contribute to stormwater pollution be inspected at least once during the five-year permit term. Allow the municipalities to develop their own list of high-priority facilities, with commensurate inspection frequencies, reflecting both risk and compliance histories, as they are currently	The permit language has been modified to provide flexibility in training requirements. The provisions require training in a minimum set of topics once during the permit term. Providing permittees the flexibility to determine the appropriate time frame and frequency of training.	Training requirements revised to require a minimum set of topics once during the 5 year permit term.

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				doing.		
CCCoSups	40	C.4.a(i)(1)(b)	Requiring Permittee to Assume Clean Up Liability Unacceptable	The MRP requires permittees to develop numerous legal authorities. Some of them are stated explicitly, others are implied, and perhaps unintentional. It reads like a wish list. Some of these wishes, I think, need to be eliminated. One example of an explicit requirement is the requirement to develop the authority to conduct various types of cleanup activities and to bill the property owner, operation, or developer. It's completely unacceptable to require the permittee to assume the enormous liabilities associated with conducting these sorts of activities.	The specific legal authority requirement regarding conducting clean up of violations has been removed. Permittees shall use means at their discretion to achieve clean up in accordance with the performance standard that all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered.	The specific language regarding conducting clean up work and billing the responsible party has been removed.
DalyCity-NSMSan	39	C.4.c	Combine ERPs for C4,C5, and C6	The ERP is mentioned in several sections of the MRP (C.4.c, C.5.b and C.6.b). To avoid confusion, all the ERP requirements should be in only one section of the permit. Request the requirement to be combined.	The ERP requirements have been revised, although they are still in separate sections. It is necessary to separate them because they correspond to different program elements. Permittees have the flexibility to create one enforcement response plan that addresses the needs for C.4, C.5, and C.6.	No changes made.
Belmont	2		No Staff to Comply with Non-emergency Discharges on Weekends	The permit requires that jurisdictions report and abate spills or illegal discharges within 48 hours. As a small City with limited staffing, we do not have staff at work on weekends to respond to non emergency events.	The specific language regarding abatement within 48 hours has been removed. We are using an approach based on outcomes. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. Permittees shall use professional judgment to determine the necessary response and appropriate timeframe in accordance with the threat to water quality. All emergency events regarding water quality impacts should be referred to a department that has the capacity to respond outside of normal business hours.	Specific language regarding response and abatement within 48 hours has been removed and replaced with performance standard regarding clean up.
JamesRogerAttII	48	C.4.b.ii.(1)(b)	Include additional commercial sources	Recommend including flea markets, amusement parks and major sport complexes including Bay Area universities and that they be included specifically by name. Events at these facilities	These areas are not municipalities. It is not appropriate to include them in a permit for municipal agencies.	No changes made.

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				attract large crowds and have been identified as major sources of trash and litter.		
JamesRogerAttII	50	C.4.b.ii.(5)	Must Include definitions of low, medium, and high potential sites	The Tentative Order must include definitions of high, medium and low potential. The facilities recommended in Comment 48 above must have a significantly higher inspection frequency that corresponds to major events, season of operation and days when the activity is operational. The permittees must be required to submit a schedule for these inspections subject to the approval of the Executive Officer.	We are using an approach based on outcomes. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. The specific requirements regarding high, medium, and low potential for stormwater pollution have been removed. Permittees are responsible for establishing a priority list based on the criteria in C.4.b.ii.(3). It is not necessary for permittees to submit the list for approval by the Executive Officer. The lists will be reported in the annual report and utilized to determine compliance with the permit provisions.	No changes made.
CCCoSups	43	C.4.b.ii(3)(b)	SIC codes out of date	It should also be noted that SIC codes (referenced in C.4.b.ii(3)(b)) are outdated and are not used by the County; this reference should be replaced with a more appropriate designator of use.	SIC Codes are sill used in the implementation of the General Industrial Stormwater permit and should be utilized when determining if coverage is required for a facility. Permittees can use an equivalent or more up to date system to track facilities at their discretion; however it will still be necessary to reference SIC Codes when determining if coverage is needed under the General Industrial Permit.	No changes made.
CCCoSups	44	C.4.b.i	Cost recovery not acceptable	It is not acceptable for the County to be required to develop the authority to conduct cleanup activities, and to bill violators to recover costs (per C.4.a.i(1)(b) and C.4.c.i(5)). This may result in significant County exposure to liability associated with cleanup. These requirements should be removed from the MRP.	The specific requirement bill violators for clean up has been has been removed. Cost recovery has been successfully used by permittees and is an effective tool to achieve compliance when necessary. It is up to the permittee to determine if this is an appropriate enforcement strategy. Permittees shall use means at their discretion to achieve clean up in accordance with the performance standard that all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered.	The specific language regarding conducting clean up work and billing the responsible party has been removed.
CCCoSups	45	C.4.b.ii(5)(e)	Not feasible to	It is also not feasible for the County to track all	The specific requirements regarding tracking	The specific

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			track all changes of use	changes in commercial and industrial uses to review for changes in the potential to contribute to pollution and whether inspections (or increased frequency) are required (per C.4.b.ii(5)(e)). Not all types of changes to use are subject to review by the County, and it is not feasible for the County to inspect every facility every year.	changes of use have been removed from the permit, although the permit did not require the tracking of all changes of use. It required that permittees continue to track no exposure facilities for significant changes in use. It is important for permittees to be aware of changes in usage that may impact stormwater quality. The permittee has the discretion to determine the appropriate means and methods to determine if a change of use will change a facilities exposure to stormwater.	requirement has been removed.
CCFCWCD	10	C.4	No Applicable Sites on Flood Control Property	There are no industrial or commercial sites on FC District property.	We agree.	No changes made.
JamesRogerAttII	4	C.4.c.i	Editorial Comment	Change "employ" to "implement" to make consistent with a regulatory approach.	Implementing an enforcement response plan is also consistent with a regulatory approach.	No changes made
JamesRogerAttII	49	C.4.b.ii.(4)(b)	Editorial Comment	Recommend adding "presence of trash and litter" to things that are to be looked for and reported.	Trash and litter are considered stormwater pollutants. It is not necessary to specifically list all potential pollutants in the provision.	No changes made
Baykeeper	39	C.4	State Objective of Provision	The Permit should clearly state the objective of the provision (See Orange County's permit "[e]ach Copermittee must implement a commercial/industrial program that meets the requirements of this section, prevents illicit discharges into the MS4, reduces commercial/industrial discharges of pollutants from the MS4 to the MEP, and prevents commercial/industrial discharges from the MS4s from causing or contributing to a violation of water quality standards."[1])	We agree.	The objective has been added to the beginning of C.4 Industrial and Commercial Site Controls section.
Baykeeper	41	C.4.b.ii(4)	Misapplies the MEP Standard	Provision C.4.b.ii.(4) still misapplies the MEP standard. Inspections should ensure that all facilities are preventing storm water discharges that are causing or contributing to a violation of water quality standards.	We agree.	This language has been removed from the provision.

[1] San Diego Permit at p. 55. See also Draft Orange County Permit at p. 35.

Response to Comments on December 14, 2007 Tentative Order
Provision C.4. – Industrial and Commercial Site Controls

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Oakley	38	C.4.c	What additional records should be maintained?	C.4.c. requires specific records be maintained of inspections and follow-ups. It also says additional records shall be made available to the Water Board. What are the other records that would be made available?	Any records that are necessary to determine compliance with the MRP, explain the circumstances of the violation, and document the follow up action that was taken. Examples include site photos, correspondence letters, site maps, diagrams, technical specifications of BMPs, testing results, etc.	No changes made.
Oakley	39A	C.4.d	Which permit for staff training?	Section C.4.d requires training in the State Industrial Permit. Which one is intended, the current 1997 version or the 2003 draft and will the State provide this training?	This section no longer requires training in the State's General Industrial Permit	Specific language removed.
Oakley	39B	C.4.d	How do we report attendance at staff trainings?	The Summary Table (forms) indicates the reporting of an attendance %age. This section indicates reporting the number counts. Which is desired?	The summary table is no longer being used. The provision now requires that the permittee reports the percentage of inspectors attending training.	No changes made.
ACCWPAtt2	18	C.4.c	Why develop ERP?	Enforcement Response Plan: If an agency already has an effective approach to enforcement, what is the rationale for requiring the development of an ERP?	The prescriptive requirements for ERP development have been removed. Permittees are still required to develop an ERP, although in many cases existing inspection plans, response protocols, and enforcement policies will meet the permit requirements.	The prescriptive ERP requirements have been removed. Permittees must develop an ERP that leads to effective site management and has the ability to meet the performance standards for violation correction in the MRP.
ACCWPAtt2	19	C.4.c.iii(4)	Not authority of Permittees to determine if coverage needed under the General Industrial Permit	C.4.c.iii.(4): It is not within the authority of the local agencies to determine if a facility is required to have coverage under the General Industrial Permit. This item should be deleted.	Ultimately, the Water Board will make the determination if coverage is needed under the State's General Industrial Stormwater Permit. This provision requires Permittees to notify business that they may need coverage under the permit and refer the names of non-filers to the Water Board.	No changes made.
Santa Clara Co	25	C.4	How to determine responsible party?	How will the responsible party be determined? There is potential for legal issues to arise that will be costly and time consuming.	Permittees should make a reasonable effort to determine the responsible party utilizing all appropriate means available to them. If it is not possible to determine the responsible party, efforts should be focused on preventing impacts	No changes made.

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Provision C.4. – Industrial and Commercial Site Controls

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
					to water quality and cleaning up the problem discharge not extended investigations to determine the responsible entity.	
Santa Clara Co	26	C.4	When to issue warnings and citations?	When should warning and citations be given out?	It is the discretion of the inspector to decide when to issue warnings and citations. The Water Board is only concerned with achieving compliance not the means and methods that are used to get there.	No changes made.
Santa Clara Co	26	C.4	Tracking of repeat offenses after 3 year window	What happens to the tracking of repeat and escalating stormwater offenses after the 3-year rolling window is up?	Permittees should use the information to inform future inspections and to determine the frequency of inspection necessary to manage the site effectively.	The 3 year rolling window for progressive enforcement requirement has been removed.
Santa Clara Co	27	C.4	Clarification regarding staff training requirements	When should staff training start? Is there a minimum amount of trainings that inspectors should attend annually? Can it take all five years of the permit before inspectors are fully trained in all the desired topics?	It is the discretion of the permittee to determine when training should start based on staff experience and educational needs. There is no minimum number of trainings as long as inspectors adequately trained. Yes, it can take all five years to completely train inspectors in all of the topics.	No changes made

[a] Refers to Provision Numbers contained in the Municipal Regional Stormwater Permit (MRP) Tentative Order dated December 14, 2007.
[b] Provision Numbers referenced are found in the Municipal Regional Stormwater Permit (MRP) revised Tentative Order dated February 11, 2009

Response to Comments on December 14, 2007 Tentative Order
Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
ACCWP Milpitas SCVURPPP CCCoSup Daly City-NSMSSan CCCWP San Jose AttA Brisbane SMCWPPP	20 16 26A 46 46 45 30 10A 9A	C.5.a.ii	Extend Time for Legal Authority Establishment	The County's ability to effectively combat illegal dumping is severely compromised by our limited legal authority under various State laws. It is extremely important to analyze what additional legal authorities, including changes to State law, the County would be required to develop in order to comply with various C.5 Provisions related to identifying parties responsible for illegal dumping and litter violations and either citing/fining them or recovering clean-up costs from them.	Under Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B) municipalities are required to have adequate enforcement authority to prohibit illicit discharges. Since at least 1999, San Francisco Bay Area counties have had prohibitions in their stormwater management plans to prevent and eliminate illicit discharges. Permittees should have the legal authority in place, or may be declaring that they are in non-compliance with this long standing regulatory requirement.	Date for implementation of legal authority has been removed from the permit.
SCVURPPP AttA SMCWPPP Brisbane	26B 9B 10B	C.5.a.ii	Legal Authority Only for Significant Trash and Litter Discharges that Affect the Water Quality in MS4	We recommend that any legal requirements in the Tentative Order for controlling "significant trash/litter generating activities" be limited to these activities that affect the quality of water in the MS4 system owned or operated by a municipality with coverage under the permit.	We agree, although permittees must also address sources of wind blown trash and direct dumping to the MS4 system. These sources have the potential to impact water quality.	No changes made.
SMCWPPP Brisbane	9G 10G	C.5.a.i(1)(a)	Only Responsible Parties Affecting Water Quality in MS4	Section C.5a.i.(1)(a) requires that permittees control certain activities by "responsible parties" within their jurisdiction; this requirement should be limited to controlling responsible parties' pollutant generating activities where these pollutants adversely affect water quality of the MS4 system that the municipality owns or operates.	We agree, although permittees must also address pollutant sources that have the potential to discharge or be mobilized in to the MS4 system. Protecting the water quality of the MS4 must address potential sources in addition to sources that directly impact water quality.	No changes made.

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Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
CCCoSup	49	C.5.a.i(2)(a)	Extend Implementation Date for Administrative Penalty	The County currently has the authority to issue criminal enforcement and penalties for illicit discharges as written in Chapter 1014-6 in the County Ordinance, upon conviction. However, an Ordinance change will be required to issue administrative penalties and fines (required in **C.5.a.i(2)(a)**). If the administrative penalty system must be employed, November 30, 2008 is not enough time to implement a change in the County Ordinance. An implementation date of July 1, 2009 is recommended.	The specific date for establishing legal authority to issue administrative penalties has been removed. We are using an approach based on outcomes. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. The means to achieve compliance with this performance standard may be determined by the permittee.	The specific date for implementation of administrative penalties has been removed.
SMCWPPP Brisbane	9C 10C	C.5.b	ERP Not required by CWA	We recommend that the ERP requirements be deleted from the permit because they are not required by the federal Clean Water Act.	An enforcement response plan is an important tool that will help permittees achieve effective and consistent enforcement. The specific requirements for development of an ERP have been removed to provide permittees with flexibility. Permittees have the ability to create an ERP specific to their needs in order to achieve compliance in accordance with the MRP provisions.	The prescriptive ERP requirements have been removed. Permittees must develop an ERP that leads to effective site management and has the ability to meet the performance standards for violation correction in the MRP.

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Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
San Leandro Pleasanton Dublin	12 8 5	C.5.b	Development of ERP Overly Burdensome and Not Necessary	Creating enforcement response plans is an overly burdensome task that will effectively draw resources away from program implementation and field-based activities to meeting prescriptive demands required by the MRP. Current spill response and business inspection practices are effective, and adoption of additional formal measures would provide no incremental benefit to water quality.	The prescriptive enforcement response plan requirements in the previous draft have been modified. The requirements are now based on the performance standards of achieving clean up before the next rain event or within10 business days. Permittees have the flexibility to create an ERP specific to their needs to meet the goals of this performance standard.	The prescriptive enforcement response plan requirements have been modified and replaced with performance standards for achieving site clean up.
SCVURPPP AttA Daly City-NSMSSan CCCWP San Jose Attny Brisbane SMCWPPP	27A 51 46 33 10D 9D	C.5.b.ii	Extend Time for Development of ERP and Training to 12 Months after Adoption	The Tentative Order should require development of the Enforcement Response Plan (ERP) at least one year after adoption of the permit. The ERP needs to be supported by local ordinances that will require adequate time to draft, allow public review comment, and adopt. Additionally, the permit should allow one year to complete training on the ERP in order for the training to fit into an annual training workshop.	We agree.	Permittees will now develop an Enforcement Response Plan (ERP) designed to meet the specific needs of the municipality.
SCVURPPP AttA SMCWPPP Brisbane	27B 9G 10G	C.5.b.ii	ERP Needs Flexibility	The Tentative Order needs to allow flexibility in responding to discharges and threatened discharges. This comment is expressed above under the similar permit requirement for Industrial and Commercial Site Controls.	We agree.	Permittees will now develop an ERP designed to meet the specific needs of the municipality.
CCCO Sup	46B	C.5.b.ii	Difficult to Determine Responsible Party	It should also be noted that it is rarely possible to identify a "responsible party" for illegal dumping and litter cases. The burden of proof is significant, generally requiring confessions or eyewitnesses. Even finding someone's name in dumped materials is not adequate proof, per the District Attorney's Office.	Permittees should make a reasonable effort to determine the responsible party utilizing all appropriate means available to them. If it is not possible to determine the responsible party, efforts should be focused on preventing impacts to water quality and cleaning up the problem	No changes made.

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Provision C.5. – Illicit Discharge Detection and Elimination

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					discharge not extended investigations to determine the responsible entity.	
ACCWPAtt2	18	C.5.b	Why require an ERP?	If an agency already has an effective approach to enforcement, what is the rationale for requiring the development of an ERP?	The prescriptive requirements for ERP development have been removed. Permittees are still required to develop an ERP, although in many cases existing inspection plans, response protocols, and enforcement policies will meet the permit requirements.	The prescriptive ERP requirements have been removed. Permittees must develop an ERP that leads to effective site management and has the ability to meet the performance standards for violation correction in the MRP.
Daly City-NSMSSan	52	C.5.c.ii	Extend Time for Development of Complaint Response and Training	Request the elimination of the specific date of November 30, 2008 and change to 12 months after permit adoption. More time is needed to develop a model and train staff.	Permittees should already have a complaint response system in place. If more time is needed permittees, may be declaring that they do not have an adequate system for reporting and responding to illicit discharges.	No changes made.
San Leandro	13	C.5.b.(i)(3)	Problems Classifying Discharges into Tiers	The attempt to classify an illicit discharge into some sort of tiered violation is going to draw a lot of staff time and resources away from field-based oversight and pollutant reduction efforts. An illicit discharge is an illicit discharge and they are all illegal. If it stayed on site or was stopped before it left the site, then on site clean-up and	We agree.	The Tiered system has been removed from the requirements.

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				abatement, along with implementing measures to preclude the spill from occurring again are required. If it left the site but was contained in the collection system and did not reach receiving waters then the responsible party (RP) must also clean and abate the collection system. If it did reach any receiving waters then the local agency is going to defer to county, state and federal agencies regarding corrective actions for mitigation & abatement outside the agency jurisdiction and still take enforcement individually or jointly with responding county, state and federal agencies as circumstances dictate.		
SCVURPPP AttA Central San Fairfield Suisun SD Oakley Daly City-NSMSSan San Jose AttA Brisbane SMCWPPP	27C 21 7 41 48, 49 32 10H 9H	C.5.b.i.3	Why is Notification Required For Tier I (Substantial) Violations that Don't Reach Municipal Conveyance	This condition requires permittees to notify the Water Board within 48 hours of "…a Tier One violation that *does not* (emphasis added) enter the municipal conveyance…". It is not clear why this type of notification of the Water Board is needed for a condition that does not reach the municipal conveyance system. It appears the notification is intended for Tier One violations that do reach the municipal conveyance.	We agree.	The Tiered violation system has been removed the requirements.
Mountain View SCVURPPP AttA Millbrae Milpitas Daly City	9 28B 9A 12C 53	C.5.d	Publicly Available MS4 Maps are a Potential Homeland Security Risk	The Regional Permit requires the City to make storm sewer maps available to the public either electronically or in hard copy. For homeland security reasons, the City is concerned about publishing detailed infrastructure maps. Has the Regional Water Board evaluated the requirement to make storm sewer maps publicly available for potential conflicts with Federal Homeland Security regulations? We request that the Water Board consult with Homeland Security	Storm drain maps were a regulatory requirement for the initial Phase I NPDES permit application per 40 CFR 122.26. We have not yet contacted the Department of Homeland Security on this issue. Citizens may need to know where drainage paths go if they observe or report a spill or other problem. There are already numerous published sources of storm drain maps available from municipal programs and the San Francisco	No changes made.

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				before requiring that this sensitive map information be made available to the public.	Estuary Institute. We are asking that each Permittee have a contact to provide this information. The contact could provide some judgment on the security risk associated with any particular inquiry, or add extra scrutiny steps around certain facilities that are sensitive.	
Brisbane SMCWPPP	10J 9K	C.5.d	Use Oakland Museum of CA maps instead of MS4 maps	The draft permit's requirement to make MS4 maps available to the public would require a substantial amount of work without any clear benefit to water quality. Due to security issues with infrastructure in a post-9/11 world, Brisbane does not believe it is appropriate or necessary to advertise the availability of utility maps. All of the municipalities' maps are public documents that are available upon request. SMCWPPP suggests that this requirement should be deleted and substituted with a requirement to use the Oakland Museum of California maps, where available, of creeks and storm drains. These maps have been completed with financial assistance from SMCWPPP. These maps provide information that would be useful to the public.	The availability of the maps would provide a direct benefit to water quality. It would help the public report illicit discharges, improve response times, and assist with the determination of potential impacts from a discharge. We are not asking permittees to make utility maps available. We are only requiring the availability of storm drain maps. These maps can be made available through a point of contact that can utilize discretion in disseminating the information. The Oakland Museum of CA maps may be appropriate in some situations; however, these maps do not provide a comprehensive representation of the areas covered by the MRP.	No changes made.
Milpitas	12A	C.5.d.i	How do MS4 maps assist with Illicit Discharge Investigation?	How will requiring public distribution of maps of the City's entire MS4 system attain the stated objective of investigating illicit discharges? Does the State expect the public to conduct these investigations?	We are not requiring that maps be distributed to the public. We are requiring that the maps be made available upon request through a single point of contact. The availability will aid in the reporting and investigation of illicit discharges. We do not expect the public to conduct preemptive inspections; however, when they discover or become aware	No changes made.

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					of a problem the maps will assist with the reporting and examination of discharges.	
Baykeeper	43	C.5.d.i	Map of MS4 system and checkpoints should be available in GIS	The map of the system and strategic checkpoints should require permittees to map illicit connections and discharges. The Permit should require that the map be in GIS format and be updated at least once every permit term.	We support the proposals suggested in these comments; however, we do not believe it is an appropriate requirement in this permit term considering the level of service necessary to comply with the permit provisions and reporting requirements. Permittees will be reporting illicit connections and discharges in their annual reports. It may be appropriate during the next reissuance to require mapping of illicit connections and the utilization of GIS based maps.	No changes made.
Milpitas	17A	C.5.d.ii	Why make MS4 maps available?	What is the purpose of making maps of the MS4 readily and conveniently available to the public? Why must they be available through a single point of contact?	Making MS4 maps readily available to the public will aid in the reporting and investigation of illicit discharges. It will help the public accurately report problems and determine if observed discharges have reached the MS4 system.	No changes made.
Milpitas	17B	C.5.d.ii	Why a single point of contact?	Why must MS4 maps be made available through a single point of contact?	They are to be made available through a single point of contact so it will be convenient and simple for the public to access the maps. The single point of contact also allows the permittees to assert discretion when making the maps available.	No changes made.
SCVURPPP Burlingame Milpitas Millbrae	28A 4 12B 9B	C.5.d.	Collection System Screening Frequency	The requirement appears to be well in excess of the federal regulation which only requires identification, rather than mapping, of the locations of major	The Federal Regulations required NPDES Municipal Phase I permit applicants to include much more comprehensive screening in their	No changes made.

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Fairfield Suisun SD Brisbane SMCCWPPP	6 10l 9J		Arbitrary and Excessive	outfalls and major structural controls. The fact sheet does not provide the technical basis for why municipalities need to survey strategic collection system check points at a density of one screening point per square mile. It is unnecessary to specify the minimum number of checkpoints if municipal staff is trained to check for illicit discharges while performing other routine maintenance activities. We recommend that the one check point per square mile requirement be deleted from the permit because it may unintentionally divert municipalities' efforts from effectively prohibiting non-stormwater discharges to the MS4.	initial NPDES Permit application than is contained in the Revised TO, (See Fact Sheet and 40 CFR 122. 26) including results of a field screening analysis for illicit connections that includes, at a minimum, a description of visual observations made at each designated field screening point. Field screening points are either all major outfalls or outfall points randomly located throughout the storm drain system and identified by overlaying the system with a 0.5 mile square grid system and selecting one field screening point for every 1/16 square mile cell. The Revised TO approach is much more efficient and easier to implement, and relies on a combination of focused inspections for illicit discharges based on the Permittees illicit discharge screening program and visual inspections during routine maintenance and other activities in the collection system to meet the screening frequency specified in the Federal Regulations.	
SMCWPPP	9L	C.5.d	Video Inspection of Collection System	It is unclear how video inspections of storm drains would count toward meeting the draft permit's requirements to do "above ground check points." This should be explained or the inclusion of video inspections deleted from the permit.	The use of video inspections in storm drains can be used to detect illicit connections to the MS4. This is the primary of the above ground check points. The above ground check points can provide important information regarding above ground points while video inspection may provide data about area not easily assessed by conventional means.	No changes made.

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File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Baykeeper	44	C.5.d.	Collection System Screening Inadequate	The field screening requirements for detection of illicit discharges fail to meet federal requirements. Applicants for a municipal separate storm sewer system NPDES permit must include in their application results of a field screening analysis for illicit connections that includes, at a minimum, a description of visual observations made at each designated field screening point. Field screening points are either all major outfalls or outfall points randomly located throughout the storm drain system and identified by overlaying the system with a 0.5 mile square grid system and selecting one field screening point for every 1/16 square mile cell. As far as we are aware, the Regional Board has not asked Permittees to submit the required field screening information or conduct the level of screening necessary to generate the information required by the regulations governing MS4 permit applications.	The permit relies on a combination of focused inspections for illicit discharges based on the Permittees illicit discharge screening program and visual inspections during routine maintenance and other activities in the collection system to meet the screening frequency specified in the Federal Regulations.	The TO was edited to include reference to the USEPA/Center for Watershed Protection publication, "*Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessment.*" Permittees are required to use this guidance document when developing and implementing their illicit discharge screening program.
SMCWPPP	9l	C.5.c	Preparation of Spill Response Flow Chart and Phone Tree	SMCWPPP recommends that the permit be modified to allow one year following permit adoption to prepare the spill response flow chart and phone tree and conduct training because SMCWPPP does not normally perform training during the period shown in the permit. In addition, as described above, it is uncertain when the permit will be adopted, so it does not make sense to put dates certain in the permit here or elsewhere.	We agree.	The deadline for developing the response flow chart and integrating into training and outreach is July 1, 2010. The information shall be submitted in the 2010 annual report.

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File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
San Leandro San Jose San Jose Attny San Jose Atta Sunnyvale Burlingame	14 13 5 34 14A 5	C.5.e	Illicit Discharge Reporting Excessive	Provision C.5.e has excessive reporting requirements. The City maintains complete records that are available for review if Water Board staff request to see them. A summary of the data in annual reports should be sufficient to demonstrate this program's implementation and effectiveness.	The reporting requirements have been reduced. Permittees will still maintain a complaint and spill response database. The information will be reported in the annual report in summary form.	The reporting requirements have been modified to summary tables. Permittees are required to keep detailed records to demonstrate compliance and allow inspection by the Regional Board upon request.
Brisbane SMCCWPPP	10K 9M	c.5.e	Tracking and Reporting Limited to Significant or Discharges	Brisbane suggests that the tracking and reporting be limited to significant incidents or discharges that are confirmed to have entered the MS4 owned or operated by the municipality and found to be threatening water quality.	The permit requires that permittees report and track all spills and discharges that may impact water quality. It is necessary to track and report actions to insure consistent and appropriate follow up and compliance with the provisions of the MRP.	No changes made.
Brisbane SMCCWPPP	10L 9N	C.5.e.ii	Tracking and Reporting Overly Prescriptive	The draft permit's requirement to "create and maintain a water quality and dumping complaint tracking and follow-up database system" (C.5.e.ii) is overly prescriptive. Brisbane suggests that municipalities be allowed the flexibility of using a database or equivalent system of their choosing to track illicit discharges. In addition, it is unclear what "water quality" is being referred to in this permit requirement, and it should be deleted or clarified.	Permittees may use a database or equivalent system to track illicit discharge reporting and response. The reference to water quality has been edited to read "water quality spill and dumping complaint tracking and follow up database system. The system should track any reported spill or dumping that may impact water quality.	Language changed to include database or equivalent tabular system. Water quality has been modified with the language "water quality spill and dumping."
San Leandro	14	C.5.c.(ii)(3)(c)	Why Reporting discharges that do not reach municipal collection system?	This reporting requirement is confusing as Water Board staff had dropped reporting of every minor illicit discharge into the curb and gutter years ago. This provision would require an on site illicit discharge (one that did not enter a	We agree.	The detailed reporting requirements have been reduced and the

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				municipal collection system) to be reported as if it were an actual discharge with eminent threat. This data is currently being reported on the quarterly illicit discharge summary forms contained in the annual reports.		tiered system for classifying discharges has been removed from the requirements.
Sunnyvale AttB	14B	C.5	Develop Reporting after Adoption	The City requests that the draft Annual Report Form in Attachment L be removed from the Tentative Order, and instead a reporting form should be developed after the permit is adopted to reflect what is actually included in the permit.	We agree. The detailed Annual Report Form Attachment L has been removed from the permit. Development of the reporting format will happen in collaboration with permittees after the permit has been adopted.	Attachment L removed.
Baykeeper	42	C.5	Permit Should State Objective of Provision	The Permit should clearly state the objective of the provision (See the draft Ventura permit "[e]ach Permittee shall eliminate all illicit connections and illicit discharges to the storm drain system, and shall document, track and report all such cases."[1]).	We agree.	The objective has been added to the beginning of Illicit Discharge Detection and Elimination section.
Baykeeper	45	C.5	Require use of creek walk data in illicit discharge detection and elimination	Permittees should be required to use information gathered as part of the creek walk requirements in their illicit discharge detection and elimination programs.	Utilizing the data from creek walks is a logical progression that permittees will employ when conducting their programs. It is not necessary to make it a specific requirement.	No changes made.
San Leandro	15	C.5	Increasing training will increase costs and reduce current programs	Increasing training from biennially to annually is going to double costs and take resources away from current program tasks.	The specific training requirements have been removed from the permit. It is expected that permittees will conduct training to implement their ERP and spill and complaint tracking systems.	Specific training requirements for Illicit Discharge investigation and reporting removed.
Oakley	42	C.5.f	When is the first year for evaluating years' activities?	C.5.f requires annual reporting of the illicit discharge activities for the "next" year based on "last" year. It is unclear what would be the first year for the	This specific section has been removed from the permit. It is expected that permittees will conduct this type of review as problems arise	Section C.5.f removed from permit.

[1] Los Angeles Regional Water Quality Control Board, Revised Order No. 07-xxx, NPDES NO. CAS004002, p 80 (August 28, 2007). (hereinafter "Draft Ventura Permit").

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				activity to be reported as, except for the ERP requirement, the other tracking activity is already in place.	or during the compilation of the annual report data.	
Daly City-NSMSSan	55	C.5.f	Annual Plan for Illicit Discharge Tracking and Response	Staff resources would be better utilized preventing and eliminating illicit discharges rather then creating another plan. Request elimination of the requirement.	This specific section has been removed from the permit. It is expected that permittees will conduct this type of review as problems arise or during the compilation of the annual report data.	Section C.5.f removed from permit.
ACCCWPAtt2	21	C.5.c.i	Non-Emergency Response Only During Normal Business Hours	The checking the voicemail for the non-emergency response number should be limited to Monday-Friday. The purpose of using 911 is to have coverage during non-working hours.	We agree. The non-emergency number should only be checked during normal business hours.	C.5.c.i has been revised to specify only during normal business hours.
ACCCWPAtt2 Daly City-NSMSSan	22 54	C.5.e.ii	Change Date for Establishment of Tracking System	Request the elimination of the specific date of November 30, 2008 and change to 12 months after permit adoption.	We agree the deadline should be extended.	The deadline for establishing the tracking system is April 1, 2010. A summary of data collected shall be submitted in the 2010 annual report.
GCRCD Att	18	C.5.a	Should Establish Penalties for Lack of Enforcement	While there is no problem addressing authority issues, most all municipalities, counties and state agencies already have the legal and citation authority to enforce the plethora of existing anti pollution and dumping laws, ref Attachment I. The problem is that these laws are largely being ignored and are not being enforced. The MRP should establish strong punitive measures to force responsible authorities to strictly enforce current anti pollution laws.	If permittees enforcement activities are not consistent with the requirements of the MRP or are not effective at preventing illegal discharges that violate water quality standards, the Water Board will take enforcement measures. It is not appropriate to stipulate specific punitive measures on the MRP. The Water Board has a long established administrative process for conducting enforcement actions.	No changes made.
GCRCD Att	20	C.5.c	Established	In addition to a phone complaint system	A web based system for reporting and	No changes

Response to Comments on December 14, 2007 Tentative Order
Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
			Web Based Reporting and Tracking for Illicit Discharge	there should also be a web based system. The systems should be integrated and enable citizens to not only log complaints, it should allow them to track their complaints and to find out how and when the complaints were handled and resolved. The system should be able to track the number and type of complaints by specific location or waterway over time and allow the public to view this information. All reports of active illegal dumping should be referred to a quick response team for immediate investigation and action. If reports of active dumping or a real time water quality problem are received it does little good to investigate the problem days or even hours after the fact, as the polluters are likely to be long gone and any liquid spill pollution event dissipated.	tracking would be useful; however, considering the numerous other requirements of the permit it is not appropriate to make this a specific requirement of the permit at this time.	made.
Daly CIty-NSMSSan	45	C.5.a.i.(1)	Remove word effectuate	Strike the word: effectuate. It is meaningless in the context of an agency's ability to enforce. An agency's authority is limited to cease, abate and clean up.	We agree.	The word effectuate has been removed from the permit language.
JamesRogerAtt2	51A	C.5.a.i.(1)	Change effectuate to require	Recommend changing "effectuate" to "require" being more regulatory oriented.	This section has been revised and this comment does not directly apply to the current language. The word "effectuate" was removed from the permit language.	The word effectuate has been removed from the permit language.
JamesRogerAtt2	51B	C.5.a.i.(1)	Change significant to all	"Significant" should be eliminated and "all" added because permittees have demonstrated the tendency to significantly under report adverse conditions when given the opportunity.	This section has been revised and the word "significant " was removed from the permit language. The word "all" is too broad. We have added a list of typical illicit discharge pollutants.	Section C.5.a has been revised and the word significant was removed.
JamesRogerAtt2	52	C.5.b.i.(2)	Change language in	The first sentence is redundant and is not required because the second	The section has been revised and this comment does not apply to the	The language in C.5.b.i.(2) was

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File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
			provision	sentence establishes the cleanup and abatement time schedule.	revised language.	removed from the permit.
Daly City-NSMSSan	50	C.5.b.i.(5)	Change language	Add to the list whether the discharge affected the quality of the receiving water. Last sentence should be amended as noted by **Bold Text** so it reads: The identification of the appropriate response shall ultimately be **recognized as** a function of the Permittee's best professional judgment.	The section has been revised and this comment does not apply to the revised language.	The language in C.5.b.i.(5) was removed from the permit.
CCCWP	44	C.5.a.i.(3)	Add Water Board to Language Regarding Referral	*Permittee shall be able to impose more substantial sanctions, including referral to a city or district attorney or Water Board, and maintain appropriate escalating response where repeat or escalating violations occur."* *Rationale for addition*: The State and Regional Board have significant enforcement capabilities under the State Water Code; certainly more than local governments. Water Board staff, in the past, has agreed to provide enforcement assistance when requested to deal with particularly difficult or egregious dischargers	The section has been revised and this comment does not apply to the revised language. The section on referrals was removed from the Legal authority provisions.	The language in C.5.a.i.(3) was removed from the permit.
Daly City-NSMSSan	47	C.5.b	Combine ERPs for C4, C5, C6	The ERP is mentioned in several sections of the MRP (C.4.c, C.5.b and C.6.b). To avoid confusion, all the ERP requirements should be in only one section of the permit. Request the requirement to be combined.	The ERP requirements have been revised, although they are still in separate sections. It is necessary to separate them because they correspond to different program elements. Permittees have the flexibility to create one enforcement response plan that addresses the needs for C.4, C.5, and C.6.	No changes made.
CCCoSup	47	C.5.a.i.(2)(b)	Legal authority to recover costs limited to property owner	The County's legal authority to recover costs of abatement only applies to the property owner, as dictated by CA Government Code – Section 25845	The section has been revised and this comment does not apply to the revised language. The section on recovery of costs was removed from	The language in C.5.a.i.(2)(b) was removed from the permit.

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File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				(including notifications/process required, also prescribing time frames); the owner of the property is often not necessarily the "responsible party," so these regulations are ambiguous in how they may apply to mobile sources.	the Legal authority provisions.	
CCCoSup	48	C.5	Do Not Subject Permittees to Liability for Clean Up	It is also not acceptable to subject the County to the liabilities associated with conducting cleanup activities (per **C.5.a.i(1)(b)**, **C.5.a.i(2)(b)** and **C.5.b.i(1)**).	The section has been revised and this comment does not apply to the revised language. The section on conducting clean up activities and recovery of costs were removed from the Legal authority and ERP provisions.	The language in C.5.a.i(1)(b), C.5.a.i(2)(b), and C.5.b.i(1)) was removed from the permit.
CCCFCD	11	C.5	Screening Area For Illicit Discharges	The FC District has no enforcement authority outside its own property. Section C.5.d, "Collection System Screening" – The FC District is not a significant source of illicit discharges. The FC District will assist adjacent municipalities and the unincorporated county in their activities to identify end of pipe water quality. However, the FC District should not be responsible, in this or future permits, for the costs of such screening that exceed the proportion of the FC District's owned land area to the entire watershed area tributary to the point of interest.	We agree.	No changes made.
Santa Clara Co	28	C.5	How to Determine Responsible Party?	How do you determine who the responsible party is? There potential could be court time involved with determining who the responsible party is.	Permittees should make a reasonable effort to determine the responsible party utilizing all appropriate means available to them. If it is not possible to determine the responsible party, efforts should be focused on preventing impacts to water quality and cleaning up the problem discharge not extended investigations to determine the responsible entity.	No changes made.

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File	Comment No	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Santa Clara Co	29	C.5	What is Progressive Enforcement?	For the progressive enforcement policy what is considered a progressive response?	The specific language regarding progressive enforcement response policy has been removed form the provisions.	Progressive enforcement response policy has been removed from the provisions and replaced with a performance standard for clean up of violations.
Oakley	40A	C.5.b	Is specific ERP for each provision required?	C.5.b says an ERP is required. C.4 also requires an ERP. Are these the same document or is a specific ERP required for each provision where it is mentioned?	This is determined by the permittee. Permittees have the flexibility to create one enforcement response plan that addresses the needs for C.4, C.5, and C.6 or to create separate ERPs for each section.	No changes made.
Oakley	40B	C.5.b	What is a significant volume?	For Tier One violations, what would be considered a "significant" volume?	The specific language regarding Tiered Violations has been removed from the permit. This comment does not apply to the revised language.	Tiered system of illicit discharge violations has been removed

[a] Refers to Provision Numbers contained in the Municipal Regional Stormwater Permit (MRP) Tentative Order dated December 14, 2007.
[b] Provision Numbers referenced are found in the Municipal Regional Stormwater Permit (MRP) revised Tentative Order dated February 11, 2009.

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Provision C.6. – Construction Site Control

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
San Jose Att A	40b	Attachment L (pg. L-44)	Excessive Tracking	Requirement to develop and implement a tracking system for all screening level inspections would not be practical.	To ensure consistency with the Permit requirements, the reporting template will be released after the adoption of the Permit.	Reporting template has been removed from the Permit.
Sunnyvale Att A	15c	C.6.	Attachment L	*Remove Attachment L from the TO. Reporting form should be developed after the permit is adopted to reflect what is actually included in the permit.*	We agree. To ensure consistency with the Permit requirements, the reporting template will be released after the adoption of the Permit.	Reporting template has been removed from the Permit.
SF Baykeeper	46	C.6.	Define	The Permit should clearly state the objective of the provision *(See Orange County's permit "[each Co-permittee shall implement a construction program that meets the requirements of this section, reduces construction site discharges of pollutants from the MS4 to the MEP, and prevents construction site discharges from the MS4s from causing or contributing to a violation of water quality standards.")*	We agree.	Added goal for the Provision.
NRDC	20b	C.6.	Language Vagueness	In many instances, the Draft Permit essentially directs the Permittees to develop their own permit, which will not be subject to public review or Board oversight. Further, the lack of performance standards and compliance measures could render these provisions useless if and when the Regional Board or the public ever needs to enforce them. Without a clear understanding of exactly what these sections require of the Permittees, the Board cannot determine that they result in the reduction of pollutants to the maximum extent practicable.	The revised TO requires certain elements in Legal Authority and Enforcement Response Plan (ERP); and requires monthly inspections of sites disturbing one acre or more of soil with tracking of specific inspection data. The revised TO provides the flexibility to the Permittee to have the Legal Authority and Enforcement Response Plan that fits into their municipality's structure. However, the effectiveness of the individual Legal Authority and ERP to reduce pollutants to the maximum extent practicable will be reflected in the tabular tracking data of the monthly inspection data in some tabular form and in the summary of the tracked data annually. We believe that the specific tracking data will provide us the necessary information to determine compliance with C.6.	Revised C.6. to provide the Permittees with the necessary flexible but with accountability.
San Jose Attorney	6c	C.6.	Reporting Onerous	Excessive reporting not linked to improvement in water quality.	We consider the reporting requirements the minimum amount of information we need to	C.6.e.iii. streamlines and consolidates the reporting

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					determine Permittee's compliance and to determine if the Permittees are taking the appropriate enforcement actions to bring sites into rapid compliance. If sites are not inspected and if rapid compliance is not happening, sediment and other construction pollutants are entering our waterbodies.	requirements for inspections.
San Jose San Jose Attorney	14b 6d	C.6.	Reporting Onerous	*Delete requirement to report inspection results at the transaction level.*	The revised TO contains the minimum summary data necessary for Water Board staff to gauge Permittee's compliance.	C.6.e.iii(1) in the revised TO states the specific summary data that must be reported in each Annual Report.
Sunnyvale Att A	15	C.6.	Reporting Onerous	Reporting requirements onerous.	We consider the reporting requirements the minimum amount of information we need to determine Permittee's compliance and to determine if the Permittees are taking the appropriate enforcement actions to bring sites into rapid compliance.	C.6.e.iii. in the revised TO streamlines and consolidates the reporting requirements for inspections.
San Jose Att A	40c	C.6.	Reporting Requirements Inconsistent	TO says that data is to be provided in summary form but Attachment L includes Table C.6 with transaction level reporting. *Remove Table C.6 to be consistent with TO.*	To ensure consistency with the Permit requirements, the reporting template will be released after the adoption of the Permit. Also, specific summary data is listed in the revised TO so that all Permittees will be reporting the same summary data. The revised TO contains the minimum summary data necessary for Water Board staff to gauge Permittee's compliance.	C.6.e.iii(1) states the specific summary data that must be reported in each Annual Report. Reporting template has been removed from the Permit.
Berkeley	17	C.6.	Too Many New Requirements	Increased efforts to inspect all construction sites, create new databases, and maintain new databases don't directly improve water quality.	Detailed inspections are not required at all construction sites. Sites disturbing less than one acre of soil and not required to implement effective erosion and sediment control measures can discharge significant volumes of polluted runoffs into the Permittee's stormdrain system and ultimately into waterbodies. These polluted discharges become illicit discharges that could have been prevented with a minimal level of oversight. The December 2007 TO does not require Permittee's to create and maintain new databases. We clarified the language in the revised TO. We consider the reporting requirements the minimum amount of information we need to determine Permittee's	Inspections are required at all construction sites disturbing one acre or more of soil and at high priority sites. The tracked data can be submitted electronically or in a tabular format.

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					compliance and to determine if the Permittees are taking the appropriate enforcement actions to bring sites into rapid compliance. If sites are not inspected and if rapid compliance is not happening, sediment and other construction pollutants are entering our waterbodies.	
SCVURPPAttny	21b	C.6.	Too Much	Requires Permittees to inspect sites subject to the Construction General Permit.	There is no regulatory conflict, and indeed the Phase I requirements are redundant with the Construction General Permit in a manner similar to Industrial and Commercial Site Controls requirements. (See response to the first comment in the C.4 Summary Response). CWA 402(0)(3)(B)(ii) requires a prohibition in stormwater permits of non-stormwater discharges into storm sewers. 40 CFR 122.26(d)(2)(i) requires Permittees to carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer. As such, Permittees are required to inspect to ensure that non-stormwater discharges are not entering the storm drain and that sites within their jurisdiction are complying with the local stormwater ordinances.	
Daly City	56	C.6.a(i)	Limit the Universe of Construction Sites	*Revise "all construction sites."*	All construction sites drain into some stormdrain and/or collection system owned by a MS4; or into some waterbody. All construction sites must have appropriate and effective controls. What are appropriate controls for a site on a hill near a creek may be different for a flat site. Different types of soils can also factor into the type of BMPs necessary. All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices.	
SMCWPPPAtt3-Table SMCWPPPAtt3-Table	10 10h	C.6.a(i)	Limit the Universe of Construction Sites	*Permit should limit its requirements to construction sites that are tributary to an MS4 owned*	This issue does not need to be addressed in each provision of the Tentative Order, but is a global definition issue of the types of activities	

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				or operated by a municipality covered by the permit.	that are regulated under the Tentative Order and under the Clean Water Act.	
Daly City	57	C.6.a(ii)(3)	Date Change	*Change November 30, 2008 to 12 months after permit adoption.*	We have rewritten C.6.a. - Legal Authority for Effective Site Management in response to comments on flexibility. Because the implementation level is now general, all Permittees should already have the required level of legal authority.	Certification that respective legal authorities meet the general Permit requirements for legal authority is due in the first Annual Report following Permit adoption.
Daly City	57b	C.6.a(ii)(3)	Date Change	*Fully train staff 24 months after permit adoption.*	C.6.a(ii)(3) in December 2007 TO does not require Permittees to fully train staff on Legal Authority.	None.
ACCWP-Att1-Redline	23	C.6.a.	Date Change	*Due date for establishing legal authority should be changed to June 30, 2009.*	We have rewritten C.6.a. - Legal Authority for Effective Site Management in response to comments on flexibility. Because the implementation level is now general, all Permittees should already have the required level of legal authority.	Certification that respective legal authorities meet the general Permit requirements for legal authority is due in the first Annual Report following Permit adoption.
Brisbane SCVURPP Att A SMCWPPPAtt3-Table	11 29b 10b	C.6.a.	Date Change	Legal authority establishment dates differ in different sections of the permit. *A minimum of one year is needed for all legal authority changes.*		
SCVURPP Att A	29b	C.6.a.	Date Change	*Five months is not enough time to change the legal authority structure.*		
SCVURPP Att A	29	C.6.a.	Legal Authority Flexibility	Permittees have been achieving compliance for years through existing legal authority that does not necessarily include all the requirements in the permit. *Provide flexibility as to whether the changes are necessary.*	We have rewritten C.6.a. - Legal Authority for Effective Site Management in response to comments on flexibility.	Removed the specific elements required in a legal authority and made it more general.
Contra Costa County Supervisors	50	C.6.a.i and C.6.b.ii(5)	Liability for Clean Up	Requirement to perform cleanup activities and seek reimbursement from the operator makes the County liable. *Don't require County to perform cleanup activities at construction sites.*		Removed the specific elements required for Legal Authority and Enforcement Response Plan and made them more general.
San Jose Att A	36b	C.6.a.ii(3)	Date Change	*Due date for establishing legal authority should be changed 18 months after permit implementation.*	We have rewritten C.6.a. - Legal Authority for Effective Site Management in response to comments on flexibility. Because the implementation level is now general, all Permittees should already have the required level of legal authority.	Certification that respective legal authorities meet the general Permit requirements for legal authority is due in the first Annual Report following Permit adoption.

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File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
San Jose Attorney	6	C.6.a.ii(3)	Overly Prescriptive Language	References to stop work orders and withholding inspections are overly prescriptive and lacks connection between water quality improvement. *Remove references to stop work orders and withholding inspections.*	A couple of cities in our Region have successfully used stop work orders to bring sites into quick compliance with effective stormwater pollutant controls. In response to comments on flexibility, we no longer specify the elements for legal authority but expect each municipality to have the ability to escalate progressively stricter enforcement to achieve expedient compliance and clean up.	Removed the specific elements required in a legal authority and made it more general.
San Jose San Jose Att A	14 36	C.6.a.ii(3)	Overly Prescriptive Language	References to stop work orders and withholding inspections are overly prescriptive and does not provide a necessary enforcement mechanism. *Remove references to stop work orders and withholding inspections.*		
Contra Costa County Supervisors	51	C.6.a.ii(3) and C.6.a.iii	Date Change	November 30, 2008 date not feasible. *Change to November 30, 2009.*	We have rewritten C.6.a. - Legal Authority for Effective Site Management in response to comments on flexibility. Because the implementation level is now general, all Permittees should already have the required level of legal authority.	Certification that respective legal authorities meet the general Permit requirements for legal authority is due in the first Annual Report following Permit adoption.
SF Baykeeper	48	C.6.a.ii.	Define	*Define "effective erosion control."*	Erosion control is well defined in the handbooks referenced in the revised TO.	C.6.c. - Best Management Practices Categories rewritten and now includes reference to BMP handbooks.
Brisbane SMCWPPAtt3-Table	11b 10c	C.6.a.ii.(3)	Overly Prescriptive Language	Imposing fines is overly prescriptive. *Allow municipalities flexibility to identify the tools to achieve compliance.*	The intent of the subprovision is for municipalities to escalate enforcement in order to achieve quick compliance and clean up. In response to comments on flexibility, we no longer specify the elements for legal authority but expect each municipality to have the ability to escalate progressively stricter enforcement to achieve expedient compliance and clean up.	Removed the specific elements required in a legal authority and made it more general.
ACCWP-Att1-Redline	14b	C.6.a-h	Reporting Onerous	Sites are inspected daily; therefore, reporting on every single inspection is not practical.	The TO does not require reporting for every single inspection.	None
SCVURPPAttny	21	C.6.a-h	Too Much	Requires more than the Phase II Rule.	The Phase II Rule is for small municipalities. The municipalities listed in the TO are large and medium municipalities or ones that were designaged due to their interrelationships to	

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File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
					the medium and large municipalities.	
ACCWP-Att2-Questions	24b	C.6.b.	Date Change	*Due date for implementing ERP should be changed to June 30, 2009.*	In response to comments on flexibility, we no longer specify specific elements for an enforcement response plan. Municipalities should already have some enforcement procedures as standard operating procedures that they are already implementing as part of their respective programs. This document provides guidance for consistent enforcement among inspectors. While the TO sets an implementation date of 180 days after Permit adoption for the ERP, Permittees should continue implementing their respective enforcement procedures regardless if there are going to be changes.	Specific elements of ERP deleted. ERP to be implemented 180 days after Permit adoption.
Brisbane SMCWPPPAtt3-Table	11f 10g	C.6.b.	Date Change	*Allow one year after permit adoption to develop ERP.*		
SCVURPP Att A	30b	C.6.b.	Date Change	*Need more than 5 months to change ERP.*		
SCVURPP Att A	29c	C.6.b.	Date Change	A minimum of 1 year to make changes in enforcement procedures.		
ACCWP-Att1-Redline Brisbane SCVURPPP ATT A SMCWPPPAtt3-Table	14 11d 30 10e	C.6.b.	ERP	Overly prescriptive with regards to development of ERP, escalation of penalties, and reporting. *Allow flexibility.*	In response to comments on flexibility, we no longer specify specific elements for an enforcement response plan.	Specific elements of ERP deleted.
ACCWP-Att2-Questions	24	C.6.b.	ERP	Objects to ERP	In response to comments on flexibility, we no longer specify specific elements for an enforcement response plan. Municipalities should already have some enforcement procedures as standard operating procedures that they are already implementing as part of their respective programs. This document provides guidance for consistent enforcement among inspectors. While the TO sets an implementation date of April 1, 2010 for the ERP, Permittees should continue implementing their respective enforcement procedures regardless if there are going to be changes.	Specific elements of ERP deleted.
Brisbane SMCWPPPAtt3-Table Daly City Oakley Moraga	58	C.6.b.	ERP	*There should not be three separate ERP requirements different from each other.*	The enforcement tools can be the same for C.4., C.5, and C.6. Timeframes for correction and field scenarios will be different for each provision.	
Brisbane	11c	C.6.b.	ERP	*Delete requirement for ERP.*	In response to comments on flexibility, we no	Specific elements of ERP

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File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
SMCWPPPAtt3-Table	10d				longer specify specific elements for an enforcement response plan. Municipalities should already have some enforcement procedures as standard operating procedures that they are already implementing as part of their respective programs. This document provides guidance for consistent enforcement among inspectors. While the TO sets an implementation date of April 1, 2010 for the ERP, Permittees should continue implementing their respective enforcement procedures regardless if there are going to be changes.	deleted.
SCVURPP Att A	30c	C.6.b.	ERP Implementation Ahead of Submittal	ERP is supposed to be implemented almost a year ahead of it being submitted.	Municipalities should already have some enforcement procedures as standard operating procedures that they are already implementing as part of their respective programs. This document provides guidance for consistent enforcement among inspectors. While the TO sets an implementation date of 180 days after Permit adoption for the ERP, Permittees should continue implementing their respective enforcement procedures regardless if there are going to be changes.	
Daly City	59	C.6.b.ii(6)	Date Change	*Eliminate November 30, 2008 and revise to 12 months from date permit is adopted.*	In response to comments on flexibility, we no longer specify specific elements for an enforcement response plan. Municipalities should already have some enforcement procedures as standard operating procedures that they are already implementing as part of their respective programs. This document provides guidance for consistent enforcement among inspectors. While the TO sets an implementation date of 180 days after Permit adoption for the ERP, Permittees should continue implementing their respective enforcement procedures regardless if there are going to be changes.	Specific elements of ERP deleted. ERP to be implemented 180 days after Permit adoption.
Daly City	60	C.6.b.ii(7)	Date Change	*Eliminate November 30, 2008 and revise to 12 months from date permit is adopted.*		
San Jose Att A	37	C.6.b.ii(7)	Date Change	*Implementation date for ERP should be changed 18 months after permit implementation.*		
Daly City	61	C.6.b.iii	Date Change	*Eliminate October 2009 and change to second annual report after permit adoption.*		Copy of Enforcement Response Plan due with the 2nd Annual Report after Permit adoption.

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File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Mountain View	11	C.6.c	Advanced Treatment	*Construction General Permit is the appropriate mechanism for requiring advanced treatment controls at construction sites.*	All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the BMPs for each construction site are effective and appropriate and a BMP may include advance treatment control.	Deleted C.6.c. - Minimum Required Management Practices.
SCVURPP Att A	99b	C.6.c	Attachment L	Compliance status column unnecessary. *Eliminate column.*	We agree.	Reporting template has been removed from the Permit. An example of how the tracked information can be reported is included in the revised Fact Sheet. In this example, there is no "Compliance Status" column.
SCVURPP Att A	32	C.6.c(3)	Advanced Treatment	Requirements are similar to those in the draft Construction General Permit. Sites that are a significant threat to water quality will need coverage under the Construction General Permit so this is duplicative. Advanced treatment is not economically feasible for sites less than one acre of disturbed area. *Delete requirements.*	All BMPs are site specific. Therefore, we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the BMPs for each construction site are effective and appropriate, and a BMP may include advance treatment control.	Deleted C.6.c. - Minimum Required Management Practices.
Brisbane SMCWPPPAtt3-Table	11g 10i	C.6.c.	Advanced Treatment	*Requirements should be the same as those that will be prescribed in the next Construction General Permit.* *Delete advanced treatment requirements or state that they are interim until the adoption of the Construction General Permit.*	We agree that the BMP categories should be the same as in the next Construction General Permit. Instead of C.6.c. being Minimum Required Management Practices, which required advanced treatment, the revised TO deletes the entire subprovsion and replaces it with the six BMP Categories (Erosion Control, Run-on and Runoff Control, Sediment Constrol, Active Treatment Systems (as necessary), Good Site Management, and Non Stormwater Management) that are exactly the same as those in the Draft Construction General Permit. BMPs are site specific. In the revised TO, Permittees have the flexibility to determine if the proposed BMPs for each construction site are appropriate and effective.	Deleted C.6.c. - Minimum Required Management Practices. Added BMP categories that are the same as those found in the Draft Construction General Permit.

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File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
SCVURPP Att A	99c	C.6.c.	Attachment L	*Instead of "Problems Observed" as a text field rather provide results as standardized categories to describe inspection results.*	We agree. We rewrote Provision C.6. to accommodate comments on flexibility. In doing so, we have standardized the BMP categories to line up with the six BMP categories in the Draft State Board's General NPDES Permit for Stormwater Discharges Associated with Construction Activities. The revised TO also specifically lists the information to be tracked for each inspection. The revised Fact Sheet has an example of how the tracked information can be presented. In this example, the "Problems Observed" column has the six standardized BMP categories.	"Problems Observed" is now standardized into the following six BMP categories: (1) Erosion Control, (2) Run-on and Runoff Control, (3) Sediment Control, (4) Active Treatment System (as necessary), (5) Good Site Management, and (6) Non Stormwater Management. Reporting template has been removed from the Permit.
SCVURPP Att A	99d	C.6.c.	Attachment L	*Rather report resolution as a standardized category. A text field allows extreme variation in responses*	We agree. Standardized categories allow the Permittees to better collect and summarize data for annual reporting.	"Resolution" is now standardized into the following three categories in the revised TO: (1) Problems fixed, (2) Need More Time, and (3) Escalate Enforcement. Reporting template has been removed from the Permit.
SCVURPP Att A	99e	C.6.c.	Attachment L	Don't need Comments column. *Information included in "Problems Observed" and "Resolution" columns.*	"Comments" is still included to give Permittees the needed space to discuss rationales for longer compliance time, escalation in enforcement, and any other information Permittees may want to record for that site inspection.	Requirements for "Comments" is listed in the Revised TO in C.6.ii.(3). Reporting template has been removed from the Permit.
EPA Region 9	3	C.6.c.	BMP	Supports detailed BMP requirements to make it more enforceable.	All construction sites must have appropriate and effective controls. What are appropriate controls for a site on a hill near a creek may be different for a flat site. Different types of soils can also factor into the type of BMPs necessary. All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the BMPs for each construction site are effective and appropriate. The revised TO provides the flexibility to the municipality and the project proponent to make immediate decisions on appropriate,	C.6.c. - Minimum Required Management Practices deleted. C.6.e.ii.(3) - Tracking added to require tracking of specific data during inspections and tracking that data in some tabular form. C.6.e.iii. - Reporting added to require specific summaries of the tracked data annually.

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Provision C.6. – Construction Site Control

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					cutting-edge technology to prevent the discharge of construction pollutants into stormdrains, waterways, and right-of-ways. We however require accountability for thorough inspections, follow-up, and enforcement to bring sites into compliance in a timely manner through. This accountability will be done through tracking of specific data during inspections, tracking that data in some tabular form, and summarizing the tracked data for reporting annually.	
SCVURPPP ATT A	31	C.6.c.	Language Change	Most of the minimum required management practices are reasonable, accepted practices but they are not applicable to every site. Confusing that permittees are required to "identify a minimum set of BMPs … for all construction sites that shall include" the whole list of BMPs. *Identify a minimum set of BMPs for each type of construction activity or site condition (i.e. potential for erosion), say as part of a checklist to be used by permittee staff.*	We agree that all BMPs are not applicable to every site. All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the BMPs for each construction site are effective and appropriate.	Deleted C.6.c. - Minimum Required Management Practices.
Moraga Oakley	44 44	C.6.c.	Language Vagueness	Permittees are to designate a minimum set of BMP's for site operators and among the items to be implemented are SWPPP's.	All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the BMPs for each construction site are effective and appropriate. Permittees no longer need to submit Minimum Required BMPs or revisions to Minimum Required BMPs.	C.6.c. - Minimum Required Management Practices deleted.
SF Baykeeper	47	C.6.c.	Language Vagueness	The permit should specify the minimum BMPs to be implemented (see the draft Ventura permit which lists specific BMPs for construction sites and references the CASQA and Caltrans Handbooks.)	The revised TO references the CASQA and Caltrans Handbooks, and our Field Manual.	C.6.c. - Minimum Required Management Practices deleted. New C.6.c.ii.(1) added to reference the CASQA and Caltrans Handbooks, and our Field Manual.

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SF Baykeeper, NRDC & Clean Water Action	7	C.6.c.	Language Vagueness	Places where the permit requires "appropriate" BMPs should be revised to include a BMP menu list of the minimum BMPs that must be implemented. *Inspections shall confirm implementation by construction site operators/developers of erosion and other pollutant controls through appropriate BMPs.*	All construction sites must have appropriate and effective controls. What are appropriate controls for a site on a hill near a creek may be different for a flat site. Different types of soils can also factor into the type of BMPs necessary. Therefore, all BMPs are site specific and all sites disturbing one or more acre of soil must have a site specific Storm Water Pollution Prevention Plan (SWPPP) has site specific BMPs for the different stages of construction. Inspections confirm whether the BMPs in the SWPPP have been implemented and maintained.	None.
Mountain View	10c	C.6.c.	Limit the Universe of Construction Sites	*Eliminate the requirement that "all" projects require BMPs.* *Allow flexibility to determine which projects are subject to erosion and sediment controls.*	All construction sites drain into some stormdrain and/or collection system owned by a MS4; or into some waterbody. All construction sites must have appropriate and effective controls. What are appropriate controls for a site on a hill near a creek may be different for a flat site. Different types of soils can also factor into the type of BMPs necessary. All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the proposed BMPs for each construction site are appropriate and effective.	Deleted C.6.c. - Minimum Required Management Practices.
SCVURPP Att A	99	C.6.c.	Reporting Requirements Inconsistent	Tracking weather conditions observed during an inspection is not needed for compliance with C.6.	Knowing the weather during the inspection gives the reader a better understanding of the severity of the violations, if any; and a gauge of the appropriateness and consistency of the enforcement, if any.	None
Moraga Oakley	45 45	C.6.c.	Slope Stabilization	Slope stabilization is required for areas that are not in production, or will not be in production for two weeks. As written, this would apply to all slopes any time of the year. *Limit this requirement to rainy season and slopes that are not in production.*	Unstablized slopes during the rainy season can be ripe for failure. Besides, most construction sites do not tend to do work on slopes during the rainy season because they cannot get heavy equipment up in soggy soils. In addition, the BMP specifications listed in "California BMP Handbook", "Caltrans Stormwater Quality Handbooks, Construction Site Best Mangement Practices Manual", and "Erosion and Sediment Control Field Manual,	C.6.c. - Minimum Required Management Practices deleted.

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					discourage work on slopes during the rainy season. However, since all BMPs are site specific, we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine when they will require require slope stabilization. But if an unstabilized slope fails during a storm event and construction pollutants get discharged into waterways, stormdrains, and/or public right-of-ways, the Permitee would have demonstrated noncompliance with its Permit.	
Moraga Oakley	45c 45c	C.6.c.	Slope Stabilization	Will alternative methods be allowed such as silt basins or filtration devices?	All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the BMPs for each construction site are effective and appropriate, and therefore may include silt basins or filtration devices.	C.6.c. - Minimum Required Management Practices deleted.
Mountain View	10	C.6.c.	Too Much to Inspect All	Inspection of all project will significantly increased the number of projects that are subject to this requirement.	C.6.c. - Minimum Required Management Practices in the December 2007 TO does not require inspections of all construction sites. Regardless of project size, it is still the Permittees responsibility to keep polluted runoff from entering their stormdrains and waterbodies. Polluted runoff from an unprotected project site disturbing less than an acre is considered an illicit discharge and can be detrimental to receiving waters.	Deleted C.6.c. - Minimum Required Management Practices.
Mountain View	10b	C.6.c.	Too Much to Inspect All	Required to inspect a large number of projects that would not pose a significant construction runoff threat.	C.6.c. - Minimum Required Management Practices in the December 2007 TO does not require inspections of all construction sites.	Deleted C.6.c. - Minimum Required Management Practices.
Daly City	62	C.6.c.ii(2)(b)	Flocculation	*Move flocculation treatment to Section (3) and limit it to large sites that pose an exceptional risk.*	All BMPs are site specific. Therefore, we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the proposed BMPs for each construction site are appropriate and effective.	Deleted C.6.c. - Minimum Required Management Practices.
JamesRogerAttII	53	C.6.c.ii(3)	Fact Sheet	The Fact Sheet incorrectly indicates that MEP performance standard applies to construction	We agree.	Fact Sheet changed to reflect current regulation of sites disturbing one acre or more of

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				sites. Construction sites >5 acres are regulated as industrial activities and strict compliance with water quality standards is required as explained on page 10 of the Fact Sheet. *Page 41 of the Fact Sheet must be revised to reflect the CWA requirements.*		soil.
Contra Costa County Supervisors	52	C.6.c.ii(3)	Language Change	*In the first sentence, move "if necessary" to after "implementation" so that it is clear that it pertains to all of the advanced treatment measures listed.*		C.6.c. - Minimum Required Management Practices deleted.
Editorial - JamesRogerAttIII	5	C.6.c.ii(4)	Define	*Define dry season ie. April 15-September 30*		Wet season defined in the footnote for C.6.e.ii.(1)(a).
Moraga Oakley	45b 45b	C.6.c.ii.(2)©	Slope Stabilization	Slope stabilization can be a significant effort and will generally take an area out of production for a significant period of time. What is the basis of the probability of rain that the Board will look to during the non-rainy season for this requirement?		C.6.c. - Minimum Required Management Practices deleted.
Daly City	63	C.6.c.iii	Date Change	*Eliminate October 2009 and change to second annual report after permit adoption.*		Copy of Enforcement Response Plan due with the 2nd Annual Report after Permit adoption.
SCVURPPP ATT A	31c	C.6.c.iii and C.6.c.i	Language Change	This requires submittal of the list of designated BMPs <u>for all sites greater than one acre disturbed area</u>, which appears to be in conflict with C.6.c.i ("all sites subject to a building or grading permit"). *BMPs are required <u>as appropriate</u> for the site and to clarify the reporting requirements.*	All BMPs are site specific and we have therefore deleted C.6.c. - Minimum Required Management Practices. Permittees have the flexibility to determine if the BMPs for each construction site are effective and appropriate. Permitees no longer need to submit Minimum Required BMPs or revisions to Minimum Required BMPs.	Deleted C.6.c. - Minimum Required Management Practices.
Moraga Oakley	46 46	C.6.c.iii.	Language Vagueness	This expands local agency responsibilities into the area controlled by the State General	CWA 402(0)(3)(B)(ii) requires a prohibition in stormwater permits of non-stormwater discharges into storm sewers. 40 CFR	C.6.c. - Minimum Required Management Practices deleted.

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				Construction Permit.	122.26(d)(2)(i) requires Permittees to carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer. As such, Permittees are responsible for ensuring that all sites, regardless of sites, are implementing and maintaining appropriate BMPs to prevent non-stormwater discharges from entering into the storm sewer.	
SF Baykeeper, NRDC & Clean Water Action	8 20	C.6.d.ii.(3)	Language Vagueness	Places where the permit requires "appropriate" BMPs should be revised to include a BMP menu list of the minimum BMPs that must be implemented. This includes the "as appropriate" educational materials given to site operators/developers, as appropriate.	All construction sites must have appropriate and effective controls. What are appropriate controls for a site on a hill near a creek may be different for a flat site. Different types of soils can also factor into the type of BMPs necessary. Therefore, all BMPs are site specific and all sites disturbing one or more acre of soil must have a site specific Storm Water Pollution Prevention Plan (SWPPP) has site specific BMPs for the different stages of construction. Inspections confirm whether the BMPs in the SWPPP have been implemented and maintained.	None.
Contra Costa County Supervisors	55	C.6.d.iii	Date Change	*Implementation date should be changed to July 1, 2010 since it's not submitted until October 2009.*	In response to comments on flexibility, we no longer specify specific elements for an enforcement response plan. Municipalities should already have some enforcement procedures as standard operating procedures that they are already implementing as part of their respective programs. This document provides guidance for consistent enforcement among inspectors. While the TO sets an implementation date of 180 days after Permit adoption for the ERP, Permittees should continue implementing their respective enforcement procedures regardless if there are going to be changes.	ERP to be implemented 180 days after Permit adoption. Copy of Enforcement Response Plan due with the 2nd Annual Report after Permit adoption.
Daly City	64	C.6.d.iii	Date Change	*Eliminate October 2009 and change to second annual report after permit adoption.*		Copy of Enforcement Response Plan due with the 2nd Annual Report after Permit adoption.

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Moraga Oakley	47 47	C.6.e,f, and h	Reporting Overlap	C.6.e, f, and h overlap in reporting. *Combine reporting requirements into one subprovision that discusses type, content, frequency, and tracking of inspections.*	We agree. C.6.e,f, and h have been consolidated into a new single subprovision, C.6.e. Inspections.	The requirements for reporting are in the new C.6.e.
Contra Costa Clean Water Program	49	C.6.e.	Attachment L	Don't track and report the number of Screening Level inspections. *Tracking and reporting the number of "Screening Level Inspections" not resulting in problem is not useful information and therefore burdensome.*	In response to comments on flexibility, Screening Level inspections are no longer required.	Screening Level inspection requirement removed.
Daly City	65	C.6.e.ii(1)	Define	*Suggest defining the scope of the inspection as being "consistent with a project's approved plans."*		Screening Level Inspections deleted.
Contra Costa County Supervisors	53	C.6.e.ii(1)	Language Change	The County will be able to more effectively (and less expensively) implement screening level inspections if the inspector, after observing an violation, were allowed to contact appropriate County staff to follow the ERP and document the violation. *Add to the end of the last sentence: "(or cause the ERP to be followed and the violation to be documented)".*		Screening Inspection Requirement deleted.
Contra Costa County Supervisors	47	C.6.e.ii(2)	Date Change	Provision intended to require site inspections just after the beginning of the rainy season (October 1st and October 15th) to ensure successful implementation of the minimum required management practices. *Delete "prior to the onset of the west season".*	It is the intent of the requirement to ensure that appropriate, effective Best Management Plans are in place before the start of the rainy season. Too often, construction sites are not buttoned up for the rainy season.	Initial Wet Season Inspection requirement removed. All sites disturbing one or more acre of land and all high priority sites shall be inspected monthly during the wet season.
Contra Costa County Supervisors	48	C.6.e.ii(2)	Date Change	Provision intended to require site inspections just after the beginning of the rainy season (October 1st and October 15th) to	It is the intent of the requirement to ensure that appropriate, effective Best Management Plans are in place before the start of the rainy season. Too often, construction sites are not	Initial Wet Season Inspection requirement removed. All sites disturbing one or more acre of land and all high

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				ensure successful implementation of the minimum required management practices. *Add "initial" before "wet season".*	buttoned up for the rainy season.	priority sites shall be inspected monthly during the wet season.
San Jose Att A	38	C.6.e.ii(2)	Language Change	*Revise to read "Inspections shall determine whether adequate preparations for wet season erosion control have been implemented consistent with minimum required management practices."*	Revised TO does not specifically require Initial Wet Season Inspections. However, we strongly encourage Initial Wet Season Inspections because they help ensure that appropriate, effective Best Management Plans are in place before the start of the rainy season. Too often, construction sites are not buttoned up for the rainy season.	C.6.e.ii.(2) - Initial Wet Season Inspection deleted.
Brisbane SMCWPPAtt3	11h 10j	C.6.e.iii.	Excessive Tracking	Too much tracking. *Only maintain a record of each wet season, stormwater specific inspection and each screening inspection that found a significant violation of a municipal stormwater ordinance.*	Wet season and screening level inspections are no longer required, although both have benefits to waterbodies. In response to comments about flexibility, we took away the specific requirements for legal authority, enforcement response plan, and minimum BMPs. Instead, we focus C.6.'s effectiveness in preventing discharge of construction related pollutants to stormdrains and water bodies on inspections. To ensure that controls are maintained and appropriate controls are being implemented for changing conditions C.6.e. in the revised TO contains the minimum summary data necessary for Water Board staff to gauge Permittee's minimum compliance. The specific tracking information required in C.6.e.(3), leaves a trial to verify that Permittee's complied with the Permit for inspections, enforcement, and follow-up. Tracking just inspections that found a significant violation does not provide adequate information to verify that Permittee's have complied with the Permit for inspections, enforcement, and follow-up.	Wet season stormwater specific inspection removed. Screening Level inspection requirement removed. Monthly inspections and tracking for sites disturbing 1 acre or more of land and for high priority sites.
Contra Costa County Supervisors San Jose Att A Sunnyvale Att A	54 40 15b	C.6.e.iii. and Attachment L	Reporting Requirements Inconsistent	Information required in the reporting template is inconsistent with the TO. *Screening level is only required by the TO be tracked when a violation is discovered during an*	We agree. To ensure consistency with the Permit requirements, the reporting template will be released after the adoption of the Permit.	Reporting template has been removed from the Permit.

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				inspection.		
Berkeley	16	C.6.f.	Inspection Frequency	Increased efforts to inspect all construction sites, create new databases, and maintain new databases, in addition to the other items in the permit. *Allow the City to establish the appropriate inspection frequency for the location of the work and potential for pollutant discharge.*	Detailed inspections at sites disturbing one acre or more of soil and high priority sites once a month during the rainy season is reasonable to ensure that controls are maintained and appropriate controls are being implemented for changing conditions.	Screening Level inspection requirement removed. High priority sites inspection requirement reduced to monthly.
Brisbane SMCWPPPAtt3-Table	11i 10k	C.6.f.	Inspection Frequency	Municipalities need to allocate inspection time based on circumstances. *Don't have an explicit inspection frequency for high priority construction sites.*	Frequency of inspections at high priority construction sites have been reduced to monthly.	High priority sites inspection requirement reduced to monthly.
SCVURPP Att A	33	C.6.f.	Inspection Frequency	Scheduling of inspections, follow-up/enforcement, and response to complaints during the wet season can be very complicated and it may be difficult to meet specific frequency requirements. *State inspection frequencies as goals and not requirements.*	While we do understand the complexity of scheduling inspections, follow-up/enforcement, and response to complaints, inspection frequencies as goals does not allow us to establish Permit compliance.	None.
Brisbane SCVURPP Att A SMCWPPPAtt3-Table	11j 33c 10l	C.6.f.	Pre-Wet Season	Pre-wet season notification ... very burdensome for large municipalities. *Allow pre-season notification to include emails, faxes, or telephoned messages.*	We agree that other methods of pre-wet season notification provide the Permittee's the needed flexible.	Method of notification not specified.
SCVURPP Att A	33b	C.6.f.	Pre-Wet Season	Pre-wet season ... inspection very burdensome for large municipalities. *Set inspection of all active sites greater than one acre as a goal.*	While we removed the specific requirement for pre-wet season inspections, we still strongly believe that pre-wet season inspection are important. These types of inspections help ensure that sites have effective BMPs implemented for the wet season. If effective BMPs are implemented, (1) exposed soils will not erode and make there way into the storm drains and waterbodies and (2) other construction related pollutants will not be exposed to rain causing contaminated run off into the storm drains and waterbodies.	Initial Wet Season Inspection requirement removed.
San Jose Att A	39	C.6.f.ii(1)	Language Change	*Add phrase "as needed" after the*		Screening Inspection

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				phrase screening inspections.		Requirement deleted.
Daly City	66	C.6.f.ii(1)(b)(vii)	Language Change	Need language to help define scope and authority within a public agency. *Revise to read "Any other relevant factors as determined by the local agency.*	C.6.f.ii(1)(b)(vii) is now C.6.e.ii.(2)(vii). We also added the Water Board in the sentence since the Permittee and the Water Board can determine if a site is a significant threat to water quality.	C.6.e.ii(2)(vii) now reads "Any other relevant factors as determined by the local agency or the Water Board."
SF Baykeeper	49	C.6.f.ii.(1)	Define	Explain the basis for selecting the 50-acre threshold for high priority construction sites.		C.6.f. - Frequency of Inspections deleted. C.6.e. - Inspections requires monthly inspections for all sites disturbing one acre of more of soil.
Daly City	67	C.6.f.iii	Excessive Tracking	Requirement to implement program for controlling, tracking, and reporting on construction management practices expensive for built out cities. *Modify language to require implementation and recording on an as needed basis or in districts where more than one site of 1-acre of disturbed land per year is likely to occur.*	All Permittees should already have standard operating procedures for inspection of construction sites, which should include inspection protocols and some method of tracking so that the inspectors can document violations and their compliance directives for the site. Tracking and reporting only need to done for the years that Permittees have sites disturbing one acre or more of land (new development and redevelopment). The revised Fact Sheet includes an example of how the tracked information can be presented. Each Permittees can determine if it will use the electronic version or a handwritten tabular version.	None
Brisbane	11k	C.6.g.	Training	Too prescriptive. *Municipalities should determine the frequency and contents of training requirements for their inspectors.* *Municipalities should have the flexibility to train in any manner or location.*	Permittees need to bring inspectors up to speed on items such as changes to standard operating procedures, revisions to ordinances, new ERP, inspection tracking and recording, and new technologies. New employees will need training to do their job. Trainings allow the inspectors to do their jobs effectively to comply with the Permit. Training a minimum of twice during the Permit term is reasonable. Permittees are free to decide where and how it will provide training to its inspectors.	None.
SF Baykeeper	50	C.6.g.	Training	*Should require training on the State's General Construction*	While knowledge about the contents of the State's General Construction Permit can be	None.

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				Permit.	valuable to inspectors, it is not the Permittees' responsibility to enforce it.	
Millbrae	10	C.6.h.	Flexible Reporting	Don't object to having to track and report inspections. *Don't restrict to electronic reporting.* *If electronic reporting is required, the Water Board should create a web-based reporting site such as the SSO reporting website.*	December 2007 TO does not restrict to electronic reporting. We clarified the language in the revised TO.	The tracked data can be submitted electronically or in a tabular format.
Contra Costa Clean Water Program	50	C.6.h.	Reporting Overlap	Remove entire subprovision. *Section is duplicative of the reporting requirements already stated in previous sections of C.6.*	We agree. C.6. has been rewritten to address comments on allowing more flexibility so C.6.h. no longer exists. The rewritten provision streamlines reporting while emphasizing accountability.	The requirements for reporting are in the new C.6.e.
Moraga Oakley	48 48	C.6.h.ii(1)	Define	*Define "numeric" tracking of all violations.*	C.6. has been rewritten to address comments on allowing more flexibility so C.6.h. no longer exists. The rewritten provision streamlines reporting while emphasizing accountability. The revised TO in C.6.ii.(3) lists specifically the information that must be tracked for each inspection, and C.6.iii.(3) lists specifically the information that must be reported annually.	C.6.h. - Tracking and Reporting deleted.
Brisbane SCVURPP ATT A SMCWPPAtt3-Table	11l 34 10m	C.6.h.ii.(2)	Excessive Tracking	Don't require tracking of stormwater specific inspections that identify a threatened discharge. *Limit tracking to significant violations of municipal stormwater ordinance.*	Tracking just inspections that found a significant violation does not provide adequate information to verify that Permittee's have complied with the Permit for inspections, enforcement, and follow-up.	None
Contra Costa Co Supervisors	55	C.6.a.ii.(3) C.6.b.ii.(7)	Change Due Dates	Since the activities that are precursors to implementation of Provisions C.6.e., C.3.f., and C.3.g. are not to be completed by November 30, 2008 (per Provisions C.6.a.ii.(3) and C.6.b.ii.(7) and are not to be reported until the October 2009 Annual Report (per Provisions C.6.a.iii. and C.6.b.iii.) implementation dates for Provisions C.6.e., C.3.f., and	All previous stormwater permits required legal authority, site inspections, and staff training. As a result, all municipalities should already (1) have the legal authority to regulate, inspect, and conduct enforcement at construction sites; (2) inspect construction sites; and (3) provide staff training. All municipalities should already have some Enforcement Response Plan/Guidance Document, which they should continue to implement until the Enforcement Response Plan is revise to comply with C.6.b.	The "due dates" for the certification of the legal authority and the implementation of the Enforcement Response Plan have been modified to reflect the anticipated adoption date of the Revised TO.

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				C.3.g., should not be required for at least one year after the precursor activities (recommended implementation date: July 1, 2010).		

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Provision C.7. – Public Information and Outreach

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Dublin	7	C.7.	Measuring Effectiveness Costly	Questions the practicality of measuring items such as "awareness" or "behavioral changes" when the City has increased permit requirements.	Stormwater Programs are required to conduct outreach to raise awareness and change behavior. If 4-6 events per year, do not achieve an increase in awareness or a change in behavior, it's time to rethink how money and time is being spent. No program should continuously fund and grow programs that are in theory good but not effecting changes.	
Dublin	7b	C.7.	Reporting Burdensome	Added cost for public outreach requirements --> $8,000/year; added major new requirements for trash and other pollutants of concern. *Not the time to add public outreach work, record keeping, and reporting requirements.*	C.7.i. and C.7.l. have been removed from the revised TO. The remaining subprovisions exist in all stormwater programs at some level. In response to comments on flexibility, the revised TO (1) eliminates the cap on individual credits for events sponsored by the respective County-wide Program and BASMAA and (2) allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both. Some level of record keeping is necessary to document implementation of Permit requirements. We consider the reporting requirements the minimum amount of information we need to determine Permittee's compliance.	C.7.i. (General Outreach Materials) and C.7.l. (Research Surveys, Studies, Focus Groups) have been removed from the revised TO. Reporting template has been removed from the revised TO. Reporting requirements have been streamlined and clearly written into the revised TO. C.7.e.ii. and C.7g.ii. in the revised TO allow Permittees to claim (1) individual credits for all Public Outreach Events are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction and (2) credit for both Public Outreach and Citizen Involvement Events if the event contains significant elements of both.
General – SF Baykeeper	51	C.7.	Specific Comments	*The Permit should clearly state the objective of the provision.*	We agree.	Objectives have been written for all the Provisions.
Pleasanton	9	C.7.	Measuring Effectiveness Costly	Too costly to measure effectiveness. *Postpone to the next round*	Stormwater Programs exist to reduce pollutants and to protect water quality. Therefore, it is	

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				of MRP permits	imperative to assess BMPs and programs to determine effectiveness. Measuring effectiveness of BMPs and programs is necessary to access the impacts that are happening as a result of BMPs and programs. If minimal or no changes are resulting from BMPs and programs, then it is time to stop spending resources and rethink next steps. No program should continuously fund BMPs and programs that are in theory good but not effecting changes. All BMPs and programs can be accessed but assessment requires planning. There are different levels of assessment and some do require more resources. Every Permittee needs to utilize a mix of assessment tools that go beyond just BMP or program implementation. CASQA has produced a manual entitled "Effectiveness Assessment Guide", which discusses this topic in detail.	
Milpitas	13	C.7. Fact Sheet	School Outreach	Teachers don't have time in their schedules to make use of materials not related to standardized tests.	Many Permittees around the Bay Area have had great success (and fun) implementing school outreach programs. Some have done the program themselves and others have partnered with other programs and/or agencies. And almost all programs align themselves with grade appropriate California Education Standards. In Milpitas, school outreach programs already exist because	None

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					the San Jose/Santa Clara Wastewater Treatment Plant (City of San Jose) sponsors them. Children are our next generation to make consumer decisions. And they are our best advocates for good practices for a cleaner Bay among their families and friends.	
SCVURPP ATT A SCVURPP ATT A	100 100b	C.7. Att. L	Reporting Burdensome	Table L-51 and T-54: Suggestion to review coordinator timesheets to determine the level of effort is overly burdensome and unreasonable since many individuals contribute to outreach efforts. *Track the total number and/or hours of training and/or performances given.*	Suggestions are not permit requirements.	Reporting template has been removed from the Permit. Reporting requirements have been streamlined and clearly written into the revised TO.
SCVURPP ATT A	100c	C.7. Att. L	Surveys	Onerous and expensive task. Large amounts of data needed to be collected to determine message effectiveness. *Do once during the permit cycle and reported the year after it is conducted.*	We consider two surveys necessary to identify and quantify the audiences' knowledge, trends, and attitudes and/or practices; and to measure the overall population awareness of the messages and behavior changes. One survey does not allow for effectiveness assessment. In addition, BASMAA already conducts regional survey for its Advertising Campaign.	
Berkeley	18	C.7.a.	Private Inlet Marking	City cannot be responsible for maintaining private inlets or markings. *Clarify that City is responsible for inlet markings on its facilities only, not privately owned facilities.*	TO only requires Permittees to maintain markings of municipally-maintained inlets. C.7.a.ii. in the TO requires Permittees to "inspect and maintain markings…of municipally-maintained inlets…" C.7.a.iii. in the TO requires Permittees to report only on	

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					municipally-maintained inlets.	
GCRCDAtt	21	C.7.a.	Specific Comments	*Require all outfalls to be labeled with unique identification numbers.*	All municipalities have storm sewer maps identifying all the outfalls. However, it is not practicable to require labeling of all outfalls because many of them are not accessible.	
San Jose Att A	45	C.7.a.	Attachment L	*Modify the benchmark of storm drain inlet labeling in Attachment L to be consistent with the Order.*		Attachment L deleted.
San Jose Att A	41	C.7.a.	Inconsistent Language	*At least 90 percent, <u>except where noted below in C.7.a.ii,</u> of municipally-maintained storm drain inlets…*		Requirement changed to 80% for all municipalities.
SCVURPPAttny	22	C.7.a.	Inlet Marking	Go beyond and more prescriptive than the Federal Permit Inspections are a significant new program component	The comparison of stormwater permit requirements for the Saipan to the TO is not germane to the TO. Saipan is a Phase 2 Program and all the Permittees are under the Phase 1 Program. The TO is based on over 15 years of progress in stormwater programs verses the Saipan Permit which is for a first year stormwater program. In 1987, Section 402 was added to the Clean Water Act (CWA) and it provided the framework for regulating municipal stormwater discharges under the NPDES Program, Phase 1 Program. All the Permittees fall under the Phase 1 Program and the TO is written for the Phase 1 municipalities. Saipan, however, is a Phase 2 municipality because is falls under one of the categories (It is operated by a municipality in an	

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					urbanized area as defined by the Census Bureau based on the 1990 or 2000 census. An urbanized area is basically a core city and urban fringe with a population of 50,000 or more.) EPA promulgated regulations for the Phase 2 Program in 1999.	
SCVURPPP ATT A	35	C.7.a.	Inlet Marking	Too hard to inspect and maintain 90% of the storm drain inlet markings within the permit term. *Reduce to 75% or use 90% as a goal.*		Reduced to 80%.
SMCWPPPAtt3-Table	11	C.7.a.	Inlet Marking	Too hard to inspect and maintain 90% of inlet markings with all the new maintenance requirements. *Use 90% as a goal.*		Reduced to 80%
Burlingame	6	C.7.a.i	Private Inlet Marking	Retroactive storm drain inlet marking time-extensive undertaking. *City will continue to provide storm drain stenciling outreach program and lend storm drain stencils to private property owners on a voluntary basis.*	See proposed revisions. These issues are best addressed at the time private gated communities and other private developments are first permitted by the Permittees, but there is no retrofit requirement in the Revised TO.	Requirement for Permittees to seek out respective private entities responsible for street maintenance to mark inlets and maintain them on privately maintained streets that were not marked upon construction has been removed in the revised TO.
ACCWP-Att1-Redline	15	C.7.a.i.	Private Inlet Marking	Jurisdictions do not have the authority to mark private streets. *Delete language.*		
Alameda City	30	C.7.a.i.	Private Inlet Marking	Private roads are outside Permittees' jurisdiction. *Change MRP requirement to encourage retroactive inlet marking on private streets.*		
Belmont	I	C.7.a.i.	Private Inlet Marking	What if the property owner says no?		
Berkeley	19	C.7.a.i.	Private Inlet Marking	Existing facilities and ~~improvements have~~ grandfathered rights which		

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				prevent the City from enforcing retroactive inlet marking. *Remove from C.7 and add to C.3 where permit requirements can be imposed as properties are improved or redeveloped.*		
Oakley	49	C.7.a.i.	Private Inlet Marking	No legal entity to hold responsible for the retrofit work on private property; local agency does not have the authority to enter and perform this type of work on private property. *Grant exemptions.*		
SMCWPPPAtt3-Table	11b	C.7.a.i.	Private Inlet Marking	Fact Sheet does not explain the technical basis for requirement. Unclear how big of a job it will be for cities Unclear what will be the benefit *Develop work plan and implementation schedule for doing pilot study of retrofitting private streets that have unmarked storm drain inlets where these inlets are tributary to the MS4.*		
Daly City	68	C.7.a.i. and C.7.a.ii	Private Inlet Marking	No authority to enter private property to inspect and verify continued maintenance of the inlet markings for new facilities or facilities not marked at the time of construction; cannot be held responsible for private property where they might be denied access.		
San Jose Att A	44	C.7.a.ii.	Specific Comments	*Revise Provision C.2.f.ii.2.c.iii so that it is*	Provision C.2.f., Catch Basin or Storm Drain Inlet Inspection and	Provision C.2.f. deleted.

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				consistent with Provision C.7.a.ii which requires inspection of storm drain stencil legibility once per permit cycle.	Cleaning has been deleted in the Revised TO.	
Oakley	50	C.7.a.iii.	Specific Comments	Does "report the municipally maintained inlet marking" mean those in the public right of the way?	Yes.	
Alameda City	22	C.7.b.	Advertising Campaign	Two advertising campaigns, media advertisements, and pre- and post-campaign surveys in an effort to target trash/litter reduction and pesticide use minimization is prescriptive and potentially costly.	BASMAA already implements a Regional Advertising Campaign on behalf of its members. Provisions C.9. and C.10. in the TO address pesticides and trash respectively. Also, the public can readily do something about these two pollutants once they are aware of the issues. Therefore, it makes sense to focus advertising campaigns on these two pollutants.	
Alameda City	22b	C.7.b.	Adversting Campaign	Water Board should do it	The Permittees have done advertising campaigns as part of their public outreach for several permit cycles, therefore this requirement is well within MEP.	None
Brisbane SMCWPPPAtt3-Table	12b 11d	C.7.b.	Advertising Campaign	Advertising campaigns are expensive. Higher priority uses for public education funds. *Require only one advertising campaign and assessment survey.*	Surveys may be done regionally or county-wide and are necessary to identify and quantify the audiences' knowledge, trends, and attitudes and/or practices; and to measure the overall population awareness of the messages and behavior changes. One survey does not allow for effectiveness assessment. In addition, BASMAA already conducts an Advertising Campaign for its members.	
Brisbane SMCWPPPAtt3-Table	12 11c	C.7.b.	Advertising Campaign	Targeting trash/litter and pesticides in advertising campaigns diffuses the	Provisions C.9 .and C.10. in the TO address pesticides and trash respectively. The public can	

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				message. *Municipalities should focus entirely on trash/litter since the State regulates the use, sale, and transportation of pesticides.*	readily do something about these two pollutants once they are aware of the issues. Therefore, it makes sense to focus advertising campaigns on these two pollutants.	
Brisbane SMCWPPPAtt3-Table	12f 11j	C.7.b.	Surveys	Level of effort required for compliance is unclear. Do not have the resources to be funding research. *Only one advertising campaign.*	The Implementation Level and the Reporting requirement have been revised to clearly communicate the level of effort necessary for compliance. Surveys may be done regionally or county-wide and are necessary to identify and quantify the audiences' knowledge, trends, and attitudes and/or practices; and to measure the overall population awareness of the messages and behavior changes.	Provision C.7.b. in the revised TO describes the Implementation Level and the Reporting requirement.
GCRCDAtt	22	C.7.b.	Advertising Campaign	Advertising campaign will not have impact on major Santa Clara Basin waterways unless it is tied to some incentive or rewards program. Pollution along the urban segments of Santa Clara Basin waterways is caused by illegal dumping and/or littering, mostly by vagrant encampments. These people don't care about the environment, our waterways, awareness campaigns, or programs. *Need strong program to prevent waterside encampments and a strong enforcement program to penalize polluters.*	We agree that homeless encampments are a major source of trash, but public awareness to prevent littering will also have an impact on our waterways.	
Millbrae	11	C.7.b.	Beyond Permittees' Ability	Water Board should work with appropriate State agencies to regulate the use	Permittees can assist the WaterBoard in these efforts of persuading the pesticide	None

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				of pesticides.	regulatory agencies. This is an MEP requirement, well within the Permittees ability.	
Millbrae	11c	C.7.b.	Unfunded Mandate	Pre and post surveys unfunded mandates.	These requirements fall well within the MEP regulatory standard and are not unfunded mandates.	None
SCVURPPAttny	23	C.7.b.	Advertising Campaign	More prescriptive than the Federal Permit and deprives the Permittees of discretion.	The comparison of stormwater permit requirements for the Saipan to the TO is not germane to the TO. Saipan is a Phase 2 Program and all the Permittees are under the Phase 1 Program. The TO is based on over 15 years of progress in stormwater programs verses the Saipan Permit which is for a first year stormwater program. In 1987, Section 402 was added to the Clean Water Act (CWA) and it provided the framework for regulating municipal stormwater discharges under the NPDES Program, Phase 1 Program. All the Permittees fall under the Phase 1 Program and the TO is written for the Phase 1 municipalities. Saipan, however, is a Phase 2 municipality because is falls under one of the categories (It is operated by a municipality in an urbanized area as defined by the Census Bureau based on the 1990 or 2000 census. An urbanized area is basically a core city and urban fringe with a population of 50,000 or more.) EPA promulgated regulations for the Phase 2 Program in 1999. In addition, BASMAA already	

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					conducts an Advertising Campaign for its members.	
SF Baykeeper	52	C.7.b.	Advertising Campaign	*Explain basis for requiring that advertising campaigns target trash/litter and pesticides versus other pollutants of concern.*	Provisions C.9 .and C.10. in the TO address pesticides and trash respectively. The public can readily do something about these two pollutants once they are aware of the issues. Therefore, it makes sense to focus advertising campaigns on these two pollutants.	
JamesRogerAttII	54	C.7.b.ii.	Advertising Campaign	Questions the need for additional trash/litter campaigns until there has been a thorough evaluation of the effectiveness of the Caltran's Trash Campaign.	Evaluation of tasks is critical to a program's success. We certainly do encourage partnership with CalTrans. However, based on the trash evidences we see in creeks, waterways, and streets, trash continues to be a primary pollutant of concern. The pre-campaign survey is intended to quantify the publics' knowledge, trends, attitudes, and practices; and the determine how to most effectively target them.	
JamesRogerAttII	54b	C.7.b.ii.	Advertising Campaign	*Money could be better spent installing treatment systems to remove trash.*	Both trash removal and outreach should receive resources. Provision C.7. addresses trash reduction outreach and Provision C.10. addresses trash removal.	
SCVURPP Attny	24	C.7.c.	Unfunded Mandate	Media Relations requirement is more prescriptive than the Federal Permit.	The comparison of stormwater permit requirements for the Saipan to the TO is not germane to the TO. Saipan is a Phase 2 Program and all the Permittees are under the Phase 1 Program. The TO is based on over 15 years of progress in stormwater programs verses the Saipan Permit which is for a first year stormwater program. In 1987, Section 402 was added	No changes.

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					to the Clean Water Act (CWA) and it provided the framework for regulating municipal stormwater discharges under the NPDES Program, Phase 1 Program. All the Permittees fall under the Phase 1 Program and the TO is written for the Phase 1 municipalities. Saipan, however, is a Phase 2 municipality because is falls under one of the categories (It is operated by a municipality in an urbanized area as defined by the Census Bureau based on the 1990 or 2000 census. An urbanized area is basically a core city and urban fringe with a population of 50,000 or more.) EPA promulgated regulations for the Phase 2 Program in 1999. In addition, municipalities already utilize free media to maximize outreach potential.	
ACCWP-Att2-Questions	25	C.7.c.ii.	Media Relations	*Allow implementation of Media Relations at local level.*		The underlined language has been added to C.7.c. in the 3rd TO: "Conduct a minimum of six pitches (e.g., press releases, public service announcements, and/or other means) per year at the county-wide program, regional, and/or <u>local levels</u>."
Berkeley Daly City	20 69	C.7.d.	Specific Comments	*Define watershed characteristics.*	Watershed characteristics of major import of public outreach are well understood.	
Daly City	70	C.7.e.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	Significant increase from the current performance standard of 5, which combines and considers all outreach efforts as an event. *Reduce the number to 2 outreach events annually or*	The number of events according to population for Public Outreach Events (C.7.e.ii.) was determined by the PIP Workgroup for the MRP. However, in response to comments on flexibility, the	C.7.e.ii. and C.7g.ii. in the revised TO allow Permittees to claim (1) individual credits for all Public Outreach Events are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach

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				change language to require a progressive increase in events annually reaching the desired amount in the final permit year.	revised TO (1) eliminates the cap on individual credits for events sponsored by the respective County-wide Program and BASMAA and (2) allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both.	the Permittee's jurisdiction and (2) credit for both Public Outreach and Citizen Involvement Events if the event contains significant elements of both.
San Jose San Jose Att A San Jose Attorney	15 42 7	C.7.e. C.7.g.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	Collaborative efforts reduce redundant work and increase the effectiveness of specific messages. *Remove language limiting collaboration.* *Don't limit municipality's ability to take full credit for inter-agency collaboration.*	See proposed revision.	C.7.e.ii. and C.7.g.ii. in the revised TO allow Permittees to claim individual credits for all Public Outreach Events and Citizen Involvement Events that are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction.
SCVURPP Attny	25 26	C.7.e. C.7.g.	Public Outreach/ Citizen Involvement Events	More prescriptive than the Federal Permit.	The comparison of stormwater permit requirements for the Saipan to the TO is not germane to the TO. Saipan is a Phase 2 Program and all the Permittees are under the Phase 1 Program. The TO is based on over 15 years of progress in stormwater programs verses the Saipan Permit which is for a first year stormwater program. In 1987, Section 402 was added to the Clean Water Act (CWA) and it provided the framework for regulating municipal stormwater discharges under the NPDES Program, Phase 1 Program. All the Permittees fall under the Phase 1 Program and the TO is written for the Phase 1 municipalities. Saipan, however, is a Phase 2 municipality because is falls	

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					under one of the categories (It is operated by a municipality in an urbanized area as defined by the Census Bureau based on the 1990 or 2000 census. An urbanized area is basically a core city and urban fringe with a population of 50,000 or more.) EPA promulgated regulations for the Phase 2 Program in 1999. All stormwater already implement Public Outreach and Citizen Involvement Events. The number of events according to population for Public Outreach Events (C.7.e.ii.) was determined by the PIP Workgroup for the MRP based on existing performance standards.	
SMCWPPPAtt3-Table	11e	C.7.e.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	Specified number of events is too high. Unclear what is the technical basis for the number of events required since that is not discussed in the Fact Sheet.	The number of events according to population for Public Outreach Events (C.7.e.ii.) was determined by the PIP Workgroup for the MRP based on existing performance standards. Existing performance standards are as follow: <u>Alameda County</u> Over 100,000 – 8 50,000 to 100,000 – 6 Less than 50,000 – 4 <u>Contra Costa County</u> Over 100,000 – 4 50,000 to 100,000 – 3 Less than 50,000 – 3 <u>San Mateo County</u> Over 50,000 – 5 5,000 to 50,000 – 4 Less than 5,000 – 3 <u>Santa Clara County</u> 8-10 However, in response to	C.7.e.ii. and C.7g.ii. in the revised TO allow Permittees to claim (1) individual credits for all Public Outreach Events are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction and (2) credit for both Public Outreach and Citizen Involvement Events if the event contains significant elements of both.

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					comments on flexibility, the revised TO (1) eliminates the cap on individual credits for events sponsored by the respective County-wide Program and BASMAA and (2) allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both. Specified number of events remains the same.	
Sunnyvale Att A	16	C.7.e. C.7.g.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	Prescriptiveness limits the flexibility to implement an effective and cost efficient outreach program.	In response to comments on flexibility, the revised TO allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both.	C.7g.ii. in the revised TO allows Permittees to claim (1) individual credits for all Community Outreach Events that are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction and (2) credit for both Public Outreach and Citizen Involvement Events if the event contains significant elements of both.
Daly City Daly City	70b 72b	C.7.e. and C.7.g.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	*Combine public outreach events and citizen involvement events into a single requirement.*	We feel that citizen involvement events are important because it allows the community opportunities to actively practice being good stewards of our environment. But in response to comments on flexibility, the revised TO allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both.	C.7.e.ii. and C.7g.ii. in the revised TO allow Permittees to claim (1) individual credits for all Public Outreach Events are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction and (2) credit for both Public Outreach and Citizen Involvement Events if the event contains significant elements of both.
Oakley	51	C.7.e. and C.7.g.	Public Outreach Events' and Citizen Involvement Events'	Currently outreach and involvement are combined. The TO breaks them out and the requirements significantly exceeds the current combined requirement. Only	In response to comments on flexibility, the revised TO allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both.	C.7.e.ii. and C.7g.ii. in the revised TO allow Permittees to claim (1) individual credits for all Public Outreach Events are sponsored or hosted by their Countywide Program or BASMAA as long as

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			Credit Limits	limited number of community-wide events. Smaller communities have less resources and opportunities to do their own.		the events are publicized to reach the Permittee's jurisdiction and (2) credit for both Public Outreach and Citizen Involvement Events if the event contains significant elements of both.
Brisbane SMCWPPPAtt3-Table	12e 11h	C.7.e.ii. and C.7.g.iii.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	Countywide events draw volunteers from other municipalities. *Allow permittees to claim credit for all citizen involvement events that occur anywhere in the county that the municipality helps fund or participates in.*	See proposed revision.	Provision C.7.g.ii. in the revised TO allows Permittees to claim individual credits for all Citizen Involvement Events that are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction.
Santa Clara Brisbane SCVURPPP ATT A SMCWPPPAtt3-Table	7 12c 36 11f	C.7.e.ii. and C.7.g.iii.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	TO discourages individual co-permittees from participating in regional training and education events since they only receive partial credit for regional events. *Continue encouraging the broad-based watershed approach.*		
SCVURPPP ATT A	37	C.7.e.ii. and C.7.g.iii.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	Watersheds and creeks do not follow jurisdictional boundaries, and citizens that want to participate in an event may do so outside of the city in which they live. Countywide events draw volunteers from other municipalities. *Revise Footnote 12 to allow permittees to claim credit for all Program-sponsored citizen involvement events in the Program area.*		
Daly City	71	C.7.f.iii.	Watershed Stewardship Collaborative	More time needed to coordinate efforts for Watershed Stewardship	Daly City, through its county-wide program, already sponsors the Community Action Grant	

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				Collab. *Change date from October 2009 to 24 months after permit adoption.*	Program.	
Brisbane SMCWPPPAtt3-Table	12d 11g	C.7.g.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	*Permit should specify that each citizen monitoring event, watershed field activity, and workshop/conference/meeting will count as one citizen involvement event.*	See proposed revision	Provision C.7.g.iii. in the revised TO clarifies how the Citizen Involvement Events are to be reported. By listing the name of the event, event location, and event date, each activity counts as one event.
Daly City	72	C.7.g.	Public Outreach Events' and Citizen Involvement Events' Credit Limits	Significant increase from the current performance standard of 5, which combines and considers all outreach efforts as an event. *Reduce the number to 1 citizen involvement event annually or change language to require a progressive increase in events annually reaching the desired amount in the final permit year.*	In response to comments on flexibility, the revised TO (1) eliminates the cap on individual credits for events sponsored by the respective County-wide Program and BASMAA and (2) allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both	C.7g.ii. in the revised TO allows Permittees to claim (1) individual credits for all Community Outreach Events that are sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction and (2) credit for both Public Outreach and Citizen Involvement Events if the event contains significant elements of both.
Millbrae	12b	C.7.g.	Reporting Burdensome	No staff resource to comply with reporting requirements.	We consider the reporting requirements the minimum amount of information we need to determine Permittee's compliance.	Reporting template has been removed from the Permit. Reporting requirements have been streamlined and clearly written into the revised TO.
Millbrae SMCWPPPAtt3-Table	12 11i	C.7.g. C.7.	School Outreach	*C.7.h. should be included in C.7.e.*	Children are our next generation. And they are our best advocates for good practices for a cleaner Bay among their families and friends. Because of the children's important role, the PIP Workgroup for the MRP separated school outreach (C.7.h.) out from Public Outreach (C.7.e).	None
San Jose Att A	43	C.7.g.	Public Outreach Events' and Citizen	Requiring that Permittees only receive credit for regional citizen involvement events that occur in their	In response to comments on flexibility, the revised TO allows Permittees to claim public outreach and citizen involvement	Provision C.7.g.ii. in the revised TO allows Permittees to claim individual credits for all Citizen Involvement Events that are

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			Involvement Events' Credit Limits	jurisdiction will likely reduce the number and effectiveness of regional-level collaboration. More efficient to do county and regional-level collaboration in many cases. *Remove language restricting credit based on event location.*	credits if the event contains significant elements of both.	sponsored or hosted by their Countywide Program or BASMAA as long as the events are publicized to reach the Permittee's jurisdiction.
JamesRogerAttII	55	C.7.g.ii.	Involvement Level	*Vallejo and Fairfield should be required to have the same number of events as other cities of comparable size.*	We agree. All cities and counties will implement Citizen Involvement Events (C.7.g.) based on individual population.	Provision C.7.g.ii. in the revised TO removes Vallejo and Fairfield-Suisun from the list of Non-population-based permittees.
SCVURPPAttny	27	C.7.h.	School Outreach	State Permit is much more prescriptive and requires a higher level of service.	The comparison of stormwater permit requirements for the Saipan to the TO is not germane to the TO. Saipan is a Phase 2 Program and all the Permittees are under the Phase 1 Program. The TO is based on over 15 years of progress in stormwater programs verses the Saipan Permit which is for a first year stormwater program. In 1987, Section 402 was added to the Clean Water Act (CWA) and it provided the framework for regulating municipal stormwater discharges under the NPDES Program, Phase 1 Program. All the Permittees fall under the Phase 1 Program and the TO is written for the Phase 1 municipalities. Saipan, however, is a Phase 2 municipality because is falls under one of the categories (It is operated by a municipality in an urbanized area as defined by the Census Bureau based on the	

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					1990 or 2000 census. An urbanized area is basically a core city and urban fringe with a population of 50,000 or more.) EPA promulgated regulations for the Phase 2 Program in 1999. In addition, many Permittees around the Bay Area have had great success (and fun) implementing school outreach programs. Children are our next generation to make consumer decisions. And they are our best advocates for good practices for a cleaner Bay among their families and friends.	
JamesRogerAttII Daly City	56 73	C.7.h.i.	School Outreach	*Delete reference to causing a behavior change since it is extremely difficult and expensive to determine.*	We strongly encourage Permittees to evaluate its School Outreach Program's effectiveness. This allows Permittees to best utilize its resources to convey its messages. Simply things such as pre and post presentation surveys for the students and teacher evaluations of the presentation are inexpensive and can provide valuable information for the Permittees to tailor their programs.	"cause behavioral change" deleted from C.7.h.i.
Daly City	74	C.7.h.iii.	School Outreach	More time needed to coordinate efforts. *Change date from October 2009 to 24 months after permit adoption.*	Many Permittees around the Bay Area have had great success (and fun) implementing school outreach programs. Some have done the program themselves and others have partnered with other programs and/or agencies. And almost all programs align themselves with grade appropriate California Education Standards. Alameda County, Contra Costa	

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File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
					County, San Francisco County, and Santa Clara County all have robust school outreach program. Children are our next generation to make consumer decisions. And they are our best advocates for good practices for a cleaner Bay among their families and friends.	
Daly City	75	C.7.j.iii.	Commercial/ Industrial/ Illicit Discharge-Related Outreach	Evaluation of at least 1 year of data is needed to determine what activities to target and to develop outreach. *Change date from October 2009 to 24 months after permit adoption.*		C.7.j. deleted
SCVURPP Attny	28	C.7.k.	Unfunded Mandate	Requirement to outreach to municipal officers is more prescriptive than the Federal Permit.	It is important for municipal officers to know about the stormwater program, including its requirements, successes, and needs. Most municipalities already provide an annual presentation to their respective elected officials.	No changes.
Millbrae	13	C.7.l.	Surveys	Water Board should do surveys and studies.	The requirements are appropriate, and have been required in previous permit cycles.	
San Jose Att A	46	C.7.l.	Surveys	*Indicate on the reporting form that reporting is necessary only after a survey, study, or focus group is implemented.*		C.7.l. deleted
SCVURPPAttny	29	C.7.l.	Surveys	Expensive and not required by the Federal Permit	The comparison of stormwater permit requirements for the Saipan to the TO is not germane to the TO. Saipan is a Phase 2 Program and all the Permittees are under the Phase 1 Program. The TO is based on over 15	

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					years of progress in stormwater programs verses the Saipan Permit which is for a first year stormwater program. In 1987, Section 402 was added to the Clean Water Act (CWA) and it provided the framework for regulating municipal stormwater discharges under the NPDES Program, Phase 1 Program. All the Permittees fall under the Phase 1 Program and the TO is written for the Phase 1 municipalities. Saipan, however, is a Phase 2 municipality because is falls under one of the categories (It is operated by a municipality in an urbanized area as defined by the Census Bureau based on the 1990 or 2000 census. An urbanized area is basically a core city and urban fringe with a population of 50,000 or more.) EPA promulgated regulations for the Phase 2 Program in 1999. In addition, BASMAA already conducts regional survey for its Advertising Campaign.	
Brisbane SMCWPPPAtt3-Table	12g 11k	C.7.l.ii.	Surveys	*Delete "undertake research to identify and quantify audiences, knowledge, attitudes, practices, and trends…" (Provision 7.l.ii) because municipalities can rely on existing information to plan advertising campaign.*	See proposed revision	Provision C.7.l. deleted in the revised TO.
Daly City	76	C.7.l.iii.	Specific Comments	*Eliminate the requirement to measure behavior change.*		C.7.l. deleted
Daly City	76b	C.7.l.iii.	Specific Comments	*Eliminate entire paragraph. Too much to do in 5-years.*		C.7.l. deleted

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Provision C.8. – Water Quality Monitoring

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
San Jose Att A	54	Att G	Table G-1 methods	The heading on page G-2, and referenced in Table 8.1, refers to water column toxicity, but Table G-1 only refers to sediment quality issues. Handle water column toxicity in an analogous way to sediment, using multiple lines of evidence to trigger follow-up actions.	Agreed. Commenter is correct in pointing out this error.	Correct the heading above Table G-1 and add proper follow up actions for water column toxicity.
SF BayKeeper	57	Att G	Table G-1 methods	Clarify in Table G-1 & Table 8.1 that the same general location must be used for the collection of the benthic community, the sediment chemistry and for the sediment toxicity samples.	Agreed, although Table G-1 is applicable after sampling is complete. Thus, the notation is useful only in Table 8.1.	State in Table 8.1 that the same general location must be used to collect benthic community, sediment chemistry & sediment toxicity samples.
SF BayKeeper	58	Att G	Table G-1 methods	For Table G-1, clarify what constitutes "indications of alterations." The footnote, "Alterations are exhibited if metrics indicate substantially degraded community," is also vague.	A more specific value cannot be determined, due to the nature of this parameter. Permittees will need to look at the relative change.	None
SMCWPPPAtt3-Table	20	Att H	Content	Contents are more for waste-water effluent than stormwater; insert "effluent" throughout to distinguish.	We agree that some references in Attachment H are more appropriate for wastewater treatment plants than stormwater, and the Attachment should be modified appropriately.	Modify or delete any references in Attachment H that are suitable only to wastewater treatment.
Daly City JamesRogerAttIII	17 13	Att H	Content	This appears written for POTWs & industrial facilities; many elements do not apply to storm water discharges. It needs revision to apply only to storm water discharges to avoid misinterpretation and erroneous reporting.		
Contra Costa Flood Control	14	C.8.	Allocation of Costs	The FC District should not be responsible for monitoring costs that exceed the proportion of the FC District's owned land area to the entire watershed area tributary to the point of interest.	Permittees rightly bear the responsibility of allocating costs when they form collaborative groups for Permit compliance at the county or regional level. The Tentative Order contains no requirements associated with this issue.	None
FSSD	8a1	C.8.	Allocation of Costs	Monitoring requirements are aggressive & burdensome for a program of our size. Monitoring & reporting requirements will take roughly all Programs' discretionary resources.	We agree to further reduce the monitoring requirements for Fairfield-Suisun and Vallejo Permittees.	Decrease Fairfield-Suisun & Vallejo Status sampling requirements.
BASMAA	2	C.8.	Cost	Annual monitoring costs beginning in 2nd yr are $5 million for all municipalities.	In response to the Permittees' concerns about cost, Board staff scrutinized each monitoring requirement and pared back many of them. Every remaining monitoring requirement is cost-	In response to Permittees' concerns about cost, several monitoring requirements are pared back:
Alameda City	13	C.8.	Cost	Estimated annual monitoring increase: $300,000 for ACCWP, $20,000 for Alameda. No funding mechanism is identified. Analysis water quality benefits and the costs.		

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San Leandro	16	C.8.	Cost	ACCWP monitoring cost increase: $400,000-$600,000 /yr & could exceed $2 million /5 yrs. Future funding source is unclear.	effective and necessary. See the Fact Sheet for a full explanation of the need for each monitoring requirement. In addition, Board staff estimated the costs of the proposed monitoring and found them to be comparable to or less than the Stormwater Programs current monitoring budgets. We estimated the annual cost for region-wide required monitoring is $1,286,500. This is just 60% of the $2,138,600 budgeted by the four largest Programs combined for Fiscal Year 2007-08. Our estimates are based on analytical costs under our laboratory contract and labor costs of $100, including travel time. They do not include time for data evaluation, report writing, or contingencies. This region-wide cost estimate of $1,286,500/year compares favorably to monitoring costs incurred by other NPDES permittees, as obtained through annual reports or personal conversation: • Los Angeles County FY0708 monitoring cost: $2,042,000 • Central Contra Costa Sanitary District annual monitoring cost estimate: $1,000,000 • Conoco Refinery annual monitoring cost estimate: $500,000	• Eliminated pump station monitoring • Reduced bioassessment sampling • Reduced nutrient sampling • Reduced temperature sampling • Reduced and modified trash assessments
Dublin	2b	C.8.	Cost	City's added cost estimated exceed $9,000 /yr.		
Burlingame	14	C.8.	Cost	Monitoring would take 2/3 of FY08-09 budget. In FY09-10 monitoring costs double, triple in mercury control and quadruple in PCBs controls. Scale back or reprioritize monitoring funding until is identified.		
Walnut Creek	3a	C.8.	Cost	Estimated countywide monitoring costs: $4,600,000-$13,950,000 for 5-yrs; this is 300% increase.		
Danville	3a	C.8.	Cost	CCCWP monitoring cost is now $420,000, and estimated to increase up to 400%.		
Contra Costa County Supervisors WQM	7	C.8.	Cost	Technicians & service for continuous sampling equipment for general water quality parameters (2 sites/yr for 2 weeks) & temperature (6 sites/yr for 8 months) are added costs, plus potential vandalism. Trash assessments (8 sites/yr) & stream surveys (6 stream miles/yr) also add costs.		
Mountain View	12a	C.8.	Cost	Monitoring is overly prescriptive & may significantly increase costs, especially later in permit cycle.		
ACFCD Zone 7 SCVURPPP	9 3a	C.8.	Cost	Increased monitoring will be very costly. Due to Prop 218, Permittees will have a difficult time meeting the requirements.		
San Pablo	21	C.8.	Cost	To reduce costs, prioritize among the 9 Monitoring Projects.		
Palo Alto SCVURPPP Daly City	4 2 77	C.8.	Cost	Focus on limited, cost-effective monitoring linked to relevant management questions.		
Santa Clara	6a	C.8.	Cost	Monitoring requirements are onerous & expensive.		
Contra Costa County Supervisors	2, 8b	C.8.	Cost	Required studies go beyond County's core mission & staff expertise, including Source Control Evaluation Study, PCB Sampling & ~~Analysis Plan, Fate & Transport Studies,~~ Brake Pad/Desktop Study, Copper Toxicity Study, PBDE Legacy Pesticides & Selenium Regional Study. Many of these studies appear		

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				to be precursors to TMDL development, which have historically & appropriately been RWQCB functions.		
ACCWP–Hearing–Feng, A.	1	C.8.	Cost	It's a large increase in monitoring; we estimate over $5 million a year, roughly double existing monitoring budgets, which agrees with Dale's estimates. This is disproportionate compared to the Regional Monitoring Program, which collects $2.9 million annually from all Bay Area dischargers, about one-quarter of that coming from stormwater programs.		
Fairfield City Suisun SMCWPPP FSSD FairfieldSuisunURP – CullenK	6 1b 2a 75	C.8.	Duplicative	Overlapping, duplicative sections miss opportunities for efficiency. Example: Status & Trends monitoring should meet needs for Long-Term Trends & Pollutants of Concern Monitoring.	We disagree that Status & Trends can be combined with Long-Term Monitoring. Status & Trends Monitoring is done once per waterbody, rotating through all the Permittees' major waterbodies over time, in order to determine the "status" of each major waterbody vis-à-vis urban runoff discharges. Long-Term Monitoring does not rotate, but instead is conducted at fixed stations in order to see changes in water quality over time. We evaluated combining Long-Term and Pollutants of Concern Monitoring, but determined that the two have very different purposes, which cannot be achieved if the two are combined. However, Permittees may use the same locations for both types of monitoring if they choose.	None
FSSD	8b	C.8.	Duplicative	To reduce costs, combine Status & Trends Monitoring Stations with Long-Term Monitoring Stations.		
Sunnyvale Att A San Jose Att A ACCWP–Hearing–Feng, A.	17b 48a 4	C.8.	Duplicative	Many sections are duplicative. Example: where monitoring under Status & Trends could meet the needs for Long-Term Monitoring & Pollutants of Concern monitoring.		
SCVURPPPATTA	54	C.8.	Duplicative	Long-Term monitoring overlaps & is confusing; rewrite & include: 1) incorporate "long-term trends" into C.8.c by requiring that a portion of the sites sampled under status monitoring be considered long-term trend sites where routine sampling occurs; and, 2) incorporate storm event sampling into C.8.f.		
CCCWP	12	C.8.	Duplicative	C.8.d. / Table 8.3 is duplicative of C.8.f.		
San Leandro CCCWP	25 20	C.8.f.	Duplicative	There appears to be duplication among C.8.f, and the POC provisions.		
SF Baykeeper, NRDC, & Clean Water Action Comment	15a	C.8.	End-of-Pipe Monitoring	MRP should require enough "end-of pipe" monitoring to compare Municipal Action Levels to actual discharge concentrations.	We disagree. EPA states [Fed.Reg. 61:166, 43761 & 61:216, 57425-29] that storm water permits should include a monitoring program to gather	None

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					necessary information to determine the extent of attainment of applicable water quality standards, which may include ambient, receiving water, discharge (as needed), or a combination of such monitoring. The Tentative Order contains such a combination of monitoring; it does not contain Municipal Action Levels as does the Ventura County Tentative Order. The Tentative Order requires Permittees to monitor water bodies that receive urban runoff, and take actions when appropriate "triggers" are exceeded.	
SF Baykeeper, NRDC, & Clean Water Action Comment	15b	C.8.	End-of-Pipe Monitoring	MRP contains robust monitoring requirements, but they focused on receiving water monitoring, not discharge, or end-of-pipe, monitoring. Discharge monitoring is required by federal regulations & is standard in many MS4 permits.	We disagree that the Clean Water Act requires on-going end-of-pipe monitoring within an MS4 permit. In requiring Permittees to monitor the water bodies (both water column & sediment) that receive urban runoff, and to take actions when "trigger" values are exceeded, we believe the Permit achieves the same or possibly better level of protection than would be achieved by end-of-pipe monitoring, and achieves this in a more cost-effective manner.	None
SF Baykeeper, NRDC, & Clean Water Action Comment	15c	C.8.	End-of-Pipe Monitoring	Discharge monitoring is needed to determine mass loading from storm water and its impacts on creeks. MRP is deficient, in that mass loading monitoring is done only at creeks. In some places, industries discharge only to the Bay, not to a creek. Failure to monitor these discharges, will underestimate storm water loading.	We disagree. POC mass loadings to the Bay are investigated through the Regional Monitoring Program, in which Permittees participate. Also, many facilities are subject to the Statewide General Industrial Stormwater Permit, which requires runoff monitoring. As in response to Commenters' comment 15b, we	None

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					disagree that end-of-pipe monitoring would improve the protectiveness of the Tentative Order.	
San Pablo	20	C.8.	Existing Data	How will added Status Monitoring parameters provide more information than we collect now- or protect water quality? Current bioassessment data provide information needed to determine creek health. We now have several years of data: adding more parameters will take resources from the current program, & years of data will be meaningless.	We disagree that continued monitoring will decrease the value of existing monitoring data; instead we continue to learn from additional data. Many procedures and parameters are continuations of the Permittees' current monitoring programs, including bioassessments. We have carefully proposed a monitoring program that is built around both past monitoring and existing State-sponsored monitoring.	None
Danville	3c	C.8.c.	Existing Data	Toxicity tests are costly & frequently inconclusive. Don't abandon 7 yrs of data by changing procedures (away from bioassessments), rendering existing data incomparable & of little use.		
Dublin	2a	C.8.	Existing Data	SFEI conducts an ongoing Regional Monitoring Program (RMP) for SF Bay; its 2007 report provides insight on watershed-specific sources & trends of pollutants in the bay. Given this, will additional data influence pollution reduction efforts required by the permit? Eliminating or reducing new monitoring wouldn't impact pollution reduction efforts & would free resources for water quality improvement efforts.	The Regional Monitoring Program focuses on SF Bay rather than creeks, which are the receiving waters for urban runoff. Monitoring requirements in the Tentative Order are intended to determine whether further/additional pollution prevention efforts are needed in order to achieve water quality standards or protect beneficial uses in receiving waters.	None
ACFCD Zone 7	10	C.8.	Existing Data	Consider using existing data to develop strategies & plans that improve water quality.	The Tentative Order proposes a monitoring program that builds on both past monitoring and existing State-sponsored monitoring.	None
SCVURPPP	39	C.8.	Existing Data	MRP doesn't give credit for previous monitoring; it should allow reduced monitoring requirements where a Permittee certifies it has completed a substantially similar body of monitoring work under previous permits.	The monitoring efforts Commenters want credit for or reduced is not clear. Status Monitoring rotates around watersheds, so repetition after a period of years is built in. Likewise, repetition is build into	None
San Jose Att A	51c, 52	C.8.	Existing Data	How is data collected per previous permits used to align and optimize MRP Provisions?		

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				Clarify that previous monitoring can be credited toward compliance with the MRP. The significant monitoring previously conducted should be accounted for.	Long-Term Monitoring, which monitors fixed stations annually. Previous monitoring results will inform Permittees' selections of waterbody(s) to sample each year; sample locations; and analysis of analytical results, at a minimum. The proposed monitoring program is similar in many ways to the Commenter's current monitoring program, & is expected to build upon previous efforts.	
San Pablo	18	C.8.	Existing Data	SWAMP is testing for pathogens; why are permittees duplicating the work?	Where SWAMP collects required data, Permittees should not duplicate the work. We're pleased that SWAMP will sample several Bay Area locations, reducing costs for Permittees. However, SWAMP will not collect all the data required in the Tentative Order.	None
CCCWP	3	C.8.	Existing Data	Explicitly state where requirements can be fulfilled by programs such as RMP, SWAMP, or grant-funded projects. This will reduce uncertainty in cost estimates.	We cannot be certain of future grant or RMP projects, but agree that the recently-finalized list of SWAMP sampling locations would be helpful.	Attach information stating SWAMP monitoring stations, parameters, and approximate dates/seasons.
CCCWP	5	C.8.	Existing Data	Specify where requirements could be met through participation in the RMP. This is boilerplate language in NPDES municipal & industrial wastewater permits.	It is unclear what "boilerplate language" is referred to. The comment's intent is also unclear. If the Tentative Order specified which requirements the RMP could satisfy, & the RMP subsequently added other monitoring that would have fulfilled additional requirements, Permittees would be precluded from benefitting from additional RMP monitoring.	None
Berkeley	24	C.8.	Flexibility Needed	The Fact Sheet acknowledges contributions of ~~the Program's monitoring & collaboration with~~ other initiatives (RMP, SWAMP), but ignores	We agree that the Tentative Order should be more flexible in some areas, specifically, in	Change Status & Trends Monitoring to provide more flexibility in selecting waterbody reaches and the number of

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				the adaptive nature of these efforts, where study results inform subsequent data collection.	establishing sampling locations without adequate information on site conditions. Modifying this to allow more flexibility will allow more cost-effective and practical monitoring. The Tentative Order strives to balance adaptive monitoring with clear expectations for Permittees & the public regarding monitoring. In the short-term, Permittees will not be free to select monitoring projects to the extent they have been. However, the monitoring requirements are based largely on the monitoring strategy developed by the Permittees (through BASMAA) in 1998, as well as the monitoring currently conducted by Permittees. In addition, the Tentative Order encourages collaboration amongst all Permittees, which we believe will lead back to more adaptive monitoring in the next permit term.	samples per reach.
Mountain View	12b	C.8.	Flexibility Needed	Revise to allow Permittees flexibility to develop & implement monitoring based on analytical results.		
Berkeley ACCWP Newark	23 9 9	C.8.	Flexibility Needed	Excess specificity is inappropriate & in some cases will obstruct cost-effective solutions to monitoring implementation.		
SCVURPPP Walnut Creek, ACCWP–Hearing– Feng, A.	3c 4	C.8.	Flexibility Needed	Many requirements are too prescriptive for allow for adaptive monitoring.		
JamesRogerAttII	57	C.8.	Format	C.8 is extremely difficult to follow. Reformat so the introduction starts with the 3 basic elements – SF Estuary Monitoring, Urban Creeks & Receiving Water Monitoring, & Special Investigations. Each element should list the subcomponent & objectives listed on page 48 of Fact Sheet. The current Provision C.8.a. should be just prior to provision C.8h, Reporting, rather than at the beginning.	We reviewed the format of Provision C.8 for clarity & disagree that a large-scale reformatting has merit. We have attempted to streamline the Tentative Order by keeping explanatory information in the Fact Sheet, & requirements in the T.O. Given the Permittees' comments regarding the length of the T.O., it does not seem warranted to make it longer.	None
JamesRogerAttII	68	C.8.e.v.	Format	This is confusing, seems misplaced because it refers to C.8.c. Urban Creeks monitoring. C.8 organization is confusing. Restructure with a logical flow & a separate & distinct reporting	We agree that C.8.e.v. could be moved into the Reporting section of this Provision, so that all monitoring report requirements	Move C.8.e.v. into C.8.g. "Reporting."

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				requirement for each element.	are in one subsection.	
San Jose Att A	50	C.8.	Format	Include a table or otherwise show linkages & overlaps between Provisions, esp. with Pollutants of Concern Provisions (C.9 – C.14).	We believe that format changes and clarifications in the Tentative Order make this unnecessary.	Delete trash monitoring from C.8; it is in C.10. Delete pump station project; it is in C.2 or C.11/12.
GCRCDAtt	23	C.8.	Format	Why are monitoring objectives no longer stated in the beginning of the section?	Monitoring objectives are still at the beginning of each monitoring section; however, the more lengthy discussion of objectives was moved to the Fact Sheet or Findings in order to streamline the Permit and keep it more focused on requirements.	None
Oakley	4	C.8, C.11, C.12	Format	When requirements repeat, are they intended to be for the same site, or different sites? For instance:• Pilot project to evaluate on-site treatment for mercury Oct '09; • Pilot project to evaluate on-site treatment for PCB's Oct '09; • PDBE's, legacy pesticides, selenium Oct '12; • Diversion of dry weather and first flush flow Oct '10	For the sake of cost-effectiveness, we expect Permittees will select the same sites for pilot projects where it makes sense to do so.	None
ACCWP–ScanlinJ	99	C.8.	General Appropriate-ness	We're okay with most of the monitoring. A few requirements will cost a lot & aren't that useful; I think we can work out those details.	Comment noted.	None
Fremont Berkeley	10-11 25a	C.8.	General Appropriate-ness	Some methods & approaches are inconsistent with good monitoring design & are poorly linked to specific monitoring objectives.	We reviewed all monitoring methods in light of these comments, and determined that some methods could be better-described, and some requirements could be eliminated or revised.	Revise/clarify bioassessment methods; allow more latitude on Status Monitoring sampling site selection; clarify when SWAMP methods are not applicable.
SCVURPPP	3b, 3d	C.8.	General Appropriate-ness	Many monitoring requirements aren't based on sound science or are not necessary.		
SCVURPPP ATT A	64	C.8.	General Appropriate-ness	Some parameters do not have SWAMP comparable methods/protocols. Data quality objectives may exceed those in the SWAMP QAPP. Revise to state that "Monitoring data shall be SWAMP comparable where applicable…."	We agree.	Revise C.8.i. "Monitoring Protocols & Data Quality" to say "where applicable" rather than "all" data must be SWAMP comparable.
ACCWP–Hearing–Feng, A.	2	C.8.	General Appropriate-ness	MRP contains open-ended requirements for which costs are uncertain. Example: SWAMP protocols that are not final & in some cases not yet published.	We reviewed C.8. and determined that some protocols could be better described.	Clarify the bioassessment protocols and references in footnotes to Table 8.1.
San Jose Att A	51a	C.8.	General Appropriate-ness	Allocating sampling efforts in this unscientific, arbitrary way ignores previous work & directs	Although we disagree that the Tentative Order allocates	Revise Status Monitoring to allow Permittees to select amongst all their

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				sampling to watersheds that may not be high priority. The number & location of sampling sites and projects are based on sub-regional population, not actual monitoring needs.	sampling efforts in an unscientific, arbitrary way, we agree that Permittees should have more flexibility to establish priorities & selecting waterbodies and reaches to monitor.	major water bodies and remove specifications on the reaches to monitor.
Contra Costa County Supervisors WQM	3	C.8.	Implementation Timeframe	Need time to organize & develop sampling plans. Set implementation date of July 1, 2009 for both regional & Permittee monitoring efforts.	It is our experience that Permittees, some of whom worked with Board staff during early development of these monitoring requirements, have begun planning for their implementation. We agree that time is needed to develop a collaborative structure, and to adjust to final permit requirements, & have allowed lead-in time accordingly.	None
Danville	3d	C.8.	Implementation Timeframe	Not realistic to implement within 1 yr. Allow 3 yrs to develop a prioritized, appropriate & meaningful monitoring program to get results within a defined cost.		
Moraga	2	C.2, C.8	Implementation Dates	Compliance dates aren't coordinated. Items to be evaluated for implementation in one provision are already mandated in another provision with an earlier implementation date, e.g.: • High efficiency sweepers • Parking restrictions • Diversion of dry weather & first flush flows	We agree that some requirements were not coordinated.	Keep requirements in a single section of the Permit, so as to avoid conflicts between sections.
Sunnyvale Att A San Jose Att A SMCWPPP	17d 47b 23c	C.8.	New Plan	Some monitoring is better suited to USEPA or State Board. Totally rewrite with only monitoring requirements reasonable for municipalities to implement.	The Commenters don't specify which monitoring is unsuitable to Permittees. We disagree & refer to the Fact Sheet, which provides the rationale behind the monitoring requirements.	None
SMCWPPP	2c1	C.8.	New Plan	Rewrite: reduce monitoring to what would be reasonable for municipalities. Delete some monitoring tasks; reduce & simplify others.	The Commenter doesn't specify what is deemed reasonable or what should be deleted. We disagree and refer to the Fact Sheet, which provides the rationale behind the monitoring requirements.	None
JamesRogerAttII	58	C.8.	New Plan	Rewrite: establish SFEI as the regional monitoring collaborative organization. SFEI would review & approve the monitoring	NPDES regulations preclude specifying the means of compliance in a permit. Thus, the	None

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				program; data collection & analysis would meet SFEI's QA/QC standards. Permittees could meet monitoring obligations and reporting requirements by providing their fair share of the collaborative program.	monitoring provision describes the monitoring Permittees must do, but does not tell Permittees how to go about doing it.	
Fairfield City Suisun SMCWPPP Sunnyvale ATTA San Jose San Jose ATTA	8 1c 2c4 17e 17 49	C.8.	New Plan	Rewrite: require Permittees to develop a monitoring plan, which could be available for public & peer review, & modification, then accepted by the Executive Officer.	We disagree that Permittees, working separately or through a collaborative structure, should create the monitoring plan after Permit issuance. NPDES permits must provide a level of specificity so that Permittees & the public are clear about what actions are required. In addition, the time needed to reach consensus on a plan; obtain peer, public & Executive Officer review; amend the plan; & obtain approval could take several years. In future permit reissuances, we expect a regional collaborative would & should influence strongly the monitoring requirements.	None
SCVURPPP	42b	C.8.	New Plan	The Permittees' regional collaborative should develop a monitoring plan that answers core monitoring questions in Prov. C.8.c-f (excluding Pump Stations-C.8.e.iii). This monitoring plan would replace MRP provisions but would require a very similar level of effort when each program's past monitoring efforts are accounted for (existing data could be used to fulfill monitoring requirements).		
CCCWP	10	C.8.	New Plan	Rewrite: develop a work plan through the regional collaborative. It may take more than 18 months.		
Fremont Berkeley ACCWP Newark	9-10 22 8 8	C.8.	Not Related to Urban Runoff	Increased monitoring & studies are not all directly related to urban runoff. These studies may be worthwhile for informing comprehensive land use & watershed management efforts; they are not appropriate in NPDES permit.	The Commenters don't specify which monitoring is not related to urban runoff. We disagree & refer to the Fact Sheet, which provides the rationale behind the monitoring requirements.	None
SCVURPPP Walnut Creek	3e 3b	C.8.	Prioritize	Many monitoring requirements aren't prioritized.	Provision C.8 contains several types of monitoring, including ambient, receiving water, & discharge (at pump stations), as recommended by EPA [Fed.Reg. 61:166, 43761 & 61:216, 57425-29], in order to gather necessary information to determine the extent of attainment of applicable water quality standards. The monitoring requirements all have value in determining water quality impacts of urban runoff; they are	None
SMCWPPP	2c2	C.8.	Prioritize	Reprioritize current monitoring to accomplish the most important monitoring objectives in draft permit.		

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					not intended to be prioritized or ranked.	
Contra Costa County Supervisors Pittsburg	8 8a	C.8.	Water Quality Benefit	New studies in C.8 - C.14 are beyond City's capability & staff resources & are prescriptive, won't benefit water quality, should be limited, eliminated or more flexible.	We disagree that the monitoring requirements have little/no nexus to water quality. Municipal storm water permits generally do not contain effluent limits, due to the nature of storm water discharges & lack of information on which to base numeric effluent limits. Instead, permits include monitoring programs to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards & to determine the appropriate conditions or limitations for subsequent permits. [Fed.Reg. 61:166, 43761 & 61:216, 57425-29] That said, we do propose added flexibility & reduction of some monitoring requirements. We address costs of monitoring below.	Reduce required number of samples; reduce bioassessment requirements; reduce number of temperature probes required; allow use of existing stream surveys up to four years old; allow options in addition to Toxicity Identification Evaluations; reduce number of analytes for pump station monitoring.
FSSD Suisun Sunnyvale San Jose	8a2 1a 17a 16a	C.8.	Water Quality Benefit	The permit contains a lengthy 18-page description of the proposed monitoring requirements. As drafted, the monitoring requirements comprise a complete wish list of overly-burdensome requirements that do not benefit the environment.		
ACFCD Zone 7	7	C.8.	Water Quality Benefit	C.8 is onerous & has little to no nexus with improving water quality.		
SMCWPPP	2b	C.8.	Water Quality Benefit	Reduce monitoring to be commensurate with benefits.		
Concord	10	C.8 - C.14	Water Quality Benefit	A huge increase in water assessment & monitoring is required without discussion of how it is supposed to improve water quality.		
Contra Costa County Supervisors WQM	1	C.8.a.	Collaborative Effort	If regional cooperation is allowed, memoranda of agreement may be needed. This approach would streamline efforts and produce a more consistent data set, but may require development of an oversight organization	The first sentence of the monitoring section states that regional cooperation is, indeed, allowed. An additional year is provided to develop an organizational structure.	None
SCVURPPP	42a	C.8.a.	Collaborative Effort	We plan to continue implementing this program through a regional monitoring collaborative (RMC). Therefore, we appreciate the option for developing an RMC as described in C.8.a(i).	Comment noted.	None
SCVURPPP	42c	C.8.a.	Collaborative Effort	To fully allow regional collaboration, the last sentence of C.8.a(i) must be revised to allow for science-based deviations in types & quantities listed in the Provision C.8, based on agreement of RMC participants and/or	As with comments that the collaborative group should design the monitoring program, we think this suggestion leaves monitoring requirements open to wide-	None

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				scientific panels/reviewers.	ranging modifications & possibly reductions. In allowing a year for the collaborative to start up, & 4 remaining years to monitor collaboratively, we intend for the collaborative to be ready to strongly influence monitoring requirements in the next permit reissuance.	
CCCWP	2	C.8.a.	Collaborative Effort	Efforts to organize a Regional Collaboration are underway but will take longer to plan and implement. Revise to state "Monitoring conducted through a regional monitoring collaborative shall commence data collection within 18 months of permit adoption. All other Permittee monitoring efforts shall commence data collection within 6 months of permit adoption."	Agreed.	Revise C.8.a.ii. to allow a regional monitoring collaborative to begin data collection within 18 months of permit adoption.
Berkeley ACCWP	21 & MP-1 MP-1	C.8.a.	Collaborative Effort	Indicating that some requirements can be satisfied by collaborative efforts is not consistent: insert language similar to C.8.a.i. in C.8.f.v.	The language in C.8.a.i. applies to all of Provision C.8, & we agree to strengthen this by adding "C.8" after "Provision."	Add "C.8" after "Provision" in C.8.a.i.
CCCWP	1	C.10, C.11, C.12, C.13, C.14	Collaborative Effort	Repeat C.8's 1st paragraph (Regional Collaboration) at the beginning of C.10, C.11 etc. for which it is intended to apply. As written, it can seem to apply only to C.8.	Agreed.	Repeat C.8's 1st paragraph (Regional Collaboration) at the beginning of C.10, C.11, C.12, C.13, and C.14.
SMCWPPPAtt3-Table	2	C.8.b.	Fair Share	We are concerned about this provision.	The comment does not specify the concern. This continues the ongoing Stormwater Programs' contributions to the Regional Monitoring Program in SF Bay. It is not a new initiative.	None
GCRCDAtt	24	C.8.c.	Monitoring Objectives	How will monitoring rotating watersheds answer: Are water quality objectives being met? Are waters likely to support beneficial uses? The best way to determine if many BUs are supported is to observe the use. Table 8.1 provides more a measure of "level of quality" for given BU. Example: cold water fish can survive in warm water for a time; recreation takes place in polluted water; degraded	The objective includes "or likely to be supportive of beneficial uses." Data collected will give indications of whether chemical, physical, and biological conditions in the monitored creeks are supportive of beneficial uses.	None

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				waterways can support rare & endangered species to a degree.		
JamesRogerAttII	59a	C.8.c.	Monitoring Objectives	The objective of determining compliance with water quality stds & discharge prohibitions cannot be achieved by annual rotating waterbodies. Instead, establish 2 waterbodies per county. Sensitive watersheds (with domestic water supply reservoirs with urban development) must be included as a special category for monitoring.	The Tentative Order contains both rotating watershed (Status) & fixed station (Long-Term) monitoring elements. This comment appears to advocate fixed station monitoring, which is already covered.	None
Concord	7	C.8.c.	Status Reporting	Section C.8.c requires a status & trends database. What is the benefit of creating all these electronic databases? Do not create new databases without a really good reason.	C.8.c. does not require Permittees to create or maintain a database. It requires that data be submitted in a format that can be uploaded to a State data base already in existence.	None
Danville	3b, 3d	C.8.c.	Status Methods	Biological Assessments effectively determine long term stream health & identify where pollutant sources may exist. MRP requires 9 additional parameters be tested. Continue BioAssessments to target where additional testing & enforcement should be concentrated to produce better, more cost-effective results.	We agree bioassessment is effective & have included this parameter in Status Monitoring. We disagree that other parameters need not be tested, because municipal stormwater discharges can contain a variety of contaminants & have a variety of impacts to receiving waters.	None
San Mateo–Brandt Grotte	3	C.8.c.	Status Methods	Many methods are inappropriate. Fresh water is generally phosphorus limited. Salt water is nitrogen limited. San Mateo streams don't have algal blooms; phosphorus is not the issue. Nitrogen is not limiting in the Bay to my knowledge. For toxicity testing, the species is inappropriate for our environment. And testing is to be done at 20 degrees Celsius when 15 degrees is the actual environment.	It appears this comment is limited to the requirement to monitor nutrients. We disagree that the methods are inappropriate. The Water Boards use these methods in SWAMP monitoring and have found elevated nutrient concentrations in most creeks in the Region.	None
GCRCDAtt	26	C.8.c.	Table 8.1	Why were (1) Geomorphic, (2) Substrate Characterization and (3) Stream Flow monitoring requirements removed from the table?	While it is established that urban development increases flows to creeks, leading to geomorphic problems, we were not certain the utility of this information is worth the cost at this time. That said, information will be obtained on geomorphic conditions through	None

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					the Stream Survey; on stream flow during Long-Term Monitoring; and on substrate during Bioassessments. Further, a geomorphic study is a required Monitoring Project.	
SCVURPPP ATT A	44	C.8.c.	Table 8.1	"Dry" & "spring" sampling are synonymous; chose one term (prefer dry).	We disagree. Spring refers to the period of falling hydrograph (April-June), and dry refers to the consistently low hydrograph (July-Sept).	Define spring and dry sampling periods in the Status Monitoring section.
ACFCD Zone 7	8	C.8.c.	Table 8.1	Some parameters require 25 sample sites; others require 15-min. interval sampling over for 1-2 weeks. This is confusing & could lead to missed monitoring.	We considered several ways to format Table 8.1, and determined that grouping by parameter, rather than time of year or method, worked best. In practice, Permittees will likely reformat the requirements in a way that suits them best.	None
SCVURPPP ATT A Berkeley ACCWP	51 MP-2e MP-2e	C.8.c.	Table 8.1 Bedded Sediments	In Footnote 25, remove "all" from 2nd sentence; some contaminants reported in MacDonald may not be high priority in Bay Area.	We disagree that the list in MacDonald is overly long. The contaminants in MacDonald are not intended to be "priorities;" they are a set of possible causes of toxicity.	None
SCVURPPP ATT A	45a	C.8.c.	Table 8.1 Bioassess	The Footnote 18 SWAMP procedure requires 2 samples collected, likely doubling the cost per site. The benefit of this effort is questionable. Clarify the footnote to state that "based on the aquatic habitat available during the time of sampling, either the RW or richest targeted habitat field method may be used".	The Commenter misinterprets Footnote 18. Only the MH sampling method is required for SWAMP comparable sampling.	None
Berkeley, ACCWP	MP-2d MP-2d	C.8.c.	Table 8.1 Bioassess	Revise Footnote 18 to allow coordination with RB2 SWAMP on deviations from SWAMP protocols described in Ode (2007).	Agreed.	Revise Footnote 18 to allow coordination with RB2 SWAMP on deviations from SWAMP protocols described in Ode (2007).
SCVURPPP ATT A Berkeley ACCWP	45b MP-2d MP-2d	C.8.c.	Table 8.1 Bioassess	SWAMP has not published a protocol/procedure for periphyton biological assessment. Until such protocol is developed, exclude periphyton bioassessments.	We disagree. SWAMP has established such protocol using the 1999 US EPA method contained in "Rapid Bioassessment Protocols for Use in Wadable Streams and Rivers."	Add reference for the periphyton method to the references for Table 8.1.
Berkeley, ACCWP	MP-2d MP-2d	C.8.c.	Table 8.1 Bioassess	Delete bioassessment requirements that aren't in the SWAMP basic level protocol.		

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CCCWP	9f, 11	C.8.c.	Table 8.1 Bioassess	Remove periphyton, pebble count, CPOM, & cobble embededness so as not to preclude using volunteer samplers.	These parameters are part of the bioassessment protocol used state-wide, & are necessary for interpretation of bioassessment results. Other monitoring parameters are likely well-suited to the volunteer monitoring program in Contra Costa County. These parameters are not difficult to measure or sample and don't preclude the use of volunteers.	None
SCVURPPP ATT A	46	C.8.c.	Table 8.1 Chlorine	Remove monitoring parameters associated with non-stormwater stressors (e.g., riparian and aquatic habitat degradation). Chlorine is associated with potable water discharges (water line breaks) rather than stormwater.	We disagree that riparian conditions, aquatic habitat, & chlorine are not associated with storm water. Stormwater quantity & quality can affect riparian & aquatic conditions. Water line breaks can result in illicit discharges.	None
SMCWPPPAtt3-Table	3	C.8.c.	Table 8.1 Chlorine etc.	Remove chlorine, nutrients, temp, diazinon & water toxicity (move to POC section) & trash assessments at BMI stations (should only be downstream of enhanced controls)	If chlorine, nutrients, temp, diazinon & water toxicity were moved to the POC section, there would be no such monitoring of receiving waters other than where fixed stations are located. We agree that trash assessments at BMI locations is not necessary, given other trash monitoring to be conducted.	Remove the requirement to conduct trash assessments at BMI sampling locations.
SCVURPPP ATT A	48	C.8.c.	Table 8.1 General Water	Remove Gen.Water Quality at 15-Minute Intervals. Programs must purchase, operate & maintain monitoring equipment for parameters that aren't directly related to stormwater impacts. And, continuous monitoring of temperature, dissolved oxygen, pH & conductivity will yield results with limited potential for spatial extrapolation.	The parameters in question are important indicators of water quality, and are monitored in lieu of more expensive monitoring of a larger suite of chemicals and compounds in the stream or at stormwater outfalls.	None
Berkeley, ACCWP	MP-2 MP-2	C.8.c.	Table 8.1 Nutrients	Delete Nutrients - storm events & dry weather grabs; redundant with Table 8.5 & excessive.	We disagree. Nutrients are being detected at significant concentrations in Bay Area creeks and may be controllable	None
San Jose Att A	56	C.8.c.	Table 8.1 Nutrients	Remove storm event-based sampling (nutrients), a costly effort with little/no water		

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				quality benefit. Local creeks & Bay don't display eutrophy due to algal blooms; the benefit of measuring nutrients in this way is marginal. Storm-based sampling is costly because staff must be "on call" to immediately respond to storm events at any hour.	contaminants in urban runoff. Storm event sampling is required in Municipal NPDES permits throughout the State & country. It is valuable in detecting urban runoff pollutants, necessary for developing loading estimates, and deemed less expensive than end-of-pipe monitoring of stormwater outfalls. In addition, data indicate that suspended sediment concentrations are declining in the Bay, increasing light penetration. In the past, although the Bay has had concentrations of nutrients similar to east coast estuaries, light has been the factor limiting large algal blooms. If light ceases to be limiting, nutrient concentrations could be sufficient to cause eutrophication.	
SCVURPPP ATT A	47	C.8.c.	Table 8.1 Nutrients	Since 2002, dry weather excess algae is rarely seen & there is little/no eutrophication of local creeks. Delete "storm event" monitoring as it's redundant with requirements in Table 8.5.		
CCCWP	9c	C.8.c.	Table 8.1 Pollutants in Fine Grained Sediments	State the method to be used to determine grain size. Is it analysis of bulk concentration of pollutants, augmented with particle size distributions? Analysis of pollutant concentration in specific size fractions? What are the appropriate size fraction cutoffs? If defensible answers aren't readily available, develop a regional work plan over a longer than 18 month period.	Plumb, R. H., 1981. Procedure for Handling and Chemical Analysis of Sediment & Water Samples. Technical Report EPA/CE 81-1, prepared for Great Lakes Laboratory, State University College at Buffalo, NY, for the U.S. EPA/CoE Technical Committee on Criteria for Dredged and Fill Material. U.S. Army Engineers Waterways Experiment Station, CE, Vicksburg.	Include this Table 8.1 references.
CCCWP	9d	C.8.c.	Table 8.1 Pollutants in Fine Grained Sediments	State the method for analyzing PCBs in sediments. EPA method 608, 8082 or 1668? If using 8082 or 1668, which congeners should be reported? If defensible answers aren't readily available, develop a regional work plan	Most Permittees preferred that methods not be overly specified, to provide flexibility as methods change and as the monitoring program evolves.	None

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				over a longer than 18 month period.		
CCCWP	9e	C.8.c.	Table 8.1 Pollutants in Fine Grained Sediments	State which pyrethroid compounds should be determined, the methods, and expected detection limits. If defensible answers to those questions are not readily available, If defensible answers aren't readily available, develop a regional work plan over a longer than 18 month period.	The pyrethroid compounds should be selected based on ongoing work in the California (e.g., DPR, SWAMP). Analytical methods and detection limits are not prescribed.	None
CCCWP	9a	C.8.c.	Table 8.1 Stressors	How will numeric nutrient measurements, chlorophyll & periphyton measurements, dissolved oxygen (DO) concentrations, and BMI data be used to determine whether or not a stressor ID study is necessary?	The results that trigger a stressor/source identification project are described in the final column of Table 8.1.	None
San Jose Att A	55	C.8.c.	Stressor ID Triggers	Require a Toxicity Reduction Evaluation (TRE)-like process before a full TIE. Additional lines of evidence, e.g. chemical analysis, should be collected similar to the process in Table G.1. Compare results to water quality criteria or to Species Mean Acute Values (SMAV) for the species tested, and to the toxicity test results, to determine if they are related. If there is sufficient exceedance of water quality criteria (or SMAV for the species tested) to explain the observed toxicity in the stream, there is no need to perform a TIE.	We agree that the TRE approach, as outlined in EPA/833B-99/002, is a good option for Permittees' as they determine the stressor or source of a water quality problem.	Revise C.8.e.i. to allow the use of a Toxicity Reduction Evaluation.
SMCWPPPAtt3-Table	MP-3	C.8.c.	Table 8.1 Stressors	Object to triggers based on single lines of evidence.	We agree that the follow-up to exceedances should be more flexible, allowing options prior to TIEs. In addition, the Tentative Order does cap the number of follow-up actions to be taken during the Permit term, thereby providing a financial cap by default.	In the final column of Table 8.1, add a second step for follow-up to Toxicity & Diazinon & Chlorpyrifos-Water Column. Allow for the use of analytical chemistry techniques to identify the cause of toxicity before proceeding further (if the source is still not identified). Also, revise C.8.e.i. to allow the use of a Toxicity Reduction Evaluation.
ACCWP–Hearing–Feng, A.	2	C.8.c.	Table 8.1 Stressors	MRP requires stressor ID & TIE procedures, on the basis of weak trigger criteria; premature initiation of such projects can lead to ineffective, inconclusive resource use.		
SCVURPPPATTA San Jose Att A	41 51b	C.8.c.	Stressor ID Triggers	Monitoring & stressor ID should follow a stepwise progression from screening through source ID ... If a toxicity test indicates survival of less than 50% a "Toxicity Identification Evaluation (TIE)" is required. TIEs are ~~extremely expensive and rarely identify~~ causes of toxicity. An alternative approach would be to evaluate additional lines of evidence, such as chemical analyses of		

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				exceedance(s) of water quality standards to explain the observed toxicity. If so, a TIE would likely be unnecessary. Replace the trigger column in Tables 8.1 and 8.3 with monitoring projects designed/implemented according to Provision C.1. A financial cap is needed for such monitoring projects.		
San Jose, San Jose Att 1	16b, 53b	C.8.c.	Stressor ID Triggers	Toxicity Identification Evaluations (TIE) are costly, not planned activities, but dependent upon monitoring results. Triggers should be deleted or preceded by additional efforts to confirm water quality results and to determine appropriate next steps.		
SF Bay-keeper	56	C.8.c.	Stressor ID Triggers	Table 8.1 triggers for stressor ID project are vague. Define "repeatedly exceeds" (across sites, within waterbody, sampling events).	Agreed.	In Table 8.1, replace "repeatedly exceeds" with "20% of results."
Berkeley ACCWP	MP-4a MP-4a	C.8.c.	Stressor ID Triggers	Delete last column in Table 8.1; add footnote referring to new C.8.c.iii; state that Stressor ID follow-up is only required for data in Attachment G. Include reference for Table G-1, adapted from Southern CA Stormwater Monitoring Coalition; Give rationale for Footnote 78, which is generic rather than Bay-specific.	We disagree that the final column should be deleted, but agree to modify it. Att.G covers sediments only; it does not describe actions to take when pollutants in the water column exceed standards. The concept for Att.G is from S. CA SMC, but the content was developed in-house; no footnote needed. Footnote 78 references consensus-based freshwater sediment quality guidelines; no Bay-specific guidelines are available or necessary.	Remove the references to doing a TIE in Tables 8.1 and 8.4 (Long-Term Monitoring Elements). Replace with "proceed to C.8.e.i." so that all the options for follow-up are in the Monitoring Projects section, and not in Status or Long-Term Monitoring sections.
Berkeley ACCWP	MP-4b MP-4b	C.8.c.	Stressor ID Triggers	Add new C.8.c.iii: "Trigger" results can lead to: 1) review of causes & follow-up in next annual report; 2) referral to local agency for mngt; 3) countywide or regional Stressor ID project; OR 4) other reporting as described in C.1.	The Commenter's suggested menu would allow "no action" other than reporting, or referral to others with no other follow-up. We disagree that such options are appropriate. We	In final column of Table 8.1, add a second step for follow-up to Toxicity & Diazinon & Chlorpyrifos-Water Column. Allow use of analytical chemistry techniques to identify the cause of toxicity. Also allow

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					agree that more options should be given.	use of TREs.
SCVURPPP ATT A	49	C.8.c.	Table 8.1 Temp	Remove Temperature at 15-Minute Intervals. Temp. changes typically aren't related to stormwater runoff. Note that temperature is measured during grab water sampling & bioassessments.	While 3 commenters ask not to monitor water temperature, there was very strong citizen support during the Permit development process for temperature monitoring. Temperature is one of the most important parameters to measure when evaluating impacts on salmonids. Grab samples are not useful to evaluate maximum temperature exposures or to calculate MWATs.	None
Berkeley ACCWP	MP-2 MP-2	C.8.c.	Table 8.1 Temp	Consider deleting temp requirement; redundant & dependant on riparian cover.		
CCCWP San Pablo	9b 19	C.8.c.	Table 8.1 Temp	Change to “15 minute intervals (unless equipment limited) May-September.” State whether probes merely must be deployed, or serviced regularly to assure they aren't damaged or stolen, and are working - which increases labor costs. For probes to be left in the field, add safe harbor language for when probes are stolen or vandalized.	We agree that temperature collection should cease in Sept., rather than November. Most Permittees likely prefer the Tentative Order to NOT require specific equipment maintenance. Probe vandalization will be considered on a case-by-case basis.	Change the duration of temperature sampling to end in September.
SCVURPPP ATT A Berkeley SMCWPPPAtt3-Table ACCWP	50 MP-2 3 MP-2	C.8.c.	Table 8.1 Toxicity	Move Toxicity, Diazinon & Chlorpyrifos during “storm events” to C.8.f (POC Monitoring); conduct at a frequency commensurate with current understanding of associated impacts. Sampling frequency should be minimal-same frequency as “Category 2” pollutants.	We disagree that all storm event sampling must be at fixed stations (as in POC Monitoring). It is important to determine whether urban discharges cause or contribute to toxicity in receiving waters.	None
Berkeley ACCWP	MP-2 MP-2	C.8.c.	Table 8.1 Trash	Delete trash; it's disassociated from management areas.	We agree to delete trash monitoring from Provision C.8.	Delete trash monitoring from Provision C.8.

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San Jose Att A	57	C.8.c.	Table 8.1 Trash	Why require trash assessments immediately downstream of enhanced trash management control catchments? C.10 directs placement of these control measures toward the lower watershed. In a stream setting, assessments integrate inputs from all catchments above the site in question, confounding the ability to assess the contribution of a single catchment. See City comments on C.10.	We agree to delete trash monitoring from Provision C.8. and keep all requirements pertaining to trash in Provision C.10.	Delete trash monitoring from Provision C.8.
SCVURPPP ATT A	52c	C.8.c.	Table 8.1 Trash	What is the scientific basis for 2/yr, every year for trash assessments? Based on numerous trash assessments, this frequency could be drastically reduced (e.g., every year of the permit term) & still achieve the objectives stated [in Comment 52a]. Reduce trash assessments to once in 1st year of the permit to establish baseline conditions & every 2 yrs thereafter.	We agree to delete trash monitoring from Provision C.8. and keep all requirements pertaining to trash in Provision C.10.	Delete trash monitoring from Provision C.8.
SCVURPPP ATT A	52a	C.8.c.	Table 8.1 Trash	The objectives of conducting trash assessments likely include 1) assess current status of specific sites in creeks, 2) detect changes over time as a result of factors such as BMP implementation, in concert with other approaches (e.g., loads reduced calculations) & 3) identify sources of trash to the assessment site. Based on these objectives, trash assessments would be best conducted at trash accumulation sites in creeks sites, & if appropriate, directly downstream of where BMPs will be implemented.	We agree to delete trash monitoring from Provision C.8. and keep all requirements pertaining to trash in Provision C.10.	Delete trash monitoring from Provision C.8.
SCVURPPP ATT A	52b	C.8.c.	Table 8.1 Trash	There is no basis to assume that trash accumulates where toxicity & pollutants in bedded sediment are sampled; remove the text "…and	We agree to delete trash monitoring from Provision C.8. and keep all requirements pertaining to	Delete trash monitoring from Provision C.8.

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				additionally at the toxicity & pollutants in bedded sediment (6/4/1) sites".	trash in Provision C.10.	
GCRCDAtt	27	C.8.c.	Table 8.1 Trash	Require identification & monitoring of trash dumping hot spots. The sources of most trash dumped into major waterways and along banks must be identified, monitored & abated in order to achieve MRP's goals.	While trash monitoring requirements are to be removed from Prov. C.8, Prov. C.10 requires Permittees to identify and abate trash hot spots.	None
JamesRogerAttII	59c	C.8.c.i.	Monitoring Frequency	Sampling frequency in Table 8.1 must be based on the number of samples required to statistically determine compliance with a specific water quality standard or discharge prohibition.	Neither the Clean Water Act, nor its implementing regulations & guidance documents, require a strictly statistically-based monitoring program for Stormwater Permittees. We believe the data collected under the proposed monitoring program will provide valuable information toward determining if water quality objectives are being met in local receiving waters.	None
Fairfield City Suisun Sunnyvale Att A San Jose Att A	7 1c 17c 48b	C.8.	Monitoring Frequency	Reduce monitoring frequency to what is needed to track long-term trends. Example: annual monitoring is unnecessary for pollutants expected to change slowly over decades.	Annual monitoring moves to new waterbodies each year; no water body is monitored annually.	None
SMCWPPP	2b	C.8.	Monitoring Frequency	Reduce monitoring frequency to match what is needed to track long-term trends. Example: scale back long-term trends monitoring from every other yr (Table 8-3) to every 10 yrs for pollutants expected to change over decades.	We disagree that monitoring only once every ten years would provide effectively usable information. Other Permittees, such as Sacramento County, conduct Long-Term Monitoring annually; we have scaled back to biennially to reduce costs.	None
SF	55	C.8.c.ii.	Status Sampling Locations	Include guidance for selecting reference sites, in order to interpret results, particularly for	Both the statewide and regional SWAMP are evaluating reference	None

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				bioassessments. Without a set of data that creates the baseline for normal or healthy receiving waters, it will be difficult to know whether beneficial uses are impaired.	conditions for bioassessment.	
JamesRogerAttII	59d	C.8.c.ii.	Status Sampling Locations	Do not allow Permittees to select stations because of the experience with Santa Clara program's trash assessment reporting.	After considering all the comments on sampling locations, we determined the optimal approach is to describe what must be sampled (stream reaches that receive urban runoff, rotating across all the major streams) and state the parameters, then allow Permittees to select exact sample locations based on their experience and knowledge of their creeks.	Change Status Monitoring so that Permittees select water body reaches.
SMCWPPPAtt3-Table	3	C.8.c.ii.	Status Sampling Locations	Allow Permittees to decide which waterbodies to monitor.		
SCVURPPP ATT A	53c	C.8.c.ii.	Status Sampling Locations	There is no legal requirement to specify monitoring locations. Revise to state that "Sampling locations shall be selected to produce data that meet the objectives of the monitoring program."		
CCCWP	6b	C.8.c.ii.	Status Sampling Locations	Set guidelines and require Permittees to propose a schedule of rotating watersheds & locations in 1st year of permit term.		
Contra Costa County Supervisors WQM	6	C.8.c.ii.	Status Sampling Locations	The large number of sampling sites (15) at lower reaches of watershed will result in redundant data sets & wasted sampling/analysis costs. Change to a % of sample sites per mile of creek reach.	We agree that the qualifiers to creek sampling locations were generally unworkable in the field.	Change Status Monitoring so that Permittees select water body reaches, as long as the reaches receive urban runoff.
CCCWP	6a	C.8.c.ii.	Status Sampling Locations	Remove qualifiers to creek sampling locations. For example, simply indicate "Kirker Creek" instead of "Kirker Creek (at Pittsburg or below)".		
Oakley CCCWP	53, 8	C.8.c.ii.	Status Sampling Locations	C.8.c refers to Walnut Creek (below confluence of Lafayette Creek). The creeks in that area are Las Trampas, Tice and San Ramon. Is the confluence of Las Trampas & San Ramon what was intended?		
JamesRoger AttIII	6a	C.8.c.ii.	Status Sampling Locations	Monitor Walnut Creek as far downstream as possible with its confluence with Concord Creek; ideally downstream of Grayson Creek		

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				in Pacheco Slough		
GCRCD-Att	25	C.8.c.ii.	Status Sampling Locations	Why isn't Stevens Creek listed for Santa Clara County?	Thank you for pointing out this oversight.	Add Stevens Creek to list of water bodies in Santa Clara County.
Daly City	78	C.8.c.ii.	Status Sampling Locations	Daly City is the only agency specified in this section. All other locations are either creeks or lakes. We request that the agency specific reference, Daly City, be removed, as it is not a waterbody.	We disagree that there are no creeks in Daly City. Channels, tunnels, and culverts are engineered creeks, and they convey waters of the State and of the United States.	None
SMCWPPPAtt3-Table	3	C.8.c.ii.	Status Sampling Locations	Remove "Waterbodies draining Daly City" because there are no creeks, just channels, tunnels, & culverts. The major drainage is Vista Grande canal that discharges to a tunnel before discharging to the ocean.		
SCVURPPP ATT A	53a	C.8.c.ii.	Status Sampling Locations	The criteria for selecting the water bodies are unclear & appear to not be based on previously collected monitoring data.	The objective is to monitor all major receiving waters over time. In general, Permittees should select new waterbodies to monitor before revisiting waterbodies for a second round of sampling; thus, previous monitoring data will be considered by Permittees when selecting which water body(s) to monitor in a given year.	None
San Jose Att A	58	C.8.c.ii.	Status Sampling Locations - 60% urban	Remove 60% or more urban or suburban land use criteria. Replace with: "Samples shall be collected in reaches chosen scientifically to determine the character of the water quality in the main receiving water for each major watershed." The optimal sampling point may, or may not, be downstream of an area with at least 60 percent urban/suburban land use.	We agree that this requirement is generally unworkable as currently written.	Rewrite to focus sampling efforts on reaches that receive urban stormwater runoff, without specifying that the catchment area must have 60% urban land use.
CCCWP Berkeley ACCWP	7 MP-3 MP-3	C.8.c.ii.	Status Sampling Locations -	The requirement to collect samples in reaches 60% or more urban or suburban may not always be		

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			60% urban	attainable. Restore the criterion that "surrounding land uses are predominantly urban or suburban".		
SCVURPPP ATT A	53b	C.8.c.ii.	Status Sampling Locations -60% Urban	The criterion of 60% urban or suburban land use" is too prescriptive and will likely eliminate many sites of interest.		
JamesRoger AttII	61	C.8.d.	Monitoring Triggers C.1	Add to C.8.c & C.8.d. that results from implementing these provisions trigger the C.1 requirements to identify and implement additional BMPs.	We agree.	Add a statement that ties Provision C.1. requirements to monitoring results.
JamesRoger AttII	62	C.8.d.i.	Long Term Mon. Location	Walnut Creek downstream of its confluence with Concord Creek or downstream from its confluence with Grayson Creek in Pacheco Slough would better represent the land use and channel types of Contra Costa County. Design sampling to overcome the tidal influence.	We agree that Walnut Creek could provide a good location for Long-Term Monitoring.	Add Walnut Creek as a possible Long-Term Monitoring location in Table 8.3.
Berkeley ACCWP	MP-5 MP-5	C.8.d.i.	Long Term Mon. Location	Revise: "each countywide program shall select 1 site, among Status watersheds chosen according to C.8.c., for Long Term monitoring in Years 2 & 4 and consulting with SWAMP.	We have discussed Long-Term Monitoring locations with Permittee representatives, and it is our understanding that the updated list of waterbodies to sample is acceptable. In addition, we suggest sample locations that are near the bottom of the waterbody and that are also sampled by the SWAMP. If they choose to use these selected locations, Permittees may use some of SWAMP sampling & analyses to fulfill Permit requirements.	Revise Table 8.3 by adding several optional waterbodies and suggesting, rather than prescribing sample locations.
SMCWPPPAtt3-Table	4	C.8.d.i.	Long Term Mon. Location	Inclusion of site selection criteria will not allow coordination with SWAMP. Do not prescribe sites.		
San Jose Att A	59	C.8.d.i.	Long Term Mon. Location	Do not require locations where surrounding land uses are primarily industrial, commercial and urban. Surrounding land uses are often not major contributors to water quality problems. Results must be interpreted in the context of the entire watershed at, above, and sometimes below the sampling point. Example: Guadalupe River where most of the contributing watershed is not urban and significant non-urban sources of mercury are well known.		
Oakley	54	C.8.d.i	Define flow	Please define flow-weighted	This is defined in	None

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		i.	weighted	composite.	referenced methods.	
San Jose Att A	60	C.8.d.iii.	Format Table 8.3	Correct table format. The Trigger column lists three freshwater species used to test water column toxicity. The species used in sediment testing, *Hyalella azteca*, is not included.	Agreed. The incorrect formatting of this table caused confusion.	Correct Table 8.3 (the new Table 8.4) format
CCCWP	13	C.8.d.iii.	Table 8.3 methods	Suspended solids concentrations (SSC) and Total Suspended Solids (TSS) are called for in different provisions, but aren't the same. SSC is not a readily available method from all labs.	SSC and TSS are required in different provisions for different reasons. SSC is necessary for long-term monitoring, and we have not encountered problems with laboratory analyses.	None
CCCWP	14	C.8.d.iii.	Table 8.3 methods	One would not collect bedded sediments in a storm event (format problem?).	This is indeed a formatting error.	Correct Table 8.3 (the new Table 8.4) format
Berkeley ACCWP	MP-6a MP-6a	C.8.d.iii.	Table 8.3 methods	Delete wet weather sampling. Move dissolved & total metals to Category 2 in Table 8.5.	We disagree. One purpose of Long-Term Trends Monitoring is to evaluate mass emissions from MS4s, which requires wet weather sampling and analyzing for metals.	None
Contra Costa County Supervisors WQM	4	C.8.e.	Monitoring Projects-Prioritize	The 9 required monitoring projects are burdensome. Prioritize and phase implementation to ensure quality of data.	We disagree that further prioritization or phasing is warranted. As written, monitoring projects are phased, in that Stressor Identification is done after Status or Trends monitoring results trigger and action, and, if done collaboratively, such monitoring results are not expected until 2-3 years into the permit cycle.	None
SCVURPPP ATT A	55b	C.8.e.i.	Monitoring Projects-Reduce #	Where monitoring results trigger a new program, State funding should be provided first; the regional cap should be reduced from 10 to 5 projects, with each countywide program required to initiate no more than 1 project.	We disagree and point to our response to comments regarding costs.	None

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CCCWP	15	C.8.e.i.	Clarify cap	Clarify that TIE triggers will satisfy the stressor ID monitoring projects called for in C.8.e.i. & are capped at 3 such projects for the permit cycle.	Agreed	Clarify that TIE triggers will satisfy the stressor ID monitoring projects in C.8.e.i. & set cap of 3 TIEs per permit cycle.
SCVURPPP ATT A	55a	C.8.e.i.	Clarify cap	To avoid duplication of effort (such as a TMDL), the "cap" in C.8.e.1.(3) should integrate the language in the last paragraph of C.1 that states Permittees "do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitation."	Agreed	State that Permittees do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitation in C.8.e.1.iii.
SF	60	C.8.e.i.	Clarify cap	Clarify how Permittees will cap the number of stressor ID projects. What criteria will be used to prioritize?	Agreed	Clarify how Permittees should select stressor ID projects in C.8.e.1.iii.
CCCWP	16	C.8.e.i.	Clarify cap	Please clarify that BMP evaluation project does not trigger Stressor ID projects.	Agreed	In C.8.e.1.ii, state that this project cannot trigger a Stressor ID project.
Berkeley SMCWPPPAtt3-Table, ACCWP	MP-85 MP-8	C.8.e.i.	Stressor ID Triggers	Stressor ID should be one or several tiered options: see comment MP-4.	Agreed	In final column of Table 8.4, add a second step for follow-up to Toxicity & Diazinon & Chlorpyrifos-Water Column. Allow use of analytical chemistry techniques to identify the cause of toxicity before proceeding. Allow use of TRE.
JamesRoger AttII	64b	C.8.e.ii.	BMP effectiveness evaluation	Suggest evaluation of permeable pavements.	While we think these are good suggestions, it is most appropriate for the Permittees, who will finance the evaluations, to determine which BMPs to evaluate.	None
JamesRoger AttII	64c	C.8.e.ii.	BMP effectiveness evaluation	Require research, development and evaluation of BMPs that address pollutants of concern and that will be required as Provision C.1 is implemented. Begin this now so there is no delay once the monitoring shows noncompliance.		
SCVURPPP ATT A	56	C.8.e.ii.	BMP effectiveness evaluation	How is this related to BMP investigations required in C.10-12? Given the high priority of TMDL / POC-related studies in C.10-12, this requirement should be removed.	A single BMP could be used to fulfill requirements of C.8.e.ii, C.11 & C.12, as long as a full range of pollutants is evaluated.	None

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Contech	3	C.8.e.iii.	BMP effectiveness evaluation - method	C.8.i. requires all data be SWAMP comparable; not appropriate for BMP effectiveness projects. WA Depart. of Ecology established Technology Assess Protocol (TAPE) for evaluating emerging & public domain BMPs (i.e. biofilters). Such a protocol should be used for evaluating BMP effectiveness.	We agree that SWAMP-comparability doesn't apply to these data & that the WDOE TAPE could be a useful model, depending on which BMP is selected for evaluation. We encourage, but don't require, Permittees to refer to this Protocol.	In C.8.e.ii, state that data need not be SWAMP-comparable.
JamesRoger AttII	64a	C.8.e.iii.	BMP effectiveness evaluation - method	Include more detail on what is expected. Require protocols equivalent to those used by WA Department of Ecology. Require typical BMP conditions where clogging has occurred, so that maintenance is considered.	Because this is the first time a BMP Effectiveness Evaluation is required in the MS4 Permit, and due to the wide variety of BMPs with different physical mechanisms, the requirement is not detailed. If necessary, requirements will be more detailed in future Permits.	None
Livermore	8	C.8.e.iii	Pump Station - Capacity Issue	Diverting dry weather or first flush flows to sanitary sewer is infeasible for most wastewater treatment plants due to capacity restrictions. This requirement should be removed.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
Oakley	55	C.8.e.iii	Pump Station - Clarify	The 10 worst pump stations must be further investigated. This infers that this is a regional collaborative effort. Is that what is intended?	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
Alameda City	12	C.8.e.iii	Pump Station - Cost	Expensive: estimated increase in one-time staffing for monitoring, sampling, & analytical coordination is about 5% of full-time staff person. The estimated fiscal impact is approximately $5,000.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
San Leandro	17b	C.8.e.iii	Pump Station - Cost	The Ettie Street pilot project has estimated data, from the CEP report, of $33,000 per gram per year (Hg) and $11,500 per gram per year (PCB), which is not feasible or defensible.		

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JamesRoger AttII	65a	C.8.e.iii	Pump Station - Criteria	There are no pump stations listed in Contra Costa County and they should be listed if there are any.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
Milpitas	18a	C.8.e.iii	Pump Station - Criteria	Why are so many of the pump stations (more than 10%) in Milpitas?		
ACCWP Newark Berkeley	10 10 25a	C.8.e.iii	Pump Station - Duplicative	Provisions overlap or aren't coordinated: particularly pump station monitoring requirements in Provisions C.8.e.iii, C11 and C12 which share similar titles & stated objectives but very little in approach or activities.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
CCCWP	18	C.8.e.iii	Pump Station - Duplicative	This duplicates requirements in C.11-12. Add: "*The requirements of this provision can be met by implementing projects under C.11.e, C.11.f, C.12.e, and C.12.f.*"		
Mountain View	17	C.8.e.iii	Pump Station - General	Allow Permittees & sanitary sewer agencies to evaluate potential benefits, impacts & cost implications of diversions to POTWs in an organized, controlled & fiscally responsible manner.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
Alameda City San Leandro	18 17a	C.8.e.iii	Pump Station - General	Cities don't control EBMUD's discharge allocation to the City, so this requirement is impractical. Requirements for flow-diversions to POTW's should start with agencies that own their POTW facilities.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
BASMAA PUMP	1	C.8.e.iii	Pump Station - General	This should focus on identified receiving water quality problems, & be practical, understandable, within the control and jurisdiction of stormwater agencies, and allow for flexibility to cost-effectively solve water quality problems.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
BASMAA PUMP Fairfield City SCVURPPP FSSD San Mateo County Pacifica SouthSF	5-6 11 8 12 9 6 1	C.8.e.iii	Pump Station - General	Replace C.8, 11, & 12 pump station requirements with one requirement for permittees to work with BACWA and the sanitary sewer agencies to assess existing information & develop a work plan & time schedule to characterize possible stormwater pollutant	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.

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Alameda City Suisun Berkeley ACCWP	18 3 MP-9 MP-9			problems with pump station discharges that identifies possible and recommended solutions depending on the types of problems identified.		
Fairfield City	10	C.8.e.i ii	Pump Station - General	This is focused on diverting pump station dry weather & first-flush flows to sanitary sewer without an understanding of the problems, if any, posed by pump station discharges.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
Milpitas	10	C.8.e.i ii	Pump Station - General	How does observation of black-colored water discharges from the Alvarado pump station (Fact Sheet pg. 18) confirm that low dissolved oxygen in the slough was caused by urban runoff?	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
SCVURPPP - Olivieri, A	6	C.8.e.i ii	Pump Station - General	Permittees could characterize, but not get into solving the problem, in this term.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
SMCWPPPAtt3-Table	MP-5	C.8.e.i ii	Pump Station - General	Object to pump station investigations as described in MRP.		
Alameda Co	11	C.8.e.i ii	Pump Station - Method	It makes sense to start with a qualitative survey or visual inspection, to determine if dry weather discharge is occurring.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
Contech	4	C.8.e.i ii	Pump Station - Method	Review & consider the Low Flow Diversion structure used in municipal projects from other CA cities while investigating the dry weather discharges.		
JamesRoger AttII	65b	C.8.e.i ii	Pump Station - Method	Initial screening reports should include drainage area, land uses, estimated pump station capacity, & nearest sanitary sewer connectable by gravity or pumping (for early implementation). These factors should be considered in prioritizing the 10 worst stations for investigation.		
Livermore	10	C.8.e.i ii	Pump Station - Method	Use of a simple ranking with no evaluative criteria is arbitrary. If all ~~sample results met drinking water~~ standards, the “lowest” ranked sites would still require additional sampling.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.

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				Some criteria should be added to evaluate the data, or preferably, this requirement should be eliminated.		
Milpitas	15	C.8.e.iii	Pump Station - Method	Replace "within 24 hours of significant storm event" with "within the next business day after a significant storm event" to avoid payment of double or triple overtime for on-call field crews.		
Milpitas	18b	C.8.e.iii	Pump Station - Method	Why collect 5 daily samples for one week in summer and again in early fall? Is it reasonable to expect trends in water quality parameters that relate to the day of the week, or is this driven by desire to have replicate sample results? It's less costly to collect duplicate grab samples during a single visit. If concerned that stations operate intermittently, we'll provide pump run charts to document operation.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
San Jose Att A	61	C.8.e.iii	Pump Station Criteria	What criteria or process of selection or parameters of interest were used to determine the designated pump stations in Table 8.4?	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
Alameda City	31	C.8.e.iii	Pump Station Timing	Timing is inconsistent: in C.8.e.iii.(1), grab samples are collected in "early summer" (after June 20th) & "early fall" (after September 20th) 2009. The ranking, based on analysis of all regional results, is by July 1, 2009, before the first set, let alone the second set, of samples is reasonably required for collection. A similar timing conflict exists in C.8.e.iii.(2). Required timelines for next-stage study planning are unreasonable, such as Dec. 31, 2009, & Dec. 31, 2010, for C.8.e.iii.(1), & C.8.e.iii.(2), respectively. Subsequent deadlines should be adjusted accordingly.	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
CCCWP	17	C.8.e.iii	Pump Station Timing	The 2009 date in 1st sentence appears incorrect. If permit becomes		

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				effective July 1, 2008, it will be extremely difficult to commence sampling in early summer. Other dates called out in (2) and (3) are also confusing.		
GCRCD-Att	28	C.8.e.iii.	Pump Operator	Why isn't the Operation Agency listed for many of the pump stations?	After considering all comments, we determined pump station requirements should be in Provision C.2.	Delete Dry Weather Discharges & First Flush Investigations monitoring project.
SMCWPPPAtt3-Table	5	C.8.e.iv	Geomorphic project	Have concerns about geomorphic project.	This project is intended to obtain information on how or where could creeks be restored in order to reduce pollutant impacts of urban runoff, including flow rates & durations. It is not a "research project."	None
JamesRoger AttII	67	C.8.e.iv	Geomorphic project method	Is this information required to implement Hydromodification Management Standards, or is this a research project that could lead to new regulatory requirements? If the latter then either delete or fund by the Water Board as a research project conducted by a university.		
Friends of Five Creeks	3	C.8.e.iv.	Efficacy of geomorphic project	Given the 10,000 sq.ft. trigger in C.3 for treatment & one acre trigger for hydromodification control, do you think this requirement will help creeks? I think not. Other sections of C.8.e.iv. should be required, not optional, in order to monitor how storm flows affect incision, erosion, and the like.	We agree with the concept that runoff from urban development modifies creeks, but disagree that Permittees should be required to conduct additional geomorphic projects at this time, given the balance of the workload.	None
GCRCD-Att	29	C.8.e.iv.	Geomorphic project method	Why was Geomorphic Monitoring moved from the Monitoring Work Group's Table 8.1? Why was requirement for 3 geomorphic assessments/yr deleted? Now Permittees have the choice of performing more time-consuming, detailed, geomorphic field measurements or an easier stormwater retention location inventory: it is not difficult to guess which will be selected.	Geomorphic projects were moved from Status Monitoring so Permittees could more logically select project locations & to offer more types of projects. The number of Geomorphic Projects was reduced out of consideration of total monitoring costs.	None
GCRCD-Att	30	C.8.e.i	Geomorphic	Why were Substrate Characterization	We agree that stream flow	None

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		v.	project method	& Stream Flow monitoring requirements deleted from drafts of Table 8.1? Stream flow monitoring is essential to improving water quality & stream function. Flow on all moderately sized and major waterways must be monitored, i.e., by a functional USGS gage station. The small size & low cost of computer controlled, battery powered flow monitors make installation easy & inexpensive. Require flow gages on all moderate & major waterways within some specified time frame.	is very useful data, and are obtaining flow data through the State's SWAMP; however, given the difficulty linking average flows to urban discharges, we removed flow monitoring to reduce overall monitoring costs.	
JamesRoger AttII	66b	C.8.e.iv.	Geomorphic project method	Focusing on decentralized landscaped-based retention systems will not likely be successful, & is costly. There are so many other opportunities to improve the overall health of an impacted water body. Amend this requirement or have it funded by the Water Board as a research project conducted by a university.	This provision is not intended or written to focus on retention systems. Instead, it does consider the many other opportunities to improve the overall health of a water body, so that storm water impacts may be reduced.	None
JamesRoger AttII	66a	C.8.e.iv.	Geomorphic project method	Encourage many actions: instream recharge, increasing shading, runoff detention and storm drain flow attenuation, regional projects that can be located where groundwater recharge is optimal, stream setbacks, removal of fish migration obstacles, installation of full capture devices to control the discharge of trash and gross pollutants, stream channel meandering or obstructions to slow erosive flows and removal of invasive vegetation.	We believe the geomorphic projects can and should encourage the types of projects described in this comment.	None
Oakley	56	C.8.e.iv.	Geomorphic project not appropriate	This should be a regional project.	As with everything in Provision C.8, geomorphic projects may be done regionally.	None
SCVURPPP ATT	58,	C.8.e.i	Geomorphic	This is beyond the scope of NPDES	We disagree. Geomorphic	None

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A, ACCWP–Hearing–Feng, A.	4	v.	project not appropriate	permits. This Water Board & State Board are developing regulatory policy on this issue; inclusion is premature.	projects complement hydro-modification management requirements of C.3.g. & support efforts to reduce the impacts of storm water runoff on receiving waters.	
GCRCD-Att	9 thru 14	C.8.e.iv.	Known Geomorphic influences	Six existing sources of hydromodification along the Guadalupe River are described.	Thank you for this information.	None
CCCWP	19	C.8.e.v.	Monitoring Project Reports	Delete stand-alone monitoring project report requirement; require only status reports in each Annual Monitoring Report.	A brief status report is to be included with the Annual Monitoring Reports. A stand-alone project report is needed following project completion, so that interested parties are not forced to piece together a series of status updates.	None
Oakley	57	C.8.e.v.	Monitoring Project Reports	Are BOTH required: status results in the annual report and a separate report within 6 months of completion?	Yes. A brief status report is to be included with the Annual Monitoring Reports. A stand-alone project report is needed following project completion, so that interested parties are not forced to piece together a series of status updates.	None
SCVURPPP ATT A	59	C.8.e.v.	Report Timing	Monitoring Project Reports - The numerous required dates for submittals throughout the Tentative Order make reporting schedules overly cumbersome and confusing. We request that monitoring project reports are included either in the Annual Urban Creeks Monitoring Report or in the Annual Report.	Many Permittees commented that Annual Reporting is already burdensome; asking them to track & include monitoring reports would add to, rather than streamline, this process. Also, monitoring reports are commonly reviewed separately from Annual Reports, so it's most effective when monitoring reports stand alone.	None
Santa Clara	6b	C.8.f.	POC is Beyond	Pollutants of Concern monitoring	This comment pertains to	None

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			City Authority	requirements are beyond our ability to regulate. Air deposition of pollutants, mercury from brake pads, & application of pesticides by State certified contractors are a short list.	the adoption of TMDLs themselves, rather than this Tentative Oder. Pollutants of Concern monitoring is vital to evaluation of TMDL implementation actions.	
JamesRoger AttII	70	C.8.f.	POC Category 3	Add a Category 3 with all other pollutants covered by Basin Plan including CTR parameters. Analyze for these at least once during permit term & during the initial major runoff event. The data can be used to determine monitoring needs in next permit term.	We disagree that this level of monitoring is warranted or connected to urban discharges.	None
CCCWP	21	C.8.f.	POC monitoring goal	Since it will not measure progress towards WLAs, what is the water quality benefit of this provision?	While the POC monitoring is not sufficient to determine progress toward achieving TMDL load allocations, it will assess inputs of POCs to the Bay, assess progress toward achieving WLAs, and help resolve uncertainties associated with loading estimates.	None
SF Bay-keeper	54	C.8.f.	POC monitoring goal	The goal of assessing progress toward achieving WLAs for TMDLs, contradicts footnote 32, which says monitoring frequency and type is not sufficient to determine load allocations for the TMDL.		
CCCWP	22	C.8.f.	POC general	Regional Board should work with BASMAA to develop a regional pollutant of concern monitoring plan, combining C.8.d, within 2 years & implementation in 3rd year.	While we disagree with the letter of this comment, we agree with the concept: that Permittees, working through a collaborative structure, may modify the design (not content) of the required monitoring.	Add a statement in C.8.a (Compliance Options) allowing a regional monitoring collaborative to alter the design (but not the types or quantities) of required monitoring.
CCCWP	27	C.8.f.ii.	POC general	Eliminate this section; it is not well thought out.	We disagree that this section should be eliminated, as it is vital to evaluation of TMDL implementation actions. Some aspects of the section will be clarified.	Move the reporting requirements to Provision C.8.h. Eliminate reference to USEPA methods & SWAMP protocols. Streamline method description.
SCVURPPP ATT A	60a	C.8.f.	POC timing	Allow time to “phase-in” POC	After consideration of this	None

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				monitoring stations, e.g., one for each countywide program could go "on-line" in year 2 & the other in year 4. This would allow programs to learn from monitoring conducted at a single site before adding an additional site. Considering that POC monitoring is likely to continue beyond the 5-year permit term to assess TMDL progress, a 1-2 year phasing process wouldn't significantly impact the intent of this monitoring requirement.	comment, we determined that monitoring requirements are adequately phased in, and no further phasing is warranted.	
SMCWPPPAtt3-Table	6	C.8.f.	POC timing	Begin sampling all stations for POCs in Year 2.	Monitoring conducted through a regional collaborative, as we expect POC monitoring will be, is required to begin in Year 2.	None
Berkeley, ACCWP	MP-6a, MP-6a	C.8.f.	Table 8.5	Move dissolved & total metals to Table 8.5 from Table 8.2. Clarify what if any "organics" should be added to Category 1 or 2.	We disagree. Table 8.2 (Status & Trends) is done once per waterbody, rotating through all the Permittees' major waterbodies over time, in order to determine the "status" of each major waterbody vis-à-vis urban runoff discharges. Table 8.5 is fixed-station monitoring.	None
JamesRoger AttII	71	C.8.f.	Table 8.5	Characterize pollutants across particle sizes, to provide information for designing enhanced stormwater treatment systems for complying with water quality standards. Techniques for this type of monitoring are challenging & costly, so require technique development & validation before implementation.	Permittees may choose to do this as part of or in support of their BMP Effectiveness Evaluation project. We disagree that it should be required.	None
Brown and Caldwell/CCCWP – AbusabaK	11	C.8.f.	Table 8.5	For total PCBs in water analysis, specify Method 608 or 1668. Only ~~Method 608 is promulgated, but the~~ detection limits are high; thus data provide limited information. Method	Most Permittees preferred that methods not be overly specified, to provide flexibility as methods change and as the	None

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				1668 has lower detection limits but it can also detect PCBs in rainwater, arctic snow, ultrapure reagent blanks of laboratory water.	monitoring program evolves.	
CCCWP	25	C.8.f.ii.	POC methods	Specify a method for PCBs in water. Method 608 is the only method promulgated for compliance monitoring. More sensitive Methods, such as 1668A, can detect PCBs in ultrapure water blanks. Should method 1668A be specified, a method detection limit should be developed based on a series of measured procedural blanks, consistent with the trace metal methodologies of the RMP. Such a detection limit study is a considerable undertaking.		
Brown and Caldwell/CCCWP – AbusabaK	11	C.8.f.	Table 8.5	Measuring methyl mercury in a 24-hour composite doesn't get you anything: samples must be collected & frozen immediately. The bacteria may be creating & destroying methyl mercury over that 24-hour period.	Agreed.	Change to collection of a grab sample.
CCCWP	24	C.8.f.ii.	POC methods	How does measurement of methylmercury in a 24-hour flow weighted composite provide useful information? Methylation and demethylation can occur in bottles over a 24 hour period; what would that tell you about the waterbody sampled?		
JamesRoger AttII	69	C.8.f.i.	POC locations	Designate specific monitoring locations for Guadalupe River, Walnut Creek & San Mateo Creek. Guadalupe River station should be at SFEI's recent monitoring site; Walnut Creek downstream of confluence with Grayson Creek in Pacheco Slough; and San Mateo Creek at Gateway Park.	These may be excellent locations for POC monitoring, and Permittees are free to select them. After considering all the comments on sampling locations, we determined these exact locations need not be specified; rather Permittees should have flexibility.	None

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CCCWP	23	C.8.f.i.	POC locations	Rheem Creek at Giant Road is privately owned & there are railroad safety issues. Better: Rheem Creek at Wanless Park or Wildcat Creek at 3rd ST.	While the locations remains unchanged, alternate locations are allowed.	Allow alternate locations to be selected.
SMCWPPPAtt3-Table	6	C.8.f.ii.	POC methods	We have concerns about storm event monitoring conducted as described in MRP.	We realize storm event is not popular, because it requires sampling labor at any hour. However, wet weather sampling is necessary to evaluate mass emissions from MS4s and is required of MS4s across the country.	None
CCCWP	26	C.8.f.ii.	POC methods	Methods for category 2 pollutants are not specified. For example, to ensure consistent selenium results, collision cell ICP-MS should be employed. Promulgated methods for organochlorine pesticides may not have detection limits low enough to provide useful results.	Most Permittees preferred that methods not be overly specified, to provide flexibility as methods change and as the monitoring program evolves.	None
SCVURPPP ATT A	60b	C.8.f.iii.	POC methods	USEPA protocols cited are 16 years old, much has been learned. Revise this section to allow for alternate stations where POC monitoring will occur, and for science-based deviations in the POC monitoring design, including sampling frequency and interval listed in Table 8.5, based on the agreement of participants in the RMC and/or scientific panels/reviewers.	We agree that the USEPA protocols were cited in error. We agree that science-based deviations from the POC monitoring design should be allowed.	Remove reference to USEPA protocols. Add a statement in C.8.a (Compliance Options) allowing a regional monitoring collaborative to alter the design (but not the types or quantities) of required monitoring.
Oakley	58	C.8.f.v.	Sediment Delivery Budget	Define what is meant by a “robust sediment delivery estimate/sediment budget”.	A scientifically-based estimate of the sediment inputs and outputs of an aquatic system.	None
JamesRoger AttII	72	C.8.f.v.	Sediment Delivery Budget	Defer the sediment delivery study until results are available from ~~Pollutants of Concern Monitoring or~~ RMP tributary study. Use this time to consult with USGS experts (Art	We do not consider this to be a redundant requirement because Permittees may fulfill any requirement of Provision C.8 using data	In C.8.a.iv. change “this Provision” to “Provision C.8” for added clarity.

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				Horowitz) to determine a scope, cost & benefits of such a study.		
SCVURPPP ATT A	61	C.8.f.v.	Sediment Delivery Budget	RMP is conducting a study to develop preliminary estimates of sediment delivery to the Bay from creeks. Revise this section to state that this RMP study will satisfy this requirement, or delete this redundant requirement.	collected by third-party organization(s).	
SF Bay-keeper	53	C.8.f.vii.	Emerging Pollutants	The workplan for emerging pollutants needs more detail. Five years is too long because by then we should be controlling these constituents.	We disagree that it is appropriate to begin sampling for emerging pollutants before the background work and workplan are completed. Given overall monitoring requirements, we do not think it is appropriate to speed up this work.	None
CCCWP	4	C.8.g.	Volunteers	The main benefit of volunteer monitoring is involving the community in watershed management, not a cost-saving mechanism. The most appropriate roles for volunteer monitors are benthic macroinvertebrate indicies (BMI), rapid trash assessment (RTA), and stream surveys. Sampling for chemical & toxicological analysis is more appropriate for trained professionals. If the Regional Board wishes to see citizen volunteers involved in more complex sample collection tasks, safe harbor language is needed.	We agree and intend that volunteer monitoring be promoted in order to allow & encourage community involvement in watershed issues, and not as a cost saving mechanism per se. We do not intend for citizen monitors to do more complex types of sampling. The bioassessment parameters are not difficult to measure or sample and don't preclude the use of volunteers.	None
CCCWP	28	C.8.g.	Volunteers	Some new biological assessments parameters (periphyton, CPOM, pebble counts & cobble embededness) are beyond the capabilities of volunteers. We request these parameters be removed so volunteers can continue to collect	While we encourage volunteer involvement, we cannot promote the collection of data that are inconsistent with data collected throughout the State and in our Region by	None

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				these data.	SWAMP, especially when we need consistent data to develop Indices for bioassessment data.	
Moraga Mayor	6	C.8.g.	Volunteers	C.8 methods are too prescriptive for volunteer monitors, who are very effective for achieving compliance.		
Oakley	60	C.8.h.	Data Format	For reports required in SWAMP format, can 1 format be used for all data submittals or will individual formats/files be created for each dataset required (C.8.h.i, C.8.i, C.10.b.ii, etc.)?	SWAMP data formats are generally organized by parameter. The bioassessment parameters are not difficult to measure or sample and don't preclude the use of volunteers.	None
Oakley	59	C.8.h.	SWAMP protocol	C.8.h requires data be in SWAMP format. The web link reveals a detailed data outline. Provide the electronic form so that Permittees will have compatible data formats.	We intend to see that Permittees have the proper forms as needed. We will not include the form in the Tentative Order, because it's possible the form will change over time.	None
SCVURPPP ATTA CCCWP Berkeley	62 29 26	C.8.h.i.	Report Timing	Move the due date for Annual Urban Creeks Monitoring Report to at least 6 months after Electronic Data Reports are due (currently Nov. 30th).	Originally we proposed such a timeline, but Permittees strongly requested that the 2 reports be due at the same time.	None
Contra Costa County Supervisors WQM	5	C.8.h.	Report Timing	Change the timeline for reporting on monitoring projects from 6 months, to 1 yr following data collection or in the next annual report.	We disagree that additional time is needed for such reports.	None
SMCWPPPAtt3-Table	8	C.8.h.i.	Report Timing	Have concerns about Nov. 30 due date for Electronic Report & Urban Creeks Mon. Report.	The Nov. 30 due date was selected by Permittees, and we consider it a long time-frame, especially for receiving raw data that was collected as long as 16 months previously, at the beginning of the fiscal year that the report covers.	None
ACCWP Newark Berkeley	11 11 27	C.8.h.	Report Timing	The Nov. 30 due date for both reports has detrimental effects (lab rush charges, force local agencies to request reporting schedule adjustments for any regional collaboratives, reduce opportunities for stakeholder input to Urban Creeks Monitoring Reports). Resolve by clarifying who (Permittee or Regional Collaborative) is responsible for each requirement.		

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JamesRogerAttII	6b	C.8.h.iii.3.	Definition	Define a water quality problem as exceedance of a water quality standard/objective or prohibition.	Several parameters do not have water quality standards, which is why the more generic term "problem" is used.	None
JamesRogerAttII	73	C.8.h.iii.5.	Report Content	Make the report required by C.1. a stand alone requirement under C.8.h.ii.(5). The report should require all the elements in Provision C.1.a. Also require written notification of the exceedances within 30-days. Require 60, 90 & 120-day reporting on the status & schedule for identification of additional or enhanced BMPs. The exceedance of a water quality standard or discharge prohibition must also trigger an accelerated monitoring program to confirm the magnitude & level of the exceedance.	We agree with the concept that link between monitoring results and the Water Quality Standards Exceedences Provision (C.1) should be clear, and that the dates should be clear.	Rewrite Provision C.1 to clarify reporting dates. Add a paragraph to the C.8 reporting provision linking C.1 requirements to monitoring results.
SCVURPPP ATT A	63	C.8.h.iii.	Report Content	Remove the requirement to include a "budget summary for each monitoring requirement"; not clear why it is needed.	Cost of monitoring requirements is often an issue (see above). In order to determine current costs, and relative merit of future monitoring requirements, the Water Board must have a good picture of costs incurred.	None
Oakley	62	C.8.h.iv.	Report Content	The report is to include "Exhibition of pollutant load…" What does this mean?	It generally means to tabulate or similarly show the pollutant load.	None
Oakley	136	C.8.	Report Content	The Permit and Summary Table list requirements for C.8. Nothing is listed for submittal. What is required?	All C.8 submittal requirements are stated in C.8 & not in Attachment L. We agree this should be clarified in Attachment L.	Clarify in Attachment L that all monitoring reporting is described within Provision C.8.
Oakley	187	C.8.	Report Content	Attach L, Section III doesn't list submittal for C.8. This section says see C.8.h.iv, however C.8.e.v cites C.8.h.ii for reporting requirements. What is required?		
JamesRogerAttII	74	C.8.h.iv.	Report Content	Add bullets requiring reporting of: Sampling management or analytical procedures that would limit the quality	We believe these are covered under the 2nd & 3rd bullets of C.8.h.iv.	None

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				of the data; Sample mngt procedures including methods used for subsampling.		
Oakley	61	C.8.h.	Report Content	C.8.h.iii discusses an integrated report. C.8.h.iv discusses content, but C.8.h.ii has a required report and its content differs from h.iv. Clarify what is required.	C.8.h.iv. lists the items that any type of monitoring report would contain.	None
Oakley	52	C.8.h.	Report Content	Sections of C.8 do not have reporting requirements until Section C.8.e, "Monitoring Projects". C.8.e & C.8.f refer to C.8.h. We presume all the reporting requirements then embodied in C.8.h.	That is correct.	None
Pittsburg	7	C.8.h.	Reporting	Remove the "Urban Creeks Monitoring Report" requirement; it's time consuming & will yield little/no water quality benefits. It's unrealistic, or impossible, to perform the extensive mapping, compile data, generate tables & figures, develop hypotheses, & evaluate annually.	Permittees are currently doing annual reporting of their monitoring efforts; this simply continues the annual reporting. It may be difficult if each Permittee were to compile its own report, but to date monitoring has been done on a county-wide basis, and it may be done on region-wide basis under the Tentative Order.	None

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CCCWP	1	C.10, C.11, C.12, C.13, C.14	Collaborative Effort	*Repeat C.8's 1st paragraph (Regional Collaboration) at the beginning of C.10, C.11 etc. for which it is intended to apply. As written, it can seem to apply only to C.8.*	We agree.	Repeat C.8's 1st paragraph (Regional Collaboration) at the beginning of C.10, C.11, C.12, C.13, and C.14.
SCVWD	5	C.11	address Guadalupe River, not stormwater	*Requests that the Regional Board staff work with us to develop an alternative that allows the storm water program to direct its resources toward (monitoring and load reduction) activities that address the larger sources of mercury in the Guadalupe River rather than on activities that result in very small reductions or none at all, as is the case with additional monitoring requirements.*	The Guadalupe River TMDL will result in other actions targeting the mercury load from the Guadalupe River. However, the provisions of this permit are unlikely to be burdensome for the Water District because the monitoring and pilot projects are not likely to take resources away from efforts focused on Guadalupe River.	
Oakley Moraga	75	C.11	Clarify meaning	*How does one estimate the amount of mercury in a device?*	Permittees may use widely available published data for the amount of mercury contained in various devices and multiply this by the weight or number of devices collected. BASMAA may provide assistance in this estimate.	
Sunnyvale	26	C.11	Diversion to POTW	*Very concerned about the required storm water pump station studies , the Monitoring Projects provision (C.8.e.iii), and the approach the Tentative Order takes toward focusing on the diversion of dry weather flows and first flush flows from stormwater pump stations to sanitary sewer lines.*	The focus of the diversion provisions on dry weather flows and first flush flows from pump stations are intended to address known water quality problems. The commenter did not suggest the nature of the concern in this comment so a more detailed response is not possible.	
SMCWPPP	15	C.11	methyl mercury monitoring, streamline	*This requirement should be deleted from this section of the permit because it is already listed under Provision C.8.*	Provision C.11.b clearly refers to Provision C.8.f to provide more detail. There is no confusion and no need to duplicate this provision.	
SMCWPPP	15	C.11	Need more time	*Proposes that the drainage areas with elevated mercury be identified within one year of the permit's adoption.*	Pilot studies for mercury are to be closely coordinated to PCBs-related provisions and sited based on PCBs concentrations. The schedule for accomplishing the C.11 and C.12 Provisions is appropriate as is.	
SMCWPPP	15	C.11	recycling limited to threats	*Requirement should be limited to the mercury containing devices and equipment that pose a threat to contaminate MS4 runoff. SMCWPPP*	The provision, as currently stated, provides an opportunity for permittees to receive credit toward	

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				is unaware of any studies that demonstrate that MS4 water quality is threatened by the use of mercury-containing thermostats and switches.	meeting load reduction requirements by quantifying the amount of mercury contained in recycled devices. With the large load reductions required of permittees, it is unwise for a permittee to request that such opportunities be limited to only that amount of mercury which has been demonstrated to threaten runoff. It simply does not make sense to limit the flexibility of permittees by constraining load reduction opportunities.	
ACCWP	43	C.11	Tie POC actions to PCBs	*The T.O. specifies levels of implementation that go beyond the previous discussions between WB staff and BASMAA and other stakeholders, or what we can confidently say is cost-effective with current knowledge. Provisions C.11.d-f should be chosen primarily on the basis of the potential for reducing PCB loads, but consideration will be given to mercury removal in the final design and implementation of the studies".*	The tentative order is very faithful to the discussions between Water Board staff and BASMAA and other stakeholders. The large majority of provisions for PCBs and mercury are implemented at the pilot scale. All of these provisions have already been selected on the basis of their potential for reducing PCBs loads. These are the final choices from a larger list of candidate actions that were chosen through discussions between the Water Board, BASMAA and other stakeholders.	
Moraga Mayor	4	C.11 - C.14	Focus	*The draft MRP requires many new studies, plans, surveys, and detailed reports. Permittees not only do not currently have the needed expertise on staff, but do not have the staffing capacity or funding to conduct or contract for all the required studies. The Regional Board must either eliminate some of the studies or prioritize their implementation.*	The C.11 through C.14 provisions have been identified as priority areas for implementation. Provisions for mercury, pesticides, and PCBs come directly from adopted or nearly-adopted TMDLs. Further, the provisions have already been prioritized and many provisions for PCBs and mercury are to be implemented at a pilot level of implementation in order to determine effectiveness prior to wide-scale implementation. Based on the TMDL implementation schedule, permittees must begin a variety of	

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					efforts this permit term if they wish to attain the load reductions required in the TMDLs on which these provisions are based.	
Moraga Mayor	5	C.11 - C.14	Municipalities not responsible for TMDL development	*It is not the local agency's role to develop TMDLs. The draft MRP not only requires studies to determine current pollutant loadings, but also directs the permittees to essentially develop the TMDLs. This requires local agencies to address regional problems and coordinate with other State agencies to do so.*	The permittees are not being required to develop TMDLs, but they do have a responsibility to implement management measures stemming from TMDLs, and they also have a responsibility to assess their cause and contribution to the violation of water quality standards.	
Mountain View	14	C.11, C.12	abatement, too expensive,	*The Regional Permit requires municipalities to investigate and abate land sources of mercury and PCBs. The investigation and abatement requirements in the Regional Permit would require significant staff and budget, and most likely would need to be conducted by professionals with specialized training investigating these sites.*	Significant resources will likely be necessary to implement C.11 and C.12. This should not have come as a surprise to permittees given that these requirements are derived from the TMDLs for PCBs and mercury. The load reductions required for these two pollutants from urban runoff are substantial.	
Moraga	6	C.11, C.12	BMPs	*When inspecting industries for "proper" BMP's, what are the "proper" BMP's? Who decides? Permittees aren't expert in industrial equipment and processes such as:* *• PCB containing equipment* *• Copper related to plating and metal finishing.*	Permittees do have expertise in identifying BMPs that will minimize or eliminate the discharge of pollutants from industrial facilities to stormwater. You do not have to be expert in the industrial process, but you do have or should have experience and expertise in BMPs to protect stormwater.	
BASMAA	3	C.11, C.12	cost	*Based on the requirements presented in Provision C.12 (PCBs) and C.11 of the MRP Tentative Order, average annual costs to all countywide stormwater programs are in excess of $1 million. Additionally, average annual costs for complying with Provision C.11 (mercury) are roughly $375,000. Total costs to countywide stormwater programs for mercury and PCBs together during the entire 5 year permit term are roughly $5.3 million. These costs do not include capital costs of retrofitting pump stations, diverting stormwater*	See response to Mountain View's comment number 14.	

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				to POTWs, or abating properties or public right-of-ways, which are likely to be 1-2 orders of magnitude higher than these estimates.		
SF Baykeeper, NRDC, & Clean Water Action	30	C.11, C.12	criteria for pilot tests	*The Permit should identify the basis/criteria on which the pilot project locations will be selected other than just being evenly distributed.*	Other criteria are suggested in the Provision. Namely, locations of elevated PCBs or mercury concentrations, , and technical and economic feasibility. There were additional considerations given in revised TO.	
SMCWPPP	15, 16	C.11, C.12	diversion to POTW, proposal	*Permittees should work with BACWA to develop a plan for a feasibility study. In addition, SMCWPP recommends that the permit be modified to state that the municipalities will assist the regulatory oversight agencies to identify funding and/or potential responsible parties to implement diversions of stormwater pump stations flows, if any diversions are found to be appropriate, and/or implement other potential BMPs.*	Permittees are free to work with BACWA and sanitary sewer agencies as they comply with diversion-related provisions, but the specific proposal to simply develop a plan for diversions by the end of the permit term is not acceptable.	
Hayward	6	C.11, C.12	diversion to POTWs	*Requiring sanitary sewer diversion projects before the data from current diversion projects has been evaluated is premature.*	The diversion-related provisions are reasonable and already include a data-gathering, feasibility assessment component to guide selection of the actual diversion projects.	
Hayward	7	C.11, C.12	diversion to POTWs	*Requirements assume that local POTWs have the hydraulic and treatment capacity to handle stormwater discharges and the infrastructure in place to carry stormwater to the sanitary sewer, which is far from the case for many local jurisdictions.*	No diversion project will be implemented or required for POTWs that can demonstrate that such diversion would result in exceedance of NPDES effluent limitations or that does not have the hydraulic or treatment capacity to handle the diverted water during the target period of diversion. There may be jurisdictions that do not have such capacity, but some certainly do have such capacity. Capacity and effluent limit considerations should be addressed during feasibility assessment component of these provisions.	

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Hayward	8	C.11, C.12	diversion to POTWs	*Wastewater treatment plants are designed to treat biological waste and not the pollutants that the MRP is trying to address with the required diversion pilot projects (mercury and PCBs). Diverting such pollutants to the POTW could affect treatment processes and result in NPDES effluent limitation violations.*	No diversion project will be implemented or required for POTWs that can demonstrate that such diversion would result in exceedance of NPDES effluent limitations or that does not have the hydraulic or treatment capacity to handle the diverted water during the target period of diversion. There may be jurisdictions that do not have such capacity, but some certainly do have such capacity. Capacity and effluent limit considerations should be addressed during feasibility assessment component of these provisions.	
Santa Clara	2	C.11, C.12	diversion to POTWs	*No analysis has been conducted to determine the effects that these requirements will have on the POTW's. The POTW's may not be adequately sized to accommodate these increased flows. Additional funding not currently available, would be necessary to expand POTW treatment capacity.*	No diversion project will be implemented or required for POTWs that can demonstrate that such diversion would result in exceedance of NPDES effluent limitations or that does not have the hydraulic or treatment capacity to handle the diverted water during the target period of diversion. There may be jurisdictions that do not have such capacity, but some certainly do have such capacity. Capacity and effluent limit considerations should be addressed during feasibility assessment component of these provisions. There is no requirement for POTWs to expand their capacity. The intent is to use existing spare capacity where it exists.	
San Jose	23, 75, attorney 10	C.11, C.12	diversions, legal constraints	*Provisions do not take into account possible technical and legal restrictions on the use of POTW infrastructure and capacity for stormwater. Technical and legal constraints should be explicitly mentioned as criteria for evaluating feasibility. Consideration of such diversions should be predicated on a*	There is little point to state all the criteria that may come into play for a feasibility assessment. The current wording does not preclude consideration of technical or legal constraints so it is not necessary to explicitly include such constraints.	

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				collaborative feasibility study with wastewater agencies before being required as a permit provision.	The provision already mentions a feasibility assessment. We cannot accept the proposal to conduct the feasibility study before establishing diversion-related requirements in the permit.	
San Jose	24, 76, attorney 10	C.11, C.12	diversions, permit inconsistent with TMDL	*San José is also concerned that Provision C.11 is inconsistent with the PCB TMDL and BPA. The PCB TMDL only states that opportunities for targeted diversions should be investigated, pilot tested, and implemented where feasible. The TMDL further states under Regulatory Analysis (page 93): "No specific project to route stormwater to a wastewater treatment plant is currently required."*	The permit is consistent with the TMDLs. The permit is precisely requiring the investigation, pilot testing, and implementation of such projects where feasible. At the time of the TMDL and as of right now, there is NO SPECIFIC project required. However, after the feasibility assessment, there will be required projects in locations suggested by the assessment.	
SCVURPPP	8	C.11, C.12	diversions, pump stations, inconsistent	*The diversion requirements are strongly focused on first flush and dry weather flows from pump stations to the sanitary system without sufficient information about possible mercury and PCBs problems related to those pump stations or whether diversion to sanitary is the best approach to addressing potential problems. The Monitoring Provision (C.8) requires that the final five pump stations selected be tested for mercury and PCBs in the third and fourth years, while the PCB and Mercury Provisions (C.11 and C.12) require five pump stations be selected for pilot diversion studies one to two years earlier. Requirements should be rewritten to address potential problems in a stepwise fashion and that discussion of flow diversion should be considered only as one of many possible solutions, assuming the results of investigations of pump station water quality justify such actions.*	The diversion provisions throughout the permit will be re-written somewhat for clarification of the various objectives for such work. However, we do expect that 5 pilot projects will be selected for the pollutants of concern component of diversion work.	
Sunnyvale	27, 28	C.11, C.12	diversions, pump stations, inconsistent	*The diversion requirements are strongly focused on first flush and dry weather flows from pump stations to the sanitary system without sufficient information about possible*	See response to SCVURPPP comment 8.	

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				mercury and PCBs problems related to those pump stations or whether diversion to sanitary is the best approach to addressing potential problems. The Monitoring Provision (C.8) requires that the final five pump stations selected be tested for mercury and PCBs in the third and fourth years, while the PCB and Mercury Provisions (C.11 and C.12) require five pump stations be selected for pilot diversion studies one to two years earlier. Requirements should be rewritten to address potential problems in a stepwise fashion and that discussion of flow diversion should be considered only as one of many possible solutions, assuming the results of investigations of pump station water quality justify such actions.		
San Jose	11, 22, 74	C.11, C.12	diversions, pump stations, inconsistent	*The diversion requirements are strongly focused on first flush and dry weather flows from pump stations to the sanitary system without sufficient information about possible mercury and PCBs problems related to those pump stations or whether diversion to sanitary is the best approach to addressing potential problems. The Monitoring Provision (C.8) requires that the final five pump stations selected be tested for mercury and PCBs in the third and fourth years, while the PCB and Mercury Provisions (C.11 and C.12) require five pump stations be selected for pilot diversion studies one to two years earlier. Requirements should be rewritten to address potential problems in a stepwise fashion and that discussion of flow diversion should be considered only as one of many possible solutions, assuming the results of investigations of pump station water quality justify such actions.*	See response to SCVURPPP comment 8.	
SF Baykeeper, NRDC, & Clean Water Action	31	C.11, C.12	LID as pollutant load reduction strategy	*These provisions should recommend that Permittees meet part of their load reductions through the implementation of LID strategies. Stream restoration activities identified in*	The provisions that have been identified in section C.11 and C.12 were those deemed most likely to result in significant load reductions of	

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				Provision C.9 (monitoring), should also be specifically mentioned as an abatement activity in this section.	mercury and PCBs. However, permittees are not precluded from demonstrating load reductions resulting from the implementation of LID strategies.	
SMCWPPP	15, 16	C.11, C.12	Loads monitoring	*This requirement should be deleted from this section of the permit because it is already listed under Provision C.8.*	Only the methyl mercury component of monitoring is duplicative. The other loads monitoring information in this section is relevant to provide information on how to show progress toward meeting load allocations.	
San Pablo	27, 29	C.11, C.12	no further study needed	*The County Program has already studied the levels of mercury in street sweeping and catch basins. Why should this be further studied?*	These provisions call for implementation, not just study, of projects to reduce mercury in runoff. Permittees are free to use past studies to guide such implementation.	
SCVURPPP	6	C.11, C.12	pilot tests too onerous	*Pilot testing of controls is required in an excessive number of locations and as a result may not be cost-effective. Scope of the pilot study work cannot reasonably be accomplished during the five year permit term, and pilot testing the diversion of stormwater runoff flows to POTWs is premature. The permit provisions should be scaled back and timelines extended in keeping with the TMDL's implementation plan.*	The TMDLs implementation plan requires that substantial load reductions be accomplished within 20 years. Therefore, significant effort must take place during this permit term to pilot test a wide range of control strategies so that information may be obtained on the optimum suite of control measures that will be necessary to achieve the allocations. See also the response to Santa Clara's comment number 2.	
Sunnyvale	29	C.11, C.12	pump station alternative proposal	*Diversion requirements should be replaced with a single requirement for the permittees to work with the sanitary sewer agencies to assess existing information and develop a work plan to characterize the possible stormwater pollutant related problems. proposed approach is: 1) develop (Bay Area wide) an inventory of municipally owned stormwater pump stations, 2) characterize operations, 3) collect general water quality data sufficient to characterize potential water quality issues, and 4) identify criteria to evaluate potential solutions and to develop*	Permittees are free to work with BACWA and sanitary sewer agencies as they comply with diversion-related provisions, but the specific proposal to simply develop a plan for diversions by the end of the permit term is not acceptable.	

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				recommended guidance to prioritize and implement appropriate solutions.		
South SF	1	C.11, C.12	pump station alternative proposal	*Diversion requirements should be replaced with a single requirement for the permittees to work with the sanitary sewer agencies to assess existing information and develop a work plan to characterize the possible stormwater pollutant related problems. proposed approach is: 1) develop (Bay Area wide) an inventory of municipally owned stormwater pump stations, 2) characterize operations, 3) collect general water quality data sufficient to characterize potential water quality issues, and 4) identify criteria to evaluate potential solutions and to develop recommended guidance to prioritize and implement appropriate solutions.*	See response to Sunnyvale comment 29.	
BASMAA	5	C.11, C.12	pump station alternative proposal	*Diversion requirements should be replaced with a single requirement for the permittees to work with the sanitary sewer agencies to assess existing information and develop a work plan to characterize the possible stormwater pollutant related problems. proposed approach is: 1) develop (Bay Area wide) an inventory of municipally owned stormwater pump stations, 2) characterize operations, 3) collect general water quality data sufficient to characterize potential water quality issues, and 4) identify criteria to evaluate potential solutions and to develop recommended guidance to prioritize and implement appropriate solutions.*	See response to Sunnyvale comment 29.	
Burlingame	16	C.11, C.12	pump station alternative proposal	*Diversion requirements should be replaced with a single requirement for the permittees to work with the sanitary sewer agencies to assess existing information and develop a work plan to characterize the possible stormwater pollutant related problems. proposed approach is: 1) develop (Bay Area wide) an inventory of municipally owned stormwater pump stations, 2) characterize*	See response to Sunnyvale comment 29.	

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				operations, 3) collect general water quality data sufficient to characterize potential water quality issues, and 4) identify criteria to evaluate potential solutions and to develop recommended guidance to prioritize and implement appropriate solutions.		
San Mateo Co.	10	C.11, C.12	pump station alternative proposal	*Diversion requirements should be replaced with a single requirement for the permittees to work with the sanitary sewer agencies to assess existing information and develop a work plan to characterize the possible stormwater pollutant related problems. proposed approach is: 1) develop (Bay Area wide) an inventory of municipally owned stormwater pump stations, 2) characterize operations, 3) collect general water quality data sufficient to characterize potential water quality issues, and 4) identify criteria to evaluate potential solutions and to develop recommended guidance to prioritize and implement appropriate solutions.*	See response to Sunnyvale comment 29.	
SCVURPPP	8	C.11, C.12	pump station alternative proposal	*Diversion requirements should be replaced with a single requirement for the permittees to work with the sanitary sewer agencies to assess existing information and develop a work plan to characterize the possible stormwater pollutant related problems. proposed approach is: 1) develop (Bay Area wide) an inventory of municipally owned stormwater pump stations, 2) characterize operations, 3) collect general water quality data sufficient to characterize potential water quality issues, and 4) identify criteria to evaluate potential solutions and to develop recommended guidance to prioritize and implement appropriate solutions.*	See response to Sunnyvale comment 29.	
Palo Alto	11	C.11, C.12	pump stations, do pilot studies first	*Permit requires diversion of dry weather and first flush flow to (POTW) from a specified number of storm water pump stations without consideration of the results of the prescribed pilot studies that will test the feasibility of such a diversion. The permit should be modified to*	The permit only requires pilot studies for 5 pump stations for this permit term. These 5 pilot projects will be selected on the basis of feasibility assessments conducted during this permit term. The language in C.11	

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				predicate the follow-up requirements on the results of the pilot studies.	and C.12 will be modified to make this clearer.	
Contra Costa Clean Water Program	2	C.11, C.12	Regional Collaboration	*Many elements of provisions C.11 – C.12 (mercury and PCB control measures) can be implemented though regional collaborations with other BASMAA members.*	We agree, and you are encouraged to do so.	
San Pablo	28, 30	C.11, C.12	too many pilot studies	*There are too many pilot projects (7). The Water Board already established the mercury TMDL so the permittees should be allowed some flexibility to decide what studies and abatement actions to take to meet the TMDL.*	There is flexibility built in regarding the particular selection of pilot projects based on feasibility and land use considerations. However, the pilot projects required in C.11 and C.12 provisions are those that have been identified as being strong candidates for pollutant removal and so must be implemented in some locations throughout the region. There is also flexibility to allow working with other permittees to implement the projects in a distributed fashion.	
Berkeley	34, 35, 37	C.11, C.12, C.13	collaboration clarification	*The TO is not clear on which requirements can be fulfilled by individual or regional collaborative efforts. Please add text to clarify that the requirements can be fulfilled by individual permittee efforts, by regional collaborative efforts, or by both.*	We will add language.	We added language regarding collaboration for every pollutant of concern Provision.
Central San	25, 30	C.11, C.12, C.13	Diversion to POTW	*Many of the proposed diversions to the sanitary sewer system put at risk sanitary agencies, such as Central San, for violating our NPDES permit, or more importantly, for causing sanitary sewer overflows. Diversion of these traditional flows to the sanitary sewer needs to be in a manner that defers to a sanitary sewer agency's authority to either deny or condition the acceptance of that water.*	See response to Santa Clara comment 2.	
Central San	26	C.11, C.12, C.13	Diversion to POTW	*Some of the diversions make a whole lot of sense as far as protecting water quality. Although acceptance of these types of sources do create challenges for us, we're prepared to meet those challenges, but the Regional Board staff needs to the sort of*	The Water Board does appreciate the challenges involved in accepting diverted stormwater. See also response to Santa Clara comment 2.	

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				challenge we're trying to address.		
Central San	27	C.11, C.12, C.13	Diversion to POTW	*Diversion to sanitary sewers should be done carefully so as not to allow diversions of stormwater flows to the sanitary sewer that don't belong there.*	See response to Santa Clara comment 2.	
Central San	29	C.11, C.12, C.13	Diversion to POTW	*Walnut Creek fisheries enhancement could conflict with promoting diversion of flows.*	Any location in Walnut Creek where diversion of water from a pump station during the dry season to a POTW that conflicts with fisheries enhancement may therefore not be a suitable candidate for a pilot diversion project.	
Central San	31	C.11, C.12, C.13	Diversion to POTW	*You should fully evaluate the cross-media issues associated with any proposed diversion before requiring any resources to be used towards either enabling them or even studying their feasibility, and also consider and authorize if possible the permit modifications for the NPDES permits issued to sanitary sewer agencies to allow for offsets to be provided should agencies accept these flows.*	See the response to Santa Clara comment 2. It is not clear what the commenter means be "cross-media" issues so we cannot respond in detail to this comment. A range of technical issues can be studied by permittees in the feasibility evaluation.	
Central San	32	C.11, C.12, C.13	Diversion to POTW	*Focus on source control rather than just diverting flows to sanitary sewer*	There are numerous provisions focused on source control of pollutants of concern.	
ACCWP	91	C.11, C.12, C.13	Diversion to POTW	*Requiring stormwater diversions to sanitary sewers are beyond the control and authority of some of the permittees. Municipalities simply do not have that legal authority. The sanitary sewer agencies must make some critical decisions to decide whether that waste can be accepted.*	Sanitary sewer agencies retain the ability to make decisions regarding the acceptability of routed stormwater.	
Oakley	142	C.11.	Reporting	*The items for C.11 are not in order. Please re-arrange to have them in alphabetic order.*	As stated in Provision C.16 of the revised tentative order, All annual reporting shall be in the format set forth in the Annual Report Form that will be developed in collaboration with the Permittees for the acceptance by the Executive Officer, by April 1, 2010.	
Oakley	147	C.11.	Reporting	*C.11.h & i have reporting requirements in the Permit & Summary Table but there is no submittal requirement. What is required?*	See response to Oakley comment 142.	

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Oakley	143	C.11.a.	Reporting	*Permit text for C.11.a requires reporting recycling amounts & estimates of mercury. This is also reflected in the Summary Table but there is no submittal requirement. What's required?*	See response to Oakley comment 142.	
Oakley	195	C.11.a.	collaboration clarification	*C.11.a mentions a collaborative effort that is not stated in the Permit text. We presume such collaboration is allowed.*	Collaboration is allowed.	
SCVURPPP attorney	34, 35	C.11.a-i, C.12.a-i	Diversion to POTW, not in federal permit	*Additionally, requiring flows to be diverted to the sanitary sewer is a new program not contemplated in the Federal Permit, could be infeasible, costly, and inconsistent with the TMDL and Basin Amendment Plan, and could have a deleterious effect on water quality.*	The concept of diversion to sanitary sewer is mentioned explicitly in the TMDL staff report for both the mercury and PCBs TMDL. There are many specific control measures that may not be contemplated in the Federal permit.	
SCVURPPP attorney	34, 35	C.11.a-i, C.12.a-i	Prescriptive and costly	*State Permit conditions requiring Permittees to conduct studies and pilot projects to evaluate different abatement measures are highly prescriptive, limit discretion, exceed the federal requirements, and could be very costly.*	All of the permit provisions referenced by the commenter are directly tied to pursuing reduction of pollutants of concern. A great deal of flexibility has been provided, and permittees retain a large measure of discretion in the selection of pilot opportunities. However, the fact remains that TMDLs must be implemented that call for large load reductions. Without strong efforts beginning this permit term, these load reductions cannot be achieved in the required timeframe. For this reason, pilot scale implementation of load reduction strategies must be accomplished immediately.	
Contra Costa Clean Water Program	97	C.11.b	methyl mercury monitoring	*This provision is duplicative of the methylmercury fate and transport requirement of provision C.11.h*	C.11.h requirements are distinct from C.11.b. There is no duplication.	
Contra Costa Clean Water Program	96	C.11.b	methyl mercury monitoring	*This provision, along with provision C.8.f, as written, won't yield any useful information about factors leading to methylmercury production and bioaccumulation. Is the management endpoint the Bay or the creeks? If the Bay, then the RMP mercury strategy should be the appropriate mechanism for*	The resolution remanding the SF Bay Mercury TMDL to the Water Board requires methyl mercury monitoring in all NPDES permits. Gaining an understanding of methyl mercury concentrations discharged to the Bay and in creeks is valuable	

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				investigating this.	for assessing the contributions of runoff to the Bay. There is currently little or no information on this parameter.	
Oakley, Moraga	76	C.11.b	Reporting	*What is the report format contemplated for the C.11.b reporting?*	See response to Oakley comment 142.	
Oakley	146	C.11.b.	Reporting	*The C.11.b submittal requirement is for 2010, not 2009 as listed.*	See response to Oakley comment 142.	
Oakley	196	C.11.b.	Reporting	*From C.11.b it appears that the reporting requirement is attachment C.11.b. If that is true what is to be reported in the Table?*	See response to Oakley comment 142.	
Contra Costa Clean Water Program	109	C.11.c	provision edit	*Change "2012" to "2013" at the end of the last sentence.*	The Provision is correct as written.	
San Jose	21, 72, attorney 10	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.*	Clarifying language will be added.	Added language to these provisions clarifying municipal role in implementing provision for private vs. public lands.
Burlingame	15	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.*	See response to San Jose attorney comment 10 on this issue.	
SMCWPPP	15	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure*	See response to San Jose attorney comment 10 on this issue.	

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				of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.		
Sunnyvale	31	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.*	See response to San Jose attorney comment 10 on this issue.	
Dublin	12	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.*	See response to San Jose attorney comment 10 on this issue.	
Daly City	96	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.*	See response to San Jose attorney comment 10 on this issue.	
SCVURPPP	7	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should*	See response to San Jose attorney comment 10 on this issue.	

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				reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.		
Mountain View	14	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.*	See response to San Jose attorney comment 10 on this issue.	
Milpitas	19	C.11.c, C.12.c	abatement on private land	*The State is responsible for regulating discharges to land that may impact water. Local jurisdictions should not be responsible for abatement on private property but should reasonably limit their responsibility to advocating cleanup and prohibiting exposure of the storm sewer system to pollutants from the site. Request that the language be revised to clarify that municipalities are not responsible for cleanup and abatement activities on private properties.*	See response to San Jose attorney comment 10 on this issue.	
SCVURPPP	71	C.11.c,d,e	language change suggestions	*Provisions are revised to state clearly that mercury is ancillary and that PCBs will be the main consideration during design and implementation of these pilot studies.*	Clarifying language will be added to show that PCBs will be main consideration for the pilot studies.	Add language explaining that PCBs will be main consideration for the pilot studies, but mercury will be a secondary driver.
Oakley	197	C.11.c.	Reporting	*We presume that the attachment for C.11.c and the entries required for C.11.c are the full report. Also, the text talks about 2012 as well as 2011, what is required?*	See response to Oakley comment 142.	
Contra Costa Clean Water Program	98, 108	C.11.c., C.12.c	Combine Provisions	*Combine all provisions relating to both Hg and PCBs to improve the clarity of what's being required as well as to remove inconsistencies between the two.*	At this point, combining mercury and PCB provisions would lead to more confusion and is not necessary. The Water Board disagrees with the contention that existing work	

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				Existing work, such as the data collected under the "Joint Stormwater Agency Projects to Study Urban Sources of Mercury and PCBs" performed by KLI in 2001 and 2002, PCBs investigations case studies, and the Prop 13/Urban Stormwater BMP Project currently being carried out by SFEI constitute reasonable progress on this provision. The Program suggests that as a next step, BASMAA members would work together to develop regional guidance to provide a consistent, peer-reviewed approach to conducting source investigations and pilot removal and abatement projects.	constitutes reasonable progress toward these provisions. The Water Board also rejects the commenter's proposal for the next step to pursue such source investigations. This is not nearly enough progress for this next permit term in view of the load reductions that must be accomplished to implement TMDLs.	
Contra Costa Clean Water Program	99	C.11.d	mine remediation, not sediment management	*The completion of the design phase of a mine remediation at the Mt. Diablo project should be considered satisfactory for meeting the requirement of this provision.*	The Water Board cannot accept this proposal. Completing a design phase of a mine remediation project has nothing to do with municipal sediment management practices.	
Contra Costa Clean Water Program	111	C.11.d	order of provisions	*C.12.c is written to be carried out concurrently with C.12.d and C.12.e and C.12.f but really C.12.d, C.12.e and C.12.f are a menu of items that respond to what happens in C.12.c. They shouldn't happen until after C.12.c is completed because we need the results of C.12.c to guide the actions of the others.*	Respond that timing of provisions is appropriate. The Water Board expects there to be concurrent efforts on the Provisions cited by the commenter.	
Oakley, Moraga	77	C.11.d	Provide detail	*What sort of retrofits will control mercury?*	The provision refers to retrofits that facilitate capture and removal of mercury contaminated sediment to prevent its subsequent discharge to surface waters.	
Contra Costa Clean Water Program	110	C.11.d	street sweepers	*What is the purpose of evaluating the cost-effectiveness of high-efficiency sweepers when the permit already requires permittees to replace 75% of their existing sweepers with high-efficiency models regardless of the outcome of that cost-effectiveness evaluation? It makes their cost efficiency a moot point and a waste of time to evaluate unless the results of that evaluation will play into the decision of how many should be replaced and the type of sweeper to be used.*	This provision does not say anything about evaluating the cost-effectiveness of high-efficiency street sweepers.	

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Roger James	78, 83	C.11.d, C.12.d	Limit evaluation of control measures	*Few benefits result from enhancing municipal maintenance practices. Pump station cleaning or diversions and street flushing are the only additional control measures that require evaluation. The practice of street flushing will raise questions about the waste and unreasonable use of water and will require a significant public education program to overcome citizen concerns. The Water Board staff should consult with water conservation staff at water supply agencies to determine how they would view this type of use of water and whether it could impact their water conservation efforts.*	The commenter has expressed an opinion about the value of municipal maintenance practices. They are only some of the menu of choices to be explored through this permit term and should still be considered. The consequences and limitations of street flushing or other practices can be considered when pilot sites are identified and should not be ruled out at this stage.	
SCVURPPP	77	C.11.d, C.12.d	pilot studies, scale back, only if grant funds pay for them	*Municipalities should do a feasibility study and cost analysis of enhanced sediment management practices. If grant funds are made available, up to two drainage areas should be selected for pilot testing of appropriate enhanced sediment management practices based on the feasibility study. Implementation actions to begin on July 1, 2011 should be eliminated from the permit because mercury-related activities during the five-year permit term should be limited to cost-effective pilot studies that are funded by state grants. Clarify that not all management measures may be feasible in pilot watersheds.*	The Water Board cannot accept the proposal that these requirements should be contingent on availability of grant funds. The TMDLs for mercury and PCBs require large reductions from urban runoff, and the pilot tests required by this permit are an appropriate and reasonable first step toward achieving these reductions. Limiting action to a feasibility study and cost analysis and pilot testing contingent on grant funds is simply not consistent with the efforts needed to address these pollutants of concern.	
ACCWP	47	C.11.d, C.12.d	pilot studies, scale back, only if grant funds pay for them	*Municipalities should do a feasibility study and cost analysis of enhanced sediment management practices. If grant funds are made available, up to two drainage areas should be selected for pilot testing of appropriate enhanced sediment management practices based on the feasibility study. Implementation actions to begin on July 1, 2011 should be eliminated from the permit because mercury-related activities during the five-year permit term should be limited to cost-effective pilot studies that are funded by state grants. Clarify that not all management*	See response to SCVURPPP comment 77.	

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				measures may be feasible in pilot watersheds.		
Berkeley	39	C.11.d, C.12.d	pilot studies, scale back, only if grant funds pay for them	*Municipalities should do a feasibility study and cost analysis of enhanced sediment management practices. If grant funds are made available, up to two drainage areas should be selected for pilot testing of appropriate enhanced sediment management practices based on the feasibility study. Implementation actions to begin on July 1, 2011 should be eliminated from the permit because mercury-related activities during the five-year permit term should be limited to cost-effective pilot studies that are funded by state grants. Clarify that not all management measures may be feasible in pilot watersheds.*	See response to SCVURPPP comment 77.	
SMCWPPP	15, 16	C.11.d, C.12.d	pilot studies, scale back, only if grant funds pay for them	*Municipalities should do a feasibility study and cost analysis of enhanced sediment management practices. If grant funds are made available, up to two drainage areas should be selected for pilot testing of appropriate enhanced sediment management practices based on the feasibility study. Implementation actions to begin on July 1, 2011 should be eliminated from the permit because mercury-related activities during the five-year permit term should be limited to cost-effective pilot studies that are funded by state grants. Clarify that not all management measures may be feasible in pilot watersheds.*	See response to SCVURPPP comment 77.	
Oakley	198	C.11.d.	Reporting	*We presume that the entries required for C.11.d are the full report.*	See response to Oakley comment 142.	
Berkeley	39	C.11.d-f	Prioritize based on PCBs	*Clarify that any prioritization or selection of pilot sites for C.11.d-f will be made on the basis of potential PCB reductions.*	We will clarify as suggested.	Clarify selection criteria for pilot sites in terms of PCBs.
Oakley, Moraga	78	C.11.e	Need more time	*The timeframe for this provision is an unrealistically short period of time given the research and development nature of this activity and the public process necessary to make it happen.*	The timeline of the Provision is reasonable.	
Contra Costa Clean Water Program	101	C.11.e	retrofits expensive and will take time	*The capital costs for stormwater retrofits are on the order of millions of dollars; this will need to be carefully planned as a regionally*	There will be costs associated with implementing this Provision, but the timeframe provided in the permit is	

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				coordinated effort to ensure consistency and measurable benefits. The time frame to implement this is unreasonable. Performing the engineering analysis, following CEQA, and obtaining the necessary permits takes time. CCCWP requests that the goal of the provision be set to have plans and designs in place by the end of the permit cycle (2013).	reasonable.	
Contra Costa Clean Water Program	100, 113	C.11.e, C.12.e	location of retrofit projects	*Please confirm that the siting of retrofit projects should generally be based on targeting PCB sources, with assessment of the ancillary benefit to mercury load reductions.*	See response to comment 71 from SCVURPPP.	
SCVURPPP	78	C.11.e, C.12.e	retrofits, only if grant funds available	*Remove "evenly distributed" criterion from this provision. Retrofit pilot testing should only be done if there are grant monies available and only at up to three sites. Pilot testing needs to be limited to be cost-effective, and the permit needs to allow flexibility in case the five pilot drainages in C.11.c. (no. 3) are found to be inappropriate locations for this testing.*	We will clarify selection criteria for the pilots. The Water Board rejects the request of the commenter regarding making this requirement contingent on grant funds. The requirement to select only 5 drainages throughout the entire Bay Area is achievable.	We will clarify selection criteria for pilot sites in terms of spatial distribution.
ACCWP	48	C.11.e, C.12.e	retrofits, only if grant funds available	*Remove "evenly distributed" criterion from this provision. Retrofit pilot testing should only be done if there are grant monies available and only at up to three sites. Pilot testing needs to be limited to be cost-effective, and the permit needs to allow flexibility in case the five pilot drainages in C.11.c. (no. 3) are found to be inappropriate locations for this testing.*	See response to SCVURPPP comment 78.	
Berkeley	39	C.11.e, C.12.e	retrofits, only if grant funds available	*Remove "evenly distributed" criterion from this provision. Retrofit pilot testing should only be done if there are grant monies available and only at up to three sites. Pilot testing needs to be limited to be cost-effective, and the permit needs to allow flexibility in case the five pilot drainages in C.11.c. (no. 3) are found to be inappropriate locations for this testing.*	See response to SCVURPPP comment 78.	
SMCWPPP	15, 16	C.11.e, C.12.e	retrofits, only if grant funds available	*Remove "evenly distributed" criterion from this provision. Retrofit pilot testing should only be done if there are grant monies available and only at up to three sites. Pilot testing needs to be limited to be cost-effective, and the permit*	See response to SCVURPPP comment 78.	

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				needs to allow flexibility in case the five pilot drainages in C.11.c. (no. 3) are found to be inappropriate locations for this testing.		
Oakley	199	C.11.e.	Reporting	*Considering the C.11.e attachment, what is to be put into the table?*	See response to Oakley comment 142.	
Roger James	79	C.11.e.i	on-site treatment, make it broader	*Onsite treatment in retrofit situations will likely occur in urban areas with significant space constraints and huge land values. The specification of detention basins, bioretention units, infiltration basins and treatment wetlands all but guarantee that the pilot project will be found infeasible because of the large footprint required by these system. The specific listing of these systems must be deleted allowing permittees to look at a broad array of control measures.*	We disagree that all pilot projects will be found infeasible. There will be pilot projects performed in this permit term as the permit suggests.	
San Jose	73	C.11.e.i, C.12.b.iii & C.12.e.i	abatement, selecting pilot locations	*Superior approach for selecting locations would be to have the location and number of sample sites be based on more objective, science-based considerations of variability, costs, and certainty needs.*	The intent is not to have all the pilot projects occur in one county or municipality. Permittees have the flexibility to employ additional criteria for selecting the actual project locations.	Some clarifying language has been added for pilot selection criteria.
Daly City	97, 101	C.11.e.i, C.12.e.i	pilot tests should be contingent upon grant funds	*We object to inference that water quality treatment is a part of a municipal stormwater permit. If requirement remains in the permit, we request language that states these pilot programs should be conditioned upon the availability of grant funds.*	We cannot accept the proposal to make these permit requirements contingent upon the availability of grant funds.	
San Mateo Co.	10	C.11.f	diversion to POTW, problems	*Joint use of the sanitary sewer pipelines could cause or increase sewer system overflows. Treatment of the diverted flows will certainly increase the operating costs of local POTWs. These costs will be passed on to the individual collection systems and their customers. The ability of the collection systems to increase sewer service charges to pay for these costs is often constrained by Proposition 218 requirements. POTWs are designed to treat sanitary sewage and may not be effective in removing pollutants that could be delivered to the POTW by storm water pump stations. Additionally, the POTW's sewage treatment*	See response to Santa Clara comment 2.	

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				process utilizes biological and chemical activities that may be adversely affected by the addition of pollutants from the pump stations, which could affect the quality of treatment attained for the sanitary sewage delivered to the POTW and released to the Bay, Ocean, or receiving waters.		
BACWA	1	C.11.f	diversion to POTWs	*BACWA is concerned that the requirement and language of the MRP assumes all POTWs can legally accept stormwater, dry weather urban runoff flow, and other traditionally storm drain conveyed waters. The MRP further assumes that acceptance of said flows will not create unintended compliance problems including permit violations and hydraulic capacity overload. The MRP does not adequately distinguish between dry weather diversions, and stormwater diversions during wet weather periods when many POTWs are challenged by capacity constraints and periodically have sanitary sewer overflows (SSOs) associated with those wet weather conditions. Before implementing this provision, these challenges must be taken into consideration.*	See response to Santa Clara comment 2.	
BACWA	2	C.11.f	diversion to POTWs	*The MRP must consider the many legal and financial issues of diversions prior to implementing a long-term diversion project. The review of legal issues should also include incidental taking of species of concern that may occur as a result of diversion of dry weather flows to the sanitary sewer system.*	See response to Santa Clara comment 2 and San Jose comments 23 and 24.	
BACWA	3	C.11.f	diversion to POTWs	*How will violation of pollutant specific numeric effluent limits attributable to accepting these flows be addressed?*	See response to Hayward comment 8.	
BACWA	4	C.11.f	diversion to POTWs	*Non-equipment or blockage-related SSOs occur when the collection system and/or treatment facilities exceed their hydraulic capacity. Capacity in collection systems and at POTWs to accept dry weather urban runoff should be analyzed before diversion. BACWA would not recommend that any first flush or*	See response to Hayward comment 7.	

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				wet weather stormwater runoff be accepted in collection systems or at POTWs without the wastewater facility having the opportunity to review their systems' capacities.		
BACWA	7	C.11.f	diversion to POTWs	*We want to be sure that the Regional Water Board's expectations for how quickly diversions can occur are realistic given the inter-governmental jurisdiction, legal, and financing issues.*	There is adequate time for these issues to be resolved.	
BACWA	5	C.11.f	diversion to POTWs	*How can acceptance of these flows allow BACWA members to gain credit for pollutant mass load reductions? Will loads be transferred from stormwater allocations to POTW allocations?*	This regulatory issue will be addressed after the pilot phase monitoring of stormwater diversions to POTWs. At that time we will better understand whether pollutant concentrations in effluent are even effected by these diversions.	
Oakley Moraga	79	C.11.f	diversion to POTWs	*C.11.f talks about working with the POTW on a county, watershed, or regional basis. Does this mean that all programs can work together to select the 20% or is it within each Program area? What is to happen in the event of POTW capacity problems?*	This issue has been clarified in the revised TO. Permittees work collectively. See response to Hayward comment 7 regarding capacity issues.	
BASMAA	3	C.11.f, C.12.f	diversion to POTW	*the permit appears to require diversions to sanitary sewers be implemented in five pilot projects irrespective of the results of required feasibility studies that demonstrate that such diversions are feasible.*	The permit assumes that five projects are feasible somewhere in the region.	
Union San	1	C.11.f, C.12.f	Diversion to POTW	*Union San WWTP is not designed to treat un-regulated increases in heavy metals, PCBs, and solids loading. Doing so could result in non-compliance, plant upset, and increased costs.*	See responses to Hayward's comments 7 and 8.	
Oakley	91	C.11.f, C.12.f	Diversion to POTW, Ensure Consistency	*C.12.f calls for the selection of 20% of the existing pump stations. This wording is virtually word for word C.11.f.i. The reporting date is different, and it is unclear what is intended. What is the requirement that is to be implemented?*	The provisions for pump stations have been revised to improve clarity.	
Daly City	98, 102	C.11.f, C.12.f	diversion to POTW, problems	*There is no evidence diversion would have a water quality benefit. There should be a survey of wastewater treatment plants determine the suitability of treatment*	We will not remove the diversion requirements from the permit. Please see response to Hayward's comments 7 and 8.	

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				envisioned by this permit section. This provision requires a public policy discussion prior to inclusion in permit. Remove this from permit. *Direct diversion has potential impacts on costs, ability to meet NPDES permit requirements and exposure to third party lawsuits. It would increase the plants dry weather flows that may require amendments to the POTW's NPDES permit.*		
ACCWP	42	C.11.f, C.12.f	diversion, pump stations	*The scope of these provisions is too extensive to be cost-effective. Replace these provisions with a single integrated provision that requires stormwater programs to work with BACWA first to use existing data to develop a plan for and perform a feasibility/cost-benefit study followed by a workplan for characterization of potential stormwater pollution problems at pump stations and identifying potential and recommended solutions.*	see response to SMCWPPP comment 13.	
Contra Costa Clean Water Program	102, 114	C.11.f, C.12.f	diversions to sanitary sewer	*This provision assumes the characterization ongoing in C.8.e.iii will warrant diversions; that outcome has yet to be determined. Stormwater programs cannot require POTWs to accept discharges. Has the Regional Board thought through the substantive or perceived degradation of biosolids quality that would result from deliberate introduction of stormwater from highly contaminated areas?*	This issue can be addressed in the selection of the pilot study locations.	
Oakley	200	C.11.f.	Reporting	*We presume that the attachment and the entries required for C.11.f are the full report.*	See response to Oakley comment 142.	
Oakley	222	C.11.f. & C.12.f.	Reporting	*The second template for C.11.f and C.12.f seem to be two formats of the same thing. Please clarify.*	See response to Oakley comment 142.	
Roger James	80	C.11.f.i	pump station selection	*The wording suggests that only pump stations within the county service areas are to be selected rather than throughout the county. The phrase "distributed throughout the Permittees' county areas and" must be deleted. Agencies such as Palo Alto, San Jose, Sunnyvale, Vallejo and Fairfield should*	This provision has been revised so this wording no longer appears.	

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				be targeted for early assessment of the acceptance of storm water runoff into their sanitary sewer systems.		
San Jose	77	C.11.f.i, C.12.f.i	diversion to POTW	*The provision is significant, problematic, and premature. It is beyond the TMDLs/Basin Plan. Diversion is likely to be fraught with engineering, financial, regulatory, legal, and institutional challenges which if done improperly could have deleterious effects on water quality. Any such evaluation should be advanced methodically and no implementation of flow diversion should be included in this Permit.*	We disagree with request to eliminate flow diversion requirements.	
Contra Costa Clean Water Program	103	C.11.g	Clarify language	*The Mercury TMDL contains "or" for each. Program requests that each of the options #1-4 under C.11.g.ii be separated by the word "or" so it's clear we're not being asked to do all of those requirements.*	Clarifying language was added.	We clarified the Permittees must choose one of the first three ways of assessing compliance as well as demonstrate interim progress toward achieving the allocation.
Contra Costa Clean Water Program	104	C.11.g	Focus Abatement on C.3 facilities	*Best way to achieve meaningful load reductions from stormwater, after abating mercury mines that discharge into wetlands, would be implementation of C.3 facilities. Attenuating direct connections between hardscape and state waters is a potentially significant benefit to ameliorating mercury loads from atmospheric deposition. A primary focus of implementing this provision should be to model or assess the mercury load reduction benefits of C.3 implementation.*	Permittees should feel free to assess mercury load reduction benefits of C.3 implementation, but this will not be the focus of mercury provisions in the permit.	
Oakley, Moraga	81	C.11.g	Provide detail	*Where are references to what the WLA's are?*	WLA means TMDL wasteload allocation.	
Contra Costa Clean Water Program	105	C.11.g	special studies, RMP should do this	*This belongs under the RMP, as a special study. This provision inappropriately delegates the Regional Board's duties to develop TMDL information. We request that you simply state that this requirement may be fulfilled by an RMP special study, and commit to supporting the special studies at the RMP technical committee and steering committee.*	This requirement comes directly from the mercury TMDL and is not a delegation of any Regional Board duty.	
Oakley, Moraga	80, 92	C.11.g, C.12.g	Provide detail	*What is the loading baseline, how is it developed and by whom? What are the loading milestones?*	These loading baselines were established in the PCBs and mercury TMDLs. Please refer to these TMDL	

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					staff reports for additional information.	
Oakley	201	C.11.g.	Reporting	*Considering the C.11.g attachment, what is to be put into the table?*	See response to Oakley comment 142.	
SF Baykeeper, NRDC, & Clean Water Action	25, 29	C.11.h, C.12.h	fate and transport studies	*The Permit should articulate an objective for this provision.*	More information about the background of this Provision can be found in the TMDL staff reports for mercury and PCBs.	
Berkeley	39	C.11.h, C.12.h	RMP satisfies compliance	*studies regarding fate, transport, and biological uptake of mercury discharged in urban runoff should primarily be conducted by the Regional Monitoring Program (RMP). Requirement should specify that compliance will be achieved through participation in the RMP.*	See response to ACCWP comment 49.	
ACCWP	49	C.11.h, C.12.h	RMP satisfies compliance	*studies regarding fate, transport, and biological uptake of mercury discharged in urban runoff should primarily be conducted by the Regional Monitoring Program (RMP). Requirement should specify that compliance will be achieved through participation in the RMP.*	These studies may be accomplished through various means, including the RMP, but the permit cannot specify those means to maintain adequate accountability mechanisms.	
SMCWPPP	15	C.11.h, C.12.h	RMP satisfies compliance	*studies regarding fate, transport, and biological uptake of mercury discharged in urban runoff should primarily be conducted by the Regional Monitoring Program (RMP). Requirement should specify that compliance will be achieved through participation in the RMP.*	See response to ACCWP comment 49.	
SCVURPPP	73, 81	C.11.h, C.12.h	RMP satisfies compliance	*studies regarding fate, transport, and biological uptake of mercury discharged in urban runoff should primarily be conducted by the Regional Monitoring Program (RMP). Requirement should specify that compliance will be achieved through participation in the RMP.*	See response to ACCWP comment 49.	
Oakley	202	C.11.h.	Reporting	*We presume that the entries required for C.11.h are the full report.*	See response to Oakley comment 142.	
Roger James	81, 87	C.11.i, C.12.i	risk reduction	*The responsibility to mange public health risks lies with the county health departments and the State Department of Health Services and not that of the permittees. The permittees*	This Provision comes directly from the mercury and PCBs TMDL and is consistent. There are similar requirements in permits for	Language was changed to be consistent with what is required in the mercury watershed permit for wastewater discharges.

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				should be required to coordinate with and furnish information to these agencies, but not required to assume their authority or responsibility.	wastewater sources, and these Provisions will be harmonized with those existing requirements.	
Contra Costa Engineering Advisory Committee (CCCEAC)	22, 23	C.11.i, C.12.i	risk reduction	*This requirement would more accurately be expressed in terms of reducing mercury in fish rather than reducing human health risks. Reduction in human health risk may be much more complex than the simple objective of reducing mercury levels in fish. This same holds true for Section C12.i (page 91) for PCB's.*	These requirements come directly from the mercury TMDL.	
SF Baykeeper, NRDC, & Clean Water Action	20	C.11.i, C.12.i	Risk Reduction stronger	*The risk-reduction language in Provisions C.11.i. and C.12.i. must be strengthened to implement specific requirements of the Basin Plan resulting from the mercury and PCBs TMDLs. Language is inadequate to ensure dischargers will fully participate in fulfilling the commitments in the Basin Plan. Language must state clearly that dischargers have a responsibility to ensure that actions necessary to truly reduce the amount of contamination fishers are exposed to are taken and that health impacts are addressed. At the very least, language from the Basin Plan should be incorporated into the MRP, while also reflecting the need to work with local communities to develop effective strategies*	See response to Roger James comment 81, 87.	Language was changed to be consistent with what is required in the mercury watershed permit for wastewater discharges.
Berkeley	39	C.11.i, C.12.i	Risk Reduction, compliance	*Modify permit to allow municipalities to comply with this task by participating in BASMAA's public outreach and education efforts conducted in cooperation with BACWA, OEHHS, and Department of Public Health to address mercury-related risks from consuming bay fish. This requirement should not be imposed on municipalities whose MS4 drains to the ocean.*	See response to ACCWP 50.	
ACCWP	50	C.11.i, C.12.i	Risk Reduction, compliance	*Modify permit to allow municipalities to comply with this task by participating in BASMAA's public outreach and education efforts conducted in cooperation with BACWA, OEHHS, and Department of Public Health to*	This Provision comes directly from the mercury and PCBs TMDL and is consistent. There are similar requirements in permits for wastewater sources, and these	

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				address mercury-related risks from consuming bay fish. This requirement should not be imposed on municipalities whose MS4 drains to the ocean.	Provisions will be harmonized with those existing requirements. Permittees are encouraged to work collaboratively and employ efforts to target locations where risks of eating Bay fish are most pronounced.	
SCVURPPP	82	C.11.i, C.12.i	Risk Reduction, compliance	*Modify permit to allow municipalities to comply with this task by participating in BASMAA's public outreach and education efforts conducted in cooperation with BACWA, OEHHS, and Department of Public Health to address mercury-related risks from consuming bay fish. This requirement should not be imposed on municipalities whose MS4 drains to the ocean.*	See response to ACCWP 50.	
SMCWPPP	15, 16	C.11.i, C.12.i	Risk Reduction, compliance	*Modify permit to allow municipalities to comply with this task by participating in BASMAA's public outreach and education efforts conducted in cooperation with BACWA, OEHHS, and Department of Public Health to address mercury-related risks from consuming bay fish. This requirement should not be imposed on municipalities whose MS4 drains to the ocean.*	See response to ACCWP 50.	
Oakley, Moraga	82	C.11.i, C.12.i	risk reduction, inappropriate provision	*Local agencies develop or participate in PCB and mercury health risk reduction programs for fish consumed from the San Francisco Bay. This activity is beyond the City of Pleasanton's funding and staffing level and is the responsibility of County, State, and Federal public health agencies. If maintained, funding should be provided.*	See response to ACCWP 50.	
Dublin	13	C.11.i, C.12.i	risk reduction, inappropriate provision	*Local agencies develop or participate in PCB and mercury health risk reduction programs for fish consumed from the San Francisco Bay. This activity is beyond the City of Pleasanton's funding and staffing level and is the responsibility of County, State, and Federal public health agencies. If maintained, funding should be provided.*	See response to ACCWP 50.	
Pleasanton	14	C.11.i, C.12.i	risk reduction, inappropriate	*Local agencies develop or participate in PCB and mercury health risk reduction programs*	See response to ACCWP 50.	

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			provision	*for fish consumed from the San Francisco Bay. This activity is beyond the City of Pleasanton's funding and staffing level and is the responsibility of County, State, and Federal public health agencies. If maintained, funding should be provided.*		
San Leandro	23	C.11.j	diversion to POTWs	*requires the diversion of stormwater pump station dry weather and first flush flows to the sanitary sewer be implemented in five pilot studies, without first reviewing the results of prior or ongoing pilot tests to evaluate feasibility. The City believes that the actions required are prescriptive in nature without first considering information from completed and in progress pump station diversion projects. An assessment of the results must be provided so that informed approaches to this issue can be a part of this permit provision.*	The diversion pilot projects provide opportunity to carefully evaluate feasibility.	
San Leandro	24	C.11.f	diversion to POTWs	*This provision requires actions outside the control or jurisdiction of municipal stormwater agencies. This would require difficult and costly work with the active participation and concurrence of wastewater agencies, most of which are not subject to this order.*	See response to comments 6-8 from Hayward, Santa Clara comment 2, and San Jose comments 23 and 24.	
Oakley	145	C.11?	Reporting	*The Permit text & Summary Table reflect reporting for sediment removal but there is no submittal requirement listed. What is required?*	See response to Oakley comment 142.	
Moraga	5	C.11-14	Baseline Data	*Measures discuss evaluation of pollutant reduction. However, there is no discussion of baseline data sources, or protocols to develop baseline data.*	Reductions are required for mercury and PCBs, and the loads referenced in the TMDLs for those pollutants establish baselines against which to measure reductions.	
Moraga	4	C.11-14	Repeating Requirements	*Requirements repeat. Are these intended to be for the same, or different, sites? For instance:* *• Pilot project to evaluate on-site treatment for Hg Oct '09* *• Pilot project to evaluate on-site treatment for PCB's Oct 09* *• PDBE's, legacy pesticides, selenium Oct '12* *• Diversion of dry weather and first flush flow Oct '10*	Yes, the same requirement is in place for mercury and PCBs. We are required to have provisions for individual pollutants of concern.	

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Oakley	5	C.11-C.14	Clarification needed	*Where evaluating reduction in pollutants is needed, there is no discussion of the baseline data sources, or protocols to develop baseline data.*	For information about load reduction requirements, please refer to the TMDLs for PCBs and mercury. These permit provisions are intended to implement these TMDLs (for C.11 and C.12)	
Contra Costa County Supervisors	81	C.11-C.14	monitoring, too much detail	*County is concerned about the appropriateness of this level of monitoring being shifted to the County. The number of studies and pilot projects, which are outside the expertise of County staff, would be anticipated to be extremely costly. Furthermore, the studies and pilot projects are not prioritized, and would be even more difficult to conduct simultaneously. In addition (also, as noted), the County objects to being required to gather data to be used in development of TMDLs. This has historically, and more appropriately, been a function of the RWQCB.*	Monitoring the loads associated with urban runoff is a responsibility of permittees, not the Water Board.	
Burlingame	15	C.11-C.14	pollutants of concerns, do something else	*The permit should identify a more reasonable, cost-effective and sensible method to address these pollutants and improve water quality while recognizing the finite resources of stormwater programs and its co-permittees.*	The current permit provisions are reasonable, cost-effective, and sensible as written.	
SF Baykeeper	4, 19	C.11-C.14	Stronger TMDL implementation, include WLAs, numeric limits	*Incorporate waste load allocations you have already adopted into this permit through numeric limits, and by quantifying the reductions expected in pollutant loading. The permit could also require fewer studies but more implementation actions, as our comment letter presents in more detail. This permit should incorporate the final WLAs include numeric limits based on TMDL waste load allocations for mercury, PCBs and pesticides.*	The actions required are those necessary to move toward achievement of the waste load allocations. There is not sufficient understanding of what will work to reduce loads to just require implementation actions. Requiring such actions without understanding benefit would not be productive. The current permit is a big step forward in implementation, while, at the same time, improving our understanding of what will work to reduce loads. We are not requiring WLAs as numeric limits in stormwater permits at this time.	
Contra Costa	5	C.11-C.14	Studies through	*Some elements of Provision C.11, C.12, and*	See response to ACCWP comment	

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Clean Water Program			RMP	*C.13, and Provision C.14 in its entirety, are more appropriately implemented as Regional Monitoring Program special studies. A simple remedy would be to note that "this requirement can be fulfilled as a special study of the Regional Monitoring Program."*	49.	
SF Baykeeper, NRDC, & Clean Water Action	24	C.12	abatement on private land	*Municipalities have the legal authority to require property owners to take action to contain PCBs or clean up a site if the site has the potential to discharge PCB-contaminated storm water. Many municipalities, however, have not established the necessary regulatory authority through adoption of ordinances or have not yet established the mechanisms and procedures needed to facilitate and oversee such actions. The Permit should require all municipalities to establish such authority, if they have not already done so, before the end of the next permit cycle.*	The permit provisions regarding abatement adequately deal with this issue as written.	
Daly City	99	C.12	Delete PCBs provisions	*This entire section dealing with PCB's needs to be struck at it forces the question of exactly how far to take an objective within the context of a five-year permit and the reasonableness of proposed deadlines.*	This is an unreasonable request given that reductions in PCB loading must be achieved by permittees.	
SF Baykeeper, NRDC, & Clean Water Action	27	C.12	evaluate effectiveness	*Permittees should be required to do sufficient effectiveness monitoring of the pilot projects to evaluate the changes in discharge quality. This will help permittees design more effective abatement programs after the pilot stage.*	There are requirements to assess effectiveness of all pilot projects.	
SCVWD	4	C.12	Focus on stormdrain PCBs	*For at least the first five-year permit period efforts should be focused on the removal and proper disposal of sediment from the storm drain systems. Once a decrease in PCB concentrations is demonstrated and progress is shown in the storm drain system, and if the load allocation is still not yet being achieved, then more aggressive source identification and elimination actions would be needed. Much prefer to focus limited resources on pollutant removal rather than on monitoring until the known contaminated sites are cleaned up.*	Actions on a variety of fronts are preferable for this permit so that we can more rapidly increase our understanding of the most beneficial mix of strategies.	
SF Baykeeper,	28	C.12	identify air	*The load estimate for storm water includes*	The currently stated provisions are	

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NRDC, & Clean Water Action			sources	*airborne mercury deposited on the Bay watershed and carried into the Bay via stormwater runoff. A new subsection should be added to Section C.11 that requires identification of potential air sources of mercury in runoff, including refineries, cement manufacturers, and crematoriums.*	those that Water Board staff have identified as having the most potential to reduce pollutant loadings from stormwater.	
Berkeley	34, 35	C.12	PCB equipment inspection,	*The effort to require that PCBs and PCB-containing equipment be identified during industrial inspections should be performed on a pilot study basis to evaluate the feasibility of such program.*	This is a modest effort, and there is enough information to require this measure to be implemented throughout the region. Most other PCB provisions are implemented at the pilot level during this permit.	
BASMAA	2	C.12	PCB provisions, should be all pilot	*The tentative order has provisions that are not consistent with the PCB TMDL or don't implement it in a cost-effective manner. Two examples are industrial inspections for PCBs and enhanced sediment removal and management. Consistent with the PCB TMDL, we'd like to see the tentative order revised to make all PCB efforts during the permit term on the pilot scale.*	The overwhelming majority of PCBs-related actions are implemented on pilot basis during the first permit term. The only PCB action slated for full implementation this permit term is C.12.a - the measure regarding finding PCBs during inspections. It makes sense to implement this throughout the region as an additional, low-cost component to industrial inspections.	
Livermore	12	C.12	PCBs at demolition sites	*This provision is seriously flawed and must be eliminated or fundamentally revised prior to adoption. Permittees lack the authority to require clean up of legacy pesticides on private property where the levels of pollutants do not exceed some pertinent water quality standard.*	This project has already been moving forward through grant-funded work. The commenter should confer with other BASMAA agencies for details.	
Livermore	13	C.12	pilot projects for abating mercury and PCBs	*This provision is seriously flawed and must be eliminated or fundamentally revised prior to adoption:*	The commenter simply rejects the provision without providing recommended changes. We decline to eliminate the provisions as requested.	
BASMAA	5	C.12	Try pilots before cleaning PCB sites	*enhanced municipal sediment management, such as increased frequency of street sweeping, and stormwater treatment retrofits, such as putting a sand filter at the bottom of a contaminated drainage. These types of approaches should be a much higher priority*	See response to SCVWD comment 4.	

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				than cleaning up PCB sites.		
NRDC	20	C.12	Vague Language	*Language relating to risk reduction strategy is too vague.*	We will make this language consistent with what is in the mercury watershed permit for wastewater.	Language was changed to be consistent with what is required in the mercury watershed permit for wastewater discharges.
Oakley	6, 107	C.12, C.?	Clarification needed	*Industrial inspections are to include "proper" BMPs. Who decides what are "proper" BMPs? E.g., PCB containing equipment; Copper related to plating and metal finishing.*	We assume commenter is referring to C.12.b. Permittees develop and select the BMPs.	
SF Baykeeper, NRDC, & Clean Water Action	23	C.12.a	Expand industrial inspection program	*This provision requires only that municipalities train inspectors to identify potential PCB sources on sites they already inspect—that is, without expanding the scope of inspection programs from the existing categories of active businesses to include additional potentially PCB-contaminated sites based on age of buildings and site history. The Permit should require a genuine expansion of the industrial inspection program to incorporate sites most likely to be sources of PCBs, including those sites that may be inactive.*	The scope of the inspection does include PCBs as part of this provision.	
SCVURPPP	74	C.12.a	industrial inspection	*revise to require performance of pilot programs in two communities to identify cost-effective and efficient ways to implement this type of program. This approach would be consistent with the PCBs TMDL Basin Plan Amendment, which specifies that PCBs actions during the five-year permit term should consist of cost-effective pilot studies.*	The overwhelming majority of PCBs-related actions are implemented on pilot basis during the first permit term. The only PCB action slated for full implementation this permit term is C.12.a - the measure regarding finding PCBs during inspections. It makes sense to implement this throughout the region as an additional, low-cost component to industrial inspections.	
San Jose	78	C.12.a	inspection, limit to certain sites	*limit to heavy industrial sites to focus the considerable effort this inspection program will require on the most likely sources. Provide specific SIC codes to include in these inspections. This requirement should be phased in as a pilot to test the efficacy of such a program, starting in a limited number of heavy industrial areas.*	See response to SCVURPPP comment 74.	
ACCWP	44	C.12.a	PCB equipment inspection,	*There is not enough experience and/or background knowledge to go directly to*	See response to SCVURPPP comment 74.	

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				region-wide implementation. The Basin Plan Amendment said that the first five-year permit term would involve implementation control measures on a pilot scale to determine their effectiveness and technical feasibility. Grant funds should be used to implement a pilot program in two communities to identify cost-effective and efficient ways to implement this type of program.		
SMCWPPP	16	C.12.a	PCB equipment inspection,	*There is not enough experience and/or background knowledge to go directly to region-wide implementation. The Basin Plan Amendment said that the first five-year permit term would involve implementation control measures on a pilot scale to determine their effectiveness and technical feasibility. Grant funds should be used to implement a pilot program in two communities to identify cost-effective and efficient ways to implement this type of program.*	See response to SCVURPPP comment 74.	
Berkeley	39	C.12.a	Prioritize based on PCBs	*Revise to begin with pilot programs in (two) communities to identify cost-effective and efficient ways to implement this type of program.*	See response to SCVURPPP comment 74.	
Oakley, Moraga	84	C.12.a	Provide detail	*This section requires the referral of any finding to the appropriate regulatory agencies. Who are the appropriate agencies to regulate PCB's and PCB using equipment?*	We will identify agencies as requested.	We will call out agencies such as county health departments, DTSC, DHS, and the RWQCB.
Oakley, Moraga	85	C.12.a	Provide detail	*This section also requires evaluation of "…disposal regulations/programs (e.g., municipal ordinances, RCRA, TSCA)". Are not State laws enforced by the State in conjunction with solid waste authorities and not the Permittees? It also talks about a sampling and analysis plan for a minimum of 10 sites throughout "Permittees' county areas". Does this mean collaboratively among all Programs?*	Yes, collaboratively.	
Moraga and Oakley	95	C.12.a, C.13.d	Municipal inspectors lack expertise	*This is the responsibility of the public health agencies. Where is the local expertise to come from to do such identification? Municipal inspectors are trained in the*	Industrial inspections already include consideration of pollutants and stormwater. The commenter is incorrect about the current scope of	

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				inspection of site development, public infrastructure construction, and building code enforcement, not industrial chemical and equipment inspection for toxic materials.	inspections.	
Oakley	148	C.12.a.	Reporting	*C.12.a has a reporting requirement for training and it is in the Summary Table but nothing is listed for submittal. What is required?*	See response to Oakley comment 142.	
Oakley	203	C.12.a.	Reporting	*We presume that the entries required for C.12.a are the full report.*	See response to Oakley comment 142.	
Roger James	8	C.12.a.iii	identify agencies	*Identify the "appropriate agencies" as county health department, DTSC, DHS and RWQCB*	We will identify agencies as requested.	We will call out agencies such as county health departments, DTSC, DHS, and the RWQCB.
Contra Costa Clean Water Program	106	C.12.b	alternative compliance	*Would participation in the SFEI/Prop 50 grant funded study of PCBs in Building Materials satisfy this provision?*	This provision requires work beyond that grant-funded work.	
Contra Costa Clean Water Program	107	C.12.b	clarify provision	*The Program requests clarification of whether the Regional Board intends this to be carried out at 10 sites within each county or 10 site distributed over the entire region?*	We will clarify this Provision.	Requirements were clarified that 10 sites apply to the entire region, not each county.
SCVURPPP	75	C.12.b	PCB construction material, how to comply	*Revise to state that this requirement can be fulfilled by participation in the Proposition 50 grant project as a stakeholder and project partner, and acknowledge that this effort is already underway prior to permit issuance. Because sampling required by this provision would possibly lead to immediate abatement orders to protect human health at some sampling sites, it will be difficult or impossible to obtain permission to sample due to the potential liability to property owners.*	The commenter's suggestion about means of compliance does not provide for adequate accountability. The grant-funded work will provide a head-start for the permittees, but the requirement cannot be limited to only that which is accomplished through that other effort.	
ACCWP	45	C.12.b	PCB construction material, how to comply	*Revise to state that this requirement can be fulfilled by participation in the Proposition 50 grant project as a stakeholder and project partner, and acknowledge that this effort is already underway prior to permit issuance. Because sampling required by this provision would possibly lead to immediate abatement orders to protect human health at some sampling sites, it will be difficult or impossible to obtain permission to sample due to the potential liability to property owners.*	See response to SCVURPPP 75.	
SMCWPPP	16	C.12.b	PCB	*Revise to state that this requirement can be*	See response to SCVURPPP 75.	

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			construction material, how to comply	*fulfilled by participation in the Proposition 50 grant project as a stakeholder and project partner, and acknowledge that this effort is already underway prior to permit issuance. Because sampling required by this provision would possibly lead to immediate abatement orders to protect human health at some sampling sites, it will be difficult or impossible to obtain permission to sample due to the potential liability to property owners.*		
Berkeley	39	C.12.b	PCB construction material, how to comply	*Revise to state that this requirement can be fulfilled by participation in the Proposition 50 grant project as a stakeholder and project partner, and acknowledge that this effort is already underway prior to permit issuance. Because sampling required by this provision would possibly lead to immediate abatement orders to protect human health at some sampling sites, it will be difficult or impossible to obtain permission to sample due to the potential liability to property owners.*	See response to SCVURPPP 75.	
San Jose	80	C.12.b,c,d	PCBs in demolition materials	*The City requests that explicit mention of ongoing Prop 13-funded projects currently underway by SFEI and others to address PCB BMP effectiveness and PCBs in demolition materials be made in regard to these Provisions. The City also requests that participation in these projects be considered to satisfy these requirements. If not, please explain why.*	See response to SCVURPPP 75.	
Oakley	204	C.12.b.	Reporting	*Considering the C.12.b attachment, what is to be put into the table?*	See response to Oakley comment 142.	
Sunnyvale	30	C.12.b.v	inspection, contingent upon sampling	*This Provision requires training and deployment of inspectors with no timeline associated. This Provision should be contingent on the results of the sampling and analysis efforts. If PCBs are not found in meaningful amounts in demolition wastes, this Provision should be omitted. Reword this Provision to be dependent upon the results of the sampling and analysis activities.*	The Provision is adequate as written in terms of sequence and timing.	
San Jose	79	C.12.b.v	inspection,	*This Provision requires training and*	See response to Sunnyvale	

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			contingent upon sampling	*deployment of inspectors with no timeline associated. This Provision should be contingent on the results of the sampling and analysis efforts. If PCBs are not found in meaningful amounts in demolition wastes, this Provision should be omitted. Reword this Provision to be dependent upon the results of the sampling and analysis activities.*	comment 30.	
ACCWP	46	C.12.c	abatement on private land	*Source control on private properties is by far the most cost-effective strategy for reducing PCBs, and that abatement activities at downstream areas before abatement of source properties may produce only temporary reductions. Adjust the timeline such that suspect locations and survey results are reported in October 2009. Clarify that the requirement to "conduct an abatement program in portions of drainages under their jurisdiction." does not require municipalities to be responsible for abating PCB contamination on private properties.*	The Provision has been revised to clarify permittee responsibilities.	
Berkeley	39	C.12.c	abatement on private land	*Source control on private properties is by far the most cost-effective strategy for reducing PCBs, and that abatement activities at downstream areas before abatement of source properties may produce only temporary reductions. Adjust the timeline such that suspect locations and survey results are reported in October 2009. Clarify that the requirement to "conduct an abatement program in portions of drainages under their jurisdiction." does not require municipalities to be responsible for abating PCB contamination on private properties.*	see ACCWP 46	see ACCWP 46
BASMAA	4	C.12.c	abatement, Clarify responsibility	*Revise these provisions to make it clear that municipalities are not responsible for abating PCB contamination on private properties nor responsible for cleaning up PCBs that have migrated to public properties from privately-owned PCB release sites. It should also be noted that on-site human health risk may become an important factor during planning*	see ACCWP 46	see ACCWP 46

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				and implementation of PCB site cleanups.		
SCVURPPP	76	C.12.c	abatement, Clarify responsibility	*Revise these provisions to make it clear that municipalities are not responsible for abating PCB contamination on private properties nor responsible for cleaning up PCBs that have migrated to public properties from privately-owned PCB release sites. It should also be noted that on-site human health risk may become an important factor during planning and implementation of PCB site cleanups.*	see ACCWP 46	see ACCWP 46
SMCWPPP	16	C.12.c	abatement, Clarify responsibility	*Revise these provisions to make it clear that municipalities are not responsible for abating PCB contamination on private properties nor responsible for cleaning up PCBs that have migrated to public properties from privately-owned PCB release sites. It should also be noted that on-site human health risk may become an important factor during planning and implementation of PCB site cleanups.*	see ACCWP 46	see ACCWP 46
SCVURPPP	76	C.12.c	abatement, Need more time	*Because of the difficulty in completing all of the activities listed in the draft permit, SMCWPPP proposes that the drainage areas with elevated PCBs be identified within one year of the permit's adoption.*	We agree and will move November 2008 reporting to the 2009 annual report	Changed November 2008 reporting to 2009 Annual Report.
SMCWPPP	16	C.12.c	abatement, Need more time	*Because of the difficulty in completing all of the activities listed in the draft permit, SMCWPPP proposes that the drainage areas with elevated PCBs be identified within one year of the permit's adoption.*	see SCVURPPP 76	see SCVURPPP 76
Roger James	82	C.12.c	abatement, not responsibility of permittees	*The program as outlined is the responsibility of the Water Board and DTSC to develop, fund and implement. Permittees should not be required to conduct soil/sediment sampling to identify additional "hot spots" at this time until the Water Board or DTSC demonstrates the ability to effectively cleanup known "hot spots".*	The Provision has been revised to clarify permittee responsibilities.	
Oakley, Moraga	86	C.12.c	collaboration clarification	*Provision states "Permittees working collaboratively…" Does this mean a Regional effort is contemplated among all programs?*	The Provision explicitly states the expectations for permittees as a group.	
Alameda City	25	C.12.c	Exempt clean-up sites from	*Provision C.12.c. should be revised to specifically exempt areas such as Alameda*	All Permittees must work collaboratively to accomplish the	

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			provisions	*Point and FISC- Alameda where the RWQCB, the Department of Toxic Substances Control, and/or other state or federal environmental agencies that already have responsibility for overseeing or implementing site remediation efforts for PCBs. It is not practical nor an efficient use of public funds for local agencies to implement pollutant control studies in areas where, presumably, the RWQCB has already overseen effective remediation.*	work required by the Provisions. Choice of the pilot studies can address the concerns of the commenter.	
SF Baykeeper, NRDC, & Clean Water Action	21	C.12.c	More TMDL action, fewer studies	*The draft Permit places too much emphasis on studies and reports and, consequently, places too little emphasis on enhancing ongoing local efforts to reduce stormwater pollution. These repetitive studies only serve to extend the timeline for implementation.* *The provision only requires investigation of five sites in the entire Bay Area. It is feasible for municipalities to use the already tested approaches and information to identify areas most likely to have elevated concentrations of PCBs and to make a full-fledged effort to abate this source of PCBs. Instead of pilot studies, simply require full-scale abatement of PCBs contaminated sites.*	The actions required are those necessary to move toward achievement of the waste load allocations. There is not sufficient understanding of what will work to reduce loads to just require implementation actions. Requiring such actions without understanding benefit would not be productive. The current permit is a big step forward in implementation, while, at the same time, improving our understanding of what will work to reduce loads. We are not requiring WLAs as numeric limits in stormwater permits at this time.	
Oakley, Moraga	87	C.12.c	Provide detail	*What are considered to be potential PCB sources, and is the testing to be water tests, or basin land testing? Also, what are visual clues? Who are the "other appropriate agencies" that the Permittees are to report to?*	The commenter should consult with other BASMAA agencies that have already begun working on these issues and can provide information about what has been taking place over the last several years. Report findings to the Water Board or DTSC as a starting point.	
SF Baykeeper, NRDC, & Clean Water Action	26	C.12.c	provide guidance	*The permit should provide guidance on this abatement program.*	It is impossible to specify manner of abatement before details are provided on the pilot locations.	
Daly City	100	C.12.c	unreasonable	*Daly City questions the appropriateness and reasonableness to this entire section as being an achievable objective within the confines of a five-year stormwater permit.*	The Provision requires 5 pilot projects throughout the region. This is a reasonable requirement.	

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Oakley	205	C.12.c.	Reporting	*Considering the C.12.c attachments, what is to be put into the table?*	See response to Oakley comment 142.	
Berkeley	39	C.12.d	Flexibility	*Clarify that the focus is sediment management activities including but not limited to practices listed, but that not all of the practices listed as examples may be feasible in pilot watersheds.*	The Provision is adequate as written.	
Berkeley	39	C.12.d	Need more time	*Accomplishing this provision will require more time.*	We disagree. The Provision is adequate in terms of sequencing and timing.	
Oakley, Moraga	88	C.12.d	parking restrictions	*Mandatory parking restrictions are not acceptable for the reasons mentioned above (C.10.b). Also, the implementation and reporting dates need to be coordinated.*	The provision is acceptable as written. See response to comments on C.10.b regarding parking restrictions.	
Berkeley	39	C.12.d	Prescriptive and broad	*too prescriptive and broad in its requirement to conduct this pilot study in conjunction with the studies in C.12.c*	We disagree. Pilot studies are an appropriate and reasonable first step toward full achievement of TMDL load allocations.	
Oakley	71	C.12.d	provision requires parking enforcement	*C.10 and C.12 make parking restrictions mandatory. Mandatory parking enforcement as a blanket requirement is unacceptable and should be left to the discretion of the local agency.*	See response to parking restriction issue in response to comments on C.10.	
Contra Costa Clean Water Program	112	C.12.d	street sweepers	*Add "at applicable areas" to this sentence so that it reads "Beginning July 1, 2011, Permittees shall implement the most potentially effective measure(s) based on the evaluation of Provision C.12.d.i and ii at applicable areas throughout the region." This is because PCBs aren't evenly distributed throughout the region.*	Permittees have flexibility in choosing where to implement pilot tests of this Provision. The suggested language change is not necessary.	
Oakley	206	C.12.d.	Reporting	*Considering the C.12.d attachment, what is to be put into the table?*	See response to Oakley comment 142.	
Central San	8	C.12.d.i	diversion to sanitary sewer, add language	*Street flushing and capture with potential routing to the sanitary sewer could be a significant concern to CCCSD depending on the flow rates, solids level, and pollutant loading. This could jeopardize compliance with NPDES permits without use of appropriate treatment and oversight. Make sure that you add text like ["…where allowed by the local sanitary sewer agency"] about coordinating with the sanitary sewer agency to determine if*	We will add clarifying language that street flushing and capture should be conducted in coordination and consultation with local sanitary sewer agency.	We will add clarifying language that street flushing and capture should be conducted in coordination and consultation with local sanitary sewer agency.

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				feasible and under what conditions [e.g. MRP Conditions C.2.i. and C.3.c.i.(1)(a)].		
Roger James	84	C.12.e	Choice of treatment methods for PCBs	*The objective and emphasis of the PCB abatement program must be identification and cleanup of "hot spots" and disposal of the PCBs in accordance with environmental regulations. Systems to treat runoff of PCBs should be designed to capture and retain the PCBs before cleanout and safe disposal rather than on systems as proposed that would allow ongoing exposure to wildlife.*	The C.12 Provisions require a range of activities to reduce PCB loads to the Bay and protect wildlife.	
San Jose	81	C.12.e	Clarify language	*This requirement may conflict with results of the technical and economic feasibility assessment if assessment recommendations do not "span treatment types and drainage characteristics." The City requests adding "as possible within the constraints of the feasibility assessment outcomes in C.12.e.i." to C.12.e.iii.*	We will add some clarifying language, but it should be possible to accomplish the goal of spanning treatment types when taking the 10 pilot study locations as a group.	We added some clarifying language.
SF Baykeeper, NRDC, & Clean Water Action	22	C.12.e	do more retrofits, no need to pilot test	*Conducting only ten "pilot projects" seems insufficient given that industrial locations are routinely required to treat stormwater prior to discharge, and that existing permits already require new developments creating or replacing more than 10,000 square feet of impervious area to incorporate stormwater treatment systems. There is no need to "pilot" the effectiveness of bioretention or sand filters in removing PCBs from stormwater, nor is there a lack of information about the feasibility of installing such facilities. Rather than a "pilot" approach, the MRP should set specific goals for full-scale retrofit of the most significantly polluted sites during the permit term.*	We disagree. Pilot studies in a number of locations for a number of different types of control measures are an appropriate and reasonable first step toward achieving TMDL load allocations.	
Oakley, Moraga	89	C.12.e	Provide detail	*seems to be calling for a collaborative (to be defined) effort for PCBs. Are these the same sites that were required for mercury?*	Yes.	
Oakley	207	C.12.e.	Reporting	*Considering the C.12.e attachments, what is to be put into the table?*	See response to Oakley comment 142.	
Oakley, Moraga	90	C.12.e.iii	Provide detail	*how many sites are to be selected, the same number as for mercury?*	The Provision provides the detail in question.	

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Roger James	85	C.12.f	diversion to POTW, confusing	*This requirement is also contained in provision C.8.e.iii and provision C.11.f. To avoid confusion these three should be combined into one requirement.*	Some clarifications made, but it was not convenient to combine into one pump station provision.	clarifying changes were made to pump station related provisions.
SCVURPPP	79	C.12.f	diversion to POTWs	*These requirements are premature, overly prescriptive and require actions outside of the jurisdiction and control of municipal stormwater agencies.*	The requirements are not premature as there is a need to explore all reasonable candidate control measures. The provision allows for flexibility and encourages working with sanitary sewer agencies, and working out such arrangements is within the control and jurisdiction of stormwater agencies.	
Central San	9	C.12.f	diversions to sanitary sewer	*This proposal is not feasible because:* *• Structural limitations related to capacity of infrastructure;* *• Risk of maintaining compliance with the NPDES Permit; and* *• Risk of maintaining compliance with the Waste Discharge Requirements regarding controlling Sanitary Sewer Overflows (SSOs).* *• Jeopardize compliance with permit limits* *Revise these Conditions to compel Permittees conduct studies of the pollutant loadings from specific areas in order to conduct multi-year trend analysis to evaluate the effectiveness of the many control strategies that are specified in the MRP. Obtaining this data would enable more thorough evaluation of alternative management strategies in the future.*	See response to Santa Clara comment 2 and San Jose comments 23 and 24.	
Oakley, Moraga	91	C.12.f	Provide detail	*This provision calls for the selection of 20% of the existing pump stations. This wording is virtually word for word C.11.f.i. The reporting date is different, and it is unclear what is intended. What is the requirement that is to be implemented?*	The pump station provisions have been revised to improve clarity.	
Oakley, Moraga	93	C.12.h.	Provide detail	*Does fate mean the eventual disposition of the PCB's? Also, is this to be done as a Permittee, Program or Regional activity?*	Please refer to mercury and PCBs TMDLs for background on meaning of "fate and transport" or confer with other BASMAA agencies for background. This is most efficiently	

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					accomplished as a regional activity.	
Oakley	149	C.12.f.	Reporting	*C.12.f & Summary Table say the reporting is for the 5 candidate stations for 2009 & 2012. It does not mention submitting the list of 20% nor does it mention 2010. Can this be clarified?*	See response to Oakley comment 142.	
Oakley	208	C.12.f.	Reporting	*Considering the C.12.f attachments, what is to be put into the table?*	See response to Oakley comment 142.	
Roger James	86	C.12.g,h	PCBs quantification not feasible	*A creek runoff monitoring program proposed in provision C.8.f. will not be able to quantify load reductions because of the wide variation in runoff rates. The Water Board staff must limit the quantification during this permit term to cleanup of "hot spots", treatment and other management measures until a runoff control plan is fully developed. These tasks should only be undertaken by or conducted by SFEI and not by permittees.*	There are other provisions to quantify load reductions through accounting for loads reduced by program activities in C.12 and other provisions. The permit cannot require monitoring by SFEI because they are not a permittee.	
Oakley	150	C.12.g.	Reporting	*C.12.g requires a PCB monitoring program, which is reflected in Summary Table with reporting in 2009 & 2012. Section III doesn't list a submittal requirement. What is required?*	See response to Oakley comment 142.	
Oakley	209	C.12.g.	Reporting	*We presume that the entries required for C.12.g are the full report.*	See response to Oakley comment 142.	
Oakley	151	C.12.h.	Reporting	*C.12.h requires reporting in 2009 & 2012. The Summary Table reflects this but there is no submittal requirement. What is intended?*	See response to Oakley comment 142.	
Oakley	210	C.12.h.	Reporting	*Considering the C.12.h attachments, what is to be put into the table for 2012?*	See response to Oakley comment 142.	
Oakley	152	C.12.i.	Reporting	*C.12.i requires reporting on implementing a risk reduction program. The Summary Table reflects this, but there is no submittal requirement. What is required?*	See response to Oakley comment 142.	
Oakley	211	C.12.i.	Reporting	*We presume that the entries required for C.12.i are the full report.*	See response to Oakley comment 142.	
Daly City	103	C.13	Diversion to POTW, copper consideration	*Copper is water-soluble and could not be removed by our treatment processes. Should this constituent be captured in the primary process through sedimentation it will end up in our biosolids. That could result in the biosolids becoming a hazardous waste thus increasing costs for disposal and open to regulatory peril.*	The amount of increased copper that would reach POTWs would not likely cause the effects claimed. In addition, POTWs are very efficient at removing copper as evidenced by the large concentration reduction from influent to effluent.	

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NRDC	20	C.13	Vague Language	*Language relating to waste from cleaning and treating copper architectural features and control of the industrial source of copper is too vague.*	We do not know the manner in which this language is too vague or how the commenter wishes it to be made less vague.	
Milpitas	14	C.13 fact sheet	confusing term	*Use of the acronym "SSO" for site-specific objectives is confusing for municipal staff who have been taught by RWQCB that the acronym stands for sanitary sewer overflow. We request that you spell out the phrase in this permit or develop another acronym.*	We define that use of the term in that section of the fact sheet. It is only used in this limited section, and it is not overly confusing for someone to understand what is meant based on the context.	
Dublin	9	C.13 various	copper provisions not worth effort	*Tentative Order requires copper-specific activities along with specific record keeping and reporting requirements, none of which contribute to copper or other pollutant removal or overall water quality improvements. Some of the requirements (such as an ordinance prohibiting washing of buildings with exterior copper) would result in a very limited source of copper and would be impractical to enforce. It is also noteworthy to mention that the added requirements for copper removal result in a negligible cost to benefit ratio.*	These provisions are taken directly from the Basin Plan amendment for the copper site-specific objectives and are necessary to implement the objectives.	
Pleasanton	11	C.13 various	copper provisions not worth effort	*Tentative Order requires copper-specific activities along with specific record keeping and reporting requirements, none of which contribute to copper or other pollutant removal or overall water quality improvements. Some of the requirements (such as an ordinance prohibiting washing of buildings with exterior copper) would result in a very limited source of copper and would be impractical to enforce. It is also noteworthy to mention that the added requirements for copper removal result in a negligible cost to benefit ratio.*	See response to Dublin comment 9.	
Roger James	9	C.13 various	editorial changes	*Provision C.13. – Change "perform" to "implement" to make consistent with a regulatory approach.* *Provisions C.13.a. and C.13.b. – Change "Manage" to "Regulate" to make consistent with a regulatory approach.* *Provisions C.13.a.i. – Delete "waste" since the objective is to control all runoff from these*	We will make some of the requested language changes.	We made some of the requested changes.

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				sources and not qualify it as a waste. Provisions C.13.c.iii. – Delete " , and such" or define what is meant by the phrase.		
San Pablo	31	C.13, C.14	Reporting	*Why are cities being required to study these pollutants? Isn't it the Water Board's responsibility to determine if a pollutant is a concern and to conduct the appropriate studies?*	The special studies for copper are taken directly from the basin plan amendment for the copper site-specific objectives and are necessary to resolve information gasp associated with copper. The studies of C.14 are necessary to investigate the cause and contribution of urban runoff to possible water quality impairments associated with these pollutants.	
Oakley	153	C.13.	Reporting	*C.13.a, C.13.b, C.13.c, C.13.d all have reporting requirements in the Permit text, and all are reflected in the Summary Table. There is no submittal requirement listed. What is required?*	See response to Oakley comment 142.	
Oakley	212	C.13.a.	Reporting	*We presume that the entries required for C.13.a are the full report.*	See response to Oakley comment 142.	
Central San	10	C.13.a.i	copper architectural feature	*Without clear instructions regarding proper disposal, a significant risk exists for these wastes to be discharged to the sanitary sewer without pretreatment. Disposal of these wastes to the sanitary sewer is not acceptable to CCCSD due to the impact on our ability to meet discharge requirements for copper. Provision should direct generators of this waste to manage the wastes generated as a hazardous waste unless a legal alternative (not the sanitary sewer) is identified.*	Provision says that such water cannot be discharged to stormdrains. The provision does not mandate disposal to sanitary sewer. There are other options.	
Alameda City	26	C.13.a.i	Funding	*The adoption and implementation of a municipal ordinance prohibiting the discharge of wastes from the installing, treating, cleaning and maintenance of copper architectural features will cause the City to incur additional staffing expense. No funding mechanism is identified for the additional staff time to enforce this requirement.*	We disagree with the claim that this is burdensome and expensive.	
SCVURPPP attorney	32	C.13.a-e	unfunded mandates	*These State Permit conditions mandate Permittees to conduct studies and pilot*	Is there a boiler plate response to the unfunded mandate comment?	

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				projects in prescriptive ways that exceed federal requirements and could be costly. *Additionally, requiring the adoption and enforcement of ordinances is a new program that exceeds federal requirements.*		
San Jose	86	C.13.b	copper from pools spas	*Delete the phrase "…including connection for filter backwash…" as it conflicts with sanitary sewer ordinances prohibiting the discharge of solids/debris to the sanitary sewer.*	Permittees do not have to allow discharge to sanitary sewer. There is an alternative mentioned in the revised Provision.	Provision was modified to allow for use in landscaping or irrigation.
Central San	11	C.13.b	copper from pools, spas	*This provision is not acceptable if it involves a passive connection to allow rainwater discharges during peak rainfall events. Distinguish between the disposal options for copper-containing pool, spa, and fountain water and water not contaminated since some sanitary sewer agencies may not be able to accept this wastewater without significant adjustments to the copper effluent limits. Clarify that this requirement involves locating a drain in the area for draining events and is not intended to direct overflow from pools, spas, and fountains to the sanitary sewer.*	Municipalities retain autonomy regarding restrictions and conditions in the prohibition or ordinance. There is now an option for disposal that does not involve sanitary sewer.	Provision was modified to allow for use in landscaping or irrigation.
SCVURPPP	83	C.13.b	copper from pools, spas	*Modify provision to indicate that this requirement should not be imposed in areas of the county that rely on septic systems. The TO should incorporate flexibility where discharge to the sanitary sewer is not feasible.*	Municipalities retain autonomy regarding restrictions and conditions in the prohibition or ordinance.	
SMCWPPP	18	C.13.b	copper from pools, spas	*modified to apply only to new connections where there is adequate sewer capacity to accept these discharges. In addition, this requirement should not be imposed in areas of the county that rely on septic systems.*	Municipalities retain autonomy regarding restrictions and conditions in the prohibition or ordinance.	
Roger James	88	C.13.b	copper from pools, spas	*The direct discharge to storm drain systems from these sources should be prohibited, but should not mandate connection to a sanitary sewer. The provision should allow discharge and irrigation of landscaping particularly for the smaller volume discharges.*	We will allow this flexibility.	modify to allow for possibility of other disposal, not to storm drain.
Union San	2	C.13.b	copper from pools, spas	*Mandatory connection to sanitary sewer would result in increased copper loading to the treatment plant. This could cause NPDES*	See response to Daly City comment 103.	

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				compliance challenges, plant upsets, impact beneficial re-use of biosolids, and cause discharge violations. This could also cause increased costs for monitoring and treatment, and would necessitate upgrading infrastructure.		
San Jose	85	C.13.b	copper from pools, spas	*Remove the words "spas" and "fountains" from the sentence. Many spas and fountains are portable devices. Requiring a permanent connection to the sanitary sewer for them is infeasible.*	Permittees can provide this clarification as they develop their own local ordinances.	
ACCWP	51	C.13.b	copper from pools, spas, too prescriptive	*Overly prescriptive language requires adoption of local ordinances prohibiting copper-containing PSF discharge, as well as installation of sanitary sewer discharge connection including "a proper permit from POTWs". This contradicts the recommendations in the CEP's Copper Management Strategy Development Resources (2006), which identified these steps not as the initial stages of implementation, but only as possible endpoints of a series of progressive steps if adequate control is not achieved at lower implementation levels. Revise to follow the CEP document's progressive implementation sequence*	There is no legal obligation to make the permit conform to recommendations made in the cited report.	
Berkeley	39	C.13.b	follow CEP document sequence	*Revise permit to follow the CEP document's progressive implementation sequence (pp 13-26)*	The Provisions are consistent with the Basin Plan amendment for the copper site-specific objectives.	
San Jose	84	C.13.b	Inconsistent Provisions	*Make sure this provision is consistent with Provisions C.15.b.v.(1)(a) and C.15.b.v.(1)(b). One requires the prohibition of discharges from pools, spas, and fountains and the other allows it under certain conditions.*	Provision C.13 governs that subset of such discharges containing copper. Therefore, if copper is present, Provision C.13.b governs discharge. If no copper is present, Provision C.15 governs.	
Berkeley	39	C.13.b	prescriptive	*Overly prescriptive language requires adoption of local ordinances prohibiting copper-containing discharge, as well as installation of sanitary sewer discharge connection including "a proper permit from POTWs". This contradicts the recommendations in the CEP's*	The Provisions are consistent with the Basin Plan amendment for the copper site-specific objectives. Consistency with the Basin Plan is required, not with a CEP document.	

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				Copper Management Strategy Development Resources.		
Oakley	213	C.13.b.	Reporting	*We presume that the entries required for C.13.b are the full report.*	See response to Oakley comment 142.	
San Jose	88	C.13.c	brake pads, consider other approaches	*The Water Board should consider other actions that the State can take to require that the manufacturers of vehicle brake pad products conduct these types of studies, since municipalities do not control the amount of copper that is used in brake pads.*	The Water Board is engaged in such efforts.	
SCVURPPP	84	C.13.c	brake pads, delete provision	*delete the proposed "desktop study to evaluate the implementation of enhance treatment system design, operation and maintenance efforts" to "minimize the amount of brake pad-associated copper from reaching the Bay." The Water Board may want to consider using grant funds or requiring that the manufacturers of these products conduct these types of studies.*	We will delete this study.	We will delete this study.
SMCWPPP	18	C.13.c	brake pads, delete provision	*delete the proposed "desktop study to evaluate the implementation of enhance treatment system design, operation and maintenance efforts" to "minimize the amount of brake pad-associated copper from reaching the Bay." The Water Board may want to consider using grant funds or requiring that the manufacturers of these products conduct these types of studies.*	We will delete this study.	We will delete this study.
Moraga, Oakley	94	C.13.c	Clarify meaning	*C.13.c talks about reporting "…depending on the progress of the BPP project… after the decision point…" What does "depending on the progress and decision point" mean?*	That phrase has been removed.	
ACCWP	52	C.13.c	copper from pools, spas, too prescriptive	*Requirement for a desktop study to evaluate implementation of enhanced treatment, O&M, which also "shall consider pilot tests" is excessive, given CEP document's assessment that "Typical runoff treatment systems have incomplete copper removal; removal of dissolved copper is even more difficult than removal of total copper. Confirm that the desktop study may be a review of similar implementation strategies evaluations by other*	We will delete this study.	We will delete this study.

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				stormwater programs, including a number of reports recently released or soon to be available from other California stormwater programs in response to metals TMDLs.		
Burlingame	15	C.13.c	copper in brake pads, not under permittee control	*The amount of copper in brake pads is also beyond the control authority of the program and co-permittees.*	The amount of copper in brake pads may be beyond permittee control, but, to the extent that this copper contaminates urban runoff and threatens water quality in receiving waters, it becomes a responsibility of permittees to address it.	
Berkeley	39	C.13.c	excessive requirement	*The requirement for a desktop study to evaluate implementation of enhanced treatment, O&M, which also "shall consider pilot tests" is excessive, given CEP document's assessment that "Typical runoff treatment systems have incomplete copper removal; removal of dissolved copper is even more difficult than removal of total copper."*	We will delete this study.	We will delete this study.
Berkeley	39	C.13.c	language change suggestions	*Revise requirement to one or more of:* *• "Conduct or cause to be conducted a literature review on potential copper sediment toxicity and sublethal effects on salmonids in SF Bay."* *• "Participate in a regional workgroup convened by WB to discuss steps for joint discharger implementation of studies to address uncertainties in copper impacts to biota in the Bay"*	We cannot accept this proposal.	
San Jose	87	C.13.c	language change suggestions	*Add the phrase "acting individually or collectively," after the word Permittees.*	The encouragement to accomplish provisions collectively was added to every provision for pollutants of concern.	
Oakley	214	C.13.c.	Reporting	*We presume that the entries required for C.13.c are the full report.*	See response to Oakley comment 142.	
Moraga	83, 96	C.13.d	Clarify meaning	*C.13.d also requires the "…reporting on BMP implementation, compliance and enforcement for the next Permit term". What does this mean?*	That phrase has been removed.	
Oakley	96	C.13.d	Clarify meaning	*C.13.d also requires the "…reporting on BMP implementation, compliance and enforcement for the next Permit term". What does this*	That phrase has been removed.	

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				mean?		
Daly City	104	C.13.d	too much detail	*The permit language gets down into the "nth" degree of detail. Suggest replacing language that allows decisions by local programs.*	The permit has to state clear enough expectations so permittees know how to comply and provide accountability mechanisms. The Provision language is adequate as written.	
Oakley	215	C.13.d.	Reporting	*We presume that the entries required for C.13.d are the full report.*	See response to Oakley comment 142.	
Daly City	105	C.13.e	explain how to comply	*Please explain how this is intended to be accomplished and within the proposed timeframe?*	Permittees either must conduct these studies or arrange for them to be conducted.	
SCVURPPP	85	C.13.e	special studies, delete provision	*The municipalities do not have sufficient resources to complete this task on the schedule shown. SMCWPP recommends that the permit delete this requirement as a low priority item.*	This requirement comes directly from the Basin Plan amendment for the copper site-specific objectives. The objectives have been approved contingent upon conducting these studies. These are not low priority items.	
SMCWPPP	18	C.13.e	special studies, delete provision	*The municipalities do not have sufficient resources to complete this task on the schedule shown. SMCWPP recommends that the permit delete this requirement as a low priority item.*	see SCVURPPP 85.	
Moraga	97	C.13.e	special studies, others should do them	*Isn't this an activity more properly implemented by the Department of Fish and Game, or the State Water Resources Control Board under the programs supporting its "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California", or Water Quality Order No 2004-0009-DWQ?*	These requirements come directly from the Basin Plan amendment establishing the site-specific objective for copper in the Bay. These same requirements will appear in all NPDES permits in the Bay Area.	
Oakley	97	C.13.e	special studies, others should do them	*Isn't this an activity more properly implemented by the Department of Fish and Game, or the State Water Resources Control Board under the programs supporting its "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California", or Water Quality Order No 2004-0009-DWQ?*	see response to Moraga comment 97.	
San Jose	89	C.13.e	Special Studies,	*Remove this provision since there are numerous other high priority requirements.*	Permittees are encouraged to coordinate with wastewater	

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			remove	*Copper is a lower priority than other POCs included in the Tentative Order. If this provision is included, use local species and natural test waters from relevant local receiving waters. This Provision should be coordinated between BASMAA and BACWA to avoid duplication of effort since similar requirements are contained in POTW permits.*	dischargers to accomplish these studies.	
Contra Costa Clean Water Program	115, 116, 117	C.13.e, c.12.h	special studies, RMP should do this	*This belongs under the RMP, as a special study. This provision inappropriately delegates the Regional Board's duties to develop TMDL information. We request that you simply state that this requirement may be fulfilled by an RMP special study, and commit to supporting the special studies at the RMP technical committee and steering committee.*	Both these provisions are taken directly from Basin Plan amendments for copper site-specific objectives and for the mercury TMDL. We will not place the requested statement concerning the manner in which permittees can comply with these provisions. The responsibility to comply rests with the permittees, not the RMP.	
Oakley	216	C.13.e.	Reporting	*We presume that the attachment plus the entries required for C.13.e are the full report.*	See response to Oakley comment 142.	
Central San	12	C.14	Emerging contaminants, keep out of POTWs	*The potential presence of these emerging pollutants in stormwater runoff is another reason we have concerns about diverting stormwater flows to the sanitary system without proper pretreatment. Increasing the contribution of these pollutants could result in levels that constitutes Reasonable Potential to exceed water quality standards, which would mean effluent limits and monitoring.*	We do not agree with your argument that it is more important to avoid the remote possibility of effluent limitations than explore potentially valuable strategies for reducing loads of pollutants that are impairing beneficial uses in the Bay.	
SMCWPPP	18	C.14	Insufficient Resources	*The municipalities do not have sufficient resources to complete this task according to the draft permit's schedule. The permit should be modified to allow the municipalities five years to develop a plan and schedule for charactering these pollutants. The other option would be for the permit language to clarify that the data collected will be limited to existing data with the information summarized in a report due five years after adoption of the MRP.*	The current schedule and scope of the Provision is reasonable. It is not a reasonable notion that the only progress that permittees can accomplish in five years of effort is to develop a plan and schedule for this important work. It is also reasonable to restrict the reporting to existing data, which is likely inadequate.	
Berkeley	38	C.14	Need more time	*Requirement to complete and report on the initial characterization phase by Oct 2010*	Characterization is now due in 2012, which is enough time to complete	

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				does not allow enough time to ramp up resources, particularly in view of many other Year 2 requirements and the high cost of PBDE analyses.	this work.	
San Jose	91	C.14.a	Don't need selenium data	*Since previous data have shown that selenium is not problematic in most urban creeks, remove selenium from this Provision.*	There are not sufficient data to make this claim. Selenium will remain on the list of pollutants to characterize through this Provision.	
Sunnyvale	33	C.14.a	focus/prioritize	*The identification of possible control measures or management practices to reduce these pollutants seems appropriate. However, given the many competing requirements of this Tentative order, the requirements listed here should be included in the prioritization efforts for all permit provisions. Prioritize this provision in consideration of all the other provisions included in the permit.*	All of the provisions in the permit must be accomplished. If the aim of requesting prioritization is to discover which permit provisions need not be accomplished, then the request is not appropriate.	
Oakley, Moraga	98	C.14.a	Impracticable Provision	*This time table does not take into consideration the time required to prepare a competent Request for Qualifications, assuming staff have the skill set to prepare such an RFQ, select the qualified consultants, prepare and advertise a Request for Proposals, analyze proposals, negotiate a cost, award the work and accomplish the work. If drainage pathways and urban runoff are what is to be analyzed, it would seem this activity would need to run through a rainy season. This schedule will have to be revised as it seems impracticable as presented.*	The due date for this characterization effort has been relaxed to 2012. But, work should start on this measure soon so that this due date can be met.	
ACCWP	54	C.14.a	Need more time	*This provision does not allow enough time to ramp up resources, particularly in view of many other Year 2 requirements and the high cost of PBDE analyses. Data requirements and reporting are not coordinated with C.8.f provisions. Clarify that information needs for this provision may be fulfilled by 1) data collected to comply with C.8 provisions; 2) existing stormwater program data from previous bedded sediment surveys; or 3) other existing data. (see also MP-1).* *Change the October 2010 Annual Report*	See response to Oakley/Moraga comment 98.	

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				requirement to consist of a summary of the sampling plan and status update; Change the October 2011 Annual report requirement to include results of characterization in addition to information for computing loads.		
SCVURPPP attorney	37	C.14.a	unfunded mandates	*The State here is effectively requiring the Permittees to determine whether the substance needs to be regulated, which is the work of the permitting agency and constitutes a new program for which no funding is being provided.*	Requiring storm water dischargers to investigate their cause and contribution to exceedances of water quality standards is not a new program. This is part of what storwater programs have been doing since their inception.	DALE - check this and revise as necessary
Contra Costa Clean Water Program	118	C.14.a	unreasonable timeframes	*This is a vaguely worded provision with unreasonable time frames. Does the conceptual model for selenium suggest that urban stormwater is a likely source? That does not appear to be the case in Contra Costa County. The goal of this provision for the first MRP permit cycle should be development of a carefully thought out, peer reviewed regional work plan that frames questions and proposes meaningful approaches to answer them.*	The time frames have been relaxed. There are outstanding questions about all of these pollutants for urban runoff that motivate these provisions.	
San Jose	90	C.14.a	Use existing data	*Pre-existing data and the monitoring requirements listed in the Water Quality Monitoring Provision (C.8) will provide sufficient data to comply with the intent of this provision. Revise this provision to clarify that data collected as part of Provision C.8.f as well as related data previously collected by BASMAA will provide a sufficient basis for completion of these tasks and thus compliance with this provision.*	The C.8 monitoring will not satisfy this Provision, nor will existing information.	
San Leandro	26	C.14.a	Funding	*The Water Board anticipating that control measures that may work for one pollutant will also work for the other pollutants is not justification that any local agency can use to divert already short resources into completing characterization of legacy pollutant distribution research for the Water Board.*	This is an editorial comment not requiring a response.	
Oakley	217	C.14.a.	Reporting	*From C.14.a it appears that the reporting requirement is attachment C.14.a. If that is*	See response to Oakley comment 142.	

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				true what is to be reported in the Table?		
SF Baykeeper	67	C.14.a.i	Emerging contaminants, characterization	*The characterization plan should include more specific details like the minimum number of sites for monitoring, where monitoring should occur, and when it should occur. Permittees should be required to collect a minimum amount of data to allow for a robust loading estimate.*	The flexibility allowed for this exploratory monitoring is appropriate for this class of pollutants.	
San Jose	92	C.14.a.v, C.14.a.v.i	clarify provision	*Modified these provisions to remain consistent with the fact sheet, which states this is an information gathering exercise.*	The Provision is consistent with the fact sheet as written.	
Contra Costa Co. Supervisors	8	C.8, C.10, C.11, C.12, C.13, C.14	Lack Capacity to Conduct Studies	*Conduct required scientific studies is beyond the County's core mission and the experience and expertise of municipal staff. The County has neither the staffing capacity nor the funding to conduct all of these specialized studies. In addition, many of these studies appear to be precursors to development of Total Maximum Daily Loads (TMDLs), which have historically (and more appropriately) been functions of the RWQCBs*	Conducting monitoring of pollutants in storm water that may be impacting beneficial uses is very much the responsibility of storm water programs.	
Oakley	4	C.8, C.11, C.12	Implementation Dates	*When requirements repeat, are they intended to be for the same site, or different sites? For instance:• Pilot project to evaluate on-site treatment for mercury Oct '09; • Pilot project to evaluate on-site treatment for PCB's Oct '09; • PDBE's, legacy pesticides, selenium Oct '12;*	The Provisions are clear enough about this issue as written. There may be some overlap in pilot project sites for mercury and PCB projects if justified and appropriate. There are no requirements for pilot projects for control measures for PBDEs, legacy pesticides, or selenium so the commenter is confused.	
Contra Costa County Supervisors	59	C.8, C9, C.11-C.14	collaboration clarification	*The requirements in these sections may be able to be carried out on a regional basis with tasks/costs shared by all co-Permittees. Use of the term "collectively" in the aforementioned provisions should be clarified with reference to establishment of sampling plans. This approach would streamline efforts and produce a more consistent data set by utilizing the same field staff, equipment, analytical laboratories, etc.. However, this proposition may require development of an oversight organization such as a Regional Monitoring*	This issue of collaboration has been clarified in the revised tentative order.	

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				Committee Program, or could be overseen by the Bay Area Stormwater Management Agencies Association (BASMAA).		
Contra Costa Flood Control	13	C.8, C9, C.11-C.14	Limits on responsibility	*The FC District should not be responsible, in this or future permits, for the costs of water quality monitoring that exceed the proportion of the FC District's owned land area to the entire watershed area tributary to the point of interest.*	This permit does not speak to the cost-sharing arrangements of monitoring.	
Berkeley, ACCWP	21 & MP-1, MP-1	C.8.a.	Collaborative Effort	*Indicating that some requirements can be satisfied by collaborative efforts is not consistent: insert language similar to C.8.a.i. in C.8.f.v, C.12b, C11/12h, C.9.e, C.9.g, C.11/12.c&d, C.11/12.e,f,gi, C.13,c,e; C.14.a.*	The language in C.8.a.i. applies to all of Provision C.8, & we agree to strengthen this by adding "C.8" after "Provision."	Add "C.8" after "Provision" in C.8.a.i.
SF Baykeeper, NRDC, & Clean Water Action	32	C.9	Define IPM	*The Permit should identify model Integrated Pest Management policies and ordinances. The Permit should define IPM and ensure that Permittees adopt definitions and ordinances that are at least as stringent as the example. We recommend a definition from the City of SF.*	Chapter 7 of the Basin Plan has a definition of IPM against which policies and ordinances can be evaluated. The fact sheet explicitly suggests UP3 as a resource to use to support development of such policies and ordinances. The UP3 website has model policies and other helpful resources to help guide policy development.	
Contra Costa Flood Control	46	c.9	duplicates State Board NPDES permit	*Permittee uses chemical herbicides now to manage our facilities and integrated pest management program, and we do have discharge requirements that the State Board has issued to us in an NPDES permit, so we would respectfully request that you not apply duplicative regulation to the flood control district in this area.*	is this a legit. Claim? How to respond?	
Sunnyvale	19	C.9	Flexibility	*The "EcoWise Certified" IPM Certification program promoted by the Association of Bay Area Governments and referenced in this permit provision is only for Branch 2 field representatives and operators for Structural Pest control. This certification program is not available to other applicators licensed through DPR.* *Requirements related to hiring "IPM Certified" pest control professionals should be removed*	The Provision already provides flexibility by saying "EcoWise or functionally equivalent". Informing residents of this certification program helps raise awareness about IPM and will promote its use. The requirement to hire IPM-certified contractors already provides flexibility because it allows an alternative means of compliance if	

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				from the permit until there is a state certification program for all professionals who apply pesticides through state agencies.	contracts require implementation of IPM.	
San Pablo	23	C.9	general	*We believe our resources would be better served by working with the Water Board to make pesticide regulators block pesticides from being sold unless they have been shown to be non-toxic.*	This is an editorial comment not requiring a response.	
Millbrae	2	C.9	Municipalities cannot control pesticide spraying	*Municipalities have no control over widespread use of pesticide within our respective jurisdictions, like aerial spraying. The MRP requires local municipalities to participate in regulatory processes and yet many of the local municipalities do not have such authority.*	The concept of aerial spraying is not mentioned in the permit. The Provision referred to (C.9.e) is well within permittees capability and is an activity you have been engaged in through BASMAA for several years.	
Daly City	79	C.9	Funding	*This will cost a significant amount of money from the City's General Fund. Funds that are not available now. Recommend this provision be phased in after a determination that funding will be available.*	This is not an acceptable request.	
SCVURPPP	65	C.9 - C.14	Explicitly allow regional efforts	*In the opening paragraph for Provisions C.9 through C.14, there should be a statement that allows Co-permittees to have the option of "utilizing regional studies for which the Co-permittee is involved" to comply with POC provisions.*	There is a statement to allow and encourage regional coordination to accomplish the Provisions.	
SCVURPPP	65	C.9 - C.14	language change suggestions	*The opening paragraph for each Provision pertaining to Pollutants of Concern Control Programs, should include a statement that such as: "The Permittees may address the requirements in this Provision by building upon their prior submissions to the Water Board." Additionally, similar to the language included in Provision C.8a, the opening paragraph for Provisions C.9 through C.14 should include a statement that allows Co-permittees to have the option of "utilizing regional studies for which the Co-permittee is involved" to comply with POC provisions.*	There is a statement to allow and encourage regional coordination to accomplish the Provisions. Including a statement alluding to "building upon past submissions to the Water Board" serves no useful purpose and is ambiguous.	
SMCWPPP	13	C.9 introduction	language change suggestions	*Please modify language in permit to tie action to a threat to water quality that is "significant" because virtually all pesticides pose some*	See response to Brisbane comment 14.	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
				threat to water quality. *Also, we suggest the language change: "municipal conveyance system" with "MS4 owned or operated by the municipality with coverage under the permit." Municipal separate storm sewer system is the term used in the federal Clean Water Act and is defined in the permit's Glossary, unlike municipal conveyance system.*		
Brisbane	14	C.9 introduction	language change suggestions	*Please modify language in permit to tie action to a threat to water quality that is "significant" because virtually all pesticides pose some threat to water quality.* *Also, we suggest the language change: "municipal conveyance system" with "MS4 owned or operated by the municipality with coverage under the permit." Municipal separate storm sewer system is the term used in the federal Clean Water Act and is defined in the permit's Glossary, unlike municipal conveyance system.*	We reject the request because this will just create an incentive for permittees to claim that there are no significant threats to water quality from pesticides to justify no or limited action on control measures. The provisions regarding pesticides are directly from the pesticide toxicity TMDL and are appropriately stated.	
Oakley	192	C.9.	Reporting	*Summary Table has cases that state "in addition to answering the following questions, submit the attachment…" For the following entries we presume:• entries required for C.9.e are the full report.• entries required for C.9.f are the full report.• entries required for C.9.g are the full report.*	See response to Oakley comment 142.	
Moraga	63	C.9.a	Define IPM	*What are the minimum requirements for such an ordinance or IPM policy?*	see response to SF BayKeeper comment 32.	
Oakley	63	C.9.a	Define IPM	*What are the minimum requirements for such an ordinance or IPM policy?*	see response to SF BayKeeper comment 32.	
SMCWPPP	13	C.9.a	don't require resubmission of IPM policy	*recommends that the permit be modified to not require the submission of the ordinance or policy if this has been done previously.*	It is not onerous to submit a copy of an existing policy.	
Brisbane	14	C.9.a	don't require resubmission of IPM policy	*recommends that the permit be modified to not require the submission of the ordinance or policy if this has been done previously.*	It is not onerous to submit a copy of an existing policy.	
NRDC	20	C.9.a	Vague Language	*Language relating to adopting IPM policy is too vague.*	See response to SF BayKeeper comment 32.	
SF Baykeeper, NRDC, &	9, 10, 11	C.9.a.ii, C.9.c.i ,	Vague Language	*Places where the permit requires "appropriate" BMPs should be revised to include a BMP*	There are very few if any instances of this phrase, in the cited provisions	

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Clean Water Action		C.13.a		*menu list of the minimum BMPs that must be implemented:*	and the instances where this phrase does occur (C..12.b and C.13.a) are acceptable because the appropriate BMPs depends on specific circumstances that must be discovered by actions of the Provisions. The BMP list cannot be stated a priori.	
SCVURPPP attorney	32	C.9.a-h	unfunded mandates	*Aside from monitoring and BMPs that reduce pesticides in runoff, the rest of C.9-related expenses exceed the requirements of the Federal Permit. These provisions are therefore unfunded mandates.*	The requirements are consistent with MEP and therefore Federal Requirements.	
Oakley	64	C.9.b	Define IPM SOP	*What is the approved resource for an IPM SOP?*	Chapter 7 of the Basin Plan has a definition of IPM against which policies and ordinances can be evaluated. The fact sheet explicitly suggests UP3 as a resource to use to support development of such policies and ordinances. The UP3 website has model policies and other helpful resources to help guide policy development.	
JamesRoger	75	C.9.b.iii	language change suggestions	*Almost every pesticide if misapplied is a threat to water quality therefore delete "that threaten water quality"*	This change invites interpretation of what constitutes threat to water quality and undermines accountability for required actions.	
SMCWPPP	13	C.9.c	training employees not worthwhile	*Municipalities should not be required to expend time training employees on how to apply over the counter pesticides, and Brisbane recommends this requirement be deleted from the permit.*	This is an opinion of the commenter with which the Water Board disagrees.	
Brisbane	14	C.9.c	training employees not worthwhile	*Municipalities should not be required to expend time training employees on how to apply over the counter pesticides, and Brisbane recommends this requirement be deleted from the permit.*	This is an opinion of the commenter with which the Water Board disagrees.	
Oakley	188	C.9.c.	Reporting	*For C.9.c, Section III refers to an attachment that is not referred to here as has been done in earlier provisions. Is completing this section plus submitting the attachment the full report?*	See response to Oakley comment 142.	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
Oakley	189	C.9.c.	Reporting	*Also, who is the certifying agency for IPM applicators and what are the standards that are being certified to?*	See response to Oakley comment 142.	
Oakley	190	C.9.d.	Reporting	*C.9.d refers to specifying IMP practices for implementation by contractors, or hiring IPM certified contractors. The information we have from the Regional IPM Conference does not list resources for certification or standards for specifying qualifications for IMP practices to be used. They only seem to arise on an ad hoc basis. What is to be used?*	See response to Oakley comment 142.	
Oakley	191	C.9.d.	Reporting	*We presume that the copy of the procurement documentation and the entries required for C.9.d are the full report.*	See response to Oakley comment 142.	
Sunnyvale	18	C.9.d.i	prescriptive	*Provision C.9.d.i is overly prescriptive in requiring the permittees to hire only IPM-certified contractors and will be almost impossible to achieve, as there is no IPM certification program available for all those licensed individuals who may apply pesticides.*	The requirement to hire IPM-certified contractors already provides flexibility because it provides an alternative means of compliance if contracts require implementation of IPM.	
Contra Costa County Supervisors	66	C.9.e	Clarify Responsibility	*Please clarify permittee role in working with Federal (US Environmental Protection Agency, US Department of Agriculture) and State (Department of Pesticide Regulation and Dept. of Toxic Substance Control) departments that oversee pesticides, since this role has traditionally been achieved by the State Water Resources Board (as a partner agency to DPR).*	The permit is just implementing the Basin Plan amendment for the pesticide TMDL .	
Contra Costa Clean Water Program	79	C.9.e	Delete provision	*While Permittees often do individually and collectively participate in Federal and State public processes, requiring such participation in this Municipal Regional Permit is not appropriate.*	This measure is not onerous. Permittees are merely required to comment on federal actions "as appropriate." Such action can be helpful in securing ongoing funding for existing efforts (currently funded through State Board grants).	
SMCWPPP	13	C.9.e	not required by federal CWA	*Municipalities should not have a permit requirement to encourage coordination of codes controlled by different state agencies. This is clearly not required by the federal Clean Water Act, and Brisbane recommends that this requirement be deleted.*	Most of what this requires is that they "track" and "encourage" through some joint effort, just as is happening now. This provision would simply provide a funding stream for existing efforts.	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
Brisbane	14	C.9.e	not required by federal CWA	*Municipalities should not have a permit requirement to encourage coordination of codes controlled by different state agencies. This is clearly not required by the federal Clean Water Act, and Brisbane recommends that this requirement be deleted.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
SMCWPPP	13	C.9.e	not required by federal CWA	*Again, municipalities should not have a permit requirement to collect data to assist the California DPR because it is not a requirement of the federal Clean Water Act. Brisbane recommends that this requirement be deleted from the permit.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Brisbane	14	C.9.e	not required by federal CWA	*Again, municipalities should not have a permit requirement to collect data to assist the California DPR because it is not a requirement of the federal Clean Water Act. Brisbane recommends that this requirement be deleted from the permit.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Contra Costa Engineering Advisory Committee (CCCEAC)	17	C.9.e	Permittees cannot control other agencies	*Requires permittees to ensure federal and state regulators are complying with federal or state regulations. It is not the appropriate role of local agencies to police federal or state regulators compliance with their own regulations.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Moraga Mayor	11	C.9.e	Permittees cannot control other agencies	*Requires permittees to ensure federal and state regulators are complying with federal or state regulations. It is not the appropriate role of local agencies to police federal or state regulators compliance with their own regulations.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Millbrae	14, 3 from hearing	C.9.e	permittees not responsible	*The Water Board should be the State agency to begin dialogue with the USEPA and the California Department of Pesticide Regulation on the impacts pesticides post to water quality. Local municipalities are the enforcers of these laws and regulations, but we do not make laws regarding their use. The Board should work with all relevant regulatory agencies to move towards banning the manufacturing and sales of these toxic chemicals which are currently easily available to the public.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Pleasanton	12	C.9.e	permittees not	*Local agencies monitor and participate in the*	See response to Contra Costa	

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			responsible	*regulatory process for pesticides and assume responsibilities for development and enforcement of regulations currently handled by Federal and State agencies. This activity is beyond the technical and legal scope of local government, and is and should continue to be handled at the State and Federal level.*	Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Dublin	11	C.9.e	permittees not responsible	*Local agencies monitor and participate in the regulatory process for pesticides and assume responsibilities for development and enforcement of regulations currently handled by Federal and State agencies. This activity is beyond the technical and legal scope of local government, and is and should continue to be handled at the State and Federal level.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Moraga	65	C.9.e(2)	permittees not responsible	*This provision is unacceptable. Local agencies do not have skills and resources to track the activities of the EPA in the implementation of the Federal Insecticide, Fungicide and Rodenticide Act and the Clean Water Act. Local agencies do not have skill and resources to monitor the California DPR in its activities and to encourage them to coordinate their activities with the California Food and Agriculture Code.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Oakley	65	C.9.e(2)	permittees not responsible	*This provision is unacceptable. Local agencies do not have skills and resources to track the activities of the EPA in the implementation of the Federal Insecticide, Fungicide and Rodenticide Act and the Clean Water Act. Local agencies do not have skill and resources to monitor the California DPR in its activities and to encourage them to coordinate their activities with the California Food and Agriculture Code.*	See response to Contra Costa Supervisors comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13.	
Oakley, Moraga	66	C.9.e(3)	Clarify meaning	*Please provide more guidance about what monitoring information is contemplated in this provision.*	This Provision refers to any monitoring data available to the permittees that are relevant to the regulatory process in which you are engaged. Please use your independent judgment to determine what is appropriate.	

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Oakley, Moraga	67	C.9.e(4)	Municipalities have no capability	*This provision is unacceptable as local agencies do not have appropriate experts on staff such as wildlife biologists or, in many cases, water quality chemists, to develop "appropriate" comment letters.*	Permittees have been engaged in just this sort of process through BASMAA for several years. We suggest that you coordinate with other permittees to continue these efforts.	
Oakley	137	C.9.e.	Reporting	*C.9.e has a reporting requirement for tracking the regulatory process. It is also included in the Summary Table but there is no submittal requirement. What is required?*	See response to Oakley comment 142.	
Daly City	80	C.9.e.i. (1) & (2)	Working with other parties	*Requires exchanging information with USEPA, but there is no pathway to accomplish this task, and there are no clear guidelines as to the content of the communiqué.*	USEPA has public processes for their actions that provide the mechanism for your input. See also response to Oakley/Moraga comment 67.	
Daly City	81	C.9.e.i. (3)	Working with other parties	*Requires communications with the Ag dept; the Ag department has stated that they cannot assign County biologists to monitor pesticides as they apply to surface water.*	Monitoring is one component of additional efforts from the County Ag. Dept., other aspects of the County Ag Dept.'s role can still be the subject of further communication.	
Daly City	82	C.9.e.i. (4)	infeasible	*at this time there is no established course for recognition of re-registered pesticide products.*	Noted. The requirement is "as appropriate".	
San Jose	62	C.9.e.ii	Prescriptive reporting	*This overly prescriptive reporting requirement should be eliminated.*	We disagree. This Provision comes directly from the pesticide toxicity TMDL.	
Oakley, Moraga	68	C.9.f	Provide guidance on what to report	*Permittees are not experts in illegal actions and not necessarily aware of what would constitute a violation of the law. Board should provide some guidance of a practical nature as to what is expected in terms of reporting.*	See response to Oakley comment 142.	
Oakley	138	C.9.f.	Reporting	*C.9.f has a reporting requirement for coordinating with the county agriculture commissioner. It is also included in the Summary Table but there is no submittal requirement. What is required?*	See response to Oakley comment 142.	
Contra Costa Clean Water Program	80	C.9.g	Delete or Clarify Provision	*This provision is vague. The required analysis would be scientifically difficult, or impossible, and certainly beyond the realm of a practical mandate. A more reliable evaluation for assessing the effectiveness of pesticide source control measures include: 1) compliance with activity-based permit*	Effectiveness may be evaluated in some of the ways suggested in the comment. Evaluating whether or not concentration or toxicity targets are met does not require analyses that are beyond the ability of permittees. This is a requirement taken directly	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
				requirements, 2) changes in knowledge and awareness, and 3) changes in behavior and implementation of BMPs	from the Basin Plan amendment for the Diazinon and Pesticide-Related Toxicity TMDL and so it cannot be removed.	
SMCWPPP	13	C.9.g	change due date of report	*recommends that the permit required report be due as part of the fourth Annual Report prepared under this permit and that the word "annually" be removed from the following title: "Annually, Evaluate Implementation of Source Control Actions Relating to Pesticides" of subprovision C.9.g.*	We will make the requested change.	We made the edit as requested.
Brisbane	14	C.9.g	change due date of report	*recommends that the permit required report be due as part of the fourth Annual Report prepared under this permit and that the word "annually" be removed from the following title: "Annually, Evaluate Implementation of Source Control Actions Relating to Pesticides" of subprovision C.9.g.*	We will make the requested change.	We made the edit as requested.
Oakley	139	C.9.g.	Reporting	*C.9.g has a reporting requirement for evaluating source control implementation. It is also included in the Summary Table but there is no submittal requirement. What is required?*	See response to Oakley comment 142.	
Daly City	83	C.9.g.i	burdensome	*City would have to dedicate an employee to study the effectiveness of the control measures, utilize laboratories to analyze required compounds and deduce toxicity concentrations of target issues.*	We have reduced the frequency of this requirement, but evaluating the effectiveness of control measures is a critical component and does not have to be as burdensome as suggested in the comment.	
San Jose	63	C.9.g.ii	correct reporting date	*The attachment L date be corrected to match the C.9.g.ii date of October 2012 Annual Report.*	See response to Oakley comment 142.	
Berkeley	28, 29	c.9.h	beyond permittee control	*The City does not have control in the free market place and it is beyond the City's authority for regulating sales and purchases. Local merchant, may not cooperate. [These] outreach requirements should be removed from Provision C.9 Pesticides Toxicity Control, and incorporated into Provision C.7 Advertising Campaign.*	Since point-of-purchase outreach currently takes place (through the Our Water Our World program), it is certainly feasible. While not all retailers will cooperate, many do. This provision doesn't require full participation; it calls for a level of effort comparable to the existing program.	
Oakley, Moraga	69	C.9.h	burdensome	*This measure is an unacceptable burden because of the data that must be collected*	This is a very reasonable provision. See responses to Berkeley comment	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
				pre- and post-action. What other measures does the Board envision as meeting this requirement? Who certifies IPM providers?	29, Oakley 193, and Contra Costa 81.	
SMCWPPP	13	C.9.h	not worthwhile reporting on amount of outreach material	*There is no benefit to reporting on the number or pounds of outreach material distributed. Brisbane recommends that the permit be modified to simply require information on the types of outreach material that were distributed.*	Reporting the quantity of outreach materials distributed may not be a perfect measure of implementation, but it is simple and is far better than none at all. We have streamlined the reporting by not requiring the reporting as a default, but only if requested by the Water Board staff.	Reporting on outreach material will be required upon Water Board staff request.
Brisbane	14	C.9.h	not worthwhile reporting on amount of outreach material	*There is no benefit to reporting on the number or pounds of outreach material distributed. Brisbane recommends that the permit be modified to simply require information on the types of outreach material that were distributed.*	see response to SMCWPPP comment 13.	see response to SMCWPPP comment 13.
Contra Costa Flood Control	15	C.9.h	outreach requirements do not apply	*Section C.9.h, "Public Outreach", is not applicable to the FC District since it does not have a permanent resident population. Testing and reporting on the FC District's activities are readily available to the SFBRWQCB and additional requirements would be duplicative and unnecessary.*	These are general permittee requirements and are not fine-tuned to each permittees circumstances.	
Berkeley	29	C.9.h	permittees can't identify audience	*There is no practical way for the City to identify the target audience for this outreach. [These] outreach requirements should be removed from Provision C.9 Pesticides Toxicity Control, and incorporated into Provision C.7 Advertising Campaign.*	Cities should know how to identify a target audience for such outreach. Cities are already conducting such outreach and must be having some success reaching a target audience. We suggest you confer with other municipalities if you really have no idea how to proceed. You may also want to consider who needs the information (e.g. residents, specific businesses, etc.)	
Moraga Mayor	12	C.9.h	permittees not responsible	*Such outreach should be handled by the state and federal agencies by controlling the labeling of consumer goods and the use of products used by landscaping and pest control agencies.*	Point-of-purchase outreach currently takes place through the Our Water Our World program; therefore, it is feasible. This provision does not require that all retailers participate, and can't be interpreted to require so because it specifically refers to	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
					OWOW, which doesn't reach the majority of retailers.	
San Pablo	22	C.9.h	prescriptive	*How does the Water Board propose that cities track the percentage of residents hiring certified operators?*	See response to Oakley comment 193.	
Alameda City	23	C.9.h	Redundant Reporting	*Provision requires us to evaluate outreach efforts to Pest Control Operators (PCO's) and landscapers will generate redundant and time-consuming reporting effort. Permittees forced to evaluate data already being submitted to another regulatory agency given that PCO's report directly on pesticide usage to the County Agricultural Commissioner's Office.*	See response to Oakley comment 193.	
Contra Costa Clean Water Program	82	c.9.h	use more general approach	*This is not the most effective or efficient way to gather information, and may not gather reliable information. A more general and comprehensive survey approach may be more effective. The provision should be integrated with the Advertising Campaign mandated in C.7.b.*	See response to Oakley comment 193.	
Oakley	140	C.9.h.	Reporting	*C.9.h has a reporting requirement for public outreach. It is also included in the Summary Table but there is no submittal requirement. What is required?*	See response to Oakley comment 142.	
Oakley	193	C.9.h.	Reporting	*The report requires estimating the number of PCO's and landscapers in a jurisdiction. Does this mean landscapers who work in the jurisdiction or who have a business address in the jurisdiction? Under C.9.h regarding the Permit text, this is impossible to estimate as there are numerous such service providers who operate on a referral basis, do not have an address or business license in the jurisdiction, and likely operate from home without advertising.*	Please do the best you can on this Provision. Structural PCOs must be licensed, so the Structural Pest Control Board would know where they are. Similarly, DPR licenses landscapers so would have information on them as well.	
Contra Costa Clean Water Program	81	c.9.h.i	inappropriate mandate	*Change this provision so as to encourage, not require, point of purchase outreach efforts. This provision currently requires the cooperation and participation of retail outlets. While Permittees have successfully conducted point of purchase programs in the past, there is no guarantee these programs can be*	Point-of-purchase outreach currently takes place through the Our Water Our World program; therefore, it is feasible. This provision does not require that all retailers participate, and can't be interpreted to require so because it specifically refers to	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
				successfully implemented in the future. It is inappropriate to mandate point of purchase programs on Permittees.	OWOW, which doesn't reach the majority of retailers.	
Contra Costa Engineering Advisory Committee (CCCEAC)	18	C.9.h.i	permittees not responsible	*This requirement should more appropriately be placed upon business owners rather than on Permittees and should be coordinated by State agencies who could more efficiently do the outreach on a regional or statewide level.*	See response to Contra Costa Clean Water Program comment 81.	
Daly City	84	C.9.h.i.	No jurisdiction, too much money	*City does not have legal jurisdiction to do this provision. This requires a person licensed as a pest control advisor and would have significant impact on the City's general fund*	See response to Contra Costa Clean Water Program comment 81.	
ACCWP	26	C.9.h.ii	delete unnecessary measure	*The requirement to track the quantity of outreach materials distributed should be removed. Why does this information need to be collected? What quantity of outreach materials is sufficient?*	see response to SMCWPPP comment 13.	see response to SMCWPPP comment 13.
Contra Costa Engineering Advisory Committee (CCCEAC)	19	C.9.h.ii	permittees not responsible	*It will be difficult for Permittees to determine which resident's contract with structural pest control and landscape pest control companies. This requirement should more appropriately be placed upon the structural and landscape pest control industry and the regulatory agencies governing them.*	See response to Oakley comment 193.	
San Jose	64	C.9.h.ii	reporting, streamline	*The documentation and reporting of measurable awareness and behavior change requirement in this Provision should be done as part of C.7.I.*	See response to SMCWPPP comment 13.	See response to SMCWPPP comment 13.
Daly City	85	C.9.h.ii.	Funding	*Complying with this provision would be too expensive for the City.*	We encourage Permittees to work together to share costs.	
Sunnyvale	20	C.9.h.iv	Flexibility	*No mechanism available to identify the percentage of its residents who hire "certified IPM providers" other than by performing expensive and time-consuming surveys of residents. This provision should be revised to allow agencies the flexibility to choose how they will implement the requirements to utilize IPM methods within those areas where they have jurisdiction.*	The provision says "may include," so the surveys are a suggestion. If permittees can provide a better metric, they may do so.	
Contra Costa Clean Water Program	83	C.9.h.iv	IPM documentation	*Delete the sentence: "This documentation may include percentages of residents hiring certified IPM providers and the change in this*	The provision says "may include," so the surveys are a suggestion. If permittees can provide a better	

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File Name	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revisions
				percentage." It would be a very difficult for Permittees to ascertain the percentages of residents hiring IPM certified providers.	metric, they may do so.	
Oakley, Moraga	70	C.9.h.v	difficult to assess PCO outreach	*As written, the reporting of C.9.h.v is unacceptable. In reporting the percentage of PCO's and landscapers reached and the reductions in pesticides used, what is the basis for the population of PCO's and landscapers reached, telephone book listing for the community or businesses licensed in the community? What should be done for communities that do not have business licenses or any phone listings for PCO's or landscapers?*	see response to Sunnyvale comment 20.	see response to Sunnyvale comment 20.
San Jose	65	C.9.h.v	Working with other parties	*Please place the words "Permittees may" in front of the sentence "Work with DPR,…"in order to maximize outreach effectiveness and to maintain permit compliance should one of the above listed entities become defunct or otherwise ineffective for collaboration on this issue.*	Flexibility will be added in this regard. We will divide the sentence in two, require working with DPR and the Ag Commissioners, and say "may work" with respect to the others.	Flexibility will be added in this regard. We will divide the sentence in two, require working with DPR and the Ag Commissioners, and say "may work" with respect to the others.
Daly City	86	C.9.h.v.	Funding	*Conducting outreach to pest control operators is too resource intensive.*	We encourage Permittees to work together to share costs.	
Daly City	87	C.9.h.vi.	Funding	*Complying with this provision would be too expensive for the City.*	We encourage Permittees to work together to share costs.	
San Jose	66	C.9.h.vi.	Make provisions consistent	*Reword this Provision to mirror the language in C.9.h.iv, so that it reads "Permittees shall document effectiveness of these actions in the October 15, 2012 Annual Report."*	We will make the requested change.	We made the edit as requested.

Response to Comments on December 14, 2007 Tentative Order
Provision C.10 – Trash Reduction

File	Comment No.	Prov. No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Martinez	2.1	C.10		The City of Martinez estimates the cost of retrofitting our catch basin system to the extent required to meet the proposed MRP requirements at nearly $600,000. We also anticipate an additional $30,000 in maintenance costs associated with this task.	The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
ACFCD Zone 7	12	C.10	2-step process not cost-effective	C.10.b.i requires Permittees to implement a two-step process of enhanced trash management control and installation of full trash capture devices. This appears to be an undue burden on the already limited resources of each Permittee agency.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots. Cleanup of Trash Hot Spots and installation of trash capture devices are both required.	
Berkeley	30	C.10	5% requirement not appropriate	The City requests requirement of a minimum of 5% structural retrofit by 2012 be eliminated, allowing the City to balance between enhanced management and full capture methods within the 10% targeted area. This will allow the City and other municipalities an opportunity to assess the effectiveness of various structural control methods, and allow for a wider selection in the mix of enhanced management and full capture methods.	The trash capture device installation requirements in the RTO have been reduced. The management measures required strike an adequate balance to address the trash in waters impacts during this permit cycle. It is anticipated that additional measures will be required in future permit cycles with the Long Term Trash Management Plan as a road map.	
State Senator Ellen Corbett	5	C.10	Accountability in trash management site selection and cleanup	Water Board must do the following: require accountability in the fundamental step of selecting trash management sites and ensuring that trash control measures are working.	Agreed.	
(Various) 33 Environmental NGOs	2	C.10	Accountability, oversight should be enhanced, timeline shortened.	The trash provisions in the Tentative Order could be a historic step in reducing trash and marine debris in San Francisco Bay, but we strongly recommend that the Board increase accountability and oversight as well as tighten up the timeline before adopting them in the Final Order.	We believe the timelines in the Revised provision C.10 are adequate. The RTO includes the requirement that Trash Hot Spots be cleaned up to the Trash Action Level, or additional actions implemented to achieve that goal. In addition, trash capture devices must also be installed in a phased effort to gain more experience with their efficient employment.	
(Various) 33 Environmental NGOs	2	C.10	Accountability, oversight should be enhanced, timeline shortened.	The trash provisions in the Tentative Order could be a historic step in reducing trash and marine debris in San Francisco Bay, but we strongly recommend that the Board increase accountability and oversight as well as tighten up the timeline before adopting them in the Final Order.	Both the Trash Hot Spot cleanup efforts and the trash capture device installation have enforceable provisions. All data in the annual reports is public. Timelines are adequate.	
Pleasanton	4.4	C.10	Additional Funding	The cost to comply with this additional effort is also not currently funded under the City's limited Storm Water Runoff Assessment Fees. Hence, this and all other additional costs noted below to comply with the more aggressive permit language, we believe will require		

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				Proposition 218 public approval process.		
CCCoEngrAdvisory	21.3	C.10	Allow Flexibility	Communities should also be given credit for reducing trash throughout their city rather than meeting a strict requirement within a 10% area.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Fremont, K. Cote	2	C.10	Allow Flexibility	Implementing enhanced trash management and incorporating trash capture devices in the same area duplicates resources and is ineffective.	The RTO does not include the duplicative trash management measure requirement.	
Fremont, K. Cote	3	C.10	Allow Flexibility	like the opportunity to say, okay, here's ten percent, and maybe three percent makes sense for trash capture, and maybe seven percent makes sense for enhanced trash management.	The RTO includes a different more flexible approach involving Trash Hot Spots, and reduced trash capture requirements.	
State Assemblyman Guy Houston	2	C.10	Allow Flexibility	Significant differences among jurisdictions . Extent of urbanization, significance and sources of litter, and available resources vary . Allow flexibility and reduce unnecessary administrative burdens.	The RTO allows flexibility in addressing Trash Hot Spots.	
Sunnyvale Att A	23	C.10	Allow Flexibility	Modify to allow flexibility and cost effectiveness	The RTO has been revised to be less prescriptive, and more flexible.	
San Jose Att A	70	C.10	Allow Flexible approach	The requirement that devices be installed "in entire catchments" is overly restrictive and not always feasible. Each inlet is unique, and not all inlets are large enough or constructed in a way to accommodate inlet-based devices.	The RTO has been revised to require a reduced amount of trash capture devices. An acreage is required, but can include partial catchments.	
Palo Alto	10	C.10	Allow Flexible approach - capture device installation only when funding available	Allow Flexible approach - capture device installation only when funding available	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The mandatory trash capture device level has been reduced in the RTO. The trash capture requirements can not be contingent on funding. The devices are not required to be installed and operation until July 1, 2013.	
San Jose	19	C.10	Allow flexible approach - enhanced measure duplication	Allow flexible approach - enhanced trash control and capture measures duplicative	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The RTO reflects revisions that no longer require duplicative trash approaches where they are not effective.	
Mountain View	13	C.10	Allow Flexible	allow the flexibility to implement cost-effective trash	RTO has been significantly revised to allow	

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			approach - Trash Pathways	controls that are appropriate for local conditions and severity of trash problem areas	flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The mandatory trash capture device level has been reduced in the RTO.	
Hearing, City of Pittsburg	2	C.10	Already Clean	primary drainage course is Kirker Creek, and almost all of that water goes into a large storm drain detention basin, no trash to leave restricted discharge point, clean with hand methods three or four times a year	Noted. Depending on specific circumstances, storm detention basin may be considered State Waters or wetland.	
SCVURPPP ATT A	66	C.10	Already Implementing Assessments and Actions	Already Implementing Assessments and Actions	Noted.	
Colma	2.1	C.10	Alternate Pathways	On March 14, 2007 the Water Board heard a status report on the Municipal Regional Storm water Permit that solicited many comments on the need to improve trash and litter control. Some of the commenters pointed out the variety of societal problems, such as homeless encampments, that in some locations contribute significantly to garbage and hazardous material being dumped along creeks.	We agree.	
Pacifica	7.3	C.10	Alternate Pathways	The proposed approach to solving trash and litter problems is overly prescriptive, and does not recognize the variety of possible trash and litter problems and the need to implement cost-effective solutions that are tailored to solve a particular type of problem. For example, in some areas, SMCWPPP has identified residents and their gardeners dumping grass clipping and yard prunings onto backyard creek banks as the source of trash and litter. In other cases, the source of the problem appears to be from a particular school, shopping mall, or freeway.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping.	
South SF	2.3	C.10	Alternate Pathways	The proposed approach to solving trash and litter problems is overly prescriptive, and does not recognize the variety of possible trash and litter problems and the need to implement cost-effective solutions that are tailored to solve a particular type of problem. For example, in some areas, SMCWPPP has identified residents and their gardeners dumping grass clippings and yard prunings onto backyard creek banks as the source of trash and litter. In other cases, the source of the problem appears to be from a particular school, shopping mall, or freeway.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping.	
Burlingame	8	C.10	Alternate	A workable solution has been proposed by SMCWPPP.	RTO has been significantly revised to allow	

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			Solution	This method allows municipalities to select a high trash area catchment in its jurisdiction, propose a list of solutions that are feasible and appropriate for that area, choose the best solution or solutions, implement them and provide for measurable reduction in trash. Focusing and testing this alternative solution first on a manageable (smaller) area before applying a pilot trash control program on a bigger area allows municipalities to comply with this requirement in a way that could yield desirable and measurable results within fiscal constraints and scope and help secure future dedicated funding. Failure at a grander scale may have an opposite and possibly irreversible effect.	flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. The approach you describe is similar to the RTO, but a larger program of Trash Hot Spot clean up and full trash capture device installation is called for, than just one catchment per Permittee.	
Menlo Park	2.4	C.10	Alternate Solution	Delete the requirement for an arbitrary 10% catchment area; instead, allow each municipality the flexibility to select one high trash impact catchment tributary to the municipal storm drain system, implement an appropriate solution, and demonstrate measurable reductions in trash and litter.	See the response to Menlo Park 2.3 above.	
Pacifica	7.6	C.10	Alternate Solution	It is recommended that the permit be rewritten to require that each municipality select one high trash impact catchment tributary to the municipal separate storm sewer system that it owns or operates, implement an appropriate solution or require the responsible parties to implement a solution, and then demonstrate measurable reductions in trash and litter. On this basis it is recommended that the permit be revised to eliminate the proposed permit's requirements for at least 10 percent of the high trash and litter urban land area within a municipality's jurisdiction to have trash controls along with the proposed requirement that half or more of this 10 percent catchment area be controlled with full trash capture devices.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. The approach you describe is similar to the RTO, but a larger program of Trash Hot Spot clean up and full trash capture device installation is called for, than just one catchment per Permittee.	
Portola Valley	1.2	C.10	Alternate Solution	It is recommended that the permit be rewritten to require that each municipality select one high trash impact catchment tributary to the municipal separate storm sewer system that it owns or operates, implement an appropriate solution or require the responsible parties to implement a	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL.	

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				solution, and then demonstrate measurable reductions in trash and litter.	Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. The approach you describe is similar to the RTO, but a larger program of Trash Hot Spot clean up and full trash capture device installation is called for, than just one catchment per Permittee.	
SouthSF	2.6	C.10	Alternate Solution	It is recommended that the permit be rewritten to require that each municipality select one high trash impact catchment tributary to the municipal separate storm sewer system that it owns or operates, implement an appropriate solution or require the responsible parties to implement a solution, and then demonstrate measurable reductions in trash and litter. On this basis it is recommended that the permit be revised to eliminate the proposed permit's requirements for at least 10 percent of the high trash and litter urban land area within a municipality's jurisdiction to have trash controls along with the proposed requirement that half or more of this 10 percent catchment area be controlled with full trash capture devices.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. The approach you describe is similar to the RTO, but a larger program of Trash Hot Spot clean up and full trash capture device installation is called for, than just one catchment per Permittee.	
Hearing, SCVURPPP	3	C.10	Alternate Trash approach	Identify the problem sites. These have been identified by Save the Bay, and through RTA assessments, identified those sources and pathways to those sites. Develop and implement specific plans for each one of those sites catchments where full capture treatment devices would be warranted, we would do that	The RTO requires Permittees to focus on Trash Hot Spots, and allows flexibility to approach clean-up as the Permittees wish.	
ACCWP	12.1	C.10	Alternative Compliance	Our member agencies are currently conducting many significant litter reduction activities including: participating in Coastal Cleanup events, banning plastic bags, street sweeping, cleaning up hotspot dumping areas, partnering with Caltrans to conduct cleanup along freeways, conducting public outreach campaigns; and installing trash capture devices. Many of these efforts go well beyond those directly related to urban stormwater runoff and receive little credit in the Tentative Order with regard	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The types of activities described would directly reduce trash impacts at hot spots. In addition, credit is granted for source control measures, such as banning plastic bags, or other instituted measures to reduce litter sources.	

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				to trash abatement efforts.		
ACCWP	14.4	C.10	Alternative Compliance	We also request that the options for enhanced control measures be revised to allow for selecting from a menu that includes items such as enhanced enforcement and litter pickup.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
ACCWPatt1	21	C.10	Alternative Compliance	Permittees receive no credit for enhanced trash control measure already in place and could be penalized for existing proactive efforts.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL.	
Alameda Co	10.4	C.10	Alternative Compliance	The County requests that the permit requirement of a minimum of 5% structural retrofit by 2012 be eliminated, allowing the use of structural or non-structural controls to achieve trash reduction. This would allow local agencies an opportunity to assess the effectiveness of various structural control methods and determine if structural controls are warranted under the Long Term 15-Year Trash Reduction Plan due in 2012. We also request that the options for enhanced control measures be revised to allow for selecting from a menu that includes items such as enhanced enforcement and litter pickup.	It is necessary to gain experience with use of full trash capture devices to address situations, such as trash behind parked cars, where it is not practical or cost effective to either remove it by street sweeping, and where hand removal is too costly or impractical. During this first stage of removing trash impacts from waters, it is necessary for Permittees to learn the effectiveness of all of the available tools to tackle this problem. Trash capture definitely is a useful tool, and is MEP based on the significant use developed by Permittees in the L.A. area.	
Colma	2.5	C.10	Alternative Compliance	In addition, since a high priority of the City/County Association of Governments of San Mateo County is to implement sustainable green streets and parking lot projects using the vehicle registration fees collected under AB 1546 (Simitian – 2004), the permit should also state that any municipality that is implementing this type of project would be meeting the permit's trash and litter requirements during this permit period through the design, construction, and maintenance of its sustainable green street or parking lot project. We believe these multi-objective projects will have a beneficial impact on trash and litter. In addition, trash and litter controls that can be accomplished as part of multi-objective projects are more sustainable and financially viable than single-purpose approaches.	Some landscape based or LID stormwater treatment controls would also serve as full trash capture devices.	
Hearing Transcript	0	C.10	Alternative	We have about a year ago, I'll give you an example, we	Revised C.10 allows flexible approach by	

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Dublin			Compliance	looked at why don't we reschedule our trash pickup and our street sweeping, so we sweep the street the day immediately after the trash is picked up, so all the stuff that falls out of the trash cans and all the stuff that blows out of the truck gets picked. Now that's not five percent of the city and that's not ten percent of the city. That's 80, 90 percent of the city and it didn't cost us anything other than just some time. We've looked at areas where we have not dumping into creeks but simply people just throwing trash over the bridge railing into a creek. What would it cost to put a higher railing so people -- or a fence, so people can't chuck that stuff over the fence. We're looking into those sorts of things. We have trash capture devices. Our trash target area under the MRP would be about -- the five percent would be about 250 acres or maybe 300 acres. We've got about 30 acres on line right now. We're looking at -- We've got another 30 acres currently under design that we may have on board within another year or two, and there's probably more in our future. But I think Leslie Estes from Oakland earlier used the term toolbox. Is full trash capture part of the toolbox? Yes. Are there other measures that are in the toolbox? Yes. Is five percent the magic number? I don't know that. We can do something. If we include -- And what I don't want to get into a situation is where we start gerrymandering that five percent to include areas, which may not be the bigger part of the problem. I think we both -- I think you want us to address real trash problems, and we're simply asking for some flexibility to do that.	Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Menlo Park	2.5	C.10	Alternative Compliance	The permit should state that municipalities which are implementing sustainable green streets and parking lot projects using the vehicle registration fees collected under AB 1546 (Simitian – 2004) will meet the permit's trash and litter requirements through design, construction, and maintenance of its sustainable green street or parking lot project	Landscape based stormwater treatment measures, such as those used in "green streets" projects may meet the full trash capture requirements, and therefore fulfill some of the C.10 requirements.	
Newark	12.1	C.10	Alternative Compliance	Newark and our fellow member agencies are currently conducting many significant litter reduction activities including: participating in Coastal Cleanup events, banning plastic bags, street sweeping, cleaning up hotspot dumping areas, partnering with Caltrans to conduct cleanup along freeways, conducting public	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The types of activities described would directly reduce trash impacts at hot spots. In addition, credit is	

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				outreach campaigns; and installing trash capture devices. Many of these efforts go well beyond those directly related to urban stormwater runoff and receive little credit in the Tentative Order with regard to trash abatement efforts.	granted for source control measures, such as banning plastic bags, or other instituted measures to reduce litter sources.	
Newark	14.4	C.10	Alternative Compliance	We also request that the options for enhanced control measures be revised to allow for selecting from a menu that includes items such as enhanced enforcement and litter pickup.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Pacifica	7.7	C.10	Alternative Compliance	In addition, since a high priority of the City/County Association of Governments of San Mateo County is to implement sustainable green streets and parking lot projects using the vehicle registration fees collected under AB 1546 (Simitian -2004), the permit should also state that any municipality that is implementing this type of project would be meeting the permit's trash and litter requirements during this permit period through the design, construction, and maintenance of its sustainable green street or parking lot project. We believe these multi-objective projects will have a beneficial impact on trash and litter. In addition, trash and litter controls that can be accomplished as part of multi-objective projects are more sustainable and financially viable than single-purpose approaches.	Landscape based stormwater treatment measures, such as those used in “green streets” projects may meet the full trash capture requirements, and therefore fulfill some of the C.10 requirements.	
Pleasanton	4.2	C.10	Alternative Compliance	The City believes that additional operation and maintenance activities such as placing additional trash receptacles in key areas and enhanced litter pickup could accomplish the trash reduction goals. In addition, public education activities in the City of Pleasanton regarding anti-littering have been successful and enhancing these educational activities, we believe, can meet or exceed the end goal of trash reduction in stormwater emanating from our City. The City’s past efforts during the Annual Coastal Cleanup Day in the Tri-Valley area are a great indicator of the success of our public education outreach. The amount of trash and debris collected by volunteers from our major creeks in recent years has been reduced to less than half of the amount we used to collect from past events.	During this first stage of removing trash impacts from waters, it is necessary for Permittees to learn the effectiveness of all of the available tools to tackle this problem. Trash capture definitely is a useful tool, and is MEP based on the significant use developed by Permittees in the L.A. area.	
San Mateo Co	4	C.10	Alternative Compliance	In addition, since a high priority of the City/County Association of Governments of San Mateo County is to	Some landscape based or LID stormwater treatment controls would also serve as full trash	

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				implement sustainable green streets and parking lot projects using the vehicle registration fees collected under AB 1546 (Simitian – 2004), the permit should also state that any municipality that is implementing this type of project would be meeting the permit's trash and litter requirements during this permit period through the design, construction, and maintenance of its sustainable green street or parking lot project. We believe these multi-objective projects will have a beneficial impact on trash and litter. In addition, trash and litter controls that can be accomplished as part of multi-objective projects are more sustainable and financially viable than single-purpose approaches.	capture devices.	
South SF	2.7	C.10	Alternative Compliance	In addition, since a high priority of the City/County Association of Governments of San Mateo County is to implement sustainable green streets and parking lot projects using the vehicle registration fees collected under AB 1546 (Simitian – 2004), the permit should also state that any municipality that is implementing this type of project would be meeting the permit's trash and litter requirements during this permit period through the design, construction, and maintenance of its sustainable green street or parking lot project. We believe these multi-objective projects will have a beneficial impact on trash and litter. In addition, trash and litter controls that can be accomplished as part of multi-objective projects are more sustainable and financially viable than single-purpose approaches.	Landscape based stormwater treatment measures, such as those used in "green streets" projects may meet the full trash capture requirements, and therefore fulfill some of the C.10 requirements.	
SF Baykeeper	62	C.10	Articulate Goal	This pilot project needs a well-defined goal . Is the purpose to quantify the effectiveness of the BMPs ? Is it to identify which types of areas generate the most trash and would thus be the most effective areas to target for BMP installation? Is the ultimate purpose to prevent trash from entering the bay and ocean, or to protect beneficial uses of creeks and streams? Understanding the effectiveness of the full capture devices installed during the pilot phase is extremely important to allow permittees to choose the most cost-effective strategies in the long-run. We feel that it would benefit the permittees to include bypass assessment in the pilot full capture devices. This would allow permittees to know that trash found downstream of the device arrived from other sources .	All of the listed aims are valid during this permit term. In addition, the Permittees will learn much about effective implementation of a trash impact reduction program. It is necessary to develop and employ assessment of trash flux downstream, and may be necessary to understand the "bypass" of the capture devices you describe in this comment.	

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Save the Bay	26	C.10	Assess downstream sites	To ensure that capture devices are successful in actually reducing trash, it is essential to require some assessment of conditions of downstream sites.	Capture device effectiveness should be apparent by the volume of trash removed from the devices during maintenance activities. We expect the Permittees will place at least some of their capture devices upstream of Trash Hot Spots, and will report on the results, but this is not an explicit requirement.	
Orinda	3.3	C.10	BASMAA Approach	The City proposes a more effective and measured approach as outlined in BASMAA's September 22, 2006 Performance Standard tables which include (1) identification and assessment of potential litter/high trash accumulation areas/watersheds, (2) identification of management actions to reduce trash levels in stormwater conveyances at such locations and identify current trash collection/control options for minimization of trash/litter inputs to storm drain inlets, (3) identification of high priority storm drain inlets within key urban areas/watershed that have had high accumulations of litter/trash to prioritize inlets for potential projects, and (4) select locations for pilot projects and implement demonstration studies to assess their effectiveness and associated costs.	The implementation proposed would be too slow and small, and would not represent MEP. RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The implementation efforts included in the Revised Provision C.10 have aspects of pilot implementation, as trash impacts to creeks will require significant additional work after this permit cycle, and much will be learned from this first round of implementation.	
Congressman Honda	2	C.10	Build Consensus	There is a potential for costly environmental impacts if these steps are not taken in a timely and appropriate manner. I encourage the Water Board to work with the municipalities to best understand the trash reduction programs that are currently in place, and to build a consensus on how to effectively remove trash from our community creeks.	The RTO allows the Permittees great flexibility in solving the problem of trash impacts in State waters.	
Congressman McNerny	2	C.10	Build Consensus	Ensuring a healthy Bay will require a coordinated effort that recognizes the unique financial situations and environmental challenges affecting each jurisdiction covered by the permit. A comprehensive and efficient solution to the trash problem can best be achieved through the input of, and cooperation between, local governments, citizen activists, and environmental experts.	Agreed.	
Congresswoman Tauscher	2	C.10	Build Consensus	A variety of strategies will be necessary, including identifying a funding mechanism to assist the municipalities in this effort, and working with local Bay	Noted and Agreed.	

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				Area governments to design a comprehensive approach will ensure the most successful outcome.		
State Senator Ellen Corbett	4	C.10	Build Enforceability	In order to ensure the effectiveness of this historic step to revise the MRP, the Water Board must do the following: build enforceability into the requirements and milestones.	Agreed.	
Contech, Lippner, G.	2	C.10	CDS effective for trash, don't flood	CDS effective for trash, don't flood	Noted.	
Friendsof5Creeks	7	C.10	Change Phasing of Requirements	In addition, permittees are required to submit a plan for dealing with trash throughout their jurisdictions at the same time these devices are installed. That is, the plan is supposed to be written before anyone could possibly know what worked and what didn't. Incorporate a rational progression from pilots to plan to action against trash pollution in a much shorter period of time.	Experience working on both Trash Hot Spots, and some trash capture implementation will be available during the development of the Long Term Plan. Some Permittees have already begun implementation, and there is significant experience being generated in the L.A. Region.	
Suisun	4.3	C.10	Change Reduction Goals	The MRP should be modified to allow flexibility in addressing trash and litter controls problems so that cost-effective solutions may be implemented that are tailored to solving particular problems. It is recommended that the permit be rewritten to require that each municipality to select one high trash impact catchment tributary to the municipal separate storm sewer system that it owns or operates, implement an appropriate solution or require the responsible parties to implement a solution, and then demonstrate measurable reductions in trash and litter.	We disagree with the approach of one high trash impact catchment per permittee, regardless of size. The current approach requires one Trash Hot Spot per 30,000 population or per 100 acres of Retail/Wholesale Commercial. Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO	
Moraga	74	C.10	Clarification	In C.10.d. the paragraph regarding the October 2011 report refers to C.10.d regarding the Long Term Trash Plan. Should this reference be to C.10.c?	The RTO has been revised and this is corrected.	
Oakley	74	C.10	Clarification	In C.10.d. the paragraph regarding the October 2011 report refers to C.10.d regarding the Long Term Trash Plan. Should this reference be to C.10.c?	Yes.	
Save the Bay	31	C.10	Clarification/Definition	It should be clarified that "high trash impact catchments" refer to sub-watershed areas draining to a specific area rather than referring to specific catch basins or sections of stormwater pipe.	Since in the RTO the trash capture requirement is set in acres, it is unlikely that confusion will occur.	
Save the Bay	33	C.10	Clarification/Definition	It is important to ensure that these areas do not include known trash or littering sites, such as a marina at a shoreline park. Estate residential area definitions should include housing units per acre. For both areas, it should be specified that these are excluded because they are	We do not agree that known trash or littering sites should not be included. These are prime locations for trash abatement. The RTO does not employ the Estate residential definition.	

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				among the lowest-intensity land uses.		
Save the Bay	34	C.10	Clarification/Definition	Permittees should not receive credit for trash capture devices installed within the last ten years, unless they can demonstrate that these devices have achieved trash-free receiving waters.	For this permit cycle, we want the Permittees to gain experience sizing and operating trash capture devices in preparation for larger scale future deployment in an efficient fashion. Previously installed devices that meet the full capture definition are valuable and should be credited. There are not very many in our Region.	
Save the Bay	19	C.10	Clarify control measure requirements	add to the list "increased cleanup of trashed waterways, whether by municipal crews or volunteers" , Many trashed waterway sites are impacted by encampments or localized littering or dumping, and would not be improved by upstream trash management.	The RTO focuses on Trash Hot Spot cleanup, and gives the Permittees flexibility to accomplish this in the manner they believe most efficient.	
Save the Bay	20	C.10	Clarify control measure requirements	minimum frequency or other metrics should be added for "increased inspection and cleanup of illegal trash dumping incidents, maintenance of adequate litter receptacles in high traffic	Again, the goal is the focus, and the means are up to the Permittees.	
Save the Bay	32	C.10	Clarify land area requirement	For counties land area can look too large	In the RTO the trash capture required area is 30% of Retail/Wholesale Commercial Land area, which is smaller.	
Save the Bay	18	C.10	Clarify Timeline	Include a similar timeline, with each milestone spelled out, to supplement the existing reporting timeline.	The Annual Report specifications are sufficient.	
Belmont	5	C.10	Concerns Regarding Full Capture	The specific design of catchment devices meeting the specified requirements is unclear. There is concern that the lower portion of the watersheds where the devices are suggested may be environmentally sensitive. There is also concern installation of the devices may cause flooding. The City of Belmont is heavily wooded and much of what would be captured in the creek is natural material such as tree branches. This doesn't seem to further goals of trash reduction	Trash capture devices may be most effective in commercial areas. The devices do not need to be placed in environmentally sensitive locations, but can be located in street level storm drain systems. The trash capture installation requirement has been redefined based on 30% of Retail/Wholesale Commercial land use, so should be more calibrated to the type of land use each Permittee has.	
ACFCD Zone 7	11	C.10	consider cost-effectiveness	Provisions C.10 through C.14 and the extensive water quality monitoring in provision C.8 will financially burden all stormwater programs. Regional Board needs to consider the cost-effectiveness of these requirements, the increased burden placed on stormwater programs	The RTO contains reduced C.10 requirements that should be less burdensome for Permittees. The other provisions mentioned are not excessively costly and are cost effective.	
Pittsburg	9	C.10	Contingent on Available Funds	Trash reduction requirements should be contingent on the procurement of capital funds with additional time allowed for phased implementation to ensure that trash capture devices will be technically effective systems placed in appropriate areas and developed with consideration of maintenance requirements.	The trash capture requirements cannot be contingent on funding. The devices are not required to be installed and operation until July 1, 2013.	

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Oakley	75	C.10	Coordinate Implementation	C.12.d talks about curb clearing parking restrictions, C.2.b talks about public outreach on the need to clear the curb, and C.10.b talks about enforceable restrictions. Mandatory parking restrictions are not acceptable for the reasons mentioned above (C.10.b). Also, the implementation and reporting dates need to be coordinated.	Mandatory parking restrictions for street sweeping have been removed from C.10. For street sweeping to be an effective way to remove fine particulate bound pollutants, such as PCBs, it is necessary to sweep to the curb. Trash also accumulates at the curb, but we are leaving the specific approach to intercept trash before it can get to waters up to the Permittees.	
Save the Bay	28	C.10	Correction	The maintenance language at the end of paragraph is written only for booms, and not spelled out for other methods. Maintenance frequency should be specified for all measures.	We agree.	Will revise C.10 to include requirement that trash capture maintenance be adequate for the proper function of the devices.
Save the Bay	29	C.10	Correction	The long-term plan component is listed as due in the October 2012 report in the first paragraph of this section, whereas C.10.d lists the long-term plan as due in the October 2011 report.	In the RTO, the long term trash management plan is due with the 2013 annual report.	
Fairfield City	12	C.10	Cost	capital cost for the installation of a full capture CDS unit, would cost between $1,340,000 and $1,800,000. Ongoing maintenance costs would be in addition	Vortex separators as described are one option for full trash capture. These devices are estimated to cost about $5000/acre of catchment treated. The estimate given would address about 270 acres.	
Hearing, SCVURPPP	2b	C.10	Cost	Waterboard incorrect cost estimates capital costs of $125 million for five percent treatment, and O and M costs are greater than that, and that's just the full capture	The full capture requirements in the RTO have been reduced. Estimates of $26 million region-wide for this permit cycle are based on Permittee cost estimates, which are conservative (high).	
Hearing,Mayor of Martinez	2	C.10	Cost	Retrofitting catch basins $600,000. maintenance $30,000 Martinez supports goal of reducing litter in our storm drain system. Require to implement aggressive litter control programs. No additional funding sources available.	The trash capture requirements in the Revised Tentative Order (RTO) have been reduced from the requirement in the initial Tentative Order. Catch basin retrofits cost about $1500 each or less, based on data from Los Angeles County. Therefore $600,000 would retrofit 400 catch basins in Martinez. Under the RTO Martinez must address about 42 acres, which should take far fewer catch basin retrofits.	The trash capture requirements in the Revised Tentative Order have been reduced from the requirement in the initial Tentative Order.

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						Permittees shall install these capture devices to treat a catchment area draining a total of 30% of the ABAG 2005 Retail/Wholesale Commercial Land Use amount for their jurisdiction.
Hearing,Mayor of San Ramon	1	C.10	Cost	Trash provision cost for San Ramon $3 million, $80,000 annual maintenance. Excluding inlet cleaning $44,000 annually.	The cost of trash capture device installation in the RTO C.10 requirements has been significantly reduced from those in the TO.	Permittees shall install these capture devices to treat a catchment area draining a total of 30% of the ABAG 2005 Retail/Wholesale Commercial Land Use for their jurisdiction.
San Jose	18	C.10	Cost	estimate to meet these requirements over the five-year permit term is approximately $11M	The RTO has reduced trash capture requirements, so this estimate is too high now.	
Santa Clara	31	C.10	Cost	not feasible to increase minimum control measures within target catchments such as sweeping and enhance inlet inspection and cleaning. not feasible to report enhanced trash control catchment areas, including map delineation, and type of control measures	RTO has been revised with more flexible requirements, however, the previous requirements were feasible.	
San Jose	20	C.10	Cost - Allow Flexible approach	San José recommends collaboration with agencies and organizations regionally to develop a strategy for building the funding necessary to implement the kind of large scale, high impact effort	We agree with the need for and efficiency of collaboration on the trash issue.	
San Jose Att	9	C.10	Cost - Allow Flexible approach	implementation costly $11M over a five year , yet no State funding . legally deficient due to lack of evidence on the effectiveness of specific controls, inclusion of duplicative measures, and failure to allow permittees flexibility to design site-specific trash controls	RTO includes reduced cost of these interim measures. There is ample evidence of trash control effectiveness from L.A. implementation. Duplicative measures not in RTO. New flexibility is included in RTO.	

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San Jose Att A	68	C.10	Cost - Allow Flexible approach - collaborate	any large scale effort to control trash must move forward methodically, cost-effectively, and accompanied by adequate resources and time to implement in order to support success. effort prescribed in the Tentative Order is not cost-effective and cannot be managed solely by local municipal resources. City requests collaboration with regional agencies to develop a strategy	The RTO trash requirements have been significantly revised to allow flexibility with accountability at lower cost. We agree with the need for collaboration with other agencies.	
SCVURPPP	70	C.10	Cost - flexibility, more study and planning	require permittee and/or program conduct these steps 1) identify trash sources and transport pathways to trash hot spots; 2) select one creek site impacted by trash transported via the municipal storm drain system; 3) identify high trash impact catchments where trash is entering the storm drain system; 4) implement an appropriate solution or require responsible parties to implement (e.g., full capture treatment devices and/or enhanced trash management measures); 5) demonstrate measurable reductions in trash and litter to these sites; 6) develop along-term plan to significantly reduce trash in high impact trash catchments; and 7) work with the Water Board and other interested parties during the term of the permit to secure resources (such as from previously approved State Bond measures) to fund the implementation of the long term plan developed above.	We agree fully with these steps, and the RTO allows this approach. The "one creek site" implementation is far too low an effort however.	
Santa Clara	3	C.10	Cost - Flexible approach	measures will cost in excess of $300,000 to install, and at least that amount to maintain the devices over the course of the five-year. requirement levels appear arbitrary, are inflexible, and do not take into consideration the effectiveness of our street sweeping program.	The RTO trash requirements have been significantly revised to allow flexibility with accountability at lower cost.	
SCVURPPP	5	C.10	Cost - prescriptive, grant funds, flexible approach	Trash requirements should be based on assessments of sources and pathways, allow flexible approach, and need grant funds for costly structural controls	The RTO trash requirements have been significantly revised to allow flexibility with accountability at lower cost. Grant funds may be available, but the requirements will not be contingent on this eventuality.	
SCVURPPP Attny	33	C.10	Cost - Unfunded Mandate	Federal Phase II, first cycle, permit for North Marianas Islands does not contain trash requirements, which are costly, therefore the requirements are an unfunded mandate under State law. Extensive inspection requirements, asking permittees to fund a pilot program - the State should fund the effort.	The North Marianas Islands Phase II permit is not comparable. Los Angeles has instituted significant trash management actions, thus demonstrating that these measures are MEP. Trash is a significant pollutant impacting Regional waters and must be address through the municipal stormwater permits.	
CCCWP	89	C.10	Cost Excessive	Implementing enhanced trash management controls on ten (10) percent of the Urban and Suburban Land Area	It is not possible at this juncture to judge what the total need for trash capture will eventually be	

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			Flexibility	would be unwarranted and result in wasted public monies. We request a more flexible mandate based on an assessment of need and/or impact.	until Permittees learn more about the problem. The trash capture requirement in the RTO has been revised down to a pilot level.	
CCCoEngrAdvisory	21.1	C.10	Cost excessive, Multiagency effort	The City of Oakland made a presentation at the last State of the Estuary Conference about litter control in their city. The City installed four CDS drainage units around Lake Meritt at a cost of $1 million. They installed another CDS drainage unit at 27th Street and Valdez Street at a cost of $500,000. They estimate to complete the work on the drainage system around Lake Meritt for full trash capture will cost $20 million, and to achieve full trash capture for the rest of the City would be $250 million. Obviously, addressing trash will be a huge fiscal burden on the cities and County. We will need to partner with the Regional Board to truly address this issue.	The estimate for cost of trash capture that has the most data associated with it is about $5000/acre of catchment. We agree that significant resources will be required to implement trash capture devices and maintain them.	
Contech, Lippner, G.	3	C.10	Cost for trash capture - CDS	$3000 - $4000 per acre treated is cost for CDS capital installation.	Noted.	
SCVURPPP	69	C.10	Cost is excessive, need State grants	"full capture devices" in 5% of their urbanized area are estimated to be between $2.6 and $84.6 million, operation and maintenance costs for these devices are estimated to be between $1.7 and $6.6 million, including "enhanced trash management measures" in an additional 5% of urbanized areas would likely significantly increase these costs. Unless the Water Board ties the application of the MRP Tentative Order's (full capture device) requirements to co-Permittee's receipt of funding from the State, allow flexibility so that cost-effective solutions may be implemented	The trash capture requirements in the RTO have been reduced, but the cost estimates mentioned seem high using the $5000/acre basis. Additional flexibility has been incorporated in the RTO requirements.	
Berkeley	32	C.10	costly redundancy	requirement to conduct enhanced litter control in areas where structural control measures will be installed should be removed. This would require municipalities to revise street sweeping routes and install no-parking signs, which would be very expensive, only to remove the signs and revise the routes again a year or so later when the structural control measures are in place.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Clayton, Hoffmeister, L	1	C.10	Costs	Three components increased in the new permit. And you'll see those under commercial inspection, the street sweeping, and DIs special trash. That's drain and inlet special trash. You can see how those costs go up for one city over the five years. Even in a phased in approach as staff has suggested, there's still some real cost considerations there. And you can see where the	The trash capture device installation requirements in the RTO have been reduced.	

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				financial shortfalls are. I only picked out those three. There's obviously other administration cost and management cost issues that go up as well,		
State Assemblyman Guy Houston	3	C.10	Costs - Consider Finances	Consider financial impact to Permittees	The trash capture device installation requirements in the RTO have been reduced.	
SCVURPPP	2	C.10	Costs - Prioritize	permit attempts to "raise the bar" without establishing the need for new requirements or priorities or allowing phasing-in over several permit cycles only focus on the following priority areas: current performance standards, Trash, Monitoring, TMDLs	The RTO includes maximum extent practicable (MEP) measures, and requirements are phased in.	
SF Baykeeper	64	C.10	Define "High Trash Catchments"	There should be some specific criteria articulated to make it easy for permittees to determine what are considered high trash impact catchments (e.g., catchments with sites that fall into specific categories using the URTA or RTA protocols).	The TAL is a starting point for this determination. We expect the Permittees to draw on their maintenance experience and other local knowledge of the most trash impacted stream and shoreline locations.	
Moraga	73	C.10	Definitions	C.10.c requires the development of a long term trash abatement plan that can be developed by "[T]he Permittees, acting individually or collectively" to be submitted by October 2012. Referring to the "General" comments above, define "collectively".	We will further define the ability for Permittees to work together to achieve their trash capture and Hot Spot cleanup requirements.	
Oakley	73	C.10	Definitions	C.10.c requires the development of a long term trash abatement plan that can be developed by "[T]he Permittees, acting individually or collectively" to be submitted by October 2012. Referring to the "General" comments above, define "collectively".	Collectively here means that some or all of the Permittees can work together on a plan which would apply to all that so participate.	
Oakley	72	C.10	Delay Implementation	Inserts make the accomplishment of the full capture program sound doable, but inserts risk clogging and obstruction of high flows causing storm flooding risk. This means that a more structural solution is needed. Some sort of in-line devices will be more practical but more costly for the urban areas. The implementation date needs to be delayed to 2015 to allow more time for device development and searching out and qualifying for grant funding.	Trash capture devices can operate without causing flooding if adequately maintained. Many proven options for trash capture exist, so more time for device development is not necessary.	
Save the Bay	16	C.10	Document Trash Impacted Area selection	Document selection process, gather information from city workers, the public, map sites.	We expect the Permittees to employ this knowledge under current requirements.	
Daly City	93	C.10	Downstream Trash Assessment	FTCDs are required to be installed by July 1, 2012. Daly City has no practical location for trash assessment downstream of the managed catchment. How do we	The requirement for assessment of trash captured by enhanced no longer applies, as was only an option in the TO.	

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				report the total volume of trash collected by all enhanced management measures before the installation requirement?		
Alameda City		C.10	duplicative requirements	Requirement to establish enhanced trash management control efforts and install full trash capture devices in the same catchment area(s) directs duplicative, cost-incurring measures to be implemented.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Berkeley	Table 16	C.10	duplicative requirements	Enhanced trash controls and capture controls in same catchment duplicative.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Fremont	7	C.10	duplicative requirements	jurisdictions will have to invest in equipment, staff and other resources to implement enhanced trash control measures, which may prove unnecessary or duplicative in areas ultimately treated with trash capture devices.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Fremont	8	C.10	duplicative requirements	Requirement to establish enhanced trash management control efforts and install full trash capture devices in the same catchment area(s) directs duplicative, cost-incurring measures to be implemented.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Sunnyvale Att A	25	C.10	Eliminate 10% - 5%	Remove current requirement of addressing 10% of urban suburban area and 5% installation of capture devices	The RTO takes a different approach based on Trash Hot Spot identification, and includes a reduced trash capture requirement.	
CCCWP	90	C.10	Enhanced Trash Management	Mandated "Enhanced trash management controls" includes a minimum of weekly street sweeping frequency which is twice as much as even the "high frequency" street sweeping areas in C.2.a. Is this intended? CCCWP requests that permit language be changed to require sweeping of enhanced trash management control areas at frequencies no greater than 2 times per month, to be consistent with requirements in C.2.a.ii. (Also, see comments under Provision C.2.b.i.)	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions.	
ACCWP	14.1	C.10	Enhanced Litter Control	The requirement to conduct enhanced litter control in areas where structural control measures will be installed should be removed. This would require municipalities to revise street sweeping routes and install no-parking signs, which would be very expensive, only to remove the signs and revise the routes again a year or so later when the structural control measures are in place.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Alameda Co	10.1	C.10	Enhanced Litter Control	The requirement to conduct in enhanced litter control in areas where structural control measures will later be installed should be removed. This would require municipalities to revise street sweeping routes and install	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	

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				no-parking signs, which would be very expensive, only to remove the signs and revise the routes again a year or so later when the structural control measures are in place.		
Newark	14.1	C.10	Enhanced Litter Control	The requirement to conduct in enhanced litter control in areas where structural control measures will be installed should be removed. This would require municipalities to revise street sweeping routes and install no-parking signs, which would be very expensive, only to remove the signs and revise the routes again a year or so later when the structural control measures are in place.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Berkeley	31	C.10	enhanced litter controls too prescriptive	The tentative order requires that the enhanced control measure areas include weekly street sweeping and parking restrictions. These measures may not be appropriate in many areas that municipalities would like to conduct enhanced litter control activities. allow for selecting from a menu that includes items such as enhanced enforcement and litter pickup, rather than be required to implement all the items listed in C.10.b.i.1.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including parking restrictions.	
Fremont	8	C.10	enhanced litter controls too prescriptive	requirements of enhanced litter control measures (e.g. parking restrictions and weekly street sweeping) are too prescriptive and will be economically burdensome to local agencies. The lack of flexibility and prescriptive requirements will make programs more costly and less effective.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Alameda Co	7.2	C.10	Excessive Cost	As this provision is presently written, it would have the Unincorporated County installing full trash capture devices over 18 square miles of its watersheds (5% of 358 square miles). At the rate of $4,500* per acre of watershed to install vortex screen separators (VSS devices), installation alone would cost the County $51.8 million. That is approximately equal to the entire Unincorporated County budget for stormwater for 45 years. *The figure for installation cost of VSS devices is taken from the direct experience of the City of Oakland. The Oakland figure of $4,500 per acre served has been consistent for devices serving several watershed sizes ranging from 16.5 acres to 121 acres. The City costs are higher than manufacturer quotes because they include costs of street utility relocation, design review, site survey, and contract administration.	The basis for trash capture in the RTO has been changed to 30% of the Retail/Wholesale Commercial Land for each Permittee. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Daly City	92.2	C.10	Excessive	Since the City of Daly City would be limited to FTCDs at	Storm drain inlet capture devices are also an	

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			Cost	these major outfalls, the flows will be substantial and analysis, design and construction may take a significant amount of time and money. Additionally, there is no identified funding for this project.	option to be explored, and there are other systems besides outfall capture devices.	
Danville	4.2	C.10	Excessive Cost	This section requires all municipalities to submit a Trash Management Plan for 2023 that complies with a "Zero Trash Impact" in 15 years. Implementation to provide "Full Capture" and "Enhanced Trash Management Controls" will be extremely costly to build and properly maintain. Danville estimates that this requirement will add $1.25 million in costs to the Town's existing program, over the next five years. This is an extremely costly solution, for a concern that is not considered a major problem in Danville creeks.	Trash impacts to creeks and the Bay is a major problem region-wide. RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The estimate for cost of trash capture that has the most data associated with it is about $5000/acre of catchment. We agree that significant resources will be required to implement trash capture devices and maintain them.	
Dublin	10.1	C.10	Excessive Cost	The City of Dublin would need to provide structural controls treating approximately 300 acres in order to comply with this permit requirement. The cost of installing these structures is estimated at $2 Million, or $400,000 per year for the duration of the five-year permit.	The estimate for cost of trash capture that has the most data associated with it is about $5000/acre of catchment, or about $1,500,000 for Dublin. In addition there will be ongoing maintenance costs. We agree that significant resources will be required to implement trash capture devices and maintain them.	
FSSD	10.1	C.10	Excessive Cost	For the City of Fairfield it is estimated that the capital cost for the installation of a full capture CDS unit, in order to comply with the requirements of the permit, would cost between $1,340,000 and $1,800,000. For the City of Suisun City it is estimated that the capital cost for the installation of a full capture CDS unit, in order to comply with the requirements of the permit, would cost between $134,000 and $142,000. For the Fairfield-Suisun Sewer District it is estimated that the capital cost for the installation of a full capture CDS unit would cost between $315,000 and $470,000. Ongoing maintenance costs would be in addition to the capital costs.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
Martinez	2.2	C.10	Excessive	The City of Martinez recommends cities are required to	Enhanced litter control measures, while very	

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			Cost	implement an aggressive litter control program but not to the extent that would require such large capital outlays with no funding source available.	useful will not be adequate alone in Permittees jurisdictions. Capture device installation has been massively implemented in Los Angeles, and is shown be both practical, of reasonable cost, and capable of intercepting significant amounts of trash. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Orinda	3.2	C.10	Excessive Cost	Implementation of the measures prescribed in this Provision will result in public monies being unnecessarily wasted with little water quality benefit.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. The estimate for cost of trash capture that has the most data associated with it is about $5000/acre of catchment. We agree that significant resources will be required to implement trash capture devices and maintain them.	
Pleasanton	4.1	C.10	Excessive Cost	If the Tentative Order is approved as written, the City will be required to provide structural controls treating approximately 500 acres in order to comply with the new requirements. Initial estimates of the cost to install and maintain these required new structures is estimated at $2.25 million and when annualized, this cost would represent approximately $450,000 for each year of the 5-year permit. This additional cost would come close to the total of our City's current annual storm water assessments to residents and businesses. In essence, just to comply with this additional requirement alone would approximately double the cost to comply with our existing NPDES permit requirements.	The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions.	
San Mateo Co	2.2	C.10	Excessive Cost	Implementation of the Trash Reduction Provision C.10 requirements is estimated to cost the County close to $1,000,000 for the first 5 years of the draft permit term. A large majority of this estimated cost is for the installation	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive	

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				of "full trash capture devices" and the associated maintenance. It is unreasonable to expect that the County could allocate this amount of resources and completes installation by 2012, given our current financial constraints.	measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
Suisun	4.1	C.10	Excessive Cost	For the city of Suisun City it is estimated that the capitol cost for the installation of a full capture CDS unit, in order to comply with the requirements of the permit, would cost between $600,000 and $800,000. Ongoing maintenance costs would be in addition to the capitol costs.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
Walnut Creek	6	C.10	Excessive Cost	While the City recognizes the need to control trash and litter problems locally, the proposed Trash Control provisions in the Permit are cost prohibitive to implement. The proposed language does not leave room for innovation or the use of alternative methods for trash and litter control.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Newark	12.3	C.10	Excessive Cost Alternative Pathways	Structural litter control mechanisms are expensive to construct and maintain and they do not address the issue of litter in our communities.	It is necessary to gain experience with use of full trash capture devices to address situations, such as trash behind parked cars, where it is not practical or cost effective to either remove it by street sweeping, and where hand removal is too costly or impractical. During this first stage of removing trash impacts from waters, it is necessary for Permittees to	

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					learn the effectiveness of all of the available tools to tackle this problem. Trash capture definitely is a useful tool, and is MEP based on the significant use developed by Permittees in the L.A. area.	
SF Baykeeper	65	C.10	Floating Booms should not count as trash capture devices	Floating booms should not count as trash capture since they only collect floating trash.	Booms are included because they can collects large amounts of floating trash, with a high percentage of persistent plastic. This trash has major impact in the ocean, and is of high concern.	
Hearing, Mayor of Daly City	1	C.10	Flooding	Trash Capture devices meeting L.A. 5mm standard cause flooding	L.A. and L.A. County do not report flooding issues with adequate maintenance. Devices are designed with an overflow path.	
Daly City	92.1	C.10	Flooding Risk Full Capture Devices	The City of Daly City covers an area roughly seven square miles in size with 4 major storm drain outfalls (excluding the portion of the city that drains into San Francisco's combined sanitary/storm system). Full Trash Capture Devices (FTCD), as defined in C.10.b.i, will be limited to these major outfalls. It is highly unlikely that we can place FTCDs that trap debris 5mm or greater in size at the catch basin inlets. Inlet grates with a 5 mm mesh (3/16 of an inch) will clog quickly and result in localized flooding with minimal rainfall events.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
Save the Bay	30	C.10	Full capture cert. problematic	Permittees should provide peer-reviewed technical studies documenting that control measures achieve full capture	During this permit term, if it proves workable, we intend to use the Los Angeles Regional Board determinations on full trash capture devices.	
Burlingame	7	C.10	Full Capture Devices	The cost to implement enhanced measures could potentially be absorbed through enhancements of regular municipal maintenance activities. However, the purchasing, installing and maintaining full capture devices is a significant fiscal challenge. It should be noted that while there is no certification process yet for "full capture" devices, the permit specifies that these devices should be able to filter and trap litter and trash as small as 5 millimeters in diameter. While this provision further requires municipal maintenance of these devices during periods of rain events to minimize ponding and localized flooding, these devices could add more costs to	The full trash capture standard has been pioneered in the L.A. Region, and is current MEP for California. Further refinements of capture device design and the standard may be necessary in the future. Studies in the Pacific Gyre demonstrate that plastic fragments smaller than 5mm are of concern, as they travel thousands of miles, are persistent, float and are mistaken for prey items by a range of marine life. There are various trash capture devices and technologies. In general, an overflow pathway is	

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				municipalities in terms of staff time and resources in addition to safety and liability issues.	maintained to avoid flooding. Lack of appropriate maintenance may allow certain devices to plug and cause flooding in extreme circumstances, just as storm drain inlets currently flood from trash and debris plugging in the absence of trash capture devices. RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
Hearing Transcript Sunnyvale	66	C.10	Full Capture Devices	The city's main concerns are in regards to the implementation of total trash removal devices;	The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Newark	12.2	C.10	Full Capture Devices	The requirement to install full trash capture devices to treat all runoff from at least 5% of the land area of every municipality is not appropriate for all municipalities as the level of urbanization and associated litter problems varies widely between municipalities.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees.	
San Ramon	9	C.10	Full Capture Devices	The City of San Ramon has several privately owned locations in which trash control devices have been installed to either meet C.3 requirements or as a condition of approval for the project. We have successfully partnered with the private property owners to install these devices, which are monitored to ensure that they are functioning properly through enforceable maintenance agreements. The City of San Ramon requests the RWQCB to include trash removal devices meeting the full capture definition installed and maintained by private	We will consider including credit for trash capture devices in private projects installed under Permittee requirements.	

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				parties in the calculation of the credit received for existing full capture trash devices.		
San Mateo Co	2.3	C.10	Full Capture Devices	It is recommended that the draft permit be rewritten to require that each municipality select one high trash impact catchment tributary to the municipal separate storm sewer system that it owns or operates, implement an appropriate solution or require the responsible parties to implement a solution, and then demonstrate measurable reductions in trash and litter. On this basis it is recommended that the permit be revised to eliminate the draft permit's requirements for at least 10 percent of the high trash and litter urban land area within a municipality's jurisdiction to have trash controls along with the proposed requirement that half or more of this 10 percent catchment area be controlled with "full trash capture devices".	We disagree with the approach of one high trash impact catchment per permittee, regardless of size. The current approach requires one Trash Hot Spot per 30,000 population or per 100 acres of Retail/Wholesale Commercial. Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO	
Hearing, Save the Bay	2	C.10	Funds available	Los Angeles passed a $500 million bond measure, Proposition O, with 75.8 percent fund trash. They passed a special parcel tax in 2006. seek a special stormwater fee from county property owners in summer of 2009. $382 million in statewide resource bonds. There have been legislative attempts to modify Prop. 218, and there are innovative measures, such as Oakland's Fast Food Restaurant Excess Litter Fee, which is raising $237,000 a year for Oakland	Noted.	
State Senator Ellen Corbett	3	C.10	Implement trash controls without delay	In order to ensure the effectiveness of this historic step to revise the MRP, the Water Board must do the following: prevent any delays in the current timeline for measurable progress over the permit term;	Agreed.	
Moraga	72	C.10	Implementation Date	C.10.b. (2) requires the installation of full capture devices with drain inlet inserts being one device for consideration. Inserts make the accomplishment of the full capture program sound doable, but inserts risk clogging and obstruction of high flows causing storm flooding risk. This means that a more structural solution is needed. Some sort of in-line devices will be more practical but more complicated for the urban areas. The implementation date needs to be delayed to 2015 to allow more time for device development and searching out and qualifying for grant funding.	The trash capture requirement for full capture includes an overflow provision above a specified storm. Thousands of the storm drain inlet type devices have been installed in the greater Los Angeles metropolitan area and flooding issues have not been reported. Significant development of trash capture devices has occurred in the Los Angeles area, to an additional year is not warranted.	
Alameda City	14	C.10	Impractical	The City is not aware of any practical device that meets the Provision C.10 definition of a Full Trash Capture System. 5 mm mesh will cause flooding.	There are many devices that meet this requirement, and they use overflow pathways to avoid flooding. Maintenance is necessary to fully	

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					prevent flooding.	
Albany	3	C.10	increase flexibility	account for the varying composition of jurisdictions, allowing jurisdictions to customize their own trash management programs	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL.	
Save the Bay	3	C.10	Increase trash capture requirement	The trash capture device requirements in this order take an extremely incremental approach to trash. By comparison, Los Angeles' trash program is much more extensive: zero trash over the entire Los Angeles River watershed, to be achieved by full capture devices wherever possible.	We agree it is an incremental or phased approach.	
Albany	4	C.10	Is trash capture sizing based on science?	uncertain whether the specific sizing of trash capture devices called out in the draft permit is scientifically grounded.	The hydraulic specification is an engineering compromise between efficiency and excessive cost. This specification will be reviewed for balance in coming years.	
Hearing, Save the Bay	1	C.10	L.A. MEP	cities in the LA Region have demonstrated leadership in addressing trash and marine debris. installations include two-stage storm filter-to-filter CDS or other vortex separation in Santa Monica, Los Angeles, Manhattan Beach, and Culver City; catch basin debris excluder devices already widely installed with 1,000's more to come, and Santa Monica and the City of Los Angeles is pioneering an urban runoff recycling facility, which removes all trash and debris from dry weather flow. Santa Monica and Los Angeles have aggressively pursued the necessary funding	Noted.	
San Jose Att A	69	C.10	lack technical basis for trash measures - enhanced measure duplication	lack technical basis for trash measures - enhanced measure duplication	There is ample technical basis for the trash management measures in the RTO. The RTO reflects revisions that no longer require duplicative trash approaches where they are not effective.	
CCCoSups	77.2	C.10	Legal Authority	The County may be required to develop new legal authority to require certain land owners and business operators in high trash or litter generation areas to purchase, install and adequately maintain and service litter receptacles.	The prescriptive requirements for enhanced trash management measures have been removed from the RTO. Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement.	
Alameda City	15	C.10	Let cities determine what to install	Allow the City to determine what is practical to install within the existing drainage infrastructure, consistent with proven and workable engineering standards, and any existing State standards.	The RTO allows the Permittees great flexibility in choice of methods for trash management, and choice and placement of full trash capture devices.	

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Save the Bay	21	C.10	litter receptacle maintenance	change the language regarding maintaining adequate litter receptacles to "Assess where more trash receptacles would reduce trash accumulation, and install additional receptacles, with adequate pickup frequency."	Such specificity has been dropped from the RTO in favor of focusing on clean up of Trash Hot Spots to the TAL	
Pacifica	7.4	C.10	Local Solutions Too Prescriptive	The Fact Sheet reports that a Water Board study found, "There are trash source hotspots, usually associated with parks, schools, or poorly kept commercial facilities, near creek channels, that appear to contribute significant portion of the trash deposition at lower watershed sites." Every trash and litter problem would be more cost-effectively handled by allowing the local municipality to identify the optimum solution rather than to require an arbitrary amount of municipal land area to have "full trash capture devices" and that another arbitrary amount of land be subject to very prescriptive "enhanced trash management control measures." The proposed permit's inflexible approach would be detrimental to identifying cost-effective ways of making measurable improvements in high priority trash and litter catchments.	Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
Save the Bay	9	C.10	Long-Term Plan	More detail on goals and structure of plan	The details on goals and structure of the long term trash elimination plan will be much more substantive after the Permittees spend a few years grappling with the problem.	
Save the Bay	10	C.10	Long-Term Plan	specify incremental reductions over the years, use data from trash capture devices, verify results	Achievement of the TAL at all Trash Hot Spots is a large incremental reduction that is required over this permit term.	
Save the Bay	11	C.10	Long-Term Plan	Specify "trash free waterbodies" instead of "no impacts to beneficial uses"	The Basin Plan prohibition already exists. The plan goals will be refined as part of the plan development process, also.	
Save the Bay	12	C.10	Long-Term Plan	specify that nothing in this permit or the long-term plan will preclude additional requirements which may be imposed by the next permit cycle adopted in 2013, by 303(d) listing, by a trash TMDL, by enforcement of permit provisions, or by any other measure.	Not necessary to state such an obvious fact. Nothing in C.10 could be construed to preclude more stringent requirements in the next permit cycle.	
State Senator Ellen Corbett	6	C.10	Maintain key requirements	50% trash capture devices and long term plan should be retained in final MRP	The trash capture device installation requirements in the RTO have been reduced.	
Contech, Lippner, G.	4	C.10	Maintenance	Maintenance of CDS is easy and cost effective	Noted.	
San Pablo	26	C.10	Maintenance	Weekly maintenance of the full capture devices will be required in our City since we have a lot of flooding and these systems clog quickly in the fall with the leaf litter. This is a huge burden on our maintenance department	There are other types of trash capture devices that meet the full trash capture standard set in the L.A. region. If street trees causing leaf clogging of these inlet systems will be too great a	

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				that is already understaffed.	problem, other devices can be used.	
Walnut Creek	7	C.10	Maintenance	Installation of full-capture devices will prevent trash from entering storm drain systems; however, they pose maintenance problems and create a potential flooding hazard. These devices must be maintained frequently and will tax our resources during major storm events when those resources may be needed to tackle other emergency situations. We urge that Water Board focus the efforts on pilot studies to assess effectiveness of various management measures for this permit cycle.	There are various trash capture devices and technologies. In general, an overflow pathway is maintained to avoid flooding. Lack of appropriate maintenance may allow certain devices to plug and cause flooding in extreme circumstances, just as storm drain inlets currently flood from trash and debris plugging in the absence of trash capture devices. RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
CCCoSups	77.1	C.10	Maintenance Litter Receptacles	The requirement for "maintenance of adequate litter receptacles in high traffic areas" is potentially problematic for multiple reasons: litter is often found around receptacles not in them; receptacles are often misused in place of property service; receptacles are often damaged/burned; there is often no clear delineation of where they are or who owns them, is responsible for emptying, repairing or replacing them, who is liable for any harm or damage caused as result of receptacle placement, use or servicing.	The prescriptive requirements for enhanced trash management measures have been removed from the RTO. Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement.	
Palo Alto	4	C.10	Manage only storm drain trash source – capture device installation only when funding available	Manage only storm drain trash source – capture device installation only when funding available	The trash capture requirements can not be contingent on funding. The devices are not required to be installed and operation until July 1, 2013.	
Save the Bay	14	C.10	Manage trash in streams from various sources	sites impacted by trash that is littered or dumped on-site or generated by uses such as encampments must all be adequately managed.	We agree, just as spills and dumping of other pollutants are required controlled in provision C.5, Illicit Discharge Abatement	
Save the Bay	13	C.10	Map trash	Strategies used to address trash upstream must be tied to	The RTO includes a focus on cleaning up Trash	

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			areas to demonstrate reductions	demonstrable reductions in trash at the downstream sites.	Hot Spots, which will demonstrate reductions in trash.	
SCVURPPP ATT A	67	C.10	March 2007 call for trash interagency team	March 2007 call for trash interagency team	Noted.	
Hearing, Citizen R. James	4	C.10	Measurable Reduction	Don't talk about installing devices. Set up some of goals of certain percent reduction loads and make them go out and monitor it.	RTO has Trash Hot Spot cleanup goals and trash capture installation requirements.	
SF Baykeeper	63	C.10	Monitor for Trash at more locations, upstream and downstream	The pilot monitoring is overly focused on downstream areas of the watersheds. Trash can and does accumulate for long periods of time in upstream locations. Assessments done in Santa Clara found that there were "no apparent spatial patterns for trash conditions in creeks. Additional trash assessments should be tied to the stream surveys required in Provision C.8. (Table 8.1). The recommended stream survey protocols include identification of trash problem areas in creeks. Use the Center for Watershed Protection's USA stream survey methodology to identify the appropriate areas to apply the URTA or RTA.	Noted. The RTO does not include trash assessment with the status monitoring or stream surveys. During this permit term the focus will be on major Trash Hot Spots, which tend to be lower in the watersheds, with the exception of direct illegal dumping sites.	
CCCWP	92	C.10	More Flexibility	The City of Walnut Creek has developed some preliminary estimates for different approaches, comparing costs for inlet approach versus a larger catchment approach. Preliminary information suggests catchment approach may be more efficient or cost effective. Regional Board staff has pointed out examples from the City of Los Angeles and from the Lake Merritt project. BASMAA has developed some preliminary estimates for different approaches, which have been compared with costs generated by the Program. All available information is too preliminary to decide on the best approach, or be able to predict implementation costs. This is why this entire provision needs more flexibility.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The trash capture device installation requirements in the RTO have been reduced. The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use.	
Colma	2.3	C.10	More Flexibility	The permit should be modified to allow flexibility in addressing trash and litter controls problems so that cost-effective solutions may be implemented that are tailored to solving particular problems.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	

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Hearing Transcript Burlingame	6	C.10	More Flexibility	And for trash, you know, the city has been proactively doing some business district cleanup, so rather than putting a device, they concentrate on areas that are more prone to trash. For example, the downtown areas, two downtown areas get cleanups from volunteers, maybe once every two months. We have participated in Coastal Cleanup Day, and we're just now getting another cleanup at the lagoon. So I do understand it, but I think what you have included in the draft MRP is not what everybody needs or could use. I think the flexibility that I'm looking for is a flexibility that will work for all the cities, individual cities, and smaller cities, and may not be the same for larger cities.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Hearing Transcript Pleasanton	64	C.10	More Flexibility	You've heard the lack of flexibility on trash programs.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Menlo Park	2.3	C.10	More flexibility	Modify the permit language to allow each municipality the flexibility in addressing trash and litter so that cost-effective solutions can be implemented which are tailored to particular problems.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. The approach you describe is similar to the RTO, but a larger program of Trash Hot Spot clean up and full trash capture device installation is called for, than just one catchment per Permittee.	
Oakland	11	C.10	More Flexibility	Oakland is also requesting specific changes to the permit language to provide flexibility for local agencies to address trash using an array current and future technologies and strategies. The City requests that the permit language requiring that half of the enhanced trash management catchment area be managed only by structural controls	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions.	

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				and the criteria restricting enhanced trash management efforts to just the lower reaches be eliminated. The City of Oakland believes that having access to all current and future strategies and technologies is essential to achieving more in trash reduction. It is also important that we not divert efforts to only the lower reaches of the watershed and potentially miss opportunities to implement strategies that can realize trash reduction in both the lower and upper watershed. Allowing the flexibility to utilize a variety of both broad and site specific strategies including structural controls, street sweeping, litter collection, enforcement, outreach, target clean-ups, inlet cleaning, etc will lead to more success.		
San Pablo	25	C.10	More Flexibility	Installing full capture devices assumes that trash only enters the water bodies via the stormdrain system. In San Pablo, a lot of trash is dumped directly into the creeks by residents and by homeless camps. The high costs of installation and maintenance (~$12,000 for installation and ~$40,000 annually for maintenance in San Pablo) could be better used for other trash management measures. We request that more flexibility be given to permittees to reduce trash. Example: In fiscal year 2006/2007, only 7 cubic yards of debris were removed from the City's 326 catch basins, of which only 2 cubic yards was trash. Conversely, 70 cubic yards of trash were removed from the creeks during the annual creek cleanup. All the trash were either too large to enter the creek through the stormdrain system or were as a result of homeless camps. This figure does not include all the trash that is removed from the creeks in the remainder of the year.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions.	
Newark	14.3	C.10	More Flexibility, Feasibility of Structural Controls	Newark is requesting specific changes to the permit language changes to provide flexibility for local agencies to address trash in a cost-effective manner. We request that the permit requirement of a minimum of 5% structural retrofit by 2012 be eliminated, allowing the use of structural or non-structural controls to achieve trash reduction. This would allow local agencies an opportunity to assess the effectiveness of various structural control methods and determine if structural controls are warranted under the Long Term 15-Year Trash Reduction Plan due in 2012.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this	

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					permit cycle to gain experience and learn what works most effectively.	
South SF	2.4	C.10	More Flexible Approach	Every trash and litter problem would be more cost-effectively handled by allowing the local municipality to identify the optimum solution rather than to require an arbitrary amount of municipal land area to have "full trash capture devices" and that another arbitrary amount of land be subject to very prescriptive "enhanced trash management control measures." The proposed permit's inflexible approach would be detrimental to identifying cost-effective ways of making measurable improvements in high priority trash and litter catchments.	See the response to South SF 2.3 above.	
Oakland	10	C.10	Multiagency effort	At the stormwater workshop the Water Board held last year, the Water Board recommended establishing a trash task force of State and local agency representatives to address trash related issues. This is an excellent idea that should be implemented. Before jurisdictions spend tens of millions of dollars on control measures that may not make a significant dent in the problem of litter in local creeks, we should work together to develop a comprehensive trash and litter control plan.	We will assist and participate in such workshops and collaboratives, but implementation should not be delayed. Sufficient information is available including the experience gained in Los Angeles and L.A. County.	
San Jose Att A	67	C.10	Multi-agency effort	form a multi-agency team to help deal with trash	We will assist with this effort after MRP adoption.	
Fremont	7	C.10	need flexibility in determining trash problems and approach	need flexibility in determining which trash problems are best addressed with enhanced trash management devices vs. trash capture devices. 5% capture device installation is too prescriptive.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The mandatory trash capture device level has been reduced in the RTO.	
Save the Bay	2	C.10	Need Trash capture requirement	Emphasis on other trash control measures, such as product bans, education, and extended producer responsibility will have limited impact without trash capture as a primary control measure.	Noted.	
Friendsof5Creeks	5	C.10	No Baseline Measurements	The trash requirements require what amounts to pilot projects to control trash in some 8-9% of the area covered by the permit (10% minus large areas of open space). No baseline measurements are required, so there will be no way to measure whether these measures succeed or fail.	The Revised TO includes requirements to address Trash Hot Spots, and assessments will occur during the Hot Spot selection, so a baseline will exist. Further assessments will chart progress.	
Friendsof5Creeks	6	C.10	No Measurement	In half of this 8-9% of their area, the measures must be designed to capture all trash except during big storms and	Further refinement of the full trash capture standard, which was developed in the Los	

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			of Full Capture	floods. For these devices, the only reporting requirement is volume captured annually, so there will be no way to measure just how "full" the capture is. That is, there will be no measure of what gets by the so-called "full capture devices."	Angeles Region, is possible during this permit cycle. We agree that the definition is somewhat arbitrary.	
CCCoSups	79	C.10	No Trash Unrealistic	It is not realistic to believe that any municipality can develop a plan that when implemented will ensure that there will be no trash impacts on beneficial uses within their jurisdictions. There will always be trash (dumping/litter) and therefore some degree of trash-related impacts. Development of a collective plan for an achievable degree of trash reduction, however, is acceptable.	We agree that trash is a challenging problem, but believe that a long term plan coupled with the knowledge gained in this permit term will eventually lead to no trash impact on receiving waters.	
Hearing,	1	C.10	obstacles to trash capture	They do not fit all circumstances. We have funding through a bond measure, yeah, money. Money is not the issue. We found out there are a lot of other issues that are getting in the way of putting in these structural controls. It's very difficult to cite; infrastructure incompatibilities, we have traffic incompatibilities, we have size limitations.	There are several types of trash capture	
Sunnyvale Att A	24	C.10	One catchment per permittee	Require permittees to identify only one catchment or hotspot per jurisdiction and clean up or require responsible party to clean up.	This level of implementation is too low for more populous Permittees.	
Livermore	11	C.10	Onerous long range goal	Trash management plans must have the goal of no impact of trash on beneficial uses by 2023. This requirement is unrealistically ambitious and fails to recognize the last 40 years of anti-littering efforts that have been unable to eliminate this societal problem. This requirement should be removed.	The requirements are focused on removing trash impacts from waters, which is a more focused goal, and significant progress should be possible.	
San Jose Att A	71	C.10	Only storm drain trash controls	The development of a long term plan should be limited to addressing the impacts of trash transported through MS4 systems.	Trash that arrives in waterbodies via wind, direct dumping, littering or wash down all impacts beneficial uses, and can be transported through the MS4. The Permittees are responsible for attempting to abate direct dumping of trash just as they are responsible for preventing any illicit discharge to State waters from their jurisdiction.	
Save the Bay	27	C.10	Opt out clause	"no practical location" should meet defined criteria, such as "creek banks are too steep to permit access," so that the opt-out measure is not invoked inappropriately and excessively. Second, reporting the total annual volume of trash collected by all enhanced management measures should be modified to break down reporting by site	In the RTO there is a presumption that all Permittees can site Trash Hot Spots sufficient to meet the requirements. All reporting of trash assessments is based on Hot Spots in the RTO.	

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Hayward	3	C.10	overly prescriptive	The overly prescriptive trash-related requirements in the MRP impose a significant burden on local agency resources, while allowing little flexibility. The required enhanced litter control measures may not be applicable in all situations.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Moraga	71	C.10	Parking Restrictions	C.10.b overlaps with C.2.b and C.12.d. C.2.b makes curb clearing of vehicles an out reach item, but C.10 and C.12 make parking restrictions mandatory. Mandatory parking enforcement as a blanket requirement is unacceptable and should be left to the discretion of the local agency. We request that those provisions require outreach only. Many communities have areas of high density, multi-use housing. While the various developments may meet the zoning conditions, there are many home businesses, and families with more than the two cars due to children of driving age or extended families. Also, there are small lot single family zones to provide more affordable housing resulting in reduced on site parking and the need for street parking. Cities can not always ensure that sweeping is done in the mid-day when most residents will be away.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping.	
Oakley	71	C.10	Parking Restrictions	C.2.b makes curb clearing of vehicles an out reach item, but C.10 and C.12 make parking restrictions mandatory. Mandatory parking enforcement as a blanket requirement is unacceptable and should be left to the discretion of the local agency. We request that those provisions require outreach only. Many communities have areas of high density, multi-use housing. While the various developments may meet the zoning conditions, there are many home businesses, and families with more than the two cars due to children of driving age or extended families. Also, there are small lot single family zones to provide more affordable housing resulting in reduced on site parking and the need for street parking. Cities can not always ensure that sweeping is done in the mid-day when most residents will be away.	Mandatory parking restrictions for street sweeping have been removed from C.10. For street sweeping to be an effective way to remove fine particulate bound pollutants, such as PCBs, it is necessary to sweep to the curb. Trash also accumulates at the curb, but we are leaving the specific approach to intercept trash before it can get to waters up to the Permittees.	
San Ramon	8	C.10	Parking Restrictions	Currently, San Ramon has very small amount of "No Parking" zones. Adopting this requirement would force local jurisdictions to install no parking signs for 10% of their urbanized areas where it is not necessarily needed and will redirect police staff from public safety duties to	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street	

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				enforce the "No Parking" requirements. The City requests the RWQCB to include the option of conducting effective public outreach to inform the public about removing vehicles from the curbside on street sweeping days.	sweeping and parking restrictions.	
Hayward	4	C.10	parking restrictions costly	In addition, enforceable parking restrictions could result in significant capital and staff costs to install and maintain signage and a drain on police resources for enforcement.	The RTO does not specify parking restrictions.	
CCCWP	91	C.10	Parking Restrictions More Flexibility	Delete *"(with enforceable parking restrictions to clear vehicles from the curbs on sweeping days)*". *Rationale for change*: This provision would have the unintended consequence of requiring installation of "No Parking" signs legible from any parking position, and at a minimum of 300 feet apart, in all geographic areas required to implement "enhanced trash management control measures". This is unacceptable. Not only would this represent a huge capital expenditure for purchase and installation of signs, these signs are unacceptable in most communities for aesthetic reasons. Permittees must be allowed to use public education and/or other means to encourage residents to not park in areas scheduled for sweeping.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions.	
Moraga Mayor	14	C.10	Parking restrictions not feasible	This section mandates street-sweeping frequencies and enforceable curb parking restrictions. Costly sign installation, hard on multi-family housing areas. Installation of parking restriction signs represents a major capital and expense burden. Significantly increased parking enforcement is not feasible with very limited police staff.	The prescriptive requirements for enhanced trash management measures such as street sweeping in a certain manner have been removed from the RTO. Use of these measures is now up to the Permittees' discretion.	
Save the Bay	22	C.10	perform assessment of trash measures	data should be collected (either in terms of trash collected or in terms of trash present at the site) from all management measures at each site. Control measure programs should be coordinated to ensure that data gathered can be compared across sites. maximize scientific utility and collect baseline information on trash conditions and loading at managed sites	Specific management measures other than trash capture pilot installation are not specified in the RTO. Assessment data will be collected at all trash hot spots, and will be comparable.	
Save the Bay	23	C.10	permitted projects must capture trash	Permittee's drainage infrastructure improvements (storm drains, pumps or pump stations, flood control projects) that would require Corps of Engineers/Regional Water Quality Control Board 401 Water Quality Certification should include full trash capture devices	We will consider the this for permitting of new outfalls. In general we require stormwater treatment measures consistent with Provision C.3 in some 401 Water Quality Certifications, and these treatment measures often will prevent trash from being discharged, but we will review our approach.	

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Hearing, Citizen	1	C.10	personal responsibility	use recyclables and reuse cups and bottles, reduce trash and litter	Noted.	
Hearing, Citizen	2	C.10	personal responsibility	pick up trash every day, ten pieces	Noted.	
CCCoEngrAdvisory	21.2	C.10	Pilot Projects	We should start with pilot projects to determine what types of programs and infrastructure work best before implementing a wholesale program.	The implementation efforts included in the Revised Provision C.10 have aspects of pilot implementation, as trash impacts to creeks will require significant additional work after this permit cycle, and much will be learned from this first round of implementation.	
Sunnyvale Hearing Transcript	72	C.10	Pilot Projects	Sunnyvale, with the assistance of SCVRP (phonetic), initiated a pilot project to determine the operations and maintenance requirements for full capture storm drain inserts. Eleven storm tech removable screen devices of 5-millimeter mesh were installed in Sunnyvale storm drain inlets in January of 2008 in a variety of different land uses and the cost was about $1,200 per unit. To date, we found that large quantities of leaves from the street trees are problematic in some of these areas. The inlets work as they're supposed to. They capture and trap everything greater than five-millimeters in size; however, we observed that they fill up with leaves very quickly with one or two storm events with relatively small amounts of trash being captured. We believe it's premature to require the installation of these types of full capture devices in the scale required in the tentative order. And the leaf issue does not seem to have been a problem in LA. It is in our areas where we have a lot of street trees, and it's required. So we request this provision to require the full capture devices be removed until such a time as the pilot studies currently under way have had a chance to get all the information together.	We agree that storm drain inlet capture devices installed on streets with significant deciduous trees may capture leaves, adding to the maintenance burden. These leave could also cause plugging and flooding of the storm drain system under the previous structure. One possible solution is the added installation of inlet "pop-open" grates, to retain the leaves at the street level for street sweeping. Additional street sweeping at leaf fall time will also help.	
Clayton, Hoffmeister, L	4	C.10	Plastic bag ban	State Law, so cities don't need to duplicate requirement	We and the Permittees can encourage legislators to address these issues. The RTO gives credit for such measures in C.10.a.viii.	
Fairfield City	13	C.10	Prescriptive	approach is overly prescriptive, and does not recognize the variety of possible trash and litter problems or the need to implement cost-effective solutions tailored to solve a particular problem. For example, homeless encampments deposit enormous amounts of trash in creeks, and are greatest source of trash in creeks within the City. MRP requires an arbitrary amount of municipal	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	

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				land area to have "full trash capture devices" and another arbitrary amount of land is subject to very prescriptive "enhanced trash management control measures", regardless of whether trash conveyed through the stormwater conveyance is an significant source to creeks and water bodies. The MRP should be modified to allow flexibility in addressing trash and litter controls problems so that cost-effective solutions may be implemented that are tailored to solving particular problems. Require each municipality to select one high trash impact catchment tributary to the municipal separate storm sewer system, implement an appropriate solution or require the responsible parties to implement a solution, and then demonstrate measurable reductions in trash and litter.	Trash in waters is an issue regardless of the route of deposition, just as illicit discharges can include direct dumping, and must be addressed. Only working on one catchment for each Permittee is not an appropriate implementation level for the larger Permittees.	
Fremont	9	C.10	prescriptive & costly	the requirements of enhanced litter control measures (e.g. parking restrictions and weekly street sweeping) are too prescriptive and will be economically burdensome	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Fremont	6	C.10	prescriptive, allow Flexibility	Need flexibility - enhanced trash management devices vs. trash capture devices. The requirement to install structural controls to treat 5% of the land area of every municipality is not appropriate for all municipalities and penalizes jurisdictions with large land areas than may not have severe litter problems	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement.	
Sunnyvale Att A	22	C.10	Prescriptive, inflexible	Overly prescriptive approach with no technical basis for enhanced management measures specification, not cost effective, does not account for different trash sources and pathways	The RTO has been revised to be less prescriptive, and more flexible.	
SCVURPPP – Olivieri, A	2	C.10	Prioritize	Do more on trash, retain current C.3 exceptions	Noted. Most current C.3 exceptions are retained.	
SCVURPPP – Olivieri, A	5	C.10	Prioritize	Prioritize Trash, TMDLs, Monitoring, don't change Industrial, Const., C.3, HMP, Non-SW discharge	Trash is prioritized. Some improvements have occurred in the conventional provisions of the MRP.	
Saratoga Mayor	1	C.10	Prioritize Trash & other components	trash is critically important and should be addressed in the MRP, but want to make clear that we understand that there are other water quality issues that Bay Area municipalities will be asked· to help address under circumstances where they face competing demands for staff and fiscal resources and have very limited ability to	The trash capture requirements of the RTO have been reduced, thus reducing costs. Beginning to address trash impact reduction in waters is a priority issue for the MRP.	

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				increase revenue to fund services.		
Hearing,Mayor of Menlo Park	4	C.10	private streets	cities cannot clean and inspect private catch basins	We agree and do not require this in the RTO. Trash Hot spot clean up specifics are up to the Permittees in the RTO.	
Menlo Park	2.1	C.10	Public Outreach Requirement	The public outreach requirement is difficult to implement, as it is inefficient to target only a small portion of the City.	Many prescriptive measures have been removed, including parking restrictions for street sweeping and specific public outreach requirements.	
Pacifica	7.1	C.10	Public Outreach Requirement	One of these proposed requirements would require "increased public outreach on litter and trash control, particularly noting the impacts on creeks and the Bay in the outreach message" (Provision 10.b.i.(1)). It would be difficult and inefficient to target public outreach messages to only a small portion of a municipality	Many prescriptive measures have been removed, including parking restrictions for street sweeping and specific public outreach requirements.	
South SF	2.1	C.10	Public Outreach Requirement	One of these proposed requirements would require "increased public outreach on litter and trash control, particularly noting the impacts on creeks and the Bay in the outreach message" (Provision 10.b.i.(1)). It would be difficult and inefficient to target public outreach messages to only a small portion of a municipality.	Many prescriptive measures have been removed, including parking restrictions for street sweeping and specific public outreach requirements.	
Save the Bay	24	C.10	purpose of reporting	C.10.d, Reporting, includes requirements to report each year whether new ordinances have been adopted that impact trash, such as plastic bag bans or litter fees. The order does not indicate what purpose is served by this reporting. If the intent is that these measures should be adopted, a clearer program should be put forth requiring their adoption.	In the RTO, credit toward meeting the trash capture requirement is granted for Permittees adopting such measures. The goal is to reduce the litter and trash load available to impact creeks within a Permittees jurisdiction.	
Friendsof5Creeks	8	C.10	Reduce Implementation Time	This plan is supposed to "prevent trash impacts on beneficial uses within their jurisdictions," whatever that means, by 2023. Trash in waterways has been illegal for more than a generation. Does anyone really think that it should take 15 years to do whatever can or will be done?	The focus on trash impacts to waters has not been as formal as this, nor the effort as concerted and included both in major permits, and with listing of impaired water bodies. Fifteen years is a reasonable time frame given the scope of the problem and the amount of new resources that problem solution is liable to require.	
Millbrae	5	C.10	Reduction Goals	The requirement to identify 10% of an urban and/or suburban land area within their respective jurisdictions to implement the pilot trash control program seems arbitrary. Why 10%? Why not 100%? We propose this section of the MRP be eliminated. We request the Water Board and municipalities work together in minimizing litter and trash in our communities and not waste very limited resources	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been	

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				on more pilot programs that may or may not lead to any conclusive results.	reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
CCCoSups	69	C.10	Reduction Goals Unrealistic	Although the County agrees that trash is unsightly and contributes to water pollution, the MRP's requirement to plan for a goal of zero trash impacts by 2023, although admirable, is completely unrealistic.	We believe that 14 or 15 years is a reasonable time frame to end the beneficial use impacts of trash in this Region.	
Livermore	9	C.10	Redundant requirements	It is redundant to have Permittees implementing full capture devices *and* enhanced measures in the same areas. The area selected for full capture devices should be eliminated from the requirements to implement enhanced controls.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Belmont	4	C.10	Regional Solutions	There should be flexibility in addressing trash and litter controls problems so that cost effective solutions may be implemented that are tailored to solving particular problems. For example, communities should be allowed to partner with neighboring communities or through the regional program and select watersheds for installation of improvements that have more significant trash problems, rather than looking at on a City by City and watershed by watershed basis.	We agree and the type of regional collaboration you describe is allowed under the RTO.	
Daly City	95	C.10	Report on Local Laws Ordinances	This should not be the responsibility of the permit holder. If this is considered an effective way to control trash and litter then this requires legislation that would ban the use of certain products and taxing high litter generation businesses. The Board should consider sponsoring legislation through the state legislature.	The control of trash impacts to receiving waters from stormwater runoff and direct dumping to waters is the Permittees responsibility under the RTO.	
Oakley	60	C.10	Reporting Format	Also, further on, in the monitoring section, other reports are required in the SWAMP format. Can the one format be used for all required data submittals or will individual formats/files need to be created for each dataset required (C.8.h.i, C.8.iC.10.b.ii, etc.)?	The reporting requirements for C.10 differ from other provisions, and each provision has unique requirements, so one format is not appropriate for all provisions.	
(Various) 10 emails 1	1	C.10	Require measurable reductions in trash	Trash hot spots in the Bay are a serious problem that need to be resolved. While concerned citizens can make a difference by volunteering to pick up trash at our shoreline sites, like on Coastal Cleanup Day, cities and counties must also do their part to protect the Bay from trash and marine debris. Please ensure that the Municipal Regional	The RTO includes the requirement that Trash Hot Spots be cleaned up to the Trash Action Level, or additional actions implemented to achieve that goal.	

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				Permit (MRP) will require measurable reductions in trash in our creeks and the Bay. Please ensure that trash provisions in the upcoming MRP require measurable reductions in trash discharge, specify enforceable measures and timelines for implementation, and require cities and counties to make their trash data accessible to the public.		
(Various) 10 emails 1	1	C.10	Require measurable reductions in trash	Trash hot spots in the Bay are a serious problem that need to be resolved. While concerned citizens can make a difference by volunteering to pick up trash at our shoreline sites, like on Coastal Cleanup Day, cities and counties must also do their part to protect the Bay from trash and marine debris. Please ensure that the Municipal Regional Permit (MRP) will require measurable reductions in trash in our creeks and the Bay. Please ensure that trash provisions in the upcoming MRP require measurable reductions in trash discharge, specify enforceable measures and timelines for implementation, and require cities and counties to make their trash data accessible to the public.	The RTO includes the requirement that Trash Hot Spots be cleaned up to the Trash Action Level, or additional actions implemented to achieve that goal.	
(Various) 106 emails2	1	C.10	Require measurable reductions in trash	Trash and plastic debris pollution is a serious water quality problem in the Bay and its creeks. Cities and counties must do their part to protect the Bay from trash and marine debris, and the MRP is an essential tool to control this problem. Please ensure that trash provisions in the upcoming MRP require measurable reductions in trash discharge, specify enforceable measures and timelines for implementation, and require cities and counties to make their trash data accessible to the public.	We believe the timelines in the Revised provision C.10 are adequate. The RTO includes the requirement that Trash Hot Spots be cleaned up to the Trash Action Level, or additional actions implemented to achieve that goal. In addition, trash capture devices must also be installed in a phased effort to gain more experience with their efficient employment.	
(Various) 106 emails2	1	C.10	Require measurable reductions in trash	Trash and plastic debris pollution is a serious water quality problem in the Bay and its creeks. Cities and counties must do their part to protect the Bay from trash and marine debris, and the MRP is an essential tool to control this problem. Please ensure that trash provisions in the upcoming MRP require measurable reductions in trash discharge, specify enforceable measures and timelines for implementation, and require cities and counties to make their trash data accessible to the public.	Both the Trash Hot Spot cleanup efforts and the trash capture device installation have enforceable provisions. All data in the annual reports is public. Timelines are adequate.	
(Various) 33 Environmental NGOs	3	C.10	Require measurable reductions in trash	Please ensure that trash provisions in the upcoming MRP require measurable reductions in trash discharge, specify enforceable measures and timelines for implementation, and require cities and counties to make their trash data	Both the Trash Hot Spot cleanup efforts and the trash capture device installation have enforceable provisions. All data in the annual reports is public. Timelines are adequate.	

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				accessible to the public.		
(Various) 33 Environmental NGOs	3	C.10	Require measurable reductions in trash	Please ensure that trash provisions in the upcoming MRP require measurable reductions in trash discharge, specify enforceable measures and timelines for implementation, and require cities and counties to make their trash data accessible to the public.	Both the Trash Hot Spot cleanup efforts and the trash capture device installation have enforceable provisions. All data in the annual reports is public. Timelines are adequate.	
(Various) 33 Environmental NGOs	1	C.10	require measurable, enforceable reductions in trash discharged to creeks and the Bay	We are writing to express our support for including trash as a pollutant of concern in the Water Board's pending Municipal Regional Permit (MRP). Trash and marine debris are an urgent concern affecting our waterways that have not yet been effectively addressed by local water quality regulations. The permit should require measurable, enforceable reductions in trash discharged to creeks and the Bay.	We agree. Measureable reductions are included in the RTO. The RTO includes the requirement that Trash Hot Spots be cleaned up to the Trash Action Level, or additional actions implemented to achieve that goal. In addition, trash capture devices must also be installed in a phased effort to gain more experience with their efficient employment.	
(Various) 33 Environmental NGOs	1	C.10	require measurable, enforceable reductions in trash discharged to creeks and the Bay	We are writing to express our support for including trash as a pollutant of concern in the Water Board's pending Municipal Regional Permit (MRP). Trash and marine debris are an urgent concern affecting our waterways that have not yet been effectively addressed by local water quality regulations. The permit should require measurable, enforceable reductions in trash discharged to creeks and the Bay.	We believe the timelines in the Revised provision C.10 are adequate. The RTO includes the requirement that Trash Hot Spots be cleaned up to the Trash Action Level, or additional actions implemented to achieve that goal. In addition, trash capture devices must also be installed in a phased effort to gain more experience with their efficient employment.	
Save the Bay	8	C.10	require measureable reductions	We recommend including a provision that states that permittees shall achieve twenty-five percent reductions in trash polluting local waterbodies by the end of the permit term. Reductions should be documented using trash assessments, downstream bypass monitoring, or increases in volume of trash removed from waterways by capture devices or cleanups.	Achievement of the TAL is the interim goal of this permit term. Trash assessment will be used, and in addition trash collected in capture devices will be recorded. 25% reduction may not be sufficient to reach the TAL for the Trash Hot Spots. A 25% global reduction may be appropriate, but would be very difficult to measure, since determining the current baseline would be required.	
East Bay EDA	4	C.10	requirements must be cost effective	with financial challenges for permittees, requirements must be cost effective	The trash capture device installation requirements in the RTO have been reduced. RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL.	
Berkeley	33	C.10	Resolve through coordinated effort	your Board recommended that you establish a trash task force of State and local agency representatives. This is an excellent idea. Before the Bay Area municipalities we spend tens of millions of dollars on control measures that	We can work with other agencies in a parallel effort while also implementing the measures in the Revised C.10. This task force could also work on the Long Term Trash Control Plan.	

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				may not make a significant dent in the problem of litter in our creeks, we should work together to develop a comprehensive trash and litter control plan.		
Berkeley	Table 14	C.10	Selection of catchments	The proposed language limits permittees flexibility for catchment placement. Eliminate following language: (1) These catchments shall, to the extent possible, be in the lower reaches or upstream tidal reaches of major tributaries following through the Permittees urbanized watersheds.	The RTO does not contain this language.	
Save the Bay	25	C.10	site selection process	ensure accountability for site selection by requiring public input and participation in site selection process.	The RTO contains a requirement that Trash Hot Spots be publicized on the Water Board web site for public comment.	
Hearing, SCVURPPP	2a	C.10	Site Specific Solutions	Trash capture won't work where wind and dumping are source, small towns.	Noted. Trash capture may remove trash deposited by wind or dumping. Inlet based capture may not prevent impacts to creeks from these sources. The RTO allows flexible approaches for these other trash impact pathways.	
Save the Bay	17	C.10	Speed up implementation time line	90 days - select high trash areas, Year 1 - implement enhanced management, Year 2 - Trash capture funding and design, Year 3 - Trash capture installed, Year 4 - Long term plan, report on capture devices, Year 5 - implement and report on Long Term Plan, maintenance of trash capture	We believe the current time frames are already aggressive, particularly given the financial status of the Permittees currently.	
Alameda City	16	C.10	State should pay	The RWQCB or the SWRCB should provide for a new revenue stream to fund this infrastructure mandate. The requirements will require additional staff time. No funding mechanism is identified for the additional municipal expense	Staff will assist the Permittees in identifying and competing for grants.	
SCVURPPP ATT A	65	C.10	State that Permittees can comply by building on prior actions	State that Permittees can comply by building on prior actions	Trash capture devices previously installed after 2003 can be credited. Other efforts will greatly aid compliance with C.10 in the MRP.	
Oakley	14	C.10	Street Sweeping C2 and C10	C.2.a indicates that there shall be a designation of frequency of streets sweeping with high, medium and low volume of traffic being one criterion. As there are no objective criteria for the high, medium and low traffic zones, this should be based on the city general plan and average daily traffic (ADT) counts. Is it mandated that there be three categories, or are less allowed at the discretion of the local agency? This section also indicates	Many prescriptive measures have been removed from the revised TO in both C.2 and C.10, including parking restrictions for street sweeping. In C.2, the street sweeping requirements have been removed, and any street sweeping will be done to meet the Pollutant of Concern or TMDL related pollutants provisions.	

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				that high frequency is to be 2 times per month. This street designation is for immediate implementation. However, by comparison, C.10.c.i (1) requires enhanced trash management controls also be immediately implemented with at least weekly sweeping. In light of Board staff indicating skepticism about sweeping effectiveness, which requirement prevails, C.2.a or C.10.c.i (1)?		
Menlo Park	2.2	C.10	Street Sweeping Frequency	The thresholds for street sweeping do not appear to be based upon any site-specific evidence.	Many prescriptive measures have been removed, including parking restrictions for street sweeping and specific public outreach requirements.	
Contech, Lippner, G.	1	C.10	Street Sweeping, grates, litter pickup not effective - Caltrans study	Caltrans litter management study conclusions that street sweeping did not decrease litter loads. There wasn't much bang for the buck in increasing the litter pickup or more modified grate inlets,	The RTO does not include street sweeping trash requirements. Inlet capture systems have been shown to be effective.	
Save the Bay	5	C.10	strengthen trash requirements	Allow flexibility but strengthen approach in the T.O.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL.	
ACCWP	12.2	C.10	Structural Controls	The requirement to install full trash capture devices to treat all runoff from at least 5% of the land area of every municipality is not appropriate for all municipalities as the level of urbanization and associated litter problems varies widely between municipalities. Structural litter control mechanisms are expensive to construct and maintain and they do not address the issue of litter in our communities.	The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	
ACCWP	14.3	C.10	Structural Controls	The Program is requesting specific changes to the permit language changes to provide flexibility for local agencies to address trash in a cost-effective manner (see attachment 1). The Program requests that the permit requirement of a minimum of 5% structural retrofit by 2012 be eliminated, allowing the use of structural or non-structural controls to achieve trash reduction. This would allow local agencies an opportunity to assess the effectiveness of various structural control methods and determine if structural controls are warranted under the Long Term 15-Year Trash Reduction Plan due in 2012.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively.	

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Alameda Co	8	C.10	Structural Controls	The requirement to install structural control measures to treat all runoff from at least 5% of the land area of every municipality is not appropriate for all municipalities as the level of urbanization and associated litter problems varies widely between municipalities. Structural litter control mechanisms are expensive to construct and maintain and they do not address the issue of litter in our communities.	The basis for trash capture in the RTO has been changed to 30% of the Retail/Wholesale Commercial Land for each Permittee.	
Hearing Transcript San Jose	63	C.10	Structural Controls Enhanced Litter Control	The trash requirements, which aims to address what I and many here as you've heard today agree is an important environmental program, include the laying of maintenance activities in a way that's redundant. It also asks that we go from enhanced hyper-maintenance to structural controls midway through the permit. That's also redundant and wasteful.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
CCCoSups	80	C.10	Submittal Dates Inconsistent	The deadline for submitting the Long-Term Plan for Trash Abatement is listed as October, 2012 in section C.10.c, but is indicated as required in the October, 2011 annual report in C.10.d. The reference in C.10.d should be changed to October 2012 for consistency.	The RTO corrects this inconsistency	
Congressman Honda	1	C.10	Support	I am writing to express my support for the measurable reduction of trash in our creeks that ends up in the Bay.	Noted.	
Congressman McNerny	1	C.10	Support	Recent media reports have publicized the challenge trash pollution poses for our region and for the world's oceans. I would like to congratulate you in addressing this issue.	Noted.	
Congressman Thompson	1	C.10	Support	I commend the Board for proposing that trash as a "pollutant of concern" be included its pending Municipal Regional Permit for storm water runoff. Your leadership on this issue will mean that we can begin to significantly address one of the most common-and most controllable-pollutants in our waterways.	Noted.	
Congresswoman Eshoo	1	C.10	Support	Trash has always been a problem for our Bay's water and wildlife. It compromises water quality and ensnares and suffocates animals in plastic debris. I urge the Board to ensure that the upcoming MRP includes provisions for reducing the amount of trash entering the Bay and request being kept informed about the renewal.	Noted.	
Congresswoman Lee	1	C.10	Support	Enforceable measures and timelines for implementation will control the urban runoff pollutant that is causing significant damage to what was once one of the most pristine waterways in the world. give our expert organizations' request that trash provisions in the	Agreed. Trash Hot Spots are to be cleaned up to the Trash Action Level (TAL).	

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				upcoming MRP require measurable reductions in trash every consideration.		
Congresswoman Tauscher	1	C.10	Support	I write to express my support of measurable reductions of trash in San Francisco Bay.	Noted. Trash Hot Spots are to be cleaned up to the TAL.	
Dr. Callaghan	2	C.10	Support	take serious, measurable steps toward reducing trash and pollutants that runoff carries. The Bay Area is becoming polluted, with degradation of our Bay and the ocean	Agreed.	
State Senator Ellen Corbett	1	C.10	support for measurable reductions	it is essential for there to be measurable reductions in trash in our creeks and the San Francisco Bay (Bay) as a requirement in the Water Board's pending MRP.	Agreed.	
Save the Bay	7	C.10	support requirements	We support the historic inclusion of trash provisions in the tentative order and believe this MRP can be a major step in controlling trash pollution of local waterways.	Noted.	
East Bay EDA	2	C.10	Support Trash Objectives	Support objectives but recognize permittees have concerns	Noted.	
Pacifica	7.2	C.10	Technical Basis Unclear	In addition, it is unclear what the technical basis is for the very prescriptive requirements listed in this section of the proposed permit. For example, what studies have been done that demonstrate the needed threshold of implementation should be for streets to be swept weekly and storm drain inlets cleaned at a minimum of four times per year?	Many prescriptive measures have been removed, including parking restrictions for street sweeping and specific public outreach requirements.	
South SF	2.2	C.10	Technical Basis Unclear	In addition, it is unclear what the technical basis is for the very prescriptive requirements listed in this section of the proposed permit. For example, what studies have been done that demonstrate the needed threshold of implementation should be for streets to be swept weekly and storm drain inlets cleaned at a minimum of four times per year?	Many prescriptive measures have been removed, including parking restrictions for street sweeping and specific public outreach requirements.	
ACCWP	13	C.10	Too Prescriptive	The requirements of the enhanced litter control measures are too prescriptive. The tentative order requires that the enhanced control measure areas include weekly street sweeping and parking restrictions. These measures may not be appropriate in many areas where municipalities would like to conduct enhanced litter control activities. In some areas enhanced enforcement or litter pickup would be more appropriate measures than those cited in the Tentative Order.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping.	
ACCWPatt1	19	C.10	Too Prescriptive	A prescriptive two-step process of enhanced trash management control followed by installation of full trash capture devices will likely waste limited city waste	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	

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				resources. Permittees will have to invest in equipment, staff and other resources to implement enhanced trash measures, which may be unnecessary or duplicative in areas ultimately treated with trash capture devices. Also, why install capture devices if the enhanced trash management is effective at keeping the material out of the storm drains?		
ACCWPatt1	20	C.10	Too Prescriptive	Required trash control measures are overly prescriptive, resource intensive and provide no flexibility for the jurisdiction to cost effectively implement enhanced trash control measures. Jurisdictions have to implement all of these measures regardless of cost, efficiency, effectiveness or long-term benefit. Enforceable parking restrictions, for example, result in significant capital costs for signage placement and enforcement resources. Increased street sweeping and inlet inspection will require additional capital and staffing. These measures may be unnecessary or duplicative with the installation on trash capture devices. In addition, increased litter collection and creek cleanups should qualify as trash control measures.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
Alameda Co	9	C.10	Too Prescriptive	The requirements of the enhanced litter control measures are excessively prescriptive. The tentative order requires that the enhanced control measure areas include weekly street sweeping and parking restrictions. These measures may not be appropriate in many areas that municipalities would like to conduct enhanced litter control activities. In some areas enhanced enforcement or litter pickup would be a more appropriate measure.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping.	
Daly City	89	C.10	Too Prescriptive	Controlling trash and litter is an important issue for the city and a lot of effort is currently spent on this societal problem. The City wants to proceed in a practical and cost effective manner. The proposed approach to solving trash and litter problems is overly prescriptive, and does not recognize the variety of possible trash and litter problems and the need to implement cost-effective solutions that are tailored to solve particular problems	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO	
Newark	13	C.10	Too Prescriptive	The requirements of the enhanced litter control measures are too prescriptive. The tentative order requires that the enhanced control measure areas include weekly street sweeping and parking restrictions. These measures may not be appropriate in many areas where municipalities	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. Many prescriptive measures have been removed,	

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				would like to conduct enhanced litter control activities. In some areas enhanced enforcement or litter pickup would be more appropriate measures than those cited in the Tentative Order	including parking restrictions for street sweeping.	
Oakland	9	C.10	Too Prescriptive	The requirements of the enhanced litter control measures are too prescriptive. These measures may not be appropriate in many areas where municipalities would like to conduct enhanced litter control activities. Targeted enforcement and cleanup efforts, multi-agency collaborations, youth employment programs, litter fees, etc. may be more effective in some Oakland neighborhoods than those cited in the Tentative Order.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
Portola Valley	1.1	C.10	Too Prescriptive	The proposed approach to solving trash and litter problems is overly prescriptive, and does not recognize the variety of possible trash and litter problems and the need to implement cost-effective solutions that are tailored to solve a particular type of problem in a particular community. The permit should be modified to allow flexibility in addressing trash and litter controls problems so that cost-effective solutions may be implemented that are tailored to solving particular problems.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping.	
State Assemblyman Guy Houston	1	C.10	Too prescriptive	Permittees won awards, their success depends on their ability to address stormwater issues in a way that is most appropriate for their individual jurisdictions.	The RTO allows flexibility in addressing Trash Hot Spots.	
FSSD	10.2	C.10	Too Prescriptive, Alternate Pathways	This proposed approach to solving trash and litter problems is overly prescriptive, and does not recognize the variety of possible trash and litter problems or the need to implement cost-effective solutions that are well tailored to solve a particular type of problem. For example, the ongoing challenge of homeless encampments in the Bay Area has caused many individuals to become "creek residents". These individuals sometimes deposit significant amounts of trash in our creeks. However, the Draft MRP requires an arbitrary amount of municipal land area to have "full trash capture devices" and another arbitrary amount of land be subject to very prescriptive "enhanced trash management control measures", regardless of whether trash conveyed through the stormwater conveyance is a significant source to creeks and water bodies.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
San Mateo Co	2.1	C.10	Too Prescriptive,	The proposed approach to solving trash and litter problems is overly prescriptive, and does not recognize	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with	

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			Alternate Pathways	the variety of possible trash and litter problems and the need to implement cost-effective solutions that are tailored to solve a particular type of problem. For example, problems range from yard waste dumping along backyard creek banks to homeless encampments to litter from a particular school, shopping mall, or freeway. Trash and litter would be more effectively handled by allowing the local municipality to identify the optimum solution rather than to require an arbitrary amount of municipal land area to have "full trash capture devices" or "enhanced trash management control measures." The proposed draft permit's inflexible approach would be detrimental to identifying cost-effective ways of making measurable improvements in high priority trash and litter catchments. The draft permit should be modified to allow flexibility in addressing trash and litter controls problems so that cost-effective solutions may be implemented that are tailored to solving particular problems.	accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Suisun	4.2	C.10	Too Prescriptive, Alternate Pathways	This proposed approach to solving trash and litter problems is overly prescriptive, and does not recognize the variety of possible trash and litter problems or the need to implement cost-effective solutions that are well tailored to solve a particular type of problem. For example, the ongoing challenge of homeless encampments in the Bay Area has caused many individuals to become "creek residents", although they are consistently asked and required to leave. These individuals deposit enormous amounts of trash in creeks, and are likely the greatest source of trash in creeks within the city. However, the Draft MRP requires an arbitrary amount of municipal land area to have "full trash capture devices" and another arbitrary amount of land be subject to very prescriptive "enhanced trash management control measures", regardless of whether trash conveyed through the stormwater conveyance is an significant source to creeks and water bodies.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees.	
SCVURPPP ATT A	68	C.10	Too prescriptive. Trash transport from wind, dumping in addition to	based on numerous creek trash assessments and local agency knowledge, the SCVURPPP has identified four general trash transport pathways to creeks. These include stormwater, wind, direct dumping and downstream transport. Successful strategies to reduce trash in creeks would best be tailored to address specific sources and	Noted. C.10 is not overly prescriptive, particularly after the changes in the RTO.	

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			stormwater wash-off	pathways at specific sites. C. 10 too prescriptive		
Daly City	94	C.10	Trash Abatement Plan	Need to revise. How is it that permit holders have become responsible for correcting societal ills associated with trash? This language makes permit holders responsible for acts by which it has no reasonable means from which to control. Effective trash control cannot be the sole responsibility of a permit holder but rather must incorporate a much longer coordinated statewide approach involving waste management, recycling, and school education.95	Permittees have jurisdiction over and are responsible under the Municipal Stormwater Permit for controlling pollutant impacts to the MS4. Trash is a major pollutant. Permittees have been responsible for removing trash from streets for years, we are simply implementing regulations and prohibitions that have been present for years, but not implemented or enforced.	
GCRCDCAtt.	32	C.10	Trash Actions Not Effective	trash capture and enhanced management won't stop littering, direct dumping and wind blown. Long term plan too slow	We agree. The trash impacts to creeks will require a multi-faceted approach. These phased management approaches will allow permittees to learn through implementation.	
State Senator Ellen Corbett	2	C.10	Trash affects the Bay and the Oceans	In the Pacific Ocean there is a garbage patch that weighs 3 million tons and covers an area the size of Texas. The Bay contributes to this garbage patch and has its own significant trash build up. Cities and counties must do their part to protect the Bay and the ocean from trash and marine debris.	Agreed.	
ACCWPatt1	22	C.10	Trash Assessment	Trash assessments are expensive and divert resources from other beneficial activities. This measure is unnecessary and duplicative when quantitative measurement of volumes collected in trash captures devices or enhanced trash capture devices can be obtained.	Trash assessments are necessary to gauge progress at Trash Hot Spots. Efforts will be made to streamline the assessments.	
under the tab Dale	24	C.10	Trash Assessment	In San Pablo, we have installed surveillance cameras and provided many services for residents to dispose of their waste properly (school educational programs, two dumpster days a year, providing more trash cans on the streets, and dump vouchers). Still, our maintenance crews pick up trash on a daily basis from city streets and the creek. Although the trash problem in some areas does improve, it is usually displaced to another location. For this reason, we request that the trash assessment not be used to determine the effectiveness of the City's enhanced trash management control.	Accountability is required, and the trash assessment methods currently developed have a significant track record and have demonstrated utility. The TAL is not an effluent limit, but an interim goal or trigger, and C.10 calls for additional efforts if it is not met by the deadline.	
Save the Bay	1	C.10	Trash big public concern	2,000 individual citizens have signed petitions to the Water Board asking for stronger provisions on trash. Twenty-five state and federal legislators whose districts are affected by the MRP have sent letters.	Noted.	

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Berkeley	Table 13	C.10	Trash capture and reduction blindly prescriptive	Requirement to identify and implement trash management controls or catchments on 10% of specified land area does not consider variations of severity of litter problems in jurisdictions and penalizes cities with large land areas that may not have severe litter problems. Cities may have to waste resources installing trash capture devices or implementing enhanced trash control measures in areas with minimal trash simply to meet the number. Reduce percentage or increase excluded area from capture requirement calcs.	The basis for determining the number of Trash Hot Spots has been revised. RTO has also been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. If a Permittee has less trash in their jurisdiction, their efforts to meet the TAL at Hot Spots will be easier, so resources will not be wasted.	
Sunnyvale Att A	21	C.10	Trash Capture devices capture leaves	Sunnyvale is studying trash capture devices in our climate, fall leaf loading may be a problem here.	Noted.	
Contech, Lippner, G.	5	C.10	Trash Capture needed - Caltrans study	Trash Capture needed - Caltrans study	Noted.	
Hayward	5	C.10	trash capture requirements duplicative	Lastly, the requirement in the MRP to install trash capture devices on one half of the area already subject to enhanced trash control measures is duplicative; in addition, structural devices are very costly to install and maintain and may not be appropriate for all communities.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
CCCWP	93	C.10	Trash Catchment Assessments	As written, the permit requires trash assessments to be performed twice a year downstream of all enhanced trash management control catchments (in addition to the trash assessments required in Table 8.1). There is concern as to how many assessment sites would be necessary to comply. It is very difficult to estimate the level of effort and money required to fulfill this permit requirement since the number of enhanced trash management control catchments will not be known until some time after the permit goes into effect. The Program requests that the Regional Board cap the number of catchments that would require trash assessments to be performed. The current monitoring cost estimate assumes a cap of 40 such sites within Contra Costa County, assessed twice a year. The trash-monitoring requirement should be called for in C.10.b.ii only, not repeated in C.8.b. under Table 1.	The revised C.10 defines the assessment numbers based on the Trash Hot Spots, which can be readily determined for all Permittees. All trash monitoring and assessment is now in C.10.	
East Bay EDA	3	C.10	trash comments not incorporated	Permittee comments on trash approach were not incorporated.	Noted.	
Save the Bay	15	C.10	Trash control on 10% of	No trash in waterways should be acceptable; current discharge prohibitions and receiving water limitations, give	We anticipate eventual installation of trash capture devices on a larger scale than currently	

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			urban land too little	the Board has a strong mandate for requiring structural treatment everywhere. In the final order, we request tripling the proposed land area to be treated for trash to 30%. Much more ambitious trash control is being pursued in Los Angeles	required, but it makes sense to accomplish this in a careful and gradual manner, so as to learn the most efficient approach before devoting major resources. It will also take time to develop those resources.	
Berkeley	Table 17	C.10	Trash controls too prescriptive and costly	Remove hard requirement language - list options.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL.	
San Jose	2	C.10	Trash enhanced measures and Capture duplicative	Trash enhanced measures and Capture at same sites duplicative	The RTO reflects revisions that no longer require duplicative trash approaches where they are not effective.	
GCRCD Cover Ltr	1	C.10	Trash is problem	Include trash as a pollutant of concern, require measurable, enforceable reductions in trash discharged to creeks and the Bay	Trash is a pollutant of concern, and has a provision, C.10, focused on just the Trash in waters problem. The RTO includes the requirement that Trash Hot Spots be cleaned up to the Trash Action Level, or additional actions are to be implemented to achieve that interim goal. In addition, trash capture devices must also be installed in a phased effort to gain more experience with their efficient employment.	
Colma	2.4	C.10	Trash Management Areas	It is recommended that the permit be rewritten to require that each municipality select one high trash impact catchment tributary to the municipal separate storm sewer system that it owns or operates, implement an appropriate solution or require the responsible parties to implement a solution, and then demonstrate measurable reductions in trash and litter. On this basis it is recommended that the permit be revised to eliminate the proposed permit's requirements for at least 10 percent of the high trash and litter urban land area within a municipality's jurisdiction to have trash controls along with the proposed requirement that half or more of this 10 percent catchment area be controlled with full trash capture devices.	We disagree with the approach of one high trash impact catchment per permittee, regardless of size. The current approach requires one Trash Hot Spot per 30,000 population or per 100 acres of Retail/Wholesale Commercial. Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
JamesRogerAttII	60	C.10	Trash Monitoring	The Bay Area's urban creeks are so heavily impacted by trash that it will be difficult to select a site that is only affected by programs with enhanced trash management controls. This provision to monitor trends in trash levels should be deferred until there have been >80% reductions	We are not clear how the > 80% trash removal would be determined before assessments are put in place. Assessments can be used under current conditions, as they have been by SWAMP and SCVURPPP. Trash Hot Spots can	

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				in the mass of trash being discharged. Permittees should not be allowed to select a site unless the entire upstream catchment has the enhanced controls or full capture devices installed. None of the waterbodies listed in C.8c.ii meet that criteria and certainly not if 60% of the catchment is urban or suburban. The requirement to monitor trash using the proposed method may have to be delayed a number of years to obtain meaningful data. This monitoring requirement should be moved to Provision 8.e.ii. where it would be more appropriate objective. End-of-pipe monitoring must be conducted to document trash reduction rather than the SCURTA or SWAMP RTA because those protocols will not document that dischargers are achieving specific targeted annual reductions in trash loading. The RTA protocols will be useful to determine acceptable levels of trash in the creeks, wetlands and the Bay's shoreline, but only after levels of trash have been reduce by 70-80%. Attachment II-I describes monitoring protocols that have been demonstrated effective in quantifying trash in storm water discharges. The Caltrans guidance must be specified as the Method in Table 8.1 for monitoring trash.	be selected before actions or trash capture are in the entire catchment. We do not currently have an "end-of-pipe" trash flux measurement method, other than the trash capture amount of total trash capture devices. We will seek more information on Caltrans and other alternative trash assessment methods.	
Danville	4.1	C.10	Trash Not a Problem Everywhere	Danville's current maintenance efforts related to trash pick-up/removal and street sweeping are well-established and successful. Previous volunteer efforts organized specifically to pick up trash in creeks has been suspended because little trash actually exists.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. If the Permittee has little trash impact to creeks, workload is reduced.	
Hearing, SCVURPPP	1	C.10	Trash not problem everywhere	Trash is a major problem at some urban creek sites and wetland sites in the Bay Area. not a problem at all sites and in all creeks	Noted. RTO trash control requirements give Permittees flexibility to approach their specific problem areas.	
Hearing,.Concord Councilmember	1	C.10	Trash not problem everywhere	Several commercial sites in Dublin, residential no trash	Commercial land uses, such as shopping malls, particularly with fast food restaurants can be significant sources of trash and litter. Schools and sports facilities may also be sources.	The Revised Tentative Order requires that each Permittee clean up a number of trash hot spots based either on population or

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						commercial retail/wholesale land use, whichever hot spot number is higher.
Concord	9	C.10	Trash Pathways	All of the efforts in Section C.10, trash reduction, are focused on street sweeping and storm drain screens. Experience from our creek cleanups suggests that most of the trash in our creeks does not come through a storm drain pipe. Most of the trash comes from other sources e.g. windblown, homeless encampments, illegal dumping, from adjoining land. Perhaps in other cities, the trash comes through storm drains. We recommend that the method of reducing trash be left up to each city. This will allow local experts to implement the right approach for their local conditions.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions and street sweeping specification.	
GCRCDCAtt.	31	C.10	Trash pathways	trash and litter control from storm drains only about 10 to 15 %, 75 to 80% of the garbage and trash either direct dumping or is being wind blown into waterways or riparian area	This may be the case in certain waterbodies. The information has not been collected to say this with certainty about the majority of trash impacted waterbodies.	
GCRCDCAtt.	33	C.10	Trash pathways	photos showed the pollution caused by direct dumping and human waste deposited either into the waterways or onto their banks. The GCRCD also filed a Letter Complaint with the Santa Clara County DA's Office on April 16, 2007	Noted. We are very concerned with the scale of impacts to some creeks by homeless encampments in particular.	
Santa Clara	30	C.10	Trash pathways	How identify ten percent high trash and litter catchments in Urban and Suburban Land Area?	The RTO has reduced trash capture requirements. Trash capture devices can be placed where the Permittees believe they will be most efficient.	
Berkeley	Table 15	C.10	Trash reduction - need flexibility	Need flexibility between enhanced trash measures and trash capture implementation - Remove the following language: and install full trash capture devices by July 1, 2012. Half or more of the total catchment area to be addressed as described in Provision c.10.a.1., must be managed through installation of full trash capture devices…. Replace with: Permittees may address implementation with full trash capture devices or with enhanced trash management control. Full trash capture devices must be installed by July 1, 2012.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL.	

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ACCWPatt1	16	C.10	Trash Reduction Goal	The requirement to identify and implement trash management controls or catchments on 10% of specified land area does not consider variations of severity of litter problems in jurisdictions and penalizes cities with large land areas that may not have severe litter problems. Cities may have to waste resources installing trash capture devices or implementing enhanced trash control measures in areas with minimal trash simply to meet the number. At a minimum, single family residential areas should be excluded. Modify the language as follows: "Urban and Suburban Land Area is defined as the entire land area of a Permittee's jurisdiction, less…estate single family residential development areas."	The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees. It is necessary for the Permittees to install trash capture during this permit cycle to gain experience and learn what works most effectively. RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions.	
Pleasanton	4.3	C.10	Trash Reduction Goal	The City of Pleasanton requests that the permit requirement be revised from the proposed prescriptive 5% enhanced and 5% full capture trash removal to a performance goal language of 10%, allowing the use of variable percentages for removing trash within the 10% targeted area. This would allow local agencies such as the City an opportunity to assess the effectiveness of these methods, including enhanced trash capture methods, in achieving a better result based on practical cost and benefit analysis.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Many prescriptive measures have been removed, including parking restrictions for street sweeping. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Dublin	10.2	C.10	Trash Reduction Goal Alternative Compliance	The City of Dublin's 10% trash target area would encompass most of the Downtown commercial areas, the West Dublin Transit Center, the East Dublin Transit Center, and both local high schools. The City's staff has reviewed existing trash control measures in these areas and believes that operation and maintenance activities such as placing additional trash receptacles and enhanced litter pickup could accomplish the trash reduction goals, and that the 5% requirement for structural retrofits could be reduced to 2-3%. The City of Dublin requests that the permit requirement of 5% structural retrofit by 2012 be modified to reduce this to the 2-3% range, allowing the use of non-structural controls to achieve trash reduction within the 10% targeted area. This would allow local agencies an opportunity to assess the effectiveness of these methods and determine if additional structural controls are warranted under the Long Term 15-Year Trash Reduction Plan due in 2012. Reducing that	The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. The trash capture requirements are necessary in order for the Permittees to gain experience with various trash control technologies to prepare for a more complete control of trash in waters by the next permit term.	

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				structural retrofit requirement from 5% to 2-3% would reduce the added cost of permit compliance by $200,000 per year.		
Save the Bay	4	C.10	Trash requirements are not too costly.	L.A. Cities also first protested with inflated cost figures. Once required, raised $500 million 2/3 vote. State bond funds also available.	Noted.	
ACCWP	14.2	C.10	Trash Task Force	At the stormwater workshop the Water Board held last year, the Water Board recommended establishing a trash task force of State and local agency representatives to address trash related issues. This is an excellent idea that should be implemented. Before jurisdictions spend tens of millions of dollars on control measures that may not make a significant dent in the problem of litter in local creeks, we should work together to develop a comprehensive trash and litter control plan.	We agree that a task force would be useful. We cannot wait for this effort to start other control measures, however.	
Alameda Co	10.3	C.10	Trash Task Force	The problem of litter in our creeks and the Bay cannot be solved through controls on stormwater discharges alone. At the stormwater workshop the Water Board held last year, the Water Board recommended establishing a trash task force of State and local agency representatives to address trash related issues. This is an excellent idea that should be implemented.	We agree.	
Colma	2.2	C.10	Trash Task Force	The Board members suggested that it would be worthwhile to form a multi-agency team to help improve the control of trash and litter. Subsequently, some legislators have also identified a need for a "more comprehensive public policy and regulation to protect the Bay from trash and marine debris."[1] . Has a multi-agency team been created to develop a more comprehensive public policy to deal with trash and litter? If so, what solutions is it recommending and how are these solutions related to what is being proposed in the draft permit?	A multi-agency team has been formed in Santa Clara County. We are not aware of similar efforts in the other Counties.	
Hearing Transcript SMCWPPP Fabry		C.10	Trash Task Force	We had a Board workshop some time last year I believe it was. And the Board directed their -- your staff to form a trash taskforce involving other jurisdictions like the California Integrated Waste Management Board, State Water Resources Board. To my knowledge, that has never happened. I think that we would still urge that something like that take place because trash is a multi-jurisdictional issue. There are a lot of things that are not	We agree that the solution to the trash-in-waters problem will involve other agencies and NGOs also, and will assist in this organization effort.	

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				storm-drain related associated with the trash problem, and we need to get other entities involved in this to deal with it on a comprehensive basis.		
Newark	14.2	C.10	Trash Task Force	The problem of litter in our creeks and the Bay cannot be solved through controls on stormwater discharges alone. This will require a coordinated effort between local and State agencies. At the stormwater workshop the Water Board held last year, the Water Board recommended establishing a trash task force of State and local agency representatives to address trash related issues. This is an excellent idea that should be implemented. Before jurisdictions spend tens of millions of dollars on control measures that may not make a significant dent in the problem of litter in local creeks, we should work together to develop a comprehensive trash and litter control plan.	We agree that a task force would be useful. We cannot wait for this effort to start other control measures, however.	
Pacifica	7.5	C.10	Trash Task Force	On March 14, 2007 the Water Board heard a status report on the Municipal Regional Stormwater Permit that solicited many comments on the need to improve trash and litter control. Some of the commenters pointed out the variety of societal problems, such as homeless encampments, that in some locations contribute significantly to garbage and hazardous material being dumped along creeks. The Board members suggested that it would be worthwhile to form a multi-agency team to help improve the control of trash and litter. Subsequently, some legislators have also identified a need for a "more comprehensive public policy and regulation to protect the Bay from trash and debris." . Has a multi-agency team been created to develop a more comprehensive public policy to deal with trash and litter? If so, what solutions is it recommending and how are these solutions related to what is being proposed in the draft permit?	SCVURPPP has formed a Santa Clara County Trash multi-agency team. We are not aware of similar efforts in the other counties, but will assist any such effort going forward.	
San Mateo Co	3	C.10	Trash Task Force	The Water Board should also follow-up on the Board members' suggestion to form a multi-agency team to help improve the control of trash and litter based on public comments received on March 11, 2007 at the public hearing. The solutions or recommendations from this multi-agency team could serve as permit requirements for the future.	We will assist each County to create a multi-agency team at the County level. Santa Clara County has already begun such an effort.	
South SF	2.5	C.10	Trash Task Force	On March 14, 2007 the Water Board heard a status report on the Municipal Regional Stormwater Permit that solicited many comments on the need to improve trash	SCVURPPP has formed a Santa Clara County Trash multi-agency team. We are not aware of similar efforts in the other counties, but will assist	

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				and litter control. Some of the commenters pointed out the variety of societal problems, such as homeless encampments, that in some locations contribute significantly to garbage and hazardous material being dumped along creeks. The Board members suggested that it would be worthwhile to form a multi-agency team to help improve the control of trash and litter. Subsequently, some legislators have also identified a need for a "more comprehensive public policy and regulation to protect the Bay from trash and marine debris.". Has a multi-agency team been created to develop a more comprehensive public policy to deal with trash and litter? If so, what solutions is it recommending and how are these solutions related to what is being proposed in the draft permit?	any such effort going forward.	
SF Baykeeper	66	C.10	Two trash assessment methods confusing	Two assessment methods will lead to confusion because the two methodologies recommended for assessment are not directly comparable. Although the names of the categories are very similar between the two protocols (e.g. URTA 'Least Disturbed Optimal Urban' versus RTA 'Optimal'), the range of values used to define the categories in the RTA and the URTA are very different, with the RTA being much more conservative in its definitions. Require reporting of raw scores.	The RTO includes only the SCVURPPP Urban RTA assessment method.	
CCFCWCD	3	C.10	Urban and Suburban Land Definition	The FC District provides services to the entire county. However, the FC District operates and maintains facilities serving tributary areas constituting approximately 80% of the urban and suburban area of the county. Section C.10.b.i should be reworded to read: Non-population-based Permittees, such as county flood control districts, shall address 1 percent of the Urban and Suburban Land Area tributary to their drainage facilities. In addition, agricultural areas and non-urban parks should not be considered part of the "Urban and Suburban Land Area".	In the RTO, the non-population based Permittees are assigned implementation levels to address this issue.	
Orinda	3.1	C.10	Urban and Suburban Land	This provision assumes that every city has high trash areas totaling at least 10% of their urban and suburban land. The primary high trash area for the City of Orinda is the downtown area and it comprises less than 5 percent of the total land area of Orinda; other localized trash hot spots have been identified in annual reports submitted to the Water Board and in total, comprise far less than 5 percent of the total land area of Orinda.	In the Revised C.10, the Trash Hot Spot requirement is based on population and commercial land use, and the trash capture requirement is based on commercial land use, to more accurately tie these requirements to trash source scale.	
Alameda Co	7.1	C.10	Urban and	In discussions with your staff, it has become apparent that	The basis for trash capture in the RTO has been	

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			Suburban Land Definition	the language of Provision C.10.a.i. contains an unintended flaw in the definition of *Urban and Suburban Land Area*. In our discussions it has become clear that your staff intended this definition to cover the developed area of each jurisdiction because that is where the vast majority of trash is produced. As it is written now, this definition would include 358 square miles of our county, encompassing all the open grazing and undeveloped land of the eastern half of the County. Much of that area is entirely uninhabited and does not have roads. Instead, the actual size of the truly urban and suburban (developed) part of the Unincorporated County is a small fraction of this area.	changed to 30% of the Retail/Wholesale Commercial Land for each Permittee.	
Alameda Co	10.2	C.10	Urban and Suburban Land Definition	propose revising the definition in MRP Section C.10.a.i. as follows: "Urban and Suburban Land Area is defined as the developed land area of a Permittee's jurisdiction, consisting of those areas in which the predominant property parcel size is 10,000 square feet or less, excluding natural resource protection areas, golf courses, cemeteries, grazing lands, farm lands, and estate residential development areas."	The RTO does not use the Urban and Suburban Land definition any longer. The mandatory trash capture device level has been reduced in the RTO to 30% of Retail/Wholesale Commercial land use, thus reducing costs for Permittees.	
Save the Bay	6	C.10	Voluntary approach failed	Seven years ago, the Board directed cities to address problematic trash levels in creeks and the Bay, without formal regulatory requirements. At that time, the Board chose to allow cities to address the problem informally, with regulation reserved as a future step if the voluntary process did not work. The voluntary approach has failed: most permittees simply ignored the directive. Santa Clara's Urban Runoff Pollution Prevention Program put some effort into study and documentation, but these preliminary steps have not yielded significant progress on reducing trash.	Agreed.	
State Assemblyman Guy Houston	4	C.10	Water Board Composition	nine seats on the Water Board, three vacancies- two meant to represent local governments. Decision of this magnitude should not be made without local government being represented on the Board.	Noted.	
Friendsof5Creeks	4	C.10	Weak Requirements	In the area of trash, the Administrative Draft seems poised to repeat of the pattern we have seen for New Development, Redevelopment, and Hydromodification. That is, under pressure – in this case, from citizen groups – the Board will adopt weak requirements that can be rationalized as a first step. Then the fuss will die down and	As trash impacted water bodies are now on the proposed 303(d) list of impaired waters, attention will remain on trash. Though these requirements are a first step, additional implementation will follow this permit cycle based on what Permittees learn. This first stage of implementation will	

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				measures will remain ineffectual, as attention moves to some new problem.	address almost 200 Trash Hot Spots, and over 5500 acres of catchment will be addressed with full trash capture devices at an estimated capital cost of $26 million.	
San Leandro	19	C.10,b.(i).	2-step process not best way	Local agencies will have to invest in equipment, staff and other resources to implement enhanced trash measures, which may be unnecessary or duplicative in areas ultimately treated with trash capture devices.	Revised C.10 does not require redundant trash management actions unless the Permittee finds it necessary to address the Trash Hot Spots.	
CCCWP	85	C.10.a	BASMAA Approach	The Program proposes a more effective and measured approach as outlined in BASMAA's September 22, 2006 Performance Standard tables, as summarized below: 1) Identify and assess potential litter/trash high accumulation areas/watersheds. 2) Identify management actions (BMPs) to reduce trash levels in stormwater conveyances at such locations and identify current trash collection/control options for minimizing trash/litter inputs to storm drain inlets. Determine the implementation costs and effectiveness of devices/BMPs investigated. 3) Identify high priority storm drain inlets within key urban areas/watersheds that have had high accumulations of litter/trash to prioritize inlets for potential projects. 4) Select locations for pilot projects and implement demonstration studies to assess their effectiveness and associated costs.	The RTO approach for C.10 contains many of these elements, and greatly increases the flexibility that the Permittees have to deploy resources to tackle the trash problem.	
CCCoSups	70	C.10.a	Cost Excessive	The costs associated with the requirements of this section must be considered relative to the entirety of County's responsibilities to its population and environment, as well as the economic law of diminishing returns, and should be revised accordingly. Ultimately, the solution involves human behavior modifications (and incentives) that will require time to develop.	There will be many approaches necessary to solve the trash impact problem. Attempting to change behavior is part of the solution.	
CCCoSups	71	C.10.a	Pilot Projects	The Trash Reduction section of the proposed MRP refers to implementation of the full trash capture devices throughout 5% of jurisdictions' urban and suburban land area as a "pilot" project, which is a precursor to the Long-Term Plan for Trash Abatement. While the County supports trash reduction (especially insofar as its water quality impacts), it seems that a smaller pilot project would be appropriate for full trash capture devices (i.e. 5-10 pilot site projects distributed through the entire County, including incorporated cities) prior to requiring such a comprehensive and expensive project. This change to the	The trash capture device installation requirements in the RTO have been reduced. The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use.	

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				MRP would require substantial changes throughout provision C.10.		
CCCoSups	73	C.10.a.i	Exclude Areas Not in Jurisdiction	The definition of "urban and suburban land area" should also be clarified such that it excludes areas that are within the ultimate permittees' boundaries, but are not within permittees' actual jurisdiction. This clarification is meant to clarify that there are areas where it is not legally feasible for the permittees to implement trash management (i.e. military bases, CalTrans' property, etc.).	The RTO has been significantly revised and the basis of trash capture device installation is now 30% of Retail/Wholesale Commercial Land Use.	
CCCWP	84	C.10.a.i	Trash Reduction Goals	This provision assumes every city has high trash areas totaling at least 10% of their urban and suburban land. This may not always be the case, particularly in smaller less urban Contra Costa municipalities, and may result in public monies being unnecessarily wasted with little water quality benefit.	The trash capture device installation requirements in the RTO have been reduced. The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use.	
CCCoSups	72	C.10.a.i	Urban and Suburban Land Definition	Agricultural areas and non-urban parks should not be considered part of the County's "urban and suburban land area". The definition of "urban and suburban land area" currently does not exclude agricultural areas or non-urban parks, but does include "estate residential development areas". This appears to be an oversight, since non-urban parks and agricultural areas are significantly less urban than "estate residential development areas". The words "agricultural areas, and non-urban parks" should be added to the list of portions of the jurisdiction that are to be excluded from "urban and suburban land area".	The RTO has been significantly revised and the basis of trash capture device installation is now 30% of Retail/Wholesale Commercial Land Use.	
CCCWP	88	C.10.a.ii	Capital Procurement	The Program can suggest a better approach that addresses both the Regional Board need for assurance of reasonable progress and the municipalities need for cost certainty in capital planning. Our proposed alternative is to make compliance with this provision contingent on attainment of two significant milestones: a)Procurement of capital funds sufficient to undertake significant trash capture projects. Based on our estimates, this would be an amount on the order of $10,000,000; and b) Initiation of projects to utilize those capital funds. These two activities would occur in sequence, according to the strategy called for in C.10.c below.	Compliance cannot be contingent on resource availability once the permit is adopted. If region wide conditions of the economy and local finances are such that major provisions of the permit are not able to be implemented by Permittees who are also suffering major funding failures in other sectors, this information can be addressed at the future date. The trash capture requirements are set four years out in the RTO.	
ACCWPatt1	17	C.10.a.ii	Catchment Selection	Eliminate following language: (1) These catchments shall, to the extent possible, be in the lower reaches or upstream tidal reaches of major tributaries following through the Permittees	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive	

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					measures have been removed, including street sweeping and parking restrictions.	
CCCWP	86	C.10.a.ii	Excessive Cost	Brown and Caldwell's preliminary capital cost estimate ranges from $3,000,000 to $160,000,000 for complying with the trash reduction provisions over the five year permit for Contra Costa alone. Operations and maintenance costs for full trash capture are estimated at $15,000,000 – $30,000,000 over the five year permit term. Implementation of the "Enhanced Trash Management Controls" would add to the capital and O&M costs. The higher cost capital projects (installation of Gross Solids Removal Devices, or GSRDs), provide the greatest certainty of success, and lower Operations and Maintenance costs. The lower cost options, such as storm drain inserts, have higher O&M costs and less certainty of success. The above proposed provisions assume all communities are impacted by trash - enough to warrant what is estimated to be extremely expensive retrofits and enhanced trash management measures. It is likely that the cost/benefit and optimum approach would be very different among municipalities (e.g., Moraga vs. Concord).	The trash capture device installation requirements in the RTO have been reduced. The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use. The estimate for cost of trash capture that has the most data associated with it is about $5000/acre of catchment. We agree that significant resources will be required to implement trash capture devices and maintain them. We agree that communities differ on the extent of the trash problem but the current requirements have been reduced below a level where this would be an issue.	
CCCoSups	74	C.10.a.ii	Full Capture Devices	Provision C.10.a.ii encourages full trash capture devices to be placed to be located in lower reaches or upstream tidal reaches of major tributaries. This seems to potentially encourage installation of devices that would severely limit biological functionality of waterways in stretches where they are likely to be in relatively natural states; this may compromise biological integrity and impede beneficial uses. It should also be noted that much of the County's drainage infrastructure is in a relatively unimproved/natural state.	We agree. Under the RTO Permittees can choose Trash Hot Spots and trash capture device placement at strategic locations other than the lower reaches of streams.	
CCCoSups	75	C.10.a.ii	Justify 5mm Capture	The 5mm seems to be an arbitrary and especially fine gradation that will not necessarily produce a high degree of water quality benefit per dollar spent. It also seems to increases chances of clogging, failure, and flooding. Unless there is specific science supporting the necessity of the 5mm specification, and a favorable cost-benefit ratio, the County requests that this specification be reviewed and adjusted appropriately.	The full trash capture standard has been pioneered in the L.A. Region, and is current MEP for California. Further refinements of capture device design and the standard may be necessary in the future. Studies in the Pacific Gyre demonstrate that plastic fragments smaller than 5mm are of concern, as they travel thousands of miles, are persistent, float and are mistaken for prey items by a range of marine life. There are various trash capture devices and technologies. In general, an overflow pathway is	

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					maintained to avoid flooding. Lack of appropriate maintenance may allow certain devices to plug and cause flooding in extreme circumstances, just as storm drain inlets currently flood from trash and debris plugging in the absence of trash capture devices.	
CCCWP	87	C.10.a.ii	More flexibility	To help permittees move forward, this provision needs to be re-written to allow for more flexibility. As worded, the fixed requirement to demonstrate the success of full trash capture on 5% would drive towards the higher capital cost projects to ensure compliance.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. he mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees.	
Daly City	90	C.10.b	5mm Capture Standard	The 5 mm full capture standard is equal to an English measurement of 3/16 of an inch. It would be helpful to understand what standard performance measure spawned a 3/16 of an inch standard for a full capture mesh device with a hydraulic capacity of not less than the peak flow rate resulting from a one year, one hour event storm within a storm drainage catchment area. It would be helpful for Regional Board staff to demonstrate the efficacy of how this specification would be achieved, how it would be calculated and provide examples of devices necessary to achieve this standard. Assuming such a standard is desirable from potential downstream impacts we offer for consideration the very real potential for unintended flooding consequences as a result. It is not recommended that such a standard be implemented as this aspect requires further review	The full trash capture standard has been pioneered in the L.A. Region, and is current MEP for California. Further refinements of capture device design and the standard may be necessary in the future. Studies in the Pacific Gyre demonstrate that plastic fragments smaller than 5mm are of concern, as they travel thousands of miles, are persistent, float and are mistaken for prey items by a range of marine life. There are various trash capture devices and technologies. In general, an overflow pathway is maintained to avoid flooding. Lack of appropriate maintenance may allow certain devices to plug and cause flooding in extreme circumstances, just as storm drain inlets currently flood from trash and debris plugging in the absence of trash capture devices.	
San Ramon	7	C.10.b	Alternative Compliance	It has been our experience that effective trash control can be achieved without the use of structural full capture devices. The City of San Ramon controls trash using three primary methods. The first method is bi-monthly street sweeping for all residential areas and weekly street sweeping for commercial and industrial areas. The current level of street sweeping exceeds the levels established in section C.2.a of the TO. The second method of trash control is a weekly trash pickup through our Citywide Landscaping and Lighting Assessment District (LLAD). As part of the LLAD contract, workers	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. The mandatory trash capture device level has been reduced in the RTO, thus reducing costs for Permittees. It is necessary to gain experience with use of full trash capture devices to address situations, such	

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				pick up trash along arterial and collector roadways during maintenance activities. The third method of trash control involves City Public Services staff collecting trash when found while conducting work in the field. The City requests the RWQCB include the option of conducting enhanced trash management control measures, such as the measures listed above, as an alternative to the installation of full trash capture devices in Section C.10.b. The City also requests the RWQCB change C.10.a.i. so that jurisdictions would have the option to implement measures other than the installation of structural full capture devices to control trash.	as trash behind parked cars, where it is not practical or cost effective to either remove it by street sweeping, and where hand removal is too costly or impractical. During this first stage of removing trash impacts from waters, it is necessary for Permittees to learn the effectiveness of all of the available tools to tackle this problem. Trash capture definitely is a useful tool, and is MEP based on the significant use developed by Permittees in the L.A. area.	
Moraga Mayor	13	C.10.b	Full capture inappropriate, need flexibility	C.10.b.i requires installation of full trash capture infrastructure and prescribes where and how much of the storm-drain infrastructure will be equipped. Board presumes all areas have the same issue with trash. MRP's requirements for trash capture devices represents a significant burden on limited capital and maintenance funds. Board must allow for some flexibility in the requirements to accommodate areas where trash is less of a problem.	Revised C.10 allows flexible approach by Permittees, who decide trash hot spots, how to clean up trash hot spots, capture device placement. The prescriptive requirements for enhanced trash management measures have been removed from the RTO.	
ACCWPatt1	18	C.10.b.i	Enhanced Litter Control	Permittees need flexibility in defining areas with full capture devices. For some areas enhanced trash management control that prevents trash from entering the storm drain system in the first place may be more productive than capturing trash after it has entered the system. Why install capture devices if the enhanced trash management is effective at keeping the material out of the storm drains?	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. It is necessary to gain experience with use of full trash capture devices to address situations, such as trash behind parked cars, where it is not practical or cost effective to either remove it by street sweeping, and where hand removal is too costly or impractical. During this first stage of removing trash impacts from waters, it is necessary for Permittees to learn the effectiveness of all of the available tools to tackle this problem. Trash capture definitely is a useful tool, and is MEP based on the significant use developed by Permittees in the L.A. area.	
CCCoEngrAdvisory	20.1	C.10.b.i	Excessive Cost	Installation of full trash capture Trash infrastructure in at least half of a catchment in at least 10% of the land area	The trash capture device installation requirements in the RTO have been reduced.	

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				by 2012 and 100% by 2023. This will be very expensive to install and maintain	The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use.	
CCCoEngrAdvisory	20.2	C.10.b.i	Flooding	The technology may not be available to remove 100% of the litter over 5 mm and still maintain flood protection.	The trash capture requirement for full capture includes an overflow provision above a specified storm.	
CCCoSups	78.1	C.10.b.i(2)	Excessive Cost	The installation of Full Trash Capture Devices" in 5% of the County's Urban and Suburban Land Area is a financially burdensome requirement, which is estimated to cost between $16 – 250 million to implement.	The trash capture device installation requirements in the RTO have been reduced. The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use. The estimate for cost of trash capture that has the most data associated with it is about $5000/acre of catchment. We agree that significant resources will be required to implement trash capture devices and maintain them.	
CCCoSups	78.2	C.10.b.i(2)	Pilot Projects	The County recommends that this requirement be reduced to a small number of pilot sites throughout the County until the devices' efficacy in trash removal, maintenance requirements, and cost effectiveness can be evaluated prior to making decisions regarding a more widespread implementation of Full Trash Capture Devices.	The trash capture device installation requirements in the RTO have been reduced. The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use.	
Daly City	91	C.10.b.i. (1)	Enhanced Trash Management	This requirement is based on the assumption that there is a relationship between the number of available receptacles and the amount of litter/trash found in the storm drains which in not necessarily the case. For example, the City of Daly City is one of the 10 most densely populated cities in the United States. The trash receptacles that we have in place are often magnets for household garbage and other illegally dumped material. The receptacles are quickly overwhelmed and provide little benefit for pedestrian litter. We have had numerous requests from residents and businesses to remove trash receptacles because of this problem.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including street sweeping and parking restrictions. Requirements for specific implementation of trash receptacles has been removed.	
San Leandro	21	C.10.b.i.1	cleanups should count as trash control	increased litter collection and creek cleanups should qualify as trash control measures. Local agencies received no credit for enhanced trash control measures already in place and could be penalized for existing proactive efforts.	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed. There will be no penalty for existing proactive measures.	
San Leandro	20	C.10.b.i.1	too prescriptive	Jurisdictions have to implement all of these measures regardless of cost, efficiency, effectiveness or long-term	RTO has been significantly revised to allow flexibility on Trash Hot Spot cleanup with	

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				benefit. Enforceable parking restrictions, for example, result in significant capital costs for signage placement and enforcement (police) resources. Increased street sweeping, inlet inspection will require additional capital.	accountability through the interim attainment of the Trash Action Level or TAL. Prescriptive measures have been removed, including parking restrictions.	
San Leandro	22	C.10.b.ii.	assessments costly, unnecessary, duplicative	Trash assessments are expensive and divert resources from other beneficial activities. This measure is unnecessary and duplicative when quantitative measurement of volumes collected in trash capture devices or enhanced trash capture devices can be obtained.	Trash assessments are necessary to determine attainment of the TAL at Trash Hot Spots. We will work with Permittees to streamline the assessment, if possible.	
CCFCWCD	4	C.10.c	Reduction Goals Unrealistic	No plan, program or device will completely eliminate impacts from litter. The requirement for a long term trash impact abatement plan should include realistic goals that are practicable.	The plan is not yet written, and these types of considerations will be addressed.	
SF Baykeeper	61	C.10.c.	Need Numeric Target	The Permit needs a specific, numeric target. The current "no trash impact goal" is imprecise and will not facilitate meaningful enforcement. What level of trash constitutes an impact to beneficial uses? How will permittees know when they have achieved the goal? How will compliance be assessed?	The interim trigger or goal of the RTO is attainment of the TAL of less than 100 pieces of trash per 100 feel of assessed stream, and no visual impact of trash. The "Urban Optimal" level of the SCVURPPP RTA. This is only an interim level set for this permit term.	
CCCWP	95	C.10.d	Dates Inconsistent	This date is inconsistent with C.10.c above, which indicates October 2012. CCCWP believes the correct date is October 2012. Please clarify.	This inconsistency has been corrected in the RTO.	
Oakland	8	C.10.d	Full Capture Devices	The requirement to install full trash capture devices to treat all runoff from at least 5% of the land area of every municipality is not appropriate for all municipalities as the level of urbanization and associated litter problems varies widely between municipalities. Structural litter control mechanisms may not be feasible in all urban settings.	The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use. This takes into account the differences among Permittee land use structure.	
CCCWP	94	C.10.d	Pilot Projects	This section states "*Report steps toward establishing pilot full trash capture device installations*." Mandating full-capture trash control installations in at least 5% of all Bay Area Urban and Suburban Land Area is neither a pilot project nor approach. The Program agrees with the concept of a pilot-project, and would like to discuss with Regional Board how this might be best achieved.	The trash capture device installation requirements in the RTO have been reduced. The trash capture requirement is now 30% of Retail/Wholesale Commercial Land Use.	
CCFCWCD	5	C.10.d	Urban and Suburban Land Definition	The last sentence in the fourth paragraph of Section C.10.d should be reworded to read: Non-population-based Permittees shall report compliance with the requirement for trash control from at least 1 percent of the Urban and Suburban Land Area.	In the RTO, the non-population based Permittees are assigned implementation levels to address this issue.	
San Leandro	18	C.10a.(i)	10%	Requirement to identify and implement trash management	The basis for determining the number of Trash	

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			requirement inappropriate	controls or catchments on 10% of specified land area does not consider variations of severity of litter problems in jurisdictions and penalizes cities with large land areas that may not have severe litter problems.	Hot Spots has been revised. RTO has also been significantly revised to allow flexibility on Trash Hot Spot cleanup with accountability through the interim attainment of the Trash Action Level or TAL. If a Permittee has less trash in their jurisdiction, their efforts to meet the TAL at Hot Spots will be easier.	

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Provision C.15. – Exempted and Conditional Exempted Discharges

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C.15.a – Exempted Non-Stormwater Discharges						
GCRCDAtt	34	C.15.a	Exempted discharges	C.15.a.ii states that the non-stormwater discharges listed in C.15.a.i are exempted unless they are identified by the Permittees or the Executive Officer as sources of pollutants to receiving waters. How will the Executive Officer identify non-stormwater discharges as sources of pollution and what criteria will be used? What are considered sources of pollution? The GCRCD has identified many outfalls along the Guadalupe River that are either thermally polluting the river, providing flash discharges causing channel erosion and fish attraction/stranding or some other form of pollution/sedimentation or a combination of these negative impacts.	The Tentative Order (TO) prohibits unauthorized polluted discharges from any sources to waters of the State. The exempted non-stormwater discharges listed under Provision C.15.a.i. are naturally occurring flows or NPDES permitted discharges. However, these discharges will be regulated if the Permittees or the Executive Officer are notified or received complaints that such discharges are degrading beneficial uses of waters of the State.	None
Oakley Moraga	99 99	C.15.a	Question	C.15.a talks about "Uncontaminated and unpolluted groundwater infiltration among the discharge types. What is meant, as any water in the ground is groundwater?	The groundwater stated in Provision C.15.a of this Order is not any water that spilled to the ground rather natural groundwater that meets the definition of groundwater consistent with the California Water Code.	
Oakley Moraga	108 108	C.15.a	Glossary	Under Illicit Discharge and in last paragraphs of C.15 the terminology "Prohibition A.1" & "Section A" is used. Past practice has been to refer to these as "Provision A".	All discharge prohibitions are provided under section "A", and all provisions are provided under section "C" of the Order consistent with the past and present MS4 permits.	
Oakley	218	C.15.a	Reporting	From provision C.15.a, it appears that the reporting requirement is attachment C.15.a. If that is true, what is to be reported in the Table?	Provision C.15.a identifies the exempted non-stormwater discharges. There is no reporting requirement for this provision.	
C.15.b – Conditionally Exempted Non-Stormwater Discharges – General						
SCVURPPP ATT A Sunnyvale Att A SCVURPPP-Olivieri, A Brisbane SMCWPPPAtt3Table Oakley	101 34 3 20.5&20.8 19.5&19.9 154	C.15.b	Reporting Attachment L	The commenters argue that the testing and reporting requirements overly expensive and burdensome and they have to be refined or drastically reduced. Some of and should be refined and or drastically reduced given the minor impact associated with these non-stormwater type of discharges.	The BMPs in existing permits lack specificity and have not been adopted by all Permittees. This Provision's proposed BMPs are adapted from the current stormwater management plans of some stormwater programs and represent	Provision nC.15.b.iii.(2)(d) has been revised to allow a reduction in monitoring after 18 months of consecutive data gathering if certain conditions are met. Also, Provision C.15.b.iv.(2) has been revised to require Permittees/dischargers to keep

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				They further argue that the existing BMPs for minor type of non-stormwater discharges, including resident's foundation drains, crawl space pumps, discharges from (inaudible) potable water supplies, should be sufficient to comply with the requirements.	the minimum acceptable control measures for the various types of discharges. The self-implementing nature of these minimum, yet tangible, BMPs will ensure compliance and discourage unauthorized discharges to waters of the State with minimum regulatory oversight. Revising the language to state that Permittees need only consider these BMPs will create inconsistencies among the Permittees' service areas and will not be protective enough of receiving waters. The Provision's monitoring requirements apply only to pumped groundwater from dewatering and planned and unplanned potable water discharges. Both types of discharges must be tested to verify that they will not violate surface water quality standards to ensure that they will not degrade the receiving waters. These monitoring results are not required to be submitted to Board staff; the Permittees need only keep records of their activities and make the data available to regulatory agencies upon request.	records or authorized major discharges of dechlorinated pool, spa, and fountain water, instead of reporting them in the annual report. Attachment L has been removed from the Revised TO.
Brisbane SMCWPPPAtt3Table	20.3 19.3	C.15.b	Alternative Discharges	All of the exempted and conditionally exempted discharges should be limited to ones that discharge to an MS4 owned or operated by a municipality covered under the permit. Many municipalities lack the authority to allow discharges to the sanitary sewer.	It is implicit that the discharges listed are limited to those that discharge into the Permittee's storm drain systems. We have added language that discharges to the sanitary sewer are subject to the local sanitary agency's authority and standards.	Provision C.15.a. and b. have been revised to specify that discharges to the sanitary sewer are subject to the local sanitary agency's authority and standards.
Fremont	11 & 12	C.15.b	Discharge to Sewer	The TO specifies circumstances where stormwater must be discharged to the	It is implicit that the discharges listed are limited to those that discharge	Provision C.15.a. and b. have been revised to specify that discharges to

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				sanitary sewer. The Water Board is imposing these requirements on local agencies without engaging the sanitary sewer agencies.	into the Permittee's storm drain systems. We have added language that discharges to the sanitary sewer are subject to the local sanitary agency's authority and standards.	the sanitary sewer are subject to the local sanitary agency's authority and standards.
Berkeley	40	C.15.b	Delete Provision	The issue of conditionally exempted discharges has been discussed for many years. Resolving this issue cannot be accomplished within the time frame allotted for this TO. Extend the review process for this Tentative Order by 6 months. Delete C.15.b.	Both Water Board staff and municipalities have spent significant amount of time and resources to develop MRP for the last three to four years. Postponing adoption of the TO will not benefit us all.	
Oakley Moraga	100 100	C.15.b	Question	... [A]mong the BMP/Control Measures, one is that if there is no alternative sanitary sewer to dispose to then the discharge can be to the storm sewer…	Discharging to storm drain is the last alternative, and even then, the non-stormwater to be discharged has to be uncontaminated or polluted. Other alternatives include discharge to landscape or discharge to sanitary sewer with the approval of local sanitary sewer authorities.	
ACCWP-Att1-Redline	23	C.15.b	Redline/ Strikeout	...The current language requires extremely burdensome analytical testing and reporting on discharges that are unlikely to contribute pollutants to the storm drain system. This will be labor intensive, wasteful of limited staff resources and will provide no tangible water quality benefit. We request that the introductory paragraph of Provision C.15.b be revised to read as follows: "The following non-stormwater discharges are also exempt from Discharge Prohibition A.1 if they are either identified by the Permittees or the Executive Officer as not being sources of pollutants to receiving waters, or if they are identified as sources of pollutants to receiving waters, that BMPs/control measures are developed and implemented, as the Permittee deems appropriate to address the threat posed to water quality, including consideration of the tasks and implementation levels of each category of	The BMPs in existing permits lack specificity and have not been adopted by all Permittees. This Provision's proposed BMPs are adapted from the current stormwater management plans of some stormwater programs and represent the minimum acceptable control measures for the various types of discharges. The self-implementing nature of these minimum, yet tangible, BMPs will ensure compliance and discourage unauthorized discharges to waters of the State with minimum regulatory oversight. Revising the language to state that Permittees need only consider these BMPs will create inconsistencies among the Permittees' service areas and will not be protective enough of	Provision nC.15.b.iii.(2)(d) has been revised to allow a reduction in monitoring after 18 months of consecutive data gathering if certain conditions are met. Also, Provision C.15.b.iv.(2) has been revised to require Permittees/dischargers to keep records or authorized major discharges of dechlorinated pool, spa, and fountain water, instead of reporting them in the annual report.

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				Provision C.15.b.i-vii below."	receiving waters. The Provision's monitoring requirements apply only to pumped groundwater from dewatering and planned and unplanned potable water discharges. Both types of discharges must be tested to verify that they will not violate surface water quality standards to ensure that they will not degrade the receiving waters. These monitoring results are not required to be submitted to Board staff; the Permittees need only keep records of their activities and make the data available to regulatory agencies upon request.	
Oakley	219	C.15.b	Reporting	The Summary Table seems to be the accumulation of all the various discharge types and the information required by the Permit text. Shall we presume that completing the Summary Table is the full report?	Reporting forms of Attachment L is not included with the TO at this time. The elements of reporting requirements are respectively given at the end of each sub-provision, and Permittees must report accordingly.	
C.15.b.i – Pumped Groundwater, Foundation Drains, Water from Crawl Space Pumps and Footing Drains						
Central San	13	C.15.b.i. (1) (h)	Diversion to Sanitary Sewer	Central San argues for the removal of the qualifier that references disposal to the sanitary sewer system as a potentially feasible alternative for disposing of non-stormwater sources.	The TO encourages, but it does not impose, diversion of non-stormwater discharges from dewatering systems with proper pre-discharge approval from local sanitary sewer authorities when landscape disposal are not available. If feasible, diversion to sanitary sewer secures treatment while preventing potential environmental impacts associated with non-stormwater if directly discharged to storm drains or water ways.	The TO is revised to clarify that diversion to sanitary sewer requires pre-discharge approval from respective local authorities.
San Jose Attrny San Jose SCVURPPP	12 27 9	C.15.b.i	Prescriptive	The draft permit's proposed level of regulation represents overkill on managing minor types of non-stormwater discharges	The BMPs in existing permits lack specificity and have not been adopted by all Permittees. This	Provision nC.15.b.iii.(2)(d) has been revised to allow a reduction in monitoring after 18 months of

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Colma Brisbane SMCWPPPAtt3Table SouthSF Burlingame Livermore	10&12 20.1 19.1 5 17 14			that pose a limited threat to water quality. The fact sheet does not describe the basis for the proposed requirements. The Water Board adopted a reasonable way to regulate these minor types of non-stormwater discharges in its amendment to SMCWPPP's permit in July 2004. This 2004 permit amendment provides a simple list of BMPs that would need to be implemented to address minor non-stormwater discharges.	Provision's proposed BMPs are adapted from the current stormwater management plans of some stormwater programs and represent the minimum acceptable control measures for the various types of discharges. The self-implementing nature of these minimum, yet tangible, BMPs will ensure compliance and discourage unauthorized discharges to waters of the State with minimum regulatory oversight. Revising the language to state that Permittees need only consider these BMPs will create inconsistencies among the Permittees' service areas and will not be protective enough of receiving waters. The Provision's monitoring requirements apply only to pumped groundwater from dewatering and planned and unplanned potable water discharges. Both types of discharges must be tested to verify that they will not violate surface water quality standards to ensure that they will not degrade the receiving waters. These monitoring results are not required to be submitted to Board staff; the Permittees need only keep records of their activities and make the data available to regulatory agencies upon request.	consecutive data gathering if certain conditions are met. Also, Provision C.15.b.iv.(2) has been revised to require Permittees/dischargers to keep records or authorized major discharges of dechlorinated pool, spa, and fountain water, instead of reporting them in the annual report.

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San Leandro Berkeley	27 40	C.15.b.i	Delete Provision	Foundation drains, water from crawl space pumps and footing drains are a structural safety requirement relating to the integrity of a building. They are used to remove collected rain water, rising ground water and infiltration. Remove C.15.b.i. from conditionally exempted non-stormwater discharges and add it to C.15.a, exempted discharges.	We understand that these types of discharges are necessary for the structural safety of buildings; however, they may contain concentrations of pollutants that will have negative impacts on the receiving surface water stream. Therefore, as for groundwater, these types of discharges must be tested and may only be conditionally exempted.	None.
San Jose Att A	93	C.15.b.i (1)	Modify TO	The City requests this provision be modified to include minimum required BMPs for all dewatering-type, non-stormwater discharges in lieu of a new local regulatory program.	Permittees are expected to implement the BMPs for non-stormwater discharges in compliance with the MRP requirements.	
Brisbane SMCWPPPAtt3Table Daly City	20.4 19.4 107	C.15.b.i (b) & (c)	Oversight Responsibility	The permit should be modified to delete the proposed requirement that new discharges of uncontaminated groundwater at flows of 10,000 gallons per day (gpd) or more be reported to the Water Board and local agencies before being discharged. If the Water Board desires this level of oversight it should simply state that the local agencies are not allowed to authorize these types of discharges because they are more appropriately regulated by the Water Board through a separate NPDES permit. The requirement to report 10,000 gpd or more to the Water Board should be deleted. What would the Water board use the information for?	Originally, the MRP Administrative Draft required that flows of 50,000 gpd or more be reported to the Water Board. However, some municipalities wanted to reduce their oversight role and requested that we lower the reporting flowrate to trigger at 10,000 gpd, which is consistent with the terms of Order No. R2-2007-0033.	Provision C.15.b.i.(1)(b) has been revised to include a statement of consistency with Board Order No. R2-2007-0033.
Contra Costa Clean Water Program	120	C.15.b.i. (1)(b)	Modify TO	"(b) *Permittees shall notify the Water Board of new discharges of pumped uncontaminated groundwater at flows 10,000 gallons/day or verify the discharge is covered under the San Francisco Bay Regional Water Quality Control Boards*	Originally, the MRP Administrative Draft required that flows of 50,000 gpd or more be reported to the Water Board. However, some municipalities wanted to reduce their oversight role and requested that we	Provision C.15.b.i.(1)(b) has been revised to include a statement of consistency with Board Order No. R2-2007-0033.

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				General Permit (Order No. R2-2007-0033). Rationale for provision removal: Discharges of pumped groundwater at flows of 10,000 gallons/day or more are regulated by Water Board Order R2-2007-0033...The proposed change will ensure partnership while relieving Permittees from strict reporting and enforcement responsibilities.	lower the reporting flowrate to trigger at 10,000 gpd, which is consistent with the terms of Order No. R2-2007-0033.	
Contra Costa Clean Water Program	119	C.15.b.i(1)	Redline/ Strikeout	Change C.15.b.i (1) to read: "(a) These discharge types shall, if necessary, be properly managed ~~treated~~ before discharge to remove pollutants, including, but not limited to, total suspended solids (TSS) or silt to allowable discharge levels. Appropriate BMPs to render pumped groundwater free of pollutant and therefore exempted from prohibition may include the following: filtration, settling,, coagulant application with no residual coagulant discharge, minor odor or color removal with activated carbon, small scale peroxide addition or other minor treatment. I*n the case of single family homes, discharges to landscaping from foundation drains, crawl space pumps and footing drains are exempt from Prohibition A."* Rationale for change: Residential (i.e., single family homes) foundation drains, crawl space pumps, and footing drains are quite common in the Bay Area due to our topography and predominance of clay soils. It is impractical to require an individual homeowner to comply with the monitoring requirements outlined in this provision.	We intended to make this revision in the Revised Tentative Order, but it was omitted due to a clerical error. We will make this revision prior to Board consideration.	
SCVURPPP ATT A Contra Costa Cnty Supervisors Contra Costa Cnty-SwartzD Colma Brisbane SMCPPPAtt3Table	87 82 43 9 20.2 19.2	C.15.b.i (1)(c)	Excessive Testing	Commenters request reconsideration of Provision C.15.b. They argue that the requirements are too prescriptive, including: • excessive testing for suspended solids, total petroleum hydrocarbons, volatile organic compounds, and metals regardless; • applying to all jurisdictions;	The TO requires initial testing, and if necessary, continuous monitoring specifically for polluted groundwater from dewatering systems. This requirement is consistent with the Water Board's policy that treated groundwater must meet existing effluent limitations before discharge	The TO added a new provision objective, which reads as: "The objective of this provision is to exempt unpolluted non-stormwater discharges and identify, employ appropriate BMPs, and monitor non-stormwater discharges that are potential sources of pollutants and to ensure

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Belmont Daly City	8 108			• no consideration the nature of the potential pollution threat non-stormwater pose, municipalities will be ultimately responsible for discharges of pumped groundwater, foundation drains, water from crawl space pumps, and footing drains meeting "water quality standards consistent with the existing effluent limitations in the Water Board's NPDES General Permits..." (Provision C.15.b.i.(1)(c)); and, • maintain records of implemented BMPs and constitute an absurd administrative exercise. For the reasons above and beyond, commenters request that the Water Board consider a greater overhaul of the permit to better integrate the document and provide greater flexibility in meeting the MRP's water quality goals.	to waterways to preserve the beneficial uses of waters of the State. Please note the additional likely revision related to single family homes and foundation drains. We intended to make this revision in the Revised TO, but it was omitted due to a clerical error. The intent of Provision C.15.b. is to facilitate Permittees in regulating discharges to the storm drains since the Permittees have responsibility for what flows in those storm drains to the receiving waters. BMPs for pollution control must be implemented, if deemed necessary.	development and implementation of effective control measures to eliminate adverse impacts to waters of the state consistent with the discharge prohibitions of the Order."
Daly City	110	C.15.b.i. (1)(d)	Excessive Testing	The groundwater in Daly City is from a deep aquifer with no chemical treatment when discharged to the ocean during over boarding. The water meets all drinking water standards and therefore should not be harmful to the environment.	The TO exempts discharges of extracted uncontaminated groundwater, and it is the responsibility of the discharger or operator to confirm the discharge meets the minimum discharge requirements. The discharge should not be based on assumption rather supported by established data..	
Daly City	109	C.15.b.i. (2)	Reporting	Records should be kept for large quantity discharges only. It will be too burdensome to keep records for minor, uncontaminated discharges.	The TO does not require keeping records of minor uncontaminated discharges. If Permittees demonstrate that the non-stormwater is uncontaminated prior to the discharge, then, it is exempted pursuant to Provision C.15.a.	No change is recommended to the TO.
Central San	22	C.15.b.i.(1)(d)	Analytical Method	This condition requires the analysis of water samples to be analyzed by methods that are not approved Water/Wastewater	We disagree with the comment. USEPA Method 8260 is widely used by numerous environmental	None

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				methods listed in 40CFR Part 136 (e.g. USEPA Method 8260 is a solid waste analytical method). In the wastewater field, use of methods that are not approved Water/Wastewater methods can result in non-compliance for the agency either using them, or allowing them to be used in a self-monitoring program. Specify that water samples used to demonstrate compliance be analyzed using approved Water/Wastewater methods.	laboratories for analysis of volatile organic compounds (VOCs). This method is generally applied to multi-media and matrices with a wide range of analyte concentrations. The method is used by groundwater monitoring programs because its low detection limits allow comparison with drinking water standards. Therefore, non-stormwater discharges from groundwater dewatering systems much employ this method or its equivalent to analyze groundwater samples for the presence or absence of VOCs before discharge to storm drains or receiving waters.	
C.15.b.ii – Air Conditioning Condensate						
JamesRogerAttIII	10	C.15.b.ii	Editorial	Provisions C.15.b.ii(1)(a) – Change "ground" to "turf or landscaped areas" since ground could be an impervious area with a high coefficient of runoff.	The TO included the word "landscape" for clarification.	
Central San	14	C.15.b.ii	Air Condition	... Air conditioning condensate is unpolluted and does not need to be discharged to the sanitary sewer. This type of discharge is expressly prohibited in the Source Control Ordinance from being discharged to CCCSD. Remove the text from this condition that requires and recommends diversion of this water to the sanitary sewer system. Alternatively, add text to defer to the standards and approval authority of the sanitary sewer agencies' regarding potential disposal of this wastewater to the sanitary sewer [e.g. condition C.3.c.i.(1)(a)].	We agree that the sanitary sewer agencies must be consulted.	We have made revisions to clarify that the POTW must be consulted in such instances.
San Leandro	28	C.15.b.ii(c)	Discharge to Sanitary Sewer	Many local agencies lack the authority to dictate discharge to sanitary sewers, and MRP should not contain such a mandate. Additionally, sanitary disposal is not the only environmentally acceptable and viable alternative for disposal of air conditioning	We recognize that sanitary sewer systems are run by separate authorities. Thus, the MRP requires these types of discharges to be directed to landscape and to sanitary sewer systems only if	Provision C.15.b.ii(1)(b) of the TO is revised to read: "Discharges from new commercial and industrial air conditioning units shall be *directed to* landscaped areas *or sanitary sewer if allowed by the local sanitary sewer*

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				condensate.	allowed by the local sanitary sewer agencies.	*agency."*
C.15.b.iii – Planned, Unplanned, and Emergency Discharges of the Potable Water System						
Milpitas Mountain View Palo Alto San Jose SCVURPPP ATTA Colma San Jose Att A SCVWD Brisbane SMCPPPAtt3 Table SouthSF Burlingame Daly City	21 15 12 28&29 88 11 94&95 63 20.1&20.7 19.1&19.8 5 17 111	C.15.b.iii	Prescriptive testing and reporting	- Provision C.15.b.iii proposes too prescriptive monitoring and reporting requirements for planned, unplanned, and emergency potable water discharges. - MRP should establish a de minimus threshold of 5,000 gallons for reporting unplanned discharges of potable water to storm drains. - Potable water discharges don't contribute pollution to water quality. - Existing BMPs are effective and modify the TO to eliminate the testing and reporting requirements or at least to increase the volume thresholds of testing and reporting. - Discharge benchmarks for pH, chlorine residual, and turbidity are overly prescriptive and in some instances are unrealistic and expensive.	- Potable water discharges contribute pollution to water quality because they contain chlorine or chloramines, two very toxic chemicals to aquatic life. - Minimum monitoring, particularly for planned discharges, for pH, chlorine residual, and turbidity is crucial to prevent degradation of water quality. - The existing BMPs for non-stormwater discharges lack specificity and not all Permittees have adopted them. This Provision established minimum requirements to heighten accountability and consistency among Permittees. - Board staff met with Water Utility representatives in February 2008 and in response to concerns about burdensome monitoring, we have substantially reduced the monitoring requirements.	This Provision has been revised to require notification for planned discharges with a flowrate of $\geq$ 250,000 gpd or a total volume of $\geq$ 500,000 gallons and for unplanned discharges that either cause fish kill or $\geq$ 50,000 gallons with detectable chlorine residual. Other changes have been made to minimize the monitoring and reporting requirements, particularly for unplanned potable water discharges.
SF Baykeeper, NRDC, & Clean Water Action	12	C.15.b.iii	Vague	Places where the permit requires "appropriate" BMPs should be revised to include a BMP menu list of the minimum BMPs that must be implemented for C.15.iii (i.e., for planned, unplanned, and emergency potable water discharges).	The water utilities and districts have already established BMPs for potable water discharges. We have established monitoring, effluent benchmarks, and reporting compliance requirements.	No Change is recommended to the TO in response to this comment.
Oakley Moraga	101 101	C.15.b.iii	Clarification	At 15.b.iii.(1)iii the Permittee is to report unplanned, planned and emergency discharges. Does this mean that the Permittees are to attempt to determine who might be a potential discharger and attempt to monitor that activity?	Permittees have ultimate responsibility for their storm sewer systems so they must ensure that any discharge to the storm drains, including potable water discharges, do not violate water quality	None.

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					standards. Potable water discharges can occur because Permittees or other entities conduct routine installation, operation and maintenance activities in the potable water distribution system. This Provision requires Permittees to comply or require potable water dischargers to comply with the BMPs, notification, and reporting requirements specificed.	
Burlingame Portola Valley SouthSF Belmont Oakley ContraCostaCnty-SwartzD San Pablo Danville Contra Costa Clean Water Program LTR Contra Costa Cnty Supervisors Belmont-BirrmannK	18 3 5 9 102 42 32 14 14 83 94	C.15.b.iii	Regulatory Authority	Permittees argue that municipalities do not have authority to oversee water districts when discharging planned or unplanned potable water discharges. Oversight of water districts should remain a responsibility of the Water Board.	Permittees have ultimate responsibility for discharges into their storm sewer system; therefore, they must control these discharges to their storm drain inlets or conveyance systems to minimize their liability and eliminate any illegal actions or illicit discharges. This Provision requires Permittees to make potential potable water dischargers aware of the compliance requirements. All significant discharges (i.e., $\geq$ 250,000 gpd planned and $\geq$ 50,000 gallons with detectable chlorine residual unplanned discharges) must be reported to the Water Board.	None
Contra Costa Clean Water Program	121	C.15.b.iii (1), C.15.b.iii (2) & C.15.b.iii (3)	Unacceptable /Requesting meeting	Provisions C.15.b.iii.(1), C.15.b.iii(2) and C.15.b.iii[3] are unacceptable. Permittees request a special meeting with Water Board staff and other stakeholders (e.g., Water Supply Districts, Fire Districts, and others) to identify an appropriate regulatory framework for addressing these discharges.	Water Board staff met with water utilities in February 2008 after the TO was out for public comment.	Substantial changes wereincorporated to the TO as a result of the meeting conducted with various water districts in February 2008 to reduce the oversight burden on the Permittees .
Daly City	115	C.15.b.iii (2)	Clarification	The focus of an unplanned discharge is in most cases, stopping the discharge. What does “containing the discharge,” mean? Trying to contain water during a main break is unrealistic.	“Containing” or controlling the discharge, especially for unplanned discharge, it means taking corrective measures to shut off releases or contain the released material if feasible to minimize erosion and	

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					sediment control associated with the discharge.	
Alameda County Water District (ACWD)	1	C.15.b.iii(1)(b)(iii) & C.15.b.iii(1)(c)(i)	Editorial	We ask to include the language "exemption" when receiving water monitoring is infeasible. Receiving water monitoring may be infeasible or impractical due to several reasons which may include the discharger's inability to gain safe access to the outfall location into surface water due to its location, or other logistical challenges.	Monitoring of receiving waters will be only where feasible.	The TO is revised to require monitoring for receiving water to be performed *where feasible.*
ACFCD Zone 7 AWCD	15 2&3	C.15.b.iii(1)(c)(i) & C.15.b.iii(2)(d)	Monitoring Requirement	- There should not be monitoring of receiving water during unplanned potable discharges only planned discharger should be monitored to determine BMP effectiveness. - Monitoring of turbidity in unplanned discharges should be only visual due to the nature of most unplanned potable water releases. - Monitoring of receiving waters for unplanned potable water discharges will be very difficult to accomplish and will likely yield inaccurate results since such discharges may travel several miles of municipal storm drain pipelines before entering a receiving water and exposed to potential contamination or turbidity from other sources.	We agree in general. The required monitoring is to ensure BMPs effectiveness in terms for chlorine residual and erosion controls either at the point of discharge to MS4 or receiving water or in the receiving water. We require monitoring of all planned discharges but we require monitoring of a subset of the unplanned discharges for turbidity. After 18 months of monitoring, the dischargers have the option to request monitoring reduction with justification.	These Provisions have been revised to reflect the responses to comments.
San Jose Att A Oakley Moraga	96 103 103	C.15.b.iii(1)(c)(i) & C.15.b.iii(2)(d)(i)	Safety and monitoring	These provisions as drafted do not reflect a priority for worker health and safety, and do not reflect EPA's position that drinking water system releases pose minimal threat to the environment. The AWWA guidelines cited in the Tentative Order emphasize that unplanned discharges present "…an emergency situation where public safety is the immediate and primary concern. In this	Potable water when discharged untreated directly to surface waters can have major negative impacts because they contain chlorine or chloramines, two very toxic chemicals to fish and other aquatic life. Therefore, the requirements for monitoring and BMPs are appropriate.	These Provisions have been revised to allow for visual assessments where there are logistical challenges. For high priority unplanned discharges (e.g., causing fish kill or endangering public health and safety), we have added language requiring notification within two hours to the State Office of Emergency Service (OES).

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				situation, the implementation of BMPs should not interfere with immediate emergency response operations or impact public health and safety".		
ACWD	4	C.15.b.iii(2)	Glossary of Potable Water	Glossary - Other Regional Boards (e.g., Central Valley, and San Diego) have permit provisions for untreated water discharges, but the MRP does not expressly exempt or disallow untreated water discharges. As such, this may create some confusion amongst the potable water utilities and the permitted Dischargers. Proposed is a permit language to avoid a confusion that may occur: "potable water will refer to water dedicated for municipal supply, including treated and non-treated potable water and raw water from conveyance systems." The preceding language is similar to that contained in the San Diego RWQCB Permit, R9-2002-0020, NPDES No. CAG679001.	Chlorinated potable water could have environmental implications when discharged directly to water ways without proper dechlorination. Thus, discharge proponents are required to implement BMPs to minimize impacts.	TO glossary of potable water is revised accordingly to avoid confusion.
ACFCD Zone 7 Oakley Moraga	14 104 104	C.15.b.iii(2)(c)(iv) & C.15.b.iii(2)(d)(ii)	typographical errors	In Provisions C.15.b.iii.(2)(c)(iv) and C.15.b.iii.(2)(d)(ii), there are typographical errors in the referenced provision. The following references should be revised accordingly: C.15.b.~~iv.~~ (1)(b)(iii) to C.15.b.iii(1)(b)(iii) and C.15.b.~~iv.~~(1)(c) to C.15.b.iii(1)(c).	Comment is noted and the TO is revised accordingly.	
Oakley Moraga	105 105	C.15.b.iii(3)	Emergency Discharge	In C.15.b.iii (3), the Permittee is to employ BMP's that do not interfere with immediate emergency response. Can the Board provide practical examples that they have seen used that will not interfere, or risk interference, with emergency response, as plugging the storm drain and collecting the runoff to storage are not practical suggestions? Under the reporting requirements "being determined by Board", how will that be done timely, how is the Board to know the nature of the event, and who is to advise the Board?	We recognize the priority of an emergency response and that is why the TO states that the employed BMPs shall not interfere with the emergency response. However, the emergency response team should make the right professional and technical judgment in terms of the safety and danger associated with the situation not the Water Board.	

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Daly City	112 , 113 & 116	C.15.b.iii.(1)(b)(ii), C.15.b.ii.(1)(b)(iii), & C.15.b.iii(2)(c)(ii)	Reporting	Monthly reporting is unrealistic. What would be the benefit of monthly reporting? What is the objective for the anticipated use of considerable staff resources? Annual reporting would be sufficient.	Monthly electronic reporting of significant discharge would allow Water Board staff to evaluate the nature of the discharges, procedures followed, and to provide appropriate regulatory guidance as necessary for future events, planned or unplanned.	
Daly City	114	C.15.b.iii.(1)(c)	Benchmark	Raise the pH benchmark to 9.5. SFPUC water is routinely between 8.5 - 9.0 and sometimes above 9.0 for pH.	We disagree. A pH range of 9 or above violates water quality objectives and is not consistent with Water Quality Control Plan, which requires a pH range between 6.5 and 8.5.	None
Central San	15	C.15.b.iii.(3)(b)	Emergency disposal	... Disposal of air conditioning condensate to the sanitary sewer on an emergency basis could create problems for CCCSD due to variable locations and potential high flow rates in smaller lines. Direct permittees to conduct studies during the term of the MRP on this wastewater source to determine types and level of pollutants present, flow rates produced, and feasibility for disposal options other than to the stormwater system.	It is implicit that the discharges listed are limited to those that discharge into the Permittee's storm drain systems. We have added language that discharges to the sanitary sewer are subject to the local sanitary agency's authority and standards.	Provision C.15.a. and b. have been revised to specify that discharges to the sanitary sewer are subject to the local sanitary agency's authority and standards.
C.15.b.iv – Individual Residential Car Washing (Relocated to Provision C.7 – Public Information and Participation)						
Brisbane SMCWPPPAtt3Table Contra Costa Cnty Supervisors	20.6 19.6 84	C.15.b.iv	Car Wash	Requirements on individual car washing, similar to all of the other types of discharges described in Provision C.15, should be limited to discharges that flow to the MS4 owned or operated by a municipality with coverage under this permit. -This section should be relocated to section C.7 since the required effort is mainly public outreach and education.	We agree. Note revision.	The requirements for individual residential car washing have been removed from Provision C.15.
C.15.b. Swimming Pool, Hot Tub, Spa, and Fountain Water						
SMCWPPPAtt3Table Contra Costa Cnty Supervisors Oakley Moraga	19.7 85 106 106	C.15.b.v	Access to Sanitary Sewer	Commenters' arguments include the following: - Not reasonable to require Permittees who many not have legal authority to monitor all discharges from swimming	We believe connection to the sanitary sewer will guarantee treatment and reduce potential impacts associated with direct discharges of swimming pools,	Provision C.15.v.(1)(c) is revised to state that: " Permittees shall require that new or *rebuilt* swimming pools, hot tubs, spas, and fountains within their jurisdiction *have a* connection to the

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Contra Costa Clean Water Program	122			pools, spas, hot tubs, and fountain from private property. - Infeasible to implement the requirement in areas that do not have an access to sanitary sewer. - Modify or reconsider TO to encourage that these discharges go to the sanitary sewer, but it may not always be possible.	spas, hot tubs, and fountains into the storm drains or receiving waters without pretreatment to remove chlorine residual and copper algaecide. We strongly encourage local POTW authorities to accept these types of non-stormwater discharges to their systems, especially for new and rebuilt ones where the connection could be achieved with marginal effort. The TO requires that swimming pools, spas, hot tubs, and fountains be connected to sanitary sewer systems. Where there is no access to sanitary sewer systems, these types of discharges shall be directed to landscaping or vegetated areas away from water ways.	sanitary sewer *to facilitate draining events. Permittees shall coordinate with local sanitary sewer agencies to determine the standards and requirements to enable the installation of a sanitary sewer discharge location to allow draining events for pools, spas, and foundation to occur with the proper permits from the local sanitary sewer agency."*
Central San Alameda City BACWA	16 17 6	C.15.b.v	Diversion to Sanitary Sewer (Pool/hot tubs)	As noted above accepting filter backwash water and discharges from these sources is acceptable provided that certain standards are met (e.g. no copper discharges above local discharge limit for copper, flow rate controls). However, Accepting discharges from new and remodeled systems will create large surface areas that are exposed to rainfall that will discharge excessive rainwater to the sanitary sewer system. Remove this requirement to require new or remodeled pools, spas, and fountains to be connected to the sanitary sewer from the MRP, or qualify the requirement to only apply if permitted by the POTW. Alameda also argues that the Water Board must seek approval from EBMUD prior to mandating this treatment method in the City of Alameda. BACWA argues that diversion of discharges from new or remodeled swimming pools, spas, and fountains to the sanitary sewer should apply only if permitted by the POTW.	Comment is noted. The TO encourages discharges from swimming pools, hot tubs, spas, and fountains to landscape away from water ways. We believe connection to sanitary sewer will guarantee treatment reducing potential impacts associated with non-stormwater discharges from swimming pools, spas, hot tubs, and fountains if directly discharged to storm drains or water ways without pretreatment. We strongly encourage local POTW authorities to accept these types of non-stormwater discharges to their systems, especially for new and rebuilt ones where the connection could be achieved with marginal effort. In any case, we realize that the authorities have the power to define the pre-discharge requirements and final approval.	See the revised TO language above in this regard.

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				In addition, BACWA wants assurances that there are controls on swimming pool diversions.		
Contra Costa Clean Water Program	122	C.15.b.v (1)(c)	Redline/strike out	*"(c) Permittees shall require that new ~~or remodeled~~ swimming pools, hot tubs, spas and fountains requiring permits have access to a sanitary sewer cleanout, if feasible."* Rationale: ...Remodeling work is typically superficial (e.g., replastering, light replacement, or new equipment filtering equipment) and would not justify the significant expense of plumbing a "connection" to the sanitary sewer.	Comment is acceptable, and the TO is revised by replacing the word "remodeled" with *"rebuilt* to clarify that the requirement applies to major replacement or rebuilt of an existing swimming pool, spa, hot tub, or fountain.	For the major revised TO language for this sub-provision is given above.
James RogerAttII	88	C.13.b.ii & C.15.b.v.(1)(c)	Pools/hot tubs	Provision C.13.b.ii. and C.15.b.v.(1)(c) – Pool, Hot Tubs, Spas and Fountain Discharges-The direct discharge to storm drain systems from these sources should be; prohibited, but should not mandate connection to a sanitary sewer; The provision should allow discharge and irrigation of landscaping particularly for the smaller volume discharges.	Comment is noted. The TO allows these type of discharges to storm drain collection systems only if the discharge will not pose environmental impacts and no other feasible disposal areas, such as landscape or sanitary sewer systems.	Provision C.15.b.v(1)(c) of the TO is revised to read: "Permittees shall require that new or *rebuilt* swimming pools, hot tubs, spas, and fountains within their jurisdiction *have* a connec*tion* to the sanitary sewer *to facilitate draining events. Permittees shall coordinate with local sanitary sewer agencies to determine the standards and requirements to enable the installation of a sanitary sewer discharge location to allow draining events for pools, spas, and fountains to occur with the proper permits from the local sanitary sewer agency."*
San Jose Att A	97	C.15.b.v(1)(a) & C.15.b.v(1)(b)	Overlapping with C.13.b	This section should be reviewed for consistency with C.13.b. One requires the prohibition of discharges from pools, spas, and fountains and the other allows it under certain conditions. The conditions should be reviewed for consistency.	Comment is noted. Provision C.13.b has been revised along with to C.15.b.v(1)(c) above.	See revised C.15.b.v(1)(c) language above.
San Jose Att A	98	C.15.b.v(1)(c)	Concern	As drafted, this provision is problematic because it does not acknowledge that many hot tubs, spas and fountains are portable and may be put in place without permits.	Permittees are asked to implement the provision requirements where they have jurisdictional authority and make a concerted effort to find violators.	

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San Jose Att A	99	C.15.b.v(1)(c)	Editorial	The City requests deleting the word "connected" and replacing it with the phrase "have a connection" to avoid inconsistencies with the Uniform Plumbing Code.	Comment is noted and edited TO accordingly.	
San Jose Att A	100	C.15.b.v(1)(e)	Editorial	The City requests replacing the word "improve" with "implement."	Permittees already have established public outreach and education programs; however, they need to improve those existing programs as new requirements evolve.	No change is recommended to the TO in response to this comment.
San Jose Att A	101	C.15.b.v(2)	Editorial	The City requests that the phrase "to the storm sewer system" be added after "fountain water" for clarification.	Comment is acceptable.	Provision C.15.b.v(2) is revised to read: "Dischargers/Permittees shall *keep record of the* authorized major discharges of dechlorinated pool, spa, and fountain water *to the storm sewer syste*m, including BMPs employed; *such records shall be available for inspection* to the Water Board.
San Jose Att A	102	C.15.b.v(2)	Modify TO	The City recommends that the threshold for reporting be reconsidered, as 5,000 gallons may be too small. Additionally, the language should be amended to clarify that reporting is related only to discharges to the storm sewer system.	The volume specification is removed from the revised TO.	
C.15.b.vi – Irrigation Water, Landscape Irrigation, Lawn or Garden Watering						
Contra Costa County Supervisors	86	C.15.b.vi.e	Irrigation runoff	The County may not have the legal authority to conduct "enforcement response" to large-volume irrigation runoff. This should not be regulated by the County, as it should be a function of the State Agricultural Permit.	The Permittees should be able to stop any unauthorized discharges from irrigation sites if the runoff reaches their storm drain inlets. Permittees can contact the Water Board for assistance if they face with uncooperative dischargers.	
C.15.b.viii – Permit Authorization for Exempted Non-Stormwater Discharges						

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Contra Costa County Supervisors	87	C.15.b.viii (1&2)	Clarification	Clarify the meaning of these provisions. If provision C.15.viii(1) implies that the preceding sections of provision C.15 only apply to agencies, activities and facilities that are owned, conducted and operated by the permittees, and provision C.15.viii(2) indicates that non-permittee dischargers would be regulated by the Regional Water Quality Control Board under a separate NPDES permit, then the County does not object to the provisions noted as unacceptable.	Provision C.15 identifies the exempted and conditionally exempted non-stormwater discharges that are allowed to be discharged without obtaining a separate NPDES permit provided the discharge is in compliance with the conditions of the Order. Provision C.15.b.viii (2) specifically implies that other dischargers are also allowed to discharge these types of non-stormwater discharges if they comply with the requirements of the Order; however, the Water Board will issue a separate NPDES permit for other non-stormwater discharges categories.	

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GCRCD-Att	2	A.	Discharge Prohibitions	Supports clarity, breadth (all surface waters and areas, such as riparian areas, creek banks and floodplains, where the pollution would eventually be transported to surface waters), and range of pollutants prohibited.	Comment noted.	
ACCWP – GrimmG	92	A.2. C.1.	Discharge Prohibitions	Allowed non-stormwater discharges & the control measures are so detailed that they may as well all be prohibited.	The control measures bmps have been reduced and described more flexibly in the Revised Tentative Order (RTO)	
GCRCD-Att	3a	B.	Receiving Water Limitation	Supports clarity with which this limitation applies (including non-stormwater discharges, such as trash, waste, junk, temperature, erosive flows)	Comment noted.	
GCRCD-Att	3b	B.1.	Receiving Water Limitation	There are two Section B.1's under the B heading and it is believed that the 2nd paragraph should be identified as B.2.	Agreed.	Fix format error, changing second "B.1" to B.2
Contra Costa Flood Control	7	C.1.	Authority	District channels receive storm water from city & county areas, but the District doesn't have authority to control storm water quality within those areas.	This is true of Permittees with upstream contributing Permittee neighbors. Permittees are responsible for their jurisdiction only.	
JamesRogerAttII	2	C.1.	Discharge Prohibitions	Add new provision & renumber C.1 to address Discharge Prohibitions Exceedances; or reword C.I to include both Water Quality Standards & Discharge Prohibition Exceedances. Currently there is no provision for addressing violations of Discharge Prohibitions A.1. & A.2.	C.1 has been revised to address this issue.	
GCRCD-Att	4	C.1.	Water Quality Standards Exceedances	Because "maximum extent practicable" is ill-defined, the requirement should be: prevent & reduce pollutants in stormwater and non-stormwater discharges, surface waters and areas where it can be transported in to these waters, as per Section A prohibitions. As written, this clause provides carte	We disagree. MEP is fairly well defined, and Provision C.1 has been revised to adequately relate to Discharge Prohibiitions A.1 and A.2 and Receiving Water Limitations B.1 and B.2.	

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				blanche to avoid full compliance with Sections A and B. Thus Section C conflicts with Sections A & B.		
GCRCD-Att	5	C.1.	Water Quality Standards Exceedances	Because "BMPs" are not defined, require responsible officials to enforce the many existing antipollution laws & hold them accountable, per the provisions in existing laws, ref. Attachment I	BMPs are well defined for most of the major aspects of this Order. The control of some of the impairing pollutants such as Trash, PCBs and Hg will require the development of new BMPs. Provision C.4, C.5 and C.6 do require enforcement of local anti-pollution laws.	
GCRCD-Att	6	C.1.	Water Quality Standards Exceedances	Paragraphs a-d will not assure compliance with A.1, A.2, B.1 and B.2., instead they indicate that if Section A & B prohibitions & limitations are not met, control measures and reporting frequency may be modified. It's not clear stricter measures would be imposed. Weaker requirements are unacceptable.	C.1 requires stricter measures if standards are not met in the receiving waters.	
JamesRogerAttII	3	C.1.a.	Discharge Prohibitions	“Promptly notify” or submittal of noncompliance reports in annual reports doesn't provide a sense of urgency in addressing permit violations. The same level of notification required of industries and POTWs should be required of the permittees.	Promptly notify has been revised to be 30 days in the Revised Tentative Order (RTO).	
CC Co. Supervisors	5	General	Alternative Approach	We want to meet water quality goals with the most cost effective expenditure. Give us water quality goals & allow us to work with you to develop the most effective implementation measures.	The RTO does include more flexibility after goals are defined. C.10 provision has been revised in this manner.	
CC Co. Supervisors	13	General	Alternative Approach	Add over-riding language allowing Permittees to propose alternative methods of meeting the intent of any particular provision, as long as	Such an approval of alternate means would require amendment of the permit. Flexibility has been	

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				Board staff approves the alternative means of compliance.	enhanced where possible, while specifying the minimum performance and accountability.	
SCVURPPP	2b	General	Alternative Approach	Focus instead on: • consistent implementation of current performance standards (as provided in BASMAA 9/22/06 document & incorporated by reference) • Phased implementation of measures consistent with currently adopted pesticide, mercury, and PCB TMDLs; • Focused, cost-effective efforts to address trash in or likely to be conveyed by stormwater into our waterways, with assessment work & data analysis informing the nature and location of actions & with structural control measures being tied into receipt of State funding such as bond moneys; • Limited, cost-effective monitoring linked to relevant management questions.	We have endeavored to address these key suggestions. Monitoring cannot be so limited that the key management questions are not addressed.	
CC Co. Supervisors	18	General	Attainability	Meet with Permittees to understand how some provisions may conflict with public safety standards & how to allow cost effective implementation.	We have done so.	
Daly City	4	General	Attainability	Provide exceptions for unattainable requirement (such as the ability to install full capture trash devices on bluffs).	We cannot pre-exempt from the permit requirements. If economic circumstances pose too great a challenge to meeting the permit requirements in some aspect in the future, we can re-open the permit at that time.	
CCCFCD–ConnaughtonG	44	General	Authority	Some requirements are based on a service area, defined as the area of authority of the flood control district, which in our case is the entire Contra Costa Co. But our facilities	We agree.	

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				don't serve that entire area. 80% of the watersheds are tributary to facilities we operate, so any requirements based on our service area should reflect what we actually do service rather than our political boundary.		
Contra Costa Flood Control	6	General	Authority	Many provisions don't specifically reference "Non-population-based Permittees" & applicability to Flood Control Districts is not clear. The FC District is not a general purpose government entity & has severely constrained revenue sources, established for maintaining single purpose storm water conveyance facilities. The FC District has no permanent resident population & no land use authority.	We agree that the non-population based permittees are different in character. Most requirements are written for City or County type Permitteees. We will consider adding language to make it clear that the permit allows for this difference.	
Daly City	2	General	Authority	Cities should not be responsible for personal behaviors (littering) or for distributing legal products (plastic bags, Styrofoam; pesticides etc.).	The RTO requires implementation of BMPs to address the Trash and pesticide issues.	
BASMAA	1	General	BASMAA draft permit	We suggested Performance Standards & Provisions of what all 77 Bay Area municipalities could afford to do to address priority water quality issues. We request they be reevaluated.	We have worked to prioritize and make the requirements of reasonable cost.	
Concord	15	General	BASMAA draft permit	Reconsider the BASMAA draft permit. We spent several weeks rewriting the entire permit and hammering out our differences.	We have incorporated some of your suggested language.	
Contra Costa Council	4	General	BASMAA draft permit	It doesn't appear that BASMAA's suggestions have been adequately considered or incorporated into MRP.	We have adequately considered all of BASMAA's suggestions.	
Mayor of Daly City – Hearing – Royer, C.	2	General	BASMAA draft permit	Direct staff to go back to the permit BASMAA drafted in 2006 and start again.	Comment noted.	
CC Engineer. Advisory Comm.	1 & 3	General	Beyond expertise	Permittees required to conduct studies that go beyond core mission,	We disagree. The requirements of the Order	

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				experience & expertise of their municipal.	are directly related to the abilities of the Permittees and their responsibility under the Water Code.	
CC Engineer. Advisory Comm., Contra Costa County Supervisors	4 15	General	Beyond expertise	Permittees essentially required to develop TMDLs through work plans, schedules, loading estimates & sources. Regional Board should do this work.	This work is indeed shared between the Permittees and Water Board staff.	
Assoc. Governments of San Mateo County–Hearing–Napier, R.	4	General	Board representatives	Until all parties who will be impacted have a representative on the Regional Board, determination of the permit should be delayed.	All parties have participated.	
Legislator–Hearing–HoustonG, Newark	3 14	General	Board representatives	Board doesn't have a county or business representative. Slow down the process so that those people are here to be part of the process.	No directly involved Board Member could vote due to conflict rules. Business representative is present.	
CC Co. Supervisors	2	General	Cost	We estimate the cost to be $75 million over 5 yrs; our current revenue source generates about $3 million/yr. The State is facing a $14 billion budget shortfall. County shortfall is projected to be $60 million. Given our limited ability to generate funding, the high cost of MRP will result in a drastic reduction of services.	We agree that significant new resources will be required for this permit cycle.	
Clatyon, Hoffmeister, L	1	General	Cost	The biggest cost increases are for commercial inspection, street sweeping, and drain & inlet special trash. Even in a stepped up or phased in approach, there's real cost considerations there.	We agree.	
Concord	2	General	Cost	MRP would cost an additional $700,000/yr in municipal maintenance alone. We can't accomplish all new requirements given limited resources; stormwater revenues are capped.	Municipal Maintenance requirements have been significantly revised to reduce costs to Permittees related to street sweeping and storm drain inlet cleaning.	
ContraCostaCnty –	21	General	Cost	There will be a quantum leap in	Noted. We can not verify	

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LierlyR				increased cost for an unincorporated county. We estimate our budget will go up over 400%.	the accuracy of your cost estimate.	
Daly City	1	General	Cost	Costs are significant. Staff's preliminary cost analysis indicates City's program will be upwards of $3.6 million for labor and approximately $8.2 million for capital during the 5-yr permit cycle.	Noted. We can not verify the accuracy of your cost estimate.	
Danville	1	General	Cost	MRP will double costs for Danville, from $425,000 to $840,000/yr.	Noted. We can not verify the accuracy of your cost estimate.	
Danville	15	General	Cost	Additional 5 Yr Costs: C.10 $1,250,000 C.8 $250,000 C.2 $150,000 C.3 $100,000 C.4 $50,000 C.5 $250,000 C.7 $25,000 Total: $2,075,000	Noted. We can not verify the accuracy of your cost estimate.	
Dublin	15	General	Cost	Dublin spends about $172,000 /yr for staff time, materials, & contribution to ACCWP. This doesn't include street sweeping, storm drain inlet cleaning, trash removal from City parks, or costs associated with review of land development which are reimbursed by developers. New / enhanced actions in MRP will increase annual cost to $925,000, an annual increase of $753,000 or 430%. Again, this cost does not include likely proportionate cost increases in maintenance and development review. Modifying the permit to address the nine items discussed above would reduce Dublin's increased annual costs by $364,000-$444,000, without significantly reducing the effectiveness of water quality	Provision C.2 in the RTC has been significantly revised to reduce costs associated with street sweeping and storm drain inlet cleaning. We can not verify the accuracy of your cost estimate.	

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				programs provided by the City.		
Martinez	4	General	Cost	We believe over the next five year the increased cost to be $1,346,000.	Noted. We can not verify the accuracy of your cost estimate.	
Menlo Park	1	General	Cost	Menlo Park is small: or estimated cost is $1.5 million dollars for 1st three years.	Noted.	
Milpitas	5	General	Cost	Fact Sheet Pg 6: The cited household cost of $9.08-12.50 is out dated & inappropriate in Bay Area. When applied to Milpitas' 18,000 dwellings, it yields an annual cost of $163,440 - 225,000, the full cost of one city employee. Our program costs are substantially higher, & we expect MRP cost increases of 30%. We also pay permit fees to RWQCB of $16,000 and program fees to SCVURPPP of $100,000/yr.	Noted. We can not verify the accuracy of your cost estimates.	
San Jose	3	General	Cost	Estimated 5-yr cost exceeds $35M, excluding costs for treatment controls on trails & during road rehabilitation; capital costs of rehabilitation of bridge crossings & culverts in rural areas; and the unpredictable cost of additional studies or activities that may be triggered by monitoring results. 1st-yr cost alone is $7,328,000. This exceeds available & projected funding.	Include in response that monitoring studies are not unpredictable because the number of studies is capped.	
San Jose – TovarM	60	General	Cost	We estimated the 5-yr cost: an additional $35 million. Not accounting for some big capital costs like road rehab, or trail impacts, that alone is another $60 million.	Noted. We can not verify the accuracy of your cost estimate.	
San Pablo	33a	General	Cost	MRP will increase costs approximately 63% (from ~$400,000/yr to ~$650,000). Stormwater assessments don't generate enough revenue; the City	Noted. We can not verify the accuracy of your cost estimate.	

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				will be out of compliance.		
AlamedaCo Newark	2 2	General	Cost Benefit	There are several requirements that will prove costly while providing only minimal water quality benefits. Several others deny Alameda County the flexibility we need to apply the most effective measures on our limited stormwater budget.	Noted. Flexibility has been added to provisions of the Revised T.O. (RTO).	
CentralSan – PotterT	24	General	Cost Benefit	We also want to make sure customers are paying for projects that have a good benefit for protecting water quality.	Noted. We agree.	
Dublin Mayor Berkeley Mayor Union City Mngr San Leandro Mayor AlCo Mayors Conf	3 2 2 2 2	General	Cost Benefit	Conduct value-engineering review for opportunities to consolidate or modify tasks to meet goals at a lower cost.	We have attempted to make these types of improvements in the RTO.	
Dublin Dublin – LanderM	1 51	General	Cost Benefit	Many requirements result in questionable or marginal improvements to water quality, & may detract from local agencies' ability to carry out clean water programs due to demands on funding, staff, and other resources.	The Tentative Order and the RTO include actions necessary to effectively reduce pollutants in stormwater runoff to the MEP.	
Fremont Mayor	2	General	Cost Benefit	Expanded requirements and lack of prioritization will result in diverting municipal resources to tasks that provide only a minimal benefit to water quality.	We disagree. The tasks in the RTO are those that will have significant water quality impact.	
Palo Alto	3	General	Cost Benefit	Some requirements have questionable benefits (e.g. testing potable water discharges, inspectingf fixed bases of mobile cleaners), as do reporting of minutia.	Both the potable water discharge requirements and the mobile source approach in the RTO have been revised.	
Pleasanton	2	General	Cost Benefit	We have doubts about the actual water quality benefits over and above those urban water quality measures, programs and requirements that we are currently imposing	Noted. The actions required in the RTO are all well based with sufficient rationale.	
San Jose	2	General	Cost Benefit	These are costly and offer questionable water quality benefit:	All of the noted items have been revised in the RTO	

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				Treatment controls on trails and during road rehabilitation; storm drain inlet cleaning in dry season only; inspecting mobile businesses in field; inspecting industrial facilities directly regulated by Water Board; duplicative control measures for trash; monitoring & benchmarks for planned & unplanned potable water discharges; excessive data management & reporting.	with the exception of the requirement to inspect industrial facilities that are also regulated by the State. This requirement has been in the Municipal Stormwater regulations since the early 1990's.	
San Jose Attorney	1a	General	Cost Benefit	Object to costly requirements that lack sufficient evidence of water quality benefit	The RTO requirements are MEP actions. Evidence of benefit can take various forms, but direct monitoring data is very expensive to aquire, and may out cost the actions themselves in some cases.	
San Ramon	2	General	Cost Benefit	The TO proposes to expand existing requirements, adopt additional requirements, and mandate capital purchases. However, these requirements have not been analyzed to determine the level of water quality benefits, if any.	Substantial basis exists for improvements over existing requirements in the RTO over the current permit for San Ramon which was written in 1999, ten years ago.	
SCVURPPP	11b	General	Cost Benefit	Tentative Order includes many requirements that represent a significant expenditure of public resources that are not available at the local level, and that, with a few notable exceptions involving pollutants of concern (which still need to be fine tuned to avoid wasting resources), are unlikely to produce a significant return in terms of increased water quality benefits.	We disagree with this statement, and find that there is substantial basis for the requirements included in the RTO.	
Sunnyvale	1	General	Cost Benefit	Linkages between new & expanded requirements and expected improvements to water quality are not identified. New or expanded	We disagree with this statement, and find that there is substantial basis for the requirements included	

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				requirements need to be practical, understandable, and address the implementation of efforts that will benefit water quality.	in the RTO.	
Oakley Oakley – KennedyF Moraga San Pablo	3 14 3 6	General	Definitions	References to organizations are not clear throughout, as the meaning of terms appears to change. Some seem to be regional, others countywide program, & others the Permittee. The use of "collaboratively", "regionally", "Permittees collaboratively", etc. seems to vary. It's difficult to understand the number of sites/activities to be mobilized & if the count is by region, Program, or Permittee.	We have reviewed the RTO to clarify each Permittee's responsibility. In all cases, each Permittee is ultimately responsible for compliance; in many cases (e.g., public outreach, monitoring) Permittees have the option of complying as a group at the Program or Regional level.	
CC Co. Supervisors Danville	17 16	General	Extension	Delay implementation until both State & County are able to absorb MRP's new costs.	This permit reissuance is already quite late for many of the Permittees that have not had a permit reissuance in ten years. Further delay is not desirable or possible.	
Contra Costa Council	1	General	Extension	Delay adoption; direct staff to work with agencies to reach consensus on a permit that will be improve water quality but still be flexible, affordable & cost effective.	The RTO is flexible, affordable and cost effective. This permit reissuance is already quite late for many of the Permittees that have not had a permit reissuance in ten years. Further delay is not desirable or possible.	
Contra Costa Council – BestL	9	General	Extension	Delay adoption, work with affected local agencies, develop a permit that will benefit water quality but be workable & cost effective.	The RTO is flexible, affordable and cost effective. This permit reissuance is already quite late for many of the Permittees that have not had a permit reissuance in ten years. Further delay is not desirable or possible.	
Fremont Mayor	5	General	Extension	Extend the public comment period	This permit reissuance is	

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Dublin Mayor Berkeley Mayor Union City Mngr San Leandro Mayor AlCo Mayors Conf EastBayEDACovPage	1 1 1 1 1 1			for six months in order to address local agency concerns	already quite late for many of the Permittees that have not had a permit reissuance in ten years. Further delay is not desirable or possible.	
JamesRogerAttIII	1b	General	Fact Sheet	Include a Goal of the Permit to implement the CCMP on page 1 of Fact Sheet.	CCMP implementation is discussed in the RTO findings.	
JamesRogerAttIII	1c	General	Fact Sheet	In Fact Sheet, include a section listing each of the CCMP Actions listed in Provision 12. and a reference to the Permit provisions that implement the Action.	CCMP implementation is discussed in the RTO findings.	
Milpitas	6	General	Fact Sheet	Fact Sheet Pg 6: The Huntington Beach closure impact to tourism example is not applicable to Bay Area. Milpitas is not a beach town & doesn't derive tourism dollars from beaches or surface streams.	Many Permittees do derive benefit from Rec2 uses of State Waters in this Region.	
Milpitas	9	General	Fact Sheet	Pg 12: What is definition of “regional entity?”	Special Districts with State Charter, such as EBMUD not named in the MRP.	
Milpitas	8	General	Fact Sheet	Fact Sheet Pg 12: The statement that under the CWA, RWQCB can't delegate its own authority to enforce General Permits demonstrates that enforcement of General Permits is the State's responsibility, not cities'. The State has a duty to protect municipalities' storm drain systems from discharges from sites that the RWQCB is regulating, or should be regulating, by General Permits.	We agree, however, the Permittees can help in this effort by alerting us to situations we are not aware of, and can make the initial contact with the discharger, and may have overlapping authority through their ordinances. Such legal authority is required by the MRP.	
ACCWP-Att2	1	General	Findings	Finding 12: CCMP isn't a regulatory document & shouldn't be used to justify adopting permit requirements.	The CCMP recommended actions are stated as such, recommendations.	
Giberson	1	General	Findings	In Finding 12, revise Action LU-1.1: “Local land-use jurisdictions' General Plans ~~should~~ **must** incorporate watershed wetlands and stream environments and **must** ~~to~~	The CCMP actions are derived from that adopted document, and can not be edited.	

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				reduce pollutants in runoff." OR, less protectively: "Local land-use jurisdictions' General Plans ~~should~~ **must** incorporate watershed wetlands and stream environments **to** ~~and~~ reduce pollutants in runoff." This eliminates confusing language in ACTION LU-1.1 and cures the apparent conflict with ACTION LU-2.7 (new in 2007).		
JamesRogerAttIII	1	General	Findings	Finding 7, page 2 – Vallejo Sanitary District should be Vallejo Sanitation and Flood Control District	Noted. This edit will be made.	
JamesRogerAttIII	1a	General	Findings	Finding 12, page should also include the CCMP Actions – 1.3, 1.4, 2.1 through 2.6.1, 3.2, 4.2, 4.3, 5.1 and 5.3.	We judge that those CCMP Actions are not appropriate for this permit.	
JamesRogerAttIII	1d	General	Findings	Finding 14, page 5 – This finding appears to have been copied from an existing permit and is not all inclusive. Reword to reflect that storm water runoff discharges to creeks which in turn flow to all the sub basins of San Francisco Bay, wetlands adjacent to the Bay and to the Pacific Ocean	The finding is appropriate as written.	
JamesRogerAttIII	1e	General	Findings	Finding 15, pg 5: Reword second line to read "interval between, depth, intensity and duration of hydrologic events." Improve the finding by listing each pollutant of concern and examples of the dominant sources. Heavy metals could include sources such as motor vehicle wear, legacy pollutants and aerial deposition.	The finding has been edited to include the first suggestion and the phrase "including, but not limited to" has been added to the list of pollutants.	
JamesRogerAttIII	1f	General	Findings	Finding 17, pg 5, line 4: Should require modification of a report if it is inadequate or incomplete rather than modifying a permittee's report.	This edit has been made.	
CentralSan – PotterT	23	General	First Flush Project	If one agency says connect with sanitary sewer, & the sanitary sewer agency says, no, we should avoid	We have revised such requirements in line with this comment. Approval of	

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				that.	the Sanitary agency is specified in the revisions.	
Antioch Mayor – Hearing – Freitas, D	2	General	Funding	We need more time, collaboration, engagement. It will take the environmental community, with the municipalities, with you, and the State Board to find a dedicated source of revenue for us to implement new requirements.	We agree that securing adequate resources, especially under current conditions, is a major challenge.	
Assoc. Governments of San Mateo County– Hearing–Napier, R.	2	General	Funding	We need citizen buy in & voters to approve a state, regional, or countywide bond measure that will allow for these types of costs to be covered.	We agree that securing adequate resources, especially under current conditions, is a major challenge.	
Assoc. Governments of San Mateo County– Hearing–Napier, R.	3	General	Funding	Use Supplemental Environmental Projects to cover costs.	This source of funds may be available for some projects meeting the particular specific needs of those Supplemental Environmental Projects and related enforcement actions.	
Assoc. Governments of San Mateo County– Hearing–Napier, R.	5	General	Funding	Providing funding has been the highest priority of my Board for four years. We sponsored legislation SCA 13 making it easier to raise funds on Proposition 218; due to partisan politics, we couldn't get it out of Sacramento. Currently, SCA 12 is hung up by partisan politics.	We agree that securing adequate resources, especially under current conditions, is a major challenge.	
Assoc. Governments of San Mateo County– Hearing–Napier, R.	6	General	Funding	We adopted a motor vehicle fee to address motor vehicles' impact on stormwater. It was a pilot program for 4 years. Reauthorization was vetoed. For every success story of finding funds, there's probably ten failures like that. Ask staff to work with us to balance what's reasonable.	We agree that securing adequate resources, especially under current conditions, is a major challenge. We believe the requirements included are reasonable.	
Belmont – BorrmannK	95	General	Funding	Tie implementation of the more costly measures to approval of funding.	Requirements can not be contingent on funding availability.	

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Brisbane	1	General	Funding	We are very small and facing severe budget shortfalls. Opportunities for increased funding are limited.	We agree that securing adequate resources, especially under current conditions, is a major challenge.	
CC Clean Water Program Danville	16 1	General	Funding	A 2/3 vote is needed to generate additional funds; this is unlikely. The other revenue source is a municipality's General Fund, which finances most municipal services. Public Safety takes the lion's share of these funds: must choose between funding police officers or MRP. We recommend a collaborative effort to determine how to generate revenue to implement all MRP provisions. Neglecting this approach would have the effect of immediately finding all Stormwater Programs in non-compliance. All existing funding is insufficient to implement the MRP provisions.	We agree that securing adequate resources, especially under current conditions, is a major challenge.	
CC Co. Supervisors	1	General	Funding	Review MRP requirements in the context of the County's responsibilities, such as smart growth, affordable housing, protecting health & safety.	We believe that these requirements are appropriate in that context.	
CC Co. Supervisors	3 & 16	General	Funding	Do not promulgate costly regulation without providing funds. Regional Board should lead effort to develop the funding sources.	We will assist the Permittees in any way we are able to obtain adequate resources.	
CCCWP – Dalziel, T	1	General	Funding	Stormwater doesn't have federal funding. If we had federal funding, we too could achieve a lot of successes that the sanitation districts have.	Noted.	
Citizen–Hearing–Kolb, L.	1	General	Funding	I suggest a Board subcommittee review over a 60-day period at a policy-level, to get a better grasp on costs and benefits.	Noted.	
City of Concord – Hearing – Khan, Q,	1	General	Funding	Our revenues are capped. Our survey indicates a tax initiative will	We are willing to assist in any way.	

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C.				not pass. Work together on finding funding mechanisms .		
City of Concord – Hearing – Khan, Q, C.	2	General	Funding	Some requirements will decrease the water quality. Example: treating runoff when existing road is reconstructed to gravel base, requiring costly acquisition of right of way, maybe condemnation of some private properties, resulting in less street maintenance, more potholes, degraded streets, longer travel time, more braking time for vehicles, releasing copper, more congestion, more oil consumption, all resulting in more pollution to water.	The road reconstruction treatment requirement has been removed from C.3 and replaced by a requirement to create ten green streets projects.	
Clayton, Hoffmeister, L	3	General	Funding	I don't see anything happening even in today's economic times for the foreseeable future changing in Sacramento. So we need to have some realistic discussions about what can be achieved and when it might be achievable.	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP are reasonable and are fundable under the current economy.	
Colma	13d	General	Funding	Funding sources are limited.	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP are reasonable and are fundable under the current economy.	
Colma Los Gatos San Mateo County Suisun Burlingame Portola Valley Redwood City Menlo Park SouthSF	13a 4 12 6 20 4 2 7 8	General	Funding	Need sufficient time to develop a plan and secure funding to implement permit requirements. Resources are limited as are new sources of funding. Allow more time to implement requirements.	The requirements in the RTO have sufficient implementation periods. We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP	

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Pacifica Belmont	11 10				are reasonable and are fundable under the current economy.	
Concord	15a	General	Funding	Reduction of reporting, recordkeeping, inspecting, & monitoring will free up people to do things that have a real impact like creek repair, drainage systems maintenance, public education, & street sweeping.	Reporting has been reduced in the RTO to the minimum necessary to determine compliance.	
Concord Mayor ContraCostaCnty – SwartzD	1 39a	General	Funding	The number of tasks is unmanageable given the City's budget.	The requirements of the MRP are reflective of MEP and can not be significantly reduced.	
Contra Costa Council	2	General	Funding	MRP contains extensive requirements that will impose costs far beyond the ability of local governments to fund.	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP are reasonable and are fundable by Permittees.	
Contra Costa Council – BestL	7	General	Funding	Requirements will impose costs beyond local governments' ability to fund. Local budgets are strained to breaking point. Real estate downturn requires communities to consider cutting essential services as property & sales tax revenues fall. Municipal budgets will be challenged as the state budget impacts the local level.	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP are reasonable and are fundable by Permittees.	
Councilmember of Concord – Hearing – Hoffmeister, L.	4	General	Funding	Maybe Board staff could apply for grants and undertake those studies to see what our baseline and how we've been doing.	The WaterBoard staff conducts SWAMP monitoring, but it is the Permittees' responsibility to monitor under the MRP.	
Cupertino	1	General	Funding	We emphasize strongly that increased costs are beyond our ability to fund at present without sacrificing other programs or getting additional funds from an as yet	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The	

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				unknown source.	requirements in the MRP are reasonable and are fundable by Permittees.	
Danville	16	General	Funding	Increased costs come without offsetting revenue sources, when local government revenues are declining. Successful implementation of MRP will require working together to identify new sources of funding.	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP are reasonable and are fundable by Permittees.	
EastBayEDACovPage	4	General	Funding	Local governments will be faced with many financial challenges in coming years for existing programs so it is most important that these new requirements be cost-effective.	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP are reasonable and are fundable by Permittees.	
Fremont Mayor	1	General	Funding	The document does not consider the fiscal impact to local governments or the realities of municipal budgets.	We agree that obtaining sufficient resources for stormwater program implementation is a challenge. The requirements in the MRP are reasonable and are fundable by Permittees.	
JamesRogerAttl	5	General	Funding	Defer, reduce scope, and establish levels of implementation commensurate with available funding until more funding is obtained. Do not defer trash control, hot spot cleanup of TMDL pollutants, or BMP operation and maintenance programs. Fund these by reducing less effective programs like street sweeping and public education.	The actions required by the MRP are the most effective use of limited resources available to Permittees for these endeavors. Some additional resources may need to be obtained by some Permittees.	
Mayor of Martinez–Hearing–Schroder, R.	1	General	Funding	Although our revenues are capped, the regulations and costs continue to increase.	Revenues are not permanently capped. Though difficult to accomplish, it is possible for	

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					Permittees to increase revenue.	
Mayor of Menlo Park – Hearing – Fergusson, K.	1	General	Funding	We need a funding plan. With voter approval of funds, we can implement new steps, but we will need time.	We agree. The new actions in the MRP come with implementation schedules.	
Mayor of San Ramon – Hearing – Wilson, A	2	General	Funding	We need to band together and find a funding source. We cannot support this unfunded mandate.	We agree that new revenue may be necessary.	
Millbrae	3	General	Funding	Millbrae established its Stormwater Enterprise Fund in 1996 & collects $230,000 annually to fund NPDES activities. Now the Millbrae General Fund is subsidizing the Stormwater Enterprise Fund. The subsidy can't be sustained without impacting public safety or without a new revenue source.	We agree that new revenue may be necessary.	
Milpitas	1	General	Funding	Consider if changes can be made to improve the financial efficiency without sacrificing your long-term objectives & desired outcomes	This effort has already occurred in the creation of the RTO.	
Milpitas, Phalen, K	1	General	Funding	The funding constraints are real: Our department is supposed to have 125 staff, but 33 positions are vacant. One in four are not filled & can't be filled because we don't have the funding. So to cope with this, we've had to get very efficient and prioritize our work. Many of us are covering a couple jobs. We've had to look at things we can postpone that are not critical.	We understand. Comment noted.	
Pacifica	5	General	Funding	We request Water Board initiate funding to subsidize the cost of implementation. Proposition 218 limits municipalities' abilities to raise fees that currently fund most of Pacifica's program. Additional funding is mandatory to comply with the permit.	We agree that new revenue may be necessary. The WaterBoard is attempting to assist some MRP efforts through grant funding.	
Pleasanton	1	General	Funding	These additional & more aggressive	Comment noted.	

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				requirements will become a substantial and costly burden for the City to implement.		
Private Citizen – GibersonM	13	General	Funding	We've heard that funding the Permit may result in police & firefighter cuts. Perhaps that's not always the case. One example: Saratoga spent $2,500,000 building the gateway wall; this might better have been spent on implementing water quality priorities through staff hiring & so on.	Comment noted.	
San Ramon	3	General	Funding	Funding mechanisms are not identified for new requirements. Local jurisdiction's ability to create new revenue streams are limited by Proposition 218 & are difficult to obtain. Proposition 218 balloting is expensive, further drawing on already scarce resources that could be used to improve water quality. Unless new sources of funding are identified by the RWQCB, the new requirements will place an undue financial burden on the City. Preliminary projections indicate that San Ramon will run a budget deficit starting in FY 09/10 if the new requirements are implemented.	Comment noted. We agree that new revenue may be necessary. The WaterBoard is attempting to assist some MRP efforts through grant funding.	
Santa Clara	1b	General	Funding	We lack operating revenue or capital reserves to fund many requirements in the draft permit & would face Proposition 218 requirements to secure funding. Given the uncertainties of voter funding, State or Federal funding will be needed to comply with many provisions.	Comment noted. We agree that new revenue may be necessary. The WaterBoard is attempting to assist some MRP efforts through grant funding.	
Santa Clara County	32	General	Funding	We have a limited budget for the Stormwater Program. There are significant restrictions to increasing funding. Numerous sections don't have a timeline and will be very	Any new work in the MRP has an implementation schedule.	

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				costly and time consuming to meet.		
Save the Bay– Hearing – Lewis, D.	1b	General	Funding	Who's paying now? The Bay is paying right now. We all need to be paying for this infrastructure, and adopting this order in order to allow us to do that.	Comment noted.	
SCVURPPP Attorney – Falk, B	3	General	Funding	We're asking for 2 things: One, work with the cities to achieve consensus, and two, for big ticket items, tie them to funding and not tie them to the prospect of getting a grant, but trigger the requirement on the getting of the grant.	Requirements in the MRP can not be tied to funding availability. We have been and continue to work with the Permittees, but consensus is not always possible.	
Sunnyvale	5	General	Funding	Phase requirements to reflect revenue & funding constraints. Time is needed to develop a financial plan, educate property owners & voters on the need for additional funding, and then to secure voter approval of any bonds or fees. Adjust compliance dates to acknowledge the need to secure & accrue funding for significant new permit requirements.	Compliance dates already allow time for development of new revenue where necessary.	
SMCWPPP	3b	General	Funding - POCs	Cities don't cause or control mercury & PCBs releases. Water Board should make grant funds available for these projects.	Permittees may control mercury and PCB sources in some cases. The WaterBoard does not control grant funds.	
Pleasanton	5	General	Funding & Costs	Additional monitoring, reporting & inspection efforts are estimated to require an additional 1,000 hours yearly over current budget. The cost for additional employee hours, as with the trash reduction measures, is not currently funded & would require a Proposition 218 public approval process.	We agree that new revenue may be necessary. The WaterBoard is attempting to assist some MRP efforts through grant funding.	
JamesRogerAttIII	9a	General	Glossary	Emerging Pollutants: Add to (1) after "beneficial uses" " cause or contribute to a public nuisance"	Comment noted.	
JamesRogerAttIII	9b	General	Glossary	Equivalent Funds & Equivalent	The statement does not just	

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				Offsite Treatment: Add "directly connected" just prior to impervious surface.	apply to directly connected impervious surface.	
JamesRogerAttIII	9c	General	Glossary	Infiltration Device: Define "fine grain soil" by Soil Classification Group or PSD.	We believe fine grain soil is adequately descriptive.	
JamesRogerAttIII	9d	General	Glossary	Monitoring Project: First item should be "Determine compliance with water quality standards and provide the basis for implementation of C.1 Provision.	That task is implicit in the monitoring in C.8.	
JamesRogerAttIII	9e	General	Glossary	Pervious Pavement: "Infiltrate" should be changed to "Percolate" to be consistent with the definitions of each.	Comment noted.	
Oakley	109	General	Glossary	Under Infiltration Device, the definition says it has 2 feet of fine grained soils. Contra Costa designs are based on 18 inches minimum. Is this a directed change or is it merely figurative?	This is the stated requirement, and applies to soil beneath, not within the treatment structure.	
Contra Costa Council – BestL	8a	General	Impact	You are drafting a permit, but you're really establishing policy, which will have a broad impact on communities.	Comment noted. The MRP contains permit requirements.	
Danville	2	General	Implementation Dates	Allow additional time to implement Provisions like water quality monitoring, new development, data gathering & reporting -- in order to ascertain the effectiveness of current requirements prior to imposing added requirements. E.g., new developments in Danville subject to 2003 C.3 requirements is only now being constructed, yet MRP contains further changes.	The proposed changes in the RTO are warranted, and no additional time is necessary.	
Oakley	2	General	Implementation Dates	Items to be evaluated for implementation in one provision are already mandated in another provision with an earlier implementation date; this should be coordinated. Examples: • High	Street sweeping and parking restrictions are no longer explicitly required. Diversion of stormwater to POTWs is coordinated in the MRP.	

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				efficiency sweepers; • Parking restrictions;• Diversion of dry weather and first flush flows.		
San Pablo	6	General	Implementation Dates	Please consider that though regional collaboration has its benefits, coordinating projects with entire Bay Area is time consuming, so some deadlines should be extended.	Aspects involving Region-wide collaboration have additional time allotted.	
Citizen–Hearing–James, R., JamesRogerAttl	3, 1	General	Include all of Bay Area	Take time and include North Bay Counties, schools, colleges, universities. At least add findings Caltrans' role.	These are Phase II entities currently, and so are not included in this Permit.	
Brisbane	2	General	Increased Requirements	Most provisions increase the requirements, significantly increasing compliance efforts needed.	While there are new requirements, most provisions are set at current levels of implementation.	
Milpitas	2	General	Increased Requirements	The number and density of provisions, subprovisions, & implementation tasks sets up a situation where our staff will be in constant risk of failure and our City at risk of violation.	Some requirements of the MRP in the RTO have been simplified or dropped.	
San Pablo	33	General	Increased Requirements	Though we agree more should be done about trash, mercury, & PCBs, we question the Water Board's proposal to change & add to the existing permit requirements which we have been implementing effectively for 15 yrs.	Comment noted.	
San Francisco BayKeeper–Hearing–Choksi, S.	3	General	Municipal Action Levels	Please establish municipal action levels and require end-of-pipe monitoring to make sure these levels are met. This is feasible; it is recommended by a State Board Panel on stormwater; and these action levels have been implemented in Southern California permits.	Given the hundreds of outfalls from the 76 Permittees, "end of pipe" monitoring would be impractically expensive using current technology. There is significant monitoring included in the MRP, and the implementation actions are required with the judgement that action levels are currently exceeded, that is	

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					the standing assumption.	
BASMAA–Hearing–Brosseau	1	General	Phased approach	We need a permit that's cost effective and based on real prioritization of objectives	The actions of the MRP are prioritized and are of reasonable cost.	
Brisbane	5	General	Phased approach	New requirements must be phased over multiple permit terms and linked to funding. For example, if an attempt to get funding through a Proposition 218 election is rejected, municipalities should not be considered in noncompliance.	It is not acceptable to make MEP permit requirements dependant on successful funding procurement.	
Concord	4	General	Phased approach	It is important to phase in new requirements over the 5-yr term & into next permit.	New requirements are phased in.	
Cupertino	5	General	Phased approach	Phase in certain revisions over a longer period; subject others to additional review; because we'll incur significant costs in terms of increased agency staffing and outlays for construction and maintenance of public roadways.	New requirements are phased in.	
Emeryville, Schultz Allen, P	1	General	Phased approach	Request time to evaluate the cost impacts. During this time, direct Board staff to quantify the additional staffing costs for plan revisions and annual reporting, training, inspection. The Conference of Mayor's was requesting six months; that's the timeline that our council was also asking for.	There has been far more than six months since this comment was made.	
FSSD	1	General	Phased approach	Lists 5 ordinances & 12 other deliverables for 1st two years. Need time to phase these in, particularly with limited resources.	Five ordinances are not required in the current RTO.	
FSSD/FairfieldSuisunURP – CullenK	73	General	Phased approach	MRP is front-end loaded. Within 1st 2yrs, about 11 different requirements start, making it extremely onerous to comply.	Most new requirements are phased in.	
Milpitas	4	General	Phased approach	Given that State law severely constrains the ability of cities to impose taxes or fees for stormwater quality protection, scale back &	The requirements of the MRP have been reduced as much as possible, and the requirements are phased.	

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				prioritize the implementation schedule.		
Mountain View	18b	General	Phased approach	Requirements with a July 1, 2008 deadline will not be feasible as budgets for that time are already established.	Timing for the RTO is quite different now (8-09).	
Pacifica	4	General	Phased approach	Revise timelines for infrastructure changes, document creation, management changes, municipal maintenance changes, & inspection & reporting changes to allow for State' funding to be available; for planning & permitting to occur at a realistic pace; & for staff support to be available. Consider existing staff workloads. Implement new provisions over three to four permit cycles.	The phase-in time frames in the RTO are reasonable.	
San Jose	33	General	Phased approach	Phase implementation of requirements to allow time to establish funding, personnel, & contracts needed to implement requirements.	The phase-in time frames in the RTO are reasonable.	
San Jose	33a	General	Phased approach	Use time periods, such as 12 months after permit adoption, in lieu of specific dates, to avoid reducing compliance timelines if there are delays in permit adoption	Noted. Timelines are changed to reflect delays in adoption.	
SCVURPPP	2a	General	Phased approach	T.O. adds new requirements in almost every section of the permit, without establishing the need or setting priorities and/or phasing-in over several permit cycles.	The permit is prioritized and phased. The requirements reflect MEP.	
SMCWPPP	3	General	Phased approach	Extend dates five years or longer to secure revenue. Extend further if voters don't support fees/ taxes.	It is not acceptable to make MEP permit requirements dependant on successful funding procurement. The phase-in time frames in the RTO are reasonable.	
Sunnyvale	4	General	Phased approach	Timelines for implementation are very short; provide adequate time for implementation. This is	The phase-in time frames in the RTO are reasonable.	

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				especially true where city ordinance changes will be required.		
Walnut Creek	2a	General	Phased approach	Phase implementation over several years.	The phase-in time frames in the RTO are reasonable.	
Citizen– Hearing – James, R.	1a	General	Prescriptive	The permit is actually too subjective: there's about 140 qualifiers (adequate, appropriate, properly, where possible). Strike all of those out. It won't affect the permit, but will avoid later arguments.	We disagree. While we have removed some qualifiers, others are necessary for accurate permit language.	
City of Oakland– Hearing–Estes, L.	2	General	Prescriptive	We want access to our whole toolbox, really crucial. E.g., we have an excess litter fee. If we use that money for structural trash control, we can't hire kids, which we do now to clean up around schools, liquor stores & other places. We need to use our entire toolbox. Don't limit us.	The RTO includes more flexibility for trash control.	
City of Pittsburg – Hearing – Fuller, J.	1	General	Prescriptive	It is a one size fits all for everyone. Need flexibility to tailor for uniqueness of watersheds & storm drain systems, different demographics & terrain, and everything else that's unique from one city to another.	The MRP RTO allows flexibility and the requirements are scaled for different size Permittees.	
City of Pittsburg – Hearing – Fuller, J.	3	General	Prescriptive	Re-look at how this MRP is written to come up with something that actually works.	Noted. The RTO includes significant changes.	
Colma	1	General	Prescriptive	Overly prescriptive, including the reporting requirements.	The RTO is more flexible.	
Concord	8	General	Prescriptive	Minutia like type of street sweeper to buy, inspection of kennels & drapery cleaners, inspection frequency of construction sites, number of press releases needed, city interdepartmental relations -- there is way more detail than should be in a permit.	The RTO is more flexible. The RTO includes significant changes.	
ContraCostaCnty – SwartzD	39	General	Prescriptive	The highly prescriptive, one-size-fits-all approach is not appropriate across the board.	The MRP RTO allows flexibility and the requirements are scaled for different size Permittees.	

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Danville –Hearing– Calabrigo, J.	1	General	Prescriptive	I agree with previous speakers who said we're looking for accountability and some additional flexibility. We wish to continue the dialogue with Board staff.	The MRP RTO allows flexibility and the requirements are scaled for different size Permittees.	
Dublin Mayor	2	General	Prescriptive	The permit is overly-prescriptive and includes tasks which provide nominal or questionable benefit to water quality.	The MRP RTO allows flexibility and the requirements are scaled for different size Permittees. The requirements are tied to MEP.	
Fremont – Cote, K	2	General	Prescriptive	We're concerned with the lack of flexibility in C.3 enhanced requirements. We see opportunities to deal with trash in a little more flexible way: Implementing enhanced trash management & then incorporating trash capture devices in the same area duplicates resources & is ineffective. Permittees should be able to divide resources between trash capture & enhanced trash management.	The MRP RTO allows flexibility. The trash requirements include new flexibility and eliminate the overlap you describe.	
Fremont Mayor	3	General	Prescriptive	Tentative Order does not provide local agencies any flexibility to cost-effectively meet stormwater quality goals.	The MRP RTO allows flexibility and the requirements are of reasonable cost.	
Livermore– GreenwoodD	104	General	Prescriptive	The permit is overly specific. It's inflexible & lacks prioritization.	The requirements are prioritized. The RTO includes additional flexibility.	
Livermore– GreenwoodD	106	General	Prescriptive	The time that we have to be innovative to create the new controls of the future will go away & we will focus all our time on meeting the little check boxes, filling out the databases, and the report forms.	Reporting has been reduced in the RTO.	
Oakland	1	General	Prescriptive	Set standards & let Permittees determine most effective means by which to achieve them. This will give cities that are meeting standards the flexibility needed to continue to	The MRP RTO allows more flexibility with sufficient accountability.	

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				innovate & succeed. At the same time, the Board will be able to dedicate its resources toward enforcement in municipalities that do not meet the standards.		
Pacifica	2	General	Prescriptive	Adaptive management is more reasonable. Pacifica has unique infrastructure & topography, which don't allow for implementation of proposed provisions.	The MRP RTO allows more flexibility.	
Palo Alto	1	General	Prescriptive	We object to the overly detailed & prescriptive requirements throughout.	The MRP RTO allows more flexibility.	
Palo Alto – BobelP	5	General	Prescriptive	Give the opportunity to have an 'or equivalent' in Permit. Let us come up with a plan that might be different than the Permit.	The MRP RTO allows more flexibility with sufficient accountability.	
Redwood City	1	General	Prescriptive	Overly prescriptive. Some requirements will actually hinder effective measures already in place, and nullify years of progress toward reducing pollution in our storm drain system and the Bay.	The MRP RTO allows more flexibility with sufficient accountability.	
Redwood City Mayor – Hearing – Foust	1	General	Prescriptive	Questions the years of work resulting in prescriptive, costly provisions.	The MRP RTO allows flexibility and the requirements are of reasonable cost.	
San Francisco BayKeeper– Hearing–Choksi, S.	2	General	Prescriptive	With no numeric effluent limits, your staff's only choice under the Clean Water Act is to be prescriptive and have multiple requirements. Permittees can't have it both ways. They have to choose either lots of requirements or a few numeric limits. And in either case, the end result has to be quantifiable improvements in water quality.	The MRP RTO allows more flexibility with sufficient accountability.	
San Jose	2b, 31	General	Prescriptive	Too prescriptive, doesn't provide flexibility to implement pragmatically, efficiently, or to redirect resources.	The MRP RTO allows more flexibility with sufficient accountability.	
San Jose Attorney	1	General	Prescriptive	Object to prescriptive requirements, which do not allow for flexibility to	The MRP RTO allows more flexibility with sufficient	

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				focus local resources on local water quality concerns	accountability.	
San Pablo	2 & 3	General	Prescriptive	MRP's prescriptive nature will not allow for innovation which is critical for balancing multiple requirements with limited budgets. It doesn't consider differences between municipalities.	The MRP RTO allows more flexibility with sufficient accountability.	
SanMateoCounty – CaseyD	89	General	Prescriptive	It's too prescriptive; permittees need flexibility to make our own decisions on where to stress our interest.	The MRP RTO allows more flexibility with sufficient accountability.	
Santa Clara	1a	General	Prescriptive	In previous stormwater permits, jurisdictions implemented stormwater pollution prevention measures to the “maximum extent practicable”. Intertwined in this standard is reasonableness, both in effectiveness and fiscal ability. Contrary to this, the draft permit is prescriptive & fiscally unachievable in many provisions.	The MRP RTO allows flexibility and the requirements are of reasonable cost.	
SCVURPPP	1	General	Prescriptive	No justification is provided to support jettisoning our effective locally-driven approach to award-winning stormwater management practices or their replacement with top-down, inflexible prescriptions that do not reflect experience with program implementation.	The MRP RTO allows more flexibility with sufficient accountability.	
SCVURPPP	2d	General	Prescriptive	Much of MRP is unnecessary, disjointed & unprioritized, forcing municipalities to reinvent their existing programs at great expense & without predictable benefit. MRP imposes prescriptive, inflexible approach that's a radical departure from past Region 2 permits & those issued by U.S. EPA.	The MRP RTO allows more flexibility with sufficient accountability. The requirements are prioritized.	
SCVURPPP – Olivieri, A	4	General	Prescriptive	Instead of endorsing prescriptive top-down approaches, continue to provide flexibility for municipalities to use their knowledge to identify and	The MRP RTO allows flexibility and the requirements are of reasonable cost.	

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				implement cost effective means of implementing these programs.		
Sunnyvale	3	General	Prescriptive	The Tentative Order is highly prescriptive.	The MRP RTO allows more flexibility with sufficient accountability.	
ACCWP–ScanlonJ	97	General	Prioritize	This is a very large permit.	Noted.	
Antioch Mayor – Hearing – Freitas, D	1	General	Prioritize	Integration is lacking.	The RTO is integrated.	
BASMAA–Hearing–Brosseau	2	General	Prioritize	Direct staff to work with us on the difficult work of prioritizing and phasing the actions .	The MRP RTO is prioritized and phased.	
CC Engineer. Advisory Comm., Contra Costa County Supervisors	2 12 & 14	General	Prioritize	There are many new requirements; most are manageable, but accumulative effort becomes unreasonable. Eliminate lower priorities.	The overall requirements in the RTO are manageable and reasonable.	
Concord	1, 3, 5	General	Prioritize	What is the most important part of permit? What are we hoping to accomplish? Lay out the relative priority of each requirement. Reducing pollutants of concern should be our primary focus.	The RTO is prioritized and represents MEP.	
Concord Mayor	2	General	Prioritize	Prioritize the new studies, plans, & reports.	The RTO is prioritized and represents MEP.	
Daly City	3	General	Prioritize	The level of effort required in MRP is overly ambitious and limits the permittees ability to be successful.	The RTO is prioritized and represents MEP. The overall requirements in the RTO are manageable and reasonable. The MRP RTO allows more flexibility with sufficient accountability.	
Legislator–Hearing–Houston, G	1	General	Prioritize	Because we don't have money, we have to scale back and make priorities.	The RTO is prioritized and represents MEP.	
Mountain View	18	General	Prioritize	Prioritize goals & phase in requirements over long-term to allow for success. This is critical as municipalities seek ways to fund a wide range of important services.	The MRP RTO is prioritized and phased.	
Newark	15	General	Prioritize	MRP should be prioritized & phased in order to achieve maximum water quality benefit with the resources	The MRP RTO is prioritized and phased.	

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				available.		
Palo Alto	2	General	Prioritize	Not reasonable to have new requirements in most sections, without prioritizing or allowing phase-in over several permit cycles, especially in light of limited municipal resources.	The MRP RTO is prioritized and phased.	
Palo Alto	4	General	Prioritize	Suggested priorities: stream-lined reporting; TMDL implem-entation; cost effective trash control & monitoring; compli-ance with current performance standards.	These along with changes to C.3 are the priority aspects of the RTO.	
Palo Alto – BobelP	2	General	Prioritize	There's too much in these 150 pages of permit & 150 pages of reporting. There's too much that's not important to ask our ratepayers for an increase. You water down the few important things in here, & trash is one of them. We need to work on trash problem. But you include all this other crud & you've left us with a situation that is hard to go back to our voters with a straight face.	The RTO requirements have been streamlined and made more flexible. Reporting has been reduced. Trash cleanup is a priority.	
San Jose	1	General	Prioritize	The aggregate effect would place considerable strain on City resources and are too extensive to accomplish within five-year term.	The RTO is prioritized and represents MEP. The overall requirements in the RTO are manageable and reasonable.	
San Jose – Tovar M	64	General	Prioritize	Permit needs to be more focused & to address priorities.	The RTO is prioritized and represents MEP.	
San Ramon	1	General	Prioritize	Although many of the tasks are manageable, the lack of prioritization creates a situation where all tasks are equally weighted therefore creating a difficult situation to manage given the limited resources and funding.	The RTO is prioritized and represents MEP. The overall requirements in the RTO are manageable and reasonable.	
SCVURPPP – Olivieri, A	1	General	Prioritize	Much of what you've heard here today asks you to pick out the highest priorities among the mass currently assembled & phase in those requirements it can	The RTO is prioritized and represents MEP. The overall requirements in the RTO are manageable and reasonable. The	

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				reasonably expect municipalities to address over the next permit's terms, & which should instead be reserved for future permit.	requirements are phased in.	
SCVURPPP – Olivieri, A	2	General	Prioritize	For example, if you want to enhance existing efforts on trash, or to address TMDL implementation plans for mercury and PCBs, you need to retain the current permit exclusion from numeric C.3 stormwater treatment requirements covering environmentally beneficial and safety enhancing features like sidewalks, bicycle lanes, trails, bridge accessories, guard rails and landscape features.	The RTO reduces or excludes requirements on trails and bicycle lanes. Bridge accessories, guard rails and landscape features are excluded from C.3.	
SCVURPPP – Olivieri, A	3	General	Prioritize	Continue to allow existing roads to be repaired without triggering expensive requirements to retrofit stormwater treatment systems, and not scuttle the current pragmatic approach of using BMPs for minor types of non-stormwater discharges including resident's foundation drains, crawl space pumps, discharges to (inaudible) potable water supplies with unnecessary requirements and expensive testing and reporting, and refine the overly burdensome reporting and recording requirements contained in the 124-page plus 57 table proposed streamlined annual reporting format.	Road reconstruction has been excluded from C.3 coverage in the RTO. C.15 has been changed in the ways you suggest to a great extent, and reporting has been reduced.	
SCVURPPP – Olivieri, A	5	General	Prioritize	The highest priorities are addressing trash, addressing adopted TMDLs for mercury and PCBs, and a focused monitoring program. Programs cannot concurrently make changes on C.3 requirements, HMP non-stormwater discharge, construction and industrial inspection programs.	We disagree, and contend that the changes to C.3 to include LID requirements is necessary to meet MEP. The changes to Construction and Industrial inspection reflect MEP also.	

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Sunnyvale	2	General	Prioritize	New or expanded requirements aren't prioritized, despite previous requests by Sunnyvale and other co-permittees to do so.	The RTO is prioritized and represents MEP.	
Walnut Creek	2	General	Prioritize	Prioritize the various provisions based on a cost-benefit analysis.	The RTO is prioritized and represents MEP. Cost benefit is not the appropriate standard under the stormwater regulations, rather reasonable cost and MEP.	
ACCWP – GrimmG ACCWP–ScanlonJ	93 102	General	Process	Direct your staff or a subcommittee of the Board to get together with these guys & resolve the issues before coming back to the Board for the next hearing.	We have worked extensively with all stakeholders.	
ACCWP–ScanlonJ	101	General	Process	The reporting form is new. I don't think we've had time to work with staff on these issues.	The Annual reporting form has been deferred for future work with the permittees.	
Cupertino	1b	General	Process	The fundamental goals are laudable & worthy of support. Some revisions may not fulfill their intended purpose, & need additional discussion.	Many issues of this type have been addressed in the RTO.	
Dublin Mayor Berkeley Mayor Union City Mngr San Leandro Mayor AlCo Mayors Conf Oakley – KennedyF Pleasanton – WilsonR	4 3 3 3 3 16 56	General	Process	Dublin's submitted 3 comment letters. Over 50 letters had been submitted to the Board by local government agencies; the concerns are generally that the permit's prescriptive & not cost effective. We understand that these concerns remain unaddressed.	We have worked extensively in the RTO to increase flexibility while retaining accountability and attaining MEP.	
Fremont – Cote, K Fremont Mayor	1 4	General	Process	Several MRP items require municipalities to use resources inefficiently. We tried to address through the comment periods by suggesting language changes, but feel many of our comments have not been incorporated. Urge you to consider some of these recommendations and actually incorporate those into the permit	We have attempted to address many issues that received specific language change suggestions. We have worked extensively in the RTO to increase flexibility while retaining accountability and attaining MEP.	

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				language.		
Fremont Mayor Dublin Mayor Berkeley Mayor Union City Mngr San Leandro Mayor AlCo Mayors Conf EastBayEDACovPage Belmont – BorrmannK	6 5 5 4 4 4 1b 96	General	Process	Direct staff to begin a dialogue with Permittees to change permit language to reflect prioritized objectives and requirements that are cost effective, provide clear water quality benefit and are fundable at the local level.	The RTO is prioritized. We have worked extensively in the RTO to increase flexibility while retaining accountability and attaining MEP. The MRP RTO allows flexibility and the requirements are of reasonable cost.	
Home Builder's Association of Northern California – Foley-Gannon, E	1	General	Process	When the original workgroups were formed, they included permittees and Board staff members. Then membership expanded to environmental communities, but regulated communities had not been asked to participate. Home Builder's Association has experience to contribute, particularly related to the C.3 program.	We have now included the Northern California Homebuilders in stakeholder discussions related to the RTO development.	
Home Builder's Association of Northern California – Foley-Gannon, E	2, 3	General	Process	With the amount of comments, written documentation & testimony over the last four years, we have not had a formal response from staff. We've seen things change from one draft to the next and sometimes it seems like they accepted that or agreed with that. We'd like a formal response.	A formal response to all comments is included in the Board consideration package.	
Livermore– GreenwoodD	107	General	Process	I urge you to direct staff to meet with us again, although we've met many times, so this time do something different.	We have worked extensively with the key stakeholders on the RTO to increase flexibility while retaining accountability and attaining MEP.	
Palo Alto – BobelP	3	General	Process	Create a high-level group to work on policy issues - trash, street sweeping, and the other stuff you've heard. Set up another mechanism to deal with smaller issues like mobile food service.	We have worked extensively with the key stakeholders on the RTO to increase flexibility while retaining accountability and attaining MEP.	
Pleasanton – WilsonR	55, 58	General	Process	Allow us to further discuss making it	We have continued to work	

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				more effective, in honest dialogue with you.	with stakeholders on the RTO	
San Francisco BayKeeper–Hearing–Choksi, S.	1	General	Process	Now that we have a draft with specifics to discuss, the forum for discussion is limited.	We have continued to work with stakeholders on the RTO on a broad range of topics.	
SanMateoCountywideProgram – FabryM	84-86	General	Process	We'd like more active involvement from the Board. The process kind of fell apart when many people in this room are so diametrically opposed, the permittees & environmental groups, and we're bringing it to the Board now. The Board should have been involved earlier.	We have continued to work with stakeholders on the RTO. We have now created a Third RTO after to Board workshops and comment rounds.	
Walnut Creek	1	General	Process	T.O. is more clearly written, but provisions are substantially unchanged from the 10/13/06 draft. MRP fails to incorporate or address previous City or BASMAA comments.	The RTO contains significant revisions.	
JamesRogerAttIII	1g	General	Receiving Water Limitation	Receiving Water Limitations, pg 1 (new pg 6): Second B.1. should be B.2. Recommend a footnote explaining the difference between water quality standard and water quality objectives.	Noted. We will rely on background information to clarify that distinction rather than a footnote.	
Dublin	6	General	Record Keeping	Added record keeping & reporting covers almost every activity; new annual report form is significantly longer; taking staff time from activities that result in actual water quality improvements. Added cost is estimated at $13,000 /yr.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined.	
Legislator–Hearing–Houston, G	4	General	Record Keeping	Tracking brochures, staff training, cars parked during sweeping - these aren't productive.	Reporting has been streamlined in RTO.	
Newark	13	General	Record Keeping	"Streamlined" reporting increases annual reports from 30 to over 100 pages, plus attachments. The level of detail is onerous & includes six new databases, taking staff from activities that benefit water quality.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined.	

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				This may turn stormwater programs into data gathering & reporting exercise rather than an effort to solve water quality issues; and due to lack of Water Board staff resources, these reports may not be thoroughly reviewed.		
Oakley	1	General	Record Keeping	Record keeping will greatly increase. It is unclear how diverting resources to collect data, which should be collected by the Board itself, & creating an enormous amount of records contributes to improving water quality.	Reporting has been streamlined in RTO.	
Oakley	8	General	Record Keeping	The Permit variously refers to templates in Attachment L but we are left to conclude that these are "examples" after page L-110. We also conclude that where ever Attachment L, Section III mentions "Table" it's referring to those examples.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Oakley	9, 112	General	Record Keeping	When an Attachment is required, what is the required format of the information?	Annual report form will be developed with Permittees in one year in RTO.	
Oakley	10	General	Record Keeping	Attachment L, Section III appears to be a complete list of material to be submitted electronically or attached to Annual Report form. However, a number of reporting requirements are left off of Section III & it's not clear why.	Annual report form will be developed with Permittees in one year in RTO.	
Oakley	11	General	Record Keeping	It is unclear what constitutes a full report as some sections say "use the forms (L) and others don't, while some sections say "in addition to answering the following questions attach…" Can the Board clarify?	Annual report form will be developed with Permittees in one year in RTO.	
Oakley	12, 110, 111	General	Record Keeping	Attachment L talks about material to be attached & material to be submitted electronically. In some areas the following Summary Table	Annual report form will be developed with Permittees in one year in RTO.	

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				seems to be the items that fulfills the "attached" requirement and in others not.		
Oakley	13	General	Record Keeping	Generally, the layout and intent of Attach.L is confusing. In some places, Section IV seems to be the "attached" information referred to in Section III. In other places it seems that all material to be submitted as referred to in Section III are a set of documents separate from Section IV entirely. Please clarify the standing of the "attachments", "tables", the "electronic submittals" and the "Summary Table".	Annual report form will be developed with Permittees in one year in RTO.	
Oakley Oakley – KennedyF Concord – RoubalJ	7 15 35	General	Record Keeping	There seem to be 12 new databases & 3 "SWAMP comparables" required. Board staff should prepare templates for these databases to ensure complete & uniform information submittal.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Pleasanton	3	General	Record Keeping	Many of the additional recordkeeping requirements in the Tentative Order may detract from current programs.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
AlamedaCo Newark	1 1	General	Reporting	Allow agencies to focus on tasks that will produce actual water quality benefits; don't divert resources to unproductive tasks such as excessive data gathering & reporting.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Brisbane	6	General	Reporting	Make reporting requirements more consistent with that for developing sanitary sewer mngt plans, where entities maintain records for review, but simply certify compliance online. SMCWPPP submits a five-volume annual report now. It's unclear how the proposed dramatic increase in reporting will improve water quality, especially since your own resource	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	

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				limitations prevent staff from providing feedback on reports you receive.		
CC Clean Water Program LTR	15	General	Reporting	Tracking, documentation, & reporting requirements are individually innocuous, but cumulatively impossible. Reporting is not "streamlined" with a 110-pg report template.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
CC Co. Supervisors	9	General	Reporting	The "tabular annual report" will increase reporting & documentation; is overly-prescriptive format; will require wholesale record-keeping changes; & will add costs that are unlikely to improve water quality in any way.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Clatyon, Hoffmeister, L	3	General	Reporting	Board staff has provided or attempted to provide some flexibility about data reporting or databases. The City of Clayton does not have electronic databases or a GIS system.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Colma FSSD San Mateo County Suisun Burlingame Portola Valley Menlo Park SouthSF Millbrae Pacifica	8a 11a 11a 2a 19a 2a 6a 4a 1a 9a	General	Reporting	Report Form is prescriptive, would require significant staff resources. In many instances is inconsistent with the Tentative Order reporting provisions and requires more information than what is required to be reported for a specific provision.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Colma FSSD San Mateo County Suisun Burlingame Portola Valley Menlo Park SouthSF Millbrae Pacifica	8b 11b 2b 19b 2b 6b 4b 1b 9b	General	Reporting	Create a 10-20 page form after the permit is adopted.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	

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Concord	14	General	Reporting	Extra reporting is burdensome & diverts resources: quarterly street sweeping audits; reporting on street repair staff training, street flushing, and trash cleanup & anti-littering enforcement; a database of construction site inspections; more. We spend over 400 labor hours & $30,000 preparing the annual report.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Concord – RoubalJ	33, 34	General	Reporting	The annual report is a major burden. In 7 yrs, its size increased over 100%. It takes 512 hrs of my time to prepare & costs $28,692. It doesn't reduce pollution one iota.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Daly City	118a	General	Reporting	We appreciate the thought put into streamlining the reporting process, but Attachment L is overly cumbersome and redundant.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Daly City	118b	General	Reporting	Work with permittees to balance necessary data collection with reasonable reporting requirements.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Danville	10	General	Reporting	Reduce extensive reporting requirements, & devote available staff resources toward program implementation.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
FSSD	11b	General	Reporting	The Program now submits a single report for all co-permittees. Individual reporting in T.O. is less efficient, could hurt collaborative spirit.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
FSSD	11c	General	Reporting	Delete Attachment L and create new form with BASMAA during 1st year.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
FSSD/FairfieldSuisunURP – CullenK	74	General	Reporting	There's a 109-page spreadsheet to fill out annually, & it's not a program report now, but is filled out by each	Reporting has been streamlined in RTO. Annual report form will be	

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				co-permittee. This reduces the collaborative effort [within] the program. A single annual report from the program is a better approach.	developed with Permittees in one year in RTO.	
Livermore– GreenwoodD	105	General	Reporting	Data collection requirements are excessive, and would be a step backwards. It's going to force programs to move from an effective program to a compliant program.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Mayor of Menlo Park – Hearing – Fergusson, K.	2	General	Reporting	Focus on your goals, what you want to achieve, and we're happy to report on that, but there's no excuse for 100-page form.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Milpitas	3	General	Reporting	Attachment L is 124 pages and will be twice that size when completed. Annual reports from 77 agencies could be 20,000 pages in total. How will you effectively assimilate and evaluate all this information?	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Milpitas, Phalen, K	2, 3	General	Reporting	For example: the reporting form is 164 pages and complicated. When I saw it, I realized you had the impression we had clerical staff to work on it. In fact, I have to type it myself and I struggle with columns, tables, margins; it's hard for me. The complexity doesn't add anything to information. It could be streamlined by being a simple Word document. I don't think it needs to be 164 pages.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Monte Sereno	7	General	Reporting	Eliminate or postpone some reporting & database management requirements, especially as cities cannot increase funding.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Moraga	7	General	Reporting	There seems to be 12 new databases & 3 "SWAMP comparables" required. Board staff should prepare the templates for these databases to ensure complete	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	

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				& uniform information submittal from Co-Permittees.		
Moraga	8	General	Reporting	MRP variously refers to templates in Attachment L but we are left to conclude that these are "examples" after page L-110. We also conclude that where ever Att. L, Section III mentions "Table" it's referring to those examples.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Moraga, San Pablo	1 4	General	Reporting	Reporting goes well beyond what is now required. It is unclear how diverting resources from implementation of BMP's contributes to improving water quality.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Mountain View	16	General	Reporting	Revise Annual Report forms to include only summary information (not narratives on each inspection). Make Attachment L consistent with reporting sections in Permit.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Oakland	12	General	Reporting	A goal in developing the MRP was to have streamlined reporting – this has not been accomplished. The "streamlined" reporting has grown from 30 pages to over 100. Reporting requirements are extensive; level of detail is onerous; includes development of 6 new databases. Diverts Permittee staff resources from water quality activities.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Oakley	113	General	Reporting	The Permit and Summary Table talk about the submittals for C.2.b, Sweeping Equipment and Operations, C.2.d Pavement Washing, C.2.e Structure Cleaning & Graffiti Removal & Inlet Marking, but these are not listed in the list of materials to be submitted. What is the disposition of this material to be?	Street Sweeping and pavement washing requirements have been removed from the Municipal Maintenance Provision. Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Oakley	221	General	Reporting	The linkage between the Permit text, Attachment L and the template is a	Reporting has been streamlined in RTO. Annual	

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				bit oblique. When use of Attachment L forms is stated, what forms are meant, there appears to be options? Is the required database to follow the form of the template or the Summary Table? Is the template optional? The information itemized in the Summary Table and the Template seems to be duplicative. Please clarify the reporting and minimize duplication.	report form will be developed with Permittees in one year in RTO.	
Oakley	144	General	Reporting	The Permit text & Summary Table require reporting for 2011 & 2012 but there is no submittal requirement for 2012. What is required?	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Pacifica	1	General	Reporting	We can't meet reporting requirements due to technological infrastructure constraints, fiscal constraints, and staffing limitations. Requirements, such as the permit & inspection tracking database and the GIS mapping systems, are costly. Also, Board staff has given no indication that existing reporting methods are inadequate.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Palo Alto	13	General	Reporting	New databases are burdensome. Decrease reporting to summary of the least amount of relevant material needed to document compliance.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Pleasanton	5	General	Reporting	The proposed permit requires extensive new monitoring, testing, and significant additional reporting efforts by the City, even though currently required reports are rarely reviewed by the Water Board staff in a timely manner due to its staffing limitations.	Reporting has been streamlined in RTO.	
Pleasanton – WilsonR	54	General	Reporting	You've also heard the issue with reporting requirements. We want to look at that effectiveness.	Reporting has been streamlined in RTO.	

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San Jose	30	General	Reporting	Unclear that increased data collection for construction inspections, amount of impervious surface, inlet cleaning, & facility inspections will result in improved water quality. Reduce reporting.	Reporting has been streamlined in RTO.	
San Jose	32	General	Reporting	Need more time to review report forms; Allow final report form be developed after adopting permit. State that where inconsistencies exist between Permit language & the report form, Permit language prevails.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
San Pablo	5	General	Reporting	The current Annual Report format is not very user-friendly, but the proposed forms are no more useful & will require more effort to complete.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
SanMateoCountywideProgram – FabryM	87	General	Reporting	Board staff can look at our programs. This has been lacking in last 3-4 yrs because all efforts have been focused on developing this permit. Previously Board staff came out regularly & worked with the programs, which was a much better way to evaluate program effectiveness than trying to put it all into a report on the internet.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO. Municipal program audits are valuable for determining compliance, but adequate reporting is also vital for determining compliance.	
SCVURPPP	10a	General	Reporting	T.O. requires development of numerous databases, use of specific reporting formats, & significant additional reporting, all in the context where currently required reports are rarely reviewed in a timely manner. The intended usefulness and practicability of the revisions are not clear and do not consider the significant incremental burden to be placed on municipalities with little, if any, resulting benefit to water quality. The Report Form is 110 pages in	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	

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				length, not including the supplemental reporting tables to summarize business, construction site, and pump station inspections.		
SCVURPPP	10b	General	Reporting	The Report Form is in many instances inconsistent with the Tentative Order reporting provisions & often requires more information than what is required to be reported for a specific provision.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
SCVURPPP ATT A	90	General	Reporting	Remove reporting form and re-develop in coordination with BASMAA during 1st year of the permit. Including the form sends the wrong message that the contents of the permit have already been decided, regardless of comments on the Tentative Order. If the reporting requirements are not reduced from their current form, reporting will waste limited municipal staff resources.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Stanford	1a	General	Reporting	Current annual reporting method have met the Stormwater Program's needs.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Stanford	1b	General	Reporting	The tentative order language and the reporting form language are not completely consistent.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Stanford	1c	General	Reporting	We understand the reporting form in the tentative order is not the entire form, but lacks upwards of 54 reporting pages. The City hasn't seen this detail; all 77 municipalities should have time to review.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Sunnyvale ATT A	35	General	Reporting	Increased data collection, tracking, database development or modification of existing databases, and data summaries are required for	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees	

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				almost every program, needing more staff time. These are costly to implement, & don't have clear linkages to water quality or to a stormwater management objective.	in one year in RTO.	
Sunnyvale ATT A	36	General	Reporting	Remove Attachment L and revise in cooperation with the permittees to provide the information required in the adopted order.	Reporting has been streamlined in RTO. Annual report form will be developed with Permittees in one year in RTO.	
Sunnyvale ATT A	37	General	Reporting	In lieu of annual report, Board staff should participate in individual program assessments & visit a permittee to review in depth. This may only need to be done once a permit cycle, with annual update reports on limited topics of concern being provided post-assessment.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Sunnyvale ATT A	38	General	Reporting	If Attachment L is not removed, remove inconsistencies between what the permit language requires and what the report format requires.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Sunnyvale ATT A	39	General	Reporting	For any inconsistencies, include a statement indicating the permit language prevails over the Annual Report form.	Annual report form will be developed with Permittees in one year in RTO. Reporting has been streamlined in RTO.	
Redwood City Mayor – Hearing – Foust	2	General	Solution for the majority	Wouldn't our time better be spent crafting a solution that perhaps can't fit all, but that can fit the majority of communities & stakeholders.	The RTO contains many flexible adjustments for different types of Permittees.	
Citizen– Hearing – James, R.	2	General	Street Sweeping	Street sweeping is not effective, per early studies. Recent studies show street sweeping not effective in controlling litter or improving water quality, & it actually degrades water quality. Don't let street sweeping cost be part of stormwater budgets. Cities are sweeping for purposes other than water quality.	The street sweeping requirements have been removed from the municipal maintenance provision.	
Pleasanton – WilsonR	57	General	Successes	We've reconstructed creeks; we see	Noted.	

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				trash removed. We go out on save the creeks days & there's less trash than previous yrs. We have effective programs that have improved, & we need to celebrate them.		
SCVURPPP	2c	General	Support	In some ways the draft permit shows improvement over the administrative draft released in May 2007.	Noted.	
U.S. EPA– Hearing – Eberhardt, D.	1	General	Support	We are pleased to see there are so many specific and enforceable provisions within the draft permit.	Noted.	
Save the Bay– Hearing – Lewis, D.	1a	General	Support	Clearly, the Bay Area lacks adequate stormwater treatment that makes a measurable difference in water quality, treatment that reduces pollutants of concern that state and federal laws require you to address, and treatment that protects beneficial uses of the Bay the public is clamoring for. You have a chance to do something about that by strengthening and adopting this order.	Noted.	
Citizen– Hearing – James, R.	3	General	Support for additional requirements	People living near creeks should have extra burdens because the property next to those creeks is so important. The gentleman from Concord that said clean water is not cum-ba-yah. I'm ashamed for him. Creeks need to flood.	Noted.	
CC Co. Supervisors	6	General	Support Regional Collaboration	We are encouraged that this MRP will be administered on a regional basis. We hope to tackle some issues with regional solutions, regulations & legislation.	Noted.	
Legislator–Hearing– Houston, G	2	General	Trash Support	Regarding the photos of trash in waterbodies: I think we should take care of those. We should take care of those first.	Noted.	
U.S. EPA– Hearing – Eberhardt, D.	3	General	Unfunded mandate	Regarding comments on unfunded mandate, the Clean Water Act and its regulation provide for	Noted.	

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				considerable state discretion when writing permit requirements, and we find the requirements in the draft permit do have a basis in federal regulations.		
Livermore–GreenwoodD	103	General	Water Quality Benefit	The requirements don't improve stormwater quality, and they're a waste of my staff's time.	We disagree. The requirements reflect some improvements over existing requirements to reflect MEP. The RTO reflects changes to improve the relevance of the requirements.	
San Jose – TovarM	59	General	Water Quality Benefit	Provisions are intended to improve water quality, but there's often an insufficient link to water quality improvements.	We disagree. The requirements reflect some improvements over existing requirements to reflect MEP. The RTO reflects changes to improve the relevance of the requirements.	
San Pablo	1	General	Water Quality Benefit	The significant increase in effort & resources may not necessarily result in improved water quality.	We disagree. The requirements reflect some improvements over existing requirements to reflect MEP. The RTO reflects changes to improve the relevance of the requirements.	
GCRCD-Att	1	General	Weak Requirements	T.O.'s requirements are vague & allow requirements to be circumvented or disregarded. It doesn't address all types of non-stormwater discharges or pollution sources. It doesn't address problems caused by current development, especially increasing runoff, erosive forces, severe erosion, & deposition that are degrading waterways now.	We have attempted to draft the RTO so that it is relevant, improved and clearly enforceable. The trash capture requirements will address existing development. There currently is no strong regulatory basis under the Clean Water Act to require correction of past built environment errors in the watersheds.	

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SCVURPPPAttny SCVURPPPAttny	1 1	A.2 & C.1	Discharge Prohibitions	Discharge Prohibition A.2 and Provision C.1 of the Tentative Order, as drafted, are contrary to State Board precedential orders that are directly on point, and are against public policy, and represent an abuse of Regional Board discretion.	The Tentative Order has been revised to address the commenter's concern that Provisions A1 and A2 should be subject to the iterative process. As revised it would provide that Discharge Provisions A1 and A2 are subject to the iterative process.
SCVURPPP ATT A	1	A.2 & C.1	Discharge Prohibitions	Because it's not expressly tied to the permit's Provisions, this could expose municipalities to enforcement actions including citizens' suits for certain conditions in receiving waters even where they otherwise are in full compliance with the Permit's specific requirements. It also does not comply with State Board precedent (see Morrison & Forester Legal Comment No.2). Add language paralleling Discharge Prohibition A.1 so as to state "Compliance with this prohibition shall be demonstrated in accordance with Provisions C.1 through C.17 of this Permit."	See response immediately above.
SCVURPPP ATT A	2	A.2 & C.1	Water Quality Standards Exceedances	Provision C.1, paragraph 1, fails to link the Permit's Discharge Prohibitions (in this case both A.1 and A.2) to specific requirements of the Permit, thus creating the same potential liability problem for municipalities & violation of State Board precedent (see Morrison & Foerster Legal Comment No.2). Add references to "Discharge Prohibitions A.1 and A.2" in both places in first paragraph of C.1 where the term "Receiving Waters Limitations B.1 and B.2" appears.	See response to first comment above.
SCVURPPP Attorney – Falk, B (Board Hearing)		A & C.1	Discharge Prohibitions	We commented on the discharge prohibition and how it has to be tied under State Board orders to the Provision C.1 or iterative process provision. We'd like to see some changes in that. It's a fairly minor issue.	See response to first comment above.
Milpitas	7	General	Legal	Fact Sheet Pg 10, Para.4: This case is out dated. The 2001 Apartment Assn of LA Co. v. City of LA was largely reversed by the June 2006 ruling in Bighorn-Desert View Water Agency v. Verj. Cities' imposition of a stormwater fee is subject to Prop. 218 challenge. Under Prop 218, cities can establish fees for SW-related services such as inspection, but to the extent fees exceed the cost of the specific service, the excess is subject to Prop 218 challenge. Thus, inspection fees can't subsidize costs of permit provisions not consisting of inspection.	We agree that imposition of stormwater fees is likely subject to Prop. 218
San Jose Attorney	1b	General	Overly Prescriptive	Overly prescriptive requirements in wastewater discharge permits are prohibited under Water Code §13360.	We disagree that the proposed permit would violate Water Code section 13360, which provides that a water board shall not specify in an order the "design, location, type of construction, or particular manner in which compliance may be had". First, the proposed permit does not specify such matters as design, location, type of construction or particular manner of compliance. Even if the proposed permit were to include such

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					specifications, it would not violate section 13360. The Court of Appeal held in *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal. App. 4th 1377 held that section 13360 is not applicable to issuance of a stormwater permit issued under the federal Clean Water Act. (id., at 1389.)
San Jose Attorney	1c	General	Legal	The overly prescriptive nature of the Tentative Order combined with its broad application to a wide range of public agency permittees, also raises a concern that the Regional Board is in effect, adopting an underground rule, in violation of the Administrative Procedures Act, rather than the "general waste discharge requirements for a category of discharges" that is contemplated by Water Code §13263.	The staff proposes that the Board adopt the Tentative Order as an NPDES permit. The Board's issuance of an NPDES permit is exempt from the rulemaking provisions of the Administrative Procedure Act. (*City of Rancho Cucamonga*, supra at 1385.)
San Jose Attorney	1d	General	Legal	Permit requirements that are not adequately linked to improvements in water quality violate Water Code §§13241 and 13263.	The permit's requirements are necessary under the federal Clean Water Act and thus the Board's action is not subject to Water Code sections 13241 and 13263 (*City of Burbank v. State Water Resources Control Board* (2005) 35 Cal. 4th 613.), to the extent that those Water Code sections would require the Board to consider factors that would result in non-compliance with federal law.
SCVWD	1	General	Legal	Several provisions require co-permittees to have authority to regulate various provisions or issue citations. We wish to clarify certain limitations of District authority as it relates to the permit conditions. • The District does not have regulatory authority to issue citations. City and County law enforcement entities have sufficient power to issue citations on our behalf for the purposes of this permit. • The legislative authority, he District Act, distinguishes the District from many other municipal agencies in several key areas. The District is not granted: i. the jurisdiction for development permitting and construction inspection, ii. the ability to create general plans to guide growth and development, iii. Or police powers. • The District does not maintain ownership or operation of municipal separate storm sewer systems. This distinction should be acknowledged within the Fact Sheet and Rationale sections: i. Implementation, page 2; ii. Regulated Parties, page 12; and/or	Comment Noted. The District, and other non-population based Permittees may not have the ability to issue citations, but need to develop effective legal enforcement capability otherwise.

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				iii. Permit Coverage, page 12. With this in mind, the joint program between the Cities and the District provides the requisite authority for implementation of permit conditions and there is no intent by the District to seek additional authority.	
ACCWP-Attny	3	General	Discharge Prohibitions	Proposed Discharge Prohibition A.2 prohibits the discharge of refuse and other solid wastes into surface waters or to any place where they would eventually be transported to surface waters. Unlike Prohibition A.1, which specifically addresses how compliance is to be achieved by implementation of provisions of the permit (effectively prohibiting discharge of non-stormwater discharges), Prohibition A.2 contains no such reference to an implementation process for compliance. The Tentative Order also neglects to include references to both Prohibitions A.1 and A.2 in the first paragraph of Provision C.1, in both places where Receiving Water Limitations B.1 and B.2 are referenced. Provision C.1 provides a procedure for addressing water quality standard exceedances. These omissions are directly contrary to State Water Resources Control Board ("State Water Board") Order WQ 1999-05, a precedential order requiring that municipal stormwater permits tie discharge prohibitions to the implementation of control measures, by which Permittees' compliance with the permit can be determined. The State Water Board Order specifically requires that Provision C.1 include language that permittees shall comply with discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in the discharges. <u>Recommended Action:</u> We therefore request that reference to discharge prohibitions A.1 and A.2 be added before "receiving water limitations" in the first and third sentences of the first paragraph of Provision C.1. In addition to this revision of Provision C.1, the language of Discharge Prohibition A.2 also needs to be revised. State Water Board Order WQ 2001-15 refines Order 1999-05 by requiring an iterative approach to compliance with water quality standards that involves ongoing assessments and revisions. The proposed language of Prohibition A.2 violates the State Water Board Order by omitting any reference to Provisions C.1 through C.17, which	This comment is similar to those summarized above that were made by SCVURPPP. The Tentative Order has been revised to reference Prohibitions A1 and A2 in C1, thus making both subject to the iterative process.

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				provides the practices by which discharge prohibitions are implemented and evaluated. This State Water Board Order specifically rejects the discharge prohibition approach proposed in the Tentative Order for Prohibition A.2. Recommended Action: Consequently, the following sentence should be added at the end of Prohibition A.2: "Compliance with this prohibition shall be demonstrated in accordance with Provisions C.1 through C.17 of this Permit." This would also clarify what we understand to be staff's intention regarding this issue. These two revisions, to Provision C.1 and Discharge Prohibition A.2, would accomplish compliance with the directives of the two above-mentioned State Water Board Orders. We agree with the comments submitted by Bob Falk on behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program ("SCVURPPP") on these issues.	
SCVURPPPAttny Comments 2	2	A.2 & C.1	Water Quality Standards Exceedances	Provision C.1 as Currently Drafted Violates State Board Order WQ 1999-05 and Needs to be Revised Accordingly	This comment is similar to those summarized above that were made by SCVURPPP. The Tentative Order has been revised to reference Prohibitions A1 and A2 in C1, thus making both subject to the iterative process.
SCVURPPPAttny Comments 2	2	A.2 & C.1	Water Quality Standards Exceedances	In Discharge Prohibitions A.1 and A.2, the Tentative Order requires that Permittees prohibit the discharge of non-exempted non-stormwater (A.1) and rubbish and other solid wastes in stormwater and non-stormwater (A.2) into storm drain systems and surface waters. However, unlike its approach within Discharge Prohibition A.1, as currently drafted, the Tentative Order does not expressly address how compliance with Discharge Prohibition A.2 is to be effectuated vis-à-vis the implementation Provisions of the permit. The Tentative Order also currently neglects to include references to both Discharge Prohibitions A.1 and A.2 in the first paragraph of Provision C.1, in both places where Receiving Water Limitations B.1 and B.2 are referenced. These omissions place the Tentative Order in direct violation of State Board Order WQ 1999-05,[1] a precedential order requiring that municipal stormwater permits tie discharge prohibitions to the	The Tentative Order has been revised to address the commenter's concern that Provisions A1 and A2 should be subject to the iterative process. As revised it would provide that Discharge Provisions A1 and A2 are subject to the iterative process.

[1] Available at http://www.swrcb.ca.gov/resdec/wqorders/1999/wqo99-05.html

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				implementation of control measures, by which Permittees' compliance with the permit can be determined.[2] With respect to the first paragraph of Provision C.1, the State Board Order specifically requires that municipal stormwater permits include the following language: "The permittees shall comply with *Discharge Prohibitions [ ] and* Receiving Water Limitations [ ] through timely implementation of control measures and other actions to reduce pollutants in the discharges..." Order WQ 1999-05, ¶ 3 (emphasis added). Request: We therefore request that the words "Discharge Prohibitions A.1 and A.2 and" be added before "Receiving Water Limitations" in the first and third sentences of the first paragraph of Provision C.1 as shown in italics immediately below: The Permittees shall comply with *Discharge Prohibitions A.1 and A.2 and* Receiving Waters Limitations B.1 and B.2 through the timely implementation of control measures and other actions to reduce pollutants in the discharge of stormwater runoff. The Permittees shall implement control measures and Best Management Practices (BMPs) to reduce pollutants in stormwater discharges to the maximum extent practicable in accordance with the requirements of this *P*ermit, including any modifications. The performance standards specified in Provisions C.2 through C.15 are designed to achieve compliance with *Discharge Prohibitions A.1 and A.2 and* Receiving Waters Limitations B.1 and B.2 through implementing management practices, specifying level of implementation, and requiring timely and complete reporting to enable determination of compliance with the specified performance standards.	
SCVURPPPAttny Comments 2	3	A.2 & C.1	Water Quality Standards Exceedances	State Board Order WQ 2001-15[3] refines Order WQ 1999-05 by requiring an iterative approach to compliance with water quality standards that involves assessments and revisions over time. The Tentative Order as drafted violates this State Board Order by omitting from Discharge Prohibition A.2 any reference to Provisions C.1 through C.17, which provide the practices by which discharge prohibitions are implemented and evaluated. The State Board	The Tentative Order has been revised to address the commenter's concern that Provisions A1 and A2 should be subject to the iterative process. As revised it would provide that Discharge Provisions A1 and A2 are subject to the iterative process.

[2] Precedential decisions and orders provide guidance for later decisions and orders. A Regional Water Board cannot reverse a State Water Board precedent. http://www.swrcb.ca.gov/resdec/index.html.
[3] Available at http://www.swrcb.ca.gov/resdec/wqorders/2001/wq2001_15.pdf

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				specifically rejected this very approach to drafting of a discharge prohibition in a municipal stormwater permit in Order WQ 2001-15: "[t]he permit must be clarified so that the reference to the iterative process for achieving compliance applies not only to the receiving water limitation, *but also to the discharge prohibitions* that require compliance with water quality standards." State Board Order WQ 2001-15, p. 16 (emphasis added).[4] Request: Accordingly, we request the sentence "Compliance with this prohibition shall be demonstrated in accordance with Provisions C.1 through C.17 of this Permit" be added to Discharge Prohibition A.2 as shown in italics immediately below: It shall be prohibited to discharge rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would eventually transported to surface waters, including flood plain areas. *Compliance with this prohibition shall be demonstrated in accordance with Provisions C.1 through C.17 of this Permit.*	
SCVURPPPAttny Comments 2	4	A.2 & C.1	Water Quality Standards Exceedances	In addition to violating these two precedential State Board Orders, the Tentative Order as drafted are contrary to sound public policy. By failing to fully tie the Discharge Prohibitions to the Provisions of the permit and iterative process, the Tentative Order essentially asks the Municipalities to make continued and significantly increased investments in their stormwater management and monitoring programs while concurrently setting them up for enforcement actions (potentially including citizens' lawsuits in federal court) and penalties *even if they fully fund, staff, and comply with every single implementation provision of the permit*. Bay Area municipalities deserve better than this Catch-22. The Regional Board must avoid this absurd and unfair outcome and instead require that staff tie the permit's Discharge Prohibitions (both A.1 *and* A.2) and Provision C.1 together as described above, and as required by State Board precedent.	The Tentative Order has been revised to address the commenter's concern that Provisions A1 and A2 should be subject to the iterative process. As revised it would provide that Discharge Provisions A1 and A2 are subject to the iterative process.
ACCWP-Attny	1	General	Fact Sheet Legal Precedent	The Fact Sheet cites the trial court's decision in *San Francisco Baykeeper v. Regional Water Quality Control Board* as a basis for the permit's detailed monitoring requirements. The *Baykeeper* case does not serve as a precedent because it is a trial court decision. The Fact Sheet should acknowledge that the *Baykeeper* case was not precedential.	The Fact Sheet identified the *Baykeeper* decision as a trial court decision and explained that it decided an issue raised concerned a stormwater permit previously issued by the Board. The Fact Sheet's reference to the case should not be interpreted to mean that the Board interprets the case to be precedential.

[4] Here, the appropriate reference to the iterative approach is already included in Prohibition A.1, so the deficiency that needs to be addressed is with A.2.

Response to Comments on December 14, 2007 Tentative Order
General Legal Comments

File	Comment #	Prov. No.	Key Word(s)	Comment	Response
ACCWP-Attny	1	General	Legal Precedent	The Fact Sheet should disclose the more recent appellate case, *Divers' Environmental Conservation Organization v. SWRCB* 145 Cal. App.4th 246. The case holds that as long as the permit provides sufficient details and standards, permittees can develop management and monitoring plans.	The decision cited by the commenter includes a very brief discussion of the adequacy of an individual NPDES permit's requirements for developing a stormwater pollution prevention plan (SWPPP). The decision does not detail the specifics of the challenge or the legal standards on which the court relied in deciding that the permit's requirements were legally adequate. Furthermore, the plan at issue was a Stormwater Pollution Prevention Plan, a different type of plan than the Tentative Order would require that dischargers prepare.
ACCWP-Attny	1	General	Legal Precedent	Neither the Baykeeper opinion or the Divers' case requires the extensive monitoring provisions proposed by staff for the MRP. The Divers decision provides Permittees and the Board extremely broad discretion in formulating monitoring programs.	The monitoring requirements adhere to the federal regulatory standard of MEP.
ACCWP-Attny	2	C15	Legal Authority for SW Diversions	Most permittees lack legal authority to discharge their flows to POTWs without the POTWs' consent. Even where the Permittee agency implements both the stormwater program and the sanitary sewer system, each may be separately funded, separately organized as legal entities and have different purposes, jurisdictional limits, and objectives in their operations. The MRP should not contain compliance obligations requiring Permittees to perform acts (diverting stormwater, even in pilot tests) beyond their legal capacity.	In the Final TO, we have clarified that discharges to the POTW require the informed consent of the POTW authority.

Response to Comments on December 14, 2007 Tentative Order
Unfunded Mandate – Legal Comments

File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
U.S. EPA– Hearing – Eberhardt, D.	3	General	Unfunded mandate	Regarding comments on unfunded mandate, the Clean Water Act and its regulation provide for considerable state discretion when writing permit requirements, and we find the requirements in the draft permit do have a basis in federal regulations.	Comment noted – we agree.
SCVURPPPAttny Comments 1	5	General	Unfunded mandate	A number of the obligations imposed by the Tentative Order are unfunded mandates because they are uniquely governmental functions and are expressly imposed on the municipalities that are permittees and not on the general public. Many of the obligations are new programs because the Regional Board did not exercise its discretion to impose the requirements in earlier permits.	The permit's requirements do not impose unfunded mandates for a variety of reasons. Among those reasons is that the requirements are necessary to comply with the federal requirement that stormwater permits control discharges of pollutants to the maximum extent practicable (MEP). Mandates imposed by federal law are exempt from the requirement that the local agency's expenditures be reimbursed. . Another reason is that the State Constitution's prohibition on unfunded mandates applies only to a new program or a higher level of service. Many of the challenged provisions are continuations of requirements already in permits previously issued to permittees. Even if the TO were to require new programs or higher levels of service, there are additional requirements that must be met before a local government would qualify for subvention (reimbursement of its costs). Subvention is not required if the costs of compliance can be reallocated or paid for with fees. The permittees can raise the fees they charge residents and businesses. Further, none of the challenged provisions is subject to reimbursement because the TO would not be uniquely imposed upon local governments. Reimbursement to local agencies is required only for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities. The fact that a requirement may

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Unfunded Mandate – Legal Comments

File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
					single out local governments is not dispositive. Where local agencies are required to perform the same functions as private industry, no subvention is required. Private industry is required to comply with NPDES permits, including storm water permits. In fact, the requirements for industrial and construction entities are more stringent than for government dischargers. The permittees would not be regulated in a manner peculiar to local government. Staff disagrees that the TO imposes unfunded mandates subject to subvention, and will respond accordingly if a claim is filed with Commission on State Mandates.
SCVURPPPAttny Comments 1 ACCWP-Attny	5 4	General	Unfunded mandate	Other obligations have been increased and/or made significantly more prescriptive in comparison to those set forth in prior stormwater permits such that they constitute higher levels of service. A "higher level of service" exists where the mandate results in an increase in the actual level of governmental services provided.	As noted above, the permit's requirements do not constitute unfunded mandates for a variety of reasons. In part, the requirements are based in federal law and are therefore exempt from the unfunded mandate State statute.
SCVURPPPAttny Comments 1	3	General	Comparison to EPA Region 9 Permit	A comparison of the municipal stormwater permit requirements that the EPA issues with those set forth in the Tentative Order belies the position that the items identified above fall within the federal Clean Water Act's maximum extent practicable (MEP) standard. A permit issued by EPA Region 9 is attached to the comments. It is much shorter than the Tentative Order and does not contain a 100+ page reporting form. The attached EPA issued permit accords the subject municipalities far more discretion in determining the scope and level of implementation of the various components of their stormwater management programs. Other EPA issued permits follow that approach.	Board staff consulted with EPA Region 9 staff concerning the permit that the permit that EPA issued that the commenter statesis shorter and provides municipalities with greater discretion than the proposed MRP. Region 9 staff confirmed that the permit it cited by the commenter is not relevant to the proposed MS4 permit. EPA's staff offered a number of reasons. They stated that the permit issued by EPA was the first stormwater permit issued to the Island of Saipan whereas the proposed MRP would be the fourth permit for most Bay Area permittees who now have over 15 years of experience implementing their stormwater permits. The fact that Bay Area permittees have that history of implementing stormwater permits is important because the federal stormwater program provides that

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Unfunded Mandate – Legal Comments

File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
					permits are expected to increase in effectiveness through iterations in the permit over time (the "iterative approach"). Furthermore, EPA noted that the Saipan permit was issued to a discharger with a population of 80,000 whereas the proposed MRP would be issued to jurisdictions with a combined population of 5 million people.
San Jose Atty SCVURPPPAttny Comments 1 ACCWP-Attny	5,5	General	Beyond CWA	Requirements that go beyond those required under the federal Clean Water Act, require consideration of economic impacts, and without the assurance of the provision of State funding, violate Article XIIIB, Section 6 of the California Constitution.	The requirements in the MRP Revised Tentative Order (RTO) are required under the Clean Water Act and constitute MEP for this Region.
ACCWP-Attny	1	General	Monitoring	40 CFR 122.48(b) provides federal legal guidance for the scope of required monitoring requirements for NPDES permits. It provides that all permits shall specify required monitoring including "type, intervals, and frequency sufficient to yield data which are representative of monitored activity." For stormwater permits not issued by EPA, there is no specific regulatory guidance on how this should be applied in the context of municipal stormwater permitting. Staff's proposal goes considerably beyond the very general federal regulatory requirement reflected in that regulation. Meaningful compliance data can be provided by the Permittees that satisfies federal regulations with a much less prescriptive and less detailed monitoring program than that indicated in the Tentative Order.	The commenter has quoted from one of several regulations cited in the draft permit Fact Sheet as providing the specific legal authority for the permit's monitoring provisions. We agree that the regulation sets forth the general subject areas that a permit's monitoring provisions must address. The draft permit's monitoring provisions are consistent with the cited regulation. Further, they are intended to ensure that permittees undertake adequate monitoring to verify whether the discharge of pollutants in stormwater runoff has been reduced to the maximum extent practicable.
SCVURPPPAttny Comments 1	6	General	Fact Sheet Legal Precedent	The substantive arguments in the Fact sheet are erroneous. Federally mandated appropriations are those required to comply with the mandates of the courts or federal government, which "without discretion, require an expenditure for additional services or which unavoidably make the provision of existing services more costly. California courts "are not convinced that the obligations imposed by a permit issued by a Regional Water Board necessarily constitute federal mandates under all circumstances." (Quotes County of Los Angeles v. Commn. On State Mandates (2007) 110 Cal. App. 4th 898, 907, 914.) The California Supreme Court has acknowledged that an NPDES permit may contain both federally mandated terms as well as terms exceeding federal law. (City of Burbank v. State Water Resources Control Board (2005) 35 Cal. 4th 613.) Where state mandated requirements exceed federal requirements, those mandates constitute a reimbursable sate mandate. (Long Beach Unified School District v. State of California (1990) 225 Cal. App. 3d 155, 172-173.)	We disagree that the Fact Sheet is erroneous. Comment noted with respect to the commenter's summary of case law.

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Unfunded Mandate – Legal Comments

File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
SCVURPPPAttny Comments 1	6	General	Federal Law Subvention	Whether an obligation imposed by a municipality results from a federal law or program does not, by itself, render that obligation a "federal mandate" for subvention purposes. Where the manner of implementation of the federal program [is] left to the true discretion of the state" the state's decision to shift the burden to municipalities gives rise to subvention. (Long Beach Unified School District v. State of California (1990) 225 Cal. App. 3d 155, 172-173.) The Tentative Order goes beyond the mandates of federal law. The Board has the authority to impose permit requirements going beyond MEP to facilitate the achievement of water quality standards, but that constitutes an exercise of discretion subjecting those requirements to the State Constitution's subvention requirement.	We disagree that the Tentative Order goes beyond the mandates of federal law. The permit's provisions are proposed to meet the federal requirement that the discharge of pollutants in stormwater be controlled to the maximum extent practicable. The Board is required to exercise its discretion in choosing specific best management practices for inclusion in a permit so that the permit will meet that federal standard. The exercise of that discretion does not create a reimbursable mandate.
SCVURPPPAttny Comments 1	6	General	Federal Mandate	In arguing that the Tentative Order is a federal mandate the Regional Board puts too much weight on the federal nature of TMDL requirements. The specific manner in which a TMDL is implemented in an NPDES permit is not a federal mandate but rather is left to the state's discretion. (Pronsolino v. Marcus (9th Cir. 2002) 291 F. 3d 1123, 1140.) Thus implementation of the TMDL requirements does not cure the Tentative Order of its constitutional violation.	We disagree that the permit would result in an unfunded mandate in violation of the California state constitution. As we note above the state is required under federal law to exercise its discretion in choosing specific best management practices for inclusion in the permit so that the permit will meet federal standards. The challenged provision is required to meet the maximum extent practicable standard. Staff will respond in greater detail if a claim is filed with the State Commission on Unfunded Mandates Commission.
SCVURPPPAttny Comments 1	6	General	Fact Sheet Subvention	The staff failed to explain why a statement in the Fact Sheet is legally significant or relevant. The Fact sheet relies on a case that does not support the assertion that the obligations imposed on municipalities by the Tentative Order "reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental discharges." The case is County of Los Angeles v. State of California (1987) 43 Cal. 3d 46.	We disagree with the commenter's characterization of the case cited in the Fact Sheet. The decision holds that local governments will not be reimbursed for costs that are an "incidental impact of laws that apply generally to all state residents and entities". *County of Los Angeles v. State of California* (1987) 43 Cal. 3d 46 at 56-57. That holding is consistent with the statement made in the Fact Sheet. We further disagree that the TO imposes unfunded mandates subject to subvention, and will respond accordingly if a claim is filed with Commission on State Mandates.

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File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
SCVURPPPAttny Comments 1	6	General	Fact Sheet Unfunded Mandate	The Fact Sheet asserts that municipalities have the authority to levy service charges, fees, and other assessments to fund compliance with the order and that the Order would thus not be an unfunded mandate. This begs the question of whether the requirement being imposed violates the prohibition on unfunded mandates.	We disagree with the commenter's assetion that a municipality's authority to levy charges, fees or assessments is not relevant to the issue of whether there would be an unfunded mandate. Government Code section 17555(d) provides that: "The commission [on State Mandates] shall not find costs mandated by the state…in any claim submitted by a local agency…if the commission finds that…[t]he local agency…has the authority to levy service charges, fees, or assessments sufficient to pay for themandated program or increased level of service." In that event there would be no prohibited unfunded mandate.
SCVURPPPAttny Comments 1	3	General	Prescriptive Reporting	The prescriptive formatting and excessive paperwork/data management and reporting requirements exceed the requirements of Federal law and constitute an unfunded mandate.	The reporting requirements have been reduced in the revised Tentative Order. The reporting in the permit is necessary to determine compliance with the permit provisions. There is no limitation on reasonable reporting to determine compliance that has been put forward by the commentor.
SMCWPPP	1	General	Reporting	The reporting requirements that are cited in Fact Sheet as based on CA Water Code section 13267 exceed the requirements of Federal law and constitute an unfunded mandate	We disagree. This issue is discussed in greater detail above in response to a comment made on behalf of the Alameda County Clean Water Program.
ACCWP-Attny	1	General	Monitoring Requirements Excessive	The Tentative Order specifies detailed and extensive monitoring requirements for the MRSP that include the following: San Francisco Estuary Receiving Water Monitoring (Provision C.8.b); Status Monitoring/Rotating Watersheds (C.8.c); Long-Term Trends Monitoring (C.8.d); Status & Trends Follow-up Analysis and Actions (Attachment G); Monitoring Projects (C.8.e); Pollutants of Concern Monitoring (C.8.f); Citizen Monitoring and Participation (C.8.g); Reporting (C.8.h); Standard Monitoring Provisions (Attachment H); and numerous other monitoring and reporting requirements contained in many provisions of the MRSP.	Comment noted.
ACCWP-Attny	5	C2.h	Rural Roads	The requirements for rural public works (Provision C.2.h.) exceed the requirements of Federal law and constitute an unfunded mandate.	The cited requirements are not unfunded mandates. The provision's rural roads have been in the Alameda and Santa Clara permits for many years. As discussed above, the constitutional prohibition on unfunded mandates only applies to new programs or increased levels of service. Further, the provisions in the permit are MEP under federal law..

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Unfunded Mandate – Legal Comments

File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
SMCWPPP	1	C2	Rural Roads	The requirements to assess stream channel function and condition when replacing culverts exceed the requirements of Federal law and constitute an unfunded mandate.	These provisions are necessary to prevent further stream degradation and to reduce the potential for downstream erosions and sedimentation. They constitute MEP under federal law and are thus not unfunded mandates.
SMCWPPP	1	C2	SB 1070	The requirements to comply with SB 1070 exceed the requirements of Federal law and constitute an unfunded mandate.	We disagree that the permit imposes requirements (including the provision cited) that constitute unfunded mandates. The Commission on State Mandates is the agency that is charged with deciding questions related to whether or not state requirements constitute unfunded mandates. In the event that the Commission considers such a claim concerning the MRP, we will provide a detailed response.
SCVURPPPAttny Comments 1 ACCWP-Attny	3 5	C2	Catch Basin Cleaning	The requirements for Inspection and cleaning of all catch basins prior to the rainy season exceed the requirements of Federal law and constitute an unfunded mandate.	This requirement has been removed from the permit.
SCVURPPPAttny Comments 1 ACCWP-Attny	3 5	C2	Street Sweeping	Compliance with prescriptive street sweeping/sweeper specifications exceed the requirements of Federal law and constitute an unfunded mandate.	This requirement has been removed from the permit.
ACCWP-Attny	4	C3.b	< 10K	Reduction of the 10,000 sq ft. new/redevelopment threshold to 5,000 sq. ft. (Provision C.3.b.i(1)(a).) exceed the requirements of Federal law and constitute an unfunded mandate.	The provisions reducing the C.3 threshold from 10,000 sq. ft. to 5,000 sq. ft. are consistent with the Los Angeles and San Diego municipal stormwater permits and the Bellflower SUSMP. They therefore meet the MEP standard and do not exceed the requirements of federal law or constitute an unfunded mandate.
SCVURPPPAttny Comments 1	3	C3	< 10K	Mandating imposition of new development and redevelopment numeric treatment standards for projects 10,000 square feet or smaller exceeds the requirements of Federal law and constitutes an unfunded mandate.	The federal standard is control of pollutants in stormwater to the maximum extent practicable (MEP). The requirements meet this MEP standard. Other permits have provisions that are equivalent or more stringent than the proposed permit provision. The Los Angeles and San Diego permits require treatment controls to 5,000 sq. ft. on the same categories. Los Angeles reduces the limit to 2,500 sq. ft. when there is a discharge to an Areas of Special Biological Significance.

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File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
SCVURPPPAttny Comments1 ACCWP-Attny	3 4	C3	Trails	The requirements for stormwater treatment on trails, bicycle lanes, and existing road rehabilitation projects exceed the requirements of Federal law and constitute an unfunded mandate.	The proposed requirements are consistent with the MEP standard. The Los Angeles permit requires that all three areas drain to treatment, but we are only proposing that impervious trail runoff go to adjacent vegetation. We are proposing a "Green Streets" Pilot Program instead of the road requirement. Additionally, Caltrans is required in their stormwater permit to address stormwater treatment in extensive road rehabilitation.
SCVURPPPAttny Comments 1 ACCWP-Attny	3 5	C3	Hydromod	The hydromodification (peak flow regardless of pollutant content) management provisions exceed the requirements of Federal law and constitute an unfunded mandate.	These requirements have already been implemented in all San Francisco Bay area Phase I MS4 permits thus they are not new programs or higher levels of service. Futher, they do not exceed federal law
ACCWP-Attny	4	C3	Arterial Roads	Replacement of certain arterial streets not previously included (Provision C.3.b.i(5).) exceed the requirements of Federal law and constitute an unfunded mandate.	Requirements for treatment of road replacement have been removed from the Revised TO.
ACCWP-Attny	4	C4.c, C5.b	Tiered Enforcement	Tiered enforcement programs for the results of industrial and commercial inspections (Provisions C.4.c and C.5.b) exceed the requirements of Federal law and constitute an unfunded mandate.	The tiered enforcement requirements from the previous draft have been removed in the Revised Tentative Order. We propose to leave the implementation details up to the Permitttees, but we would expect adequate enforcement and legal response to achieve timely compliance. The Los Angeles and San Diego permits are far more prescriptive.
ACCWP-Attny	5	C4	Inspection Requirements	Detailed/commercial inspection requirements (Provision C.4.b&c.) exceed the requirements of Federal law and constitute an unfunded mandate.	The commercial inspection requirements from the previous draft have been removed in the Revised Tentative Order. Under the Tentative Order, the Permittees will determine the inspection requirements in the development of their Enforcement Response Plans. The details would be up to the Permitttees, but we expect adequate enforcement and legal response to achieve timely compliance.
SCVURPPPAttny Comments 1	3	C4	State Permitted Facilities	Inspection of industrial facilities directly permitted by the State or Regional Water Boards and which pay NPDES permit fees to the State to help defray the cost of administering and overseeing compliance with such permits exceed the requirements of Federal law and constitute an unfunded mandate.	Inspection of facilities permitted by the State and Regional Water Boards is already required under the current permit requirements. The Federal regulations clearly indicate a strategy of co-regulation.

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File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
SCVURPPPAttny Comments 1	3	C4	State Permitted Facilities	Inspection requirements: commenter provided further detail about his comment above. Clean Water Act regulations set forth the facilities that municipalities are required to inspect. They are solely municipal landfills, hazardous waste treatment disposal and recovery facilities, industrial facilities that are subject to a specified section of SARA, and industrial facilities that a municipality as determined to be contributing a substantial pollutant loading to the municipal storm sewer system. (40 CFR sec. 122.26(d)(2)(iv)(C).) Federal regulations do not require inspections of additional industrial facilities or construction sites which have their own NPDES permit coverage (for which they pay fees to the State and the State does not share the fees with local governments).	The assertions made in this comment are incorrect. The municipal regulations require an effective program to prevent polluted stormwater runoff from municipal and industrial entities regardless of their status under the Statewide General Industrial or Construction Permits. Many permittees already inspect these facilities under the current permit.
ACCWP-Attny	4	C5.a	Legal Authority	Establishing the legal authority for the illicit discharge detection and elimination program (Provision C.5.a.) exceeds the requirements of Federal law and constitutes an unfunded mandate.	Federal Regulations require adequate legal authority to prevent pollutants from entering the MS4. The legal authority is necessary to achieve compliance thus there would be no unfunded mandate.
SCVURPPPAttny Comments 1	4	C5	Mobile Business	Mandatory requirements to identify and inspect field operations of mobile businesses where business is based and registered outside of co-permittee's boundary line (Provision C.4.b.ii(c)) exceed the requirements of Federal law and constitutes an unfunded mandate.	The requirements for inspection of mobile businesses have been moved to C.5. More prescriptive requirements for identification and inspection are in the San Diego municipal stormwater permit. The permit requirements are thus not unfunded mandates.
SMCWPPP	1	C6	BMP Effectiveness	The requirements to study effectiveness of BMPs exceed the requirements of Federal law and constitute an unfunded mandate.	The proposed permit is based on implementation of BMPs in lieu of numberic limits as provided under federal regulations. The dischargers' existing MS4 permits require monitoring of the effectiveness of BMPs. The monitoring included in the proposed permit is necessary to demonstrate that dischargers have complied with permit requirements, thus controlling the discharge of pollutants in stormwater to the maximum extent practicable.
ACCWP-Attny	4	C6.a	Construction Mgmt.	Coverage for inspection and enforcement for stormwater pollution control on all construction sites (Provision C.6.a.) exceeds the requirements of Federal law and constitutes an unfunded mandate.	Inspection of sites contributing polluted runoff to the MS4 system has been required for years. These are not new requirements the actions required are MEP.
SMCWPPP ACCWP-Attny	1	C6	Construction Controls	Advanced treatment for construction site runoff where municipalities have determined there is an exceptional threat to water quality exceeds the requirements of Federal law and constitutes an unfunded mandate.	The comment concerns a provision that is not included in the revised Tentative Order.

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File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
SMCWPPP	1	C4, C5, C6	Enforcement Response Plans	Requirements for Enforcement Response Plans exceed the requirements of Federal law and constitute an unfunded mandate.	The permit is based on implementation of BMPs in lieu of numeric limits. Enforcement response plans are BMPs and are necessary to ensure that the discharge of pollutants to stormwater is controlled to the maximum extent practicable.
SMCWPPP	1	C7	SD Inlet Marking	Retrofit Storm drain inlet parking on privately maintained streets exceeds the requirements of Federal law and constitutes an unfunded mandate.	The comment concerns a provision that is not included in the revised Tentative Order.
SCVURPPPAttny Comments 1	3	C8	Monitoring	The permit includes excessive and highly prescriptive monitoring requirements with an additional layer of monitoring/investigation activities triggered based on monitoring results and with no upper resource limit. These requirements exceed Federal law and constitute an unfunded mandate.	The monitoring requirements do contain an upper resource limit. The monitoring provisions in the Revised Tentative Order are less prescriptive than the Los Angeles permit.
ACCWP-Attny	4	C9.a	IPM Ordinances	Development of Integrated Pest Management ordinances for some Permittees (Provision C.9.a&b) exceed the requirements of Federal law and constitute an unfunded mandate.	The development of an IPM program has been done by Permittees before,thus the requirement is not a new program or higher level of service. The development of a Plan under the revised Tentative Order is falls under the federal regulatory standard of MEP, and therefore does not constitute an unfunded mandate.
SMCWPPP	1	C9	Pesticide Management	Track CA DPR Pesticide evaluation activities and encourage it to coordinate with CA Water Code exceeds the requirements of Federal law and constitutes an unfunded mandate.	The comment concerns a requirement that is in the permits previously issued to some of the permittees. It thus constitutes MEP.
SMCWPPP	1	C9	Pesticide Management	Requirements to assist DPR and CA Agric. Commissioners to ensure that pesticide applications comply with water quality standards exceed the requirements of Federal law and constitute an unfunded mandate.	The requirements are for simple assistance, and fall well within the federal regulatory definition of MEP, and therefore do not constitute an unfunded mandate.
SCVURPPPAttny Comments 1	3	C10	Trash Control	Prescriptive control measures for trash collection and management (especially purchase, installation and maintenance of full capture devices) exceed the requirements of Federal law and constitute an unfunded mandate.	The current requirements for trash control measures are significantly below what is currently being implemented in Los Angeles. The requirements and implementation in Los Angeles have demonstrated MEP, therefore requirements for trash capture device installation do not constitute an unfunded mandate.
ACCWP-Attny	4	C10	Trash Control	Requirements to cover pilot enhanced trash control in certain high trash impact catchments (Provision C.10.a,b&d.) exceed the requirements of Federal law and constitute an unfunded mandate.	Trash control requirements are changing to allow more flexibility and recognize variability in permittee's area of jurisdiction, but are still far below the MEP level established in Los Angeles under implementation of the Trash TMDL. Trash is a demonstrated stormwater

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File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
					pollutant requiring control to protect the Beneficial Uses of receiving waters,
SMCWPPP	1	C10	Trash Controls	Requirements to implement trash and litter controls based on Basin Plan prohibition which is intended primarily to protect recreational use, including boating and navigation exceed the requirements of Federal law and constitutes an unfunded mandate.	The requirements to implement trash would control the discharge of pollutants into stormwater to the maximum extent practicable and therefore are necessary to comply with federal law.
SMCWPPP	1	C10	Trash Controls	Requirements to enforce local ordinances to displace homeless encampments from creek sides exceed the requirements of Federal law and constitute an unfunded mandate.	These requirements have been removed from the Revised TO.
SCVURPPPAttny Comments 1	3	C11 C12	PCBs Hg Private Property	Requirement for effectuating abatement/remediation of privately-owned properties identified as having elevated levels of PCBs or mercury exceed the requirements of Federal law and constitute an unfunded mandate.	The requirement referenced in this comment is not in the revised Tentative Order. We agree that permittees should help identify properties, but are not responsible for requiring clean-up. The responsibility to require clean-up is a function of the Water Board and DTSC.
SCVURPPPAttny Comments 1	3		PBDE	Creation and implementation of a plan to assess and manage discharge of PBDE exceed the requirements of Federal law and constitute an unfunded mandate.	PBDE is a major pollutant of concern with a strong likelihood of health impacts and pollutant mobilization through stormwater.
ACCWP-Attny	4	C15.b	Non-SW Discharges	Significant modifications to conditionally exempt non-stormwater discharge requirements, control measures and monitoring (Provision C.15.b.) exceed the requirements of Federal law and constitute an unfunded mandate.	We are collapsing the detail normally found in the separate Stormwater Management Plan or plans into the permit, to have the minimum prescription and reporting demonstrate MEP level of control of non-stormwater discharges.
SCVURPPPAttny Comments 1 SMCWPPP ACCWP-Attny	3 1 5	C15	Pump Stations	Prescriptive pump-station pilot program (i.e., stormwater diversion from pump stations to the sanitary sewer) and associated monitoring exceed the requirements of Federal law and constitute an unfunded mandate.	The pilot projects are related to TMDL implementation and are consistent with the requirments under Federal Law.
SCVURPPPAttny Comments 1	3	C15	Potable Water Discharge	Mandatory monitoring and benchmarks for potable water discharges from hydrants and leaks exceed the requirements of Federal law and constitute an unfunded mandate.	These are conditions for allowing non-stormwater discharges. The permit could ban them outright. The monitoring and attainment of benchmarks for these discharges constitutes MEP
ACCWP-Attny	5	C15	Non-SW Discharge	BMP/control measure requirements for non-stormwater discharges (Provision C.15.b.) exceed the requirements of Federal law and constitute an unfunded mandate.	These requirements and the BMP technology have been in place for many years. Their application is MEP.

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File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
ACCWP-Attny	7	C15	GW Discharge	Reporting of uncontaminated groundwater at flows greater than 10,000 gallons per day before discharging exceed the requirements of Federal law and constitute an unfunded mandate.	Long term continuous discharges of this volume are rare and needs to be monitored at the beginning for potential pollutant impacts and erosive potential. Reporting of these discharges falls well within the federal regulatory standard of MEP.
ACCWP-Attny	7	C15	Non-SW Discharge	The permit requires that Permittees "effectively prohibit" the discharge on non-stormwater into the storm drain system and water courses. There are exceptions provided in Provision c.15, which describes a tiered categorization on non-stormwater discharges. Federal regulations support this approach and give municipalities considerable latitude in this determination. 40 CFR 122.26(d)(2)(iv). Provision C.15.b exceeds federal requirements. The conditional exemptions in C.15.b.i-vii are too narrowly drawn and overly prescriptive in nature, thus going well beyond federal law. The federal regulations intend that municipalities must be allowed more discretion in the determination of applicable control measures relating to discharges that may be sources of pollutants.	The commenter has cited a federal regulation that sets forth various requirements for MS4 dischargers to meet in their permit applications. The commenter has not explained how provision C.15.b of the TO is inconsistent with federal requirements. The requirements are necessary to ensure that permit controls the discharge of pollutants to stormwater to the maximum extent practicable.
ACCWP-Attny	7	C15	Non-SW Discharge	Assurance that the discharges must meet water quality standards consistent with effluent limits in Water Board general permits exceed the requirements of Federal law and constitute an unfunded mandate.	The TO has been revised to clarify that the discharges must meet applicable requirements in specified general permits. The requirement references existing requirements and does not constitute an unfunded mandate. If these discharges are long term or have pollutants of concern that do not meet effluent limits, the discharges must receive coverage under an applicable individual NPDES permit.
SMCWPPP	1	C15	Non-SW Discharge	Control Discharges and activities regardless of whether the discharge flows to the storm sewer exceed the requirements of Federal law and constitute an unfunded mandate.	The TO's requirements are based on the recognition that direct dumping and even windblown discharges from rights of way within the Permittees' jurisdictions into the MS4 constitute discharge of pollutants in stormwater. Under federal law the permit must control discharges of pollutants into stormwater to the maximum extent practicable.
ACCWP-Attny	7	C15	Non-SW Discharge	Attainment of prescribed turbidity levels exceed the requirements of Federal law and constitute an unfunded mandate.	The attainment of turbidity levels to protect water quality in non-stormwater discharges can be achieved with BMPs that have been utilized for over 15 years. The use of sediment control BMPs is MEP.

Response to Comments on December 14, 2007 Tentative Order
Unfunded Mandate – Legal Comments

File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
ACCWP-Attny	7	C15	Non-SW Discharge	Attainment of prescribed pH levels exceed the requirements of Federal law and constitute an unfunded mandate.	In order to be an exempt non-stormwater discharge, the discharge must have no pollutant effect. Attainment of the proposed pH levels will ensure that the discharge of pollutants is controlled to the maximum extent practicable.
ACCWP-Attny	7	C15	Construction Controls	Erosion prevention requirements for non-stormwater discharges exceed the requirements of Federal law and constitute an unfunded mandate.	The erosion prevention requirements in the permit are MEP the are proposed in lieu of the federally mandated prohibition and thus do not exceed Federal regulations.
ACCWP-Attny	7	C15	Non-SW Discharge	Dewatering discharges to be discharged to the sanitary sewer if available exceed the requirements of Federal law and constitute an unfunded mandate.	The revised Tentative Order includes language that makes transfer contingent upon POTW acceptance. Language has been added that allows POTW refusal.The requirement in the TO will result in control of pollutants in stormwater to the maximum extent practicable. It is in lieu of the federally mandated prohibition on such discharges and is based on the implementation of BMPs in lieu of numeric limits. Further, routing of discharges to sanitary sewers is a demonstrated BMP.
ACCWP-Attny	7	C15	Non-SW Discharge	Maintenance of records of the discharges, BMPs implemented and monitoring activity exceed the requirements of Federal law and constitute an unfunded mandate.	The maintenance of records is necessary to determine compliance with the permit's requirements to ensure control of discharges into stormwater to the maximum extent practicable. The implementation of BMPs and monitoring to insure compliance of non-stormwater discharge are MEP actions required to prevent impacts to receiving waters.
ACCWP-Attny	4	C15.b	Non-SW Discharge	Cover discharges from pools, hot tubs, spas and fountains (Provisions C.13.b and C.15.b.v.) exceed the requirements of Federal law and constitute an unfunded mandate.	These requirements are currently included in municipal stormwater permits issued to these Permittees. The actions required in the provision are MEP. The discharge of exempt non-stormwater is only allowed after Chlorine and other pollutants are removed.
Baykeeper	1	General	MEP Standard Vague Requirements	Once again, we request that Regional Board staff review the Permit and ensure that it articulates specific performance criteria based on an analysis of what is necessary to implement the federal Maximum Extent Practicable ("MEP") standard, and that each permit task or objective is translated into specific, measurable requirements with associated deadlines.	We have addressed this issue in our response to comments submitted subsequently by the commenter.

Response to Comments on December 14, 2007 Tentative Order
Unfunded Mandate – Legal Comments

File Name	Comment No.	Prov. No.	Key Word(s)	Comment	Response
				1.)The Permit's vagueness creates an impermissible self-regulation scheme prohibited by *Environmental Defense Center v. EPA*. Vague permit requirements are not only troublesome from a compliance review perspective, but are contrary to existing case law. In *Environmental Defense Center v. EPA, the Ninth Circuit,* interpreting the "maximum extent practicable" standard of the federal Clean Water Act, has emphasized the need for specificity in MS4 permits. In 2003, environmental groups challenged the Phase II rule issued under the CWA by EPA. Under the Phase II rule, the permittees were required to develop individualized pollution control programs. The permitting agency, however, had no obligation to review these plans. The Ninth Circuit found that Congressional intent was clear in the language of the CWA that "stormwater management programs that are designed by regulated parties must, in every instance, be subject to meaningful review by an appropriate regulating entity" to determine whether the measures implemented would actually reduce pollutant discharges. The failure to require agency review of the plans, held the Court, amounted to impermissible self-regulation because "[n]o one will review [the MS4's pollution control plan] to make sure that it is reasonable or even in good faith." Therefore, the Phase II rule "would allow permits to issue that would do less then require controls to reduce the discharge of pollutants to the maximum extent practicable." More recently, the Second Circuit adopted similar reasoning in Environmental Defense Center in reviewing similar permit procedures for concentrated animal feeding operations ("CAFOs"), which require operators to develop and implement individualized nutrient management plans and other BMPs. In Waterkeeper, the Second Circuit also held that the terms of self-designed programs must be subject to meaningful review. The rationale behind both decisions applies here. Unless a permit imposes clear and specific requirements, it gives too much latitude to permittees to determine what controls they will implement. Without agency and public oversight of how this discretion is exercised, the Permit establishes a self-regulatory plan that the courts have clearly held to be impermissible.	

Item 7. Municipal Regional Stormwater NPDES Permit – Municipalities and Flood Management Agencies in Alameda County, Contra Costa County, San Mateo County, Santa Clara County, and the Cities of Fairfield, Suisun City, and Vallejo in Solano County

Appendix F

Response to Comments on the February 11, 2009 Revised Tentative Order

The Response to Comment Tables are arranged by the Provisions of the Final TO, with the exception of General and Legal Comments, which are placed at the end. C.1 comments are included in the Legal section.

Response to Comments February 11, 2009 Tentative Order
Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Berkeley	1	C.2	Support Deletion of Street Sweeping	The City appreciates many of the changes incorporated in the Revised Tentative Order, in particular: (1) the deletion of the requirement to purchase certain types of street sweepers.	Comment noted.	No changes made.
ACCWP Attachment1	1					
Newark	1					
Crabbe, David	2	C.2	Removal of Street Sweeping Provisions	I also object to the relaxation of street sweeping requirements. Not only does it keep junk out of the bay, but it also keeps our neighborhoods clean and attractive. Please note that the City Council does not speak for me, nor do I suspect it speaks for many of my fellow residents.	The permit gives permittees credit for street sweeping that utilizes methods, frequencies, and equipment that measurably reduces stormwater pollutants.	No changes made.
SMCWPPP	1	C.2	Provision Streamlined and More Flexible	This permit provision was streamlined, in part, by no longer including specific requirements for street sweeping, types of street sweepers that need to be purchased and used, and by deleting record keeping and reporting requirements associated with street sweeping. In addition, further streamlining and flexibility have been accomplished by deleting specific requirements for cleaning storm drain inlets and storm drainage facilities other than storm drain pump stations.	Comment noted.	No changes made.
Oakland	1	C.2	Support Removal of Prescriptive Street Sweeper Requirements	We also thank the Board for many of the changes incorporated in the Revised Tentative Order, including eliminating requirements to purchase specific types of street sweepers, install treatment systems for road reconstruction projects within the existing footprint, implement an impervious surface data collection pilot project, and perform prescriptive trash requirements. We appreciate the Board's willingness to	Comment noted.	No changes made.

Response to Comments February 11, 2009 Tentative Order
Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				address some of our previous concerns.		
Contra Costa Board of Sups Attach 1	1	C.2	Concerns Regarding Elimination of Street Sweeping Requirements	Though it has been removed as a requirement in the Revised Tentative Order (RTO), it appears that the MRP anticipates that Permittees will continue to conduct this activity. Street sweeping is referenced as a trash removal Best Management Practice (BMP) in C.10; also, a pilot program to evaluate the effectiveness of street sweeping for removing mercury and PCBs is discussed in C.11 and C.12. Contra Costa County ("the County") appreciates that the RWQCB has removed the prescriptive street sweeping requirement in an effort to address co-Permittees' concerns about the high cost of meeting the previous iteration of the MRP's many requirements. However, the County is concerned that removing street sweeping as an explicit requirement may make it more difficult for the County to justify maintaining current levels of street sweeping service, possibly resulting in backsliding on the water quality advances made over the past several years. This will be especially likely if cuts must be made in the current street sweeping schedule in order to pay for other provisions of the MRP, some of which may be less effective at improving water quality than street sweeping. Finding 16 For the MRP notes that specific extraneous pollutants found in urban run-off, including heavy metals, dioxin and PBDEs, can be deposited on paved and	The Water Board agrees that street sweeping is an effective stormwater control practice if conducted using methods and frequencies that effectively eliminate pollutants. Permittees can use sweeping practices that measurably remove stormwater pollutants to satisfy the requirements for Provisions C.10, C.11, and C.12.	No changes made.

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				other impervious surfaces. The County feels that street sweeping is one of the most effective ways to prevent these pollutants from entering the storm drain system.		
Save the Bay	28	C2	Do Not Eliminate Requirements for High Efficiency Street Sweepers	The RTO eliminates requirements in Section C.2 for high-efficiency street sweeper upgrades, even though these are the only sweepers that have a documented impact on trash and other sediment-associated pollutants. The RTO also eliminates requirements for cleaning and inspecting storm drain catch basins, even though such actions can help identify trash problems when properly documented. Language in previous drafts that specified pump station retrofit requirements has also been deleted in the RTO. These established programs should not be deleted unless replaced with programs that are already clearly documented to be more effective.	These programs are still available for permittees to use in order to reduce POCs and trash. In their current structure many permittees do not sweep using equipment that is optimized for pollutant removal or at speeds effective to remove pollutants. Permittees can use sweeping frequencies and techniques that remove stormwater pollutants to satisfy the requirements for Provisions C.10, C.11, and C.12.	No changes made.
Daly City	1	C.2.a.i	Clarify Use of SQAHMO	The addition of the reference to the SQAHMO re-instates many of the deletions from the C.2 section of the 12/07 TO. This document broadly covers all aspects of C.2. Municipal Operations but it is specifically referenced to C.2.a. It is unclear whether this reference is intended only for C.2.a or could it be applied to the entire C.2 Municipal Operations of the 2-09 TO?	Provision C.2.a.i refers to the use of the California Stormwater Quality Association's Handbook for Municipal Operations as a source of methods to be used in street and road repair and maintenance.	The permit language was modified to state methods such as those described in the CASQA Handbook for Municipal Operations shall be used in street and road repair.

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Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
SMCWPPP	1	C.2.a.i	Street and Road Repair and Maintenance	The task description states that road repair and maintenance BMPs followed shall be as described in California Stormwater Quality Association's Handbook for Municipal Operations. The permittees should be allowed flexibility in identifying and using appropriate BMPs. Modify the permit to state that street and road repair and maintenance BMPs, such as those described in the California Stormwater Quality Association's Handbook for Municipal Operations, may be used.	Permittees have the flexibility to use methods equivalent to those described in the CASQA Handbook if they are equally as effective for preventing or removing stormwater pollutants.	The permit language was modified to state methods such as those described in the CASQA Handbook for Municipal Operations shall be used in street and road repair.
Contra Costa Board of Sups Attach 1	2	C.2.a.ii.(1)	What if Sanitary Sewer Disposal Unavailable?	The RTO does not provide what should be done if disposal to the sanitary sewer system is not available, and does not acknowledge that many areas of the County lack sanitary sewer service. The sanitary districts have generally expressed an opposition to accepting stormwater.	If sanitary sewer disposal is unavailable, permittees shall use appropriate BMPs to prevent the discharge of pollutants to receiving waters.	No changes made.
Daly City	2	C.2.a.ii.(1)	Clarify Intention for Diversion to Sanitary Sewer	"Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer system is available for the wastewater generated from these activities provided that appropriate approvals and pretreatment standards are met." What does this mean? How do you enforce "shall coordinate to determine"?	It means that permittees will contact sewer agencies and attempt to obtain approval for discharge of maintenance wastewater in situations where appropriate. If approval is not granted or if this option is not available, permittees shall use standard BMPs for controlling pollutants. This will be enforced by verifying that permittees have made reasonable effort to determine if sanitary sewer disposal is feasible.	No changes made.

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Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Fremont	1	C.2.a.ii.(1)	Disposal of Street Maintenance Wastewater	Language requiring that street maintenance wastewater shall be discharged to the sanitary sewer and may require the installation of a pretreatment system is not necessary and overly burdensome. This requirement should be removed and the permittees allowed to manage wastewater resulting from street and road maintenance operations through existing and approved BMPs and disposal guidelines.	If sanitary sewer disposal is unavailable, permittees shall use appropriate BMPs to prevent the discharge of pollutants to receiving waters.	No changes made.
Kolb, Larry and James, Roger	5	C.2.b	Add Private Property	PROVISION C.2.b-page 10 A similar provision covering street and road repair, sidewalk/plaza maintenance and pavement washing and stormwater pump stations should be developed for these activities on private commercial property.	The MRP does not directly regulate activity on private commercial property. It is the responsibility of permittees to insure that commercial properties do not break local storm water ordinances and adequately prevent and eliminate stormwater pollutants.	No changes made.
Caltrans	1	C.2.c.i	Add Phrase to Graffiti Removal Provision	The subsection states [showing changes proposed in the TO]: (1) Permittees shall implement appropriate BMPs to prevent ~~*pollutant*~~ *polluted stormwater and non-stormwater* discharge from bridges and structural maintenance activities directly over water or into storm drains. Because it is impossible in some situations to capture or control all discharges from bridges and related structural features, we suggest adding the terms "to the extent technically feasible and cost effective."	The proposed changes are not appropriate. It is always the permittees responsibility to prevent the discharge of pollutant discharge to the MEP. It is not relevant whether the cost is effective. It only matters if the cost of cleaning up to the MEP is reasonable.	No changes made.

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Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Caltrans	2	C.2.d	Pump Station Inventory Appropriate	*"The objective of this sub-provision is to prevent the discharge of water with low dissolved oxygen (DO) from pump stations, and to explore the use of pump stations for trash capture and removal from waters to protect beneficial uses of receiving waters."* The inventory requirement is appropriate.	Comment noted.	No changes made.
Caltrans	3	C.2.d	Dissolved Oxygen and Corrective Actions Premature	The DO monitoring and mandated corrective actions are premature. We are not aware of any information that has been developed showing that DO below 3 mg/L within pump stations results in adverse water quality conditions in receiving waters. In the context of roadways, the monitoring and inspection requirements for pump stations could cause lane closures, risks to employees, and travel disruption.	The DO in the pump station is not the problem; however, the discharge of water with DO below 3mg/L to the MS4 can kill fish and aquatic organisms. The impacts of low DO have been observed by Regional Board Staff and documented by numerous studies. Permittees shall investigate pump stations a minimum of two times of year during the dry season to prevent the discharge of first flush or dry season discharge with DO below 3 mg/L.	No changes made.
Caltrans	4	C.2.d	Difficult to Implement Corrective Actions	Please clarify the corrective actions: *"Such post-storm inspection and monitoring shall focus on trash and discharge impacts, including presence of odor, color, turbidity, debris, trash, and floating hydrocarbons"*. The provision requires debris and trash removal and replacement of oil booms, which would be difficult to implement without standards, and many of our facilities were not designed to	The pump station inspection has been revised to require a minimum of two inspections during the rainy season. Many permittees are already conducting inspections and removing trash without specific standards in place. If trash is present and will create	Pump station inspection requirements have been reduced to require a minimum of two inspections during the rainy season.

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				accommodate trash collection and absorbent booms. As an alternative to pump stations at intermediate locations, which may be preceded or followed by additional facilities where monitoring and treatment controls are already in place, we suggest setting goals for point-of-discharge conditions.	water quality impacts, it should be removed. Standards are not necessary to determine how to remove trash and replace oil absorbent booms.	
Alameda City	9	C.2.d	Increased Resources for Stormwater Pump Station Monitoring	Provisions C.2.d, *Stormwater Pump Stations*, requires the monitoring and analysis of dry weather and rain event flows at all eight of the municipal stormwater pump stations. These requirements, without the identification of the funding mechanism for the additional staff time, heightened expertise, and analytical expense, creates an additional staffing and expense burden to the City. The estimated minimum increase in annual municipal staffing to implement this provision for monitoring, sampling, and reporting is approximately 10% of a full-time staff person.	The inspection frequency has been reduced in the Final TO. Permittees should be able to conduct the required activities during the normal course of pump station operation with only a minimal increase in effort. The pump station inspection and trash removal efforts will directly reduce the discharge of stormwater pollutants.	The required inspection frequencies in both the dry and wet season have been reduced.
Kolb, Larry and James, Roger	6	C.2.d	Change Language	PROVISION C.2.d-page11 Change "explore" to "determine the technical and economic feasibility" to make this more meaningful	The purpose of this provision is to explore and investigate possible opportunities for trash removal. Conducting a technical and economic feasibility study is beyond the scope of this provision. Permittees may choose to conduct this type of analysis as part of their trash reduction program.	No changes made.

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Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
San Jose	1	C.2.d.i	Revise language to establish Consistency	To ensure consistency between Task Description and Implementation Levels, the City suggests the following: "Operation and Maintenance of Stormwater Pump Stations – Permittees shall develop and implement measures to operate, inspect, and maintain these facilities to minimize non-stormwater discharges containing pollutants, and apply corrective actions when DO levels are below limits."	Adding language regarding corrective action for DO levels in this section (C2.d.i) would be too specific. Permittees need to implement measures to reduce pollutant loads in the stormwater discharges to comply with WQSs.	No changes made.
Millbrae	5	C.2.d.i	CWA Requirements Regarding Non-Stormwater Discharges and Pump Stations	Section C.2.d.i. requires all pump stations to be operated, inspected and maintained to eliminate non-stormwater discharges containing pollutants but the Federal Clean Water Act only requires that permits "shall include a requirement to effectively prohibit non-stormwater discharges into storm sewers. We request that the permit be modified to state that permittees shall implement a program to effectively prohibit non-stormwater discharges to the Stormwater pump stations that they own and operate where these discharges are disallowed by the MRP.	Non-stormwater discharges are prohibited per the conditions in C.15. Permittees shall insure that pump station discharges meet the requirements of the MRP.	No changes made.
SMCWPPP	2					
San Jose	2	C.2.d	Dissolved Oxygen Requirements Only Where Discharge to Creek and Minimum Pump Threshold	The City requests that the provision to measure DO apply only to those pump stations that discharge to a creek or waterbody and that a minimum threshold total pump station capacity of 10 CFS be applied for inspecting and collecting DO data to ensure limited resources are directed only to pump stations where the discharge could potentially cause concerns. The City requests that the provision clarify that the 3mg/L DO	The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.

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Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				threshold is an action level.		
Pittsburg	3	C.2.d	Minimum threshold for Pump Station Monitoring Requirements	This provision needs clarification regarding the size and types of pumps subject to monitoring and reporting activities. This provision should provide a minimum pump station size threshold for monitoring requirements, i.e. larger than ____ gallons per minute. The problem is that while we have pump stations, they are all very small. The time necessary to meet the monitoring requirements is not productive based on their limited capacity. Please also provide guidance regarding the appropriate location for DO data collection.	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons.	The required inspection frequencies in both the dry and wet season have been reduced.
ACCWP	16	C.2.d	Revise Pump Station Monitoring	There have been rare instances in the Bay Area where discharges from pump stations have caused a water quality problem. However, the monitoring and reporting requirements are more onerous than necessary. **Proposed Resolution**: Change the maximum sampling required to twice per year for two years and allow an exemption from monitoring in situations where it can be demonstrated that there is no potential water quality problem, such as in Livermore, where the summer discharge is to a dry arroyo or where the discharge rate is too minimal to impact water quality.	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
Newark	6					
Oakland	11	C.2.d	Exempt Monitoring Where No Impact to	The City of Oakland operates two small stormwater pump stations and four sump pumps; they all operate only during rain. There may be occasional groundwater	The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek	Exemption included for areas that will drain to dry

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Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
			Receiving Waters	infiltrating into the pump stations. All eventually discharge into larger bodies of water. It is highly unlikely that the DO level will impact the receiving waters. **Proposed Resolution**: Allow an exemption from monitoring in situations where it can be demonstrated that there is no potential water quality problem or where the discharge rate is too minimal to impact water quality.	immediately downstream of the discharge.	creek and infiltrate immediately downstream.
Kolb, Larry and James, Roger	7	C.2.d.i	Add language to C2	PROVISION C.2.d.i.-page 11 Add "and discharge prohibitions".	It is implicit in the MRP that all discharges will comply with discharge prohibitions. The pollutant loads from pump station discharges should be reduced to meet WQSs	No changes made.
Kolb, Larry and James, Roger	8	C.2.d.ii(1)	Add Footnote	Add a footnote for "characteristics" to indicate "Drainage area, land uses, dimensions and elevations of wet well, inlet and discharge pipes, bar screens and trash racks, high and low flow pump capacities, dry and wet weather flows".	This section has been revised to include specific characteristics of pump station that are consistent with previous Water Board data collection efforts.	Specific characteristics have been added as a footnote in the Final TO.
Fremont	3	C.2.d.ii.(1)	Dissolved Oxygen Monitoring in Dry Season Provides No Water Quality Benefit	Sampling and collecting DO data at all pump stations twice a year between July & October provides no water quality benefit. Nuisance irrigation runoff mixed with decaying plant material and sediment that collects in the pump stations is expected to cause low DO levels as this material will accumulate in volumes for long periods before the pumps activate. These stations are designed to start pumping activities during high stormwater flows when the	Assessing DO levels during the dry season is not a waste of effort. If low DO levels are measured permittees shall implement corrective actions to prevent receiving water impacts upon discharge. The statement that low DO is unlikely to impact water bodies is overly generalized	No changes made.

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Provision C.2 – Municipal Maintenance

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				additional water would counteract low DO. Inspecting and collecting monitoring data on water having low DO, but unlikely to impact receiving water bodies, wastes manpower and limited resources. Eliminate this requirement.	and does not recognize that adverse impacts frequently occur.	
ACCWP Attachment1	1	C.2.d.ii.(2)	Dissolved Oxygen Pump Station Monitoring	Collect DO data from all pump stations twice a year during the dry season. Change the maximum sampling required to twice per year for two years and allow an exemption from monitoring in situations where it can be demonstrated that there is no potential water quality problem, such as in Livermore, where the summer discharge is to a dry arroyo or where the discharge rate is too minimal to impact water quality.	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
Alameda County	3					
Berkeley Attachment1	1					
Oakland Attachment1	1	C.2.d.ii.(2)	Dissolved Oxygen Pump Station Monitoring	Collect DO data from all pump stations twice a year during the dry season. Allow an exemption from monitoring in situations where it can be demonstrated that there is no potential water quality problem or where the discharge rate is too minimal to impact water quality. "Add minimum pump size."	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
						downstream.
Fremont	4	C.2.d.ii.(3)	Pumping to Raise Do Levels Not Practicable	To institute continuous pumping activities to bring the DO level to 3 mg/L is not practicable. It would likely result in damage to the pump station equipment due to increased on/off pump cycling resulting from the need to pump such low volumes of water to achieve the required 3 mg/l DO level. Remove this requirement in conjunction with the removal of C.2.d.ii(2).	Permittees are not required to implement continuous pumping if it will damage equipment. The provision has been revised to include aeration, or other appropriate measures to increase DO levels.	The provision has been revised to include aeration, or other appropriate measures to increase DO levels.
NOAA	2	C.2.d.ii.(3)	Consider Aeration or Discharge to Sanitary Sewer When Dissolved Oxygen Low	Setting the dissolved oxygen (DO) threshold at 3 milligrams per liter (mg/L) or parts per million (ppm) for discharges from pump stations before requiring corrective actions may result in water quality impacts to receiving waters if sufficient dilution is not available. While the DO should easily be above this level during storm events when the retention time of stormwater in a pumping station may be very short, during drier portions of the year the retention time of water in a pumping station may be prolonged, resulting in poor DO conditions. This discharge to a waterbody during a low-flow time period may impact beneficial uses and ESA listed species. The permit should require the exploration of aerating these discharges during these periods of the year or diverting them to the sanitary sewer system to prevent impacts.	The Final TO requires dry season monitoring to identify low DO levels and implementation of corrective actions if DO level fall below 3 mg/L.	
Millbrae	6	C.2.d.ii.(3)	Implementation of Corrective Measures Only When	Section C.2.d.ii.(3) states that the implementation level requires that corrective actions be applied if dissolved oxygen levels are at or below 3 mg/l. This	The monitoring requirements have been reduced to require a minimum number of	The required inspection frequencies in both the dry and
SMCWPPP	3					

Response to Comments February 11, 2009 Tentative Order
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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
			Dissolved Oxygen Level Will Impact Receiving Waters	requirement should be conditioned on having a discharge from the pump station that causes a receiving water problem. We request that the permit language be modified to state that corrective actions will only be necessary if the pump station is discharging water with low dissolved oxygen that is causing an unacceptable reduction of dissolved oxygen in the receiving water.	inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
Kolb, Larry and James, Roger	8	C.2.d.ii(4)	Start Monitoring in 2009	This program must be started in 2009 rather than waiting for the 2010-11 wet weather season because earlier permits have already required enforceable programs.	Earlier permits have not required monitoring as specified in the MRP. Permittees will need time to organize and coordinate inspections and response efforts	No changes made.
ACCWP Attachment1	1	C.2.d.ii.(4)	Rain Threshold for Inspection	Inspect pump stations in the first business day after ¼ inch storm Change to ½ inch storm	Changing to a ½ inch storm may not allow for collection of enough data to accurately assess the impacts of pump station discharges.	No changes made.
Alameda County	4					
Berkeley Attachment1	2					
Oakland Attachment1	2					
Fremont	5	C.2.d.ii.(4)	Remove Pump Station Inspection After Rain Event	To inspect pump stations in the first business day after a ¼ inches rain event for 9 separate criteria is unnecessary and wasteful of limited resources. Some of these pump stations are very expensive to inspect due to their confined space entry configuration. Remove this requirement in	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt	The required inspection frequencies in both the dry and wet season have been reduced.

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				conjunction with the removal of C.2.d.ii(2),(3)	DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
Fremont	7	C.2.d.ii.(4)	Remove Pump Station Inspection After Rain Event	Section C.2.d.ii.(4) states that implementation level requires that pump stations be inspected in the first business day after ¼-inch or larger storm events. This level of prescriptiveness is unnecessary. The permittees should have flexibility, based on their experience, to decide when to inspect the stormwater pump stations that they own and operate. We request that the permit language be modified to delete a specific amount of stormwater that triggers a requirement to inspect stormwater pump stations.	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
Millbrae	7					
San Mateo County	2					
SMCWPPP	4					
Fairfield Suisun Sewer District	3	C.2.d.ii.(4)	Modify Rain Even Inspection Threshold and Extend Time	Provision C.2.d.ii (4) requires the inspection of all pump stations on the first business day following a ¼-inch storm. This requirement is problematic due to staffing limitations and the fact that local agencies have the knowledge and ability to operate pump stations remotely, without environmental consequences. We request that this provision be modified to apply to prioritized pump stations determined to be a significant water quality problem. Furthermore, we request that 48-hours be	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and

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				the allowed time window to conduct inspections following major storm events. In addition, the ¼-inch rainfall threshold for conducting inspections should be raised to a ½-inch rainfall threshold, a rainfall volume more indicative of runoff events.		infiltrate immediately downstream.
Fremont Attachment	2	C.2.d.ii.(1-4)	Eliminate Pump Station Record Keeping	Inspect 2x/yr during dry season (July to Oct); monitor for DO; corrective measures for low DO concentrations 3 mg/L or lower. Collecting data and maintaining records is overly burdensome and impracticable. Eliminate this record keeping requirement	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
Sunnyvale	17A	C.2.d.ii.(2-4)	Clarify DO value is Trigger for Identifying Additional Actions	We request that you clarify that the DO value included in this provision is a trigger and would be used for the purpose of identifying pump stations with problems and for identifying additional actions that might be needed.	It is explicitly stated in the permit provisions that the DO data is being collected to identify pump station problems. The provisions require corrective actions if DO monitoring identifies levels below 3 mg/L.	No changes made.
Sunnyvale	17B	C.2.d.ii.(2-4)	Oil Absorbent Booms and Pump Stations	The inspection requirement for pump stations after a ¼ inch of rain within a 24-hour storm event or larger storms makes an assumption that we have oil absorbent booms at the pump stations. This is not	This requirement only pertains to pump stations that have or utilize oil absorbent booms. If oil booms are not necessary or	Added language to clarify that oil absorbent booms shall only be replaced

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				necessarily the case. This should be clarified that pump stations are not expected to have oil booms in place.	appropriate for a pump station design then they do not have to be checked and replaced.	as needed.
Mountain View	4	C.2.d	Pump Station Inspection and Monitoring	Requiring inspection and maintenance within 24 hours of significant rain events may divert personnel resources during critical "storm patrol" operations and could potentially endanger employees by requiring them to enter these facilities during high-flow conditions. The City operates and maintains five storm water pump stations, which vary in type, construction, drainage inputs and flow rate. The additional monitoring, inspection and maintenance required in the Regional Permit places an increased demand on limited staff resources. The City recommends revising this provision to limit the monitoring and maintenance requirement to storm water pump stations having characteristics that may warrant the additional activities. For example, require the dissolved oxygen monitoring only at pump stations that could contribute sufficient flow of low dissolved oxygen water to have a deleterious effect on receiving water quality. Additionally, the City recommends extending the time after significant storms when inspection and maintenance are required to ensure that personnel can be dispatched according to resource needs and to ensure worker safety.	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge. If a hazard exists or personnel are needed to respond to storm impacts, inspection should be delayed until an appropriate time.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.

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Palo Alto	4	C.2.d	Pump Station Inspection and Monitoring	Provision C.2.d.ii.(4), which requires inspection of all pump stations in the first business day following a large storm, will be problematic for cities with a large number of pump stations. For example, Palo Alto has nine pump stations, several of which do not discharge directly to a creek or the Bay. We request that this provision be modified to focus on inspection of only pump stations of significant size that discharge directly to water bodies, and that more time be allowed following a major storm event to conduct the inspections.	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
San Jose	2	C.2.d	Pump Station Inspection and Monitoring	This provision requires that the City augment pump station maintenance and operations activities with dry weather monitoring and post-storm inspection and cleaning activities. Corrective actions are required if monitoring results fall below a specified threshold. The extent of the corrective action that may be required is not presently known and may be disruptive to core operation of storm pump stations, in addition to being resource intensive to administer. As drafted in the TO, all storm pump stations are subject to this provision. In San José, there are more than 25 pump stations of varying sizes, not all of which flow to a water body. San José requests that only pump stations that are of significant size and that discharge directly to a creek or water body	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.

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				be included under this provision and that the provision be revised to ensure that pump station operations are adequately supported to protect public safety.		
Santa Clara County	6	C.2.d	Pump Station Inspection and Monitoring	The County has six pump stations. Four of these pump stations are to keep roadways from flooding and two are strictly groundwater stations that have no drain inlets. All of our pump stations pump ground water continuously all year long and have already been exempted from Discharge Prohibition A.1. Since our pump stations are primarily groundwater pump stations and are located under roadways, there will never be any water from urban runoff to sample during the dry season, only ground water. Because the County has both groundwater pump stations and surface water pump stations, we request clarification on which pump stations must meet the requirements of C.2.d. We also request that pump stations where the primary purpose is to pump groundwater be exempted from these requirements.	We will review this issue in more detail with the County. At this stage we advise that these pump stations should be sampled.	
Santa Clara County	7	C.2.d	Pump Station Inspection and Monitoring	Finally, the requirement that all pump stations are inspected within the first business day following a storm event that results in a quarter inch of rain or more will interfere with other required obligations that the County must accomplish. We request that this provision be modified to require inspection for pumps stations that are of significant (i.e. capacity of 10,000 gallons per minute) size only and that more time be allowed following a storm event to	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry

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				conduct inspections. Our maintenance crew has limited staff and other obligations that must be met in any given day. For this reason, we request at least five workdays to complete inspections.		creek and infiltrate immediately downstream.
SCVURPPP Attachment 1	1	C.2.d	Pump Station Inspection and Monitoring	However, item (4) requiring inspection of all pump stations in the first business day following a large storm is problematic for cities with a large number of pump stations. For example, the City of Santa Clara has 21 pump stations, and the City of San Jose has 25 pump stations, many of which do not discharge to a creek or the Bay. We request that this provision be modified to prioritize monitoring and inspections on pump stations that are a significant problem and that discharge directly to water bodies, and to allow more time following a major storm event to conduct the inspections. In addition, we request that you clarify that the DO value included in the provision is a trigger or action level and not a numeric effluent limitation per se and will be used only for purposes of identifying problematic stations and for identifying needed additional actions.	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that will drain to a dry creek immediately downstream of the discharge.	The required inspection frequencies in both the dry and wet season have been reduced. Exemption included for areas that will drain to dry creek and infiltrate immediately downstream.
Union City	2	C.2.d	Pump Station Monitoring Financially Burdensome	Provision C.2.d: Stormwater Pump Stations – This provision requires the inspection and collection of the dissolved oxygen (DO) data from all pump stations twice a year during the dry season between the months of July and October and inspecting pump stations in the first business day after 1/4 –inch rainfall within	The monitoring requirements have been reduced to require a minimum number of inspections in the dry and wet seasons. The Final TO has been revised to exempt DO monitoring in areas that	The required inspection frequencies in both the dry and wet season have been reduced. Exemption

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				24 hour and larger storm events. The requirement of inspecting the pump station is expected. However, it is not practicable and is financially burdening the City for collecting DO data and inspecting the pump station for every storm event. The City recommends this unnecessary provision being removed.	will drain to a dry creek immediately downstream of the discharge.	included for areas that will drain to dry creek and infiltrate immediately downstream.
ACCWP Attachment3	1	C.2.d.iii	Reporting Trash Levels in Pump Station	Reporting on the levels of trash and debris removed from the pump stations unnecessary. If this information is needed for a specific purpose, a one-time assessment would suffice. Delete the requirement to collect and report on trash and debris removed from pump stations.	The objective of this provision is to assess and determine the feasibility of controlling trash discharges at pump stations. In order to assess potential benefits of trash removal from pump stations, it is necessary to monitor and collect data.	No changes made.
Berkeley Attachment2	2					
Newark Attachment	1					
Oakland Attachment2	2					
Kolb, Larry and James, Roger	8	C.2.d.ii(4)	Change Language	Change waste materials to "trash, vegetative material and sediments separately".	The permit language requires permittees to determine presence and quantity estimates of trash. It is expected if these types of debris are present insignificant quantities they will be recorded during observations and quantity estimates.	No changes made.
Sunnyvale	18	C.2.d.iii	Data Collection and Reporting Excessive	The data required to be kept and reported on for maintenance activities at storm water pump stations is excessive. Requiring that cities report the mass or volume of the debris and trash removed from a pump station fore-bay or bar screen does not provide essential information as	The objective of this provision is to assess and determine the feasibility of controlling trash discharges at pump stations. In order to assess potential benefits of trash removal from pump	No changes made.

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				to the effectiveness of the pump station operations. It is unclear why this information is needed. It should be sufficient to provide records of pump station maintenance activities, showing that appropriate maintenance has occurred without having to collect data that does not have a clear purpose identified.	stations, it is necessary to monitor and collect data.	
Pittsburg	2	C.2	Reporting and Recordkeeping Burdensome	The reporting requirements for municipal operations are onerous and burdensome. Several other Sections, such as Illicit Discharge, Trash, Pesticides Toxicity Control, and Exempted and Conditionally Exempted Discharges, require varied reporting and/or monitoring requirements required of Municipal Maintenance staff. Our City's Maintenance Department is already operating at a minimum, and may act be reduced further as response to the City's current economic crisis. The City urges the Board to consider limiting the continuous reporting requirements to the most problematic section(s) that need monitoring. The City urges elimination of monitoring requirements in areas where it is not warranted, or where it may have been warranted in the past but there are currently no unacceptable exceedances.	The objective of this provision is to assess and determine the feasibility of controlling trash discharges at pump stations. In order to assess potential benefits of trash removal from pump stations, it is necessary to monitor and collect data.	No changes made.
Pittsburg	4	C.2.e.ii	Remove Post Construction Controls for Rural Roads	This provision requires post-construction treatment measures for maintenance activities of existing Rural Public Roads. Please remove the last sentence requiring post-construction treatment measures to treat runoff from the new impervious surface area created in association with	The language was revised to clarify that the requirements for after construction controls are related to the maintenance and implementation of BMPs for sediment and	The Final TO language was revise to stat that Permittees shall implement and require contractors to

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				road projects. Regular maintenance activities should be distinguished from creation of new roads in this section. Section C.3 already provides guidance for new road projects that create 10,000 square feet of contiguous impervious surface, with exceptions where appropriate.	erosion control.	implement BMPs for erosion and sediment control during and after construction.
CCCWP Attachment	1	C.2.e.i	Remove Reference to Post Construction BMPS	Omit "*and post*" from the second sentence so it reads: "*Permittees shall implement and require contractor to implement BMPs for erosion and sedimentation control measures during ~~and post~~-construction for maintenance activities on rural roads, particularly in or adjacent to stream channels or wetlands*". *Rationale for Omission:* This provision should be consistent with C.2.e.ii.(1), which states Permittees shall "*implement BMPs for erosion and sediment control measures during construction, and maintenance activities……*".	The language was revised to clarify that the requirements for after construction controls are related to the maintenance and implementation of BMPs for sediment and erosion control.	The Final TO language was revise to stat that Permittees shall implement and require contractors to implement BMPs for erosion and sediment control during and after construction.
CCCWP Attachment	2	C.2.e.ii.(1)	Delete Reference to C.3	Delete second sentence referring to implementation of the C.3 requirements. *Rationale for Deletion:* Including C.3 provisions in section C.2 is unnecessary, duplicative, and may cause confusion to permittees reading multiple notations of the same permit requirements.	We agree.	Language deleted.
CCCWP Attachment	3	C.2.e.ii.(2)(e)	Remove Regrading Rural Roads to Slope	Delete "……..*re-grade roads to slope outward where consistent with road engineering safety standards*…." from this section as follows:"*(e) Maintenance of*	This provision only applies to unpaved rural roads where outsloping is appropriate and in	Permit language revised to apply only to unpaved rural roads

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			Outwards	*rural roads adjacent to streams and riparian habitat to reduce erosion, replace damaging shotgun culverts, ~~re-grade roads to slope outward where consistent with road engineering safety standards, and install water bars~~; and"* *Rationale for Change:* Re-grading roads to slope outward on an inside curve is in direct conflict with the American Association of State Highway and Transportation Officials (ASSHTO) and Caltrans standard practice of grading roads to slope inward for vehicle safety on curves. There is no road engineering safety standards that would allow roads to be sloped outward so this wording should be deleted.	accordance with road safety standards.	where outsloping is in accordance with road safety standards.
CCCWP Attachment	4	C.2.e.ii.(2)(e)	Water Bars Not Appropriate for Paved Roads	Furthermore, "water bars" are a feature for unpaved roads and are not appropriate for paved roads. On paved roads, they would be an inappropriate speed bump. Sawing transverse grooves in the pavement will have the effect of shortening the life of pavement and can only be used where the design thickness of the pavement has considered the structural reduction of pavement thickness due to the grooves.	Water bars are not required for paved rural roads. They should only be implemented on unpaved roads where appropriate.	Permit language revised to apply only to unpaved rural roads where water bars are appropriate.
Caltrans	5	C.2.f	Eliminate Reference to Caltrans Maintenance Staff Guide	There is a reference to the Caltrans Storm Water Quality Handbook Maintenance Staff Guide. *"Each SWPPP shall incorporate all applicable BMPs that are described in the Caltrans Storm Water Quality Handbook Maintenance Staff Guide, May 2003, and its addenda."* Caltrans would prefer that reference to	This is just reference to the utilization of the methods included the guide. It does not prevent Caltrans from updating or modifying the 2003 Maintenance Staff Guide.	No changes made.

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				2003 Maintenance Staff Guide be removed and replaced with more generic reference. This is necessary to avoid staff guide becoming "standard practice" which will limit Caltrans ability to update or modify practices as appropriate.		
Daly City	3	C.2.f.i.(1)	Clarify Reference to Caltrans Maintenance Staff Guide	Added reference to the Caltrans Storm Water Quality Handbook Maintenance Staff Guide, May 2003, and its addenda (referenced addenda could not be found). This document is over 250 pages and covers the entire stormwater program for all Caltrans maintenance activities.	The addenda are included as appendices to the document and are available in the PDF version of the guide on Caltrans website.	No changes made
CCCWP Attachment	4	C.2.f.i.(1)	Add Reference to CASQA Handbook for Municipal Maintenance	Insert "*California Stormwater Quality Association's California BMP Handbook for Municipal Activities and/or*" to: "*Each SWPPP shall incorporate all applicable BMPs that are described in the California Stormwater Quality Association's California BMP Handbook for Municipal Activities and/or the Caltrans Storm Water Quality Handbook Maintenance Staff Guide, May 2003, and its addenda.*" *Rationale for Insertion:* The California BMP Handbooks are a well recognized and readily available resource, and reflect the current state of water quality best management practices for all typical activities conducted at municipal corporation yards.	We agree.	Reference added.
SMCWPPP	6	C.2.f.i.(1)	Modify Language Regarding Guidance	The permit requires the preparation of a Stormwater Pollution Prevention Plan (SWPPP) for corporation yards and that the SWPPP incorporate all applicable	The permit language states that the BMPs will be incorporated as appropriate. Permittees are only required	No changes made.

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			Materials for SWPPP Development	BMPs from the Caltrans Storm Water Quality Handbook Maintenance Staff, May 2003 and its addenda. The Caltrans Handbook should be considered as a basis for identifying appropriate BMPs, but it should not be an absolute mandate for what is needed. Modify the permit to state that each SWPPP shall incorporate applicable BMPs by considering information in handbooks, such as the Caltrans Storm Water Quality Handbook Maintenance Staff, May 2003 and its addenda.	to implement BMPs that apply to their specific circumstances.	
San Jose	3	C.2.f.i	Caltrans Storm Water Quality Staff Guide Only Supplemental	The City requests that the Caltrans Storm Water Quality Staff Guide is identified as a supplemental guide for developing and improving SWPPPs.	The permit language states that permittees will implement all applicable BMPs as appropriate.	No changes made.
SMCWPPP	6	C.2.f.ii	No Date for Completion of SWPPP	There is no date provided for completing the SWPPP, and a date should be given. Add permit language that requires that the SWPPP be completed by July 1, 2010 or one year following adoption of the permit, whichever date occurs later.	We agree.	Completion date of July 1, 2010 has been added.
SCVURPPP Attachment A	2	C.2.f.ii.(3)	Some Vehicle and Equipment Areas No Accessible Sanitary Sewers	The Revised TO requires Co-permittees to retrofit all vehicle and equipment wash areas to be plumbed to the sanitary sewer. Some relatively rural corporation yard facilities are not accessible to sanitary sewers, and the MRP should allow wash waters to flow to vegetated areas or other areas that do not impact water quality. As stated in our February 25, 2008 letter, SCVURPPP recommends that the	If sanitary connections are not available, permittees should collect wash water and use appropriate BMPs for treatment and disposal that will not impact surface water or groundwater.	The permit language was revised to clarify disposal options when sanitary sewer connection not available.

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				language be revised to allow for this alternative.		

[a] Refers to Provision Numbers contained in the Municipal Regional Stormwater Permit (MRP) Tentative Order dated December 14, 2007.
[b] Provision Numbers referenced are found in the Municipal Regional Stormwater Permit (MRP) revised Tentative Order dated February 11, 2009

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Provision C.3. – New Development and Redevelopment

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Friends of Five Creeks	3	C.3.	Assessment of Effectiveness	This draft does eliminate important components. In particular, there will be no real measurement of whether various methods to treat and retain urban runoff – that is, C.3 and hydromodification measures -- really work. We will basically continue to base requirements for low-impact development -- swales, bioretention, green roofs, etc.-- on imperfect projections and faith.	The Final TO contains more stringent and precise requirements for source control, site design and LID treatment for all Regulated Projects. Also, Provision C.3.c. requires Permittees to report on their procedures for determining the feasibility/infeasibility of harvesting and reuse, infiltration, and evapotranspiration and to develop biotreatment soil media and green roof design specifications.	See revised Provision C.3.c.
Friends of Five Creeks	5	C.3.	General comment	Provision C.3. should strengthen these first-try rules so that LID and hydromodification rules begin to have actual effect on runoff pollution and volume in our Bay Area cities. The revised TO moves modestly in that direction by lowering to 5,000 ft^2 the threshold for requiring treatment of runoff in parking lots and for certain types of high-pollution business and closing some loopholes in the ways applications are deemed complete and projects are exempted from requirements, calling for green street pilot projects, and allowing large single-family homes to choose from a menu of	Comment noted.	None

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Provision C.3. – New Development and Redevelopment

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				measures that lessen runoff.		
ACCWP Berkeley Newark Oakland	1 1 1 1	C.3.	General Comment	We appreciate many of the changes incorporated in the Revised TO and in particular, the deletion of the requirements to install treatment systems for road reconstruction projects within the existing footprint and to conduct an impervious surface data collection pilot project. However, many of our concerns have not been addressed and some of the new requirements in the Revised TO are of great concern.	Comment noted.	None
Stopwaste.org	4	C.3.	Goal statement for Provision C.3.	On Page 15, Section C.3., last sentence to initial paragraph, add highlighted text in last sentence of paragraph, "This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques and Bay-Friendly Landscaping practices employing landscape-based design and treatment measures."	We have deleted the reference to "landscape-based treatment measures" in the sentence because it seems to narrow the definition of LID to exclude accepted LID measures such as harvesting and reuse; therefore, the reference to Bay Friendly Landscaping practices would be inappropriate here.	None
BASMAA Att Contra Costa Brd of Sups Att A Fairfield FSSD Menlo Park	3 8 5 4 3	C.3. C.3.b.ii.(4)	Implementation / Effective Dates	• Numerous requirements in Provision C.3. require immediate implementation. Significant key sections have been modified (e.g., new road projects, LID, and the HM threshold and applicability area	• We concur that all new requirements should not have immediate effective dates; however, Provision C.3. also contains some requirements that have	• Any new requirement in Provision C.3. with an immediate effective date has been revised to allow a later

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Provision C.3. – New Development and Redevelopment

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Mountain View Pacifica Palo Alto San Jose Att A Santa Clara Co SCVURPPP SCVURPPP Att A Suisun City Sunnyvale West Valley Clean Water Program	8 19 6 5 14 11 4 5 20 5			definition) but insufficient time is allowed to implement the requirements. Implementation will require staff training; revisions to policies, procedures, development review processes, ordinances, and guidance documents; and public outreach. Permittees should have at least one year to prepare to implement the new requirements. • All "effective immediately" dates should be changed to at least 6 months after the MRP is adopted. • For applicable public road or trail projects that have received funding or are in the plan development phase but do not have construction scheduled by the effective date, the treatment requirement was not considered during planning for these public projects.	been carried forward from the existing stormwater permits and these requirements should have immediate effective dates. • The grandfathering language for public projects contained in Provision C.3.b.ii.(1) allows projects that have funding committed and construction scheduled to begin within 3 years of the MRP effective date to be exempted from the threshold requirement. We concur that this grandfathering allowance should apply to public road and trail projects as well.	implementation date. • Grandfathering language has been added to Provision C.3.b.ii.(4)
BASMAA Att	2	C.3.	LID Definition	C.3 introductory paragraph – delete from last sentence of first paragraph "…employing landscape-based treatment measures." as this changes and narrows the definition of LID and connotes that LID is not appropriate in ultra-urban areas or transit-oriented development.	We concur	The referenced text has been deleted.
Contech	2	C.3. C.3.c.	LID Treatment Requirements	The selection requirements for LID treatment controls on new development and redevelopment projects are	• In the sentence in question, we have deleted the reference to	None

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Provision C.3. – New Development and Redevelopment

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				fundamentally flawed. The C.3. opening paragraph states the goal to "address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects…is to be accomplished primarily through the implementation of LID techniques employing landscape-based treatment measures." Provision C.3. effectively supplants the goal of reducing the discharge of pollutants of concern to the "maximum extent practicable" (MEP), with the goal of implementing landscape-based techniques to the MEP. These are not interchangeable goals. The MEP approach is mandated by the CWA and requires a performance based hierarchy of management approaches. An "implement landscape-based treatment measures to the MEP" goal relies on the false assumption that landscape-based BMPs treatment measures are always more effective and feasible as compared to "vault based systems."	"landscape-based treatment measures" because it seems to narrow the definition of LID to exclude other accepted LID measures such as harvesting and reuse. • LID treatment measures, which include landscape-based treatment, is a preferable approach to treating and reducing stormwater runoff because it is cost-effective, sustainable, and environmentally-sound. LID treatment measures are effective because they can remove a broader range of pollutants in a more robust and redundant fashion, and can achieve multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperatures, increased energy efficiency and	

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					other community benefits. As such, these measures satisfy the MEP criteria of the Clean Water Act.	
Stopwaste.org	1	C.3.	Reference to Bay-Friendly Landscaping Coalition	We have attached to this letter some specific language we are asking be included in the MRP. The language with respect to Bay-Friendly Landscaping is non-regulatory, but will help ensure that every reader of the MRP over the next five years, and perhaps much longer, becomes aware of the Bay-Friendly Landscaping approach and its relevance to the outcomes the MRP seeks to achieve.	Comment noted.	Specific recommended language that we deemed appropriate has been added to the appropriate sections of Provision C.3.
Contra Costa Brd Of Sups Att A	4	C.3.a.	Implementation Dates	The timetable for this section (immediate implementation required) is unrealistic. Modifications to the County Ordinance Code (and potentially other documents) will be necessary to ensure legal authority to implement the modifications made to other sections of Provision C.3. The County recommends changing the implementation date (C.3.a.ii.) to July 1, 2010.	• With the exception of Provisions C.3.a.i.(6)-(8), Provision C.3.a. specifies elements that should already be in place under the Permittees' current stormwater permits. As such, the "phase-in" period has already passed so the requirements should be effective as soon as the MRP is effective. • In response to comments on the Dec. 2007 TO, we revised Provision C.3.a.i.(8) to allow one	Provisions C.3.a.i.(6)-(7) have been revised to allow six months for implementation.

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					year after the MRP effective date for General Plan amendments. • We concur that some time is necessary to comply with Provisions C.3.a.i.(6)-(7).	
Stopwaste.org	7	C.3.a.i.	New Development and Redevelopment Performance Standards *Additional Requirement*	Add an additional task to this Provision as: C.3.a.i.(9) Adopt a Bay-Friendly Landscape Ordinance that requires that civic landscapes are designed and constructed to meet or exceed the minimum requirements on the Bay-Friendly Landscape Scorecard in order to achieve a more sustainable, integrated approach to water quality and conservation, watershed protection, air quality and habitat protection in public landscapes."	The suggested language was not incorporated because it would impose additional requirements.	None
ACCWP Att 1 Berkeley Att 1 Newark Att Oakland Att	3 3 2 3	C.3.a.i.(2)	"303(d) Listed Waterbodies"	Clarify this section because "303(d) listed waterbodies" may not be understood by everyone, and include a list of the currently listed water bodies/pollutants in the Fact Sheet.	This is not necessary because the phrase "303(d) listed waterbodies" is discussed in the MRP Findings.	None
BASMAA Att San Jose Att A SCVURPPP Att A	5 4 3	C.3.a.i.(2)	Pre-development	The term "pre-development" appears twice and should be changed to "pre-project" to be consistent with the rest of C.3.	In the context of the referenced language, it is implicit that "pre-development" refers to the conditions prior to construction of the Regulated Project (i.e., pre-	None

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					project).	
Stopwaste.org	5	C.3.a.i.(7) 2nd Bullet	Source control measures for non-Provision C.3. regulated projects	Add to the last sentence the highlighted text below: "Landscaping that minimizes irrigation and runoff, promotes surface infiltration where possible, and minimizes the use of pesticides and fertilizers and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping (For example, meet or exceed the minimum requirements on the Bay-Friendly Landscape Scorecard, www.BayFriendly.org)"	We concur.	The reference to sustainable landscaping practices and programs such as Bay-Friendly Landscaping has been added to Provision C.3.a.i.(7)
Fremont	8	C.3.a.i.(8)	General Plan Updates	Maintain the language in Section C.3.I. of Order R2-2003-0021. The language in this Provision is too broad in scope; not all of the task items listed are required to be included in a General Plan and interfere with local land use decisions.	The intent of Provision C.3.a.i.(8) is to require Permittees to review and revise as necessary their General Plans to reflect a more holistic approach to water quality and supply. This Provision references general concepts only and there are no specific requirements that would interfere with local land use decisions.	None
Stopwaste.org	6	C.3.a.i.(8)	General Plan Updates	Add to the end of the sentence the highlighted text, "Revise, as necessary, General Plans to integrate water quality	We concur.	Reference to the Bay-Friendly Landscape Guidelines has been

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				and watershed protection with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and policies, for example, by referencing the Bay-Friendly Landscape Guidelines."		added.
Stopwaste.org	8	C.3.a.ii.	New Development and Redevelopment Performance Standards *Additional Requirement*	In second paragraph of this Provision, add a reference to (9) as shown in the highlighted text, "**Due Dates for Full Implementation** – Immediate for C.3.a.i.(1)-(7) and July 1, 2010 for C.3.a.i.(8) and (9) For Vallejo Permittees: July 1, 2010 for C.3.a.i.(1)-(8)."	The suggested language was not incorporated because it would impose additional requirements.	None
Stopwaste.org	9	C.3.a.iii.	New Development and Redevelopment Performance Standards *Reporting*	Add a reference to C.3.a.i.(9) as shown in highlighted text below, "Reporting – Provide a brief summary of the method(s) of implementation of Provisions C.3.a.i.(1)–(9) in the 2011 Annual Report."	The suggested language was not incorporated because it would impose additional requirements.	None
NOAA	6	C.3.b.	Regulated Projects	• We support this Provision as it seems to include virtually all potential development and redevelopment projects, but the protections of this section could be greatly strengthened by requiring projects to address the stormwater pollutants from all existing, new, and/or replaced	• We agree that this Provision would be greatly strengthened by requiring stormwater treatment from existing impervious surfaces; however, it is not economically feasible for all businesses and	None

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				impervious surfaces. • There is not a biological or water quality reason to set a "50% of impervious area" threshold before requiring inclusion of the entire site, as is done in Provisions C.3.b.ii.(1)(c) and C.3.b.ii.(3). • The Permittees could be required to set up a decision making system to address an alternative percentage of the site.	homeowners to retrofit their properties with stormwater treatment. Also, Permittees do not have the manpower or resources to implement such requirements. • The 50% rule is an acknowledgement that in general, if a Regulated Project is replacing and/or adding more than 50% of the existing impervious area, it is practicable and economical to design stormwater treatment system(s) to address the runoff from the entire site. It is also a means to realistically address runoff from some existing impervious areas. The 50% rule is used in all stormwater permits statewide.	
Pacifica	12	C.3.b.i.(1)	Incorrect Reference	References to various sections of the MRP are erroneous and confusing. For instance, there is no Provision C.3b.i.(1), yet there is a requirement tied to it. Errors of this type create confusion and undecipherable regulations and should be edited throughout the document and	We have tried to remove incorrect references throughout the Final TO.	Changes made as necessary to remove incorrect references.

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				reissued for re-review.		
Contra Costa Council	3	C.3.b.ii.	Stormwater Treatment Requirements for Industrial Facilities	• The MRP requires municipalities to impose LID requirements on any industrial facility disturbing more than 10,000 ft^2 of impervious surface area. If less than 50% of the facility is disturbed, the facility would be required to treat the runoff from the disturbed portion using LID standards. If more than 50% of the facility is disturbed, the runoff from the entire facility would need to be treated using LID methods. Applying standards that were intended primarily for residential and commercial development to industrial development is inappropriate. Industrial facilities are different because they often handle hazardous materials. Requiring such facilities to direct runoff to vegetated areas and maximize infiltration, for example, could make containment of spills and other materials more difficult and lead to unfortunate consequences. • Industrial facilities are subject to stormwater requirements either under the statewide Industrial General Permit or an individual NPDES permit. They are obligated to implement BMPs developed especially for industrial facilities.	• The 50% rule is applicable to all redevelopment projects, including industrial facilities, and is a requirement in current stormwater permits for the Bay Area and statewide. The 50% rule is an acknowledgement that in general, if a Regulated Project is replacing and/or adding more than 50% of the existing impervious area, it is practicable and economical to design stormwater treatment system(s) to address the runoff from the entire site. It is also a means to address runoff from some existing impervious areas. • This Provision requires all new development and redevelopment projects, including industrial development, to include treatment for the stormwater runoff from the sites. These post-construction requirements are different from the	None

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				Addition of another layer of regulatory requirements is duplicative, dangerous, and not sound public policy.	BMPs required by the General Industrial Permit, which include source control, proper procedures for handling and storage of potential pollutant sources, and "good housekeeping" at industrial facilities so that pollutants are not released in any runoff leaving the facilities.	
ACCWP Att 1 BASMAA Att Berkeley Att 1 Brisbane Burlingame CCCWP Att Contra Costa Brd Of Supervisors Contra Costa Council Fairfield Fremont FSSD HBANC Millbrae Newark Att	5, 6 4 5, 6 8 3 8 6 1 6 10 5 1 8,16 4, 5	C.3.b.ii.(1) C.3.c.ii.	Grandfathering or Pipeline Language *Private Projects*	• Exclude from new requirements projects with applications deemed complete per the Permit Streamlining Act prior to July 1, 2011. If an agency imposes a new stormwater treatment requirement in the middle of its review process that was not applicable when the application was deemed complete, then the project would have to be re-designed and defeat the Legislature's efforts to ensure clear understanding of development permit requirements. • If the grandfathering language is not revised to coordinate the applicability of new requirements with the application deemed complete date, then Water Board staff should specifically involve Permittees in the rewriting of the language. • As written, the grandfathering	• The Permit Streamlining Act requires public agencies to determine whether a permit application is complete within 30 days after receipt; if the public agency does not make this determination, the application is automatically deemed complete after 30 days. Data we have collected from audits and file reviews as well as reported to us by Permittees confirm that in many cases, the development permit applications have not been reviewed for compliance with Provision C.3.	The grandfather language in Provisions C.3.b.ii.(1) and C.3.c.ii. has been revised to use a combination of the "application deemed complete" and "final discretionary approval" milestone dates: • Any private project whose application has been deemed complete by a Permittee on or before the Permit effective date shall be exempt from the new requirements as long as the project

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San Mateo SCVURPPP Att A SMCWPPP Suisun City Sunnyvale	3 5 7, 10, 17 6 22			language is confusing to development review staff and reflects the fact that state regulators lack familiarity with the day-to-day functioning of the development review process. It would also be very difficult to enforce due to the ambiguities of the language on determining at what point in time a project is subject to the new requirements. • This provision is fundamentally unfair, in that a local permitting agency can change its requirements after an applicant has made a good faith effort to submit a full and complete application that complies with the permitting agency's rules and regulations in place at the time of the application. • Other development standards and requirements (CEQA, Map Act, etc.) are triggered at the time the project is "deemed complete." If standards change after review is complete (but before approval), it is too late to make changes to the project design. The entire review process would need to start again. • For projects requiring an EIR, this threshold is particularly problematic because preparation of the EIR may take several years. Subjecting a	requirements and yet have automatically been deemed complete 30 days after the application submittal date. Therefore, we feel the "deemed complete" date is too early in the permitting process for projects to be grandfathered and essentially exempted from the lower 5000 ft^2 threshold, LID requirements, and other new requirements. Projects should be further along in the permitting process before they are granted this exemption from complying with new requirements. • However, we understand that Provision C.3.b.ii.(1)'s use of the "final, major, staff- level discretionary review and approval date" does not correspond to a defined point in any land use decision making process nor any known milestone in the development review	applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental or addendum to the original applications, plans, or other documents required for any necessary approvals of the project by the Permittees. If during the time period between the Permit effective date and the implementation date for the new requirements, the project applicant has not taken any action to obtain necessary approvals from the Permittees, the project will then be subject to the new requirements. • Any private development project that has an

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				project to new/changed stormwater requirements at the time of approval could render the EIR insufficient, forcing new environmental review. • The list of project types in Footnote No. 2 is unworkable because it combines actions associated with pre-project land division (e.g., parcel map, tentative maps, tract map) with specific development proposals (e.g., discretionary permit, development permit). Additionally, the term "technical and or engineering review" is ambiguous and does not align with known milestones in the development review process.	process. • Given these challenges, we concede that it is appropriate to use the "application deemed complete" date. However, it should be used only to grandfather projects whose applications have been deemed complete by the Permit effective date instead of the much later implementation date for the new requirements. • Furthermore, any project applicant with an application deemed complete by the Permit Effective date must demonstrate he is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original applications, plans, or other documents required for any necessary approvals of the project by the Permittees. If during the time period between	application deemed complete after the Permit effective date shall be exempt from the new requirements only if the applicant has received final discretionary approval for the project before the implementation date for the new requirements.
Oakland Att 1 Sunnyvale	4 22	C.3.b.ii.(1) C.3.c.ii.	Grandfathering or Pipeline Language *Private Projects*	• Change "Final, major, staff-level discretionary review" to "<u>Final discretionary review</u>." Restore the original language about "conformity" and delete the added language about complete applications. • The language defining the time of applicability is confusing. It refers to "staff-level" approvals, but many approvals requiring stormwater review are made by elected/ appointed officials at public hearings rather than by staff. It also refers to "major" approvals, yet every jurisdiction has its own way of interpreting "major" and "minor"		

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				permits and these do not necessarily conform to the thresholds for stormwater review. At a minimum, remove the words "major" and "staff-level." If this new language is adopted, "final discretionary approval" should be a sufficient description.	the Permit effective date and the implementation date for the new requirements, the project applicant has not taken any action to obtain necessary approvals from the Permittees, the project will then be subject to the new requirements. • Projects whose applications are deemed complete after the Permit effective date should know that the new requirements are imminent and that they have the time period between acceptance of their application and the implementation date for the new requirements to get their project approved; therefore, projects whose applications are deemed complete after the Permit effective date that get "final discretionary approval" by the implementation date for the new requirements are grandfathered from the new requirements as well.	
HBANC	1	C.3.b.ii.(1)	Grandfathering	• The reference to local agency	We concur and appreciate	We concur and

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		C.3.c.ii.	or Pipeline Language *Private Projects*	determination of "adherence to applicable local, state, and federal codes" is vague, impracticable, and does not correspond to any defined point in any land use approval process. • We understand that staff's concern is that utilizing the standard "application deemed complete" trigger for grandfathering projects allows projects that have been deemed complete but now reviewed to be exempt from the new MRP requirements. Staff explained that this situation is particularly problematic where such projects do not go forward for a significant period of time. To address these issues, we recommend inserting the following language into Provision C.3.b.ii(1) and C.3.c.ii: "For development projects for which an application has been deemed complete before July 1, 2010, the requirements of Provision C.3.c.i. shall not apply so long as the project proponent is diligently pursuing the project. Diligent pursuance may be demonstrated by submittal of further applications, plans, or other documents required for any necessary approval(s) of the project by the Discharger. If in any twelve	the suggested language revisions, which we have modified and used in our revisions to these Provisions. Also see response immediately above.	appreciate the suggested language revisions, which we have modified and used in our revisions of these Provisions. Also see response immediately above.

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				(12) month period following July 1, 2010, the applicant fails to take any action to obtain necessary approvals from the Discharger, the Project will then be subject to the requirements of Provision C.3.c.i. For public projects for which funding has been committed and construction is scheduled to begin by July 1, 2011, the requirements of Provision C.3.c.i shall not apply. " • We believe that this language would meet the dual goals of ensuring that projects which have undergone design and review are not unfairly subject to a new set of regulations that could require significant revisions while at the same time ensuring that the exemption is limited to projects which are being actively reviewed and considered.		
NOAA	7	C.3.b.ii.(1) C.3.c.ii.	Grandfathering or Pipeline Language *Private Projects*	This grandfathering provision exempts development projects from the requirement to incorporate LID techniques if they have received final, major, staff-level discretionary review and approval before July 1, 2010. We object to this provision because most of the Permittees have been required to have a working stormwater program in place for many years. They should be more than capable of evaluating and	The grandfathering language allows projects which have undergone design review and later stages of development or construction to not be subjected to a new set of regulations that could require significant revisions. At the same time, the language must also ensure	See the discussion in the two responses immediately above.

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				requiring stormwater BMPs for all projects upon approval of this permit by the Water Board. Development projects coming through the approval process now should already be designed with stormwater BMPs in place and this provision seems to open the door for allowing a batch of projects to get through without fully addressing their impacts.	that this "exemption" from new regulations is limited to those projects that are actively pursuing their permits and proceeding with development. Based on numerous comments on this Provision, we recognize that the language in the revised TO does not reflect recognized milestones in the development approval process. Therefore, the grandfathering language has been revised to reflect more universal development milestones. Also see the two responses immediately above.	
NOAA	8	C.3.b.ii.(1) C.3.c.ii.	Grandfathering or Pipeline Language *Public Projects*	We object to the exemption for public projects for which funding has been committed and construction is scheduled to begin by July 1, 2011. This could result in many public projects claiming this exemption which would impact the water quality and attainment of beneficial uses in the San Francisco Bay area for a long time. It would be more efficient and less expensive to prevent these impacts.	Application of the grandfathering exemption to public projects that have construction scheduled to begin by a new requirement's effective date (for the 5000 ft^2 threshold, 2 years after the MRP effective date) may be too late in the permitting process to implement new requirements, particularly since this type of approval	None

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					requires actions by city councils or boards of supervisors. We feel allowing an additional year after a new requirement's implementation date to determine the "grandfathering date" for public projects is appropriate.	
ACCWP ACCWP Att 1 Alameda Berkeley Berkeley Att 1 Dublin Fremont Hayward Livermore Mountain View Newark Newark Att Oakland Oakland Att 1 Pleasanton San Pablo Sunnyvale	15 4 3, 10 13 4 5 6, 9 7 7 5 7 3 10 5 8 1 21	C.3.b.ii.(1)(a)	Special Land Use Categories *5000 ft²* *Treatment Threshold*	Do not reduce the Regulated Project applicability threshold to 5000 ft² because: • It will result in a disproportionate amount of implementation costs directed at inspecting and enforcing compliance of small treatment devices. • The cost of inspection and enforcement would continue to increase dramatically over time. • It is inefficient and wasteful to dedicate this level of public resources toward the maintenance of small devices that would be of questionable usefulness even if they were rigorously maintained. • There is also an excessive administrative burden associated with executing operations and maintenance agreements for each of these devices.	The 5000 ft² threshold for the identified special Land Use Categories in Provision C.3.b.i.(1) constitute MEP and are consistent with State Board guidance, court decisions, and other Water Boards' requirements. In the precedential decision contained in its WQ Order No. 2000-11, the State Board upheld the SUSMP (Standard Urban Stormwater Mitigation Plan) requirements issued by the Los Angeles Water Board's Executive Officer on March 8, 2000 and found that they constitute MEP for addressing pollutant discharges resulting from Priority Development	None

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				• A study by Regional Board staff found that the existing 10,000 ft^2 threshold captured 97% of all the impervious surfaces installed in the cities of Livermore, Dublin and Pleasanton. • Is supporting data available showing that reducing the impervious threshold for special land use categories will improve water quality? • Preparation of Stormwater Management Plans is very expensive for applicants. Requiring this for smaller projects is likely to have a chilling effect on development and redevelopment at a time when it is most needed due to the economic situation. • Using different thresholds for different types of projects introduces additional complexity and confusion for applicants/staff.	Projects. The State Board re-affirmed that SUSMP requirements constitute MEP in their Order WQ 2001-15. Provision C.3.b.i.(1)'s requirement that development projects in the identified Special Land Use Categories that add and/or replace $\geq$ 5000 ft^2 of impervious surface shall install hydraulically sized stormwater treatment systems is consistent with the SUSMP provisions upheld by the State Board. Provision C.3.b.i.(1) is also consistent with Order No. R9-2007-0001 issued by the San Diego Water Board, Order No. R4-2009-0057 issued by the Los Angeles Water Board, Order No. 2009-0030 issued by the Santa Ana Water Board, and State Board's Order WQ 2003-0005 issued to Phase II MS4s. Under Order WQ 2003-0005, Phase II MS4s must apply the lower 5000 ft^2 threshold for requiring stormwater treatment systems by April	
Livermore	7	C.3.b.ii.(1)(a)	Special Land Use Categories *5000 ft^2 Treatment Threshold*	For small sites subject to the reduced treatment threshold of 5000 ft^2, effective vegetated controls are difficult or impossible to effectively implement in a cost-effective manner. The requirement to lower the treatment threshold should be eliminated from the permit once and for all, unless the Board and staff are interested in implementing ineffective, "symbolic"		

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				stormwater controls on these small projects. While these features may be effective for limited portions of these smaller sites, in most cases they do not fully solve the problem nor make this requirement workable.	2008. The MRP already allows 2 years from the MRP effective date for the Permittees to implement the lower 5000 ft^2 threshold, essentially 3½ years later than the Phase II MS4s.	
Berkeley Att 1	4	C.3.b.ii.(1)(a)	Special Land Use Categories *5000 ft^2 Treatment Threshold*	Alternatively, remove the requirement for maintenance agreements for or inspections of these smaller Regulated Projects subject to the lower treatment threshold.	These smaller projects represent land use categories that have greater potential to contribute pollutants to stormwater runoff. Therefore, it would be inappropriate to remove the maintenance and inspection requirements for them.	None
Union City	3	C.3.b.ii.(1)(a)	Special Land Use Categories *5000 ft^2 Treatment Threshold*	This provision lowers the threshold for Regulated Projects from 10,000 ft^2 to 5000 ft^2. This also places additional review efforts by the City staff. It appears that any project with ≥5,000 ft^2 of impervious surface would need to obtain an individual permit from the Board.	No individual permit from the Water Board is required.	None
Contra Costa Brd Of Sups Att A Contra Costa Council	5 2	C.3.b.ii.(1)(c) -(d)	50% Rule for Redevelopment	The MRP should require redevelopment projects to ameliorate stormwater impacts to the MEP instead of applying the 50% rule, which requires any redevelopment project disturbing ≥ 50% of the pre-existing impervious surface to comply with the	The purpose of the 50% rule is to require stormwater treatment at projects where a substantial amount of impervious surface is being replaced. It is a means to address the pollutant	None

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				stormwater treatment requirements for the entire project. If less than 50% is disturbed, the project still must implement the permit's requirements for the stormwater runoff from the "disturbed" portion. Infill and redevelopment projects bring significant environmental, quality of life benefits and economic benefits that may be used to defray the added costs of implementing the MRP's new requirements. Any improvement in stormwater management as a result of redevelopment is an improvement over the pre-existing conditions, so redevelopment projects should be encouraged not penalized.	loading from existing development and impervious surfaces when these sites are being redeveloped. Use of the 50% rule in this Provision is consistent with the Permittees' current stormwater permits and stormwater permits statewide; therefore it is considered MEP. In situations where the site conditions render the treatment of existing impervious areas challenging or cost-prohibitive, Provision C.3.e. provides alternative means of compliance with Provision C.3.b.	
Oakland Att 1	8	C.3.b.ii.(3)	Redevelopment Definition	The definition of "redevelopment" states that the site has some past development. This definition is way too strict. In Oakland, many redevelopment sites were originally undeveloped, then developed, and then the improvements were removed and the site was returned to its natural state (for example, in the course of remediating contaminated soil). It doesn't make sense to call a project a redevelopment	The distinction recommended in the comment does not affect the applicability of Provision C.3.b.'s requirements. All development projects, new and redevelopment, is required to provide LID stormwater treatment in accordance with Provisions C.3.c. and d.	None

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				project if it's on a site that had impervious surface once in the distant pass but is now pervious. Change to "Redevelopment is any…on a site containing existing impervious surface."		
ACCWP Att 1 Berkeley Berkeley Att 1 Oakland Att 1	7 15 7 9	C.3.b.ii.(3)	Redevelopment Projects	The Water Board's "General Comments and Responses - MRP November 2007 Tentative Order" expresses the Board's intent to maintain the existing exemption for paving work in the right-of-way. However, this Provision abbreviates this exemption language to only "pavement resurfacing within the existing footprint." This language is far short of the affirmative language in the current permit which includes structural section rehabilitation and any other road reconstruction. Therefore, the exemption language in this Provision should be replaced with the language from the current permit: "Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation, within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed."	The requirements and by extension the exemptions listed in this Provision apply to redevelopment of structures and their associated parking lots. The December 2007 TO contained a Provision (C.3.b.i.(5)) to regulate road expansion and rehabilitation projects. In response to comments, we removed that Provision, thereby maintaining the existing exemption for road rehabilitation and/or reconstruction work in an existing right-of-way.	None
Caltrans	6	C.3.b.ii.(4)	Caltrans Road Projects	We appreciate the exclusion of Caltrans road projects from the list of	We concur.	The suggested revisions have been

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				Regulated Projects. It would be preferable to state this exclusion as "Caltrans highway projects and associated facilities." Park and Ride Lots and Safety Roadside Rest Areas, for example, are covered by the Caltrans' Statewide Permit and they would not fall under the building and planning authority of the Permittees.		incorporated into this Provision.
Contra Costa Brd Of Sups Att A Pleasanton Santa Clara Co	7 12 8	C.3.b.ii.(4)	New Road Projects *Bike lanes* *Sidewalks* *Trails*	To require treatment (and flow control) of runoff from sidewalks, bicycle lanes and trails to an increased degree is to effectively discourage these amenities from being included in projects by rendering it more expensive for Permittees to include these amenities in road projects; therefore it seems inconsistent with goals of the NPDES permit to require treatment of runoff from these types of impervious surface.	• This Provision only requires treatment of runoff from bike lanes built as part of a new road project. Bike lanes added to existing roads are not subject to treatment requirements. • Although widening existing roads with bike lanes and sidewalks increases impervious surface and increases stormwater pollutants because of aerial deposition, they have been excluded from this Provision because we recognize the greater benefit that bike lanes and sidewalks provide by encouraging less use of cars.	An exclusion from treatment for bike lanes built as part of a new road project but that are not hydraulically connected to the road and that direct stormwater runoff to adjacent vegetated areas has been added into Provision C.3.b.ii.(4)(d).
BASMAA Att Millbrae SMCWPPP	6 10 8	C.3.b.ii.(4)(a)	New Road Projects *Bike Lanes*	Provision C.3.b.ii.(4)(a),(b), and (c) requires new bicycle lanes regardless of whether they are built as part of a new street or roadway or added to an existing roadway to be subject to the treatment requirements. All bike lanes should be excluded from compliance with Provision C.3 in order to create an incentive for alternative modes of transportation that reduce the emission of green house gases and other vehicle-caused stormwater pollutants.		

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Pacifica San Jose Att A SCVURPPP Att A Sunnyvale	11 7 6 23	C.3.b.ii.(4)(a)	New Road Projects *Bike Lanes*	Construction of new bike lanes built as part of a new street or roadway or added to an existing roadway should be excluded from the treatment requirements of Provision C.3.	• This Provision also contains specific exclusions for: sidewalks built as part of a new road and built to direct stormwater runoff to adjacent vegetated areas; bike • lanes built as part of a new road but not hydraulically connected to the new road and built to direct stormwater runoff to adjacent vegetated areas; impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or towards the outboard side of levees; and sidewalks, bike lanes, or trails constructed with permeable surfaces. • We concur that the use of bike lanes reduces air and water pollutants by encouraging less use of cars; however, the additional impervious	
Pleasanton San Jose Att A	12 8	C.3.b.ii.(4)(b)	New Road Projects *Sidewalks*	Excluded projects should also include new sidewalks and sidewalk additions built in infill locations where adjacent vegetated non-erodible permeable areas do not exist and it is impractical to build them. Sidewalks provide an environmental benefit for encouraging alternative modes of transportation. The City requests that new sidewalks in infill locations where directing runoff to vegetated areas is infeasible be excluded from the requirements of Provision C.3.d		

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					surface from bike lanes do increase stormwater pollutants because of aerial deposition. Also, bike lanes right next to and hydraulically connected to traffic lanes will receive pollutants from vehicles travelling in the traffic lanes. • New roads do not have the drainage and space constraints of projects adding bike lines to existing roads, so stormwater treatment can easily be designed and built to account for the bike lanes additional impervious surface. • We realize there may be two types of bike lanes built as part of new road projects and so an exclusion from treatment is appropriate for bike lanes built as part of a new road project but that are not hydraulically connected to the road and that direct stormwater runoff to adjacent vegetated areas.	

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ACCWP Att 1 Berkeley Att 1 Brisbane Burlingame Millbrae Mountain View Newark Att Oakland Att 1 Pacifica San Mateo Santa Clara Co SCVRUPPP Att A SMCWPPP Sunnyvale	8 8 9 4 9, 11 6 6 10 10, 11 4 10 7 9 23	C.3.b.ii.(4)(b)	50% % Rule for Road Widening Projects	Revise this Provision to allow the 50% rule to apply to road widening projects. This rule allows any redevelopment project altering less than 50% of the impervious surface of a previously existing development with no post-construction controls to design stormwater treatment only for the impervious surface being replaced and/or added as part of the project. The Fact Sheet states that Water Board staff expects that most road widening projects will not be able to separate runoff flows from existing and new lanes; therefore, road widening projects are not allowed the same 50% rule that applies to other redevelopment projects. The MRP should not restrict the ingenuity and resourcefulness of municipal staff and design professionals. It is not reasonable or practicable to burden roadway widening projects with an inflexible requirement to treat all stormwater runoff from the entire road.	We concur that it is appropriate to apply the 50% rule to road widening projects. However, we still anticipate that most road widening projects will not be able to separate stormwater runoff flows from existing and new traffic lanes. In these cases, if onsite stormwater treatment systems are installed, they still must treat the runoff from the entire road. However, if offsite treatment or in-lieu fees are provided under Provision C.3.e., the 50% rule will allow projects replacing <50% of the impervious surface to address only the runoff from the added traffic lanes.	Provision C.3.b.ii.(4) has been revised to include the 50% rule for road widening projects.
Pleasanton	12	C.3.b.ii.(4)(b)	New Road Projects	The requirement for installing treatment devices for additional traffic lanes on a public street should be exempt. Adding new traffic lanes has the benefit of minimizing pollution from congested traffic conditions. Adding this stringent requirement to these community	Roads are considered one of the most polluted impervious surface types because of the contribution of pollutants from vehicles and the immediate washing of these pollutants into the	None

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				enhancement features places limits on the already strapped funding for these projects and results in postponement and perhaps eliminating the project.	storm drain system during rainfall events with no diversion through pervious or vegetated areas. As such, requiring treatment for road widening projects is appropriate.	
Mountain View Santa Clara Co	6 9	C.3.b.ii.(4)(c)	Trails	All trail projects should be exempted from the treatment requirements to keep costs of these projects at a manageable level. The requirement to treat runoff from new, nonexempt trail projects may be difficult to design and construct, and may be a disincentive for cities to pursue development of these important pedestrian and bicycle trails.	To develop a fair and workable stormwater requirement for trails we worked closely with the Santa Clara stormwater program, especially the Santa Clara Valley Water District and the City of San Jose, two entities with numerous trail projects planned in the South Bay. We believe the exemption language in the revised TO addresses cost concerns while ensuring that stormwater runoff from trails is treated.	None
Daly City	4	C.3.b.iii and C.3.b.iii.v.(2)	Green Street Pilot Projects vs. Pilot Green Streets Project	Different Titles - Make language consistent with section C.3.b.iii.	Although the "Green Street" pilot projects are referred to a little differently, it is understood the different titles refer to the same pilot projects.	None
ACCWP ACCWP Att 1	18, 19, 21 10	C.3.b.iii.	Green Street Pilot Projects	Some municipalities have been aggressive in implementing green	In response to the Permittees' request for	None

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BASMAA Att Berkeley Berkeley Att 1 Fairfield FSSD Newark Newark Att Oakland Att 1 San Jose Att A SCVURPPP Att A SMCWPPP Suisun City Sunnyvale	7-9 16, 19 10 7-10, 12 6-10 11 8 12 9 8 11 7-12 25		*Existing Projects*	development and have installed projects that meet the requirements of this provision. Allow green street projects implemented since 2003, which meet the treatment sizing criteria and incorporate the green street components, to count towards the required number of pilot projects, with appropriate documentation of project elements.	allowing existing projects to be counted as one of the 10 required green street projects, we asked BASMAA numerous times for information on specific projects that the Permittees wanted us to consider; however, no information on any projects was provided to us. Therefore, no existing project will be given "credit" as one of the required 10 green street pilot projects.	
ACCWP Att 1 BASMAA Att Berkeley Att 1 Dublin Fairfield FSSD Oakland Att 1 Newark Newark Att Pleasanton San Jose Att A SCVURPPP Att A SMCWPPP Suisun City Sunnyvale	15 7-8, 11 15 7 7-8, 10-12 6-10 17 8, 10 8, 13 8 9 8 11, 14 7-12 25	C.3.b.iii.	Green Street Pilot Projects *Due Date*	Extend due date to at least July 1, 2014 to allow full permit term for achieving provision. The unrealistic time frame for identifying projects, obtaining funds, planning, design and construction demonstrates a lack of familiarity with the construction project development process. No one expects regulatory staff to understand the roadway project development process; therefore, the MRP would benefit from better communication and collaboration with Permittees who work on roadway improvements on a routine basis.	We concur that allowing the full permit term for completing all 10 green street pilot projects is appropriate. However, we rely on data generated by the requirements of the MRP for the permit term to determine the requirements for the next permit term. Therefore, a report on the green street pilot projects completed by the end of the fourth year of the MRP is appropriate.	Provision C.3.b.iii. has been revised to extend the due date for completion of all 10 green street pilot projects to the end of the permit term. A reporting requirement has been added to Provision C.3.b.v.(2) for projects completed by the fourth year of the MRP.
Campbell	3	C.3.b.iii.	Green Street Pilot Projects	Reduce or delay these new requirements.		

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			Due Date			
BASMAA Att CCCWP CCCWP Att Fairfield FSSD Newark Att San Jose Att A SCVURPPP Att A SMCWPPP Suisun City Sunnyvale	7-8, 10 14 10 7-8, 10-12 6-10 8 9 8 11 7-12 25	C.3.b.iii.	Green Street Pilot Projects	The following changes should be made to this section to facilitate implementation by the Permittees: • Make the pilot projects contingent on securing funding. • Allow parking lots to qualify as a type of green streets project. • Allow new road projects and redevelopment projects to count toward the total of ten projects. • Delete or reference as a goal the requirement to meet the hydraulic sizing criteria in Provision C.3.d. to make the redevelopment or retrofit projects feasible because space within right-of-ways in densely urban areas is limited and drainage areas tributary to treatment facilities comprise both new and existing areas.	This Provision was added in response to numerous comments from the Permittees objecting to treatment requirements for road reconstruction projects because of the level of difficulty and lack of funding. The intent of this Provision is to replace the road reconstruction treatment requirements with less onerous requirements and provide an opportunity for Permittees to collect data and learn from the pilot projects so as to make future projects easier to implement. As such, they cannot be Regulated Projects already subject to Provision C.3. (i.e., new road projects or redevelopment projects) They must also be subject to Provision C.3.d. because otherwise they will be undersized and not achieve the required treatment level. However, we have revised the Provision to allow	This Provision has been revised to allow parking lot projects to be pilot projects as long as they also treat street runoff.

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					parking lot projects to be pilot projects as long as they also treat street runoff.	
ACCWP Att 1 Berkeley Livermore Menlo Park Newark Att Oakland Att A Union City	9 9 8 3 7 11 4	C.3.b.iii.	Green Street Pilot Projects	Eliminate this Provision because: • The Permit already establishes a requirement for municipalities to comply with treatment requirements for road projects that create 10,000 sq. ft. of impervious surface and compliance with hydrograph modification requirement for new road projects that create an acre or greater of impervious surface. • Given the current economic conditions faced by municipalities, expensive pilot projects that are also redundant with other established requirements, should be eliminated.	The Provision C.3. treatment requirement only applies when new roads are built or additional traffic lanes are added. This Provision was added in response to numerous comments from the Permittees objecting to treatment requirements for road reconstruction projects because of the level of difficulty and lack of funding. The intent of this Provision is to replace the road reconstruction treatment requirements with less onerous requirements and provide an opportunity for Permittees to learn from the pilot projects. The pilot projects provide treatment for street projects which would not otherwise be required, so there is no redundancy with existing requirements as the commenters contend.	None
Metropolitan	2	C.3.b.iii.	Green Street	We strongly support your requirement	We concur that location in a	Provision C.3.b.iii.(2)

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Transportation Commission		C.3.b.iii.(2)	Pilot Projects	for the construction of 10 green street pilot projects within the first four years of the permit and strongly urge that these projects be required to be located in the region's defined "priority development areas" (PDAs) as per the Association of Bay Area Governments (ABAG) / MTC FOCUS program. We also support additional green street projects be included in the program, if possible.	PDA should be added as a key element; however, we acknowledge that it will be difficult for every project to include all the key elements. Therefore, Provision C.3.b.iii.(2) has been revised to require that as a whole, the ten projects should include all the key elements instead of each project having to include all the key elements.	has been revised to add location in a PDA as a key element and to require as a whole, the ten pilot projects should include all the key elements.
SMCWPPP	4	C.3.b.iii.	Green Street Pilot Projects	A positive improvement in this Provision is elimination of a requirement to install stormwater treatment controls for road rehabilitation projects. The replacement requirement for 10 green street pilot projects aligns with the Countywide Program's interest in pilot testing the use of green streets and parking lots.	Comment noted.	None
SMCWPPP	11	C.3.b.iii.	Green Street Pilot Projects	These requirements should specify that there be at least two projects in each countywide program.	We concur	Provision C.3.b.iii. has been revised accordingly.
San Leandro	4	C.3.b.iii.	Green Street Pilot Projects	Language is poorly written. It is not clear what a project must contain to be considered a green street.	Comment noted.	Additional language has been added to clarify the requirements.
ACCWP Att 1	13	C.3.b.iii.	Green Street	Eliminate the monitoring requirement	This Provision requires	This Provision has

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Berkeley Berkeley Att 1 Fremont Newark Newark Att Oakland Att 1 Pittsburg San Leandro SMCWPPP	18 13 11 10 11 15 8 4 13		Pilot Projects *Monitoring*	form this Provision: • Provision C.8 already contains extensive monitoring requirements. • Unless grant funding becomes available, it will be hard enough for the Permittees to implement green street pilot projects and the necessary long-term operations and maintenance and verification inspections. • Monitoring water quality benefits from individual LID installations is a cumbersome and costly requirement that will not improve water quality. • Tracking the on-going O&M costs associated with the pilot green streets project is burdensome on Permittees resources, and only serves as an excessive data gathering exercise.	Permittees to "conduct appropriate monitoring of these projects to document the water quality benefits achieved." This language is broad and allows flexibility. To highlight that flexibility, we have added the following qualifier, "Appropriate monitoring may include modeling using the design specifications and specific site conditions."	been revised as described under the Response column.
Pacifica SMCWPPP	13 11	C.3.b.iii.(1)	Green Street Pilot Projects *Types of Projects*	The pilot projects should be focused on locations with the most opportunities for these types of projects. The requirement that the pilot projects be representative of various types of streets (i.e., arterial, collector, and local) should be replaced with a requirement that the pilot projects be conducted on the types of streets that provide the most opportunity for being retrofitted within each county.	This Provision was added in response to numerous comments from the Permittees objecting to treatment requirements for road reconstruction projects because of the level of difficulty and lack of funding. The intent of this Provision is to replace the road reconstruction treatment requirements with less onerous requirements and	None

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					provide an opportunity for Permittees to learn from the pilot projects. As such, they should be representative of different street types and not just the "easier" projects.	
ACCWP ACCWP Att 1 BASMAA Att Berkeley Berkeley Att 1 Dublin Fairfield FSSD Newark Newark Att Oakland Att 1 Pleasanton San Jose Att A SCVURPPP Att A SMCWPPP Suisun City Sunnyvale	18-19, 21 11-12 7-8 16-17, 19 11-12 7 7-8, 10-12 6-10 8-11 8-10 13-14 8 9 8 11 7-12 25	C.3.b.iii.(2) C.e.b.iii.(2)(d)	Green Street Pilot Projects *Key Elements*	We are concerned about both the feasibility of implementing this Provision's requirements and the appropriateness of some of the requirements in a stormwater permit because they go beyond water quality considerations. Our recommended changes for making implementation feasible, notwithstanding our legal concerns, are listed below: • The key elements listed under Provision C.3.b.iii.(2)(a)-(e) are unnecessary requirements given broad support for LID and they go beyond what is required in federal Clean Water Act stormwater permits. Either delete them as requirements for each Green Street Project or only require each project to consider them. • Because it would be nearly impossible for one project to contain all of the key elements listed, require that as a whole, the ten projects should contain the listed elements rather than each project containing	We concur that it will be difficult for every project to include all the key elements but as a whole, the ten projects should include all the key elements.	Changes have been made to this Provision to allow the 10 pilot projects, as a whole, to include all the key elements listed.

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				the listed elements. • The parking requirements should be deleted because parking management is handled through land use regulation as part of an overall strategy to reduce transportation demand by various land uses and is not part of street design.		
Stopwaste.org	10	C.3.b.iii.(2)	Green Street Pilot Projects *Key Elements*	Add text to the second to last sentence in the paragraph, "Permittees shall cumulatively complete 10 pilot green streets projects that incorporate LID techniques for site design and treatment in accordance with Provision C.3.c. and that provide stormwater treatment sized in accordance with Provision C.3.d. It is also desirable that they meet or exceed the Bay-Friendly Landscape Scorecard minimum requirements (www.BayFriendly.org)."	We concur.	Language added.
Stopwaste.org	11	C.3.b.iii.(2)	Green Street Pilot Projects *Key Elements*	Add an additional section (f) as follows, "(f) Meet or exceed Bay-Friendly Landscape Scorecard minimum requirements (www.BayFriendly.Org)"	The suggested language was not incorporated because it would impose additional requirements.	None
ACCWP Att 1 Berkeley Att 1 Newark Att Oakland Att 1	14 14 12 16	C.3.b.iii.(2)(a)	Green Street Pilot Projects *Key Elements Natural Features*	The term "natural feature" used to describe a landscape-based facility that treats and/or infiltrates stormwater is the wrong term because even landscape-based systems are not "natural" per se, they are designed and engineered systems. The term landscape-based is recommended,	"Natural feature" is a broad generic term that encompasses landscape-based systems and as such, no change is necessary.	None

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				since it is a term that is associated with design.		
ACCWP Att 3 Berkeley Att 2 Oakland Att 2 Newark Att	2 3 3 14	C.3.b.v.(1)	Regulated Projects *Reporting*	Reporting requirements are overly detailed. Eliminate categories of data, or make listing optional if not appropriate (such as street addresses that may not exist for new subdivisions), cross streets if an address is given, application date (approval date should be sufficient).	The data collection and reporting requirements for Regulated Projects are consistent with what is already being reported by most Permittees under their current stormwater permits.	None
Stopwaste.org	12	C.3.b.v.(1)	Regulated Projects *Reporting*	On page 21, Section C.3.b.v.(1) add an additional section (o) as follows "(o) Sustainable landscape measures incorporated into the project including, if relevant, the score from the Bay-Friendly Landscape Scorecard."	The suggested language was not incorporated because it would impose additional requirements.	None
Sunnyvale	24	C.3.b.v.(1)	Regulated Projects Reporting	• Additional reporting requirements may require restructuring of databases and data collection systems. • Developer name and phase number are unnecessary in establishing compliance with requirements and should not be added. • Reporting on each phase of a project separately is also unnecessary if the Stormwater Management Plan prepared at the time of approval covers all phases. It should be sufficient to report on all planned BMPs at one time.	• The data collection and reporting requirements for Regulated Projects are consistent with what is already being reported by most Permittees under their current stormwater permits. • The Developer's name is important because we use the information and construction inspection data to identify exemplary as well as problem developers who may	None

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					benefit from outreach or require enforcement. • As many subdivisions are built in phases over many years, the phase number distinguishes the phases as distinct separate projects.	
Fremont	12	C.3.b.v.(1)(c)	Regulated Projects *Reporting*	Eliminate reporting on the watershed because it is burdensome and does not improve water quality.	We disagree. Watershed data is very basic information that is even taught in schools more and more. Watershed information provides valuable data on which waterbodies Regulated Projects are discharging into and is essential when offsite and Regional projects are constructed in place of onsite treatment systems.	None
ACCWP Att 1 ACCWP Att 3 Berkeley Att 1 Berkeley Att 2 Newark Att Oakland Att 1 Oakland Att 2	16 3 16 4 15 18 4	C.3.b.v.(1)(d)	Regulated Projects *Reporting*	Remove requirement for reporting area of land disturbed. These data have no relevance to Regulated Projects for post-construction stormwater management. Collecting these data is unnecessary and cumbersome.	Site and land disturbed area is very basic information that is readily available from the development application. This information allows us to cross-check with construction sites subject to the general construction stormwater permit.	None
Kolb, Larry	11	C.3.b.v.(1)(k)	Regulated	This must also include operation and	Reporting specific	None

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James, Roger		Page 21	Projects *Reporting*	maintenance procedures and costs, funding mechanisms, monitoring program protocols to determine when replacement/renovation is required.	information on each Regulated Project's operation and maintenance procedures, costs, and funding mechanisms is too burdensome. As more stormwater treatment systems are installed and operation and maintenance inspections performed, more data will become available on treatment system performance. The recommendation for protocols to determine when replacement/renovation of these systems is required is a good one but more applicable for the next permit term.	
ACCWP Att 1 ACCWP Att 3 Berkeley Att 1 Berkeley Att 2 Fremont Newark Att Oakland Att 1 Oakland Att 2 Pacifica	17 4-5 17 5, 6 12 16, 17 19 5, 6 14	C.3.b.v.(2)	Green Street Pilot Projects *Reporting*	• Eliminate the Green Streets reporting requirement because this is a cumbersome, overly burdensome, and non-essential reporting task that will reduce the scope and scale of these types of projects. • Report on status only (i.e., design, construction, completion) until project is complete. • Report on O&M provisions only if entity other than Permittee is	This Provision was added in response to numerous comments from the Permittees objecting to treatment requirements for road reconstruction projects because of the level of difficulty and lack of funding. The intent of this Provision is to replace the road reconstruction treatment requirements with less	None

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				responsible. • Eliminate cost reporting. • Green Streets projects will be reported in the Table of New Development projects, as required in C.3.b.v.(1).	onerous requirements and provide an opportunity for Permittees to learn from the pilot projects. As such, the listed data is required to provide basic information to Permittees on the feasibility of, barriers to, cost effective methods for, and other relevant information on implementing green street projects.	
Stopwaste.org	13	C.3.b.v.(2)	Green Street Pilot Projects *Reporting*	Ad the highlighted sentence, "…For each completed project, Permittees shall report the capital costs, operation and maintenance costs, and legal and procedural arrangements in place to address operation and maintenance and its associated costs and the sustainable landscape measures incorporated into the project including, if relevant, the score from the Bay-Friendly Landscape Scorecard."	We concur.	Language added.
Kolb, Larry James, Roger	12	C.3.b.v.(2)	Regulated Projects *Reporting*	The information required must also include design criteria, as built drawings, replacement costs during a 50-year life cycle, monitoring program and results.	Reporting specific information on each Regulated Project's design criteria, as-built drawings, and replacement costs during a 50-year life cycle is too burdensome. Reporting on operation and maintenance program and	None

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					inspection results are required by Provision C.3.h.iv.	
NOAA	5	C.3.c.	LID	We strongly support the inclusion of Low Impact Development (LID) techniques as compliance options in the proposed permit for reducing the discharge of pollutants in stormwater runoff to the maximum extent practicable.	Comment noted.	None
Friends of Five Creeks	4	C.3.c.	LID	In the 7 years since the current permits were adopted, stunningly few projects have been actually built incorporating the current LID rules. (I made a pretty thorough search in the East Bay in the course of developing a website, www.bluegreenbldg.org that showcases such projects.) Please do not credit mythical projections of widespread effect of these weak, exception-ridden rules. The reality is that the current permit has led to a handful of what amount to pilot projects. Importantly, though, these show that urban-runoff pollution can be curbed without great hardship, financial or otherwise.	We concur that the LID requirements should be more stringent and specific so that more Regulated Projects incorporate LID, particularly for treatment.	The stormwater treatment requirements of Provision C.3.c. have been rewritten to incorporate more specific requirements.
NRDC & SF Baykeeper	6 18-20 26 42-43	C.3.c.	LID	• LID is the single most practicable means of protecting and restoring beneficial uses in the Bay Area. • LID has been established as a superior and practicable strategy and,	We concur and have revised this Provision to include a requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID	In response to comments, extensive revisions have been made to Provision C.3.c.

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				therefore, must be required. • The CA Ocean Protection Council has strongly endorsed LID. • USEPA has also called upon Water Boards across California to prioritize the implementation of LID. • This Provision fails to require the implementation of LID techniques common in other jurisdictions through specific numeric metrics and fails to set post-construction requirements representative of the Clean Water Act's MEP standard. • This Provision does not describe actual BMPs and accompanying performance standards; it only identifies six design measures of which Regulated Projects must implement at least one. • These site design measures need not be hydraulically sized to treat any particular amount of stormwater, and there is no guidance/requirement for which measure to select and no requirement that more than one, non-hydraulically sized measure be implemented. This does not satisfy EPA's counsel that, among other components, BMPs must be attached to measurable goals that include "a quantifiable target to measure progress toward achieving the activity or BMP."	treatment measures.	

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Contech	3	C.3.c.	LID Treatment Requirements	This Provision would prohibit the use of a treatment train, including a vault based filtration system followed by an underground infiltration system, where a landscape based BMP, such as bioretention, could be used. From the perspective of meeting the requirement to reduce the discharge of pollutants of concern to the MEP, the systems are equivalent if the water quality design storm is infiltrated. Perhaps the underground system will reduce irrigation demands, simplify operation and maintenance requirements and allow for denser development of the site. This Provision takes away the decision making power from a stormwater management system engineer.	Comment noted. We have revised this Provision to include a requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID treatment measures. LID treatment measures are defined as harvesting and re-use, infiltration, evapotranspiration, or biotreatment. The revised requirements would allow a scenario as described in the comment as long as the Provision C.3.d. stormwater runoff is treated and/or infiltrated by the bioretention unit.	In response to comments, extensive revisions have been made to Provision C.3.c.
Contech	1	C.3.c.	LID Site Design Approach	This permit intends to force stormwater management system designers to follow a LID design approach similar to the three part approach appearing in previous California NPDES permits, which requires sequenced application of source control, site design and finally treatment control features. The LID movement is partly a response to the widespread failure to adequately consider site design elements that can reduce the amount of runoff generated on site, prior to implementation of	Comment noted.	None

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				treatment or flow controls. This permit generally does a good job of redirecting focus toward site design elements.		
USEPA	2-4	C.3.c.	LID Treatment Measures	• This Provision does not establish a clear, measurable performance standard to require landscape-based treatment, on-site retention, and/or storage for re-use. • This Provision needs to include a numeric value for quantity of runoff which would be directed to LID treatment measures. EPA's primary objective for incorporating LID into renewed MS4 permits, especially for those that represent the third or fourth generation of permits regulating these discharges, is that the permit must include clear, measurable, enforceable provisions for implementation of LID. In our review of MS4 programs across our Region, we have found that it is common for permits to rely on the development of plans to achieve certain permit objectives, rather than including prescriptive requirements in	We concur and have revised this Provision to include a requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID treatment measures.	Extensive revisions have been made to Provision C.3.c.

[1]EPA et al., Green Infrastructure Statement of Intent, April 19, 2007, available at http://www.msdgc.org/downloads/wetweather/greenreport/Files/Green_Report_Exhibit_A.pdf

[2]Managing Wet Weather with Green Infrastructure, Action Strategy, EPA, January 2008, available at http://cfpub.epa.gov/npdes/greeninfrastructure/information.cfm#greenpolicy

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				the permits. While the Permittees often make significant and sincere efforts in their development of these plans, the plans often result in a reliance on qualitative provisions rather than specific measurable criteria. As a result, we have found that there often is uncertainty among both the MS4 Permittees and the permitting agencies as to specific permit expectations. The incorporation of LID techniques into MS4 permits provides an opportunity to establish clear, measurable performance standards for the implementation of LID. • LID (also called "green infrastructure") is a preferable approach to treating and reducing stormwater flow to MS4s.[1] • LID is an approach to storm water management that is cost-effective, sustainable, and environmentally-sound. • The effectiveness of landscape-based treatment for stormwater is generally superior to the "conventional" treatment addressed in Provision C.3.d of the MRP because landscape-based treatment can remove a broader range of pollutants in a more robust and redundant fashion, and can achieve		

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				multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperatures, increased energy efficiency and other community benefits such as aesthetics, recreation, and wildlife areas.[2] • The benefits of LID include: stormwater pollutant reductions, maintenance requirements do not generally require specialized equipment or personnel, and maintenance is often consistent with the requirements of other landscaping (e.g., mowing, mulching, trash clearing, etc.); reduced and delayed stormwater runoff volumes; enhanced groundwater recharge; reduced sewer overflow events; increased carbon sequestration; urban heat island mitigation and reduced energy demands; improved air quality; increased habitat and recreational space; improved human health; and increased land values.		
Contech	4-6	C.3.c.	LID Treatment Requirements	• Some vault based systems (e.g., media filters), perform on par with landscape-based, vegetated BMPs and provide distinct advantages because they remove and retain	LID treatment measures, which include landscape-based treatment, are a preferable approach to treating and reducing	None

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				pollutants in typically underground locations. • This Provision does not allow selection of treatment controls based on spill protection, aesthetic or health and safety issues, maintenance feasibility, or anything else besides whether or not the treatment system is vault-based or vegetated. • Engineered treatment and hydromodification controls should be selected based on site constraints, their proven performance capabilities, and the pollutants and hydrologic conditions of concern on site. • If there is insufficient information available to make these comparative performance assessments, the monitoring section of the permit should be revised to include a program to establish the performance implications of various design criteria for common BMPs.	stormwater runoff because it is cost-effective, sustainable, and environmentally-sound. LID treatment measures are effective because they can remove a broader range of pollutants in a more robust and redundant fashion, and can achieve multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperatures, increased energy efficiency and other community benefits. As such, these measures satisfy the MEP criteria of the Clean Water Act while vault-based treatment systems do not.	
Filterra	1-3	C.3.c.	LID Treatment Requirements	Based on the prescriptive wording it is evident that the WB prefers landscape-based stormwater BMPs. We have concerns that the revised TO is solely a design-based plan and lacks performance-based standards that establish water quality pollutant limits,	Provision C.3.c. has been revised to include specifications for biofiltration treatment systems, and a requirement for future development of biofiltration soil specifications. These	None

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				discharge effluent standards or treatment goals. Depending on site soils and geography, available landscape space, targeted pollutants and other variables, Filterra may be the best choice to achieve pollutant removal and hydromodification goals for many retrofit, redevelopment, infill and new construction applications.	specifications are not performance-based standards that establish water quality pollutant limits, discharge effluent standards or treatment goals.	
ACCWP Att 1 Berkeley Att 1 CCCWP Att Contra Costa Brd Of Sups Att A Newark Att Oakland Att 1	18 18 11 9 18 20	C.3.c.i.(1)	LID Source Control Requirements	• Since not all of the listed source control measures are appropriate for all projects, state that they are required "as appropriate." • Provide a statement that the requirements to plumb discharges to the sanitary sewer are dependent upon the local sanitary sewer agencies approval, not just its authority.	• It is implicit that certain source control measures are only applicable to certain types of Regulated Projects. • Reference to a local sewer agency's authority and standards implies that its approval is required.	None
Contech	7	C.3.c.i.(1)(b)-(e)	LID Source Control Requirements	The source control requirements are qualitative and possibly unenforceable. These criteria should be rewritten to be quantitative and measurable. For example: (c) Trash storage areas must be covered and enclosed with fencing such that rainwater cannot contact stored trash, and trash can not be transported by wind or water from the containment area. (e) Irrigation systems use no more than 80% of the average water demand for	This Provision strives to define source control requirements such that maximum flexibility is preserved to allow for unique and innovative project designs. We view these types of qualitative standards as fully enforceable.	None

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				similar type conventional landscape systems. Landscape systems may not cause or contribute to dry weather runoff be created.		
Stopwaste.org	14	C.3.c.i.(1)(d)	LID Source Control Requirements *Landscaping*	Add to the sentence, "Landscaping that minimizes irrigation and runoff, promotes surface infiltration, and minimizes the use of pesticides and fertilizers and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping (For example, meet or exceed the minimum requirements on the Bay-Friendly Landscape Scorecard www.BayFriendly.org) ;	We concur.	Reference to sustainable landscaping practices and programs such as Bay-Friendly Landscaping added.
Contra Costa Brd Of Sups Att A	10	C.3.c.i.(2)	LID Treatment Requirements	No guidance is provided to determine how much runoff is effectively managed by the treatment methods noted in C.3.c.i.(2)(a through d), and there is therefore a lack of clarity as to how much remaining stormwater runoff must be treated per C.3.d. It is recommended that these requirements be changed to recommendations. As a less-preferred alternative, this section could be augmented with a defensible rubric for determining how "remaining storm water runoff" is to be calculated.	This section has been revised to set a specific numeric value for the quantity of runoff that must be treated with LID measures and the language in question has been deleted.	None
CCCWP Att	12	C.3.c.i.(2) C.3.c.i.(2)(a)	LID Site Design	Change the initial sentence as shown below because implementation of each	• The listed site design requirements are minimum	None

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			Requirements	of these design elements is contingent on the characteristics of the site and the project. *"Require each Regulated Project to implement the following design elements, as appropriate to the project:* *(a) Conserve natural areas~~, to the extent feasible~~, including existing trees, other vegetation, and soils;"*	LID techniques that every Regulated Project should include. Including the qualifier, "as appropriate" only serves to weaken the requirement. • We concur with the deletion of the qualifier "to the extent feasible.".	
NRDC & SF Baykeeper	27 29-31 33 – 35 39 41	C.3.c.i.(2)	LID Treatment Requirements	• The vague "hierarchy" of treatment measures in this Provision does not set forth any consistent, achievable standard and is insufficient to meet the MEP standard; it must be paired with a measurable requirement for the implementation of LID. • The State Board commissioned a report which found that "[t]he important concept across all of [the] approaches [described in the report] is that the regulations established a performance requirement to limit the volume of stormwater discharges."[3] • A study completed for the Ocean Protection Council, recommended the following standard: "Regulated	We concur and have revised this Provision to include a requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID treatment measures.	Extensive revisions have been made to Provision C.3.c.

[3] State Water Resources Control Board (December 2007) *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption*, at 23 (emphasis added) (hereinafter "SWRCB LID Report").
[4] Ocean Protection Council of California (January 2008) *State and Local Policies Encouraging or Requiring Low Impact Development in California*, at 27.
[5] Letter from E. Bromley, U.S. Environmental Protection Agency, Region 9, to San Francisco Regional Water Quality Control Board, at 2.

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				development projects shall reduce the percentage of effective impervious area to less than five percent of total project area by draining stormwater into landscaped, pervious areas."[4] • EPA has highlighted similar but more specific concerns, remarking that the MRP "needs to include a numeric value for the quantity of runoff which would be directed to pervious areas" and "suggest[ing] a requirement such as proposed in the August 2007 draft Ventura County MS4 permit [5% EIA]."[5] • The MRP, however, contains nothing other than qualitative provisions and nearly everything is left to the discretion of the Permittees, which violates federal law. • The widespread implementation of other far more stringent requirements creates a presumption that such requirements would be practicable in the Bay Area. • The Response to Comments purports to explain why the Water Board does not need to impose a numeric performance standard, but the reasoning derives from anecdotal statements without supporting materials. • This Provision would allow the		

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				installation of conventional treatment systems without any particular justification or notification to the Executive Officer. • Staff point to ¶ C.3.c.i (2)'s revised hierarchy of stormwater treatment options, with an attendant requirement that the Regional Board's executive officer be notified and/or approve a site design when certain thresholds are exceeded, as a significant improvement in the Tentative Order. • The MRP fails to set a specific numeric performance standard for the implementation of LID, so the LID site design measures listed in Provision C.3.c.i.(2) are not required to be hydraulically sized to treat any meaningful quantity of stormwater. • The LID provisions remain a collection of largely hortatory provisions with no specific measurable outcome. Narrative and subjective terms (i.e., "Conserve natural areas, to the extent feasible," "Minimize impervious surface," etc.) are still prominent. Such vague provisions would not enable the Water Board or the Permittees to measure the outcomes of, or to enforce, the MRP's requirements since their implementation could vary		

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				enormously.		
USEPA	4	C.3.c.i.(2)(a)-(h)	LID Site Design and Treatment Requirements	• In order to incorporate clear, enforceable LID requirements into the Bay Area permit, sections C.3.c.i.2.(a) through (f) should be revised to clarify that regulated projects must utilize LID design elements to ensure onsite management of stormwater. • Provisions describing these design elements should be revised to remove qualifiers such as "to the extent feasible" and "as practicable."[6] • The Provision should be clear that the use of the conventional means in C.3.c.i.2(g) and (h) would not be counted in determining whether projects meet the permit's LID requirements. • Sections C.3.c.i.(4)- (6), which allow regulated projects to avoid use of LID design elements in favor of vault-based treatment systems, should be deleted.	• We concur and have revised this Provision to include a requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID treatment measures. • We have also removed the qualifiers "to the extent feasible" and "as practicable."	Extensive revisions have been made to Provision C.3.c.
Contech	8	C.3.c.i.(2)(d)	LID Site Design Requirements	These site design and stormwater treatment requirements require that runoff be directed to "vegetated" areas. As a water conservation measure, and to avoid soil erosion caused by	The intention is to have stormwater runoff directed into vegetated areas so that some treatment is provided. We assume that whichever	None

[6]In addition, these qualifiers appear to allow self-regulation by the Permittees rather than require oversight by the Regional Board on the issues of feasibility and practicability. See Environmental Defense Center, Inc. v. EPA, 344 F.3d 832 (9th Cir. 2003), and Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486 (2nd Cir. 2005)

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				directing high velocity flows toward vegetated areas, the word "vegetated" should be changed to "permeable" in this section.	measure(s) that is chosen will be suitable for the specific site conditions and designed properly.	
Contech Oakland Att 1	9 21	C.3.c.i.(2)(d)	LID Site Design Requirements	Footnote 3 is missing from this section. Presumably it includes some definition or runoff reduction performance standard for permeable surfaces.	Footnote 3 appears on page 22 when "permeable surfaces" is first used. The superscript "3" used in this section is simply a cross-reference back to Footnote 3.	None
James, Roger Kolb, Larry	13	C.3.c.i.(2)(d)	LID Site Design Requirements	Mandating these specific design elements is a violation of Section 13360 of the California Water Code and must be avoided because of the dangers created by seismic hazards. The recent article in the March 24 edition of the Contra Costa Times must be of concern to the Regional Board and taken into consideration when mandating design elements that can result in property damage. The proposal for widespread application of site design measures involving infiltration lacks creditability considering the California Geological Survey's mapping of the Bay Area identified significant areas vulnerable to liquefaction and landslides during large seismic events. It is unrealistic to expect Permittees to require these design elements in all developments	These site design measures are consistent with techniques already being implemented throughout the Bay Area and California. We have included enough options in the Provision so that projects with unsuitable site conditions for infiltration are not required to infiltrate.	None

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				especially in these danger zones. This section must require Permittees to consider creation of seismic hazards when implementing this provision.		
Sunnyvale	26	C.3.c.i.(2)(d)	LID Site Design Requirements	The required measures may not be feasible for many projects, particularly redevelopment projects in an urban setting where it is impossible to divert runoff to rain barrels or vegetated areas. The alternatives of using permeable surfaces may also be infeasible because of concerns about groundwater quality.	These site design measures are consistent with techniques already being implemented throughout the Bay Area and California, including highly urbanized areas.	None
ACCWP Att 1 BASMAA Att Berkeley Att 1 Fairfield FSSD HBANC Newark Att Oakland Att 1 San Jose Att A Suisun City Sunnyvale	19 12 19 13 11 4 19 22 10 13 27	C.3.c.i.(2)(e)	LID Treatment Requirements	In the following sentence "After completion of the site design measures specified in Provision C.3.c.i(2)(d), treat as much of the remaining stormwater runoff…" Add the words "as practicable" between "stormwater runoff" and "this includes any runoff leaving…)". This is consistent with paragraphs (f) and (g).	This Provision has been extensively revised and the referenced sentence has been deleted so the comment is no longer applicable.	None
Fairfield FSSD Suisun City	14 12 14	C.3.c.i.(2)(e)-(f)	LID Treatment Requirements	The language in these sections implies that there is a train of treatment devices required to be used in series on every project. Please delete and utilize section C.3.c.i.(2) (d) as a guidance for the Boards preferred site measures.	This Provision has been extensively revised and the sections have been deleted so the comment is no longer applicable.	None
Contech	11-14	C.3.c.i.(2)(e)-	LID Treatment	These subsections impose a treatment	LID treatment measures,	None

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		(h)	Requirements	BMP selection hierarchy that is form based instead of performance based. It is inconsistent with the directive in the Clean Water Act to reduce the discharge of pollutants to the maximum extent practicable. Some vault based systems typically perform better for key pollutants of concern than some natural feature systems. Certainly we should expect biofiltration BMPs to significantly reduce pollutant loads leaving sites when designed similar to the Contra Costa County IMP criteria which requires slow percolation through 18 inches or more of soil and vegetation. However this section does not require such BMPs and it does not include any BMP performance criteria, either for runoff reduction or pollutant removal. Instead, it simply prioritizes the use of "natural feature" BMPs. Such pitfalls are avoidable with adequate coordination and training. Unfortunately this section requires that "natural feature" BMPs be used regardless of the level of coordination and training that is likely. Where control over construction, operation and maintenance of "natural feature" BMPs can not be reasonably assured, using a vault based system may be a better bet for improving water quality.	which include landscape-based treatment, are a preferable approach to treating and reducing stormwater runoff because it is cost-effective, sustainable, and environmentally-sound. LID treatment measures are effective because they can remove a broader range of pollutants in a more robust and redundant fashion, and can achieve multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperatures, increased energy efficiency and other community benefits. As such, these measures satisfy the MEP criteria of the Clean Water Act while vault-based and conventional treatment systems do not. These sections have been revised to reflect this view	

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					by setting a specific numeric value of 100% for the quantity of runoff that must be treated with LID measures. As a result, the treatment selection hierarchy referenced in the comment has been deleted	
SMCWPPP	15	C.3.c.i.(2)(f)	LID Treatment Requirements	It is unclear what is meant by "natural feature systems (e.g., bioretention, vegetated swales, tree wells, planter boxes, and green roofs)" and "conventional systems (e.g. extended detention basins)" and why a preference is given for the former over the latter. Simply state a preference for landscape-based stormwater treatment systems over below ground treatment systems because of ease of maintenance and because they allow water to be reused as part of landscaping and infiltration. Add to the glossary definitions for terms, such as "natural treatment systems," "conventional systems," and "primary treatment."	See response immediately above.	Extensive revisions have been made to Provision C.3.c.
CCCWP Att	13	C.3.c.i.(2)(g)	LID Treatment Requirements	This Provision should make explicit that sand filters are suitable conventional treatment systems, while also providing suitable design criteria—criteria which are lacking in Provision C.3.d.	This Provision has been extensively revised and the referenced section has been deleted so the comment is no longer applicable.	None

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Contech	10	C.3.c.i.(2)(i)	LID Treatment Requirements	Please change the word "vegetated" to "permeable" to allow the use of xeriscaped or non-vegetated permeable areas to intercept flow from impervious areas.	This section has been revised to set a specific numeric value for the quantity of runoff that must be treated with LID measures and the language in question has been deleted.	None
Contech	15	C.3.c.i.(2)(i)	LID Treatment Requirements	This is a site design approach and should be moved to subsection (d) or prior to that section. If it is intended to apply to landscape areas, it should be combined with subsection (e). The term "vegetated" should be replaces with "permeable".	This Provision has been extensively revised and the referenced section has been deleted so the comment is no longer applicable.	None
James, Roger Kolb, Larry	14	C.3.c.i.(2)(i)	LID Treatment Requirements	Consideration of slope stability in the design must be a consideration in whether infiltration is feasible and if the design element should even be considered. If the Regional Board insists on mandating site designs that promote site instability and create seismic hazards then it must also be prepared to be held accountable for ensuing damages.	See response immediately above.	None
ACCWP ACCWP Att 1 Alameda BASMAA Att Berkeley Berkeley Att 1 CCCWP Att	17 20-22 4, 11 13 14 20-22 14	C.3.c.i.(4)-(6)	LID Treatment Requirements	• For projects with limited space to install adequate landscape-based treatment controls vault-based BMPs may be the only feasible systems. • There is no sound evidence that structural controls are not effective and no guarantee that vegetated	• LID treatment measures, which include landscape-based treatment systems are a preferable approach to treating and reducing stormwater runoff because it is cost-	Extensive revisions have been made to Provision C.3.c.

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Contra Costa Brd Of Sups Att A Daly City Dublin Fairfield FSSD Fremont Livermore Mountain View Newark Newark Att Oakland Att 1 Pacifica Palo Alto Pleasanton San Jose San Jose Att A San Leandro Santa Clara Co SCVURPPP Suisun City SMCWPPP Sunnyvale West Valley Clean Water Program	12 5-6 8 15 13 7, 13 9 7 12 20-22 23-25 15 5 11 3 11 5-6 11-12 9 15 16 29 6			treatment measures will work indefinitely without ongoing monitoring and maintenance. • This Provision ignores the reality that many jurisdictions are engaged in redevelopment of higher-density urban areas and not greenfields. • Storm runoff from existing developments built more than twenty years ago predates nonpoint pollution control requirements and is likely not treated. Therefore, we believe that the Board would concur that redevelopment of these properties should be encouraged so that some treatment could be provided. Furthermore, we believe that redevelopment of developed sites meets many of the same goals of LID so it id unclear why the requirements appears to do the opposite. • Limiting the use of vault-based systems conflicts with community development strategies that are promoted in Assembly Bill 375. • The additional notification and approval requirement encroaches upon a city's land use authority, puts the cities at risk for violating the Permit Streamlining Act, and will significantly delay the project approval process, which would	effective, sustainable, and environmentally-sound. LID treatment measures are effective because they can remove a broader range of pollutants in a more robust and redundant fashion, and can achieve multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperatures, increased energy efficiency and other community benefits. As such, these measures satisfy the MEP criteria of the Clean Water Act while vault-based treatment systems do not. • LID treatment measures are subject to the same operation and maintenance requirements as other stormwater treatment systems. • We acknowledge that	

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				increase costs. • Clarify timeline for response from Water Board Executive Officer upon notification from jurisdiction and whether this is for notification purposes only or for approval. • The Water Board Executive Officer does not have the legal authority to review or take part in local agency issuance of discretionary project approvals. The Executive Officer may determine at the end of annual reporting that a jurisdiction has not met MRP requirements for the year, but cannot supersede local authority over individual projects; • Water Board is notified of all projects per the annual report requirement so this Provision is redundant. • Revise to state the goal of limiting the use of vault-based systems, specify when they can be used, and request notification of the use of these systems in the annual report only.	Executive Officer notification and approval of non-LID treatment methods as outlined in the revised TO is not workable and the notification and approval requirements have been removed. • Extensive revisions have been made to this Provision to set a specific numeric requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID treatment measures onsite.	
NRDC & SF Baykeeper	36, 37	C.3.c.i.(4)-(6)	LID Treatment Requirements	• These Provisions are lacking and unlawful. • They do not give the Executive Officer approval authority until a developer proposes to use vault-based treatment systems for 50% or more of the design storm volume.	We concur and have revised this Provision to include a requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID treatment measures.	Extensive revisions have been made to Provision C.3.c.

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				Most vault-based systems perform poorly so that even allowing 30% or 40% volume treatment through such features virtually guarantees high pollutant loads and concentrations, • No criteria are given for judging whether conventional practices and/or vault-based treatment systems are truly necessary. • No guidance is given for the determination of what constitutes "site constraints" that would qualify a site for the lax stormwater BMP implementation that triggers executive officer notification/approval, nor do the provisions specify under what conditions "Equivalent Offsite Treatment" could be considered "infeasible." Indeed, it is not obvious why implementing equivalent offsite treatment would ever be infeasible.		
Contech	16-19	C.3.c.i.(4)-(6)	LID Treatment Requirements	• The reporting and approval requirements for projects using "vault-based treatment systems are based on the false assumption that "vault-based" systems are inherently inferior to "natural feature" systems. If the Board is interested in reviewing approval trends for any type of system, BMP installation, inspection and maintenance records submitted annually is sufficient.	• LID treatment measures, which include landscape-based treatment systems are a preferable approach to treating and reducing stormwater runoff because it is cost-effective, sustainable, and environmentally-sound. LID treatment measures are effective	None

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				• The requirements in this section create an additional review requirement for some projects that becomes the burden of the Executive Officer of the Board. • "Vault-based treatment systems" are undefined but could reasonably be assumed to include modular filter systems, sand filters, gravity separators, flow-through planter boxes or any other system which is contained in an impermeable vault. It is possible for a BMP to have both "natural features" and to be "vault-based". • It is also unclear what "primary treatment" means. For example, the first step in a treatment train, usually consisting of gross solids removal, is conventionally referred to as primary treatment. In this case, I suspect the term "sole" treatment more accurately captures the intent of the section. • These points of semantic clarification are made necessary by the lack of performance standards in this section. A preferable alternative would be to replace this entire section with the requirement that the treatment system with the best documented performance for the pollutants and hydrologic conditions	because they can remove a broader range of pollutants in a more robust and redundant fashion, and can achieve multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperatures, increased energy efficiency and other community benefits. As such, these measures satisfy the MEP criteria of the Clean Water Act while vault-based treatment systems do not. • We acknowledge that Executive Officer notification and approval of non-LID treatment methods as outlined in the revised TO is not workable and the notification and approval requirements have been removed. • Extensive revisions have been made to this	

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				of concern, that is also feasible, be used.	Provision to set a specific numeric requirement for 100% of the Provision C.3.d. stormwater runoff to be treated with LID treatment measures onsite. • The referenced section has been deleted so the comments regarding clarification of terms and definitions are no longer applicable.	
James, Roger Kolb, Larry	15	C.3.c.i.(4)-(6)	LID Treatment Requirements	The glossary must include definitions of vault-based treatment systems and primary treatment. The rationale for this section must be presented because vault based systems are capable of capturing and removing pollutants for safe disposal in compliance with regulations while the mandated design elements only accumulate and concentrate pollutants that are removed when they reach hazardous levels or are flushed into water bodies during high flow events. The Regional Board staff must recognize that the vault based systems limit the exposure of the public, pets and wildlife to these hazardous levels while design systems expose the	See response immediately above.	None

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				public, pets and wildlife to pollutants that can reach hazardous levels.		
ACCWP Att 1 Berkeley Att 1 Contra Costa Brd Of Sups Att A Newark Att Oakland Att 1	21 21 11 21 24	C.3.c.i.(5)(b)	LID Treatment Requirements	This provision indicates that there is a preference for Equivalent Offsite Treatment over vault-based treatment. It is not clear whether this provision is intended to allow projects that do not otherwise qualify for Alternative Compliance (per C.3.e) to employ Equivalent Offsite Treatment as a preferred option to vault-based treatment. Clarification is requested.	The referenced section has been deleted so the comment regarding clarification of intent is no longer applicable.	None
ACCWP Att 3 Berkeley Att 2 Newark Att Oakland Att 2	6 7 23 7	C.3.c.iii.	LID *Reporting*	Reporting of implementation efforts is redundant with reporting under C.3.b.v.(1), which demonstrates LID elements of each approved project.	We disagree. Reporting on implementation efforts is in the programmatic context for each Permittee whereas reporting under Provision C.3.b.v.(1) is on measures at each Regulated Project. For any potential overlap in reporting, this Provision also allows a reference to the reporting table for Provision C.3.b.v.(1).	None
James, Roger Kolb, Larry	16	C.3.d.i.(2)(c)	Numeric Sizing Criteria *Flow Hydraulic Design Basis*	It is not clear that the Regional Board staff has carefully analyzed our comments and supporting information in Comment 30. submitted on the December 2007 draft MRP since there has not been a change in this provision or response to the February 29, 2008	Provision C.3.c.i.(2)(b)(vi) of the Final TO requires bioretention treatment systems to be designed to have a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater	None

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				comment. We expect an analysis of this issue however the issue can be addressed by adding the following footnote to this section of the provision: "Flow rates shall be based on rainfall intensities that correspond to the BMP catchment's time of concentration. The surface area of BMPs designed to retain storm water to mitigate this increase in flow shall be considered as impervious surface".	runoff surface loading rate. This corresponds to an average storm intensity of 0.2 inches per hour. As the commenter states there is a safety factor of 2 added to the 85% percentile hourly annual rainfall data. This is a substantial storm intensity, and represents an optimization of the sizing of flow through stormwater treatment devices, but a fairly conservative optimization. This represents an inch of rain in a five hour period, which is a fairly infrequent rain event in this region. No requirement for size of LID or stormwater treatment catchment exists, but even if treatment is installed for small catchments, this does not necessarily require design of treatment capacity for a smaller time of concentration sized to that catchment. The stormwater treatment measures are often designed with a small storage volume above the treatment area, which also	

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					serves to ameliorate the effects of short time frame variability in the intensity of rainfall. All in all, overflow of treatment systems designed to this rainfall flow standard will be acceptably infrequent in this region.	
Caltrans	7	C.3.d.iv.	Infiltration Devices	This Provision has been modified to state: "In these areas, *a greater [than 10 ft vertical distance from the base of the infiltration device to the seasonal high groundwater mark may be appropriate and* treatment system approvals should be subject to a higher level of analysis..." These restrictions on infiltration and specification of additional analysis exceed the State Water Board's Proposed Regulations and Proposed Statewide Waiver for Onsite Wastewater Treatment Systems (OWTS) (Septic Systems): "Three feet minimum depth to groundwater or impermeable layer for conventional septic system. Two feet minimum depth for systems with supplemental treatment." Septic system discharges likely present a greater risk to groundwater than stormwater.	These changes were made in response to comments from local water management agencies with concerns about pollutants from infiltration devices. Also, by design, infiltration devices "inject" water into the ground while septic systems disperse water through a larger surface area; therefore, a greater distance to the highest groundwater mark is appropriate for infiltration devices.	None
James, Roger Kolb, Larry	17	C.3.d.iv.(1)	Infiltration Devices	This section should require that proponents of these devices file reports	The MRP does not implement the requirements	None

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				required by the Safe Drinking Water Act UIC program with USEPA-IX. This section must also include unlined cisterns as an infiltration device.	of USEPA's Safe Drinking Water Act; therefore, we cannot include a requirement for reporting of infiltration devices with USEPA. Infiltration devices as defined in this Provision (using a depth to width ratio) would include unlined cisterns that meet the specifications so there is no need to list them here.	
CCCWP Att Contech Contra Costa Brd Of Sups Att A	15 20 13	C.3.d.iv.(2)(a)	Infiltration Devices	• Remove the requirement to include a "suitable soil" layer because infiltration systems are only allowed in areas with appropriate natural soil types to accommodate infiltration. Importing additional soil adds expense with no discernible benefit, and the soil layer only serves to add a potential failure point. If this requirement is retained, the maximum infiltration rate of 5 inches/hour should be changed to a minimum infiltration rate of 5 inches/hour. • It is not feasible to engineer a soil mix to reliably limit infiltration to a maximum of 5 inches/hour while also guaranteeing infiltration will occur at a rate sufficient for stormwater treatment and flow-control. In fact, a	• The two feet of suitable soil and maximum infiltration rate required by this Provision serve to ensure adequate removal of pollutants since these are specifications for infiltration devices used as stormwater treatment devices. • Given that infiltration devices are structures that are designed to infiltrate stormwater into the subsurface and bypass the natural groundwater protection afforded by surface soil, the 5 inches/hour maximum infiltration rate	None

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				soil meeting the specification as written in the Revised Tentative Order would almost certainly cause the infiltration device to fail. • Percolation through 2 feet or more of suitable soil at an infiltration rate of at least 5 inches/hr prior even when an infiltration facility meets groundwater and well head setback requirements is an unnecessarily high level of treatment for runoff that will be traveling through at least 10' of native soil prior to reaching the water table.	ensures that the required treatment is achieved and that groundwater basins are sufficiently protected. It represents a long-term steady state infiltration rate for these devices.	
Contech	21	C.3.d.iv.(2)(d)	Infiltration Devices	.A spill protection requirement is needed to protect groundwater from contamination for these areas that pose a high threat to water quality. Vault based spill containment should be required upstream of "infiltration devices" or landscape based infiltration BMPs on these sites. Hydrodynamic separators are routinely used upstream of infiltration devices since they provide spill protection and can be sized to reliably remove particles as fine as 50 microns. Where the ratio of annual infiltration volume to infiltrating surface area is very small, for example a dry well, treatment by filtration upstream of infiltration may be necessary.	These requirements do not preclude the use of hydrodynamic separators upstream of infiltration devices if the site conditions warrant their use. However, we do not agree that it is necessary to require spill protection for infiltration devices that are designed and sized properly.	None
James, Roger	18	C.3.e.	Alternative	This Provision does not include two	• Provision C.3.h. requires	None

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Kolb, Larry			Compliance	critical elements required to ensure that infiltration BMPs are sustainable during a project's life: • Verification that a BMP has been constructed as designed by requiring as built drawings and verification of infiltration rates through field testing. The performance of BMPs that rely on infiltration will begin to deteriorate from the date of initial installation as the soils clog from accumulation of sediments and schmutzdecke. • Rehabilitation/replacement requirement because the performance of all infiltration BMPs will eventually deteriorate requiring rehabilitation or replacement.	initial inspection of a treatment system within 45 days of construction and ongoing operation and maintenance inspections for the life of the system. • Based on the results of these inspections, Permittees are required to take appropriate enforcement actions when the treatment systems are not operating or being maintained properly. These enforcement actions will require appropriate compliance actions, including rehabilitation and/or replacement of the malfunctioning BMP. • Provision C.3.c. has been revised to include design specifications for biotreatment systems and a requirement for Permittees to propose soil media specifications and soil testing methods to verify a long-term infiltration of 5-10 inches per hour.	

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Contra Costa Co Flood Cntrl Att A	1	C.3.e.	Alternative Compliance	The MRP does not provide for alternative means to comply with the water quality and flow control requirements and hydromodification requirements. The Water Board should allow jurisdictions the flexibility to implement regional mitigation of C.3 impacts for projects that cannot acceptably meet onsite LID criteria. It is particularly problematic that some roadway projects and redevelopment projects in urban and dense suburban areas will not reasonably accommodate retrofit with LID facilities.	Alternative compliance with the stormwater treatment requirements and a specific allowance for Regulated Projects to contribute funds to Regional Projects is allowed for all redevelopment projects under Provision C.3.e. We concur that alternative compliance should be available to all projects, so this Provision has been revised to allow for this.	This Provision has been revised to allow alternative compliance for all Regulated Projects.
Daly City SMCWPPP	7 18	C.3.e.	Alternative Compliance *Exemption from Hydraulically Sized Treatment*	Alternative compliance with the hydraulically sized stormwater treatment under C.3.d has been eliminated from this heading of the permit. It also unclear whether the Water Board staff intended to delete Alternative Compliance from Provision C.3.d from this heading since this section describes an exemption from installing hydraulically-sized treatment systems.	The exemption from hydraulically sized treatment for such projects has been eliminated, so this comment is no longer applicable.	None
ACCWP Att 1 BASMAA Att Berkeley Att 1 CCCWP CCCWP Att Contra Costa Brd Of Supervisors	23, 24 14 23, 24 13 9,16, 18 1, 14	C.3.e.i.	Alternative Compliance *All Regulated Projects*	• Expand the alternative compliance option to include all road projects, which are more likely to rely on use of the alternative compliance option, due to limited right of way for treatment controls and the piecemeal nature of road improvements. Such	We understand the commenter's concerns and have revised this Provision to allow alternative compliance to all Regulated Projects. Additionally, appropriate grandfathering	Provision C.3.e. has been revised to allow alternative compliance or payment of in-lieu fees for all Regulated Projects. Appropriate grandfathering

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Fairfield Fremont HBANC Newark Att Oakland Oakland Att 1 Pittsburg San Pablo San Jose Att A Santa Clara Co SCVURPPP SMCWPPP Suisun City West Valley Clean Water Program	16 14 2 24 27 26 9 2 12 13 10 19 16 7			projects are most often not afforded additional land to incorporate LID design features. • Allow alternative compliance for new development and for road projects also because this option is intended to provide flexibility. • The elimination of the alternative compliance option and grandfathering for road projects has negative ramifications for road projects, particularly the Vasco Road Safety Improvement Project. Vasco Road is a heavily used rural road that has experienced numerous collisions. The project includes widening and installation of median barriers to improve safety but we have limited right of way and mitigating on site for the additional pavement will be difficult. The project design is currently 80% complete. Under this Provision alternative compliance would not be an option for this project, and the lack of grandfathering language would require the design of the project to be modified significantly, resulting in increased cost, delays, and loss of federal stimulus money.	language has been added for road widening projects.	language has also been added for road widening projects.
Oakland Att 1	31	C.3.e.i.	Alternative Compliance	Provision C.3 requirements overlap with "green" building requirements that	See response immediately above.	See entry immediately above.

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			"Green" Projects	also require stormwater management and water quality features. To streamline the design and permitting process, projects certified "green" under either the LEED program or the Green Point Rated program should also qualify for alternative compliance.		
Oakland Att 1	28	C.3.e.i.	Alternative Compliance *Urban Uses*	Footnote 5 states that a density of 18 development units per acre is required for urban uses. This definition only applies to residential projects. Therefore, the footnote should include a threshold, such as a minimum floor-area ratio, for nonresidential projects.	Since this Provision has been changed to allow alternative compliance for all Regulated Projects, the comment and requested changes are no longer applicable.	Provision C.3.e. has been revised to allow alternative compliance or payment of in-lieu fees for all Regulated Projects.
NRDC & SF Baykeeper	7 18-19 23 30 44-50 53, 55	C.3.e.i.(1)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment*	The State Water Board has established the SUSMP hydraulic sizing criteria (Provision C.3.d.) as a compliance floor for all Regulated Projects. A permit cannot meet the MEP standard if it does not impose these criteria to reduce stormwater pollution, yet the revised TO waives these criteria entirely for the broad category of projects described in Provision C.3.e.i.(3). These Regulated Projects, which include brownfields, low-income housing, senior-citizen housing, and transit-oriented development, are only required to implement one of seven site design measures, without any performance/sizing requirement or demonstration of technical infeasibility.	We concur and the exemption from hydraulically sized treatment for such projects has been eliminated. However, we acknowledge that when considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto - related pollutant impacts. For these types of projects, the Water Board intends to allow incentive LID	Extensive revisions have been made to Provision C.3.e.

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				While we agree with the environmental preferability of such projects in comparison to their greenfield counterparts, there is no reason to establish a blanket waiver of all meaningful stormwater mitigation requirements simply because a project constitutes "smart growth.	treatment reduction credits. That is, projects qualifying for credits may be allowed to provide LID treatment onsite for less than 100% of the Provision C.3.d. stormwater runoff. Permittees are required to propose to the Water Board by December 1, 2010, the types of projects that should be allowed the LID treatment reduction credit.	
NOAA	9	C.3.e.i.(1)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment*	There is no water quality or biological reason to give the listed categories a special exemption from the requirement for providing maximum site design treatment controls or requiring equivalent offsite treatment We object to this exemption, especially for projects that will occur in watersheds which still support ESA listed steelhead trout.	See response immediately above.	Extensive revisions have been made to Provision C.3.e.
USEPA	5	C.3.e.i.(1)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment*	The MRP should include a clearly defined, enforceable process for requiring off-site mitigation in the project vicinity for projects where use of LID design elements is infeasible.	See responses immediately above.	Extensive revisions have been made to Provision C.3.e.
Contech	22-23	C.3.e.i.(1)	Alternative Compliance	It is important to incentivize infill and redevelopment projects; however, this	See responses immediately above.	

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			Projects Exempted from Hydraulically Sized Treatment	section requires only a limited set of treatment BMPs to be considered prior to waving the hydraulic treatment control sizing requirements of section C.3.d. While these sizing requirements may be difficult to achieve with the landscape based BMPs listed in footnote 6, there are numerous underground options that can be employed without impacting geologic stability and without limiting the density of development on site.		
Contra Costa Brd Of Sups Att A	15	C.3.e.i.(1) Footnote 6	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment*	It may be extremely difficult to implement one of the listed site design treatment controls, and other treatment methods, such as green roofs, would provide equivalent treatment. The list of site design treatment controls should include an additional bullet for "other site design measures that provide stormwater runoff treatment equivalent to or greater than at least one of the listed site design treatment controls."	The site design treatment controls listed in Footnote 6 of the Revised TO refers to requirements for certain projects that were allowed to be exempted from the hydraulically sized treatment requirements of Provision C.3.d. This exemption has been removed in the Final TO; therefore, the list of site design treatment controls is no longer applicable	None
HBANC	5	C.3.e.i.(1)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment*	C.3.e.i.(1) last line of (1), "as possible" should be replaced with "as practicable"	The exemption for certain projects from the hydraulic sizing requirement of Provision C.3.d. has been removed in the Final TO; therefore, the requested change is no longer	None

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					applicable.	
ACCWP Att 1 Berkeley Att 1 Newark Att Oakland Att 1	25 25 25 29	C.3.e.i.(1)(a)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment Brownfields*	Eliminate the subsidy requirement for Brownfields projects to be exempt from hydraulic sizing requirement. Because this limitation seems unrelated to the goal of facilitating Brownfield remediation and most Brownfield redevelopment does not receive subsidies or similar benefits.	The exemption from hydraulically sized treatment for such projects has been eliminated. However, we acknowledge that when considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto - related pollutant impacts. For these types of projects, the Water Board intends to allow incentive LID treatment reduction credits. That is, projects qualifying for credits may be allowed to provide LID treatment onsite for less than 100% of the Provision C.3.d. stormwater runoff. Permittees are required to propose to the Water Board by December 1, 2010, the types of projects that should be allowed the LID treatment reduction credit.	Extensive revisions have been made to Provision C.3.e.
CCCWP Att Contra Costa Brd of Sups Att A	17 16	C.3.e.i.(1)(b)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment Low Income Housing*	The low income housing definition should coincide with the California Redevelopment Law requirement of 15% which is also consistent with Contra Costa County's 15% Inclusionary Housing Ordinance requirement.		
Metropolitan	1	C.3.e.i.(1)(d)	Alternative	Based on analytical work in the field,	The exemption from	Extensive revisions

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Transportation Commission			Compliance *Projects Exempted from Hydraulically Sized Treatment Transit Oriented Development (TOD)*	including MTC's studies of the issue, the factors of TODs that appear to contribute most to lower levels of per capita and per household automobile ownership and vehicle miles of travel are: • Close proximity to high quality transit • High density development • Low levels of parking • Mixed land use (residential / retail / commercial). These factors also contribute to higher mode shares for transit, walking and bicycling. We support your refinement of the definition and requirements for TODs to clarify your policies and procedures. The standards as proposed appear to define very high quality TODs for the purpose of modified water treatment requirements in a reasonable manner.	hydraulically sized treatment for such projects has been eliminated. However, we acknowledge that when considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto - related pollutant impacts. For these types of projects, the Water Board intends to allow incentive LID treatment reduction credits. That is, projects qualifying for credits may be allowed to provide LID treatment onsite for less than 100% of the Provision C.3.d. stormwater runoff. Permittees are required to propose to the Water Board by December 1, 2010, the types of projects that should be allowed the LID treatment reduction credit. We appreciate MTC's comments and will take them into consideration when we review the	have been made to Provision C.3.e.

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					Permittees' proposal.	
NRDC & SF Baykeeper	51-52	C.3.e.i.(1)(d)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment Transit Oriented Development (TODs)*	The TOD requirement that a project be located within a half-mile of a "transit station" carves out large portions of the metropolitan Bay Area for waivers, given the plethora of rail and bus lines. There are, for instance, 19 BART stations within Alameda County alone. Accounting for the close proximity of some stations to each other, the BART system in Alameda County would create approximately 13.5 square miles of waiver-eligible land, which includes vast swaths of prime real estate in downtown Oakland and Berkeley.[7] The criteria for commercial projects requires the project's FAR to be at least 3 (i.e., it must be at least three stories tall without any tapering—not a difficult standard to meet in urban areas). While the parking restrictions are lower than typical suburban development, they are not stringent for heavily urbanized settings—Portland, Oregon's central business district, for instance, allows no more than 0.7 parking spaces per 1000 square feet of office	The exemption from hydraulically sized treatment for such projects has been eliminated. However, we acknowledge that when considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto - related pollutant impacts. For these types of projects, the Water Board intends to allow incentive LID treatment reduction credits. That is, projects qualifying for credits may be allowed to provide LID treatment onsite for less than 100% of the Provision C.3.d. stormwater runoff. Permittees are required to propose to the Water Board	Extensive revisions have been made to Provision C.3.e.

[7] The radius of waiver eligibility around a transit station is a half-mile, meaning that the total area eligible for a waiver is $\Pi(0.5)^2$ (approximately, 0.79 square miles). With 19 BART stations in Alameda County, this has the potential to create 15 square miles of waiver-eligible land, but the short distances between some BART stations, particularly in downtown Oakland, creates an overlapping area of approximately 1.5 square miles.

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				space and 1 parking space per 1000 square feet of retail.[8]	by December 1, 2010, the types of projects that should be allowed the LID treatment reduction credit. We will take these comments into consideration when we review the Permittees' proposal.	
ACCWP Att 1 Alameda Berkeley Att 1 CCCWP Att Contra Costa Brd Of Sups Att A Daly City Fremont Newark Att Oakland Att 1 San Leandro	26, 27 12 26, 27 17 17-19 8 15 26, 27 30 7	C.3.e.i.(1)(d)	Alternative Compliance *Projects Exempted from Hydraulically Sized Treatment Requirements Transit Oriented Development (TOD)*	• Setting minimum service levels for bus hubs and bus transit stations is problematic; schedules are subject to change and are not governed by the Permittees. • The minimum Floor Area Ratio (FAR) of 3 would exclude many projects that can legitimately be categorized as TODs. • Limiting parking does not necessarily reduce the amount of impervious surface and tying the incentive to an unreasonable low parking requirement for semi-urban regions effectively eliminates the incentive and obviates an otherwise good policy. • Lower density requirement to 25 units per acre. This is more feasible for the less urbanized areas. For example,	The exemption from hydraulically sized treatment for such projects has been eliminated. However, we acknowledge that when considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto - related pollutant impacts. For these types of projects, the Water Board intends to allow incentive LID treatment reduction credits. That is, projects qualifying for credits may be allowed	Extensive revisions have been made to Provision C.3.e.

[8] U.S. Environmental Protection Agency (January 2006) *Parking Spaces/Community Places: Finding the Balance Through Smart Growth Solutions*, at 16.

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				the TOD at the Eastern Dublin BART station has 25.1 units per acre. • Raise the parking limitations to the following maximums: Restaurants = 5 spaces per 1000 ft^2 Offices = 2 spaces per 1000 ft^2 Retail = 2.5 spaces per 1000 ft^2 • Parking limits should be changed to 1.5 parking spaces per unit so TOD projects are marketable. • Remove the parking limits because it is inappropriate for the MRP to define residential parking standards for municipalities. • Residential portions of qualifying TODs are more likely than not to have underground parking, so these restrictions would not serve to reduce impervious surface. • Lower the minimum FAR (Floor Area Ratio) to 1 because 3 would exclude many projects that can legitimately be categorized as TODs. Land uses allowed within individual spaces in a TOD are subject to change after the development is completed. Therefore, it would be more appropriate to establish overall parking restrictions addressing entire TOD projects (erring on the side of less stringent parking restrictions). This section should add language indicating that the parking ratios	to provide LID treatment onsite for less than 100% of the Provision C.3.d. stormwater runoff. Permittees are required to propose to the Water Board by December 1, 2010, the types of projects that should be allowed the LID treatment reduction credit.	

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				should be required for the designed occupancy. • The State's planning policy on traffic congestion management, Government Code Section 65088(g) states, "the Legislature intends to do everything within its power to remove regulatory barriers around the development of infill housing, transit-oriented development, and mixed-use commercial development in order to reduce regional traffic congestion and provide more housing choices for all Californians." Consistent with this policy, TODs should be entirely exempted from installing site design treatment controls for purposes of compliance with C.3.		
NRDC & SF Baykeeper	44 53, 55	C.3.e.i.(2)	Alternative Compliance *Infill and Redevelopment Projects*	For all infill and redevelopment projects that are not eligible for a complete exemption from stormwater treatment requirements, this Provision still allows non-compliance with onsite requirements, so long as projects "minimize[e] the new and/or replaced impervious surface on-site" and then perform "Equivalent Offsite Treatment" or contribute "Equivalent Funds" to a "Regional Project." While these requirements do impose the Provision C.3.d. hydraulic sizing criteria, they do	We concur and Provision C.3.e.i. has been revised to specify that offsite LID treatment measures must provide hydraulically-sized treatment (in accordance with Provision C.3.d.) of an equivalent quantity of both stormwater runoff and pollutant loading and achieve a net environmental benefit. Another option is that the Regulated Project	Extensive revisions have been made to Provision C.3.e.

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				not ensure that offsite mitigation will result in the same benefits as onsite treatment because they allow projects implementing alternative compliance measures to select from three options for designing/sizing the offsite BMPs: (1) an equal area of impervious surface; (2) an equivalent quantity of pollutant loading; or (3) an equivalent quantity of runoff. These options are not necessarily equal to onsite treatment. If an equal area of impervious surface or equivalent quantity of runoff is treated, there is no guarantee that the same pollutant loading (both in amount and pollutant type) will be mitigated. If an equivalent quantity of pollutant loading is treated, there is no guarantee that an equivalent quantity of stormwater will be mitigated, which could lead to hydromodification impacts.[9] Projects should be required either to provide offsite mitigation at higher ratios (e.g., 1:1.5, as is common in the environmental context)[10] to account for any locational differences or to ensure that equivalent quantities of pollutant loading and stormwater runoff are mitigated.	must pay in-lieu fees to a Regional Project to provide hydraulically-sized treatment (in accordance with Provision C.3.d.) of an equivalent quantity of both stormwater runoff and pollutant loading and achieve a net environmental benefit.	

[9] The hydromodification criteria do not apply to all projects that would be eligible for alternative compliance, so the hydromodification section would not address this concern. *See* Tentative Order ¶ C.3.g.

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ACCWP Att 1 BASMAA Att Berkeley Att 1 Newark Att Oakland Att 1 San Jose Att A SCVURPPP Att A SMCWPPP Sunnyvale	28 15 28 28 32 13 12 20 30	C.3.e.i.(2)	Alternative Compliance *Completion Date for Offsite Projects*	The penalty for offsite projects that are delayed is unworkable. It is reasonable to have as a goal incentivizing the timely construction of the offsite project, but requiring additional treatment for tardiness is not reasonable because it would require a change to the project, resulting in further delays, and possibly exceeding space limitations on the designated site. The allowance of more time to complete an Equivalent Offsite Treatment project should be contingent upon Executive Officer approval, consistent with the requirement later in this same paragraph for Regional Projects.	If an offsite project is not completed at the time the Regulated Project is completed, then the Regulated Project will essentially be discharging untreated stormwater runoff with no mitigation. The penalty is appropriate and for offsite projects where installing a larger treatment system is not available, in-lieu fees may be paid to a Regional Project for the penalty amount of additional runoff that must be treated.	None
NRDC & SF Baykeeper	54	C.3.e.i.(2)(a) Footnote 9	Alternative Compliance *Equivalent Offsite Treatment*	The achievement of this goal would be more likely if the Tentative Order clarified that "landscape-based treatment measures" means LID retention-based BMPs, which completely eliminate runoff and thus attenuate pollution and runoff to the maximum extent practicable. As currently written, the Tentative Order's lack of a definition for "landscape-based treatment measures" could allow the construction of conventional treat-and-release BMPs, which are	We concur and this Provision has been revised to specify that all offsite treatment must be LID treatment.	Extensive revisions have been made to Provision C.3.e.

[10] *See, e.g.,* West Virginia Draft Permit, at 15; Anacostia Waterfront Corporation (June 1, 2007) Final Environmental Standards, at 16.

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				significantly less effective than LID features at pollutant removal and stormwater quantity mitigation. The implementation of LID retention-based BMPs should always be feasible for offsite mitigation since projects utilizing the alternative compliance option can choose from a variety of different locations and thus avoid the site constraints that, in rare cases, make onsite retention technically infeasible.		
NOAA	11	C.3.e.i.(2)(a)	Alternative Compliance *Equivalent Offsite Treatment*	We must also caution the Water Board that this requirement may still not protect designated beneficial uses, including ESA listed species, in all cases. Different sections of streams can serve different biological functions and the function of one stretch may be absolutely crucial to the beneficial use overall. For example, if a section of a stream supports spawning for ESA listed steelhead trout, it not only has a specific beneficial use (SPAWN) but also a biological function that must be protected at that specific location. If a project proposes to impact that spawning section of the stream, equivalent offsite treatment elsewhere in the watershed will not offset the biological impact or impact to the beneficial use. The proposed permit should clarify that site-specific	The Final TO language on net environmental benefit will address this issue. This may lead to alternative compliance in the same water body nearby.	None

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				beneficial uses such as this must be accounted for in project planning; and they should require approval by the Executive Officer before an allowance for equivalent offsite treatment is granted.		
NOAA	10	C.3.e.i.(2)(a)	Alternative Compliance *Equivalent Offsite Treatment*	We strongly support the requirement for equivalent offsite treatment for infill and redevelopment projects that cannot meet the numeric sizing criteria for stormwater BMPs in most cases. This requirement could provide drastic benefits toward reducing stormwater pollution and help to bring some sectors expected to have difficulty meeting these permit requirements (e.g., schools or churches) into compliance as potential beneficiaries of this provision. The requirement could be further strengthened, and more stormwater associated pollutants removed, if the equivalent offsite treatment requirement included addressing existing impervious surfaces.	We agree that this Provision would be greatly strengthened by requiring stormwater treatment from existing impervious surfaces; however, it is not economically feasible for all businesses and homeowners to retrofit their properties with stormwater treatment. Also, Permittees do not have the manpower or resources to implement such requirements at this time.	None
Daly City	9	C.3.e.iii.(1)	Alternative Compliance *Implementation Level*	The permit requires rescinding existing alternative compliance programs. Include existing alternative compliance programs. Specify cut off date for projects that have been approved for alternative compliance that would require the Permittee to rescind the	This Provision has been revised to include appropriate grandfathering language.	See Provision C.3.e.iv.

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				approval and require conformance to existing permit.		
ACCWP Att 3 Berkeley Att 2 Newark Att Oakland Att 2	7 8 29 8	C.3.e.iv.	Alternative Compliance *Reporting*	Eliminate requirement to report on legal authority/ procedural changes because it provides no value.	Implementation of this Provision represents a major change to a Permittee's stormwater program; therefore, the legal and procedural changes must be reported to the Water Board.	None
NOAA	12	C.3.f.	Alternative Certification of Stormwater Treatment Systems.	This provision allows "staff of another Permittee subject to the requirements of this permit" to certify a regulated project's adherence to Provision C.3.d. Is there an auditing system in place to detect and eliminate unqualified certifiers and to prevent a quid-pro-quo certification trading system from developing among the Permittees? Allowing only California registered professionals in this role gives the Water Board the option of trying to remove the professional certification from a person found to certify projects incorrectly or fraudulently. What is the recourse for the "staff from another Permittee"?	This Provision was included to provide flexibility to small cities that lack qualified staff to review Regulated Projects. Ultimately, the Permittee using third party reviewers, including staff from other Permittees, is responsible for determining a Regulated Project's compliance with Provision C.3. requirements. If this review is not being done appropriately, the Water Board may take enforcement action against the Permittee using third party reviewers.	None
Daly City	10	C.3.f.	Alternative Certification of Stormwater Treatment	Clarify verification requirements for third party reviewers (copies of certificates, etc.) and the level of reporting and recordkeeping required	Permittees must ensure that the third party reviewer is a State of California licensed and registered civil	None

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			Systems	by Permittee.	engineer, architect or landscape architect, or staff of another Permittee subject to the requirements of the MRP. Permittees must make a reasonable effort to ensure that the third-party reviewer has no conflict of interest with regard to the Regulated Project being reviewed. That is, any consultant, contractor or their employees hired to design and/or construct a stormwater treatment system for a Regulated Project can not also be the certifying third party. Permittees must also require the reviewer to certify the Regulated Project's adherence to Provision C.3.d. and keep a record of that certification and any accompanying reports. Reporting for this Provision should be done by noting the Regulated Projects that were reviewed by a third party in the Provision C.3.b. reporting table.	

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ACCWP Att 3 Berkley Att 2 Newark Att Oakland Att 2	8 9 30 9	C.3.f.iii.	Alternative Certification of Stormwater Treatment Systems	Reporting on who conducted a plan review is overly prescriptive; city engineer's approval of plans should be evidence of adequate plan review .	The reporting requirement only applies to Regulated Projects that were reviewed by a third party for adherence to Provision C.3.d. Reporting for this Provision is simply done by noting the Regulated Projects that were reviewed by a third party in the Provision C.3.b. reporting table. If a city engineer did the review, this Provision is not applicable.	None
Mountain View Palo Alto Santa Clara Co SCVURPPP West Valley Clean Water Program	8 6 14 11 5	C.3.g.	Hydromodification Management	An extension of the implementation date is especially important for the HM requirements, since there have been significant changes in the SCVURPPP HM applicability criteria (project size thresholds and map).	Additional implementation time is not necessary because the Permittees have been implementing HM requirements since 2005. The MRP does not change the requirements, just the HM applicability areas so no additional implementation time is needed.	None
NRDC & SF Baykeeper	25	C.3.g	HM Standard	The Tentative Order's failure to set an appropriate hydromodification standard.	The Final TO contains the comprehensive and appropriate hydromodification standard that was previously adopted into all of the Phase I municipal stormwater	

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					permits in this region. The Final TO maintains the consistent regulatory approach from previous permits that pre-project rather than pre-development is the appropriate baseline condition under the Final TO. We do not find support in the regulations for requiring a redeveloper to essentially retrofit a development site to a condition that may have been altered significantly decades previously. The enhanced LID requirements in the Final TO, when implemented, will further reduce hydromodification impacts from all regulated projects.	
NRDC & SF Baykeeper	56	C.3.g	Revise HM Baseline	The Hydromodification section, as explained in our last comment letter, establishes a site's "pre-project" (existing) condition as the baseline for analysis. (Tentative Order ¶ C.3.g.ii.) This would effectively grandfather antiquated stormwater management practices and is entirely inappropriate and insufficient. For a more detailed discussion of the problems with this	The Final TO maintains the consistent regulatory approach from previous permits that pre-project rather than pre-development is the appropriate baseline condition under the Final TO. We do not find support in the regulations for requiring a redeveloper to	

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				standard, which has not changed from the previous draft, see our February 29, 2009, letter (at 22-23).	essentially retrofit a development site to a condition that may have been altered significantly decades previously. The enhanced LID requirements in the Final TO, when implemented, will further reduce hydromodification impacts from all regulated projects.	
NOAA	13	C.3.g	MEP HM Requirments	This section on hydromodification management should reiterate that <u>all projects</u> need to treat and/or infiltrate stormwater to the maximum extent practicable under provision C.3.c. whether or not the project meets the hydromodification management definition given in this provision. Some of these options (*e.g.*, cisterns, rain barrels, permeable pavements) would obviously aid in minimizing hydromodification impacts. We object to limiting the hydromodification management definition to only those projects that increase impervious surface area over the pre-project condition because this will miss addressing this form of pollution in already impacted watersheds. This could prevent the attainment of unimpaired beneficial uses in those	It is un-necessary to reiterate the requirements of C.3 for treatment of regulated projects. We agree that the enhanced LID requirements in the Final TO, when implemented, will further reduce hydromodification impacts from all regulated projects. The Final TO maintains the consistent regulatory approach from previous permits that pre-project rather than pre-development is the appropriate baseline condition under the Final TO. We do not find support in the regulations for requiring a redeveloper to essentially retrofit a	

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				watersheds and impair the recovery of ESA listed steelhead trout in watersheds impacted in this manner.	development site to a condition that may have been altered significantly decades previously.	
NOAA	22	C.3.g	Analysis of Exemption Threshold	The potential consequence of the "exceeds 2% of the project construction cost, excluding land costs" threshold is not presented in the draft documents. Will this exemption threshold result in numerous projects being excused from the hydromodification management requirements? Has the Water Board and/or the Permittees conducted an analysis of this issue that can be summarized in the permit?	This language has been removed from the Final TO.	
NOAA	23	C.3.g	Exemption for No Increase in Impervious Area	In the Contra Costa Permittees Hydromodification Management Requirements, provision 1.a. seems to exempt redevelopment projects that do not increase impervious surface area, even in areas already experiencing hydromodification impacts, from addressing their contributions to the hydromodification. Please see our comment on Provision C.3.g. This broad exclusion is not acceptable, particularly in watersheds that support ESA listed steelhead trout. In Contra Costa County, this includes Wildcat, San Pablo, Pinole, Rodeo, Alhambra, Pacheco and Mt. Diablo creeks.	The Final TO maintains the consistent regulatory approach from previous permits that pre-project rather than pre-development is the appropriate baseline condition under the Final TO. We do not find support in the regulations for requiring a redeveloper to essentially retrofit a development site to a condition that may have been altered significantly decades previously. The enhanced LID requirements in the Final	

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					TO, when implemented, will further reduce hydromodification impacts from all regulated projects.	
Sunnyvale	31	C.3.g	Revision of HMP Applicability Map	Sunnyvale requests that the revised HMP applicability map provided by SCVURPPP be adopted with this permit. The current map, as provided with the TO, contains some minor mapping errors (especially in the exempted drainage area for the Sunnyvale West Channel) which incorrectly indicate that the HMP requirements are applicable.	The Final TO includes the recently updated revised HMP applicability map for SCVURPPP, which resolves these issues.	
Sunnyvale	64	C.3.g Attachment F	Revision of HMP Applicability Map	Sunnyvale requests that the coloring error in the SCVURPPP HMP Applicability Map be corrected for the area between the intersection Highway 101 and Highway 237 that is within Sunnyvale. This area should not be "green" as indicated on the TO's HMP map version. HMP requirements do not apply to this area, since stormwater drainage goes to the Sunnyvale West Channel.	The Final TO includes the recently updated revised HMP applicability map for SCVURPPP, which resolves this issue.	
Stanford University	1	C.3.g	Revision of Exempt Areas	The current Tentative Order of the Municipal Regional Permit, dated February 11, 2009, identifies areas on the HMP Applicabiliy Map (Attachment F for Santa Clara Permittees) as "under review". Per attachment F, item 4c of the Tentative Order, Permittees may	The Final TO includes the recently updated revised HMP applicability map for SCVURPPP, which resolves this issue.	

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				present new data indicating that the actual level of imperviousness of a particular area is greater than or equal to 65% impervious. As indicated in Attachment F, Item 4, this evaluation could be made based on either a catchment or subwatershed level. Stanford met with Santa Clara Program staff member Lucy Buchan to review data and develop a method for making this evaluation. Upon initial review of available data, Subwatershed 21 (SUBID = SFQ_E1) was identified as likely greater than 65%, warranting detailed analysis. Using GIS shapefiles for subwatersheds and catchments provided to Stanford by Lucy Buchan (originally provided by Santa Clara Valley Water District), 2006 aerial photography data and campus basemap data with field verification, Stanford mapping staff used AutoCAD to delineate areas of buildings parking lots, roads and sidewalks and made area measurements to determine the cumulative impervious area within this subwatershed. The attached map reflects the results of this analysis. The total subwatershed area is 16,331,397 square feet, 10,797,489 square feet of which are		

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				impervious resulting in an overall impervious percentage of 66.1% within this subwatershed. Based on this analysis, we request that subwatershed 21 be categorized as red, i.e., projects in this subwatershed are exempt from the HM Standard and associated requirement		
Palo Alto	1	C.3.g	Revision of Exempt Areas	City staff have reviewed the areas that are designated as "Areas Under Review" within the City of Palo Alto on the latest Hydromodification Management Plan (HMP) Applicability Map to determine whether or not there is justification for exempting these areas from the HMP requirements based on more detailed impervious area data maintained by the City. The City has extensive impervious area records used as the basis for charging the monthly Storm Drainage Fee that is billed to each developed parcel in the City. The Storm Drainage Fee amount for each land parcel is based on the amount of impervious surface on the parcel. The Storm Drainage Fee billing unit is known as an "Equivalent Residential Unit (ERU)", which is equal to 2500 square feet of impervious surface. Based on this analysis demonstrating that the catchment	The Final TO includes the recently updated revised HMP applicability map for SCVURPPP, which resolves these issues.	

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				immediately to the north of downtown Palo Alto is approximately 76% impervious, I hereby request that this catchment be changed to "red" (exempt) on the HMP Applicability Map to be adopted by the Water Board with the Municipal Regional Permit.		
SCVURPPP Attachment C	1	C.3.g	Revision of Exempt Areas	This attachment contains our request to make changes to the SCVURPPP HMP Applicability Map in order to reflect a more accurate percentage of impervious surface in two areas based on new, local impervious surface data. These areas (one catchment and one subwatershed) are part of the "Areas Under Review" noted as pink on the February 2009 applicability map contained in the Revised TO. The information provided is consistent with the process allowed for review of these areas described in Attachment F.4.c. of the Revised TO. The two areas that were reviewed for accuracy of impervious surface data included: 1.) A catchment just to the north of downtown Palo Alto, known as Catchment 386 on the SCVURPPP map. The City of Palo Alto used impervious area records from its Storm Drainage Fee billing process to	The Final TO includes the recently updated revised HMP applicability map for SCVURPPP, which resolves these issues.	

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				estimate the imperviousness of land parcels in this catchment, and added the estimated impervious area of streets and sidewalks in the catchment to determine that the catchment is approximately 76% impervious. 2.) A subwatershed on Stanford campus, including portions of Santa Clara County and the City of Palo Alto, that encompasses Stanford Shopping Center, Stanford Hospital, Stanford University classroom and research buildings, and associated parking lots. Stanford Utilities Division staff used 2006 aerial photography data and campus basemap data (with field verification) on AutoCAD to delineate areas of buildings, parking lots, roads and sidewalks, and determined that this subwatershed is 66.1% impervious.		
SCVURPPP Attachment A	72	C.3.g	Extend Time to Implement Changes and Revisions	The HMP applicability requirements (map and project size thresholds) for the Santa Clara Program Co-permittees are sufficiently different from the current permit such that the co-permittees will need time to revise ordinances, policies and procedures, update handbooks and guidance materials, and educate staff and project applicants about the changes to the applicability map and project size	The project size thresholds have not changed and the map changes are minor, therefore no additional implementation time is included in the Final TO	

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				thresholds before they can successfully be implemented. We therefore request that an implementation date of July 1, 2010 be added to the Santa Clara Program HMP applicability requirements in Attachment F.		
Contra Costa Board of Sups Attachment A	20	C.3.g	Update Reference to CCCWP Guidebook and Swales	The reference to pre-sized and pre-designed Integrated Management Practices should specify that the designs are "per guidance in the most current iteration of the Contra Costa Clean Water Program's *Stormwater C.3 Guidebook*." Note that swales and bioretention areas, which function identically, have been grouped together as "Bioretention Facilities" in the most recent edition; the reference to "Swale" should be updated accordingly.	This change has been made in the Final TO.	
CCCWP Attachment	6	C.3.g.ii.(1)	Change Reference to IMPs and Input General Statement Regarding the CCCWP Guidebook	Edit as shown here: Contra Costa Permittees, when using the ~~two pre-sized and pre-designed Integrated Management Practices (IMPs), the "Flow-Through Planter" and the "Swale"~~ design procedure, criteria, and sizing factors specified in the Contra Costa Clean Water Program's *Stormwater C.3 Guidebook* per Attachment C of his Order, are not required to meet the low-flow criterion of 10% of the 2-year peak flow. ~~These two IMPs are designed to control to the specified low flows.~~ After the Contra Costa Permittees conduct	The Final TO contains revisions that resolve this set of issues using slightly different language. Reference to the two outdated IMPs has been removed. Also, to further clarify the intent of the provision, reference to the Program's Stormwater C.3 Guidebook was added to the Contra Costa- specific Hydromodification Management requirements	

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				the required monitoring, the ~~design of these IMPs~~ procedure, criteria, and sizing factors will be reviewed. *Reason for Change:* Although the existing language in the Revised Tentative Order seems intended to allow Contra Costa's LID approach to continue, the language is so specific as to be already outdated and so restrictive as to prevent ongoing development of improvements to Contra Costa's LID designs.	in Attachment C (Requirement #3). This requirement states the 4th Edition of the Stormwater C.3 Guidebook shall be implemented during the permit term, and significant changes to the IMPs, sizing factors, or manner of implementation shall be approved by the Water Board. In this context, Water Board staff interprets "significant" to mean changes from designing IMPs to achieve the maximum low-flow threshold of 0.2Q2. The requirement is not intended to restrict development of new IMP designs that achieve the hydrologic criteria expressed in the permit.	
CCCWP Attachment	7	C.3.g.ii.(4)	Calculating Post-Project Runoff	Delete the second sentence of this paragraph, which states: "*Retention and detention units shall be considered impervious surfaces for the purposes of calculating post-project runoff. Pre- and post-project runoff shall be calculated and compared for the entire site, without separating or excluding areas that may be considered self-retaining.*"	The second sentence as written is not inconsistent with the CCCWP HMP design and implementation approach. CCCWP has submitted calculations demonstrating adequate HMP performance of self-retaining areas as they	

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				Reason for Change: The basis of LID is to disperse runoff to landscaped areas where possible and to use small-scale bioretention or other LID facilities distributed throughout the site. The clause eliminating credit for self-retaining areas would disallow the practice of directing downspouts to concave-graded landscaped areas as a means of control. The clause requiring comparison for the entire site would disallow use of distributed LID facilities and would disallow Contra Costa's simplified approach with sizing factors.	specify. Therefore, when pre- and post-project runoff are calculated using the method of analyzing separate portions of the site which, taken together, equal the entire site, this requirement is met. Therefore, the HMP design approach contained within the CCCWP C.3 Guidebook, 4th edition, is acceptable and shall be implemented for this permit term. Only significant changes in the HMP design approach, such as to the low flow criteria of 0.2Q2, need be reviewed by the Board.	
BASMAA Attachment	16	C3.g.ii.(4)	Delete 2nd Sentence Regarding HM Standard	Calculating Post-Project Runoff – delete 2nd sentence as counterproductive and a disincentive to good site planning and design, and is also inconsistent with the site design provisions in C.3.c. and BASMAA's *Start at the Source* Guidance Manual	This clause does not exclude the use of self-retaining areas. This only requires that they be included in the HM analysis. They can be included in the analysis as performing as self-retaining areas, that form of HM performance in the analysis is not excluded. Also, pre- and post-project runoff can be compared for the entire site by describing	

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					the controls for the entire site as a combination of the HM performance of each piece of the site.	
SMCWPPP HMP Comment	1	C.3.g	Update HM Control Area	SMCWPPP is submitting a revised HM Control Area Map in order to align the boundary between HM areas and exempt areas with Assessors parcels boundaries, & avoid bisecting parcels. These changes were necessitated by new digital map data for San Mateo County, including Assessors parcel data & Oakland Museum of CA's data set of watershed boundaries. Water Board staff reviewed the proposed HM Control Area Map revisions and advised SMCWPPP to submit the revised map for incorporation in the MRP, to replace the existing HM Control Area Map. As we discussed, these changes to the Map are relatively minor, resulting in a net **increase** of 20 acres to the total area subject to HM requirements throughout the county.	Agreed	Replace the San Mateo County HM Control Areas Map with the submitted map.
ACCCWP Attachment 1 Berkeley Attachment 1 Newark Attachment Oakland Attachment 1	29 29 31 33	C.3.g	Omitted Exclusions from Existing Order	The HM provision does not include exclusions to the HM requirements that are included in Provision C.3.f.v(a)-(d) of the current municipal stormwater permit as amended by Order No. R2-2007-0025. These exclusions have been omitted in the Tentative Order, despite assurances that the existing	The Final TO HM requirements apply to all Regulated Projects that create and/or replace one acre or more of impervious surface and are not specifically excluded within the requirements of	

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				HM requirement would not be changed, in view of the fact that HM requirement went into effect very recently. These exclusions are important for retaining cost incentives that favor infill redevelopment in contrast to new development with higher impacts on water quality. Include in the MRP the existing exclusions to HM requirements. The current municipal stormwater permit (as amended) includes the following exclusions from the HM requirement: projects consisting of one single-family home that are not part of the larger common plan of development; sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features associated with streets, roads, highways, or freeways under the Permittees' jurisdictions; transit village type of development; a project within a "Redevelopment Project Area" that redevelops an existing brownfield site, or the portion of a project that creates housing units affordable to persons of low or moderate income.	Attachments B–F. A project that does not increase impervious surface area over the pre-project condition is not an HM Project. The maps of applicability for Alameda County exclude many areas from HM applicability.	
ACCCWP Attachment 1 Berkeley Attachment 1 Newark	9 10 32	C.3.g.(iv)	Reporting Redundant	Reporting is redundant with reporting under C.3.b(v)(1). Eliminate requirement.	The reporting here is not redundant, as it pertains to treatment measures specifically to meet the HM requirements.	

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Attachment Oakland Attachment 1	10					
Fremont	15	C.3.g. Attachment B	Omitted Exclusions from Existing Order	HM exclusions in the current HM Standard (Order No. R2-2007-0025) are omitted from the MRP. Maintain the exclusions allowed in Order No. R2-2007-0025. The HM standard has only been recently adopted and municipalities are working on questions that have been discovered during implementation. Water Board staff indicated that the HM Standard would remain the same in the MRP for at least one permit cycle to allow time for smooth implementation.	The Final TO HM requirements apply to all Regulated Projects that create and/or replace one acre or more of impervious surface and are not specifically excluded within the requirements of Attachments B–F. A project that does not increase impervious surface area over the pre-project condition is not an HM Project. The maps of applicability for Alameda County exclude many areas from HM applicability.	
Kolb, Larry & James, Roger	19	C.3.g.v.(3)	Reduce Percent Impervious Area	The % impervious area must be reduced to 25% based on studies by the Center for Watershed Protection. See Policy Comment 3 in our 2-29-08 comments on the Dec. 2007 draft MRP.	It is not practicable to require development projects to be limited to 25% impervious surface. The effect of the LID requirements may be to cause development projects to hydraulically perform as if there was smaller impervious surface.	
Kolb, Larry & James, Roger	20	C.3.g.v.(3)	Shorten Time Schedule	The time schedule must be shortened by one year since the City of Vallejo	The schedule for Vallejo is appropriate given their state	

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				has known for many years and certainly since the December 2007 tentative MRP stated that the HMP would be required	of C.3 implementation.	
Contech	24	C.3.g.ii.(1)	CCC Monitoring Contains No Water Quality Parameters	The Contra Costa monitoring program referenced here includes no water quality parameters. At least a small number of IMPs should be monitored for effectiveness on an individual basis. The monitoring provisions in section C.8 are not sufficient to establish the effectiveness of individual controls.	The HM IMP verification study will monitor hydraulic parameters, primarily flow and rainfall.	
Contech	25					None
Contra Costa Brd Of Sups Att A	21	C.3.h.ii.(5) C.3.h.iv.	Operation and Maintenance Inspections *Database and Inspections*	No implementation dates are provided for the requirements to implement a database and to conduct reporting relative to ongoing operation and maintenance of permanent stormwater management facilities. Implementation dates of July 1, 2011 and July 1, 2012 are recommended for C.3.h.ii. and C.3.h.iv., respectively.	A one-year implementation timeframe has been added for development of the database and reporting requirements are applicable to the 2010 Annual Report.	Provision C.3.h. has been revised to allow one year for development of the database and reporting is required beginning with the 2010 Annual Report.
ACCWP Att 1 Berkeley Att 1 Contra Costa Brd Of Sups Att A Oakland Att 1 San Leandro	32 32 21 36 8	C.3.h.ii.(5)	Operation and Maintenance of Stormwater Treatment Systems *Database*	• The requirement for a new database or tracking system cannot be accomplished immediately. • No implementation dates are provided for reporting relative to ongoing operation and maintenance of permanent stormwater management facilities. I • Implementation dates of July 1, 2011	A one-year implementation timeframe has been added for development of the database and reporting requirements are applicable to the 2010 Annual Report.	Provision C.3.h. has been revised to allow one year for development of the database and reporting is required beginning with the 2010 Annual Report.

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				and July 1, 2012 are recommended for C.3.h.ii. and C.3.h.iv., respectively.		
Fremont	16	C.3.h.ii.(5)(d)	Operation and Maintenance Inspections *Database and Inspections*	The addition of including the "Size of the treatment systems(s)" into the database for all Regulated Projects is too prescriptive and unnecessarily burdensome.	We disagree. The size is basic information that is readily available from the approved design for the treatment systems.	None
ACCWP Att 1 Berkeley Att 1 Newark Att Oakland Att 1 Pacifica SCVURPPP Att A SMCWPPP Sunnyvale	30 30 33 34 16 13 21 32	C.3.h.ii.(6)	Operation and Maintenance Inspections *Frequency*	• Replace the requirement to inspect 20% of all Regulated Projects and 20% of the vault-based systems annually with requirement to submit an inspection plan for inspecting all Regulated Projects at least once during the 5 year permit cycle. • As the number of installed BMPs increases over time, this will be an increasingly untenable burden to municipalities. • Continue to allow more flexibility because the process for prioritizing BMPs for inspection involves a consideration of many factors. • Inspection of all newly installed storm water treatment systems within 45 days of installation is unreasonable. Various treatment systems may be installed at different times during the construction of the facility and they are inspected by Building Inspectors as part of their inspection of the facility. This permit requirement will result in multiple	• Requiring Permittees to inspect at least 20% of the installed stormwater treatment systems and HM controls ensures that they are inspected at least once every 5 years and all the inspections will not take place in the 5th year. This requirement serves to prevent failed or improperly maintained systems from going undetected until the 5th year. We have the additional requirement to inspect at least 20% of all installed vault-based systems because they require more frequent maintenance and problems arise when the appropriate maintenance schedules are not followed. Also, problems with vault	None

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				"post-construction" visits to one site to inspect the different phases of the installation for treatment systems on a site that is still under construction. • We request that the 45-day time period requirement be rephrased to require post-construction inspections within 45 days after a project has been completed or occupancy approved. • Allow inspections within 6 months of installation instead of 45 days. Inspections during the installation period should minimize the need to do further inspections following the installation.	systems may not be as readily identified by the projects' regular maintenance crews. Neither of these inspection frequency requirements interferes with the Permittees' current ability to prioritize their inspections based on the factors listed in the comments. • Requiring the inspection of stormwater treatment systems within 45 days of installation ensures that Permittees will verify that the correct systems have been installed. Six months later is just too late to discover that a system has been incorrectly installed. Some Permittees currently have staff present during the entire installation process. • Given that Building Inspectors are routinely onsite during the Regulated Project's entire construction, they may also be trained to inspect the newly installed post-	

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					construction treatment systems.	
Contech	26	C.3.h.ii.(6)	Operation and Maintenance Inspections	This Provision creates an unnecessary burden by requiring Permittees to conduct all inspections. This creates an unnecessary burden on them. Provision C.3.h.ii.(1) already requires site owners to formally accept inspection and maintenance responsibility. It should be sufficient for the Permittees to collect inspection and maintenance reports, including information required in section C.3.h.iv.(1), from the site owner or service provider in lieu of an actual site visit by the Permittee.	We disagree. Permittees must conduct their own inspections to independently verify that treatment systems are operating and being maintained properly.	None
ACCWP Att 1 Berkeley Att 1 Oakland Att 1 San Leandro SMCWPPP	32 32 36 8 23	C.3.h.iii	Maintenance Approvals	• The immediate full implementation due date is not feasible. • Allow a 2-year phase-in period for these new requirements.	This Provision requires Permittees to ensure that treatment systems are properly operated and maintained by Regulated Projects, a basic requirement that is in the existing stormwater permits and other stormwater permits statewide. No phase-in period is required.	None
BASMAA Att Pacifica San Jose Att A SCVURPPP Att A	17 17 14 14	C.3.h.iii	Maintenance Approvals	Please revise the first sentence to say "Permittees shall require" that treatment systems be properly maintained and operated for the life of the project. There is no possible way	We disagree. "Ensure" means implicitly that the Permittees are required to include adequate conditions of approval for the treatment	None

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SMCWPPP Sunnyvale	22 33			for Permittees to "ensure" the proper operation and maintenance for those systems on privately owned property. We can require them to be maintained properly, then follow enforcement procedures if they fail, but we cannot "ensure" that they will operate or maintain them for the life of the project.	systems, inspect the treatment systems, and take appropriate enforcement actions against the Regulated Projects if the systems are not operated and maintained appropriately.	
West Valley Clean Water Program	8	C.3.h.iii.	Maintenance Approvals	Change this Provision to state, " . . .for Regulated Projects that construct wetlands, Permittees should inform Regulated Projects of the need to comply with Water Board Resolution 94-102: Policy on Use of Constructed Wetlands for Urban Runoff Pollution Control…"	See response immediately above.	None
ACCWP Att 1 Berkeley Att 1 Newark Att Oakland Att 1	31 31 34 35	C.3.h.iii.	Maintenance Approvals	Revise this Provision to state that if the Permittee (not the responsible party) is working diligently and in good faith then the Permittee will be in compliance. What if the responsible party is not working diligently or in good faith but the Permittee is working diligently and in good faith (for example, by taking enforcement action to rectify the situation)? In that situation, the Permittee should not be held in violation of the provision.	This language was added in response to Permittees wanting protection from regulatory liability in the event that State or federal agencies effectively prohibit a Regulated Project from conducting maintenance on a treatment facility. In the example cited in the comment where a Permittee fails to take appropriate steps (e.g., inadequate enforcement) to bring a Regulated Project into compliance, the Permittee	None

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					would be found to be in violation of the MRP's requirements and subject to enforcement action from the Water Board. Therefore, the suggested language change would be inappropriate.	
ACCWP Att 1 Berkeley Att 1 Oakland Att 1 San Leandro SCVURPPP Att A Sunnyvale	32 32 36 8 15 34	C.3.h.iv.(1)	Operation and Maintenance Inspection *Reporting*	• The reporting requirements for O&M inspections are still excessive. A summary of the total number and types of BMPs inspected and categories of problems found should be sufficient to evaluate a Permittee's inspection program • Detailed records can be kept locally for review upon request. Specifically, information on facility name, address, and responsible operator name should be kept in local files and not be part of a public annual report. • Delete Provision C.3.h.iv.(1) because the only two items that the WB should be concerned with are design problems with specific types of BMPs and O&M problems with associated enforcement actions. • The discussions required in Provision C.3.h.iv.(3) should be able to address and provide enough information • The greatly expanded reporting requirements cannot be	• This Provision and the associated Reporting Table C.3.h. requires only standard information that should be collected on each operation and maintenance inspection. We require this type of information to evaluate a Permittee's inspection and enforcement program and to determine compliance with the Permit. Summary data alone without facility-specific inspection findings does not allow us to determine whether Permittees are doing timely follow-up inspections at problematic facilities and taking appropriate enforcement actions. • A one-year implementation	Provision C.3.h. has been revised to allow one year for development of the database and reporting is required beginning with the 2010 Annual Report.

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				accomplished immediately.	timeframe has been added for development of the database and reporting requirements are applicable to the 2010 Annual Report.	
Contech	27	C.3.h.iv.(1)	Operation and Maintenance Requirements *Reporting*	This section should make it clear that the BMPs must be inspected to ensure that the initial design infiltration, storage, flow capacity or other parameters are met. Unfortunately, vegetation health or other qualitative observations are often used as a surrogate for an actual BMP performance assessment. This is not acceptable since it does not ensure that the BMP is performing its intended water quality or hydraulic function.	Various countywide programs have developed inspection guidance and checklists to address exactly the issues raised in this comment.	None
ACCWP Att 3 Berkeley Att 2 Newark Att Oakland Att 2 West Valley Clean Water Program	10 11 35 11 9	C.3.h.iv.(3)	Operation and Maintenance Inspections *Reporting*	Reporting on inspections is redundant with Provision C.3.h.(iv)(1) so this requirement should be eliminated or changed to "report newly installed stormwater treatment systems and HM controls with the annual report" only.	We disagree. This Provision requires each Permittee to evaluate its program based on the data collected for Provision C.3.h.(iv)(1) and list proposed changes based on that evaluation.	None
Fremont	17	C.3.h.iv.(3)(a)	Operation and Maintenance Requirements *Reporting*	Eliminate the requirement for a "..general comparison to the inspections findings from the previous year."	See response immediately above.	None

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Pacifica	18	C.3.i.	Required Site Design Measures for Small Projects and Detached Single-Family Home Projects	Additional time should be allowed for the implementation of these "staff time demanding" additional requirements. Modify the permit to allow a five year period before the new requirements must be met.	Since this Provision only requires site design measures and not hydraulically sized treatment, two years is sufficient time to implement the requirements.	None
ACCWP Att 1 Alameda Berkeley Att 1 Oakland Att 1 Pleasanton Newark Att	33 5, 13 33 37 9 36	C.3.i.	Site Design Measures for Small Projects and Detached Single-Family Home Projects	All projects are already required to implement stormwater design/treatment requirements to the MEP. This requirement is unnecessary, results in additional tracking/monitoring, and will have little or no real impact on water quality given that the majority of projects are already covered under the requirements based on the 10,000 sq. ft. threshold. For Alameda, the estimated increase in annual municipal staffing to implement this expanded Provision C.3 oversight is approximately 10% of a full-time staff person and the water quality benefit derived from this Provision is expected to be minimal and does not justify the increased costs.	The commenters misunderstand the requirements of this Provision. It is only applicable to projects that trigger the impervious surface thresholds listed but that do not fit the descriptions of Regulated Projects under Provision C.3.b.ii.	None
Brisbane Contra Costa Brd Of Sups Att A Dublin SMCWPPP Sunnyvale	10 22 6 24 35	C.3.i.	Site Design Measures for Small Projects and Detached Single-Family Home Projects	• Allow Permittees the ability to not require directing runoff to landscaping and permeable surfaces where there are potential geotechnical problems or where implementing these requirements will require the use of pumped drainage	These site design measures are consistent with techniques already being implemented throughout the Bay Area and California. We have included enough options in this Provision so	None

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				systems. • It may be extremely difficult to implement one of the listed site design treatment controls for an urban project that is built to the property lines, does not have any vegetated areas, and does not involve driveways, walkways, parking lots, or bicycle lanes. The list of site design treatment controls should include an additional bullet for "other site design measures that provide stormwater runoff treatment equivalent to or greater than at least one of the listed site design treatment controls."	that problematic sites can include at least one site design measure. Therefore, projects with unsuitable site conditions for any one site design measure will not be forced to pick that site design measure.	
Contech	28	C.3.i.	Site Design Measures for Small Projects and Detached Single-Family Home Projects	Please change "vegetated" to permeable where it appears. This is especially important for roof runoff management since downspout and roof gutter flow is delivered at a high velocity that may erode vegetation and soil. Directing these flows to a gravel area or piping them directly to a subsurface infiltration trench vastly reduces the potential for on-site erosion.	The intention is to have stormwater runoff directed into vegetated areas so that some treatment is provided. We assume that whichever measure(s) that is chosen will be suitable for the specific site conditions and designed properly.	None
Dublin Sunnyvale	6 35	C.3.i.	Site Design Measures for Small Projects and Detached Single-Family	Do not require specific site design measures for small "unregulated" projects because: • This dramatic increase in the number of projects that staff must review will	• These small projects contribute stormwater runoff pollutants and volume (just like any other development with	None

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			Home Projects	place additional strains on already limited resources; • Ordinances, staff processes, procedures, and written materials will need to be updated, requiring additional staff resources.	impervious surfaces) that cumulatively are significant. These projects should not be automatically exempted from stormwater regulations. This Provision is only applicable to projects that would otherwise require approvals and/or permits issued under a Permittee's planning, building or other comparable authority and requires simple site design measures to reduce the runoff pollutants and volume from these projects. • This Provision contains a two-year phase-in period for Permittees to revise ordinances, procedures, and written material.	
NOAA	14	C.3.i.	Site Design Measures for Small Projects and Detached Single-Family Home Projects	We explicitly express our support for this Provision	Comment noted.	None
ACCWP Att 3 Berkeley Att 2	11 12	C.3.i.iii.	Site Design Measures for	Eliminate this requirement because reporting on this material provides	This Provision contains minimal reporting	None

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Newark Att Oakland Att 2	37 12		Small Projects and Detached Single-Family Home Projects *Reporting*	nominal benefit to water quality.	requirements – essentially a status update on how Permittees are implementing the requirements of this Provision.	
ACCWP Att 1 Berkeley Att 1 Oakland Att 1	34 34 38	C.3.i.vi.	Standard Specifications for Lot-Scale Treatment BMPs	Delete the requirement for submittal of standard specifications for lot-scale treatment BMPs because Water Board can always request to review the BMPs as needed. Alternatively, change the submittal date to September 15 to align with Annual Report.	The purpose of the development of lot-scale measures by the Permittees is to provide guidelines to small projects and single-family homes for selecting and installing correctly the appropriate site design measures and/or treatment measures to satisfy the requirements of this Provision. We expect that any guidelines cooperatively developed by the Permittees will also be adopted by them for implementation.	None
BASMAA Att	18	C.3.j.	Impervious Surface Data	We support the deletion of requirement to collect impervious surface data for small projects.	Comment noted.	None

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SCVURPP Attachment A	16A	C.4	Permittee Jurisdiction	The Permittees' responsibility for regulating industrial and commercial businesses needs to be limited to only those businesses within their jurisdictions and only for stormwater runoff conveyed in municipal separate storm sewer systems.	We agree, although permittees must also address pollutant sources that have the potential to discharge or be mobilized in to the MS4 system. Protecting the water quality of the MS4 must address potential sources in addition to sources that directly impact water quality.	No changes made.
San Jose MRP Comments Attachment A	15	C.4.b.ii.1.g	Inspection HVAC Equipment	The City understands that this provision is not meant to include HVAC equipment common to commercial office buildings, as inspection of those systems would greatly increase inspection workload without a clear benefit to water quality.	We agree. Inspections are not required to inspect the full extent of HVAC systems; however, permittees should observe outdoor portions of HVAC equipment to insure that they are not contributing pollutants that may impact stormwater runoff.	No changes made.
Santa Clara County	15	C.4.c	Violation Correction 10 Business Days Unrealistic	Requiring all violations to be corrected before the next rain event, but not longer than 10 business days, is unrealistic. We request that more flexibility for correcting violations within a timely manner be provided.	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for correction of violations is being established in lieu of the prescriptive enforcement response requirements that	No changes made.
SCVURPP Attachment A	17					

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					were included in the previous draft TO. Permittees have the flexibility to conduct enforcement in a manner that they deem appropriate to meet the violation correction performance standard.	
ACCWP Attachment1	35	C.4.a.ii.(1)	Legal Authority for Effective Site Management Too Broad	Legal authority is too broad as regards ability to oversee, inspect, and require expedient compliance and abatement at all sites that cause or contribute to pollution of stormwater runoff. The ordinances that municipalities adopted in the early 1990s were for the municipally owned/operated municipal separate storm sewer systems (MS4), not for stormwater runoff in general. Revise the legal authority to what is required by federal Clean Water Act requirements to control pollutants that flow to municipally owned/operated MS4s.	The entire permit is specifically regulating pollution of stormwater runoff to the MS4 and receiving waters. It is not necessary in every section to reestablish the areas regulated by the permit.	No changes made.
BerkeleyAttachment1	35					
Pacifica	36					
OaklandAttachment1	39					
Newark Attachment	38					
SMCWPPP	26					
SCVURPP Attachment A	18	C.4.c.ii.(4)	Recordkeeping	Make Recordkeeping (C.4.c.ii.(4)) and Reporting (C.4.c.iii.) fully consistent with same provisions for Enforcement Response Plans in C.5 Illicit Discharge Detection and Elimination and C.6 Construction.	It is not appropriate to make the recordkeeping requirements of Section C.4, C.5, and C.6 fully consistent. These provisions while similar in the need for enforcement response deal with different stormwater pollution issues that require different information to assess effectiveness and compliance. In order to keep the recordkeeping to the	
BASMAA Attachment	19					

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					minimum necessary for determining compliance with the permit, it is not possible to make these Sections identical.	
Sunnyvale	36	C.4.c	Enforcement Response Plan (ERP)	Sunnyvale's current ERP is designed to mainly enforce federal pretreatment regulations. Modifications of our existing ERP (which will likely include revisions to a city ordinance) to meet the requirements outlined within the MRP will take a significant amount of time as well as funds to complete. While this can eventually be accomplished, it is not likely that we would be able to do so by the implementation date of the permit (July 1, 2009), which would put Sunnyvale immediately into non-compliance with this MRP provision. Additional time will be needed to revise our ERP (and potentially a city ordinance) to meet these new requirements.	Permittees should already have the legal authority to conduct enforcement at Industrial and Commercial sites. These requirements have been in place since the early 1990's for municipal stormwater programs. Permittees should be actively taking enforcement actions as necessary. We have added a date for the implementation of the ERP to give permittees time to adapt and revise current plans to meet the requirements of the MRP.	Added April 1, 2010, as completion date for development of ERP.
ACCWP Attachment1	1	C.4	Removal Business Inspection List	We appreciate many of the changes incorporated in the Revised Tentative Order, in particular: the deletion of the prescriptive list of businesses requiring inspections	Comment noted.	No changes made.
Newark	1					
Berkeley	1					
Fremont	17	C.4.a.ii.(2)	Eliminate Recordkeeping for Non-compliance after 10 Business Days	The additional requirement of "…Violations shall be corrected prior to the next rain or within 10 business days after the violation. If more than 10 business days are required for correction, a rationale shall be given …." The requirement to provide a rational	The requirement for recordkeeping when correction of violations exceeds 10 business days is necessary to assess the effectiveness of municipal	No changes made.
Newark Attachment	39, 42					

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				is onerous. Eliminate the requirement to provide a rationale for time frame required to achieve compliance. This record keeping requirement is time consuming, without achieving measurable water quality; and summaries of inspections are already reported.	stormwater enforcement programs. The documentation of cases exceeding the timeframe will allow the Water Board to compare and assess the enforcement activities of permittees. The correction standard will improve water quality because permittees will more closely monitor and enforce clean up of problem areas within a given time frame. If enforcement is not effective in meeting the correction standard, permittees shall assess and revise their enforcement protocols to improve the methods used to achieve violation correction. The 10 business day correction standard was established in order to the limit the prescriptive elements of the ERP.	
ACCWP Attachment1	36	C.4.a.ii.(2)	Violation Correction 10 Business Days Unrealistic	The requirement that violations shall be corrected during certain specified time periods is unrealistic and should be replaced with a more realistic estimate of 30 days. Replace the requirement to correct violations "prior to the next rain event or within 10 business days" with a more realistic timeframe of 30 days.	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the	No changes made.
BerkeleyAttachment1	36					
Newark Attachment	39, 42					
Oakland Attachment1	40					

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					delay. The 10 days for correction of violations is being established in lieu of the prescriptive enforcement response requirements that were included in the previous draft TO. Permittees have the flexibility to conduct enforcement in a manner that they deem appropriate to meet the violation correction performance standard.	
SMCWPPP	27	C.4.a.ii.(2) and C.4.c.ii.(2)	Timely Correction of Violations	The requirement that violations shall be corrected during certain specified time periods is unrealistic and unnecessary. Replace the requirement to correct violations "prior to the next rain event or within 10 business days" with a more flexible requirement to correct violations of local stormwater ordinances as soon as practicable.	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for correction of violations is being established in lieu of the prescriptive enforcement response requirements that were included in the previous draft TO. Permittees have the flexibility to conduct enforcement in a manner that they deem appropriate to meet the violation	No changes made.

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					correction performance standard.	
Fremont	18	C.4.a.ii.(2) C.4.c.ii.(2)	Violation Correction 10 Business Days Unrealistic	This requirement that violations shall be corrected by the next rain event or within 10 business days is unrealistic and unattainable. If more than 10 business days are required for the correction, a rational shall be given in tabulated sheets. Remove this requirement and replace with "Every effort should be made to correct these violations before the next rain event or within 10 business days if practicable. If not, the permittees shall institute a time frame for achieving compliance based and the type, severity and corrective action required." Summaries of all inspection reports are currently submitted with the annual report and any issues dealing with compliance are addressed in these comments. There is no need for a separate tabulated format as this is duplication.	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for correction of violations is being established in lieu of the prescriptive enforcement response requirements that were included in the previous draft TO. Permittees have the flexibility to conduct enforcement in a manner that they deem appropriate to meet the violation correction performance standard.	No changes made.
San Leandro	9	C.4.a.ii.(2)	Justify Correction timeline	Prescribing a baseline of 10 days for corrective actions is unreasonable. 30 days is the standard baseline across other regulatory programs, such as pretreatment and UST, with a shorter time frame given when conditions warrant it, such as next storm event projected or eminent threat to people or the environment. Change Baseline time frame from 10 to 30 days and eliminate justification for any	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for	

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				correction time frame less than 30 days.	correction of violations is being established in lieu of the prescriptive enforcement response requirements that were included in the previous draft TO. Permittees have the flexibility to conduct enforcement in a manner that they deem appropriate to meet the violation correction performance standard.	
Contra Costa Board of Sups Attachment A	24	C.4.b	Extend implementation Date	Implementing the MRP's requirement to undertake corrective actions within 10 days of a violation will require increased collaboration between departments that are responsible for different aspects of enforcements; it will also require modifications to procedures for documentation, tracking, and reporting. It would not be possible to implement these changes prior to the effective date of the MRP. An implementation date of July 1, 2010 is recommended.	Implementing the performance standard of 10 business days for correction of violations should be implemented in a timely manner upon adoption of the permit. While permittees are implementing the performance standard, coordination can be conducted between departments to optimize efforts. The data regarding compliance can be collected while tracking and reporting systems are developed. The requirement for 10 business days for corrective action is a necessary standard in absence of a prescriptive ERP.	No changes made.
ACCWP	37		Exempt Flood	The inspection plan should not be for sites	It is not appropriate to	No changes

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Attachment1		C.4.b.i	Control Districts	within each Permittee's jurisdiction because the flood control districts do not have businesses within their jurisdiction. Also, the sites covered by the plan should be ones that drain to an MS4 owned or operated by a municipality that is a Permittee. Modify the language to limit the creation of an inspection plan to municipalities that have commercial and industrial sites. In addition, modify language about sites within a Permittee's jurisdiction to just sites within a municipality that have stormwater drainage that flows to an MS4 owned or operated by the municipality.	completely exempt Flood Control Districts from this requirement. The Flood Control Districts are responsible for the inspection of facilities that are located on their property and under their control. This may include the Districts' corporate and service yards or property owned by the District that is leased to a commercial or industrial entity.	made.
BerkeleyAttachment1	37					
Oakland Attachment1	41					
SMCWPPP	28	C.4.b.i	Exempt Flood Control Agencies from Inspection Plan	The inspection plan should not be for sites within each permittee's jurisdiction because the flood control agencies' jurisdiction overlaps with municipalities and there is no need to require duplicative efforts. Also, the sites covered by the plan should be ones that drain to an MS4 owned or operated by a municipality that is a permittee. Modify the language to limit the creation of an inspection plan to municipalities that have commercial and industrial sites. In addition, modify language about sites within a Permittee's jurisdiction to just sites within a municipality that have stormwater drainage that flows to an MS4 owned or operated by the municipality.	It is not appropriate to completely exempt Flood Control Agencies from this requirement. The Flood Control Agencies are responsible for the inspection of facilities that are located on their property and under their control. This may include the Agencies' corporate and service yards or property owned by the Agency that is leased to a commercial or industrial entity. Local entities that have overlapping jurisdiction with Flood Control Agencies should coordinate efforts to insure that inspections are duplicative. The permit does	No changes made.

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					not require duplicate inspections if jurisdictions overlap.	
ACCWP Attachment1	38	C.4.b.ii	Limit List of Business to Inspect	This section requires each Permittee to annually update and maintain a list of businesses that could cause or contribute to pollution of stormwater runoff without limiting this requirement to certain Permittees and without limiting the requirement to businesses that drain stormwater to an MS4 owned or operated by a municipality. Make similar modifications as suggested above in ACCWP comment 37 to this permit section.	It is not appropriate to completely exempt Flood Control Districts from this requirement. The Flood Control Districts are responsible for the inspection of facilities that are located on their property and under their control. This may include the Districts' corporate and service yards or property owned by the District that is leased to commercial or industrial entities. If a Flood Control District does not have any of these facilities under their control they can present that information to the Water Board and would only be necessary to update the list if circumstances changed to require inspection of a facility.	No changes made.
BerkeleyAttachment1	38					
Oakland Attachment1	42					
SMCWPPP	30					
Contra Costa Board of Sups Attachment A	23	C.4.b	No implementation of State Requirements	It is inappropriate for the SWRCB to collect a fee of $1008 for permittees covered under the General Industrial Permit, but intends to delegate responsibility for inspection to the MS4 Permittees without reimbursement. If Permittees are delegated responsibility for enforcing State General Permits, sufficient revenue from	The MRP does not require permittees to enforce the State's General Industrial Stormwater Permit. Permittees must only enforce the requirements of local stormwater and urban runoff ordinances in	No changes made.

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				these permits should be transferred to the MS4 Permittees to defray the MS4 Permittees' costs	compliance with the MRP. Even though a commercial industrial facility has coverage under the State's General Industrial Permit, it does not absolve permittees from enforcing compliance with local ordinances and preventing polluted discharges to their MS4.	
Contra Costa Council	4	C.4.b	Industrial Facilities Already Under State Permit	Section C4b.i requires municipalities to conduct stormwater inspections of industrial facilities. As noted above, these facilities are already covered by the Statewide General Industrial Stormwater permit issued by the State. The State receives a fee to inspect these facilities and does so on a regular basis. Municipal staff does not have the expertise or resources to inspect complex industrial facilities. Requiring duplicative and redundant inspections of industrial facilities would be a waste of scarce municipal resources and is likely to lead to inconsistent results.	The MRP does not require permittees to enforce the State's General Industrial Stormwater Permit. Permittees must only enforce the requirements of local stormwater and urban runoff ordinances. It is the responsibility of the State to conduct enforcement and follow up of violations of the General Industrial Permit. Permittees must inspect State permitted facilities to insure no violations of violations of municipal stormwater and urban runoff pollution ordinances in compliance with the MRP	No changes made.
SMCWPPP	29	C.4.b.ii	Inspection Plan Implementation Date	There is no date for developing an Inspection Plan, which is a new requirement. The permit should allow one year from permit adoption to comply with this new requirement. Add additional language to the permit that states that if an	We agree that there should be a date for the update and completion of the Industrial Inspection Plan. We have added a completion date of July 1, 2010, to the permit	Added completion date of July 1, 2010 update and completion of Inspection Plan.

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				Inspection Plan does not currently exist, municipalities have until July 1, 2010 or one year following permit adoption, whichever is later, to prepare the Inspection Plan.	requirements. Permittees are still required to conduct inspections and enforcement while the plan is being updated.	
Alameda County	6	C.4	Exemption Language for Permittees with No Industrial Commercial Facilities	The Revised Tentative Order defines several requirements to be implemented by "each permittee" throughout Provision C.4. Certain entities do not have industrial and commercial facilities (i.e. the Alameda County Flood Control and Water Conservation District). A statement should be added to this provision, deeming this provision non-applicable for permittees that do not have industrial and commercial facilities.	It is not appropriate to completely exempt Flood Control Districts from this requirement. The Flood Control Districts are responsible for the inspection of facilities that are located on their property and under their control. This may include the Districts' corporate and service yards or property owned by the District that is leased to a commercial or industrial entity.	No changes made.
ACCWP Attachment1	39	C.4.b.ii.(4)	Exempt FCDS from Inspection Requirements	This section requires that each Permittee conduct inspections. This requirement should be limited to municipalities and not flood control agencies.	It is not appropriate to completely exempt Flood Control Districts from this requirement. The Flood Control Districts are responsible for the inspection of facilities that are located on their property and under their control. This may include the Districts' corporate and service yards or property owned by the District that is leased to a commercial or industrial entity.	No changes made.
BerkeleyAttachment1	39					
Oakland Attachment1	43					
SMCWPPP	31					

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
ACCWP Attachment1	40	C.4.b.ii.(6)	Recordkeeping Requirements in One Section	The record keeping listed under this section is not as comprehensive as the recordkeeping required under the Enforcement Response Plan (C.4.c.ii.(4)). All of the inspection related record keeping should be listed in one place in this section and not be listed in different places and expressed in different ways. Consolidate all of the annual reporting requirements in this section.	The record keeping requirements listed in Section C.4.b.ii are specific to that section. It is necessary to keep the record keeping requirements with the specific provisions for clarity and to demonstrate the compliance verification mechanisms for each provision.	No changes made.
ACCWP Attachment3	12					
BerkeleyAttachment2	13					
BerkeleyAttachment1	40					
Newark Attachment	40					
Oakland Attachment1	44					
Oakland Attachment2	13					
SMCWPPP	32					
ACCWP Attachment1	41	C.4.b.ii	All Annual Reporting in One Section	The annual reporting requirements listed under this section are not as comprehensive as the annual reporting required under the Enforcement Response Plan (C.4.c.iii). All of the annual reporting should be listed in one place in this section. It is uncertain what the purpose is of including language about the percent of violations resolved within 10 working days or in a timely manner. Consolidate all of the annual reporting requirements in this section. If there are annual reporting items that merit additional discussion and consideration, these should be worked out following adoption of the MRP	The annual reporting requirements listed in Section C.4.b.ii are specific to that section. The annual report requirements for all provisions will be compiled in one document after the permit is adopted and the reporting format is developed. It is necessary to keep the reporting requirements with the specific provisions for clarity and to demonstrate compliance verification mechanisms for each provision.	No changes made.
ACCWP Attachment3	13					
BerkeleyAttachment2	14					
BerkeleyAttachment1	41					
Newark Attachment	41					
Oakland Attachment1	45					
Oakland Attachment2	14					
SMCWPPP	33					
ACCWP	42			It is inefficient to have requirements	The recordkeeping	No changes

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Attachment1		C.4.c	ERP Requirements in One Section	expressed for different Enforcement Response Plans in Provisions C.4.c., C.5.b., and C.6.b. Requirements for recordkeeping and reporting should not be incorporated into the Enforcement Response Plan section as occurs in C.4.c. Express the requirements for an Enforcement Response Plan (ERP) in one section of the permit and refer to this ERP, as needed, in other sections of the permit so that there is consistency in the requirements for an ERP.	requirements are a specific component of the ERP, so they are included in the ERP section. The ERP requirements are specific to each permit section and should remain separate. Permittees have the flexibility to create one ERP to satisfy the requirements of C.4, C.5, and C.6 if they choose.	made.
BerkeleyAttachment1	42					
Fremont	22					
Oakland Attachment1	46					
SMCWPPP	34					
ACCWP Attachment1	43	C.4.c	Revise language	Typo Replace "public and private construction" with "industrial and commercial"	We agree.	Language corrected.
BerkeleyAttachment1	43					
Contra Costa Board of Sups Attachment A	25					
Oakland Attachment1	47					
San Leandro	10					
ACCWP Attachment3	14	C.4.c.iii	Reporting Inspection Results	Requirement for reporting on inspection results is redundant with C.4b(iii). Eliminate requirement.	C.4.b.iii only requires the development of a list of facilities within a permittees jurisdiction and the facilities scheduled for inspection in the current year. C.4.c.iii is the section that requires the reporting of inspection results. These Sections are not redundant and require the collection of different information to assess	No changes made.
BerkeleyAttachment2	15					
Newark Attachment	43					
Oakland Attachment2	15					

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					effectiveness and compliance with the permit provisions.	
San Leandro	11	C.4.c.ii.(2)	ERP- Timely Correction of Violations	10 days to correct all violations is unrealistic as is the requirement to document every time 12 or 15 working days are needed instead of 10 working days. The more paperwork and data entry there is required by this permit the less time there is for actual field work necessary to implementing an effective program. We recommend a more standard baseline of either 20 working days or 30 days and recognition that Permittees will continue to prescribe shorter time frames when weather or threat to sensitive receptor conditions warrant doing so.	The requirement for recordkeeping when correction of violations exceeds 10 business days is necessary to assess the effectiveness of municipal stormwater enforcement programs. The documentation of cases exceeding the timeframe will allow the Water Board to compare and assess the enforcement activities of permittees. If enforcement is not effective in meeting the correction standard, permittees shall assess and revise their enforcement protocols to improve the methods used to achieve violation correction. The 10 business day correction standard was established in order to the limit the prescriptive elements of the ERP.	No changes made.
ACCWP Attachment3	15	C.4.d.iii	Modify Training Reporting Requirements	Reporting % of staff attending training is not of value and difficult to calculate Modify requirement	The reporting of percentage of staff attending training will be used to assess Permittees efforts to	No changes made.
BerkeleyAttachment2	16					
Newark Attachment	43					

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Provision C.4. – Industrial and Commercial Site Controls

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Oakland Attachment2	16				educate staff. This information is valuable to approximate the efforts of Permittees to keep staff trained and informed about developments in stormwater investigation and enforcement. Calculation of percentage of staff attending is already done by many permittees and should not be considered difficult to calculate.	
Alameda City	23	C.4.b.iii.(1)	Submission of Facility List for Annual Inspection	Provision C.4.b.iii.(1), *Inspection Plan, Reporting*, requires the annual submittal to the RWQCB of specific revisions or updates to the list of the businesses subject to the local agency's business inspection work plan. This is an additional tracking and reporting exercise that will require additional staff time with no substantive benefit to water quality protection gains and will provide redundant information when compared with the annual inspection list submitted in compliance with Provision C.4.b.iii.(2). Restaurants and retail food facilities typically have a high turnover and we anticipate that significant changes to a complete list of businesses subject to inspection will occur every year. The City suggests that this annual business list update requirement be deleted from the Revised Tentative Order.	The list of businesses subject to the local agency's business inspection work plan and the annual inspection list are being completed for different purposes. The list of business subject to inspection under the work plan determine the businesses that are under the permittees jurisdiction and help permittees prioritize and determine inspection frequencies. The businesses scheduled for annual inspection convey the agency's determination of priorities to the Water Board and implementation of the inspection work plan. It is essential for effective	No changes made.

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					oversight and enforcement to assess new businesses that may require inspection.	
Fremont	19	C.4.b.ii.(2)	Annual List of Businesses to Inspect Problematic	Submitting a list of facilities scheduled to be inspected for the each fiscal year in each annual report is problematic as businesses come and go. Committing to a specific list takes away the flexibility of the permittee in determining priorities and redirecting resources throughout the year. Replace list of facilities with the number of facilities to be inspected in each category (i.e. automotive repair, restaurants, NOI, misc. businesses etc.).	Permittees still have the flexibility to amend the list of facilities to inspect and to change priorities during the year based on circumstances and professional judgment. The list of facilities scheduled to inspect allows the Water Board to determining compliance with the Permittees established inspection frequencies and to compare annual efforts between permittees.	No changes made.
Fremont	20	C.4.b.ii.(6)	Replace List of Businesses with General Categories	The reporting requirement of providing a list of facilities scheduled for inspections during the current fiscal year is onerous, especially in these current economic times with many businesses closing. Developing a current list of operational business is a wasteful use of resources. Providing a general category list (e.g. automotive repair, restaurants, etc) is sufficient, and allows the inspectors flexibility due to geographic area. Eliminate the record keeping requirement of providing "… a list of facilities scheduled for inspections…" replaced with provide the number of facilities to be inspected in a	Permittees still have the flexibility to amend the list of facilities to inspect and to change priorities during the year based on circumstances and professional judgment. The list of facilities scheduled to inspect allows the Water Board to determining compliance with the Permittees established inspection frequencies and to compare annual efforts between permittees.	No changes made.

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				category such as restaurants, automotive repair, NOI, etc.		
Alameda City	24	C.4.c	Documentation and Tracking Require 5% Additional Staff Person	Provisions C.4.c and C.5.b, *Enforcement Response Plan*, require tracking, justification analysis, and reporting to the Water Board for corrective action responses taking longer than ten (10) days. This documentation effort is estimated to require approximately 5% of a full-time staff person.	The requirement for recordkeeping when correction of violations exceeds 10 business days is necessary to assess the effectiveness of municipal stormwater enforcement programs. The documentation of cases exceeding the timeframe will allow the Water Board to compare and assess the enforcement activities of permittees. The 10 business day correction standard was established in order to the limit the prescriptive elements of the ERP.	No changes made.
Oakland Attachment2	17	C.4.e.iii	Inspections and Reporting Redundant	Inspections and reporting are redundant with C.2, C.8, and C.10, Eliminate Requirement.	The inspections for these sections are specific to the requirements and objective of each provision. It is necessary to report the inspection results in order to determine compliance with the provisions.	No changes made.
Dublin	9	C.4	Current Practices Effective	The Permit requires development of a formalized Emergency Response Plan (ERP) for use with business inspections, spill response, and construction, which would detail how the City responds to these incidents, as well as other	The development of the ERP and processes for record keeping and reporting are necessary to establish consistency in enforcement response	No changes made.

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				processes, record keeping, and reporting. Included in the ERP are requirements to adopt, by ordinance, escalating penalties for noncompliance. In summary, the City of Dublin's current spill response, business inspection practices, and construction inspection practices are effective, and adoption of additional formal measures would provide no incremental benefit to water quality. The added cost of adopting additional business and spill response measures is estimated at $6,000 per year.	programs and to demonstrate compliance with the MRP requirements. If Dublin has an effective response program, it should be relatively easy to formalize the procedures and track enforcement responses.	
San Mateo	5	C.4	Consolidate Requirements	These sections are an example of the cumbersome nature of the permit language. The language should be simplified and streamlined. For example, recordkeeping requirements should be consolidated in one section, annual reporting requirements in one section, enforcement response plan requirements in one section, etc.	It is necessary for individuals who may only be interested in one section of the permit to have all requirements for a specific section in one place. After the permit is adopted, the recordkeeping and annual reporting requirements will be compiled in one document to guide the development of the annual reporting format.	No changes made.
SMCWPPP	2	C.4	Support Revisions	This revised permit provision incorporates flexible requirements for developing an Industrial and Commercial Business Inspection Plan, including selection of businesses and inspection frequency.	Comment noted.	No changes made.
Daly City	11	C.4.b.ii(4)(d)	Verifying Coverage Under State General Permit	This section requires permittee to verify coverage. The Water Board should determine if coverage is required under the General Industrial Permit, not the	Ultimately, the Water Board will make the determination if coverage is needed under the State's General	No changes made.

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				Permittee. Please clarify.	Industrial Stormwater Permit. This provision requires Permittees to notify business that they may need coverage under the permit and refer the names of potential non-filers to the Water Board.	

[a] Refers to Provision Numbers contained in the Municipal Regional Stormwater Permit (MRP) Tentative Order dated December 14, 2007.
[b] Provision Numbers referenced are found in the Municipal Regional Stormwater Permit (MRP) revised Tentative Order dated February 11, 2009

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Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Kolb, Larry & James, Roger	22	C.5	No Plans Inspection Driven	The requirements of this provision should not include development of illicit discharge detection and elimination and should be limited to implementation of the program since these programs have been required since the initial NPDES permits and should be in place and mature. This program should not rely on complaints and must be inspection driven.	The program will not be driven solely by complaints. The purpose of developing a plan is to insure that strategic implementation is utilized to proactively detect illicit discharges. The plan will help target efforts in areas with the highest potential for violations.	No changes made.
SMCWPPP Letter	3	C5	Support Revisions	This permit provision simplifies requirements for ERPs and deletes unnecessary requirements for preparing Illicit Discharge Control Plans.	Comment noted.	No changes made.
San Jose	16	C.5.a.ii.(3)	Revise Language	The City suggests the Provision is revised to read "Permittees shall have adequate legal authority to control the discharge of spills, dumping or disposal of materials other than storm water to the MS4."	We agree, although permittees must also address pollutant sources that have the potential to discharge or be mobilized in to the MS4 system. Protecting the water quality of the MS4 must address potential sources in addition to sources that directly impact water quality.	No changes made.
Central Contra Costa Sanitary District	2	C.5.a.ii	Sanitary Sewer Discharges	Permittees are required to have adequate legal authority to address stormwater and non-stormwater pollution; several examples are identified, with the first being sewage. This implies that stormwater agencies are being given legal authority over public sanitary sewers. This reference to sewage does not distinguish between sources originating from a private system	If sanitary sewer agencies are not responding appropriately to sanitary sewer releases, permittees do have the authority to respond and insure that appropriate clean up occurs. If sanitary sewer agencies respond appropriately and	No changes made.

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				versus a sanitary sewer system operated by a public agency. SSOs from public agencies' sanitary sewer systems are adequately regulated by federal and state agencies, and potentially third party lawsuits, under the Clean Water Act and California laws. The MRP should not create another layer of regulatory oversight at the local level for the public sanitary sewer agencies. Modify the text to clarify that the legal authority for Permittees to regulate sewage as a pollutant under the MRP is limited to releases from privately owned and operated laterals and collection systems.	comply with federal and state regulations than municipalities do not need to be involved in the clean up and enforcement process to sanitary sewer releases. Permittees jurisdiction is not limited to privately owned and operated sewage systems. If the MS4 system is being impacted by a sewage release from a sanitary agency, permittees do have the legal authority to respond.	
ACCWP Attachment1	44	C.5.a.ii.(1)	Only Non-Stormwater Discharges to the MS4	The requirement to have adequate legal authority for "non-stormwater pollution" is overly broad. The authority should be more specific to non-stormwater discharges to MS4s owned/operated by Permittees. Modify the legal authority requirement to having the ability to control non-stormwater discharges to the Permittees' MS4 as required by the federal Clean Water Act.	Permittees must also address pollutant sources that have the potential to discharge or be mobilized in to the MS4 system. Protecting the water quality of the MS4 must address potential sources in addition to sources that directly impact water quality.	No changes made.
Berkeley Attachment1	44					
Newark Attachment	45					
Oakland Attachment1	48					
SMCWPPP	35					
ACCWP Attachment1	45	C.5.a.ii.(2)-(3)	Control Discharge to MS4	The requirement to have adequate legal authority for discharges to "storm drains" is too broad. Modify the legal authority requirement to having adequate legal authority to control discharges to the Permittees' MS4.	Permittees must also address pollutant sources that have the potential to discharge or be mobilized in to the MS4 system. Protecting the water quality	No changes made.
Berkeley Attachment1	45					
Newark Attachment	46					

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File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
Oakland Attachment1	49				of the MS4 must address potential sources in addition to sources that directly impact water quality.	
SMCWPPP	36					
Alameda City	24	C.5.b	Increased Time Documenting Actions	Provisions C.4.c and C.5.b, Enforcement Response Plan, require tracking, justification analysis, and reporting to the Water Board for corrective action responses taking longer than ten (10) days. This documentation effort is estimated to require approximately 5% of a full-time staff person.	The justification and analysis of enforcement actions taking longer than 10 business days to achieve compliance is necessary to evaluate the effectiveness of municipal enforcement programs. The requirement to justify actions was added in lieu of a prescriptive enforcement response plan.	No changes made.
Sunnyvale	37	C.5.b	Extend Time for Development of ERP	As described in C.4.c above, the Sunnyvale's ERP (and possibly city ordinances) will need to be revised to meet the new requirements of the MRP. This can eventually be accomplished, but not by the implementation date of July 1, 2009. Additional time will be needed to revise our ERP (and potentially a city ordinance) to meet these new requirements.	Permittees should already have the legal authority to conduct enforcement of illicit discharges. These requirements have been in place since the early 1990's for municipal stormwater programs. Permittees should be actively taking enforcement actions as necessary. We have added a date for the implementation of the ERP to give permittees time to adapt and revise current plans to meet the requirements of the MRP.	Added April 1, 2010, as completion date for development of ERP.

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Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
ACCWP Attachment1	46	C.5.b.ii.(2)	Correction of Violations in 10 Days Unrealistic	The requirement that violations shall be corrected within prescribed time periods is unrealistic and unnecessary. Replace the requirement to correct violations "no longer than 10 business days after violation is discovered" with a more flexible requirement to "correct violations of local stormwater ordinances as soon as practicable." Eliminate the requirement to provide "rationale.... if the more than 10 business days is required for compliance..."	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for correction of violations is being established in lieu of the prescriptive enforcement response requirements that were included in the previous draft TO. Permittees have the flexibility to conduct enforcement in a manner that they deem appropriate to meet the violation correction performance standard.	No changes made.
Berkeley Attachment1	46					
Oakland Attachment1	50					
Newark Attachment1	47					
SMCWPPP	37					
Santa Clara County	15	C.5.b	Correction of Violations in 10 Days Unrealistic	Requiring all violations to be corrected before the next rain event, but not longer than 10 business days, is unrealistic. We request that more flexibility for correcting violations within a timely manner be provided.	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for correction of violations is being established in lieu of	No changes made.

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Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
					the prescriptive enforcement response requirements that were included in the previous draft TO. Permittees have the flexibility to conduct enforcement in a manner that they deem appropriate to meet the violation correction performance standard.	
ACCWP	8	C.5.b.ii.(2)	Excessive Reporting and Recordkeeping	There have been improvements to the requirements, in particular, removing the reporting template. However, the reporting and recordkeeping requirements are still onerous and many do not provide significant improvements for accountability. Examples of excessive reporting and recordkeeping requirements include: (4) a requirement to provide a rationale for each corrective action that will take more than 10 days to complete (C.5.b.ii(2));	The requirement for recordkeeping when correction of violations exceeds 10 business days is necessary to assess the effectiveness of municipal stormwater enforcement programs. The documentation of cases exceeding the timeframe will allow the Water Board to compare and assess the enforcement activities of permittees. The correction standard will improve water quality because permittees will more closely monitor and enforce clean up of problem areas within a given time frame. If enforcement is not effective in meeting the correction standard, permittees shall assess and revise their	No changes made.
Fremont	4					
Oakland	5					

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Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
					enforcement protocols to improve the methods used to achieve violation correction.	
Fremont	23	C.5.b.(2)	ERP Requirements in One Section	ERP requirements in multiple locations, and inconsistent. State the ERP requirements in one section of the permit and refer to it as needed, in other sections of the permit.	The ERP requirements are specific to each permit section and should remain separate. Permittees have the flexibility to create one ERP to satisfy the requirements of C.4, C.5, and C.6 if they choose.	No changes made.
Oakland Attachment1	51	C.5.b.ii.(2)	Modify ERP Requirements	Requires guidelines on when to employ the range of regulatory responses from warnings, citations and cleanup and cost recovery, to administrative or criminal penalties. Remove requirement of guidelines and allow municipalities to impose range of types of enforcement. Although the City can utilize all these enforcement tools, they are not always effective or municipality may not have that enforcement option. Requires re-writing process, ordinances, and protocols.	The development of guidelines for employing specific enforcement actions is necessary to achieve consistent actions from inspectors and municipal inspection staff. Permittees still have the flexibility to determine the appropriate actions for specific violations. The ERP may specify a range of responses that are appropriate to achieve compliance.	No changes made.
Sunnyvale	38A	C.5.c.i	Requirements Unclear	The requirement listed in the third paragraph of this provision is unclear. What is expected to show compliance by the term "Permittees shall conduct reactive inspections in response to complaints"?	Permittees are expected to react to complaints according to the threat to water quality and to conduct follow up investigations and actions to insure that illicit discharge impacts to the	No changes made.

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Provision C.5. – Illicit Discharge Detection and Elimination

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					quality of stormwater runoff are abated, minimized, and/or prevented.	
Sunnyvale	38B	C.5.c.i	Implementing Non-emergency Call Line	Also, as described in other sections of the permit, addressing the new requirement for establishing a non-emergency voice-mail for reporting that is checked daily will require additional funds and staff time to implement it. As one small item, it may not be significant, but when included as a whole with all the other new requirements of the MRP that Sunnyvale will have to comply with, it has a significant cumulative impact on already limited resources.	The establishment of a number to report illicit discharges is a basic function of municipal spill response activities. This provision has been amended to require that the non-emergency number is only checked during normal business hours. During off hours, the spill response line should refer to the appropriate local emergency response entity.	C.5.c.i has been modified to only require checking of the non-emergency spill response line during normal business hours.
ACCWP Attachment1	47	C.5.c.i	Check Voicemail Only on Work Days	"If 911 is selected, also maintain and publicize a staffed, non-emergency phone number with voicemail, which is checked daily." Requiring Permittees to check a voice-mail box on weekends and holidays would generally require payment at over-time rates. Municipalities cannot afford this and it is unnecessary. Revise to "checked on work days."	We agree. The language has been revised to only require checking the voice-mail box during "normal business hours".	C.5.c.i has been modified to only require checking of the non-emergency spill response line during normal business hours.
Berkeley Attachment1	47	C.5.c.i	Check Voicemail Only During Business	Add "during normal business hours" at the end of the second sentence as follows: "If 911 is selected, also maintain and publicize a staffed, non-emergency phone number with voicemail, which is checked	We agree. The language has been revised to only require checking the voice-mail box during "normal business hours"	C.5.c.i has been modified to only require checking of the non-emergency
Oakland Attachment1	52					

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CCCWP Attachment	20		Hours	daily during normal business hours." Reason for Addition: Municipal staff will not be available to respond to non-emergency stormwater complaints during non-business hours.		spill response line during normal business hours.
Fairfield-Suisun Sewer District	15	C.5.c.i	Spill Response Only During Normal Business Hours	The requirement to maintain and publicize a staffed, non-emergency phone number with voicemail, which is checked daily, if 911 is selected, is unrealistic as it requires additional and unfunded resources. We request that the non-emergency staff phone number be required to be checked daily during normal weekday business hours (i.e., Monday–Friday, 8 am to 5 pm) in the event that 911 is used as the central contact point. Any spill/dumping incident occurring before or after weekday hours and during weekends; and deemed to be a serious threat to a water body will be addressed by other responders (e.g., City Fire Departments, contract hazardous material responders, etc.).	We agree. The language has been revised to only require checking the voice-mail box during "normal business hours"	C.5.c.i has been modified to only require checking of the non-emergency spill response line during normal business hours.
Fairfield	18	C.5.d	Tracking and Inspecting Mobile Businesses	"Establish oversight and control of pollutants from mobile sources" As a city, cannot even track or collect business licenses for these mobile businesses. Yet have participated in or shared information leading to enforcement of several mobile sources through collaboration with the Alameda County Environmental Crimes Task Force and County District Attorney's office. The more this permit demands of individual agency staff time; the more staff	The mobile source control provision allows permittees to collaborate on a county wide or regional basis in order to develop source control BMPs and encourages cooperation in order to implement the provision. The new requirements encourage enforcement response	No changes made.
Suisun City	18					

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ACCWP Attachment1	47			may be forced to pull back on un-funded regional participation. Implementation level should consist of developing BMPs and reporting on successful partnering where it is available with entities/agencies that do have control. Example is the recent addition of owner certification to comply with ACCWP BMPs achieved by ACCWP partnering with Al. Co. Env Health Agency who permits mobile catering trucks.	activities as described in these comments. Permittees must proactively respond to illicit discharge complaints regarding mobile businesses.	
Berkeley Attachment1	48	C.5.d	Difficulty Inspecting Mobile Sources	Under the TO, mobile sources appear to require compliance by each Permittee. A mobile business is a business that is not fixed in any one particular jurisdiction. While the TO calls for a county-wide/regional collaboration with respect to discharge of pollutants from mobile sources, it still calls for a County developed program for mobile sources. The County's ability to oversee compliance and enforcement of mobile sources is difficult because mobile sources are not fixed in the County.	The mobile source control provision allows permittees to collaborate on a county wide or regional basis in order to develop source control BMPs and encourages cooperation in order to implement the provision. We understand the transient nature of mobile businesses and expect permittees to work together to develop response and enforcement strategies.	No changes made.
Newark Attachment1	48					
Oakland Attachment1	53					
San Leandro	12					
Santa Clara County	16					
Sunnyvale	39	C.5.d	Extend Time for Implementation of Mobile Source Control	This provision requires that Sunnyvale and the other permittees immediately (by July 1, 2009) develop and implement a program to reduce the discharges from mobile businesses. Immediate implementation of this provision is not feasible and will likely result in immediate non-compliance by Sunnyvale and other permittees. To cooperate regionally to develop and	Permittees should already be actively responding to illicit discharge complaints for mobile businesses. The program to develop BMPs and enforcement strategies for mobile business shall be developed during the first year of permit	No changes made.

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				implement a program, it will take more than the few months after the intended adoption date for the MRP to develop and implement such a program region-wide. Additional time is needed to comply with this provision.	implementation and progress reported in the Annual Report.	
SMCWPPP	38	C.5.d.ii.(1).(b) C.5.d.iii	Control of Mobile Sources Implementation Level and Reporting	It is unnecessary and redundant to require both an ERP and in this section an "enforcement strategy" for mobile businesses. There is also no need to report annually on the implementation of this enforcement strategy separately from the reporting about the ERP. Remove the requirement to have an enforcement strategy for mobile businesses and the requirement to report annually on the implementation of the enforcement strategy.	Mobile businesses are regulated under a separate section in order to provide Permittees with more flexibility in implementation of mobile source requirements and to provide a mechanism for county wide and regional collaboration. Permittees may include their mobile business enforcement strategy as part of their ERP if desired.	No changes made.
Contra Costa Board of Supervisors Attach A	27	C.5.d	Revise Requirements for Mobile Sources	Due to the cross-jurisdictional nature of discharges of pollutants from mobile sources, the County recommends that this section be revised to allow this requirement to be conducted collectively via the Contra Costa Clean Water Program, which includes sanitary district staff in its Industrial and Commercial Workgroup. At least one sanitary district has already established a program to permit mobile washers that provides a framework for permit application and review, and subsequent inspections. This enables recommendations that other businesses	The provision allows for regional collaboration and implementation. Permittees have the flexibility to designate a Clean Water Program with the authority to implement the mobile source inspection and enforcement activities.	No changes made.

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				utilize these environmentally responsible mobile washer companies. It is recommended that this section be incorporated into C.4.b.ii, with mobile food vendors, pressure washers, carpet cleaners, etc. listed as specific priority facilities in the Inspection Plan.		
Mountain View	9	C.5.d	MS4 Map Availability Concerns	The Regional Permit requires the City to make storm sewer maps available to the public either electronically or in hard copy. The City is concerned about publishing detailed infrastructure maps for security reasons. The City answers public requests for information related to the storm drainage system, but does not provide maps for public review. Has the Regional Water Board evaluated the requirement to make storm sewer maps publicly available for potential conflicts with Federal Homeland Security regulations? What is the rationale for requiring publication of the infrastructure maps?	The Water Board is not requiring the publishing of detailed infrastructure maps. The provision only requires making maps of the MS4 drainage system publicly available in order for citizens to assist with the identification and prevention of illicit discharges. Permittees shall control the dissemination of the maps for illicit discharge control purposes. This should not be in conflict with Homeland Security regulations.	No changes made.
Sunnyvale	40A	C.5.e	Phase Implementation of MS4 Screening Program	The requirement to develop and implement a screening program utilizing the USEPA/Center for Watershed Protection publication "Illicit Discharge Detection and Elimination (IDDE): A Guidance Manual for Program Development and Technical Assessment" as immediate upon adoption with no phase in time is unacceptable and will likely cause municipalities such as Sunnyvale to be out of compliance with this provision upon adoption of the permit.	Permittees are not required to develop a plan exactly as described in the manual. The USEPA/Center for Watershed Protection Manual is to be used as a reference in developing the screening program that will be implemented during the permit term. Permittees will not be in immediate non-	No changes made.

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				According to Table 4 the USEPA document listed above, to implement an IDDE program, the first step is to audit the existing program with the resulting product being a 5-year IDDE program development plan. The monitoring criteria listed in the Provision C.5.e.ii of the permit would not start until year 2-5 of the plan, once developed, according to the guidance document cited. However, the permit requires this type of program to be implemented immediately. Also, according to Table 9 of this publication, the estimated Median Annual Cost of an IDDE program is $121,825, based on 2004 dollars. If video inspections are required, obtaining just the equipment to perform such surveys is at least $180,000, and this does not count the staff training and operating time for the unit, plus any flushing of lines that would need to be done to utilize the video equipment appropriately. This is a significant cost as a new program requirement, and when included as a whole with all the other new requirements, it will have a considerable cumulative effect on already limited resources for permit compliance by Sunnyvale. Sunnyvale requests that an implementation time frame, such as that outlined in the USEPA publication referenced in this provision (a 5-year time frame) be allowed so that cities	compliance if the manual has not been used prior to adoption. Video inspection are not required under the permit, although permittees may use video inspections to comply with the illicit discharge screening requirements if they choose to conduct them.	

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				can develop a collection system screening program in a reasonable and cost-effective manner.		
Sunnyvale	40B	C.5.e	MS4 Map Availability Concerns	The requirement to produce and make available maps of the MS4 system to the public still does not take into account issues with potential Homeland Security requirements. In the response to comments, Water Board staff indicated that they had not yet contacted Homeland Security about this issue. Also, we believe that the requirement to publicize maps of the city's storm drain collection system should not be required until such a time that the Water Board staff has received clear direction that it is not a Homeland Security issue.	The Water Board is not aware of any security concerns regarding publicizing the drainage paths for the storm drain system. Permittees are being asked to publicize the availability of the information and make them available to the public upon request under the guidance of municipal staff. If the request for map information seemed inappropriate, permittees could deny access to the information.	No changes made.
Santa Clara County	17	C.5.e	MS4 Map Availability Concerns	This section of Provision C.5 requires the County to make storm water sewer maps available to the public. Storm water sewer maps may be critical infrastructure information that is voluntarily submitted to the California Emergency Agency for use by that office, the information is exempt from disclosure under Cal. Gov't Code s 6254(ab). The revised TO does not acknowledge the limitations on the County (and other Permittees) to disclose such maps under the California Public Records Act.	The Water Board is not aware of any security concerns regarding publicizing the drainage paths for the storm drain system. Information regarding storm rain flow paths should not be considered Critical Infrastructure Information as referenced in CA Govt Code 6254 (ab). Permittees should on make the maps	No changes made.

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					available to assist with prevention and identification of illicit discharges.	
ACCWP Attachment1	50	C.5.e.ii	Simplify MS4 Map Availability	The requirement to make MS4 maps publicly available should be simplified to allow fulfillment of this requirement by making the Creek & Watershed Maps produced by the Oakland Museum of California available. These maps depict storm drain lines that are 2-feet or larger in diameter, which should be sufficient for most public interest/educational purposes. Modify this requirement to allow the use of the Oakland Museum of California Creek & Watershed maps.	In some cases, the use of the Oakland Museum creek maps may be appropriate; however these maps do not provide complete coverage for many permittees. If additional information is required to adequately depict drainage paths of the MS4 system permittees should make additional maps available to the public upon request.	No changes made.
SMCWPPP	40					
Berkeley Attachment1	50	C.5.e.ii	Clarify usage of USEPA Manual	The requirement to utilize the USEPA/Center for Watershed Protection publication "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessment" is unclear and should simply encourage the use of guidance, such as that provided by this manual. Modify language to state that the "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessment" and other similar	Permittees are not required to develop a plan exactly as described in the manual. The USEPA/Center for Watershed Protection Manual is to be used as a reference in developing the screening program that will be implemented during the permit term. The manual in its entirety is intend for implementation.	No changes made.
Newark Attachment	50					
Oakland Attachment1	55					
SMCWPPP	39					
ACCWP Attachment1	49					

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				manuals may be used for guidance.		
ACCWP Attachment3	16	C.5.e.iii	Collection Screening Inspections Redundant	Collection Screening Inspections and reporting are redundant with C.2, C.8, and C.10 Eliminate Requirement.	The collection screening requirements are specific requirements to proactively screen and assess the potential for illicit connections and discharges. These provisions are not redundant with C.2, C.8, and C.10, although they may be implemented concurrent with those sections if permittees conducting screening activities while implementing those provisions.	No changes made.
Berkeley Attachment2	17					
Newark Attachment	51					
Contra Costa Board of Supervisors Attach A	28	C.5.e	Joint Tracking Between County and Flood Control District	Since the Flood Control District is housed within the County's Public Works Department, it is requested that the Water Board allow for (unincorporated) Contra Costa County and the Flood Control District to jointly track and report illicit discharges; this would eliminated the necessity to separately track activities that are undertaken by the two entities for the same purpose.	It is not necessary for Flood Control District and unincorporated Contra Costa County to redundantly track and report illicit discharges. It is only necessary for one entity to track and report joint illicit discharge responses.	No changes made.
Danville	7	C.5	Retain Existing Illicit Discharge Program	This section will increase the number of field screenings required to be performed in Town creeks, add more prescriptive requirements for conducting dry season field screening surveys/inspections, and require more active code enforcement procedures. In and of itself, this provision	Existing illicit discharge programs are currently not consistent between Stormwater programs. The MRP provisions will improve consistent reporting and tracking of illicit discharge	No changes made.

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				will require hiring of additional staff to meet the proposed requirements and handle the extra documentation and reporting efforts being requested. The Town's cost is about $50,000 annually. **Suggested Recommendation:** Retain existing permit language including existing program, inspection plan, documentation and reporting requirements.	control activities.	
Fairfield	19	C.5.e	Collection System Screening	The requirement to survey at least one screening point per square mile per year including some key major outfalls draining industrial areas is very burdensome and unrealistic. The number of inspections required is too many for the City to realistically inspect with their current staff levels.	The Federal Regulations required NPDES Municipal Phase I permit applicants to include much more comprehensive screening in their initial NPDES Permit application than is contained in the Revised TO, (See Fact Sheet and 40 CFR 122. 26) including results of a field screening analysis for illicit connections that includes, at a minimum, a description of visual observations made at each designated field screening point. Field screening points are either all major outfalls or outfall points randomly located throughout the storm drain system and identified by overlaying the system with a 0.5 mile square grid system and selecting one field screening point for every 1/16 square	No changes made.

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					mile cell. The Revised TO approach is much more efficient and easier to implement, and relies on a combination of focused inspections for illicit discharges based on the Permittees illicit discharge screening program and visual inspections during routine maintenance and other activities in the collection system to meet the screening frequency specified in the Federal Regulations.	
Fairfield- Suisun Sewer District	16	C.5.e	Collection System Screening Too Prescriptive	These requirements are too prescriptive and unnecessarily burdensome. It is the permittee's experience that surveying outfalls and underground storm drain lines for illicit discharges has had very little effect on identifying or controlling these types of discharges. A much more effective use of resources should be directed to actively surveying/inspecting above ground sources of these discharges. Keep current permit requirements.	The Federal Regulations required NPDES Municipal Phase I permit applicants to include much more comprehensive screening in their initial NPDES Permit application than is contained in the Revised TO, (See Fact Sheet and 40 CFR 122. 26) including results of a field screening analysis for illicit connections that includes, at a minimum, a description of visual observations made at each designated field screening point. Field screening points are either all major outfalls or outfall points randomly	No changes made.
Suisun City	19					
Fremont	24					

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					located throughout the storm drain system and identified by overlaying the system with a 0.5 mile square grid system and selecting one field screening point for every 1/16 square mile cell. The Revised TO approach is much more efficient and easier to implement, and relies on a combination of focused inspections for illicit discharges based on the Permittees illicit discharge screening program and visual inspections during routine maintenance and other activities in the collection system to meet the screening frequency specified in the Federal Regulations.	

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Livermore	10	C.5.e	Collection System Screening	This provision requires the City to develop and implement a screening program utilizing the U.S.E.P.A/ Center for Watershed's publication entitled "Illicit Discharge Detection & Elimination, A Guidance Manual for Program Development and Technical Assessment". It further requires that the City establish one screening point per square mile of the City's Urban and Suburban Area less Open Space Area. The purpose of such a screening program is to provide a means to identify and stop illegal discharges to the storm sewer system. This is another area of the permit in which Board staff should utilize the expertise of the stormwater program staff, many of whom have over 15 years of practical experience actually implementing programs, rather than academically proposing "how" to do things in such detail. The screening-point approach may be good for an agency just starting to implement an illicit discharge program to identify on-going illicit connections. However, since our programs have been in place for over 10 years, any agency running a professional program has long ago eliminated illicit connections. This provision, as written, is overly prescriptive and unnecessarily burdensome. The City has demonstrated through past illicit discharge investigation	The Federal Regulations required NPDES Municipal Phase I permit applicants to include much more comprehensive screening in their initial NPDES Permit application than is contained in the Revised TO, (See Fact Sheet and 40 CFR 122. 26) including results of a field screening analysis for illicit connections that includes, at a minimum, a description of visual observations made at each designated field screening point. Field screening points are either all major outfalls or outfall points randomly located throughout the storm drain system and identified by overlaying the system with a 0.5 mile square grid system and selecting one field screening point for every 1/16 square mile cell. The Revised TO approach is much more efficient and easier to implement, and relies on a combination of focused inspections for illicit discharges based on the Permittees illicit discharge screening program and	No changes made.

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				activities that surveying outfall screening points and underground storm sewer system points for illicit discharge activity has been both inefficient and ineffective in discovering and reducing illicit discharge activity. Conversely, time spent performing "above-ground" survey inspections of commercial and industrial business parks has yielded much more success in identifying and stopping illicit discharges. This is a much more effective and efficient utilization of resources in identifying, stopping, and abating illicit discharge activity. The City has communicated the results and successes of it past illicit discharge activity in various reports to the Board over the years. This provision should be modified to allow permittees to implement measures that are effective in identifying and controlling illicit discharges.	visual inspections during routine maintenance and other activities in the collection system to meet the screening frequency specified in the Federal Regulations.	
Alameda County	7	C.5.e.ii	Exclude Non-population Based Permittees from Collection System Screening	This provision requires "Permittees" to "implement the screening program by conducting a survey of strategic collection system check points (one screening point per square mile of Permittee urban and suburban jurisdiction area, less open space)..." This requirement is geared more toward cities and not toward non-populated Permittees such as the Alameda County Flood Control and Water Conservation District. **Proposed Solution:** This provision should exclude non-populated Permittees or include requirement that are specific for	Flood Control District's are only responsible for inspecting areas under their direct sphere of control. It is essential that Flood Control District's conduct inspections of the MS4 to assess non-stormwater discharges and illicit flows from their outfalls.	No changes made.

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				non-populated Permittees.		
Contra Costa Board of Supervisors Attach A	26	C.5	Does Not Address Inter-jurisdictional Challenges	The MRP does not address inter-jurisdictional challenges in enforcement of source discharges of trash, illegal dumping and other illicit discharges. It is not appropriate for one Permittee to be held responsible for illicit discharges originating within another jurisdiction. Provision C.5 should be modified such that a jurisdiction is not penalized for illicit discharges originating within another jurisdiction.	In cases that have inter-jurisdictional challenges permittees should cooperate and coordinate with the responsible entities. If it is not possible to obtain compliance after coordinated efforts, the Water Board should be contacted.	No changes made.
Contra Costa Board of Supervisors Attach A	29	C.5.f	Difficult to Abate Certain Discharges in 10-day Period	Some locations are not accessible for safe recovery of large debris, such as mattress and couches, and crews often must deploy costly boom trucks with operators. Although the County agrees that a 10-day abatement window is a reasonable time to abate active liquid discharges (although all efforts will be made to abate discharges more quickly, as appropriate), this may not be appropriate for all incidents of solid waste dumping. The County is requesting that the timeline for abatement of certain appropriate discharges be increased to 30 days. It is recommended that 30 days be allowed for abatement of discharges that are "neither prone to mobilization nor pose an imminent threat to water quality."	The permit allows permittees flexibility to achieve violation correction. If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for correction of violations is being established in lieu of the prescriptive enforcement response requirements that were included in the previous draft TO.	No changes made.
Contra Costa Co Flood Control Attach A	2	C.5.f	Lack of Authority to Respond	The primary concern of the Contra Costa County Flood Control and Water Conservation District (Flood Control District) is the lack of authority in responding to illicit discharges originating	Flood Control District's should directly enforce the requirements for illicit discharge response in areas where they have authority.	No changes made.

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				within city jurisdictions adjacent to our flood control channels. The MRP presents challenges in enforcement of point source discharges of trash, illegal dumping and other illicit discharges whose sources are located in cities' jurisdictions (where County Ordinances do not apply), that enter Flood Control District channels and downstream waterways in unincorporated areas. As written, the Flood Control District may be held responsible for illicit discharges it has limited means to effectively control, primarily in the form of structural controls like exclusion fencing. This section of the permit should make some concession for Flood Control agencies in recognition of their limited ability to enforce and correct/eliminate illicit discharges.	When cross jurisdictional cases arise, it expected that Flood Control District's will coordinate efforts with the appropriate responsible agency in order to achieve clean up and abatement.	
Contra Costa Co Flood Control Attach A	3	C.5.f	Lack of Authority to Respond	As noted above, the Flood Control District has no authority to abate an illicit discharge from a source outside its property. The Flood Control District can report the number and location of illicit discharges on its property, but cannot be reasonably expected to provide follow up information on incidents reported to cities. The MRP should limit the Flood Control District's responsibility to addressing illicit discharges originating on its property.	Flood Control District's should directly enforce the requirements for illicit discharge response in areas where they have authority. When cross jurisdictional cases arise, it expected that Flood Control District's will coordinate efforts with the appropriate responsible agency in order to achieve clean up and abatement.	No changes made.
Contra Costa Co Flood Control Attach A	4	C.5.f	Problem with 10 Day Clean Up	In general, the Public Works Department, on behalf of the Flood Control District, responds to complaints within three days.	The permit allows permittees flexibility to achieve violation correction.	No changes made.

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				However, removal of illegally dumped debris may not occur within the required 10 day response time due to the volume, geographic separation of dumping locations and limited staff available to the Flood Control District. Locations of dumped materials often are do not allow for safe recover of large debris, such as mattresses and couches, without the use of costly boom truck equipment. In the case of homeless encampments, the Flood Control District must often coordinate cleanup efforts with the cities that own fee title to the lands underneath road bridges that attract homeless encampments; these efforts also require the involvement of law enforcement and social service providers to address the needs of evicted people. Although the requirement to conduct abatement of liquid discharges within 10 days, it is requested that 30 days be allowed for abatement of discharges that pose a low immediate risk to water quality.	If violations are not corrected in 10 business days or before the next rain event, permittees can provide an explanation justifying the reason for the delay. The 10 days for correction of violations is being established in lieu of the prescriptive enforcement response requirements that were included in the previous draft TO.	
Danville	6	C.5	Reduce Reporting Requirements	New record keeping and reporting requirements contained in Provisions C.3. New Development, C.6 Construction Site Controls, C.5. Illicit Discharge and Detection. And C.10 Trash. These efforts will require the creation of data base systems, employee training and considerable implementation time preparing reports that will have little impact on the environment. The Town does not have adequate resources available for these purposes and suggests that program	The data collected and reported in C.5 is the minimum amount necessary to assess illicit discharge investigation and response effectiveness.	No changes made.

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				funds be more effectively spent elsewhere. **Suggested Recommendation:** Reduce the extensive data base reporting requirements outlined in the proposed permit for both local agency and SFRWQCB benefit, and devote available staff resources toward program implementation.		
ACCWP Attachment1	51	C.5.f.ii	Tracking and Case Follow Up Overly Prescriptive	The information tracked is overly prescriptive and unnecessary. For example, information tracking about the response times will divert resources from doing the actual illicit discharge detection and elimination work. Remove the detailed information listed in this permit section.	Tracking response times is an effectiveness measure that can be used to evaluate and improve illicit discharge enforcement. Tracking response times will not create any significant time drain on enforcement resources. Recording a resolution date in files and database and summarizing the results in the annual report is a simple task.	No changes made.
SMCWPPP	41					
Berkeley Attachment1	51	C.5.f.ii	Record Keeping Requirement Overly Detailed	Record keeping requirements are overly detailed. Allow agency to determine means of tracking incidents; annual reporting will indicate number of unresolved issues, if any	It is necessary for all permittees to track and report actions in a uniform manner. The recordkeeping and reporting information required is the minimum necessary to determine appropriate identification and response to illicit discharge complaints and compliance with the MRP provisions. Permittees have the flexibility to develop the	No changes made.
Newark Attachment	52					
Oakland Attachment1	56					
ACCWP Attachment3	17					

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					specific mechanism and tabular system to collect and report the data.	
Berkeley Attachment2	18	C.5.f	Requirement to Establish Additional Database Redundant	The requirement to create and maintain an additional database or tabular system is redundant and an inefficient use of resources. Remove this requirement. This data is already captured in the Illicit Discharge database.	Maintaining a database is an efficient way of tracking results and effectiveness. C.5.f does not require an additional database for Illicit Discharges. It establishes the minimum level of information that should be recorded in the database.	No changes made.
Oakland Attachment2	18					
Fremont	25					
Fremont	26	C.5.f.(2)-(3)	Requirement to Establish Additional Database Redundant	List investigation information & response time in separate data base. This information would already be entered into the Illicit Discharge database, so an additional database is unnecessary and a waste of resources. These types of discharges should be reported in the existing illicit discharge database.	Maintaining a database is an efficient way of tracking results and effectiveness. C.5.f does not require an additional database for Illicit Discharges. It establishes the minimum level of information that should be recorded in the database.	No changes made.
San Leandro	13	C.5.f.i.(3)	Level of Detail Required for Illicit Discharge Tracking Will Impact Implementation	There are far too many needless data tracking requirements; such as response in days of; call to investigation, investigation to abatement and call to abatement. This level of detail is inhibitory to effective implementation and draws funding and resources from field based tasks to reporting and data management. We recommend deleting section (3) as it is unnecessary to implementation of an effective illicit discharge component.	Tracking response time is an effectiveness measure that can be used to evaluate and improve illicit discharge enforcement. Tracking response times will not create any significant time drain on enforcement resources. Recording response times and a resolution dates in a database and summarizing the results in annual reports	No changes made.

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
					is a simple task.	
Daly City	12	C.5.f.ii	Tracking and Case Follow Up Resource Burden	The information tracked is overly prescriptive and unnecessary. Information tracking about the response times will divert resources from doing the actual illicit discharge detection and elimination work. Remove the detailed information listed in this permit section. Nevertheless, if not removed the Implementation schedule should be changed to July 1st, 2010 or later to allow sufficient time to develop the plan.	Tracking response time is an effectiveness measure that can be used to evaluate and improve illicit discharge enforcement. Tracking response times will not create any significant time drain on enforcement resources. Recording response times and a resolution dates in a database and summarizing the results in annual reports is a simple task.	No changes made.
Dublin	9	**C.5**	Current Practices Effective No Need for ERP	The Permit requires development of a formalized Emergency Response Plan (ERP) for use with business inspections, spill response, and construction, which would detail how the City responds to these incidents, as well as other processes, record keeping, and reporting. Included in the ERP are requirements to adopt, by ordinance, escalating penalties for noncompliance. The City of Dublin, during the 2007-08 Fiscal Year, responded to a total of 36 spills or discharges, of which 34 incidents were abated that year, with the remaining 2 cases requiring physical improvements at the site which were completed by the end of the 2008. The majority of these dealt with oil leaks from parked vehicles, construction debris being dropped in a street, or similar	An enforcement response plan is an important tool that will help permittees achieve effective and consistent enforcement. The specific requirements for development of an ERP have been removed to provide permittees with flexibility. Permittees have the ability to create an ERP specific to their needs in order to achieve compliance in accordance with the MRP provisions.	No changes made.

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.5. – Illicit Discharge Detection and Elimination

File	Comment No.	Provision No.[a]	Key Word(s)	Comment	Response	Proposed MRP Revision[b]
				problems. The most extreme incidents involved a sewage spill due to a plugged sewer main, dumping of cooking oil by a restaurant into a private storm drain, and trash generated at a market. In summary, the City of Dublin's current spill response, business inspection practices, and construction inspection practices are effective, and adoption of additional formal measures would provide no incremental benefit to water quality. The added cost of adopting additional business and spill response measures is estimated at $6,000 per year.		

[a] Refers to Provision Numbers contained in the Municipal Regional Stormwater Permit (MRP) Tentative Order dated December 14, 2007.
[b] Provision Numbers referenced are found in the Municipal Regional Stormwater Permit (MRP) revised Tentative Order dated February 11, 2009

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Daly City	5	C.6.	Overly Prescriptive	This will require additional staff time to implement without any improvement to water quality.	Board staff has inspected many construction sites that lacked BMPs, lacked effective BMPs, and/or lacked maintenance on the BMPs. A number of times, Board staff was present when illicit discharges into the MS4s were occurring. The reporting requirements level the playing field and bring accountability. The need for accountability will help ensure that construction sites are inspected at the prescribed frequency. Field presence and consistent enforcement will help ensure that adequate BMPs are in place, thereby reducing the potential for illicit discharges.	
Danville	6	C.6.	Reduce Reporting Requirements	Permit requires the creation of database, employee training, and lots of time to prepare reports that have little impact on the environment. *Reduce database reporting requirement and devote staff resources toward program implementation.*	Board staff has inspected many construction sites that lacked BMPs, lacked effective BMPs, and/or lacked maintenance on the BMPs. A number of times, Board staff was present when illicit discharges into the MS4s were occurring. The reporting requirements level the playing field and bring accountability. The need for accountability will help ensure that construction sites are inspected at the prescribed frequency. Field presence and consistent enforcement will help ensure that adequate BMPs are in place, thereby reducing the potential for illicit discharges.	
BASMAA Attachment	20	C.6.	Revise Goal Statement	Goal statement is a summary of the provision. *Revise into a goal statement like other*	We believe that the goal statement is appropriate.	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				provisions.		
Moraga Oakley	1 1	C.6.	Significant Improvement	C.6. contains a set of strong, and appropriately detailed and clear set of requirements. It will strengthen enforcement of water quality protection in the construction environment.	Thank you!	
SMCWPPP SMCWPPP	42 44.b.	C.6.	Too Much to Do All Sites	The permit should not require implementation of a construction site control program at all construction sites. It should focus efforts on construction sites that are of sufficient size to pose a reasonable threat to water quality and are located where stormwater runoff from the site flows into the municipality's MS4. *Modify the language to qualify that permittees are responsible for all construction sites that have a grading permit and are located where stormwater runoff from the site flows into the municipality's MS4 and poses a threat to cause or contribute to a water quality standard*	40 CFR 122.26(d)(1)(iii)(B) requires that Permittees prohibit through ordinance, order, or similar means, illicit discharges to the municipal separate storm sewer. All construction sites, regardless of size, can pose a threat to water quality if appropriate and adequate BMPs are not implemented. A large number of "small" remodels, rebuilds, and expansions can equate to a rather large development. Just this past rainy season, a site way under one acre (approximately 530 ft long and between 8 – 12 ft wide) had significant erosion issues because it lacked erosion and sediment controls. Erosion from the site caused flooding and the spreading of sediment onto the public road ways and a number of illicit discharges occurred into the municipality's MS4. Pollutants must be contained on the construction site. Construction pollutants shall not be going to stormdrains, waterbodies, or neighboring properties.	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				exceedance.		
Pacifica San Bruno	2 4	C.6.	Too Much with No Water Quality Improvement	Too prescriptive and will require additional staff time to deal with an unnecessary amount of information and reporting that does not relate to water quality.	Board staff has inspected many construction sites that lacked BMPs, lacked effective BMPs, and/or lacked maintenance on the BMPs. A number of times, Board staff was present when illicit discharges into the MS4s were occurring. The reporting requirements level the playing field and bring accountability. The need for accountability will help ensure that construction sites are inspected at the prescribed frequency. Field presence and consistent enforcement will help ensure that adequate BMPs are in place, thereby reducing the potential for illicit discharges.	
Contra Costa Brd of Sups Attch A	30	C.6.a.	Time Extension	Adoption of legal authority may not be feasible prior to the 2010 Annual Report since it is dependent on other activities with later implementation dates, such as ERP. *Change to 2011 Annual Report.*	The Enforcement Response Plan is a staff working document to implement the legal authority. Adequate legal authority has been required since the beginning of the stormwater programs in the early 1990s, 40 CFR 122.26(d)(2)(I)(B-F).	
Pacifica	24	C.6.a.i.	Language Change	*Modify the language to qualify that permittees are responsible for all construction sites that have a grading permit and are*	40 CFR 122.26(d)(1)(iii)(B) requires that Permittees prohibit through ordinance, order, or similar means, illicit discharges to the municipal separate storm sewer. All construction sites, regardless of size, can	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				located where stormwater runoff from the site flows into the municipality's MS4 and poses a threat to cause or contribute to a water quality standard exceedance.	pose a threat to water quality if appropriate and adequate BMPs are not implemented. A large number of "small" remodels, rebuilds, and expansions can equate to a rather large development. Just this past rainy season, a site way under one acre (approximately 530 ft long and between 8 – 12 ft wide) had significant erosion issues because it lacked erosion and sediment controls. Erosion from the site caused flooding and the spreading of sediment onto the public road ways and a number of illicit discharges occurred into the municipality's MS4. Pollutants must be contained on the construction site. Construction pollutants shall not be going to stormdrains, waterbodies, or neighboring properties.	
Brisbane	14	C.6.a.i.	Too Much To Do All Sites	Should not be required to implement construction site control program at all construction sites. *Focus on construction sites of a sufficient size to pose a reasonable threat to water quality and that are located where stormwater runoff from the site flows into a municipal separate storm sewer system owned or operated by the municipality. And link to*	All construction sites, regardless of size, can pose a threat to water quality if appropriate and adequate BMPs are not implemented. A large number of "small" remodels, rebuilds, and expansions can equate to a rather large development. Just this past rainy season, a site way under one acre (approximately 530 ft long and between 8 – 12 ft wide) had significant erosion issues because it lacked erosion and sediment controls. Erosion from the site caused flooding and the spreading of sediment onto the public road ways and a number of illicit discharges occurred into	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				municipal permitting actions, such as issuing a grading permit.	the municipality's MS4. Pollutants must be contained on the construction site. Construction pollutants shall not be going to stormdrains, waterbodies, or neighboring properties.	
Burlingame Millbrae San Mateo Pacifica	7 13 6 24.b.	C.6.a.i.	Too Much To Do All Sites	Should not be required to implement construction site control program at all construction sites. *Focus on construction sites of a sufficient size to pose a reasonable threat to water quality and that are located where stormwater runoff from the site flows into a municipal separate storm sewer system owned or operated by the municipality.*	All construction sites, regardless of size, can pose a threat to water quality if appropriate and adequate BMPs are not implemented. A large number of "small" remodels, rebuilds, and expansions can equate to a rather large development. Just this past rainy season, a site way under one acre (approximately 530 ft long and between 8 – 12 ft wide) had significant erosion issues because it lacked erosion and sediment controls. Erosion from the site caused flooding and the spreading of sediment onto the public road ways and a number of illicit discharges occurred into the municipality's MS4. Pollutants must be contained on the construction site. Construction pollutants shall not be going to stormdrains, waterbodies, or neighboring properties.	
Homebuilders Association	3	C.6.a.ii.(1)	Active Treatment Not Needed	Active Treatment has raised several potentially significant unintended environmental consequences in the reissuance of the General Construction Permit. *Eliminate Active Treatment*	The Revised TO mimics the BMP requirements of the Draft General Construction Permit.	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				Requirement.		
Kolb, Larry & James Roger	23	C.6.a.ii.(1)	Program Should Extend Beyond Finishing of Lots	*Control programs should extend until the site is fully stabilized by landscaping or the installation of permanent erosion control measures.*	It was intended for controls to be in place until the site is fully stabilized.	Language has been added to clarify that municipalities must have the ability to require effective controls through all phases of construction until the site is fully stabilized by landscaping or the installation of permanent erosion control measures.
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment #2	18 19 53 19	C.6.a.iii.	No Reporting Value	Requirement to certify adequacy of legal authority has not value. *Delete requirement.*	Legal authority is the foundation to C.6. The Phase 2 Rule specifically requires legal authority to implement proper controls on applicable construction sites. Therefore, it behooves the Phase 1 municipalities to ensure that their respective legal authorities are adequate to implement C.6.	
Contra Costa Brd of Sups Attch A	31	C.6.b.	Change Date	Makes better sense for the implementation of the ERP to be required prior to the	ERP must be implemented year round.	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				onset of the rainy season. *Change implementation date to October 1, 2010.*		
Dublin	9	C.6.b.	ERP Not Necessary	City's current construction inspection practices are effect. Adoption of formal measures would provide no incremental benefit to water quality and would cost about $6,000.	ERP does not necessarily need to be adopted by the Council or Board of Supervisors. The ERP is a working document for staff that standardizes operating procedures for day to day work. A written ERP is intended to help all staff take consistent actions. In doing so, timely compliance should reduce illicit discharges from construction sites.	
Santa Clara County SCVURPP	18 19	C.6.b.	ERP Scaled Back	Appreciates deletion of the more prescriptive ERP requirements.	Comment Noted.	
Santa Clara County	18.b.	C.6.b.	Extend ERP Deadline	Still contains overly burdensome and extensive reporting requirements, which have the potential to interfere with enforcement work of staff. The County is experiencing escalating enforcement actions for violations at construction sites. To develop and implement an ERP will take significant time, including time for legal review, revision of ordinances, and training staff on the new requirements.	ERP does not necessarily need to be adopted by the Council or Board of Supervisors. The ERP is a working document for staff that standardizes operating procedures for day to day work. Most municipalities should already have some version of an ERP to guide staff to enforce the ordinance and take enforcement actions against violators in a consistent manner.	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				Extend deadline to develop and implement the ERP.		
Sunnyvale	41	C.6.b.	Extend ERP Deadline	City has enforcement authority to require effective stormwater pollutant controls and progressively implement stricter enforcement actions to bring construction sites/contractors into compliance but does not have a formal ERP in place that meets all the requirements of the Permit. The ERP will require a significant amount of staff time and funds to support its development, as well as possible ordinance changes to support its implementation. *Allow additional time.*	The ERP is a working document for staff that standardizes operating procedures for day to day work. All Pretreatment Programs are required to have an ERP. Sunnyvale, which has a very aggressive Pretreatment Program, should be able to readily adapt its Pretreatment Program's ERP for its Stormwater Program.	
Fremont Attachment	28	C.6.b.ii.	ERP Requirements Inconsistent	ERP requirements are in multiple locations and are inconsistent. *State the ERP requirements in one section of the permit and refer to it in other sections of the permit.*	The ERP could be one document, with a separate section of field violation scenarios for C.4. C.5., and C.6.	

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Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Fremont Attachment Fremont Attachment	27 29.b.	C.6.b.ii.(1)	Corrections within 10-Business Days	*Remove requirement that all violations be corrected by the next rain event or within 10 business days.* *Replace with "Every effort should be made to correct these violations before the next rain event or within 10 business days if practicable. If not, the permittee shall institute a time frame for achieving compliance based and the type, severity and corrective action required."*	It is a goal to correct violations by the next rain event but no longer than 10 business days after the violations are discovered. We know that in a few instances, such a slope failure, it may not be safe for someone to go out and implement corrective actions until the slope is stable and that may be after the next rain event or even 10 business days after the violation is discovered. However, sites disturbing more than an acre should be able to correct most violations within the goal because they are required by the General Construction Permit to have equipment, materials, and workers available for rapid response to failures and emergencies (Section A.11.). The failure or lack of erosion and sediment controls is a violation of local ordinances and must be addressed by the next rain event because there is a high probability for illicit discharges. The second sentence of the City's recommended replacement language could be very appropriate in an ERP document.	
Santa Clara County	15	C.6.b.ii.(1)	Corrections within 10-Business Days Unrealistic	Correcting violations by the next rain event but no longer than 10-business days is unrealistic. *Allow more flexibility for correcting violations within a*	It is a goal to correct violations by the next rain event but no longer than 10 business days after the violations are discovered. We know that in a few instances, such a slope failure, it may not be safe for someone to go out and implement	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				timely manner.	corrective actions until the slope is stable and that may be after the next rain event or 10 business days after the violation is discovered. However, sites disturbing more than an acre should be able to correct most violations within the goal because they are required by the General Construction Permit to have equipment, materials, and workers available for rapid response to failures and emergencies (Section A.11.). The failure or lack of erosion and sediment controls must be addressed by the next rain event because there is a high probability for illicit discharges.	
Daly City	13	C.6.b.ii.(3)	Extend ERP Deadline	Can't meet implementation date. *Change to July 1, 2010.*	The ERP is a working document for staff that standardizes operating procedures for day to day work. Most municipalities should already have some version of an ERP, written or unwritten, to guide staff to enforce the ordinance and take enforcement actions against violators in a consistent manner.	
Kolb, Larry & James Roger	24	C.6.b.ii.(3)	Compliance Date for ERP Only	Limit April 1, 2010 implementation date to ERP since construction program has been in place since the beginning.	The Revised TO development and implementation date of April 1, 2010 in C.6.b.ii.(3) is intended only for the ERP.	
Pacifica	25	C.6.b.ii.(3)	Extend ERP Deadline	*Allow up to one year following adoption of the MRP to develop and implement ERP.*	The ERP is a working document for staff that standardizes operating procedures for day to day work. Most municipalities should already have some version of an	

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Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
					ERP, written or unwritten, to guide staff to enforce the ordinance and take enforcement actions against violators in a consistent manner.	
SCVURPPP	19.b.	C.6.b.ii.(3)	Extend ERP Deadline	All Co-Permittees have been effectively using escalating enforcement actions as needed at construction sites but some do not have a written enforcement plan. It will take time to develop, reviewed by legal staff, and then incorporated into codes and ordinances, and finally to train staff. *Extended deadline to develop and implement the ERP.*	ERP does not necessarily need to be adopted by the Council or Board of Supervisors, or incorporated into codes and ordinances. The ERP is a working document for staff that standardizes operating procedures for day to day work. Most municipalities should already have some version of an ERP, written or unwritten, to guide staff's work. Pretreatment Programs are required to have an ERP. Co-Permittees that have Pretreatment Program should be able to readily adapt its Pretreatment Program's ERP for its Stormwater Program.	
SMCWPPP	43	C.6.b.ii.(3)	Extend ERP Deadline	There should be additional time to develop and begin implementation of this type of plan. *Allow up to one year following adoption of the MRP to develop and implement ERP.*	The ERP is a working document for staff that standardizes operating procedures for day to day work. Most municipalities should already have some version of an ERP, written or unwritten, to guide staff's work.	
Sunnyvale	42	C.6.c.	Clarify What "All" Construction Sites Mean	City is concerned about the impact that this would have on very small sites, perhaps ones that are currently not regulated due to the size or	Thank you for promoting the use of the practices in "Blueprint for a Clean Bay". The revised TO turns the City's promoting to requiring the use of the practices. All construction sites, regardless of size,	

Response to Comments on February 11, 2009 Revised Tentative Order
Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				nature of the construction activity. City currently promotes the use of the practices in the BASMAA "Blueprint for a Clean Bay" for all construction activities that could result in stormwater pollution. *Clarify the size or type of construction project where these requirements are applicable.*	can pose a threat to water quality if appropriate and adequate BMPs are not implemented. A large number of "small" remodels, rebuilds, and expansions can equate to a rather large development. Pollutants must be contained on the construction site. Construction pollutants shall not be going to stormdrains, waterbodies, or neighboring properties.	
SMCWPPP	44.b.	C.6.c.i.	BMP Categories Too Prescriptive	The six categories of BMPs are overly prescriptive and the types of BMPs needed depend on individual construction site characteristics. *Permit should clarify that BMPs from the six categories are not necessarily required and will depend on the nature of the construction project, the phase of construction, its location, and the season.*	The December 2007 TO required minimum management practices. The Revised TO backed off from requiring minimum management practices because BMPs are site specific. Instead, it required site specific BMPs from six BMP categories that contain standard BMPs that have been in existence for many, many years in reputable handbooks such as the CA BMP Handbook and Caltrans Stormwater Handbook. It is intended for the BMPs to be site specific, seasonally appropriate, and construction phase appropriate. Our construction inspections have shown that most construction will need BMPs during most phases of construction from all categories, except for Active Treatment Systems.	Added "site specific" to C.6.c.i.

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Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Mountain View	10	C.6.c.i.	Don't Mandate All Construction Sites	Permit mandates that the City require all construction sites to have seasonally appropriate effective BMPs. This will significantly increase the number of projects subject to review, approval, and inspection to ensure compliance, many that would not pose a significant construction runoff threat. Allow the City the flexibility to determine which projects should have requirements for erosion and sediment control BMPs. *Eliminate requirement for all projects to have BMPs.*	The Revised TO already allows the necessary flexible to determine seasonally appropriate, **site specific** BMPs for the construction sites (C.6.c.ii.). 40 CFR 122.26(d)(1)(iii)(B) requires that Permittees prohibit through ordinance, order, or similar means, illicit discharges to the municipal separate storm sewer. 40 CFR 122.26(d)(2)(iv)(A-D) requires Permittees to enforce these ordinances and to take enforcement actions against violators.	Added "site specific" to C.6.c.i.
Contra Costa Brd of Sups Attch A	32	C.6.c.ii. C.6.d.ii. C.6.e.ii.	Change Date	No implementation dates. This will require changes to the County's current construction site erosion/sediment/pollution prevention program including Ordinance changes. *Change implementation date to October 1, 2010.*	Permittees already require site specific BMPs, check SWPPP, and inspect construction sites. They are to continue what they are supposed to be already doing.	
SCVURPPP BASMAA Attachment	20 21	C.6.d.i.	Specific Change	*Change the second sentence of this section be made consistent with C.6.d.ii.(2) by revising it to*		Change made.

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Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				state "Permittees shall also verify that sites disturbing one acre or more of land have filed a Notice of Intent for coverage under the Construction General Permit."		
SMCWPPP	45	C.6.d.ii.(2)	BMPS Categories Too Prescriptive	Too prescriptive to require BMPs for each of the six categories at different types of construction sites. *Clarify that BMPs from the six categories are not necessarily required and will depend on the nature of the construction project, phase of construction, its location, and the season.*	The Revised TO does not require BMPs from each of the six categories at each construction site. It allows the necessary flexible to determine seasonally appropriate, **site specific** BMPs for the construction sites (C.6.c.ii.). If non stormwater management BMPs are not necessary during the grading phase, then it would be site specific not to have non stormwater management BMPs during the grading phase.	Added "phase" appropriate to C.6.c.i.
Kolb, Larry & James Roger	25	C.6.e.i.	Language Change	*"Potential Problems" should be changed to "threatened violations of local ordinances and/or erosion control plans" to make this more specific.*		Changed "potential problems" to "threatened violations of local ordinances".
Kolb, Larry & James Roger	26	C.6.e.ii.(1)	Language Addition	*Add "owner" after sites.*		Changed "sites" to "site developers and/or owners".

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Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Daly City	14	C.6.e.ii.(2)	Limit Enforcement to Property Line	Inspectors are given pre-wet season inspection checklist for project that may cause sediments to flow beyond property lines. *Area of enforcement responsibility must be established i.e. within property line and public right of way).*	Pre-wet season, wet season, and dry season check lists should all direct inspectors to ensure pollutants are contained on the construction sites. Construction pollutants must not leave the site on their way to stormdrains, waterbodies, or neighboring properties.	
SCVURPPP Sunnyvale	21 43	C.6.e.ii.(2)(b)	Specific Change	*Define High Priority Sites as other sites determined by the Permittee or which the Water Board has designated as significant threats to water quality.*	Sentence says the same thing.	
BASMAA Attachment	22	C.6.e.ii.(2)(b)(vii)	Specific Change	"Water Board" in the sentence leaves it too open-ended and undefined. *Delete Water Board.*	We rewrote the second sentence in C.6.e.ii.(2)(b).	Changed to "In evaluating the threat to water quality, the following factors shall be considered:".
SMCWPPP	46	C.6.e.ii.(3)(c)	Not Responsibility for Discharges into Waterbodies	Clean Water Act does not require municipalities to oversee discharges from construction sites that discharge directly to waterbodies without flowing through an MS4. *Delete language about inspecting discharges to*	If the waterbody is not part of the MS4, then it is not the Permittees' responsibility. We would appreciate your referrals.	

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Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				waterbodies.		
Pacifica	26	C.6.e.ii.(3)(c)	Not Responsible for Discharge into Water Bodies	Inspections should be limited to discharges to the MS4 owned and operated by the municipality. *Delete inspection of discharges to waterbodies.*	If the waterbody is not part of the MS4, then it is not the Permittees' responsibility. We would appreciate your referrals.	
Fairfield Fairfield-Suisun Sewer District Suisun City	20.c. 17.c. 20.c.	C.6.e.ii.(4)	Burdensome and Wasted Resources	Requires major revisions to our database and retraining of inspectors. Information will vary by construction site and it not readily available to inspectors. No benefit to water quality and wasted public resources.	We consider the reporting requirements for C.6. the minimum amount of information we need to determine Permittee's compliance and to determine if the Permittees are inspecting, reinspecting, and taking the appropriate enforcement actions to bring sites into rapid compliance. If sites are not inspected and if rapid compliance is not happening, sediment and other construction pollutants are entering our waterbodies.	
Contra Costa Brd of Sups Attch A	33	C.6.e.ii.(4)	Change Date	*Progress made towards compliance with C.6 should be reported in the 2010 Annual Report.* *Full C.6. reporting should begin with the 2011 Annual Report.*	Permittees should already be implementing most requirements.	
Fremont Attachment Fremont Attachment	27.b. 29.c.	C.6.e.ii.(4)	Database Duplicative	Summaries of all inspection reports are currently submitted with the annual report and any issues	Perhaps the summaries were inadvertently left out. We don't find them in the commenter's Annual Report.	

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Provision C.6. – Construction Site Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				dealing with compliance are addressed in these comments. A separate database or tabulated format is duplication.		
Sunnyvale	44.c.	C.6.e.ii.(4)	Delay Implementation	There is no phase-in time. Resource is limited to develop tracking and database and conduct monthly inspections. *Allow a one year phase in time.*	According to the City's Annual Report, it is already conducting inspections. It is unclear why regular inspections would not be conducted on active sites throughout the rainy season.	
Kolb, Larry & James Roger	27	C.6.e.ii.(4)	Language Addition	*In the second sentence add after violation "of local ordinances and/or erosion control plan is observed or threatened" and change "problems" to "actual or threatened violation of local ordinances and/or erosion control."*		Changed "potential problems" to "threatened violations of local ordinances".
ACCWP Berkeley Newark Oakland	8 7 4 5	C.6.e.ii.(4) C.6.e.iii.	Recordkeeping and Reporting Onerous	The reporting and recordkeeping requirements are still onerous and many do not provide significant improvements for accountability.	We consider the reporting requirements for C.6. the minimum amount of information we need to determine Permittee's compliance and to determine if the Permittees are inspecting, reinspecting, and taking the appropriate enforcement actions to bring sites into rapid compliance. If sites are not inspected and if rapid compliance is not happening, sediment and other construction pollutants are entering our waterbodies.	

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ACCWP Attachment-1 Berkeley Attachment 1 Newark Attachment Oakland Attachment #1	52 52 54 57	C.6.e.ii.(4) C.6.e.iii.	Reporting Too Detailed	A new construction inspection form that captures the requested data will need to be developed and a new construction database will need to be developed and maintained. *Revise reporting requirement to include a report on the total number, a summary of the construction inspections performed, and a summary of the violations observed/corrected.*	The tracking information is intended to standardize inspection frequency, response, and enforcement among all Permittees. The tracking information will help the Permittees and the Water Board determine information such as the frequency of site visits, frequency of reinspections, and what are the major violations. This information will help with tailoring trainings and educational materials for inspection staff and construction sites. Currently, it is not clear how often sites are inspected, how often there are reinspections, and the types of violations. • Alameda County and its Cities do not report any information on construction. • Contra Costa County and its Cities each provide Quantitative Results on a two page table that summarizes some information about inspections and enforcement actions. Each of Permittee's Table provides a very broad overview. It tells you how many inspections were done but not by site. It tells you the number of rainy season inspections to the least visited site. Sometimes the number of inspections for the least visited site was 1. The Contra Costa Permittees standardized the enforcement actions to written corrective measures, notices to comply, stop work orders, notices of violations,	

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					and fines. However, the annual report does not provide any discussions on the nature or gravity of the violations, if every site was visited, or how often each site was visited. Kudos to the cities of Concord, Moraga, and Orinda who provided informative detailed narratives about their respective construction inspection program. • San Mateo County and its Cities include a Summary of Pre-Wet Season Erosion Control Inspection Form. This Form has the project name and address, project type, inspection, box to check off if General Construction Permit is required, box for whether erosion and sediment controls were in place, and description of corrections made. Some pre-wet season inspections were done well into December and January. The majority of the inspections yielded no erosion or sediment violations. Besides the Summary Pre-Wet Season Form, there is no narrative discussion on construction inspections. • Santa Clara County and its Cities don't have uniform reporting. For the most part, the narratives do not tell us how many sites the Permittee had, how many inspections were conducted, what type of violations were observed, and how many and the types of enforcement action taken.	

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Alameda City	14	C.6.e.ii.(4) C.6.e.iii.	Reporting Too Detailed	Questions the need for an additional tracking system. *Revise reporting requirement to include a summary of the construction inspections performed and a summary of the violations observed/corrected.*	The reporting requirements listed in the Revised TO is asking for a summary of the construction inspections performed and a summary of the violations observed.	
Brisbane Burlingame Millbrae	15 8 14	C.6.e.ii.(4)	Too Much to Track	List of tracking information for each construction site inspection is unnecessary to protect water quality.	We believe that the list of tracking information is necessary for Board staff to determine that the Permittees are protecting water quality through its respective construction inspection and enforcement program.	
SMCWPPP	47	C.6.e.ii.(4) C.6.e.iii.(1)	Too Much Tracking	List of information to track and report for each construction site inspection is too prescriptive and unnecessary to protect water quality. No value to collect "inches of rain since last inspection." *Delete C.6.e.ii.(4)(d), (g), and C.6.e.iii(1)(d), (e), (f), (h), and (i).*	In response to comments on the December 2007 TO, we greatly reduced the prescriptiveness of the Provision with respect to legal authority, ERP, Minimum BMPs, and inspection requirements. So, in the Revised TO, we allowed great flexibility in those areas **but** put the accountability and effectiveness of Provision C.6. into tracking and reporting. The tracking and reporting requirements level the playing field and bring accountability. The need for accountability will help ensure that construction sites are inspected at the prescribed frequency. We believe that the list of tracking information is necessary for Board staff to determine that the Permittees are protecting water quality through its	We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"

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					respective construction inspection and enforcement program. Requested deletions to C.6.e.iii.(1) reduces reporting to bare bone summaries that provide no information to determine if the Permittee is in compliance with its Permit and if the Permittee is taking the appropriate enforcement actions to bring sites into rapid compliance	
Santa Clara County SCVURPPP Sunnyvale	19 22 44	C.6.e.ii.(4)	Too Much Tracking	The level of detail of the inspection reports and tracking reports are very prescriptive.	We believe that the list of tracking information is necessary for Board staff to determine that the Permittees are protecting water quality through its respective construction inspection and enforcement program.	
BASMAA Attachment	23	C.6.e.ii.(4)	Too Prescriptive	List of information to be tracked at each construction site is too prescriptive.	We believe that the list of tracking information is necessary for Board staff to determine that the Permittees are protecting water quality through its respective construction inspection and enforcement program.	
Millbrae	3	C.6.e.ii.(4) C.6.e.iii.	Overly Prescriptive Tracking and Reporting	Voluminous amounts of tracking and reporting will require additional staff time without improving water quality.	We believe that the list of tracking information is necessary for Board staff to determine that the Permittees are protecting water quality through its respective construction inspection and enforcement program.	
San Leandro	14	C.6.e.ii.(4)(d)	Inches of Rain	*Remove inches of rain since last inspection.*		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with

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						runoff?"
ACCWP Berkeley Fremont Newark Oakland	8.b. 7.b. 4 4.b. 5.b.	C.6.e.ii.(4)(d)	Inches of Rain Excessive	Recording the inches of rain since the last inspection for each construction site inspection is not needed to determine compliance.		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
ACCWP Attachment-1 ACCWP Attachment-3 Berkeley Attachment 1 Berkeley Attachment 2 Newark Attachment Oakland Attachment #1 Oakland Attachment #2	53 20 53 21 55 58 21	C.6.e.ii.(4)(d)	Inches of Rain Excessive	*If requirement to report is not reduced to a summary than reduce the data that must be report, in particular the inches of rain since the last inspection.*		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
Fremont Attachment	29	C.6.e.ii.(4)(d)	Inches of Rain Ineffective	Trying to access data on rainfall since the last inspection and rationales for longer compliance time at a construction site serves no rational purpose and wastes limited staff resources. Inspections are conducted after major rain events to	Sites disturbing more than an acre should definitely be able to correct most violations within the 10-day goal because they are required by the General Construction Permit to have equipment, materials, and workers available for rapid response to failures and emergencies (Section A.11.). The failure or lack of erosion and sediment controls is a violation of local ordinances	We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"

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				ensure compliance. *Delete requirement to record inches of rain since the last inspection.*	and must be addressed by the next rain event because there is a probability for illicit discharges.	
Pacifica Pacifica	27 28	C.6.e.ii.(4)(d)	Inches of Rain Not Related to Water Quality	Too prescriptive. *Delete requirement to record inches of rain since last inspection.*		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
BASMAA Attachment	24	C.6.e.ii.(4)(d)	Inches of Rain Onerous	*Delete requirement.*		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
Fairfield Fairfield-Suisun Sewer District Suisun City	20 17 20	C.6.e.ii.(4)(d)	Inches of Rain Unnecessary	Unclear why some of this information (e.g., inches of rain since last inspection) needs to be tracked and included in the Annual Report.		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
Brisbane San Mateo Millbrae Cupertino	15.b. 7.b. 14.b. 4	C.6.e.ii.(4)(d)	No Tracking Value	No value to collect inches of rainfall since the last inspection.		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
Burlingame	8.b.	C.6.e.ii.(4)(d)	No Tracking Value	No improvement in water quality to collect inches of rainfall since the last inspection. Requires additional staffing resource to gather the information		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"

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				and report. *Delay implementation to better economic times or scale back significantly.*		
Fairfield Fairfield-Suisun Sewer District Suisun City	20.b. 17.b. 20.b.	C.6.e.ii.(4)(d) C.6.e.ii.(4)(f) C.6.e.ii.(4)(g)	Redundant	Six BMP categories and Specific Problems appear to be identical.	The Six BMP categories are broad and are not the same as the Specific Problems. The Specific Problems are intended to help better understand the issues in the field. The following could be specific problems for the Erosion Control Category: No erosion control on exposed soils; seeds didn't germinate; slope failed. The following could be specific problems for the Good Site Management Category: Trash throughout site; paint cans uncovered and left out on the curb; bags of concrete mix not covered.	
CCCWP	21	C.6.e.ii.(4)(d)	Require Inches of Rain Only If There Was A Previous Violation	May be relevant for tracking whether a previous violation and required corrective action has been conducted in a timely manner. But rain data is burdensome when inspectors inspect thousands of sites each rainy season. *Change to "Inches of rain since the last inspection (if the previous inspection resulted in a violation requiring timely corrective*		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"

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				action."		
Santa Clara County	19.b.	C.6.e.ii.(4)(d)	Too Much to Track Inches of Rain	Recording the inches of rain fallen since the last inspection is not feasible. This will vary between construction sites, is not readily available to inspectors, and is not relevant to the site's effective use of BMPs. The scheduling of inspections and follow up is time consuming for staff, taking away from their other obligations under the TO. *Allow more flexibility.*		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
SCVURPPP	22.b.	C.6.e.ii.(4)(d)	Too Much to Track Inches of Rain	Information will vary by construction site, is not readily available to inspectors, and is not relevant to the site's effective use of BMPs.		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
Sunnyvale	44.b.	C.6.e.ii.(4)(d)	Too Much to Track Inches of Rain	Not feasible to report inches of rainfall since the last inspection since it will vary from site to site, depending on the micro-climates and the information is not something that is readily		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"

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				available to inspectors. Information not necessary to determine the effectiveness of a site's BMPs.		
Fairfield Fairfield-Suisun Sewer District Suisun City	21 18 21	C.6.e.ii.(4)(f) C.6.e.ii.(4)(g)	Burdensome	Unnecessary reporting.	The Six BMP categories are broad and are not the same as the Specific Problems. The Specific Problems are intended to help better understand the issues in the field. The following could be specific problems for the Erosion Control Category: No erosion control on exposed soils; seeds didn't germinate; slope failed. The following could be specific problems for the Good Site Management Category: Trash throughout site; paint cans uncovered and left out on the curb; bags of concrete mix not covered.	
SMCWPPP	47.b.	C.6.e.ii.(4)(f)	Six BMP Categories Have No Benefit	No benefit to track and report problems within the six BMP categories. *Remove the requirement that problems observed need to use the six BMP categories and remove the reference to "Discharge of Sediment or Construction Related Material" unless what this is referring to is clarified.*	The six BMP categories contain standard BMPs that have been in existence for many, many years in reputable handbooks such as the CA BMP Handbook and Caltrans Stormwater Handbook. These are the same categories of BMPs contained in the Draft General Construction Permit. It is intended for the BMPs to be site specific, seasonally appropriate and phase appropriate. Our construction inspections have shown that most construction will need BMPs from all categories, except for Active Treatment	We have revised C.6.e.ii.(4)(f) to: "Problem(s) observed using Illicit Discharge and the six BMP categories listed in C.6.c.i."

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					Systems. "Discharge of Sediment or Construction Related Material" means Illicit Discharge. Please see Fact Sheet Attachment 6.1.	
San Jose Attachment A	17	C.6.e.iii(4)(d)	Too Much to Track Inches of Rain	The requirement to track inches of rain since last inspection does not result in environmental benefit for the amount of time and resources necessary to implement.		We revised C.6.e.ii.(4)(d) to say, "Has there been rainfall with runoff?"
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment #2	19 20 56 20	C.6.e.iii.	Reporting Requirements Too Detailed	*Provide flexibility in reporting as needed to track and correct problem sites.*	A consistent set of requirements for all Permittees makes expectations clear and levels the playing field. We consider the reporting requirements the minimum amount of information we need to determine Permittee's compliance and to determine if the Permittees are taking the appropriate enforcement actions to bring sites into rapid compliance.	
Berkeley Attachment 2	23	C.6.e.iii.	Reporting Too Detailed	*Revise requirements to just the facts and eliminate guessing at effectiveness.*	All the reporting requirements in the Revised TO are based on facts observed from the inspections.	
Pacifica	27.b.	C.6.e.iii.	Too Much Reporting	*Delete. C.6.e.iii(1)(d), (e), (f), (h), and (i).*	Requested deletions reduces reporting to bare bone summaries that provide no information to determine if the Permittee is in compliance with its Permit and if the Permittee is taking the appropriate enforcement actions to bring sites into rapid compliance.	

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Fremont Attachment	30	C.6.e.iii.(1)(c)-(i)	Reporting Requirements Too Detailed	Especially percentage of various parameters are too detailed and do not provide any use to improving water quality or measuring the quality and effectiveness of the program. *Have staff in the field inspecting rather than bean counting.* *Remove (c)-i). Reporting requirements should be based on parameters which truly reflect the quality and effectiveness of this program.*	A consistent set of requirements for all Permittees makes expectations clear and levels the playing field. We consider the reporting requirements the minimum amount of information we need to determine Permittee's compliance and to determine if the Permittees are taking the appropriate enforcement actions to bring sites into rapid compliance. Requested deletions reduces reporting to bare bone summaries that provide no information to determine if the Permittee is in compliance with its Permit and if the Permittee is taking the appropriate enforcement actions to bring sites into rapid compliance.	
SCVURPPP Sunnyvale Fairfield Fairfield-Suisun Sewer District Suisun City	23 45 21.b. 18.b. 21.b.	C.6.e.iii.(1)(d) C.6.e.iii.(1)(f) C.6.e.iii.(1)(g)	Reduce Reporting Requirements	(f) number of discharges and (g) number of sites with discharges are burdensome to track and compile. Information is already covered in (d). *Delete* C.6.e.iii.(1)(f)-(g).	C.6.e.iii.(1)(d) asks for the number and percentage of violations in each of the <u>six categories</u>. This requirement does not include the <u>number of discharges</u> (actual and inferred) required in C.6.e.iii.(1)(f) or the <u>number of sites</u> with discharges (actual and inferred) required in C.6.e.iii.(1)(g).	
SCVURPPP	24	C.6.e.iii.(3)	Specific Change	Typographical error. C.6.e.ii.(3) should be C.6.e.ii.(**<u>4</u>**).	Thanks for catching the typo!	Reference changed to C.6.e.ii.(4).
SMCWPPP	48	C.6.e.iii.(3)	Water Board Should Develop and Maintain Database	*Permit should state that the Water Board will offer municipalities the option of using a database that the Water Board develops and*	We would be happy to provide Fact Sheet Attachment 6.1. as a template for tracking by hand or electronically. However, it is still the responsibility of the individual Permittee to maintain the information.	

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				maintains.	Maintenance of the data helps Permittees track adequate inspections and enforcement actions.	
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment #2	21 22 57 22	C.6.f.(iii)	No Reporting Value	Percentage of staff attending training has no value and is difficult to calculate. *Modify.*	This is intended to be a mechanism for Permittees to document that all staff conducting construction stormwater inspections and/or BMP reviews is given the necessary training.	Revised C.6.f.iii. to "Permittees shall include in each Annual Report the following information: training topics covered, dates of training, and the names of staff members who attended each training."

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Dublin	10.b.	C.7.	Awareness and Behavioral Changes	Questions the practicality of measuring awareness or behavioral changes.	40CFR 122.26(d)(2)(v) states that the Permittees must include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program." 40CFR 122.42(c) says that the Permittees must submit annual reports on the progress of their respective stormwater programs. The purposes of the public education programs are to inform the community about how everyday activities can impact stormwater discharges and potentially cause adverse impacts to local water bodies, and introduce steps that the community can take to reduce the discharges and resulting impacts. If outreach activities do not achieve an increase in awareness or a change in behavior, it's time to rethink how money and time is being spent. No program should continuously fund and grow programs that are in theory good but not effecting changes.	
ACCWP Berkeley Oakland	8.b. 7.b. 5.b.	C.7.	Don't Need Effectiveness Evaluation for Compliance	The standard of compliance is conducting the activity. Effectiveness evaluations are done as needed to improve program, not to measure compliance.	40CFR 122.26(d)(2)(v) states that the Permittees must include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management	

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					program." 40CFR 122.42(c) says that the Permittees must submit annual reports on the progress of their respective stormwater programs. The purposes of the public education programs are to inform the community about how everyday activities can impact stormwater discharges and potentially cause adverse impacts to local water bodies, and introduce steps that the community can take to reduce the discharges and resulting impacts. If outreach activities do not achieve an increase in awareness or a change in behavior, it's time to rethink how money and time is being spent. No program should continuously fund and grow programs that are in theory good but not effecting changes.	
Kolb, Larry & James, Roger	29	C.7.	Scale Back Surveys	Focused surveys of public information campaigns have been found to be minimally effective. The program outlined appears to be rather costly and could be scaled back with reallocation of funds to activities that result in the reduction of pollutants of concern.	Surveys may be done regionally or county-wide and are necessary to identify and quantify the audiences' knowledge, trends, and attitudes and/or practices; and to measure the overall population awareness of the messages and behavior changes. BASMAA already conducts an Advertising Campaign for its members.	
Dublin	10	C.7.e.	Too Many New Requirements	City is required to complete 2 additional outreach	The number of events according to population was determined by the PIP	

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				events. While the City has implemented more than 4 outreach events each year, this Permit requires additional region-level outreach. Added costs for outreach are estimated at $11,000/year. *Since there are major new efforts to deal with trash and other POCs, this is not the year to add additional required public outreach work, and to impose additional record keeping and reporting requirements to this provision.*	Workgroup for the MRP based on existing performance standards. Existing performance standards are as follow: <u>Alameda County</u> Over 100,000 – 8 50,000 to 100,000 – 6 Less than 50,000 – 4 <u>Contra Costa County</u> Over 100,000 – 4 50,000 to 100,000 – 3 Less than 50,000 – 3 <u>San Mateo County</u> Over 50,000 – 5 5,000 to 50,000 – 4 Less than 5,000 – 3 <u>Santa Clara County</u> 8-10 However, in response to comments on flexibility on the December 2007 TO, the revised TO (1) eliminates the cap on individual credits for events sponsored by the respective County-wide Program and BASMAA and (2) allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both. Specified number of events remains the same. 40CFR 122.42(c) says that the Permittees must submit annual reports on the progress of their respective stormwater programs. The purposes of the public education programs are to inform the community	

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					about how everyday activities can impact stormwater discharges and potentially cause adverse impacts to local water bodies, and introduce steps that the community can take to reduce the discharges and resulting impacts. We consider the reporting requirements the minimum amount of information we need to determine compliance.	
ACCWP Berkeley Fremont Oakland	8 7 4 5	C.7.	Too Much Reporting	Extensive reporting and evaluation for many provisions.	40CFR 122.42(c) says that the Permittees must submit annual reports on the progress of their respective stormwater programs. The purposes of the public education programs are to inform the community about how everyday activities can impact stormwater discharges and potentially cause adverse impacts to local water bodies, and introduce steps that the community can take to reduce the discharges and resulting impacts. If outreach activities do not achieve an increase in awareness or a change in behavior, it's time to rethink how money and time is being spent. No program should continuously fund and grow programs that are in theory good but not effecting changes.	
Alameda City	29	C.7.a.i.	Inlet Markings on Privately Owned Streets	*Clarify whether the City will be responsible for ensuring that the inlet markings on privately owned streets are being maintained in*	Permittees are not responsible for ensuring that the inlet markings on privately owned streets are being maintained in perpetuity. But through the PIP Programs, Permittees should certainly	

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				perpetuity.	encourage owners of privately owned streets to keep their markings legible.	
Fremont Attachment	31	C.7.a.i.	Storm Drain Inlet Inspection Form	Development of a separate inspection and maintenance of storm drain inlet markings is too prescriptive and would not be feasible with limited resources of staff and funding. *Modify requirements to allow permittees to assess storm drain markers as part of existing field activities and maintain marking as needed.*	The Revised TO does not specifically requires the development of a separate inspection form to ensure the legibility of the inlet markings.	
Kolb, Larry & James, Roger	28	C.7.a.i.-ii.	Mark All Stormdrains	This program must also include marking and maintaining storm drain inlets on private commercial and high density residential developments and public entities such as schools, universities, colleges, sport complexes, BART, etc.	Schools, universities, and colleges will be covered under the new Phase 2 General Permit. If private commercial properties require inspections through the Industrial Program, Permittees should require maintenance of the inlet markings. And through the PIP Programs, Permittees should certainly encourage such owners to mark their inlets and to keep their markings legible.	
ACCWP Attachment-1 Berkeley Attachment-1 Newark Attachment Oakland Attachment #1	54 54 58 59	C.7.b.	Delete Language	The goal of the advertising campaigns will be to change behavior. The best way to do that may not be to tie it to a stormwater message. *Delete reference to increase awareness of stormwater messages.*	The ideal goal of the advertising campaigns will be to change behavior. The stepping stone to behavioral change is raising awareness. Please refer to CASQA's *Municipal Stormwater Program Effectiveness Guidance*. The Revised TO does not specify the exact stormwater messages that must be	

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					in the advertising campaign or the survey questions that must be asked. Permittees have total flexibility on what the messages will be and how they will ask survey questions on awareness and behavioral changes.	
Newark Attachment	59	C.7.b.	Focus On Trash Only	Best to focus on just one pollutant at a time. *Delete reference to pesticides.*	Provision C.9. and C.10. in the Revised TO address pesticides and trash. The public can readily do something about these two pollutants once they are aware of the issues. Therefore, it makes sense to focus advertising campaigns on these two pollutants.	
West Valley Clean Water Program	10	C.7.c.iii.	Allow for County-wide Program Reporting	Other sections allow the Countywide to report. *Allow Countywide Program the ability to report Media Relations for all co-permittees.*	We agree.	The underlined language was added to C.7.c.iii. "In each Annual Report, each Permittee (or the Countywide Program, if the media relations campaign was done countywide or regionally) shall include details of each media pitch, such as the medium, date, and content of the

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						pitch."
ACCWP Attachment-1 Berkeley Attachment-1 Oakland Attachment #1	55 55 60	C.7.c.iii.	Typo	*Delete the "s" on Permittee. Typo is repeated in the next several sections.*	Thanks for catching the typos!	"S" deleted off of "Permittees" in C.7.c.iii., C.7.d.iii., C.7.e.iii., C.7.g.iii., and C.7.h.iii.
Daly City Daly City	15.b. 16.b.	C.7.e. C.7.g.	Duplicative	C.7.e. and C.7.g. are very similar. *Combine public outreach events and citizen involvement events into a single requirement.*	40 CFR 122.26(d)(2)(iv) specifically requires public participation. In response to comments, the revised TO already allows Permittees to claim public outreach and citizen involvement credits if the event contains significant elements of both.	
Fairfield Suisun City	22 22	C.7.e.	Too Many Events	2007 TO required Fairfield-Suisun, which includes the Sewer District and the cities of Fairfield, to annually participate and/or host a total of 2 public outreach events. The 2009 Revised TO requires the three Permittees to annually participate and/or host a total of 14 public events (6 for the District, 5 for the Fairfield, and 3 for Suisun). 14 is too onerous.	The cities of Fairfield and Suisun are not non-population-based Permittees.	
Fairfield-Suisun	19	C.7.e.	Too Many	2007 TO required 2 events	Since the District does not own any of the	Fairfield-Suisun

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Sewer District			Events	for the District. This is equitable based on our service area, population and service provided. The 6 events required in the 2009 Revised TO is too many for a small non-population based agency like the District.	streets, storm drain inlets, catch basins, storm drain lines, drainage channels, creeks, or pump station, it is not a municipal separate storm sewer system. The District is no longer named as a Permittee.	Sewer District has been removed from the footnote to C.7.e.
Daly City	15	C.7.e.ii.	Clarification	*Clarify what constitutes an outreach event. Are local pollution prevention messages in a newsletter or utility bill considered outreach events?*	C.7e.i. describes examples of outreach events as fairs, show, workshops, community events, street fairs, and farmers' markets.	
Contra Costa Co Flood Control Attch A	5	C.7.e.ii.	Don't Require PIP for Non Population-Based Permittees	District is not a population-based entity and therefore has no population to reach. It does not host any land uses that generate trash that affects its waterways. No staff or funding to support these activities.	The District does have an outreach responsibility to the community. The requirements should be interpreted as appropriate for non-population based Permittees.	
Newark	4	C.7.e.iii C.7.f.iii. C.7.g.iii. C.7.h.iii.	Too Much Reporting	Onerous and many do not provide significant improvements for accountability.	40CFR 122.42(c) says that the Permittees must submit annual reports on the progress of their respective stormwater programs. The purposes of the public education programs are to inform the community about how everyday activities can impact stormwater discharges and potentially cause adverse impacts to local water bodies, and introduce steps that the	

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					community can take to reduce the discharges and resulting impacts. If outreach activities do not achieve an increase in awareness or a change in behavior, it's time to rethink how money and time is being spent. No program should continuously fund and grow programs that are in theory good but not effecting changes.	
ACCWP Attachment-1 Berkeley Attachment-1	56 56	C.7.e.iii.	Delete Language	Assessment of effectiveness for each event is not useful to Water Board staff or to the Permittees and it will be a waste of resources. *Delete requirement to report on effectiveness.*	We certainly hope that Permittees have been assessing the effectiveness of each event they attend. We strongly feel that effectiveness assessment is a valuable tool for Permittees. Permittees need this mechanism to determine if their events have achieved the desired impact and met goals. If desired impact is not achieved and/or goals are not met, it's time to redirect valuable resources.	
Oakland Attachment #1	61	C.7.e.iii. C.7.g.iii. C7.h.iii.	Delete language	Assessment of effectiveness for each event is not useful to Water Board staff or to the Permittees and it will be divert resources. *Delete requirement to report on effectiveness and maintain reporting on activities.*	We certainly hope that Permittees have been assessing the effectiveness of each event they attend. We strongly feel that effectiveness assessment is a valuable tool for Permittees. Permittees need this mechanism to determine if their events have achieved the desired impact and met goals. If desired impact is not achieved and/or goals are not met, it's time to redirect valuable resources so that the goals are met. CASQA's "Municipal Stormwater Program Effectiveness Assessment Guidance" provides tools on how to evaluation	

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					effectiveness.	
ACCWP Attachment-3 Newark Attachment Oakland Attachment #2	22 60 23	C.7.e.iii.	Overly Detailed Reporting	Reporting requirements are overly detailed. *Revise requirements to just the facts and eliminate guessing at effectiveness.*	We strongly feel that effectiveness assessment is a valuable tool for Permittees and should already be done by Permittees. Permittees need this mechanism to determine if their events have achieved the desired impact and met goals. If desired impact is not achieved and/or goals are not met, it's time to redirect valuable resources so that the goals are met. CASQA's "Municipal Stormwater Program Effectiveness Assessment Guidance" provides tools on how to evaluate effectiveness.	
Fremont Attachment	32	C.7.e.iii.	Post-Event Survey Unnecessary	Post-event survey is unnecessarily burdensome, especially for large events. *Continue the same level of evaluation of event effectiveness by describing how each agency evaluates outreach activities.*	C.7.e.iii. of the revised TO asks Permittees to assess the effectiveness of the efforts with appropriate measures. Post-event survey could be one of the assessment methods if the Permittee determines it is an appropriate measure. Collectively, we need to determine if all these educational programs are increasing target audiences' knowledge regarding stormwater pollution and effecting behavioral changes.	
NOAA	14	C.7.f. C.7.g. C.7.h. C.7.i.	Supports Provisions	NOAA explicitly supports Watershed Stewardship Collaborative Efforts, Citizen Involvement Events, School-Age Children Outreach, and Outreach to Municipal Officials.	Noted.	

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Stopwaste.org	15	C.7.f.i.	Add Language	Add the highlighted text, "**Task Description –** Permittees shall individually or collectively encourage and support watershed stewardship collaborative efforts of community groups such as the Contra Costa Watershed Forum, the Santa Clara Basin Watershed Management Initiative, and "friends of creek" group and other organizations that benefit the health of the watershed such as the Bay-Friendly Landscaping and Gardening Coalition. If no such organizations…"		Added as requested.
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment #2	23 24 61 24	C.7.f.iii.	Overly Detailed Reporting	Reporting requirements are overly detailed and may already be reported by other groups. *Limit reporting to listing the activity or group which the Permittee supports. Consolidate this reporting with C.7.e.iii.*	The reporting requirements are appropriate, and have already been reduced to the minimum.	
Fremont Attachment	33	C.7.g.	Post-Event Survey Unnecessary	Post-event survey is unnecessarily burdensome, especially for large events. *Continue the same level of evaluation of event*	Post-event survey is not specifically required in the revised TO.	

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				effectiveness by describing how each agency evaluates outreach activities.		
Newark Attachment	62	C.7.g.ii.	Assessments Resource Intensive	Requirement to sponsor or host citizen involvement events and provide assessments require an excessive commitment of resources above what is currently implemented.	40 CFR 122.26(d)(2)(iv) specifically requires public participation. 40CFR 122.42(c) says that the Permittees must submit annual reports on the progress of their respective stormwater programs. If outreach/involvement activities do not achieve an increase in awareness or a change in behavior, it's time to rethink how money and time is being spent. No program should continuously fund and grow programs that are in theory good but not effecting changes. We strongly feel that effectiveness assessment is a valuable tool for Permittees and should already be done by Permittees. If desired impact is not achieved and/or goals are not met, it's time to redirect valuable resources so that the goals are met. No program should continuously fund and grow programs that are in theory good but not effecting changes.	
Daly City	16	C.7.g.ii.	Focus on Quality and Not Quantity of Events	Focus should be a quality of events not quantity. *Eliminate the requirement that puts a number of events required.*	We agree that focus should be on the quality of the events. That, however, will require better assessment measures (effectiveness measures) than what the Revised TO requires. The rest of the commenters would rather not do any assessment.	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
ACCWP Attachment-1 Berkeley Attachment 2 ACCWP Attachment-3	57 57 57	C.7.g.iii.	Delete Language	Assessment of effectiveness for each event is not useful to Water Board staff or to the Permittees and it will be a waste of resources. *Delete requirement to report on effectiveness.*	We strongly feel that effectiveness assessment is a valuable tool for Permittees and should already be done by Permittees. Permittees need this mechanism to determine if their events have achieved the desired impact and met goals. If desired impact is not achieved and/or goals are not met, it's time to redirect valuable resources so that the goals are met. CASQA's "Municipal Stormwater Program Effectiveness Assessment Guidance" provides tools on how to evaluate effectiveness.	
Berkeley Attachment 2 Newark Attachment Oakland Attachment #2	24 25 25	C.7.g.iii.	Overly Detailed Reporting	*Revise requirements to just the facts and eliminate guessing at effectiveness.*	We certainly hope that Permittees have been assessing the effectiveness of each event they attend. We strongly feel that effectiveness assessment is a valuable tool for Permittees. Permittees need this mechanism to determine if their events have achieved the desired impact and met goals. If desired impact is not achieved and/or goals are not met, it's time to redirect valuable resources so that the goals are met. CASQA's "Municipal Stormwater Program Effectiveness Assessment Guidance" provides tools on how to evaluation effectiveness.	
ACCWP Attachment-1 Berkeley Attachment 1	58 58	C.7.h.iii.	Delete Language	Assessment of effectiveness for each event is not useful to Water Board staff or to the Permittees	We strongly feel that effectiveness assessment is a valuable tool for Permittees and should already be done by Permittees. Permittees need this	

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				and it will be a waste of resources. *Delete requirement to report on effectiveness.*	mechanism to determine if their events have achieved the desired impact and met goals. For example, some municipalities have used informal/formal pre and post tests for students and evaluation forms from teachers. Teachers have lots to cover in a school year. If your program isn't highly benefitting them or their students, they aren't going to use your program.	
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment #2	25 26 64 26	C.7.h.iii.	Overly Detailed Reporting	*Revise requirements to just the facts and eliminate guessing at effectiveness.*	We strongly feel that effectiveness assessment is a valuable tool for Permittees and should already be done by Permittees. Permittees need this mechanism to determine if their events have achieved the desired impact and met goals. If desired impact is not achieved and/or goals are not met, it's time to redirect valuable resources so that the goals are met. CASQA's "Municipal Stormwater Program Effectiveness Assessment Guidance" provides tools on how to evaluate effectiveness.	

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Provision C.8. – Water Quality Monitoring

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Friends of Five Creeks	2	C.8	Support for the monitoring requirements	In the area of monitoring, I am pleased that the current draft retains most of the framework our stakeholders' group proposed as the minimum needed to obtain some basic idea of the status and trends in water quality in the Bay Area. The Board and staff, and we all, need this information in order to not flail in the dark.	Comment noted	None
SCVURPPP Attachment A SCVWD	26 8	C.8	Credit for previous sampling	Allow the Santa Clara Program to obtain credit for its previous and current monitoring. Include a provision that allows a stormwater program to reduce monitoring requirements to the extent that it can certify that it has already completed a substantially similar body of monitoring work.	The monitoring efforts Commenters want credit for or reduced is not clear. Status Monitoring rotates around watersheds, so repetition after a period of years is built in. Previous monitoring results will inform Permittees' selections of waterbody(s) to sample each year; sample locations; and analysis of analytical results, at a minimum. The proposed monitoring program is similar in many ways to the Commenter's current monitoring program, & is expected to build upon previous efforts.	None
Danville	4	C.8	Don't change procedures	It makes little sense to abandon over 7 years of data and change the procedures, rendering existing data incomparable, of little or no use.	Existing data should inform Permittee's next steps as they conduct the monitoring program outlined in C.8. It is necessary to for all Permittee's to use the same standard protocols as our monitoring programs are informed by updated scientific information.	None

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Palo Alto Santa Clara County SCVURPPP SCVWD CCCWP Walnut Creek Pleasanton SCVWD Sunnyvale	8 20 5 8 5 2 7 22 10	C.8	General	As currently drafted, many of the monitoring requirements are: 1) not based on sound science; 2) too prescriptive to allow for adaptive monitoring or collaborative efforts underway via the Regional Monitoring Program for Water Quality (RMP); 3) not necessary (data for data's sake and/or focused beyond pollutants subject to regulation under a federal permit); and 4) not prioritized so as to allow monitoring resources to be focused on the most urgent water quality issues.	1) Following the previous round of public comments, we reviewed the scientific basis of each monitoring requirement, then made changes to better-describe methods, and revise or eliminate many requirements. We disagree that monitoring requirements, and the Commenters do not specifically reference method(s) they deem to be based on less-than-sound science. 2) We have added language to more explicitly allow Permit compliance through efforts underway via the RMP. 3) We disagree that the monitoring requirements are unnecessary or beyond regulatory intent. Municipal storm water permits generally do not contain effluent limits, due to the nature of storm water discharges & lack of information on which to base numeric effluent limits. Instead, permits include monitoring programs to gather necessary information to determine the extent to which the permit provides for attainment of water quality standards & to determine the appropriate conditions or limitations for subsequent permits. [Fed.Reg. 61:166, 43761 & 61:216, 57425-29] 4) We disagree that the monitoring requirements could be any further	

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					prioritized. The Tentative Order requires the absolute minimum monitoring, reflecting the current economic conditions in the Region.	
Danville	4	C.8	Delay	Reduce requirements. Allow 3 years to develop a monitoring program.	The monitoring requirements have been developed through a long process that included significant stakeholder input. We disagree that additional time is needed to develop a monitoring program.	None
– BEGINNING OF COMMENTS ON THE COSTS OF THE MONITORING REQUIREMENTS –						
Campbell	3	C.8	Reduce or delay; prioritize	New requirements for water quality monitoring, special studies, and pilot projects need to be reduced or delayed.	In response to the Permittees' concerns about cost, Board staff scrutinized each monitoring requirement and pared back many of them again, in addition to the reductions made following the first Tentative Order. The reductions made to the second Tentative Order are listed in the column to the right. Every remaining monitoring requirement is cost-effective and necessary. See the Fact Sheet for a full explanation of the need for each monitoring requirement. In response to the estimates	In response to concerns regarding the cost of monitoring, the following items are reduced or deleted: • Reduce nutrient sampling by 66% by eliminating 2 rounds of sampling per year. • Eliminate nutrients sampling during storm events entirely. Now all Status nutrient sampling can be done with the bioassessments, minimizing labor costs. • Eliminate analysis
Mountain View	11	C.8	Expensive: Reduce or delay; prioritize	These monitoring requirements are overly prescriptive and may result in significantly increased costs, especially during the later years of the permit cycle.		
SCVURPPP Att A	30	C.8	Too expensive: Reduce or delay; prioritize	SCVURPPP costs are estimated at over $1.2 million/yr (plus SWRCB fees for SWAMP, about $35,000/yr, & $170,000/yr to the Regional Monitoring Program). SCVURPPP's costs are significantly greater than the roughly $400,000 estimate by the Water Board.		
ACCWP ACCWP	4 5	C.8	Too expensive: Reduce or	Our primary concern was the increase in monitoring costs. While there have been some minor		

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			delay; prioritize	improvements, unnecessary requirements have been added. … we estimate higher monitoring costs than in the previous Tentative Order, about $1,150,000/yr, totaling $5,762,595 over the permit term, nearly tripling our current $400,000/yr monitoring budget.	presented by some commenters, we find these estimates to be excessive, especially in the following aspects: 1. Duplication of effort/cost: Permittees' cost estimates do not consider the flexibility offered by the Tentative Order to use data collected by Surface Water Ambient Monitoring Program (SWAMP) and other programs; to consolidate data management, quality control and quality assurance; and to conduct various reporting requirements. Both cost estimates and the comments reflect that Permittees are looking at the monitoring requirements as tasks each Stormwater Program will do separately. One Permittee comments about this sentence that follows Long-Term Monitoring requirements: "*The SWAMP plan is to collect sediment toxicity and sediment chemistry samples annually at these stations during the month of June.*" Does this mean that if SWAMP collects these data, stormwater programs are not	for diazinon and chlorpyrifos from Status water-column toxicity samples. • Reduce bedded-sediment toxicity sampling by 66%. • Reduce bedded-sediment pollutant sampling by 66%. • Modify the pathogen methodology so that only one sample is required, and further sampling is required only where pathogen concentrations are elevated. • Eliminate the Long-Term Monitoring requirements, except for the water column and sediment toxicity sampling. Place this into Pollutants of Concern Monitoring, as requested by
Palo Alto Santa Clara County SCVURPPP SCVWD CCCWP Walnut Creek Pleasanton SCVWD Sunnyvale	8 20 5 8 5 2 7 22 10	C.8	Too expensive: Reduce or delay; prioritize	Monitoring requirements represent a very significant increase in resource commitment and will require a very significant expenditure of public resources. Monitoring, in general, requires a considerable amount of resources including time, staff and funding.		
ACCWP Att-2 Newark Att	8 67	C.8	Too expensive: Reduce or delay; prioritize	Parameters are not justifiable in terms of costs vs. benefits. Monitor only for Sediment Quality Triad parameters (benthic macroinvert. bioassessment, bedded sediment toxicity & bedded sediment chemistry). These parameters have been scientifically validated as indicators for basic physical, chemical and biological conditions of streams.		
Alameda City	6	C.8	Too expensive: Reduce or	Revise requirements to prioritize needs, water quality benefits and cost-effectiveness and to phase		

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			delay	requirements over more than one permit cycle	required to? The answer is "yes," and Board staff has emphasized this type of collaboration throughout the permit development process. 2. Not only are Permittees not taking advantage of opportunities to consolidate, share responsibilities, and reduce staffing requirements, but estimates for data management and reporting are quite high. It is a rule of thumb that data management and QA should not take up more than 10% of a monitoring budget. For the Regional Monitoring Program, data management and QA take up less then 10% of the budget, despite very strict QA requirements. One Commenter calculated up to 25% for "Data Quality Evaluation and Data Compilation and Entry". This cost estimate is especially high because SWAMP has already developed tools and provides assistance to make data entry and QA efficient and cost effective. Permittees will be required to electronically transmit monitoring data to SFEI, which is the regional	Commenters. • Eliminate all Long-Term Monitoring for Vallejo and Fairfield-Suisun, because these Programs have a much smaller population (funding) base; • Continue to encourage Permittees to use the 4 Long-Term Monitoring stations for which SWAMP will collect one of the two remaining required analytes. • Provide much more flexibility within Pollutants of Concern Monitoring, so that the methodology being developed by Regional Monitoring Program (RMP) stakeholder for Small Tributaries Loading may be used to fulfill Permit
Alameda City	15	C.8	Too expensive: Reduce or delay; prioritize	C.8 is estimated to increase the annual monitoring program about $640,000. The impact to City of Alameda is about $25,400/yr. No funding mechanism has been identified. Phase; prioritize.		
Berkeley Berkeley Newark	4 6 13	C.8	Too expensive: Reduce or delay; prioritize	Water Board staff has underestimated monitoring costs at $1,268,500/yr for the Region. ACCWP estimates the cost at $1,150,000/yr – an increase of $750,000, or a near tripling of the current budget. Berkeley cannot afford a 55% increase.		
Fremont	3	C.8	Too expensive: Reduce or delay; prioritize	Expanded monitoring is expected to cost Alameda County jurisdictions an additional $1,000,000/yr. Monitoring should focus on TMDL pollutants and concur with monitoring revisions proposed by the ACCWP.		
Newark	14	C.8	Too expensive: Reduce or delay; prioritize	Board member McGrath stated on March 11, 2008 that his first priority is legacy and TMDL pollutants. We agree, and believe the monitoring requirements should focus on those pollutants. Many costly requirements are not a priority. Reduce or defer to allow resources for high priority mercury & PCB		

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				In addition to $750,000/yr increase in monitoring costs, ACCWP estimates $250,000/yr needed for mercury and PCBs. The Program's annual budget is $1.8 million. Newark cannot afford a 55% increase.	data node for the California Environmental Data Exchange Network (CEDEN). Data will be delivered in SWAMP format which is an Excel file. SWAMP provides assistance for all aspects of SWAMP formatting including a template and help desk. There is also a QA help desk. SWAMP has also developed a website checker so that labs can upload and check data. In addition, CEDEN provides website data display so this will not be a cost to MRP programs. To provide perspective, we compare what SWAMP spent monitoring rotating watersheds, which is very similar to the Status Monitoring requirements in the Tentative Order. The regional SWAMP receives $310,000/yr. For the first 5 years of monitoring, SWAMP monitored an average of 68 sites/yr, compared to 54 sites required for **ALL** stormwater programs combined. SWAMP paid full labor costs to CA Department of Fish & Game and Moss Landing Marine Laboratory. In comparison, one Commenter estimates its Status Monitoring cost will be $344,500 for only 20 sites and fewer analytes.	requirements. • Allow phasing-in of Pollutant of Concern monitoring stations, so that monitoring of half of the stations may be delayed until Year 4 of the Permit term. • Allow an additional 3 months for both electronic and written reporting to eliminate any potential need for laboratory "rush" surcharges. Note that, in balancing data needs and costs, one additional round of General Water Quality data collection is added to the Revised Tentative Order, in order to monitor the general health of urban streams (dissolved oxygen, temperature,
Oakland	4	C.8	Too expensive: Reduce or delay; prioritize	Oakland's additional costs could be $1,000,000 over permit term. Many costly monitoring provisions are not a priority, such as: taxonomic ID of algae; silica, dry weather suspended sediment concentration, temperature, pathogens; sediment chemistry and toxicity to evaluate ambient conditions.		
Newark Att	69	C.8	Too expensive: Reduce or delay; prioritize	High cost for efforts that is partly duplicative or would be more efficiently achieved by incorporation in other provisions; separate wet-weather sampling station is extremely costly and labor-intensive for little added benefit.		
Menlo Park	3	C.8	Too expensive: Reduce or delay; prioritize	We are very disturbed to find C.8 has been expanded to be more costly and labor-intensive, to add very costly and prescriptive testing requirements that will have little benefit to water quality		
San Mateo	8	C.8	Reduce or delay;	Monitoring requirements should be reduced and phased in more		

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			prioritize	gradually	[Notes: SWAMP's physical habitat assessment and bioassessment requirements were less than required in the Tentative Order. However, in all, SWAMP collected much more data than the TO requires. SWAMP monitored nutrients, metals, organics, and toxicity in the water column at 33 sites three times each year with this budget of $310,000/yr.] Board staff estimated the costs of the proposed monitoring and found them to be comparable to or less than the Stormwater Programs current monitoring budgets. Before making the reductions listed to the right, we estimated the annual cost for required region-wide monitoring is $1,286,500. This is just 60% of the $2,138,600 budgeted by the four largest Programs combined for Fiscal Year 2007-08. This region-wide cost estimate of $1,286,500/year compares favorably to monitoring costs incurred by other NPDES permittees, as obtained through annual reports or personal conversation: • Los Angeles County FY0708	conductivity, and pH) during low-flow, summer months.
Antioch	2	C.8	Too expensive: Reduce or delay; prioritize	C.8 will be costly; excessive, unjustified. The CCCWP estimate is approximately $6M. Should be conducted, funded at the State level, e.g. SWAMP, University studies, & SFEI – not municipalities		
Concord	2	C.8	Too expensive	Monitoring is expensive, excessive. Collect the needed data through SWAMP.		
Contra Costa Brd of Sups Attch A	36	C.8	Reduce or delay; prioritize	Prioritize monitoring; some requirements should be postponed, pending results of monitoring required.		
Danville	4	C.8	Too expensive: Reduce or delay; prioritize	CCCWP does all monitoring for about $420,000 (2008-09). Brown & Caldwell estimates monitoring costs will increase over 400%, estimated at $50,000/yr for Danville.		
Fairfield Fairfield-Suisun Sewer District Suisun City	23 20 23	C.8	Too expensive: Reduce or delay; prioritize	C.8 poses a significant cost increase, especially to Fairfield-Suisun Program, which makes up roughly 2.5% of the population covered by the TO. Program costs are estimated at over $135,000/yr (plus SWRCB fees for SWAMP) – significantly greater than the roughly $30,000 estimate by Water		

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				recommend that the monitoring requirements for the FSUMRP be significantly reduced	monitoring cost: $2,042,000 • Central Contra Costa Sanitary District annual monitoring cost estimate: $1,000,000 • Conoco Refinery annual monitoring cost estimate: $500,000 Our estimates are based on analytical costs under our laboratory contract and labor costs of $100, including travel time. They do not include time for data evaluation, report writing, or contingencies.	
Moraga Oakley	2 2	C.8	Too expensive: Reduce or delay; prioritize	We are deeply concerned about the burdens that will be imposed by C.8. - significant addition to the amount of monitoring and reporting and substantial increase in cost.		
San Pablo	3	C.8	Too much	Though there have been some reductions, monitoring is still a huge undertaking compared to our current programs.		
SMCWPPP Letter	6	C.8	Too expensive: Reduce or delay; prioritize	Expensive, estimated $4 million over 5 years. Requirements to assess chemical, biological, & geomorphic conditions are unlikely to lead to improved water quality. Monitoring projects will have uncertain benefits. Reduce, phase in, prioritize.		
Vallejo Sanitation and Flood Control District	2	C.8	Too expensive: Reduce or delay; prioritize	Financial burden with no benefit to water quality. Water Board should collect data to address management questions; it receives funding for these activities. We would be more amenable to reduced monitoring to address questions directly linked to stormwater discharges.		
Dublin	11		Too expensive	The added cost of new monitoring efforts to the City of Dublin is estimated at $19,000 per year.		

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SCVURPPP Att A	28	C.8	Grant Funds Used to Fund POC Monitoring	Board staff implied that some POC monitoring is currently being conducted with grant funds, and that some SWAMP monitoring will fulfill monitoring requirements. To clarify, grants are **NOT** currently funding POC monitoring & SWAMP budget **cannot** be relied upon as a stable funding source.	To clarify, some POC *best management practice* projects, not monitoring projects, are being conducted with grant funding. While SWAMP budget is subject to change, SWAMP will conduct monitoring now & in the future. Very significant effort was made to ensure that Permittees would benefit by having SWAMP fulfill some monitoring requirements. Indeed, SWAMP is committed to collecting some of the data required under the Tentative Order.	None
– END OF COMMENTS ON THE COSTS OF THE MONITORING REQUIREMENTS –						
Contra Costa Brd of Sups Attch A	34	C.8.a.	Require regional collaboration rather than allow it	In the interest of higher data value associated with consistent sampling and data analysis, and the cost saving associated with economies of scale, consider requiring that these efforts be undertaken regionally. To facilitate this approach, which will require intensive efforts to establish a framework & legal agreements & budgetary negotiations, set implementation date for July, 2011.	We agree that, for many reasons, regional collaboration is the preferred way to collect water quality data. In particular, it appears that Permittees are not taking full advantage of the cost efficiencies associated with regional collaboration. However, both the law and our own preferred way of working with Permittees prevent us from specifying a method of compliance with permit requirements. We allow one extra year to set up a collaborative body	None
ACCWP Att-2 Newark Att SCVURPPP Att A	5 65 46	C.8.a.	Compliance Options	Allow programs to submit an alternative monitoring design prepared by a regional collaborative, which includes	We agree to clarify that Permittees may, through a regional collaborative, create an alternative monitoring design. Indeed, the	Add to C.8.a.(i).: … an alternative approach may be pursued by

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				justification for collecting alternative types, quantities & qualities of data which will provide equivalent info, or address objectives stated in the permit. Add to C.8.a(i): "Permittees may comply with monitoring described in C.8. using alternative quantities or methods to those described, as long as they are conducted at a similar level of effort and yield equivalent data that answer management questions described herein to the same degree."	Tentative Order allows this at C.8.a.(i).: "The types, quantities, and quality of data required within Provision C.8. establish the minimum level-of-effort that a regional monitoring collaborative must achieve. Provided these data types, quantities, and quality are obtained, a regional monitoring collaborative may develop its own sampling design." Nonetheless, we will augment this statement as shown in the column to the right.	Permittees provided that: either similar data types, data quality, data quantity are collected with an equivalent level of effort described under C.8.f; or an equivalent level of monitoring effort is employed to answer the management information needs stated under C.8.f.
CCCWP Att SMCWPPP SCVURPPP Att A	22 49 31	C.8.b	Management questions	The management questions should be consistent with the monitoring questions laid out by the Regional Monitoring Program. RMP management questions were arrived at by consensus of all stakeholders, represent the current best thinking on the subject and should be respected in regards to how they guide the MRP: *Are chemical concentrations in the Estuary potentially at levels of concern and are associated impacts likely?* *What are the concentrations and masses of contaminants in the Estuary and its segments?* *What are the sources, pathways,*	As the commenter is likely aware, the management questions laid out by the Regional Monitoring Program have been somewhat modified since we began work on the Municipal Regional Permit. We agree that section C.8.b. should reiterate the same questions as used by the Regional Monitoring Program, which are stated at: http://www.sfei.org/rmp/rmp_prog_info.html#objectives	Change the questions listed in C.8.b. to be the same as the management questions laid out by the Regional Monitoring Program. Add a footnote acknowledging that the stated objectives may change over time, but the overall mission of monitoring the quality of the San Francisco Bay remains the same.

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				loadings, and processes leading to contaminant-related impacts in the Estuary? *Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased?* *What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?*		
ACCWP Att-2 Newark Att	6 66	Table 8.1 Status Monitoring	*Be more specific in terminology*	Time frames could be interpreted to mean monitoring must be conducted in each of the named months. Revise 2nd sentence to specify spring sampling during "April or May", dry weather during "June, July, August or Sept."	We agree that the wording could be misinterpreted.	Revise wording so it is clear that the stated months represent timeframes during which to conduct a sampling event.
ACCWP Att-2	7	Table 8.1 Status Monitoring	Too much specificity	Most of ACCWP's previous comments still apply regarding excess specificity	The Commenter does not state which of its previous comments still apply and which do not. We have added flexibility to the Tentative Order in several places.	None
ACCWP Att-2 ACCWP Att-2 Newark Att BASMAA Att SMCWPPP Palo Alto Fairfield-Suisun Sewer	2 9 67 25 50 9 22	Table 8.1 Status Monitoring	Biological Assessment	Adding taxonomic ID for 2 types of algae is a significant cost increase. Added physical habitat parameters include "reachwide algal % cover" which does not correspond to any parameters in the draft "SWAMP Reachwide Benthos Method for Stream Algae Sampling and Associated Physical Habitat Data	While most Permittees have not routinely collected algae and other physical assessment data in the past, we disagree that the requirement is excessive of overly costly. Please see our response to comments above regarding costs, particularly the amount of similar sampling (and more) conducted by	None

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District San Pablo SCVURPPP Att A Contra Costa Brd of Sups Attch A	4 34 6			Collection" (Version 3, 2-09, V. 4 still in prep). Requiring the following measurements is excessive and inappropriate for urban stream reaches: • Depth and pebble count+CPOM requires 420 observations be recorded at each sampling site. • Cobble embeddedness prescribes a "random walk" search for stones to augment preceding measurements if 25 cobbles were not found. Delete algae from footnote including added physical habitat measures, as well as chlorophyll-a and ash free dry weight, and substitute under Monitoring Projects design of a characterization study to be conducted next permit term for nutrients and algae together. Algae bioassessment protocol for CA is draft & not fully tested. No evidence shows algae are good bioindicators of the condition of urban creeks in N.CA. Algae bioassessments should not be required until protocols have been adopted and a pilot test on the utility of algae to address the management questions is	SWAMP with an annual budget of $310,000. The required protocol is well-established. SWAMP established the protocol using the 1999 US EPA method contained in "Rapid Bioassessment Protocols for Use in Wadable Streams and Rivers." These parameters are part of the bioassessment protocol used state-wide, and are necessary for interpretation of bioassessment results. Although some Permittees are/were not presently well-versed in conducting all aspects of bioassessments, the SWAMP has recently provided to Permittees, free of charge, a day-long classroom and field training workshop on algae sampling. Further workshops are under consideration. These parameters are not difficult to measure or sample and don't preclude the use of volunteers.	

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				conducted.		
SCVURPPP Att A	33	Table 8.1 Status Monitoring	Biological Assessment	Footnote 28, pg 60, indicates that macroinvertebrates shall be identified…using a fixed-count of 600 organisms/sample. For past 3 yrs, stormwater programs used a fixed count of 500 per CA DFG's Aquatic Bioassessment Lab. Is this deviation is justified? The increased number of organisms will increase costs with no demonstrated benefit. Revise the fixed count to 500.	The SWAMP Quality Assurance Program adopted the 600 count method, as stated in the SWAMP QA Memorandum (5-21-07, Beverly van Buren & Peter Ode). This minimum sample count ensures large enough sample size to use current biological assessment tools. When preparing taxa lists for Observed / Expected models, "ambiguous taxa" (species not occurring in the models) must be removed from the taxa list. This can result in significant reductions to the total organism counts at a site. 500-count samples have at times reduced below the 300 count required for the models as a result of the "removal of ambiguous taxa" step – a problem greatly relieved by adopting the 600 count standard. The cost increase in going from 500 to 600 count is considered negligible compared to the cost of having to re-sample the site in order to be able to compare the results to available assessment tools.	None
Fairfield-Suisun Sewer District ACCWP Att-2 Newark Att	29 2 67	Table 8.1 Status Monitoring	Change Nutrients to a Monitoring Project Or	A "Nutrient Characterization Study Work Plan" should be required as a monitoring project in C.8.e., rather than in C.8.c. The Work Plan would include: a) literature review of nutrient concentrations &	We disagree that nutrient sampling should be delayed. SWAMP data collected over the past five years demonstrates that nutrients are present in urban streams across the region.	Reduce Status monitoring nutrient sampling requirements to once per year (from three times per

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Santa Clara County SCVURPPP Att A BASMAA Att CCCWP Att Walnut Creek SMCWPPP ACCWP Att-2 Newark Att	21 42 26 28 3 51 10 7		Require a Nutrient Monitoring Project Next Permit Term Nutrients	associated impacts to biological communities; b) summary of readily available data collected in Bay Area creeks/rivers; c) plan & timeframe for collection and analysis of additional water quality and biological community samples needed to answer management questions presented. Remove nutrients sampling - instead design a characterization study to be conducted next permit term. If nutrient sampling remains, clarify inconsistencies between "minimum sampling occurrence" & "minimum # of sample sites to monitor per year". Table 8.1 says "3/year in conjunction with algae sampling and water column toxicity sampling". This implies the sampling is to occur in spring, dry season and during storm events. However, references to storm, spring and dry were stricken and replaced with "20/10/4" not specifying any season. If these sites are to be sampled 3/yr, this has increased the level of effort. The Program believes Regional Board staff intended to reduce the sampling to once per year at 20/10/4 sites, but is not clear what	SWAMP has established protocols, so further study is not necessary to develop protocols. Nutrient parameters are being monitored state-wide. We agree a special study (or monitoring project under C.8.d.) to assess nutrient concentrations and collect the data to support Nutrient Numeric Endpoints may be important, but that could add costs that Permittees would oppose. In an effort to reduce monitoring costs to the greatest extent possible, we agree to eliminate storm event monitoring for nutrients, as well as one dry weather sampling for nutrients from Status Monitoring requirements. The number of nutrients sampling events will be reduced from 3/year to once per year. In considering the nutrient data collected thus far by SWAMP, nutrient concentrations generally do not exhibit as much variability temporally as they do spatially. Thus, it seems reasonable, given economic conditions today, that nutrient requirements should be	year).

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				season that should occur. Despite removal of "storm event" sampling "in conjunction with water column toxicity" is still required, including storm event sampling & 2 other times/yr, an increase in # of sampling sites from 3 to 20. Nutrient sampling also added chemical analytes & a SSC, without justification. Delete Nutrients; instead design a study to conduct next permit term.	reduced.	
SCVURPPP Att A Fairfield-Suisun Sewer District SMCWPPP	35 23 56	Table 8.1 Status Monitoring	Nutrients	Nutrients are prescriptive; not based on clear objectives or a conceptual understanding of potential nutrient impacts. SCVURPPP has sampled for nutrients since 2002 during dry weather. Concentrations are generally greater than EPA's criteria for total nitrogen & total phosphorous, but excess algae is rarely seen & there is little to no evidence of eutrophication. Delete nutrients; instead add "Nutrient Characterization Study Work Plan."		
Contra Costa Brd of Sups Attch A	35	Table 8.1 Status Monitoring	***Excessive data required***	Some requirements are reasonable, others are not. Requirement for constant data-logging at hourly intervals for six months is inefficient, and will yield an enormous amount of data of dubious value.	Data-logging over a six-month period is not required in the Tentative Order. General Water Quality probes are required to be deployed for 1-2 week intervals.	None

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San Jose Att A	18	C.8.c.i & Table 8.1 Status Monitoring	Delete storm event sampling	Delete requirements for storm event sampling in keeping with modifications to the previous TO. Such sampling presents costly logistical challenges and significant safety concerns.	Storm event sampling is required in Municipal NPDES permits throughout California & the United States. Sampling during storm events is needed to determine what pollutants, if any, are present in urban runoff and is much less expensive than end-of-pipe monitoring of stormwater outfalls. We agree to reduce storm event sampling in Status Monitoring, but sampling for toxicity during storm events is vital in helping determine impacts of urban runoff to the health of our waterbodies.	Delete storm event nutrient, diazinon, and chlorpyrifos sampling; retain storm event toxicity sampling in Status Monitoring.
BASMAA Att CCCWP Attachment SMCWPPP Newark Att Fairfield-Suisun Sewer District ACCWP Att-2 ACCWP Att-2 SCVURPPP Att A	27 30 52 67 24 3 11 37	Table 8.1 Status Monitoring	Toxicity & Diazinon and Chlorpyrifos	Move toxicity & OP pesticide during "storm events" to C.8.f - (POC Monitoring) since there is other storm event monitoring in that section. Sample commensurate with current level of understanding of impacts of these pollutants. Water column toxicity & diazinon concentrations in creeks have decreased since the phase-out of diazinon, so sampling should be minimal - the same frequency as "Category 2" pollutants.	We understand that Permittees prefer to delete any storm event monitoring from Status Monitoring due primarily to the cost of mobilizing a sampling crew during rain events. This is one reason why Board staff advocates working collaboratively, so that each Program does not have to bear the expense of contracting for this service, and so that separate contractors do not duplicate the planning, preparing, reporting, and other tasks that could more efficiently be consolidated. Status Monitoring is the single time when the Permittees' various waterbodies are monitored. If all	Delete storm event nutrient, diazinon, and chlorpyrifos sampling; retain storm event toxicity sampling in Status Monitoring.

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					storm event monitoring were conducted under Long-Term or Pollutants of Concern Monitoring – which are stationary and never rotate among the waterbodies – then only a very small number of streams will be sampled during storm events. We would not, then, learn of any potential impacts of urban runoff to streams across the Permittees' jurisdictions.	
CCCWP Attachment SMCWPPP ACCWP Att-2 SCVURPPP Att A BASMAA Att BASMAA Att	29 53 12 38 29 30	Table 8.1 Status Monitoring	Toxicity and Pollutants in Bedded Sediments	Change minimum number of sample sites back to the December 14, 2007 Tentative Order values.	The number of sediment samples to be analyzed for toxicity and pollutants was increased in the second Tentative Order after conferring with Permittees and reducing other requirements. Some Permittees expressed the opinion that sediment sampling was more valuable than some water column sampling. Nonetheless, we agree to reduce the sediment sampling as requested by these commenters.	Reduce the Toxicity & Pollutants in Bedded Sediment sample sites from 10/5/1 per year (# of sites varies by Stormwater Program size) to 3/2/1 per year.
Fairfield-Suisun Sewer District ACCWP Att-2 Newark Att SCVURPPP Att A	25 10 67 39	Table 8.1 Status Monitoring	Toxicity and Pollutants in Bedded Sediments Footnote	Remove "as well as other contaminants of interest" in Footnote 35: "*Analytes shall include … as well as other contaminants of interest, including pyrethroids.*" This phrase could lead to misunderstanding of the analytes required. The footnote includes indirect	We agree that the phrase "*as well as other contaminants of interest*" is open-ended and will delete it.	Delete the phrase "*as well as other contaminants of interest*" from the footnotes associated with Toxicity and Pollutant sampling in Bedded Sediment.

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				reference to several analytes not named in the T.O., some of which may not have reasonable potential for stormwater impacts.		
BASMAA Att ACCWP Att-2 SCVURPPP Att A SMCWPPP Newark Att	28 14 36 57 68	Table 8.1 Status Monitoring	Temperature Footnote & Trigger	Change temperature trigger to water quality objective in Basin Plan. –OR— The reference is not applicable to Bay Area streams that only have warm water fish (no salmonids). The applicability to Bay Area creeks with coldwater fish is also questionable as salmonids in Bay Area have been shown to have different habitat requirements compared to Pacific Northwest Streams.	We disagree that the water quality objective for temperature in the Basin Plan is appropriate. This objective applies to thermal discharges and is not applicable to ambient water quality. In lieu of specific local temperature objectives, we find that the temperature threshold, as written in the footnote, is appropriate.	None
BASMAA Att CCCWP Att Fairfield-Suisun Sewer District SMCWPPP ACCWP Att-2 ACCWP Att-2 Newark Att SCVURPPP Att A	31 31 26 54 2 13 67 40	Table 8.1 Status Monitoring	*Pathogen Indicators - Delete requirement*	Pathogen Indicators – delete parameter as agreed during Water Board/BASMAA meetings in summer June 10, 2008 Delete Pathogen indicator; method is intended for swimming uses. It would be more cost effective to develop one or more screening projects targeted at areas with significant risk of human exposure through non-swimming contact recreation	We disagree that pathogens should be removed from the monitoring program, and any perceived agreement to do so is a misunderstanding. Pathogen monitoring is important regardless of whether recreation occurs in a waterbody, because pathogens can impair other beneficial uses as well. Pathogen monitoring recently led to discovery of a leaking sewer pipe, which the sewer district was directed to repair. Other pathogens sources more directly related to urban runoff are also controllable.	Change the analytical method to Example #2, pg. 54, of USEPA's *Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, May 2002 Draft. This method allows a single sample be compared to the trigger, and further sampling is needed only if the trigger is exceeded by the first

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					We have considered how to reduce pathogen monitoring costs by modifying the monitoring protocol, which requires repeated sampling in a single stream. We agree to specify a simpler, less expensive method.	sample. Allow Permittees to modify this method upon approval of the Executive Officer.
Fairfield-Suisun Sewer District	27	Table 8.1 Status Monitoring	Stream Survey	FSURMP must assess 3 stream miles /yr, or 33% the level of effort required of larger programs. FSURMP only serves roughly 2.5 % of the population covered by the TO. Based on this, FSURMP's stream surveys should be more equitable (e.g., one stream mile/yr).	Actually, because FSURMP is required to conduct Status monitoring for only one year, the total number of stream survey miles is only 3 over a 5-year permit term, which is less than one mile per year.	None
SMCWPPP	55	Table 8.1 Status Monitoring	Stream Survey	SMCWPPP should get reduction in amount of stream mile surveys, given amount already completed. Add a footnote that reduces the amount of annual stream miles to survey in half if more than 20 stream miles were surveyed during last five years.	Board staff thought this issue was adequately addressed by the footnote which states "The Stream Survey need not be repeated on a waterbody if a Stream Survey was completed on that waterbody within the previous four years." Thus, if San Mateo Permittees are conducting Status Monitoring on a stream they already surveyed, then no further surveying is required that year.	Change the footnote from "…the previous four years…" to "… the previous five years."
Fairfield-Suisun Sewer District SCVURPPP	21 27	Table 8.1 Status Monitoring, & Provision C.8.e(i)	Triggers	We appreciate revisions to the stressor/source ID, which allows a stepwise process and utilizes existing data to evaluate the stressor or source of concern. The	This comment does not specify which specific reference, footnote, or language is of concern. Other more specific comments are addressed elsewhere in this	None

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Attachment A				applicability and accuracy of specific references (i.e., footnotes) and language used in the "trigger" column in Table 8.1 remain a concern.	document.	
ACCWP Legal	3	Table 8.1 Status Monitoring, & Provision C.8.e(i)	Triggers	C.1 requires notification where a determination has been made that discharges are causing or contributing to an exceedance of a water quality standard and requires submission of BMP related reporting for most exceedances. Adding triggers in C.8 & C.10 adds confusion to the well drafted and more comprehensive requirements of C.1. Delete the trigger columns in Tables 8.1 and 8.3.	We disagree and believe, based on past experience, that placing within Provision C.8 information on when monitoring results trigger a notification adds clarity regarding expected follow-up actions.	None
ACCWP Att-2 Newark Att	14 68	Table 8.1 Status Monitoring, & Provision C.8.e(i)	*Triggers*	Requirement for follow-up Monitoring Projects triggered by single-factor exceedances in Table 8.1 is excessive.	None of the triggers in Table 8.1 relies on a single exceedance to trigger a follow-up Monitoring Project. Also note there is a cap on the number of Monitoring Projects required over the Permit term.	None
BASMAA Att CCCWP Att SMCWPPP ACCWP Att-2 ACCWP Att-2 ACCWP Att-2 Newark Att Newark Att Palo Alto Santa Clara	32 23 58 3 15 19 69 71 10 21	C.8.d Long-Term Monitoring	Delete requirement Revise requirement Or Move requirement	C.8.d Long-Term Monitoring – delete provision as redundant, confusing. Significantly revise. Suggestions include: 1) develop mngt questions & compare them to questions for status & POC monitoring; 2) incorporate into C.8.c (Status Monitoring) by requiring that a portion of the sites sampled under	We agree that the storm-event sampling information required under Long-Term Monitoring can be pared down and combined with the storm-event sampling needed for Pollutants of Concern Monitoring.	Delete C.8.d. Long-Term Monitoring. Require only the water column and sediment toxicity sampling be conducted, but move this into Pollutants of Concern Monitoring, as requested by

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County SCVURPPP SCVURPPP Fairfield-Suisun Sewer District	5 41 28		to Provision C.8.f.	status monitoring be considered long-term trend sites where routine sampling occurs; and, 3) incorporate into C.8.f. (POC Monitoring). Eliminate nonessential or duplicative storm event monitoring from C.8.c & C.8.d; storm event sampling of high-priority pollutants can be transferred to the Category 2 parameter list in Table 8.5 of Provision C.8.f. Sites listed are not appropriate for wet weather sampling using methods prescribed. If retained as a separate monitoring activity, Board staff's proposal to make Table 8.3 non-prescriptive would allow selection of a more suitable site, but C.8.d would then be more redundant & confusing.		Commenters.
ACCWP Att-2 Newark Att	17 69	C.8.d Long-Term Monitoring	Revise	Recommendation for three-week antecedent dry period between storms is confusing & unrealistic. 4 evenly spaced isolated storms at this interval would be a minimum of 2.5 months in an "ideal" artificial system.	The recommendation is just that: a recommendation, and represents the ideal situation. Other time frames are not precluded by the terms of the Tentative Order.	None
ACCWP Att-2 Newark Att	18 70	C.8.d Long-Term Monitoring	Clarification	Concern re follow-up trigger: Table is unclear whether repeated sampling after an exceedance can be one of the four annual events.	Yes, the repeated sampling after an exceedance would be conducted during another storm event, and thus would constitute another sampling occurrence.	None

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CCCWP Att	24	C.8.d.iii.	Clarification	Below Table 8.4, is the following sentence, "* *The SWAMP plan is to collect sediment toxicity and sediment chemistry samples annually at these stations during the month of June.*" Does this mean that if SWAMP collects these data, stormwater programs are not required to?	Yes, as stated in C.8.a.iv., the required data may be collected by any entity.	None
Vallejo Sanitation and Flood Control District	2	C.8.d Long-Term Monitoring	Beyond CWA	Proposes long-term monitoring to detect exceedances of water quality objectives in receiving waters. This provision appears to go beyond the Clean Water Act.	We disagree that the requirements go beyond Clean Water Act authorities. Please see the Fact Sheet for the full discussion of the legal authority for Provision C.8 monitoring requirements.	None
Hayward	6	C.8	Pump station investigations	Another major concern is the requirement to conduct pilot projects to divert discharges from stormwater pump stations to the sanitary sewer, found in Provisions C.8, C.11, and C.12.	This requirement is not in Provision C.8 of the Revised Tentative Order.	None
BASMAA Att ACCWP Att-2 Newark Att	33 21 72	C.8.e.i.(3) Stressor/ Source Identification step 3	Delete requirement	C.8.e.i.(3) Monitoring Projects – delete requirement to "implement one or more controls"; implementation requirement out of place in document	C.8.e.i. lays out the steps of physical stressor or pollutant source identification – these come into play when monitoring results indicate potential problems. The steps include (1) further sampling or study to narrow down the cause of the problem, (2) evaluate options for controlling the cause, (3) controlling the cause, & (4) confirming that the cause has been reduced or removed. To move/remove step 3	None

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					alone is not logical. The steps do not include deadlines for completion, and the Tentative Order includes a cap on the number of Stressor/Source Identifications required. We see no overriding logic in separating the steps.	
Pacifica San Bruno Millbrae	3 5 4	C.8.e.i.(3) Stressor/ Source Identification step 3	Control Actions Unpredictable	Control actions needed to comply with some requirements are unpredictable because they may be triggered by monitoring results, such as C.8.e.i.(3).	It appears the Commenters are concerned that they cannot predict what actions may be needed to control pollutants or stressors that are revealed through monitoring. The Tentative Order does not specify a deadline for taking control actions, and thus provides adequate flexibility for Permittees to plan for any necessary actions.	None
SMCWPPP	59	C.8.e.(i)(4).	Delete Stressor / Source Identification	Permittees are required to "confirm the reduction of the cause(s) of the trigger stressor/source," which duplicates actions required by C.1, but in an unnecessarily prescriptive manner. Remove this requirement.	We disagree that step 4 is prescriptive in any way. As noted above, we see no overriding logic in separating the 4 steps of the Stressor/Source Identification procedure. We also disagree that duplicate actions are required or in any way appear to be required.	None
NOAA	15	C.8.e.i(1)	Support the requirement to conduct a TRE or TIE	We strongly support the requirement to conduct a TRE or TIE when monitoring results trigger follow-up actions. Clarify if toxicity monitoring (but not necessarily another TRE or TIE) will continue to be required as a monitoring	Thank you for the support. Yes, each type of monitoring (e.g., Status, Long-Term, Pollutants of Concern) is required. Any toxicity reduction or toxicity identification evaluation (TRE or TIE) would be conducted as a "Monitoring Project,"	None

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				measure while a corrective action plan (*e.g.*, through a cease and desist order or a total maximum daily load) is developed and implemented.	while the other types of monitoring continue.	
ACCWP Att-2 Newark Att San Jose Att A	20 72 18	Table 8.1 C.8.e.i(1) & Attachment G	TIE too expensive	The added option for TRE is a positive change but TRE/TIE can still be inappropriate and potentially ineffective high-cost responses if thresholds are exceeded for parameters other than water toxicity. Although greater flexibility is provided by allowing a TRE to precede a TIE, triggered activities are still unpredictable and potentially costly, making budget planning difficult or impossible. Change the number of toxicity-triggered projects required to two.	We agree to change the number of toxicity-triggered projects to two to provide greater flexibility and minimize costs. Based on our knowledge to date of toxicity occurrences in urban streams, a minimum of two toxicity evaluations is reasonable.	Revise C.8.e.i.(5) to "… and at least two must be toxicity follow-ups …"
BASMAA Att ACCWP Att-2 Newark Att	34 22 72	C.8.e.i.(6) Stressor / Source Identification step 6	Delete statement	C.8.e.i.(6) Monitoring Projects – delete provision; legal language out of place in document	C.8.e.i.(6) states "[a]s long as Permittees have complied with the procedures set forth above, they do not have to repeat the same procedure for continuing or recurring exceedances … unless directed to do so by the Water Board." Other Permittees asked that this be clearly stated within C.8.e.i., and we see no substantive reason to delete it.	None
NOAA	16	C.8.e.ii. BMP Effect'ness	Exclusions	Why are Fairfield-Suisun and Vallejo exempt from this requirement?	Fairfield-Suisun and Vallejo are not subject to this requirement because both programs have, relatively, a	None

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		Invest'n			very small citizen base, and thus we intend for them to learn from the other BMP evaluations while not shouldering that particular cost.	
BASMAA Att ACCWP Att-2 Newark Att SMCWPPP	35 22 73 60	C.8.e.ii. BMP Effect'ness Invest'n	Delete requirement	C.8.e.ii. Monitoring Projects: BMP Effectiveness Investigation – delete provision as redundant with C.11 and C.12. Or clarify that this requirement may be met by assisting with studies being led by others, such as the West Coast Estuaries Initiative's monitoring of the effectiveness of BMPs.	We disagree that C.8.e.ii. should be deleted. Permittees are given flexibility to investigate various types of Best Management Practices (BMPs), including stormwater treatment or hydrograph modification controls, or to conduct the BMP evaluation required in C.11 and C.12. The Commenters may be assuming that all Permittees will collaboratively conduct the BMP evaluation required in C.11 and C.12, thus making C.8.e.ii. superfluous. However, C.8.e.ii. is needed in the case that Permittees do not join a monitoring collaborative.	None
Kolb, Larry & James, Roger	30	C.8.e.ii.	Would Eliminate CCCWP monitoring	Contra Costa program is required to monitor 3 BMPs at 5 sites, and this provision would relieve them of that. That requirement must remain in place because of the significant concern with Contra Costa program's BMP/IMP sizing criteria. The Board should determine the status/ results of that monitoring and if not met should pursue enforcement action.	We disagree: C.8.e.ii. in no way relieves the Contra Costa County stormwater program of requirements contained in other sections of the permit.	None

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Provision C.8. – Water Quality Monitoring

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
NOAA	14	C.8.e.iii & C.8.f.	Support for these requirement	We wish to explicitly express our support for the following provisions: C.8.e.iii – Geomorphic Project, C.8.f – Pollutants of Concern Monitoring.	Comment noted.	None
SCVURPPP Att A	43	C.8.f Pollutants of Concern	Phase in Pollutant of Concern Monitoring Stations	This is a significant undertaking. The logistics of storm event monitoring makes this highly resource intensive. Allow time to "phase-in" POC stations, e.g., one for each program could go "on-line" in year 2 & the other in year 4, allowing programs to learn before adding an additional site. Because POC monitoring would continue beyond permit term, a 1-2 year phasing would not impact the intent of this requirement.	We agree that it is reasonable to phase in this monitoring, which will continue beyond the Permit term. While phasing is acceptable, a sufficient number of stations must be installed and monitored to provide spatial and temporal resolution of runoff loads that represent the various drainage areas.	Revise C.8.e.i. to allow monitoring of half the stations to be delayed until Year 4 of the Permit term.
BASMAA Att ACCWP Att-2 Newark Att Palo Alto Santa Clara County	36 23 74 11 21	C.8.f Pollutants of Concern	Flexibility	C.8.f Pollutants of Concern – revise language to allow flexibility in requirement to use alternative methodologies and number of sites based on the Small Tributaries Loading Strategy, at an equivalent level of effort	Agreed.	To the following sentence at the beginning of C.8.f. "Permittees shall implement the following monitoring components" add the following: "or pursue an alternative approach addressing the aforementioned management information needs."

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Provision C.8. – Water Quality Monitoring

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
SMCWPPP ACCWP Att-2 SCVURPPP Att A SCVURPPP Att A	61 23 44 45	C.8.f Pollutants of Concern	No management questions are included	Modify permit to include management questions agreed upon by Small Tributaries Loading Strategy workgroup (i.e., Water Board staff, BASMAA, SFEI and technical reviewers). Incorporate these management questions into the permit.	We agree that it is important to state the information needs driving Pollutants of Concern monitoring, and that the Small Tributaries Loading Strategy workgroup (STLS) is committed to filling those needs. Lest the STLS modify its recently decided-upon management questions (see previous response concerning RMP questions), we will simply state the information needs.	Add the information needed by Pollutant of Concern monitoring to C.8.f.
CCCWP Att SMCWPPP ACCWP Att-2 Newark Att	25 64 27 77	C.8.f. Pollutants of Concern	Consistency with RMP	Methodology is inconsistent with RMP's Small Tributaries Loading Strategy. There is no scientific basis for a different methodology. Re-design to be consistent with the RMP, or remove entirely.	We agree to clarify that the methodology for meeting C.8.f. pollutant of concern monitoring requirements may be modified in such a way as to be consistent with the RMP's Small Tributaries Loading Strategy (STLS). The reference to Regional SWAMP is no longer necessary.	To C.8.f., add that Permittees may pursue an alternative approach that addresses each of the management information needs of the STLS. Remove the reference to SWAMP.
ACCWP Att-2	25	C.8.f.(i). Pollutants of Concern	SWAMP not involved	Reference to "Regional SWAMP program" is inappropriate, since this strategy design is not driven by SWAMP needs or monitoring types.		
SMCWPPP	63	C.8.f.(i). Pollutants of Concern	Unnecessary Locations	Reduce number of sites to 3 regionally & state that this is being accomplished through use of existing RMP funds provided to SFEI.	We disagree that this reduction is warranted. Three monitoring stations would not be adequate to yield the management information needed for pollutant of concern monitoring.	None
ACCWP Att-2 Newark Att	24 5	C.8.f.(i). Pollutants of Concern	Too many Locations	Number of required sites too high; Change to equivalent of 1 station per county in addition to stations operated by the Regional	We disagree. Each of the 4 largest Programs would have 2 stations if this monitoring were conducted individually. We understand from	None

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				Monitoring Program. [At present if the RMP stops monitoring Zone 4 Line A, ACCWP would be obliged to pick up the cost in addition to monitoring at Castro Valley Creek]	numerous discussions with each Program that this monitoring will be conducted collaboratively. With the clarification we agree to above (that Permittees may pursue an alternative approach that addresses each of the management information needs of the STLS), we see no rationale for further modification to this provision.	
ACCWP Att-2 Newark Att	26 76	C.8.f.(i). Pollutants of Concern	Distinguish chemical classes	Pyrethroid and other added pesticides will increase costs. Carbaryl and fipronil belong to different chemical classes and are not pyrethroids as implied by the wording in the table. Revise wording of table listing to distinguish carbaryl and fipronil from pyrethroids	We agree to revise the format of the table so that carbaryl and fipronil, which are replacing pyrethroids in the marketplace, are listed separately from pyrethroids.	Reformat Table 8.5 so that carbaryl and fipronil are listed separately from pyrethroids.
ACCWP Att-2 Newark Att	28 77	C.8.f.(iv.)	Pollutants of Concern Monitoring – Methods	Direction for sampled storms to be separated by 21 days of dry weather is unrealistic and inappropriate – delete.	The recommendation is just that: a recommendation. It represents the ideal situation. Other time frames are not precluded by the terms of the Tentative Order.	None
SMCWPPP	65	C.8.f.(v).	Sediment Delivery Estimate	Remove this requirement because it is already completed by SFEI.	As stated in C.8.a.iv., any monitoring requirement may be fulfilled by parties other than the Permittees. While we are pleased this necessary will be obtained at no further cost to Permittees, we believe it is a valid Permit requirement.	None
SMCWPPP	66	C.8.g.	Citizen	Remove citizen monitoring	We disagree, because a large	None

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
			Monitoring	because it should not be in both C.7 & C.8.	number of stakeholders advocated for the citizen monitoring section in C.8.	
CCCWP Att	26	C.8.g.	"Safe harbor" language for volunteer data	For citizen volunteers, safe harbor language is needed, so volunteers' learning curve, errors, or omissions do not become compliance liabilities. For example: "*If volunteers participate in sample collection, compliance with this provision will be considered on development and execution of an approved sampling and analysis workplan.*"	We disagree that such language is needed. Many citizen volunteers have demonstrated that they are able to collect data of adequate quality. The State-wide emphasis, also the subject of SB1070 (California Legislative year 2005/2006), is on the collection of data using standard methods so that the data are of known quality and can be used to draw inferences about water quality.	None
SMCWPPP BASMAA Att ACCWP Att-2 Newark Att	67 37 29 78	C.8.h.i. Reporting	Reporting WQS Exceedance	Remove provision C.h.(i) from permit because it duplicates Provision C.1 and is unnecessary. C.8.h.i. Reporting: Water Quality Standard Exceedance – revise "within 30-days" Revise to conform with or reference C.1.	We disagree and believe, based on past experience, that placing within Provision C.8 information on when monitoring results trigger a notification adds clarity regarding expected follow-up actions. We also disagree that there is any inconsistency between C.1 and C.8.h.i.	None
Caltrans	8	C.8.h.i. Reporting	Clarification	The reference to "data" in line one is unclear. Is this effluent data or effluent and receiving water data? Does the 2nd sentence mean that receiving water data is to be used to identify exceedances but not effluent data?	"Data" refers to all data collected pursuant to C.8. Yes, due to variability, difficulties, and costs of monitoring effluent (i.e., stormwater runoff or outfalls), Permittees monitor receiving waters instead.	In the first 2 sentences in C.8.h.i., clarify that "data" refers to all data collected pursuant to C.8.
BASMAA Att BASMAA Att	38 39	C.8.h.ii. & C.8.h.iii.	Due date	We get spring BMI sample results in fall, so allowing even minimal	We agree that a longer reporting time frame is needed.	Revise report due dates to January 15

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Provision C.8. – Water Quality Monitoring

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
SMCWPPP SMCWPPP ACCWP Att-2 ACCWP Att-2 Newark Att CCCWP Att Fremont Fairfield-Suisun Sewer District Fairfield-Suisun Sewer District Oakland SCVURPPP Att A	68 69 30 31 79 27 4 3 31 5 47	Electronic Reporting and Urban Creeks Monitoring Written Reports		time for QA and uploading to electronic databases, we would not be able to meet the Sept. 30 deadline for electronic reporting. With annual reports also due in the fall, it would not be possible to submit the Urban Creeks Mon. Report by Dec. 15th. Reporting timelines are unrealistic & inappropriate. It's highly likely that the Electronic Reporting due date (Sept 30) will not allow all data collected during the previous fiscal annual to be included. It would require completion of sample processing, lab analysis & QA/QC to occur in 3 months, which is far less time than other regional collaborative monitoring programs (e.g., RMP) can achieve. The Sept 30 due date would likely increase resource scheduling problems and added rush costs for analysis and QA/QC of data collected in spring and summer. Change due date for Electronic Report to Dec. 15 & Urban Creeks Report to March 15.	Bioassessment samples will be collected in May-June, and can take up to six months for completion of laboratory analyses. Thus, we agree to extend the reporting period by 3 months. To date, reporting periods have coincided with fiscal years (July 1 through June 30). However, in the July-September timeframe, dry weather sampling will occur, and laboratory turn-around times for the associated analyses are short. This dry weather period is associated closely (in terms of the water year) with the previous wet weather period. In looking at monitoring data in totality to analyze runoff impacts to the overall health of a stream, the dry weather sampling results are important. It would not make sense to wait over a year for reporting of these data. Thus, while the reporting dates will be extended three months, the dry weather data will be included in the reporting period.	for the Electronic Reports and March 15 for the Urban Creeks Monitoring (written) Report. Revise the reporting period to run October 1 through September 30.
ACCWP Att-2	4	C.8.h.ii. & C.8.h.iii.	Reporting Costs	RMP experience shows that monitoring budgets should account for costs of managing & coordinating the program, including review by scientific advisers &	We agree, and that is why the Tentative Order encourages reporting be consolidated at the regional level, to facilitate scientific advising and stakeholder	None

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				collaborative stakeholder involvement.	participation.	
ACCWP Att-2 Newark Att	32 80	C.8.h.iii.	Language too broad	Under discussion of data, requirement to "Develop hypotheses to investigate pollutant sources, trends, and BMP effectiveness" is open-ended. Require hypothesis "where appropriate and feasible using available information."	Agreed.	Add "where appropriate" to C.8.h.iii.
Kolb, Larry & James, Roger	31	C.8.h.i.	Add Language	"Violation of Discharge Prohibitions" should be added to the title and elsewhere in this section.	We disagree that the emphasis of C.8.h. is "Violation of Discharge Prohibitions."	None
Kolb, Larry & James, Roger	32	C.8.h.iii.(5)	Change Language	"Water quality problems" should be changed to "actual or threatened exceedance of water quality standards".	We disagree, because some parameters within the monitoring program do not have associated water quality standards or objectives, such as bioassessment.	None
CCCWP Walnut Creek	5 1	C.8 All	*General comment*	We believe some of the monitoring requirements are still: 1) not based on sound science; 2) too prescriptive to allow for adaptive monitoring; 3) not necessary.	See responses to specific comments above.	See changes listed above

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Provision C.9. – Pesticide Toxicity Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
NRDC & SF Baykeeper	58	C.9, C.11-C.14	Include Allocations	The Tentative Order Fails to Include or Enforce Waste Load Allocations from Applicable TMDLs	This comment was addressed in response to the original tentative order. See response to SF Baykeeper comments 4 and 19 concerning the original TO.	
NRDC & SF Baykeeper	60	C.9	Provision does not implement TMDL	The Tentative Order is similarly devoid of any information related to compliance with the Pesticide Toxicity TMDL in Provision C.9.	The pesticide provisions are taken directly from the Pesticide Toxicity TMDL.	
San Jose Attachment A	20	C.9.f.i	Add language	Insert the phrase "as needed" so the sentence reads "Permittees shall maintain regular communications with county agricultural commissioners (or other appropriate State and/or local agencies) *as needed* to…"	The requested change does not improve the clarity or effectiveness of the provision.	
San Jose Attachment A	21	C.9.g.i	Add language	Insert the phrase "may be done jointly with other Permittees" in Task Description.	The encouragement to work with other parties is stated explicitly at the top of C.9 so it is not necessary to repeat it for individual elements.	
San Jose Attachment A	22	C.9.h	Flexibility	The MRP Summary Response to Comments, dated 3-18-10, page 98, bottom row, states that "Flexibility will be added in this regard. We will divide the sentence in two, require working with DPR and the Ag Commissioners, and say "may work" with respect to the others." The revised TO does not include this change. The City requests that this change be made.	We will make the requested change.	Make change requested in both original and revised tentative order.
SCVURPPP A	48	C.9 – C.14	Add	The opening paragraph for each	This comment was addressed in	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
			Language	Provision pertaining to Pollutants of Concern Control Programs, needs to include a statement such as: "The Permittees may address the requirements in this Provision by building upon their prior submissions to the Water Board."	response to the original tentative order. See response to SCVURPPP comment 65 concerning the original TO.	
Sunnyvale	48	C.9.d	IPM certification	It is not clear, nor is it defined anywhere in the MRP documentation what an "IPM-certified" contractor is. To our knowledge, there is no IPM certification program for pesticide applicators within the Department of Pesticide Regulation or other state agency. There is an "EcoWise" certification program for structural pest control operators, but there is no equivalent for those who apply pesticides to landscapes. Until there is a state certification for pesticide applicators that use IPM practices, we suggest that this language be removed or modified to reflect the actual situation. We believe including the requirement to include contract specifications for contractors to incorporate the requirements of an agency's IPM policy or ordinance is sufficient to promote the use of IPM practices.	This comment was addressed in response to the original tentative order. See response to Sunnyvale comment 19 concerning the original TO.	
ACCWP Attachment-	59	C.9.a	Remove Language	Permittees can adopt a resolution supporting others in implementing	This phrase is appropriate because several C.9 sub-provisions relate to	

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Provision C.9. – Pesticide Toxicity Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
1 Berkeley Attachment 1 Newark Attachment San Leandro	59 81 15			IPM. Remove the added "and others" (in the preamble) as Permittees can only enforceable control their own operations on this issue. Remove the reference to ordinance in C.9.a entirely or replace with resolution.	discouraging pesticide use by others (e.g. not public agency staff). Regarding the reference to an ordinance, this was not a change from the original tentative order, and the language reads "policy or ordinance". This language is flexible enough so as not to be burdensome.	
ACCWP Attachment-1 Berkeley Attachment 1 Oakland Attachment 1 San Leandro	60 60 62 16	C.9.e	Delete Provision	Bay Area Permittees and regional groups; such as BASMAA & BACWA; have a long and successful history of doing all the tasks in this section collectively. The regional, statewide and national collaborative groups and processes will continue to work has they have. The only effective way the Waterboard can accelerate this process is through more consistent participation and dedication of its resources. Section C.9.e should be deleted from the permit.	This comment is very similar to many received on the original tentative order. Please see responses to Contra Costa County supervisors' comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13 on the original tentative order.	
ACCWP Attachment-1 Berkeley Attachment 1 Oakland Attachment	61 61 63	C.9.f	Delete Provision	The Waterboard needs to develop effective relationships with DPR and the County Ag Commissions directly, not attempt to mandate this upon NPDES Permittees The task descriptions of section i should be recommendations, not mandates, otherwise it should be	This comment is not based on a change to tentative order. This provision comes directly from the pesticide toxicity TMDL and is part of implementing that TMDL.	

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Provision C.9. – Pesticide Toxicity Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
1 San Leandro	17			deleted from the permit. The reporting requirement should be information provided to the Water Board by the County Ag Commissions and/or DPR and should be removed from this permit.		
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment 2	26 27 82 27	C.9.b(iii)	Too much detail	Reporting requirements are overly detailed. Revise to allow a qualitative instead of quantitative discussion of IPM efforts	This provision is not overly detailed and currently requires and mixture of quantitative and qualitative reporting. The only reporting element that is quantitative is the need to assess a trend. This can be accomplished without burdensome quantification.	
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment 2	27 28 83 28	C.9.c(iii)	Reporting not useful	Reporting % of staff attending training is not of value and difficult to calculate. Modify requirement	This metric is the most straightforward way of assessing the extent to which municipalities are training employees in IPM. This should not be too difficult to provide.	
ACCWP Attachment-3 Berkeley	28 29	C.9.d(iii)	Reporting not useful	Does the Board <u>really</u> want copies of our standard specs and individual contracts? The additional attachments will further complicate	The text about the contract is provided as a suggestion but is not the only possible acceptable means to confirm compliance.	

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Provision C.9. – Pesticide Toxicity Control

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Attachment 2 Newark Attachment Oakland Attachment 2	85 29			permit submittal. Eliminate submittal of documents and allow agencies to summarize IPM requirements		
ACCWP Attachment-3 Berkeley Attachment 2 Newark Attachment Oakland Attachment 2	29 30 85 30	C.9.e(iii)	Reporting not useful	This requirement is inappropriate to put in a stormwater permit. Pesticide regulation is beyond the jurisdiction of local agencies. The Board should be providing input on these issues to the appropriate State and Federal agencies that regulate pesticides. Eliminate requirement	See response to ACCWP Attachment 1, comment 60 above.	
Fremont	34	C.9.d	Flexibility	A July 1, 2010 implementation date (to hire an IPM-certified contractor) may be infeasible if the City contract is not up for renewal prior to that date. Add "or next contract award thereafter" to allow City additional flexibility.	This is a reasonable request to add flexibility	Add language as suggested
NOAA	17	C.9 preamble	Broaden Language	We suggest changing the introduction to this pesticides toxicity control section to include the carbamate insecticide class, of which the named pesticide carbaryl is highly likely to be the most commonly encountered in urbanized settings. However, all	This is a good point.	We will do this as well as correct spelling of carbaryl.

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Provision C.9. – Pesticide Toxicity Control

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				carbamates cause sublethal effects to salmonids similar to the organophosphate insecticide class with which effects may be additive or synergistic.		
NOAA	18	C.9.h	Point of Sale Notice	The proposed permit should require that all Permittees shall insure that all point of purchase locations have properly posted point of sale notification warnings as required under the January 22, 2004, court order from the U.S. District Court in Seattle, Washington (Washington Toxics Coalition v. EPA). More information and a copy of the Court's order (including a listing of affected communities that includes many of the Permittees) are available at www.epa.gov/espp/litstatus/wtc/pos.htm. Inspection could occur in conjunction with other stormwater related inspections (*e.g.*, outside storage areas, *etc.*).	Imposition of this requirement is beyond the scope and specification of the TMDL implementation plan.	
Pleasanton	13	C.9.b,c	Reporting	There are currently similar established reporting requirements on municipalities regarding pesticide use by the California Department of Pesticide Regulation. This reporting requirement is in essence redundant and unnecessary. Regional Water Quality Control Board could and should coordinate the collection and	There are multiple agencies to which municipalities must report concerning any number of activities. These C.9.b,c provisions do not contain burdensome reporting requirements, and these requirements were taken directly from the pesticide toxicity TMDL implementation plan.	
Livermore	11					

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				acquisition of this data from the California Department of Pesticide Regulation. In light of the need for efficiency and to eliminate the redundancy with other State programs/agencies' requirements, this requirement should be deleted.		
Pleasanton	14	C.9.f	Beyond scope	This provision is beyond the technical and legal scope of local government. The Board may, as necessary, obtain this type of data through collaborative efforts with other State agencies. This provision should be removed from the Tentative Order.	We disagree. This provision is neither beyond the technical or legal scope of local government. This provision is taken directly from the urban pesticide TMDL implementation plan and is necessary to implement that TMDL.	
Livermore	12					
U.S. EPA	15	C.9	WLAs and reopener	The basin plan amendment adopted by the Regional Board in 2005 indicates that if the BMPs prove to be insufficient to meet WLAs, the Board may require additional control measures. We recommend the permit include a reopener clause which would provide that if the initial BMPs prove insufficient to comply with the numeric WLAs, the permit may be reopened to include additional controls as necessary to ensure consistency with the WLAs. It is our position that the permit should include the numeric WLAs themselves, as this would provide	Permits are adopted every 5 years. It is highly unlikely that the sufficiency of BMPs to comply with WLAs will be evaluated within this 5 year permit term. No reopener clause is needed. Adding the WLAs to the permit without numeric limits derived from the WLAs does not help provide consistency with the TMDL or enhance the enforceability of the permit because WLAs by themselves are not enforceable. The implementation provisions regarding pesticides are taken directly from the	

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				greater assurance of consistency with the TMDL and would enhance the enforceability of the permit with regards to the WLAs.	TMDL so the permit is already consistent.	
Dublin	12	C.9.e	Beyond scope	This activity is beyond the technical and legal scope of local government, and is and should continue to be handled at the State and Federal level. Further, if the Regional Board (a State agency) already has reason to believe that certain pesticides should not be used because of water quality impacts, it should take the case directly to the State agencies responsible for pesticide control and not rely on local government to perform these duties.	We disagree. Please see response to ACCPW Attachment 1, comment 60 on this issue.	
Larry Kolb, Roger James	33	C.9.a	Wording	Change "threaten water quality" should be changed to "threaten beneficial water uses" because standards haven't been established for many pesticides and some of the existing standards are considered to be inadequate.	The term "threaten water quality" is satisfactory. This term does not lose force even for situations where standards have not been established or may be deemed inadequate.	
Pacifica	29	C.9.a	Wording	The permit should be restricted to	This may be a useful suggestion if it	

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SMCWPPP	70			pesticide uses that reach stormwater that flows to MS4s owned and operated by the municipalities in order to meet the federal Clean Water Act requirements. Modify the permit language so that it more narrowly focuses on pesticides that adversely affect stormwater that flows to MS4s owned and operated by the municipalities.	were possible to distinguish just those pesticide molecules that have the potential to impact water quality, this might be a good idea. But, this is not the case. Further, because pesticides are very toxic, water quality impacts occur if even a very small fraction of total applied pesticides reach receiving waters. Thus, the most effective and sensible control strategy is to target all applied pesticides in a watershed.	
Stopwaste.org	16	C.9	Wording	Add the following highlighted text in the last sentence of the paragraph. "Permittees may coordinate with BASMAA, the Urban Pesticide Pollution Prevention Project, the Urban Pesticide Committee, ***the Bay-Friendly Landscaping and Gardening Coalition*** and other agencies and organizations in carrying out these activities.	We will add the language as requested.	We will add the language as requested.
Stopwaste.org	17	C.9.c	Wording	Amend the sentence as shown , "Permittees shall ensure that all municipal employees who, within the scope of their duties, apply or use pesticides that threaten water quality are trained in IPM practices and the Permittee's IPM policy ***and may also include other training opportunities such as Bay-Friendly Landscape Maintenance Training***	We will add the language as requested.	We will add the language as requested.

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				& Qualification Program and Eco-Wise.		
Stopwaste.org	18	C.9.h	Wording	Add the highlighted reference, "Public Outreach (may be done jointly with other Permittees, such as through CASQA or BASMAA and/or the Urban Pesticide Pollution Prevention Project***, or the Bay-Friendly Landscaping & Gardening Coalition)***	We will add the language as requested.	We will add the language as requested.
SMCWPPP	71	C.9.b	Reporting	There is no implementation date. Add an implementation of two years following permit adoption.	Reporting takes place in every annual report, starting with the first such report.	
SMCWPPP	72	C.9.b	Reporting	The permit requires annual reporting to show trends in quantities and types of pesticides used, and this frequency of reporting to detect trends is unnecessary. Modify reporting so that information about the quantities and types of pesticides used is reported every five years.	The frequency of reporting is appropriate.	
SMCWPPP	73	C.9.d	Reporting	Modify reporting requirement for this provision so that the requested information does not need to be reported unless requested by the Water Board.	Reporting requirement is quite reasonable as written.	
SMCWPPP	74	.9.e	Delete provision	This portion of the permit requires a lot of tasks that go well beyond what is required by the federal Clean Water Act. Modify the permit to delete	This comment is very similar to many received on the original tentative order. Please see responses to Contra Costa County supervisors'	

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				the four tasks listed under C.9.e.i. because they may be done more effectively by other agencies than local municipalities and they are not required by the federal Clean Water Act.	comment 66, Contra Costa Clean Water Program comment 79, and SMCWPPP comment 13 on the original tentative order. We also note that this requirement is taken directly from the TMDL implementation plan.	
SMCWPPP	75	C.9.g	Duplication	The activity of this provision is already covered under Provision C.1 and should not be duplicated here. Modify the permit to delete this section, which is unnecessary and duplicative of Provision C.1.	This requirement is taken directly from the TMDL implementation plan. C.9.g provides additional direction and detail not found in C.1. For example, C.1 says nothing about evaluating effectiveness of implemented control measures nor evaluating attainment of specific concentration and toxicity targets.	
SMCWPPP	76	C.9.h	Outreach	The permit requires that the permittees provide resources for an integrated pesticide management (IPM) certification program for structural pesticide management, if needed to augment grant funding. The permit should not require municipalities to fund this type of activity since it is not a requirement of the federal Clean Water Act nor any state statute.	We will delete the clause about "provid(ing) resources" in C.9.h.iii (4).	We will delete the clause about "provid(ing) resources" in C.9.h.iii (4).
SMCWPPP	77	C.9.h.v	Outreach	The permit contains a specific list of groups that the municipalities are required to work with to conduct outreach to pest control operators. The list provided should simply state that the list is offered as examples of	The list is a suggested, not mandatory list, and this will be clarified.	Text was added clarifying that this is a suggested list of parties with whom to

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				the groups available that municipalities may choose to work with. Modify the permit to state that municipalities may work with groups and organizations, such as DPR, county agricultural commissioners, etc., when conducting outreach to pest control operators.		cooperate.

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Provision C.10. – Trash Reduction

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BASMAA Attachment	40	C10.a.i	Revise Goal Statement	reduce "goal statement" from 378 words and more of an executive summary to just a goal statement (66 words, first sentence only) (D- Document construction / typographic / formatting / consistency)	Goal statement has been reduced in size.	
BASMAA Attachment	41	C10.a.i	Revise Language in Goal Statement	replace "tangible progress" with "improvement" in goal statement (C- Unscientific / technically or managerially unsound)	Load reduction of trash, or tangible progress will be required during this permit term.	
BASMAA Attachment	42	C10.a.i	Remove Language Not Part of Goal Statement	remove or move rest of language that is not part of a goal statement to Fact Sheet (D- Document construction / typographic / formatting / consistency)	Goal statement has been edited.	
BASMAA Attachment	43	C10.a.i	Clarify TAL Triggers not Water Quality Objective or Effluent Limitation	clarify that Trash Action Level (TAL) is a goal or a trigger for more actions, not a water quality objective or numeric effluent limitation (B- Legal liability / Legal authority / Inconsistent with Basin Plan, Clean Water Act, and/or Porter-Cologne)	Trash Action Level has been removed from the Third Tentative Order (TO).	
BASMAA Attachment	44	C.10.a.ii.	Trash Hot Spots	confirm identification of hot spots "on State waters" is doable for all 77 permittees (B- Legal liability / Legal authority / Inconsistent with Basin Plan, Clean Water Act, and/or Porter-Cologne)	Permittees will propose Trash Hot Spots in 2010. If a few Permittees have no opportunities to clean Trash Hot Spots within their jurisdictions, they can make that case at that time.	
BASMAA Attachment	45	C.10.a.ii.	Trash Hot Spots	delete the sentence "The Trash Hot Spots will be publicized on the Water Board web page to enable public review and comment for a minimum of	Any proposal presented to the Water Board is public information. We may take this step unless the Permittees have	

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				30 days." (C- Unscientific / technically or managerially unsound)	already involved the public and stakeholders in the Trash Hot Spot selection process already.	
BASMAA Attachment	46	C.10.a.ii.	Trash Hot Spots	change last sentence, 2nd paragraph to "If no communication is received by the Permittees April 1, 2010, the hot spot selections are approved." (D- Document construction / typographic / formatting / consistency)	In the Final TO revision of the C.10 Trash Load Reduction Provision, we have stated that the Permittees can proceed with their proposed Trash Hot Spots unless they are informed otherwise.	
BASMAA Attachment	47	C.10.a.iii.	Non-Population based Permittees Hot Spots Selection	Non-Population based Permittees Hot Spot Selection – move right hand column of Table 10-1 to provision C.10.a.v. Trash Capture Requirement; the column is not related to the header of this section - selection (D- Document construction / typographic / formatting / consistency)	This table has been moved to Attachment M in the Final TO.	
BASMAA Attachment	48	C.10.a.iv.	Clarify TAL Trigger	Clarify that Trash Action Level (TAL) is a goal or a trigger for more actions, not a water quality objective or numeric effluent limitation, and change the characterization of the goal from TAL to Trash Reduction Goal (B- Legal liability / Legal authority / Inconsistent with Basin Plan, Clean Water Act, and/or Porter-Cologne)	The TAL has been removed from the Final TO.	
BASMAA Attachment	49	C.10.a.iv.	Change Date	Change date July 1, 2012 to July 1, 2014 – the date in this section, which is about achieving TALs/Trash Reduction Goals, should be after the date in the next section, which is about	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with a trash load accounting methodology proposed by the	

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				implementation to achieve TALs/Trash Reduction Goals (C- Unscientific / technically or managerially unsound)(D- Document construction / typographic / formatting / consistency)	Permittees.	
BASMAA Attachment	50	C.10.a.vii.	Booms	Booms or sea curtains – to be consistent, change reference in 3rd sentence regarding cleaning from "any storm" to be the same as the design storm in C.10.a.v. Trash Capture Requirement (one year, one hour) (D- Document construction / typographic / formatting / consistency)	Booms or Sea Curtains are not longer specifically described in the Final TO, except with regard to non-population based Permittees. While these devices will not count toward full trash capture installation, the trash removed will count toward the trash load reduction.	
BASMAA Attachment	51	C.10.a.viii.	Trash Source Reduction	support this new, positive incentive (E- Support)	Noted.	
BASMAA Attachment	52	C.10.a.viii.	Change Report Date	change reporting date from 2012 to 2013 for receiving 20% credit (D- Document construction / typographic / formatting / consistency)	The trash load reduction tracking method proposal from the Permittees will set forth the credit system for trash and litter source control measures, such as plastic bag bans.	
BASMAA Attachment	53	C.10.b.i.	Change Assessment to Modified Urban RTA	given assessment is based on counting trash items, change method to modified Urban RTA focused on that protocol (A- Affordability- Increased cost / lack of resources / need for phasing of provisions and schedules)	Assessment of Trash Hot Spot Clean ups is more flexible in the Final TO, including allowing for measuring volume of trash collected.	
BASMAA Attachment	54	C.10.b.i.	Change Assessment	change frequency of assessment from twice to once a year for each Trash	The frequency of assessment has been reduced to one a year	

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			Frequency	Hot Spot and allow flexibility for assessments to be limited to Urban RTA Parameter 1 (Level of Trash) and Parameter 2 (Actual Number of Trash Items Found) except that at least one assessment during year two (2010) and at least one assessment during year four (2012) must include all six Urban RTA Parameters (A-Affordability- Increased cost / lack of resources / need for phasing of provisions and schedules)(C-Unscientific / technically or managerially unsound)	and made more flexible in the Final TO.	
BASMAA Attachment	55	C.10.c.	Change Dates for Long Term Plan	to be consistent, change dates 2024 to 2029 (20 years = other TMDLs) and 2013 to 2014 (C- Unscientific / technically or managerially unsound)(D- Document construction / typographic / formatting / consistency)	The date for attainment of full abatement of impacts of trash to receiving waters is July 1, 2022. The Long Term Trash Load Reduction Plan is due Feb. 1, 2014.	
BASMAA Attachment	56	C.10.c.	Change Language	in each occurrence of term "no impact", add "unreasonable" (B- Legal liability / Legal authority / Inconsistent with Basin Plan, Clean Water Act, and/or Porter-Cologne)	We have avoided use of such qualifiers, as they are not well defined. The Trash Action Level (TAL) is no longer included in the Final TO.	
BASMAA Attachment	57	C.10.d.	Clarify TAL Trigger not Water Quality Objective or Effluent Limitation	in each occurrence, clarify that Trash Action Level (TAL) is a goal or a trigger for more actions, not a water quality objective or numeric effluent limitation (B- Legal liability / Legal authority / Inconsistent with Basin Plan, Clean Water Act, and/or Porter-	The Trash Action Level (TAL) is no longer included in the Final TO.	

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				Cologne)		
BASMAA Attachment	58	C.10.d.	Delete Funding as Reportable Item	in each occurrence, delete "funding" as a required reportable item (B- Legal liability / Legal authority / Inconsistent with Basin Plan, Clean Water Act, and/or Porter-Cologne)	Funding is not a required reporting parameter in the Final TO version of Provision C.10.	
BASMAA Attachment	59	C.10.d.v.	Change Due Date of Long Term Plan	C.10.d.v. Reporting: 2013 Annual Report – change due date of Long-Term Plan for Trash Abatement to 2014 Annual Report (C- Unscientific / technically or managerially unsound)	The Long Term Trash Load Reduction Plan is due Feb. 1, 2014.	
Caltrans	9	C.10	Trash Control Implementation Should Be Coordinated With TMDL Implementation	***Page 116*** **– C.10. Trash Reduction –** Reference to the ongoing installation and operation of trash control devices for the Los Angeles River and Ballona Creek may decrease the need for pilot testing in the Bay Area. **Also, solutions for trash should be coordinated with implementation plan requirements for future Trash TMDLs and other TMDLs for other pollutants**. The concern is that the devices being installed for trash TMDL are not compatible with the structural controls required for other TMDLs developed for various watersheds. The piecemeal issuance of the requirements for trash may mean that permittees such as the Department are required to implement controls prior to being aware of the total pollutant control requirements to	No Trash TMDL is currently proposed for this Region. Trash controls are due in July 1, 2014, allowing ample opportunity for coordination with efforts underway for the PCB and Mercury TMDLs, if necessary.	

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				comply with all TMDLs within the bay area.		
CCCWP	6	C.10.	More Focused and Affordable Implementation of Pilot Scale Trash Controls	The capital cost for "pilot-scale" deployment/installation of these devices in Contra Costa County alone is estimated to range from $1.5 to 33 million dollars. The operation and maintenance costs are estimated to be $1.5 million annually. A more expensive approach, in terms of capital costs, involves installation of much larger structural facilities[1] strategically deployed to treat larger catchment areas. The Countywide operation and maintenance cost for these larger structural devices is estimated to be $650,000 annually – significantly less than the inlet screens. Unfortunately, by law (Assembly Bill No. 2768) the Program's dedicated Stormwater Utility Assessment revenues cannot be used for debt financing. Therefore, the least expensive option will necessarily be employed in order to meet the "pilot scale" full trash capture requirements. To avoid these unintended consequences, the Program requests a more focused and affordable pilot-scale deployment approach, which will	The capital outlay for larger type trash capture devices will not necessarily require debt financing to cover the cost of construction. This is particularly true as grant funds are being made available for some trash capture installation.	

[1] An example of the larger type device is one used by Caltrans in Los Angeles called a Gross Solids Removal Device (GSRD).

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				help us learn: 1) what types of devices work best in different applications and settings; 2) the maintenance costs and requirements of the various devices; and, 3) the various devices' durability and parts availability.		
CCCWP	7	C.10.	Make TALs Consistent with SWRCB's Blue Ribbon Panel	Water Board staff's proposed requirements for selecting, cleaning and assessing "trash hot spots" has been improved, but still needs further refinements to make these requirements more feasible and effective, such as Revising the proposed Trash Action Level (TAL) to be consistent with the concept of action levels developed by the State Water Resources Control Board's Blue Ribbon Panel.	The TAL has been removed from the Final TO. The assessment of Trash Hot Spots has been made more flexible.	
CCCWP	8	C.10.	Revise TAL Definition	Revising the proposed Trash Action Level (TAL) to be 100 pieces of trash or less per 100 feet of creek/shoreline, instead of the Santa Clara URTA "urban optimal" category.	The TAL has been removed from the Final TO. The assessment of Trash Hot Spots has been made more flexible.	
CCCWP	9	C.10.	Credit Previously Installed Trash Capture Devices	Allowing credit for all previously installed full trash capture devices meeting the permit requirements.	All previously installed devices meeting the full trash capture definition can be counted toward this requirement.	
CCCWP	10	C.10.	Modify Trash Hot Spot Assessment Requirements	Modifying the trash hot spot assessment requirements in order to reduce overall compliance costs while still providing meaningful trash	The assessment of Trash Hot Spots has been made more flexible.	

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				monitoring information.		
CCCWP	11	C.10.	Provide Flexibility to Change Hot Spots to Achieve Maximum Benefits	Providing municipalities the flexibility and option to present justification for redirecting trash hot spot reduction measures and resources to another trash hot spot(s), where greater benefit or trash load reduction could be achieved.	The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees. If Permittees want to move Trash Hot Spots, they would need to make a proposal with supporting information.	
CCCWP Attachment	32	C.10.a.ii.	Change Timeframe and Process for Approval of Hot Spot Report	*"If ~~no communication~~ neither Executive Officer approval nor a list of requested alternative hot spot locations is received by the Permittees 60 days after the ~~close of that comment period~~ submission of their Hot Spot Report, the hot spot selections are approved."* *Reason for Change*: Water Board staff's proposed language requires a minimum of 30 days public review of the submitted Hot Spot Report on the Water Board's web page, and a maximum of 60 days following the close of the public review period for the Water Board Executive Officer to affirmatively approve the Hot Spot Report, or to request alternative hot spots. While it would seem this	In the Final TO, the Permittees can proceed to clean up their selected Trash Hot Spots unless otherwise informed by the WaterBoard.	

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				language specifies up to three months (i.e., 90 days) for either Executive Officer approval of the Hot Spot Report or a request for alternative sites, there is no timeframe for initiating the 30 day public review period. This is unacceptable, and the 60 day period for Executive Officer action seems unnecessarily long. The change requested above provides 30 days for public review of the Hot Spot Reports, and 30 days for Executive Officer action, while providing a time certain for municipal receipt of a response to their Hot Spot Report submittal.		
CCCWP Attachment	33	C.10.a.iv.	Change TAL Definition	"*iv. ~~**Trash Hot Spot Clean Up to Trash Action Level Hot Spot Goal** - Permittees shall achieve TAL by July 1, 2012, at these trash hot spots, and then maintain at least that level.~~ The trash hot spot goal (THSG) ~~TAL implemented~~ for this permit cycle, which does not represent full attainment of the Basin Plan trash prohibition or water quality objectives for trash, will be 100 pieces of trash or less per 100 foot assessment reach ~~the "Urban Optimal" level of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)~~*	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	

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				~~*version of the Water Board developed Rapid Trash Assessment method (Urban RTA) Attachment 10.1. The Urban Optimal level of the Urban RTA includes the requirements of less than 100 pieces of trash per 100 foot assessment reach, and that there be no visual impact from trash within the assessment reach.*~~ *Reason for Change*: A trash action level (TAL) should be consistent with the concept of action levels developed by the Blue Ribbon Panel of experts assembled by the State Water Resources Control Board. As defined by the Blue Ribbon Panel, an Action Level or TAL should be a numerical goal that defines a threshold for the potential need for further management actions, and is not a water quality objective or numeric effluent limit. We request that the Tentative Order clarify that the TAL is a goal, and not a water quality objective or numeric effluent limit. We also request the TAL goal be set at 100 pieces of trash or less per 100 feet of creek/shoreline, instead of the Santa Clara URTA "urban optimal" category. Having a specific number of trash items established as the TAL goal is more consistent with the goal		

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				statement provided in C.10.a.(i) and allows less subjectivity than the Urban Rapid Trash Assessment Protocol.		
CCCWP Attachment	34	C.10.a.v	Give Credit for Previously Installed Trash Capture Devices	*"Previously Installed Capture Device Credit – Credit can be claimed for trash full capture devices meeting the full capture definition and installed and maintained by the Permittees ~~before January 1, 2003~~ prior to the adoption of this Order."* *Reason for Change:* The Program sees no rationale for limiting credit or excluding any previously installed "full capture trash devices" that meet the definition and intent of this provision. Whether a "full capture trash device" was installed before or after January 1, 2003 is completely arbitrary and irrelevant. Such installations should be credited regardless of when they were installed.	All previously installed devices meeting the full trash capture definition can be counted toward this requirement.	
CCCWP Attachment	35	C.10.a.vii	Change Percentage Credit for Sea Curtains	**1. Booms or sea curtains.** Change 10% back to 25% as follows: *"Booms or sea curtains receive credit for ~~10%~~ 25% of the tributary catchment area.*	Booms or Sea Curtains are not longer specifically described in the Final TO, except with regard to non-population based Permittees. While these devices will not count toward full trash capture installation, the trash removed will count toward the	

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				Reason for Change: The December 14, 2007 Tentative Order allowed booms and sea curtains to receive credit for 25% of the area draining to the booms/curtain. It is unclear why the percentage credit was reduced, therefore we request the above change be made, which is consistent with Water Board staff's previous proposed language.	trash load reduction.	
CCCWP Attachment	36	C.10.b.i.	Change Hot Spot Assessment Method	**Trash Hot Spot Assessment.** Change this section as follows: *Permittees shall assess trash at their designated trash hot spots relative to the Trash Hot Spot Goal (THSG) ~~using the SCVURPPP Urban Rapid Trash Assessment (Urban RTA) (Attachment I). These assessments shall occur twice~~ at least once a year for each approved Trash Hot Spot~~, at the beginning and end of~~ during the dry season~~, in the spring and fall of each year, with the first assessments occurring as a part of the Hot Spot selection process, in late summer 2009, after permit adoption. If a trash assessment scores less than 10 pieces of trash per 100 feet, two years in a row, assessment can be reduced*	The RTA or Urban RTA are no longer required Trash Hot Spot Assessment methods. Simple volume of trash removed along with dominant types of trash collected can be reported.	

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				~~*to once a year.*~~ *Assessments may be limited to Urban RTA Parameter 1 (Level of Trash) and Parameter 2 (Actual Numb of Trash Items Found) except that at least one assessment during year two (2010) and at least one assessment during year five (1013) must include all six Urban RTA Parameters. The assessments shall be augmented by photo documentation as described in C.10.a.ii., which shall be reported with the assessments in the annual report.* *Reasons for Changes:* In Fiscal Year 2008/2009, Contra Costa County Volunteer Monitors conducted several trash assessments using both the SCVURPPP's Urban Rapid Trash Assessment and the San Francisco Bay Regional Water Quality Control Board's Rapid Trash Assessment Protocols. These assessments are labor and time intensive. The most time consuming aspect of both assessments involved tallying the collected trash items into the various trash categories. This fact, combined with the fact that the TAL goal is based upon the number of trash items per 100 feet of creek/shoreline, we request the assessment method require quantification of trash items at hot		

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				spots and not the URTA. Additionally, we request the assessment of each hot spot be conducted once a year during the dry season. However, we propose that the URTA be conducted once during year two (2010) and once during year five (2013). The purpose for conducting the URTA in year two is to establish a baseline, which would be based upon a one year accumulation of trash at each trash hot spot (i.e., the time between the initial assessment and clean-up conducted in late summer 2009 and the year-two URTA conducted after May 1, 2010). Information obtained in the year-two URTA (i.e., trash types, sources, and pathways) would be used to develop trash source reduction strategies in accordance with C.10.a.viii, and to refine other measures designed to meet the TAL goal. Results obtained in the year five URTA can be compared to the year two URTA, and as a method to evaluate the effectiveness of any implemented trash source reduction measures and other trash reduction measures. The proposed changes outlined above would reduce overall compliance costs while still providing meaningful trash monitoring information.		
CCCWP	37	C.10.c.	Long-Term Plan	"*The Permittees, acting individually or*	The Long Term Trash Reduction	

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Attachment			for Trash Impact Abatement	*collectively, shall create a long-term trash management plan to ~~prevent~~ further reduce trash impacts on beneficial uses within their jurisdictions to the maximum extent practicable with the long term goal of supporting ~~no impacts on~~ beneficial uses ~~from trash~~ by ~~2024~~ 2029. This plan ~~for achieving this 15-year, no-trash-impact goal will~~ shall be submitted with the ~~2013~~ 2014 Annual Reports."* *Reason for Changes*: Trash on our streets, in our neighborhoods, and in our water bodies is a societal problem. Simply understanding trash sources, pathways, and effective control measures will not be sufficient to end littering, illegal dumping, and homeless encampments, or otherwise eliminate trash impacts. Further significant trash reduction efforts will require a multitude of sustained and costly actions by local governments; institutional or legislative changes in the way products are made, packaged, sold, used and disposed of; and, significant changes in people's behaviors. The changes outlined above are necessary and reflect reality while committing local governments to significantly reducing trash in water bodies. A twenty year timeframe is	Plan is required to meet full abatement of trash impacts to receiving waters by July 1, 2022 in the Final TO.	

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				commensurate with the significant public investment that will be required for retrofitting and/or replacing significant portions of our aging drainage infrastructure with full trash capture devices.		
CCCWP Attachment	38	C.10.d.iv.	Change Trash Reporting Requirements	*"Permittees shall report the results of assessments of Trash Hot Spots, including photos, and compare assessment results with the ~~TAL~~ Trash Hot Spot Goal (THSG). Report whether the ~~TAL~~ THSG has been achieved at the trash hot spots. If ~~TAL~~ THSG has not been achieved, the Permittee shall either report on additional actions aimed at further reducing trash at each Trash Hot Spot no meeting the THSG or present justification for redirecting resources to other locations ~~to achieve this goal~~."* *Reason for Changes:* For some trash hot spots, particularly those impacted by larger and more urban watersheds, meeting the trash hot spot goal of 100 pieces of trash or less within a 100 foot reach of stream or shoreline may prove difficult to achieve. Moreover, it is conceivable that a municipality's trash reduction actions could result in significant and measurable reductions	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	

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				in trash loading or accumulation at selected hot spots while still not attaining the trash hot spot goal. In this scenario, a municipality would be required to expend an inordinate amount of public resources trying to meet an arbitrary trash reduction goal on a single trash hot spot. Consistent with the "knee of the curve" concept and the "law of diminishing returns", which has been applied in other aspects of the proposed permit (e.g., the C.3.d. treatment BMP sizing criteria), a municipality should be allowed the flexibility and option to present justification for redirecting resources to another trash hot spot(s) where greater benefit or trash load reduction could be achieved. To provide this flexibility, we request the above change.		
Contra Costa Brd of Sups Attch A	37	C.10	Trash Goals Unrealistic Consider Cost	The County concurs with the Water Board that trash is unsightly and contributes to water pollution. The MRP's requirement to plan for zero trash impacts within 15 years by 2024, though admirable, is unrealistic. The costs associated with the requirements of this section must be considered relative to the entirety of the County's responsibilities to its population and environment (as well as the economic law of diminishing returns) and should	The attainment of no trash impacts to receiving waters by 2022 is a reasonable target.	

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				be revised accordingly. Ultimately, the solution involves human behavior modifications (and incentives) that will require time to develop, and for which the County will be one of numerous proponents of this behavioral change. The County supports trash reduction, both in waterways and throughout the County. However, there are a number of specific provisions that merit revision or more wholesale reconsideration, as noted below.		
Contra Costa Brd of Sups Attch A	38	C.10.a.ii & C.10.d.i	Extend Implementation Date	The short time line for the Trash Hot Spot Selection report due February 1, 2010, is unlikely to yield the best results. Contra Costa County proposes a report date of July 1, 2010, which would allow monitoring for a full rainy season to identify the most impacted trash hot spots, and correlate the hot spots with sources of trash.	July 1, 2010 is the Final TO date for the Trash Hot Spot Selection Report.	
Contra Costa Brd of Sups Attch A	39	C.10.a.iv	Revise TAL Assessments	There are serious concerns regarding the feasibility of meeting TAL (Trash Action Level) cleanup levels within the time frame provided. Section C.10 ignores the on-the ground realities of pathways through which trash is conveyed from its sources to water bodies. It is likely that a hot spot in one jurisdiction is (primarily) the recipient of trash originating within	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	

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				another municipality. It may not be possible for a jurisdiction to address a trash source (or conveyance) located within another jurisdiction. Also, most storm drains and creeks cross jurisdictional borders, conveying trash from one jurisdiction into another. Furthermore, within the County's jurisdiction is land that, although it is within the Permittees' boundaries, is not within Permittees' actual jurisdiction (such as Caltrans right-of-ways). Provision C.10 should be modified such that a jurisdiction is not held responsible for trash originating within another jurisdiction; this would also provide an opportunity to foster increased cooperation between Permittees. The County proposes that a full baseline trash assessment (which characterize waste types) be required in Year 1 (which will be useful for public outreach and source control purposes), and that an end point full assessment be performed in Year 5. The County recommends that trash assessments during permit years 2 through 4 be limited to counting only. Setting a strict TAL may result in Permittees dedicating sufficient		

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				resources to clean up the hot spots (only) to meet the TAL, focusing on relatively small stretches of creek at the expense of cleaning up more extensive waterway reaches to attain possibly less of an improvement but over a larger area. The exhibit to the left demonstrates the complexity of jurisdictional boundaries within (and likely trash sources contributing to trash in) the Walnut Creek watershed. It would likely not be possible to identify a trash hot spot location within Walnut Creek that does not receive trash from sources in multiple jurisdictions. A more regional, collaborative approach for (at least for the "pilot scale deployment" of) trash capture devices would facilitate Permittees in addressing some more severe trash hot spots that could not effectively be tackled by a single Permittee due to sources from multiple Permittees' jurisdictions.		
Contra Costa Brd of Sups Attch A	40	C.10.a.v	Credit for Existing trash Capture Devices	Credit should be given for any full trash capture devices that have already been installed, regardless of when they were installed. The reference to January 1, 2003 should be removed from the last paragraph of Section C.10.a.v.	We agree. This revision has been made.	

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Contra Costa Brd of Sups Attch A	40.5	C.10.a.v/C.10.b.i	Justify 5mm particle retention or revise	The definition of "full trash capture device" provides for devices that trap particles retained by a 5mm mesh screen. The 5mm particle retention requirement seems to be an arbitrary and especially fine gradation that will not necessarily produce the highest degree of water quality benefit per dollar spent. This fine of a gradation also seems likely to cause storm drain systems to clog and fail, leading to flooding. Unless there is specific scientific research supporting the 5mm specification, and an appropriate corresponding cost-benefit ratio, the County requests that this specification be reviewed and adjusted appropriately (or deferred until appropriate studies can be conducted to determine the appropriate specification).	This standard has been and is being implemented on a massive scale in the Los Angeles region, so not only represents MEP for California, but is the specification that the devices readily available on the market are designed to meet. While this specification will not stop all trash, it removes a major portion down to cigarette butts in size, and still allows appreciable water flow to avoid flooding.	
Contra Costa Brd of Sups Attch A	41	C.10.c/C.10.d	Plan unrealistic	It is not realistic for any municipality to develop a plan to entirely eliminate trash impacts on beneficial uses within their jurisdictions. There will always be some level of trash (dumping/litter), and there will be a corresponding degree of trash-related impacts. Development of a collective plan for an achievable degree of trash reduction (as opposed to zero trash impact), however, is acceptable.	The Permittees, working with all stakeholders and the WaterBoard have 12 years to work on an interpretation of Discharge Prohibition A.2. and the level of evidence of clean-up that will constitute no trash impacts to beneficial uses or Receiving Water Limitations.	

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Contra Costa Brd of Sups Attch A	42	C.10.c	Consider Pilot Scale Trash Capture	The installation of full trash capture devices per Section C.10 is referred to as a "pilot scale deployment." It should be noted that the devices are to be installed by July 1, 2013, which is nearly the end of the NPDES Permit's term. This will only allow for a year or two before the release of the next iteration of the NPDES Permit. The County urges the Water Board to continue to consider the installation of full trash capture devices to be a "pilot scale deployment" for some time into the term of the next NPDES Permit (at least) so that Permittees have an adequate period of time to observe the devices' function, gain experience maintaining the devices, and develop the expertise necessary to make any subsequent "full scale deployment" efficient and successful.	The minimum Trash Capture Device installation requirement is not described as a "pilot scale deployment" in the Final TO revision. This level of trash capture in necessary to begin to meet MEP and to make significant progress toward meeting the Trash Load Reduction requirement of 40% by July 1, 2014.	
Contra Costa Brd of Sups Attch A	43	C.10.c	Consider Pilot Scale Trash Capture	One final issue the County may be forced to address in this current section as written is the legal authority to access creeks and retrofit drainage that may be candidates for trash hot spot designation and installation of full capture devices but are on private property.	The Permittee may opt to require the private property owners to implement the trash controls in those instances.	
Contra Costa Co Flood Control Attch A	6	C.10.a.iii	Not population based entity, No capture devices	The Flood Control District is a non-population based entity. With the exception of homeless encampments	In the Final TO we have clarified the requirements for non-population based Permittees.	

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				on Flood Control District property, it does not host residential, commercial or other land uses the generate trash that effects waterways. In general, the Flood Control District is a recipient of trash from outside its property, not a source of trash. There are no trash-generating activities on Flood Control property that can be mitigated with full capture devices on outfall structures to its channels. Therefore, the Flood Control District should not be responsible for implementing full capture devices on outfall structures or establishing trash booms. The Flood Control District can facilitate capture some trash through the installation of trash booms in certain locations. However, the trash collected by such an installation will principally come from sources outside the Flood Control District's property. For this reason, the Flood Control District's responsibility should be limited to cooperating with benefited cities and the unincorporated County in the installation of trash booms.		
Contra Costa Co Flood Control Attch A	7	C.10.a.iii	Shared Trash Hot Spot Responsibility	Trash Hot Spots should be established in conjunction with upstream jurisdictions and the financial responsibility for establishment and monitoring of Hotspots on Flood Control District property should be	The non-population based Permittees will have sole responsibility for a small number of trash hot spots.	

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				shared with upstream jurisdictions in proportion to their trash loading.		
Contra Costa Co Flood Control Attch A	8	C.10.a.iii	FCD Role Limited to Cooperation	While it is not reasonable for the Flood Control District to be required to install trash capture devices, it is recognized that Flood Control District property includes ideal locations for trash capture. However, the requirement of the Flood Control District should be limited to cooperating with the trash-contributing jurisdiction in establishment, operation and maintenance of trash capture devices within Flood Control District property (at the other jurisdictions' expense). The exhibit to the left illustrates the complications posed by jurisdictional boundaries within the Walnut Creek watershed. This supports the positions that the Flood Control District, as a recipient of trash (as opposed to a generator of trash) from numerous municipalities, cannot be expected to be responsible for this trash originating outside its jurisdiction. Furthermore, the reality of numerous jurisdictions contributing trash to a creek (Flood Control District property) bolsters the argument that it would be more appropriate for a collaborative approach to be employed in addressing trash. Due to the obvious potential for	The non-population based Permittees will have sole responsibility for a small number of trash capture devices. The Final TO requires that Permittees produce a Short Term Trash Load Reduction Plan. This plan will be Permittee specific. Proposals for collaborative work on trash capture could be included. It would be necessary to be clear on the contribution and credit toward compliance that would accrue to each partner in the collaborative.	

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				hotspots to provide a measure of effectiveness of regional trash management initiatives, it would be best to locate hotspots at the downstream end of Flood Control District channels. These downstream locations are also best suited for the placement of trash booms, so it would be most effective to locate hotspots and trash booms in close proximity. These downstream locations also are most likely to be receiving trash originating within a larger number of jurisdictions. Therefore, the MRP should encourage all jurisdictions to cooperate financially in the establishment of hot spots and placement of trash booms on Flood Control District property by allowing all jurisdictions in the tributary watershed to count a collaboratively funded hotspot and boom as fulfillment of all or a portion of their individual jurisdictions' trash management requirements.		
Contra Costa Co Flood Control Attch A	9	C.10.a.ii & C10d.i	Extend time for Implementation	The short time line for the Trash Hot Spot Selection report due February 1, 2010, will be difficult to meet, and may not yield selection of highest priority Hot Spots based on best available information. The Flood Control District proposes a report date of July 1, 2010. This will better allow the Flood Control	This revision has been made, the Hot Spot Selection report is due July 1, 2010.	

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				District to conduct monitoring for this purpose through a full rainy season, and will allow time to coordinate the establishment and cooperative funding of Hot Spots with the upstream jurisdictions.		
Contra Costa Co Flood Control Attch A	10	C.10.a.iv	Unreasonable to establish standard dependent on upstream actions	It is unlikely that it is possible for the Flood Control District to achieve the established Trash Action Level in any hotspot area without the successful mitigation by upstream jurisdictions contributing trash to runoff. It is unreasonable to subject the Flood Control District to a cleanup standard that is dependent on the actions of municipal entities over which it exercises no control. The Flood Control District should be required to cooperate with upstream jurisdictions by identifying and monitoring Hot Spots on Flood Control District property to assess the effectiveness of trash capture by upstream jurisdictions, but only when proportionate cost sharing is provided by all benefitted entities. Setting a strict TAL on Flood Control District regional channels could result in the need to spend a lot of resources in futile attempts to clean up 100% of trash within a few relatively short stretches of creek.	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	

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Contra Costa Co Flood Control Attch A	11	C.10.b	Change Assessment Requirements	The Flood Control District proposes that a full baseline trash assessment be performed in Year 1, and an end point full assessment be performed in Year 5; these would characterize waste types and correlate them to land uses, which will be useful for targeting public outreach and source control efforts. However, if the goal is to reach our Urban Optimal Trash Action Level, it is recommended that in Years 2-4 trash assessments be limited to counting only.	The Trash Load Baseline report is due February 1, 2012, and a 40% reduction in trash loading is to be demonstrated by July 1, 2014.	
Daly City	4	C.10	Include Exemption When Requirements Unattainable	A form of exemption needs to be included when a permit requirement is considered unattainable (such as trash requirements when pipes are mostly subterranean).	There is no exemption from the Basin Plan Discharge Prohibition, which is included in the Permit as Prohibition A.2. The requirements contain flexibility in certain key aspects.	
Danville	5	C.10	Use Comparative Needs Approach, Reduce Capital Improvement Requirements, Allow Alternative Compliance	Language in the revised TO proposes to reduce the number of full capture trash devices that would be required for Danville, but adds a significant new trash management strategy that requires cities to identify Trash Hot Spots by February 1, 2010. These Hot Spots will be public noticed and approved by the SFRWCQB. The trash Hot Spots will require cities to conduct regular maintenance, inspections, monitoring and annual reporting of the results of the Town's	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	

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				maintenance efforts. Cities will be required to achieve an interim Trash Action Level (TAL) by July 2012 of no visual trash impact and an Urban Optimal level of no more than 100 pieces of trash within 100 feet of the assessment creek reach. The TO is clear, this approach is the first phase of implementation and will allow cities time to develop expertise on trash assessments to achieve a long-term goal that will be defined during the permit term. The Town of Danville values and has always emphasized the need for litter removal in our community. Danville's current maintenance efforts that relate to trash pick-up/removal and street sweeping are well-established and successful. The new TO requirements relating to trash assessments, monitoring efforts, documentation of results and reporting back to the SFRWQCB will only serve to expend unnecessary time and effort in exchange for little gain in our community at an annual cost increase of $66,000. The fact that this is only the first step in a continuum of ratcheted up requirements is of concern to our		

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				community. Trash collection efforts in Danville are currently very effective and there is little chance for significant improvement. However, these proposed requirements will only stand to cost the Town of Danville more money and will take time and effort away from the goal of trash reduction. **Suggested Recommendation:** Implement a trash management program based on a comparative needs assessment, minimize the required reporting efforts when compliance is achieved and eliminate the minimum capital improvement requirements; or allow another form of alternative compliance.		
Danville	6	C.10	Reduce Reporting Requirements	New record keeping and reporting requirements contained in Provisions C.3. New Development, C.6 Construction Site Controls, C.5. Illicit Discharge and Detection. And C.10 Trash. These efforts will require the creation of data base systems, employee training and considerable implementation time preparing reports that will have little impact on the environment. The Town does not have adequate resources available for these purposes and suggests that program funds be more effectively spent elsewhere.	The record keeping and reporting requirements in the Permit in general and Provision C.10 in particular have been reduced to the minimum necessary to determine compliance.	

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				Suggested Recommendation: Reduce the extensive data base reporting requirements outlined in the proposed permit for both local agency and SFRWQCB benefit, and devote available staff resources toward program implementation.		
Fairfield	1	C.10	Trash Capture Requirements Overly Prescriptive	Our review of the Revised TO indicates that Water Board staff has made modifications and improvements relative to the previous MRP, particularly the "core" municipal stormwater management program elements that address municipal and industrial operations, construction inspection, public information and outreach. However, we still have some major concerns with the trash requirements. The Revised TO requires that capture devices be installed to drain a total of 30% of the retail/wholesale/commercial land use amount for the City. This proposed approach to solving the trash problem is overly prescriptive, and does not recognize a variety of possible trash and litter problems within the City (e.g., homeless living adjacent to creeks).	The minimum Trash Capture requirements have been significantly reduced for the First TO. This level of trash capture is necessary to begin to meet MEP and to make significant progress toward meeting the Trash Discharge Prohibition A.2. and Receiving Water Limitations by Year 12, and the Short Term Trash Loading Reduction Requirement of 40% by July 1, 2014.	
Fairfield	24	C.10.a(iv)	Clarify Definition of TALs	A trash action level (TAL) is consistent with the concept developed by a panel	The TAL has been removed from the Final TO. The primary	

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				of experts assembled by the State Board. As defined, a TAL is a numerical goal that defines a threshold for the potential need for further management actions. It is not a water quality objective or numeric effluent limit. We request that language be revised to make the TAL definition more clear. In addition, we recommend that the TAL be set at 100 pieces of trash or less per 100 foot of creek/shoreline instead of the proposed SCVURPPP "urban optimal" category. Having the number of trash items as the TAL is more consistent with the goal statement presented in provision C.10.a (i). It permits less subjectivity than the Urban Rapid Trash Assessment Protocol. In addition, it allows Permittees to focus on reducing the level of trash at a hot spot to a defined endpoint.	accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	
Fairfield	25	C.10.a(vii)	Why percentage credit for sea booms changed?	The previous version of the draft MRP Tentative Order allowed non-tidal booms or sea curtains to receive credit for 25% of the area draining to the booms/curtain. It is unclear why the percentage credit was reduced to 10% in the Revised TO. We request that the original percentage (i.e., 25%) be reinstated as the percentage of the draining area required to be addressed by full trash capture devices.	There is no direct reference to booms or sea curtains in the Final TO, except with regard to non-population based Permittees, and these devices will not meet the full trash capture standard. Trash removed from such devices would be credited toward the Short Term Trash Load Reduction Goal.	

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Fairfield	26	C.10.b(i)	Change Assessment Frequency	It is unclear what scientific basis was used to establish the frequency of twice per year for conducting assessments at each approved trash hot spot. Based on the numerous trash assessments conduct by other stormwater programs (i.e., SCVURPPP) within the Bay Area, we believe that this frequency could be reduced to once a year and still achieve the objectives stated above. In addition, if the TAL is based on the number of trash items per 100 feet of creek/shoreline, it is unclear why Rapid Trash Assessments (RTAs) are needed. As a result, we request that the assessment method require the quantification of trash items at hot spots but RTAs not be conducted. RTAs require additional time, resources and yield subjective data that are not specifically needed to address the TAL.	The required Hot Spot assessment frequency has been revised to once per year. The TAL is no longer in the Final TO revision of Provision C.10.	
Fairfield-Suisun Sewer District	32	C.10.a through C.10.d	Do Not Have Authority to Clean Hot Spots or Operate Trash Capture Devices	The District does not own, operate or maintain flood control channels, culverts, ditches or stormwater outfalls. As a result, the District does not have the authority to cleanup hot spots, or operate and maintain full capture treatment devices in the creeks of Fairfield and Suisun City. Furthermore, the District lacks the land use authority on which a permittee	The Fairfield-Suisun Sewer District has been removed as a Permittee in the Final TO, as it is not a flood control entity.	

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				may rely on to control sources of litter. The District should be removed from all requirements contained in Provision C.10.		
Kolb, Larry & James, Roger	34	C.10	Does not Make Significant Progress toward compliance with Discharge Prohibition	The Trash Reduction program contained in the February 2009 MRP is considerably weaker that that contained in the December 2007 draft MRP, does not represent significant progress towards compliance with the ***Discharge Prohibitions*** and needs to be replaced with the elements discussed below. The discharge of trash and solid waste to the Bay Area's creeks, wetlands, Bay and Ocean have been prohibited in Water Board's water quality plans and policies since the mid 60's, Basin Plans since 1975 and have been prohibited in countywide NPDES permits for over 18 years. The Permittees have been implementing municipal maintenance practices and public education programs for over 15 years that are aimed at reducing the discharge of gross pollutants including trash. However, ongoing violations of the NPDES Permits discharge prohibitions and receiving water limitations have been well documented by the Water Board staff's Rapid Trash	The Final TO incorporates the Trash Discharge Prohibition (A.2. in the TO) into the requirements, and calls for both a Short Term Trash Load Reduction Plan, and attainment of compliance with the Discharge Prohibition by 2021.	

[2] National Research Council, 2009, *Tackling Marine Debris in the 21st Century*

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				Assessment Protocol, testimony received by the Water Board on March 14, 2007 and 303(d) submittals of February 28, 2007. We find it disturbing that the February 2009 MRP makes no mention of the recent listing of 26 water bodies impaired by trash and doesn't use that list to prioritize the "hot spots" for initial enforcement action. The Los Angeles Regional Water Quality Control Board has taken aggressive regulatory action to address trash in that region's waterways. Its actions have been appealed to the State Board; have been upheld by the courts and approved by the State Board and USEPA. The magnitude of and impacts on the environment from trash in the Bay Area's waterways are comparable or greater than found in Los Angeles. The Bay Area's trash control program should be at least as aggressive as that in Los Angeles and have compliance schedules at least as restrictive. The National Research Council has recommended the adoption of a goal of zero discharge of waste into the marine environment including land-		

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				based marine debris, derelict fishing gear, shipborne waste and abandoned vessels.[2] The report addresses multiple types of marine debris and notes that plastics are now ubiquitous in the oceans and along coasts creating ecological and socioeconomic impacts.		
Kolb, Larry & James, Roger	35	C.10.a.i	Revise Goal Statement	The statement is extremely weak and needs to be replaced with Goals, Objectives and Implementation Strategy. The Goal must state: Establish a target of zero trash in creeks, wetlands and the Bay and Ocean to be achieved by 2020.	The Goal Statement has been Revised. The long term goal or target of no trash impacts and compliance with the Discharge Prohibition A.2. on trash is set for 2021.	
Kolb, Larry & James, Roger	36	C.10.a.i	Revise Objectives	The Objectives of the Permit must include: State that implementation of this permit shall address water bodies listed in the recent 303(d) listing revisions and state that additional water bodies may be added as additional areas of impairment are identified.	This permit is intended to address all waterbodies within the Permittees jurisdiction, so includes those waters proposed for 303(d) listing for trash.	
Kolb, Larry & James, Roger	37	C.10.a.i	Revise Objectives	Require 10% annual reductions in the volume and mass of trash ***discharged*** by the Permittees through compliance with Discharge Prohibitions A with a 30% reduction to be achieved by 2014.	The Final TO requires a 40% reduction in trash loads by 2014.	
Kolb, Larry & James, Roger	38	C.10.a.i	Revise Objectives	Require documentation of the reductions in the volume and mass of	The Final TO does this.	

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				trash through installation of full capture devices or an increased level of effort of municipal maintenance practices.		
Kolb, Larry & James, Roger	39	C.10.a.i	Revise Implementation Strategy	The Implementation Strategy must: State the RWQCB's intention to establish "acceptable" levels of trash in creeks, wetlands and Bay and Ocean that do not constitute a nuisance, adversely affect beneficial water uses and/or cause a contamination by 2019. SFEI should conduct the studies necessary to determine the "acceptable" levels of trash.	Currently the Final TO requires compliance with the Discharge Prohibition and Receiving Water Limitations by 2021. We believe there will be ample discussion once the short term goal of 40% reduction is achieved during this permit term on the subject of "how clean is clean" practicably for trash, and if any level of trash in waters is "acceptable".	
Kolb, Larry & James, Roger	40	C.10.a.i	Revise Implementation Strategy	Require Permittees to develop a Trash Control Program including identification of full capture devices, design and siting criteria, siting plans, funding for construction and long-term (say 50-years) life-cycle operation and maintenance costs of devices	Trash capture device installation is required as part of the Short Term Trash Load Reduction Plan. There is a requirement for adequate maintenance of the devices, but not life-cycle cost funding up front.	
Kolb, Larry & James, Roger	41	C.10.a.i	Revise Implementation Strategy	Require Permittees to submit a monitoring plan that will document the reductions in the ***discharge*** of the volume and mass of trash and compliance with the Prohibitions.	The Short Term Trash Load Reduction Plan shall contain a methodology to document loads prevented or reduced from discharge.	
Kolb, Larry & James, Roger	42	C.10.a.i	Revise Implementation Strategy	Require applicants for water quality certifications for storm water discharges to install full capture devices (new and rehabilitation of storm water pump stations, flood control projects and new outfalls	This comment is not directly pertinent to the MRP RTO. We have asked such applicants to consider trash capture in some instances.	

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				serving high trash generation land uses).		
Kolb, Larry & James, Roger	43	C.10.a.i	Revise Implementation Strategy	Include an enforcement program that encourages use of federal stimulus funds, state grants and State Water Pollution Cleanup and Abatement Account funds and state that failure to pursue these funding opportunities is failure to achieve the MEP standard.	It is not clear what the commenter means by "enforcement program". There is a requirement for installation of trash capture, and there are grant funding opportunities. We do not require pursuit of grant funds, but failure to meet the trash capture requirements would constitute non-compliance, which could be subject to enforcement.	
Kolb, Larry & James, Roger	44	C.10.a.i	Revise Implementation Strategy	Urge Permittees to include and address gross pollutants including pollutant bound sediments and vegetation as part of the trash control program.	The definition of trash and litter does not include sediment. Vegetation residues from human activity, such as lawn and shrub clippings dumped would be considered trash.	
Kolb, Larry & James, Roger	45	C.10.a.ii.	Replace Hot Spot Selection Method	**(page 77)** This section must be replaced with a finding that the RWQCB recently proposed revisions to the 303(d) list of impaired water bodies that added 26 water bodies where beneficial uses have been impaired by trash. The permit must contain a list of each water body and the Permittee in the water body's catchment/watershed. The focus of this permit must be on these water bodies and there is no need for further assessments by	The Final TO requires trash load reduction on the Permittees' entire jurisdiction. The 26 water bodies proposed for 303(d) listing are certainly not the only or even most trash impacted water bodies, but are those with the most substantial body of evidence for this listing cycle. Therefore while they are of significant concern and must be cleaned up, they are by no means the priority waterbodies in	

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				Permittees. Additions to this listing of water bodies should be permitted pending the next 303(d) update/revision if evidence is provided that meets the 303(d) listing criteria.	the Permittees jurisdictions.	
				The previous draft permit required that Permittees to identify trash impacted areas in 10% of a significant portion of the urbanized area. An analysis of the ABAG data for Contra Costa County indicates that previous draft would require programs to control trash for over 14,000 acres while the proposed permit would require trash control programs in only about 1,500 acres – a very significant reduction in the trash control requirements.	Noted.	
				The proposed revision would require development and implementation of trash control programs in those watersheds where impairment of beneficial water uses has been determined by the Regional Board through the 303(d) process rather than an arbitrary designation of a percent of an area.	There are many more waters in the Region impacted and impaired by trash than those proposed for listing.	
				Some Permittees have demonstrated that they cannot be objective in selecting sites and evaluating trash levels in their water bodies. The Santa	The Final TO requires the Permittees to reduce trash loads from their entire jurisdiction in an accountable manner.	

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				Clara program in a recent annual report indicated significantly improved conditions over previous years whereas information provided by Larry Johnman and others clearly show ongoing significant levels of trash in creeks. Comments submitted by several Permittees on the recent proposed revisions to the 303(d) list suggested that their programs have resulted in significant reductions in the amount of trash. These contentions were made based in part on observations made during the summer months where trash discharged during the wet weather months had long become imbedded in sediments and vegetation making objective observations impossible. These assertions of significant improved conditions are disingenuous at best. In summary there is no valid basis for another process to identify trash hot spots when the Regional Board has recently identified 26 water bodies that have been impaired by trash. Permittees should now focus their efforts and resources on programs to comply with the prohibition of the ***discharge*** of trash in the watersheds of the 26 water bodies.	Limiting Hot Spots to the 26 waterbodies proposed for listing would unduly limit the Permittees' efforts to address the trash impacts problem.	
Kolb, Larry &	46	C.10.a.iv	TAL Standards	**(page 79)**	The TAL is no longer a	

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James, Roger			Not Permanent	There is a danger that the proposed "Urban Optimal" Trash Action Level (TAL) will become a permanent standard even though the section indicates that the TAL does not represent full attainment of the Basin Plan (NPDES Permit) trash ***discharge*** prohibitions or water quality objectives. Historically interim standards become permanent standards unless there is a clear and concise scientific well funded process for refining a standard. The section should state the process that will be used to develop final acceptable levels of trash through SFEI. This section should also make it clear that the Transportable, Persistent, Bouyant Litter shall be <25 pieces and no Biohazard, Toxic or Sharp Objects shall be present as part of the TAL in addition to the <100 trash items.	component of the C.10 provision in the Final TO. The short term requirement is 40% load reduction in four years, and compliance with the Discharge Prohibition A.2. and Receiving Water Limitations by year 12 or 2021.	
Kolb, Larry & James, Roger	47	C.10.a.v	Don't accept L.A. type catch basin inserts.	The definition of a Full Trash Capture Device is adequate provided there is not an implied acceptance of catch basin inserts that have been approved by the Los Angeles RWQCB (see Fact Sheet page 71 and later discussion on the effectiveness of catch basin inserts). The section should indicate that compliance with the Discharge Prohibitions can be achieved through the installation of Full Trash Capture	Storm drain catch basin inlet inserts meeting the Full Trash Capture standard will be allowed and credited under the Final TO. They are functional and useful devices in the tool box of trash abatement technologies.	

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				Devices for 30% of the ABAG land use categories (high density residential ->8 units/acre, industrial, major infrastructure, military, commercial services) in those water bodies that have been 303(d) listed as impaired by trash by July 1, 2013 and 10% of the land uses annually until 2019 when 80% coverage would be achieved.		
Kolb, Larry & James, Roger	48	C.10.a.v.	Credit for previous installation	Permittees that have installed Full Capture Devices before the effective date of the permit should be able to claim credit. A number of cities and entities have installed CDS devices since 2003 that are effectively removing trash including Cities of Oakland, South San Francisco, San Francisco, Port of San Francisco, and Port of Oakland and should be given credit.	Previous installations of Full Trash Capture Devices are credited toward the requirement in the Final TO.	
Kolb, Larry & James, Roger	49	C.10.a.vi.	Revise exemption and required monitoring	Small Permittees discharging to trash impaired water bodies should only be exempt from installation of full capture devices if they document that no trash is ***discharged*** from their storm drain systems through end-of-pipe monitoring for a period of three years.	This option may also be available to the Permittees, but the exemption for very small Permittees does not include such discharge verification. This can be reviewed during this permit cycle in preparation for the next permit requirements.	
Kolb, Larry & James, Roger	50	C.10.a.vii	Also Give Credit for Trash Removal	**(page 80)** Granting credit for booms and sea curtains endorses the acceptance of the ***discharge*** of trash and violation of	The credit described is included in the concept of the Short Term Trash Load Reduction Plan and credit methodology. The credit is	

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				the ***Discharge Prohibitions***. If these credits are given why not provide a similar credit for cleanup programs where trash is removed from creeks by volunteers. It is poor public policy to provide a reward for cleanup of pollutants that have been ***discharged*** in violation of an NPDES Permit when the emphasis must be on compliance with a prohibition. Any credit provided should be in the form of the type and level of enforcement actions or amount of civil monetary penalties assessed. If credits are to be given then the mass and volume of material removed must be determined and credited as part of the reduction.	not, however, from civil enforcement, but toward meeting the 40% reduction.	
Kolb, Larry & James, Roger	51	C.10.a.viii	Trash Source Reduction	The proposed actions to reduce solid waste and litter are commendable and must be part of every Permittee's compliance strategy and strongly encouraged by the RWQCB; however, unless these actions can be directly translated into compliance with the ***Discharge Prohibitions*** a Permittee should not be granted relief from the trash capture installation requirement. Any relief or credits provided should be in the form of the type and level of enforcement actions or amount of civil monetary penalties assessed. If credits are to be given then the mass and volume of material removed must	Both minimum trash capture and trash load reduction are required in Provision C.10 in the Final TO. The Discharge Prohibition is the 12 year target.	

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				be determined and credited as part of the reduction and no rewards should be made for just making efforts.		
Kolb, Larry & James, Roger	52	C.10.a.viii	TRASH HOT SPOT ASSESSMENT	Use of the Rapid Trash Assessment to monitor levels of trash in water bodies is contrary to the requirement to comply with the ***Discharge Prohibitions***. Permittees must focus their efforts on installation of Full Capture Devices and municipal maintenance practices that reduce the ***discharge*** of trash impaired water bodies and monitoring the reductions in the discharge of trash using Caltrans protocols. The Rapid Trash Assessment protocols will be a useful tool in establishing acceptable levels of trash that do not adversely affect beneficial water uses, cause a nuisance and/or contamination. The impairments to the water bodies 303(d) listed are so gross that Rapid Trash Assessments in these water bodies would be a waste of limited public resources that must be better spent on implementing trash control programs and not studies. The RWQCB should be developing through SFEI a program to determine acceptable levels of trash using g the Rapid Trash Assessment protocols as a beginning point. This program would be initiated only after there have been	While the Final TO still requires assessment of Trash Hot Spots annually, this assessment can be a simple tabulation of the trash volume removed from the Hot Spot. The Short Term Trash Load Reduction Plan is focused on implementation of trash prevention and removal actions, in addition to the minimum trash capture installation.	

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				significant – 70-80% reductions in the mass and volumes of trash being currently ***discharged***.		
Kolb, Larry & James, Roger	53	C.10.c.	Long Term Plan	**(page 81)** This section should address compliance with the ***Discharge Prohibitions*** and Water Quality Standards and require that the Long-Term ***Program*** include the following elements: Full Capture Devices Identification of full capture devices including sizing and design criteria Funding for construction and long-term operation and maintenance for a long-term (say 50-years) life cycle of the devices. Implementation schedule Municipal Maintenance Practices Monitoring program to document reductions in mass and volume of trash ***discharges*** Evaluation of new and improved maintenance practices to reduce ***discharges*** of trash Long-term funding program Relevant Laws and Ordinances Monitoring/evaluation program to document reductions in mass and volume of trash ***discharges*** Funding for long-term oversight of the program	The Short Term Trash Load Reduction Plan contains these elements. We expect the Long Term Plan to build upon these elements, but also contain them. We do not currently ask for information on long term maintenance funding and oversight as it is sufficient to require that the actions occur, not that the funding is secured.	

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Kolb, Larry & James, Roger	54	C.10 Fact Sheet	COSTS OF TRASH CONTROL – FACT SHEET – (page 70)	**COSTS OF TRASH CONTROL – FACT SHEET – (page 70)** The Fact Sheet contains information on the costs of Full Capture Devices (CDS Units) installed by the City of Oakland at Lake Merritt and describes the City of Los Angeles storm drain catch basin program to control trash. An investigation of the City of L.A.'s claim on the .90% efficiency and overall performance of the catch basin inserts and trash excluders raises significant questions about the effectiveness of the City's program to control trash. The basis of the Los Angeles RWQCB's approval of catch basin inserts is highly questioned as it appears that the City submitted and the RWQCB accepted erroneous information. The City's report "Catch Basin Inserts; Method to Determine CB Inserts Act as Full Capture Devices" and "Technical Report: Assessment of Catch Basin Inserts" can be found at http://www.lastormwater.org/Siteorg/download /pdfs/general_info/Request-Certification-10-06.pdf. Attempts to clarify and obtain more information on the protocols used to characterize the material removed by the catch basins	The level of trash capture required in this permit cycle is relatively small for the Permittees' jurisdictional area, but still amounts to an estimated $26 million investment. Inlet screens are one of the options for trash capture, and more will be learned about their effectiveness and costs both here and in the L.A. area over this permit term.	

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				and CDs unit and on the maintenance program from City staff have been unsuccessful. The reports and field observations in the enclosed CD raise very significant questions about the effectiveness of that program: The >90% effectiveness of the catch basin inserts was determined dividing the weight of material removed from the catch basins by the weight of the material removed from the catch basins plus the weight of only the ***floatables*** removed from the CDS units. The material removed from the catch basins included the ***floatables***, sediment and vegetation while only ***floatables*** were removed from the CDS unit. Data from a number of cleanouts of CDS units and studies by Caltrans and others to determine the relative percent of the total mass that can be attributed to ***floatables***, indicates that it is less than 5%. Based on data from cleanout of CDS units it is estimated that the catch basin inserts were no more than 10-15% effective rather than the >90% asserted by the City. The efficiency of catch basin inserts cannot possibly be the 90% reported by the City because significant amounts of trash were collected in the CDS unit down stream of the catch		

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				basins even with storms that were only 0.28-inch and 0.31-inch. A >90% catch basin efficiency for design storms should produce no trash in the CDS unit and someone should have picked up on this. During the efficiency study catch basins were cleaned after storms with depths greater than 0.25-inch while in actual practice the City apparently only performs maintenance two to three times a year. An analysis of rainfall data for Los Angeles indicates that there are about 12 storms a year where rainfall exceeds 0.25-inch. In the Bay Area we have about double that number of storm events so maintenance based on the Los Angles criteria would have to be significantly increased. Maintenance requirements and frequency of maintenance of catch basin inserts has been the subject of multiple studies and depending on the design and physical features it is reasonable to expect that maintenance frequencies of significantly greater than three times per year are required. Several studies suggested that maintenance is required on a storm event basis and even during storm events may be required.		

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				Another factor that seems to have been overlooked when considering catch basin inserts is that many land uses such as high density residential, commercial, industrial, schools, sport complexes, etc have extensive drainage systems with multiple storm drain inlets. A field visit to three commercial shopping centers and two schools found that the number of storm drain inlets in each case to significantly exceed those on the adjacent public streets. In order for catch basin inserts to be effective municipalities would be required to develop and implement programs that would require installation on private property and at schools where they currently may not have authority. It is highly questionable whether the municipalities have the resources to provide periodic replacement and the required maintenance on their own systems much less provide the oversight of catch basin inserts on private properties.		
Pacifica	3	C.8.e.i(3), C10	Control actions unpredictable	The control actions needed to comply with some of the permit's requirements are unpredictable because they may be triggered by monitoring results, such as Provision C.8.e.i.(3). An additional uncertainty is posed by	The Final TO C.10 Trash provision contains predictable targets that the Permittees shall meet with predictable actions.	

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				having to achieve an arbitrary and potentially unrealistic trash and litter clean up level.		
Pacifica	20	C.10	Should not be used to address direct dumping, litter and wind transport	Municipal separate storm sewer (MS4) permit should not be used to address trash and litter in creeks from direct dumping, littering, and wind transport. Remove requirements for controlling trash and litter that end up in creeks from sources other than MS4s owned or operated by Permittees.	The Final TO does not contain direct requirements to clean up such trash where it is clearly proven that the source is only from non-MS4 pathways. However, cleanup of Trash Hot Spots is credited toward reaching the Short Term Trash Load Reduction of 40% in July 1, 2014.	
Pacifica	21	C.10	Trash Assessments Once Every 5 Years	The requirement to assess trash hot spots twice a year detracts from efforts that could more usefully be spent correcting trash and litter problems. Modify the permit to reduce the trash assessments requirements to once every five years. In addition, the sentence about reducing the assessments if less than 10 pieces of trash per 100 feet are found should be removed.	Required assessments have been simplified and reduced to once a year.	
Pacifica	22	C.10	TALs should be goals note requirements	The permit proposes a trash clean up (action) level for what it terms trash hotspots that should be expressed as a goal and not an inflexible mandate because of uncertainty about what levels of trash reduction is needed to protect beneficial uses and what levels are reasonably achievable.	The TAL has been removed from the Final TO. However, the Short Term Trash Load Reduction is a requirement.	
Pacifica	23	C.10	Reduce capture	The requirement to install full capture	The Final TO minimum trash	

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			20% commercial land use area	devices on 30% of the ABAG 2005 Retail/Wholesale Commercial Land Use area is too ambitious. The installation of full capture on 20% of this land use is a reasonable level of implementation as part of what the permit characterizes as an initial pilot scale deployment. Due to infrastructure issues, costs associated with meeting this requirement are unreasonable for the City of Pacifica.	capture requirement remains at 30% of Wholesale/Retail Commercial Land. This is a relatively small trash capture requirement and can not be further reduced to be meaningful.	
Pittsburg	10	C10.iv	Clarify the size of particle considered trash	The City requests clarification of the size of particle that is considered a piece of trash. Section v. references the installation of full trash capture devices that trap particles retained by a 5mm mesh screen, therefore if 5mm is the size that defines a particle of trash, the Urban Optimal level requirement of "less than 100 pieces" would easily be exceeded if say, a single Styrofoam container were to disintegrate.	Any particle of trash or litter that could have an impact on water quality is a piece of trash. Piece counting trash assessments are no longer required in the Final TO.	
San Pablo	5	C.10	Opposed to trash capture, No single pathway	We are once again opposed to installing trash capture devices since it assumes that trash only enters the water bodies via the storm drain system.	Trash capture systems are one of the tools to reduce trash impacts. The amount of trash capture in the current revision is a reasonable component of a trash management approach.	
San Pablo	6	C.10	TALs should be goals	Per the findings of the Blue Ribbon Panel, Action Levels are meant to be goals. Please clarify so that it is not	The TAL has been removed from the Final TO.	

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				mistaken to be a water quality objective.		
San Pablo	7	C.10	More credit for sea curtains	The previous TO allowed for a 25% credit for sea curtains but the revised TO reduced it to 10% without any justification. Sea curtains are viable options in some areas and should be given more credit.	Under the Final TO booms or sea curtains are not credited for trash capture, except for non-population based Permittees, but the trash removed by such a system counts towards the Short Term Trash Load Reduction requirement.	
San Pablo	8	C.10.c.	No impact to beneficial uses unrealistic	Provision C.10.c. which requires no impact to beneficial uses in the long term is unrealistic. Even if all catch basins were equipped with the expensive trash capture devices, illegal dumping and homeless camps are societal issues that will require resources outside the stormwater program's purview to resolve. Please see proposed language in the County Program's comments.	The language of the Discharge Prohibition A.2. and the Receiving Water Limitations is clear, trash should not be discharged to waters. The discussion of the exact nature of the standards for the 12 year goal of no trash impacts will be further discussed during this permit term.	
San Pablo	9	C.10	Allow changing of Hot Spots for Effectiveness	In certain hot spots, it may be difficult to meet the requirement of 100 pieces of trash within a 100 foot reach of creek. However, if the municipality has substantially reduced the amount of trash in that particular area, it would be more cost effective to move to another hot spot rather than spend more resources to get to the 100 piece goal.	The TAL has been removed from the Final TO. Trash remove from hot spots is credited toward the 40% reduction in 4 years, and the target for hot spots is substantial reduction of trash.	
San Ramon	2	C.10.a.v.	Trash Capture	The Revised Tentative Order creates	The minimum trash capture	

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			for Commercial Areas Unfunded Mandate	many new, unfunded mandates that may or may not have an impact on local water quality. For example, Section C.10.a.v. of the Revised Tentative Order requires the installation of full trash capture devices for 30% of the retail/wholesale commercial land use within the City's jurisdiction by July 1, 2013. This section is a prime example of an expensive mandate that makes several assumptions that are not applicable to all stormwater programs throughout the Bay Area.	requirement is based on the work done in the L.A. area and now represents MEP. The amount of trash capture installation required is reasonable and a balanced component of an integrated approach to trash load reduction.	
San Ramon	3	C.10.a.v.	Other Methods to Reduce Trash, Funding for Full Capture Devices Not Available	The first assumption is that existing trash control measures are not effective in reducing or eliminating trash from our creeks. The City of San Ramon has found that regular street sweeping (up to once per week) combined with extensive landscaping (captures trash before entering the street) and manual litter removal through a Citywide Landscaping and Lighting District has been very effective in reducing trash in our creeks. Our extensive public education efforts contribute to the reduction of littering as well. The second assumption is that local jurisdictions have the funding to install full trash capture devices. Under the	The Final TO credits all actions that remove trash from the MS4 or waters toward the Short Term Trash Load Reduction requirement. We understand that trash capture will require new resources, and are assisting in obtaining grant funds for trash capture installation. We recognize that trash discharged through the MS4, while a major source of impacts to waters, and is not the only source.	

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				proposed requirements, 30% of the retail/wholesale commercial land use in the City of San Ramon totals 82 acres. Brown and Caldwell Environmental Engineering provided a conservative estimate to the Contra Costa Clean Water Program for the installation of full trash capture devices for this area. Based on a cost of $17,400 per acre, the City will be required to spend $1,430,280 on treatment devices by July 1, 2013. This cost does not include funding for right-of-way acquisition or the relocation of utilities. Finally, this section assumes that all trash enters our local creek through the storm drain system. Installation of full capture devices will not have an impact on trash that enters the creek through other conveyances such as illicit dumping and windblown trash.		
Save the Bay	2	C10	Provisions Inadequate Response to Trash Problem	The trash provisions contained in section C.10 are a woefully inadequate response to the documented negative impacts of trash on beneficial uses of Bay Area waters, the Regional Board's recently approved 303(d) listings for trash impairment, explicit direction to staff from Regional Board members, the *Implementation Strategy to Reduce and Prevent Ocean Litter* of	With the changes contained in the Final TO, we believe the Provision C.10 approach is a framework of requirements that will generate significant progress in trash load reduction to waters, toward a goal of complete cleanup in 12 years.	

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				Governor Arnold Schwarzenegger's Ocean Protection Council, and the escalating public demand to reduce marine debris. For all of these reasons, and because Save The Bay has daily direct experience with trash pollution through our shoreline restoration programs, we focus these detailed comments on the RTO's proposed permit provisions for trash.		
Save the Bay	3	C10	Should Address Trash Before TMDL Development	The Regional Board formally acknowledged the extent of trash pollution throughout the Bay in February of 2009 when it voted to list as 24 tributaries and two large sections of Bay shoreline as impaired by trash under section 303(d) of the federal Clean Water Act. As members of the Board noted during public hearings on this action, levels of trash in regional waters demand attention and these listings add to the impetus to tackle the problem with effective controls that can be mandated through permitting actions. Board staff also stated at a January 2009 public hearing that the Municipal Regional Permit can and should address recent 303(d) listings for trash impairment in a more timely fashion than waiting many years for the development of Total Maximum Daily Load requirements. The trash provisions of	We agree.	

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				this regional stormwater permit must be responsive to the serious water quality impairments documented in the Board's recent 303(d) listings.		
Save the Bay	4	C10	Trash Discharge must be Eliminated to Comply with Basin Plan	The RTO's descriptive language acknowledges "*the ubiquitous, unacceptable levels of trash in waters of the San Francisco Bay Region….*"[3] *"Observations made by members of the public and Regional Board staff since 1997 indicate a preponderance of trash in, on and near water bodies, particularly in urban portions of streams, lakes, and coastlines throughout the San Francisco Bay Region.*"[4] This discharge of trash and marine debris must be eliminated to comply with the Basin Plan, as well as other applicable state and federal laws and regulations. The Regional Board has a clear legal mandate for this action. As cited in sections A and B of the RTO, the **Basin Plan** explicitly prohibits discharges of "*rubbish, refuse… or other solid wastes into*	We agree. The Final TO C.10 Provision is written to make substantial progress toward compliance with the Discharge Prohibition A.2. in 12 years.	

3 Revised Tentative Order Municipal Regional Stormwater Permit Fact Sheet section C.10-4, p.67

4 Ibid, 12.

5 The Fourth Appellate District Court of Appeal. January 2006. City of Arcadia et al. v. State Water Resources Control Board: 17.

6 Ibid.: 16.

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				surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas." Receiving water limitations prohibit discharges that cause "*floating, suspended or deposited macroscopic particulate matter, visible, floating suspended or deposited oil or other products of petroleum origin*," such as plastics, or "*substances present in concentrations or quantities that would cause deleterious effects on aquatic biota, wildlife or waterfowl, or that render any of these unfit for human consumption.*" As the California Court of Appeal noted in its decision on the Los Angeles River TMDL, the Los Angeles Regional Board established that Basin Plan requirements provide the authority for mandating a goal of zero trash, since: "*Even small quantities [of trash] can maim and kill wildlife, [which] becomes entangled in it or ingest[s] it. [Trash] [c]an obstruct and repel boaters and contact recreators and compromise the aesthetic quality that's essential to the recognized aspect of non-contact recreation beneficial use for the Los Angeles River.*"[5] The Los Angeles Regional Board *"found no study to document*		

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				that there is an acceptable level of trash that will cause no harm to aquatic life."[6] A majority of beneficial uses of the San Francisco Bay and its tributary watersheds are affected by elevated trash levels, including non-contact and contact recreation (REC-1, REC-2), estuarine habitat (EST), marine habitat (MAR), fish migration (MIGR), rare and endangered species (RARE), fish spawning (SPWN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), commercial and sport fishing (COMM) and wildlife habitat (WILD).		
Save the Bay	5	C10	303d Listing Provides Additional Legal Authority	The **Clean Water Act** requires that MS4 permits "*include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*"[7] and federal regulations require MS4s to control pollutant discharges that will cause or contribute to *"an excursion above and State water quality standard, including state narrative criteria for water quality.*"[8] In early 2009, the Regional Board took decisive action to recognize 24 tributaries and two shoreline sections	We agree.	

7 Clean Water Act 402(p)(3)(B)(ii)

8 Federal NPDES Regulation 40 CFR 122.44(d)(l)(i)

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				of the Bay as impaired by trash under the Clean Water Act section 303(d). Action by the U.S. Environmental Protection Agency to approve the 303(d) listings is reasonably foreseeable and provides additional legal authority for the Regional Board to issue an MS4 permit that reflects the severe, established, widespread nature of the regional trash pollution problem.		
Save the Bay	6	C10	Should Address Marine Debris	The problem of marine debris is so dire and pervasive that Governor Arnold Schwarzenegger's California Ocean Protection Council has adopted a statewide *Implementation Strategy to Reduce and Prevent Ocean Litter.* That strategy says "*Regional Water Boards should amend Municipal Separate Storm Sewer System (MS4) permits to require that municipalities install storm sewer catchment devices or otherwise prevent litter from entering waterways that lead to the ocean.*"[9] In addition to the Basin Plan and the Clean Water Act, the **Comprehensive Conservation and Management Plan** (CCMP) recognizes that the "*full use of*	We agree.	

9 California Ocean Protection Council. 2008. An Implementation Strategy for the Resolution to Reduce and Prevent Ocean Litter: 21.

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				the Estuary is being impeded by the presence of pollutants like trash."[10] The CCMP is a blueprint for restoring and maintaining the estuary through specific recommended corrective actions. Among these actions, the CCMP recommends "*installation of treatment control facilities*" as a practical strategy to address the trash problem, "as soon as possible," *with a performance measure of achieving a "percentage reduction in trash and other pollutants of concern."*[11] The CCMP also calls for achieving a "*number of sites (or miles of shoreline) with reduced marine debris" and a "percentage decrease in trash around marinas/beaches.*[12]		
Save the Bay	7	C10	**Provisions Don't Meaningfully Address Trash Problem**	In spite of these clear legal and policy mandates, staff has explicitly acknowledged in RTO section C.10 and the associated Fact Sheet that the proposed trash provisions <u>are not intended to meaningfully address trash pollution in this permit term.</u> Rather, the provisions relegate established Best Management Practices (BMPs) to only an "*initial pilot scale of deployment, to enable permittees to*	The Final TO requires the compliance with the Short Term Trash Load Reduction of 40% in July 1, 2014 for the Permittees entire jurisdictions. In addition minimum trash capture system installation is required, as well as annual cleanup and assessment of Trash Hot Spots.	

10 Comprehensive Conservation and Management Plan. 2007. Action PO-1.8: 139.

11 Ibid.

12 Comprehensive Conservation and Management Plan. 2007. Actions AR-9.1 & 9.2: 44-45.

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				learn" and "*begin actions and develop expertise"* for an as yet undefined plan in the future.[13] Structural trash controls are to be implemented only as a "*step toward understanding the appropriate use of the various trash capture device options.*"[14] The C.10 Goal Statement admits that the "*actions required in this permit term are unlikely to eliminate the impact of trash on beneficial uses or achieve the Basin Plan water quality standard for this pollutant after five years.*" This approach explicitly contradicts the RTO's stated intent "*that this Permit shall ensure attainment of applicable water quality objectives and protection of the beneficial uses of receiving waters and associated habitat.*"[15] Although the Basin Plan offers a strong basis for requiring significant, enforceable restrictions on discharge of trash, the Regional Board has failed to enforce discharge prohibitions and receiving water limitations on trash in the Bay under the current MS4 permit. This lenient approach to enforcement of illegal trash discharge has not		

13 Revised Tentative Order, Municipal Stormwater Permit. 2009. C.10.a: 77.

14 Fact Sheet, Revised Tentative Order, Municipal Stormwater Permit. 2009. C.10.a.v: 69.

15 Ibid: 2.

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				yielded reduction in trash pollution or produced increased useful efforts from permittees. The lack of enforcement under the current MS4 permit creates further imperative for the MRP to detail a trash program that includes explicit performance expectations to ensure permittee compliance and Board enforcement — the RTO will not achieve this outcome.		
Save the Bay	8	C10	Focus Clean Up efforts on 303d Listed Waterways	Although most permittees failed to assess their jurisdictions as the Regional Board directed in 2001, Rapid Trash Assessments (RTA) and documentation by concerned citizens have revealed many trash-clogged waterways that already qualified for listing as trash impaired on the 303(d) list approved by the Regional Board in February 2009. Through their regular maintenance activities, municipal staff and staff from flood-control districts should already be well aware of additional areas in their jurisdictions where trash accumulates in or near waterways. Santa Clara County permittees in good faith began an extensive assessment and study program for trash, which reported at least 200 trash-polluted sites. The most logical and appropriate way reduce trash impacts within this permit	The Final TO requires trash load reduction on the Permittees' entire jurisdiction. The 26 water bodies proposed for 303(d) listing are certainly not the only or even most trash impacted water bodies, but are those with the most substantial body of evidence for this listing cycle. Therefore while they are of significant concern and must be cleaned up, they are by no means the priority waterbodies in the Permittees jurisdictions. This permit is intended to address all waterbodies within the Permittees jurisdiction, so includes those waters proposed for 303(d) listing for trash.	

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				term is for the Board to start with the directive that any water body already established as trash-impaired through the 303(d) listing process must be the focus of aggressive clean up actions designed to eliminate further trash discharges to receiving waters from these waterways. Permittees should be mandated to spend time and money on further assessments after actions are being taken to resolve already-documented problem areas. The first priority should be to focus on cleaning up the 26 water bodies the Board has approved for 303(d) listing, other locally known trash impairments, and other waterways that subsequently meet the 303(d) criteria during the permit term.		
Save the Bay	9	C10	Initial Clean Up in 6 months, Maintain Sites as Approx. Zero Trash	The MRP should require permittees to quickly report these sites to the Board and take initial clean up actions within six months. The list of reported priority water bodies should be made available for public review. Subsequently, these sites should be maintained at "no impact to beneficial uses" or approximately zero trash. Cleanup of these waterways should not be restricted to small three hundred foot segments of shoreline. Rather, trash discharge to these waterways and their receiving waters	While significant progress is expected in this permit term, six months is too short a time frame for significant cleanup. The Short Term Trash Reduction requirement is 40% Trash Load reduction in July 1, 2014.	

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				must be eliminated where it occurs and accumulates. The Regional Board can then use its discretion to take enforcement action when this requirement is not met, taking into account the efforts of permittees.		
Save the Bay	10	C10	Submit Clean Up Results in First Year Report	In the first year report, permittees should submit documentation of actions they have taken to clean up the first round of trash impaired waterways and locally known trash impairments, along with recent RTA scores for high trash accumulating regions of the water bodies. Permittees should also submit scored results of virtual (photographic) trash assessments along all waterways in their jurisdictions, indicated on maps. Quantitative RTA scores or equivalent (URTA) should be acceptable for submission if completed within the last three years.	We have allowed more flexible trash assessments including reporting of volume of trash collected in Trash Hot Spot cleanups, rather than the more labor intensive RTA or Urban RTA. Annual reports will include trash removed by all actions and reports of trash preventative actions.	
Save the Bay	11	C10	Small Municipalities with Minimal Problems Should Use Simplified RTA	The C.10 provisions should ensure a quantitative overview of regional trash pollution while minimizing unnecessary "study" of this well-established and easy-to-identify problem. The Regional Board must not accept the false notion that every part of identifying and reducing trash pollution is difficult or time-consuming. Because research is not a substitute for meaningful action	In this Final TO all Permittees can use a simplified assessment of Trash Hot Spots of reporting the volume of trash removed during the annual cleanup, and the general makeup of that trash. Permittees will be responsible for reducing the Trash Loads from their entire jurisdiction by 40% in July 1, 2014 under this Final TO.	

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				to eliminate pollution, extraneous efforts should be avoided. The RTO's hot spot formulation requires small permittees with no known trash impairments to identify and designate a hot spot that may or may not be significant. Instead, small permittees without known impairments should be directed to map and report the levels of trash along the water bodies in their jurisdictions using the time-efficient "virtual RTA" established and vetted during the 303(d) assessment process.		
Save the Bay	12	C10	Address Obvious Problems Immediately, Delay Full Capture While Funding Secured	The immediate directive of the permit's trash provisions should be to clean up obvious, known impairments now. While addressing some trash problems and inputs will take significant time and investment, including for important BMPs like full-capture devices, there are also businesses, schools and other sources that can be pursued immediately with warnings or fines for not controlling trash. Homeless encampments and illegal dumping sites can be remediated, catch basins can be cleared more frequently, and litter enforcement actions can be taken under existing laws. All of these can be accomplished while funding mechanisms are developed for	Full capture minimum installations must be completed by July 1, 2014, which allows significant time to develop funding. The Short Term Trash Load Reduction Plan will include many of the BMPs described in your comment.	

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				structural trash controls. The RTO should be rewritten to ensure that each year's accomplishments are sustained and built upon through subsequent annual reductions in trash pollution.		
Save the Bay	13	C10	Require measured annual reduction	The Regional Board should require measured annual reduction in trash discharge to water bodies, using the best available tools. The permit must either stipulate enforceable performance metrics for the entire permit jurisdiction or require BMPs to reduce trash pollution to the maximum extent practicable (MEP) that can produce significant, measurable success within this permit term. The permit provisions should cultivate programs and practices that will achieve Basin Plan water quality standards and discharge prohibitions in the long-term.	The Final TO requires all Permittees to meet a Short Term Trash Load Reduction of 40% by July 1, 2014.	
Save the Bay	14	C10	Require 10% annual load reduction	<u>After the first year, a minimum 10% additional annual reduction in trash load should be demonstrated across each jurisdiction.</u> Currently, permittees have limited tools for assessing the actual amount of trash flow in water bodies. The best monitoring methods available include the RTA (which relies on shoreline-caught trash as an indicator), Caltrans protocols, or trash	The Final TO requires all Permittees to meet a Short Term Trash Load Reduction of 40% by July 1, 2014 (2013).	

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				removed from capture devices – either full capture (>5mm) or trash booms, which catch only a proportion of floatable items. The 10% reduction during this permit term would therefore be reasonably demonstrated by documenting installation and appropriate maintenance of full-capture devices equivalent to catch runoff from 10% of land area or more each year.		
Save the Bay	15	C10	Must be able to demonstrate Reduction with Alternative Methods	The RTO does not contain clearly stated mandates and reporting requirements for sizing and maintenance of structural trash controls, and should be rewritten to do so. Some permittees may prefer to expressly define and document reasons for choosing one or more alternate BMPs for trash control, including for homeless encampments and illegal dump sites. If the permit is written to allow for this alternative approach, permittees must be required to demonstrate the percent reduction in trash accomplished through these methods by providing quantitative results from actual RTAs across all high trash accumulating areas and lower portions of watersheds within the permit jurisdiction.	The C.10 Provision is written as the Commenter suggests in the Final TO. After creating a Trash Load Baseline in Year 2, the Permittees can demonstrate reductions using any set of effective BMPs and documenting the additional trash removed from their jurisdiction.	
Save the Bay	16	C10	Ensure	In the period covered by this new	The Short Term Trash Load	

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			Meaningful Data Collection and Organization	permit, the Regional Board should ensure that permittees are well trained in the current methodologies, and that data collected and submitted is formatted consistently made available publicly to establish a baseline for trash impacts in the region. In the future, the Board should work to refine methods for measuring trash in water bodies through the Regional Monitoring Program.	Reduction accounting method must be proposed for WaterBoard approval. Adequate reporting and accounting will be required.	
Save the Bay	17	C10	Provide Objectives for Long Perm Plan	**Explicitly Define Expectations for the "Long-Term Plan"** If the Regional Board intends to allow permittees to submit a self-determined long-term plan for achieving water quality standards for trash, then the Board must provide direction and detail for the objectives those plans will meet and a schedule for attaining Basin Plan water quality standards and discharge prohibitions, which are absent from the RTO.	Such expectations and timing are included in the Final TO revisions.	
Save the Bay	18	C10	Define no impact to beneficial uses as zero trash	The permit should define no impact to beneficial uses as zero trash, and require that any substitute standard be proven effective at achieving no impact to beneficial uses through peer-reviewed studies that take into account all beneficial uses impacted by trash and marine debris.	The requirement for this permit term is 10% per year reduction in Trash Loads, and a 40% reduction by July 1, 2014 (2013). The Discharge Prohibition A.2. and Receiving Water Limitation must be met by Year 12. Further definition of "how clean is clean" will occur through ongoing	

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					stakeholder process with the submittals by the Permittees during this permit term, and with the Permit Reissuance in five years.	
Save the Bay	19	C10	Stipulate Expectations for Long Term Plan Reporting and Documentation	In addition, the permit should stipulate what is expected in a long-term plan to report and document municipal activities, including sizing, maintenance schedules, and funding development plans for full capture devices. Consequences for submitting an inadequate plan and a process for full public review should be detailed.	Trash capture devices must be installed by July 1, 2014 of this Permit (2013). The Permittees will report on installation and maintenance of these devices after installation.	
Save the Bay	20	C10	Must Have Quantifiable Short Term Reductions	The RTO trash provisions proposed in C.10 and as stated in the Fact Sheet are explicitly not intended to meaningfully address trash pollution in this permit term. Rather, the provisions require only an "initial pilot scale of deployment, to enable permittees to learn" and "begin actions and develop expertise" for this as yet undefined plan in the future. This approach is unacceptable, and will delay significant trash reductions and improvements in water quality. There is no indications that convoluted provisions proposed in this RTO that would provide essential new information or yield a more robust approach to achieve water quality standards in a reasonable future	The Trash Provision C.10 has been extensively revised in the Final TO. The Final TO requires all Permittees to meet a Short Term Trash Load Reduction of 40% by July 1, 2014. The Discharge Prohibition A.2. and Receiving Water Limitation must be met by Year 12.	

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				timeframe. A long-term plan is only acceptable in conjunction with a significant, quantifiable short-term reduction in trash pollution during this permit term, and must not be used by permittees to further delay achievement of water quality standards. The proposed deadline of 2024 for achieving zero trash discharge, which has already been extended several times, is too generous given the severity of trash pollution and the mechanisms available to reduce it. It has already been twenty-seven years since the Regional Board identified widespread trash impairment of regional waters and <u>twenty-two years since permittees were directed to manage trash pollution in their jurisdictions.</u>		
Save the Bay	21	C10	Limited Spatial Coverage for Established BMPs.	C.10 would require permittees to implement structural trash BMPs in only a tiny portion of the permit area. This RTO slashes spatial coverage and scope of well-established structural trash control BMPs from an already low 10% of urban/suburban acreage in the initial draft. The lack of requirements in C.10 for submitting siting plans or maintenance reports will make it difficult for the Regional Board and the public to understand and	While the minimum Trash Capture device installation requirement is smaller than that presented in the first TO, the Final TO requires Permittees to demonstrate a 40% reduction of trash loads by July 1, 2014 for their entire jurisdiction.	

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				evaluate the effectiveness of the limited structural controls required. The RTO brings the spatial coverage of structural trash BMPs such as full capture devices for the entire permit region from approximately 65,500 acres (102.3 mi^2) in the original draft down to 5527 acres (8.6 mi^2).		
Save the Bay	22	C10	Spatial Coverage of capture devices inappropriate.	Because structural trash BMPs are generally placed in high-trash generating areas close to the bottom of watersheds, the RTO's proposed spatial scope of coverage is illogical. It is also inadequate to address the high levels of trash and associated impacts to beneficial uses that the Regional Board has noted throughout the past decade.	The Trash Capture requirement, while reduced from the First TO, still amounts to $26 million for the Permittees in total.	
Save the Bay	23	C10	Rationale for Hot Spot Formulation and Credit for Booms Unclear	There is also no specified acreage included in the convoluted formulation for allocating trash hot spots and treatment of trash booms is contradictory. While admitting that booms are ineffective at capturing a large portion of trash, Section C.10 still gives booms a credit for 10% of the tributary catchment area, which could easily be all of the acreage required by the 'full-capture device' provisions. For flood-control districts, it is unclear why the allotment for booms is less than that for trash capture devices, and also	The Final TO does require 40% reduction in trash loads by July 1, 2014. Trash booms or sea curtains are no longer credited as trash capture devices, except with regard to non-population based Permittees, but the trash loads removed will be credited toward the trash load reduction requirement.	

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				unclear what the rationale is for either allotment. Given the spatial coverage of this regional permit (approximately 655,000 acres), the scope of the watersheds draining to the Bay, and the well-established structural BMPs available for trash capture, the spatial coverage of C.10 provisions are indefensibly low. Instead, an annual 10% percent reduction in trash discharge should be required across the entire permit jurisdiction.		
Save the Bay	24	C10	Inadequate and Arbitrary performance standards.	As noted above, the staff's articulation that the performance standards in the RTO are not intended to meet Basin Plan requirements is inconsistent with the expressed intent of the MRP and is unacceptable. We support numeric objectives for trash discharge toward achieving zero trash, but the proposed interim standard is unacceptable. The RTO's minimum performance standard for "Hot Spots" after year three of the permit term is a "Trash Action Level" (TAL) defined as 100 pieces of trash per 100 feet of embankment. This level of trash clearly violates water quality standards by any reasonable interpretation. The RTO also refers to this standard as "urban optimal," following Santa Clara Valley Urban	The TAL is no longer included in the Final TO version of the C.10 Trash Provision. There is the requirement for 40% Trash Load reduction by July 1, 2014.	

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				Runoff Pollution Prevention Program's (SCVURPPP) arbitrary categories. This is an unacceptably low minimum performance standard incorporating misleading terminology. The Regional Board must not suggest through this permit that 100 hundred pieces of trash per 100 feet of embankment is "optimal." While the RTO states that meeting the TAL is not equivalent to meeting Basin plan water quality standards, using this TAL and describing it as "urban optimal" could establish this as the *de facto* standard, deterring progress toward achieving actual Basin Plan standards and causing potentially impaired areas to be incorrectly identified as clean.		
Save the Bay	25	C10	Inadequate and arbitrary performance standards	There is also no definition of "no visual impact" in the RTO or its appendices. "No visual impact" is a stated performance standard that is entirely unenforceable without explicit definition.	We agree that there is a degree of subjectivity to the "no visual impact" standard for Trash Hot Spot cleanup. Photo documentation is required and we are confident that non-compliance will be evident and discernable with the documentation.	
Save the Bay	26	C10	MRP Should Not Undercut Basin Plan	The Basin Plan requires that there be no impact to beneficial uses and expressly prohibits discharge of trash and debris into receiving waters. The	The requirement for this permit term is 10% per year reduction in Trash Loads, and a 40% reduction by July 1, 2014. The Discharge Prohibition A.2. and	

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				legal interpretation of this has been established as *zero trash.* This permit must reinforce and implement these definitions, not undercut them.	Receiving Water Limitation must be met by Year 12. Further definition of "how clean is clean" will occur through ongoing stakeholder process with the submittals by the Permittees during this permit term, and with the Permit Reissuance in five years.	
Save the Bay	27	C10	Inefficient Hot Spot Formulation and Assessment Methodology	Rather than utilize the evidence already established and collected by the Regional Board, Section C.10 of the RTO contains an arbitrary and cumbersome formulation for locating hot spots, and fails to suggest methods of eliminating trash discharge at those spots. The origin and justification for the RTO's requirement of one hot spot per 30,000 residents also is unclear. For these hot spots, the RTO suggests that unspecified "Enhanced Trash Management Actions" achieve a numeric goal based on a shoreline indicator (one piece of trash per foot of shoreline), but these actions remain undefined and do not have to be reported. In the RTO, failure to achieve the numeric goal for shore-bound trash also carries no specific	The TAL is no longer included in the Final TO version of the C.10 Trash Provision. There is the requirement for 40% Trash Load reduction by July 1, 2014.	

16 Revised Tentative Order, Municipal Stormwater Permit. 2009. C.10.a: 77.

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				consequences to remedy the failure. The RTA methodology was designed as an assessment tool. It does not measure the amount of trash actually in the water column, but indicates what that amount and composition might be. RTA metrics therefore appropriately focus on the trash caught on embankments prior to an assessment-related clean-up (rather than a systematic elimination of trash discharge). Using these metrics as a water quality goal inappropriately blurs the line between monitoring and implementation if they are used without explicit measures to control trash inputs. In fact, the goal for "hot spots" described in the heading of C.10.a is to "demonstrate improved trash *assessments* at trash hot spots."[16] Demonstrating measurable, sustainable results to achieve zero trash discharge for the most critically impaired water bodies is the most reasonable and efficient first step in this permit term. The permit should not mandate searching for over 163 small reaches at which to perform assessments over the next five years, as the RTO does.		

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Save the Bay	28	C10	**Other Trash-Related Provisions Should not be Eliminated**	The RTO eliminates requirements in Section C.2 for high-efficiency street sweeper upgrades, even though these are the only sweepers that have a documented impact on trash and other sediment-associated pollutants. The RTO also eliminates requirements for cleaning and inspecting storm drain catch basins, even though such actions can help identify trash problems when properly documented. Language in previous drafts that specified pump station retrofit requirements has also been deleted in the RTO. These established programs should not be deleted unless replaced with programs that are already clearly documented to be more effective.	These actions will occur through the Short-Term Trash Load Reduction, as many of these actions will be necessary to achieve the trash load reductions.	
Save the Bay	29	C10	Establish Enforceable Performance Metrics	Ensure that the permit stipulates enforceable performance metrics for the entire permit jurisdiction. The permit should achieve a 10% or greater documented yearly reduction in trash discharge, or alternatively, require installation of full-capture structural trash controls that serve, each year, an additional 10% or more of land area over the previous year's baseline.	The Final TO Trash Provision C.10 requires the Permittees to propose a trash load reduction tracking system for Board approval by Feb. 1, 2012.	

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Save the Bay	30	C10	replace Hot Spots with Directive for Zero trash in 303d Listed Waterways	Replace the convoluted hot spot provisions with directives to achieve zero trash discharge from waterways meeting the 303(d) listing criteria, including the 26 water bodies recently approved for listing by the Regional Board, new water bodies found to meet the 303(d) criteria during the permit term and locally known trash impairments.	Through the Short Term Trash Loads Reduction Plan due in Year 2, the Permittee must demonstrate 40% reduction of Trash Loads by July 1, 2014. Trash Hot Spots are assessed and simply cleaned up to no visual impact annually.	
Save the Bay	31	C10	Define and require full reporting of trash management actions and maintenance standards	Define and require full reporting for trash management actions and maintenance of trash controls and replace misleading standards ("Trash Action Level," "Urban Optimal") with quantifiable, prescriptive actions toward achieving zero trash discharge.	Through the Short Term Trash Loads Reduction Plan due in Year 2, the Permittee must demonstrate 40% reduction of Trash Loads by July 1, 2014. The actions are up to the Permittees, but the loads reduced must be documented. Trash Hot Spots are assessed and simply cleaned up to no visual impact annually.	
SMCWPPP Letter	5	C.10	Support Focusing Implementation of Trash Capture, Revise Hot Spots	The Countywide Program appreciates the improvement in this permit provision to require a more focused implementation of full-capture trash devices in retail and commercial areas rather than the December 2007 draft permit's proposed implementation based on using a percentage of a municipality's urban and suburban land area. The List of Issues Table contains recommendations for how to	Noted.	

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				use the Water Board's recently completed process to identify trash impacted waterways as a basis for the permit's "hotspots" for priority cleanup.		
StopWaste.org	2	C10.b.i	Include Alternative Trash Characterization Methods	With respect to source reduction of litter, we ask that Section C.10.b.i. of the draft permit be modified to allow the Executive Director to approve alternative methods of trash characterization if doing so would support evaluation of the types of government actions described in Section C.10.a.viii. (local ordinances, fees, and bans). Stopwaste.org has the power to implement and enforce such actions throughout Alameda County. But to evaluate and implement them we would need different information about trash in creeks than is specified in Appendix I, and in particular on the trash tally worksheet on pages I-12 and I-13.	The Final TO C.10 Trash Provision has been significantly revised, and the Permittees, working with stakeholders can propose additional assessment methods when they propose the Short Term Trash Load Reduction Plan and associated methodology. We are interested in working with StopWaste.org towards accomplishing the Permits goals.	
StopWaste.org	3	C10.b.i	Add Language	On page 82, Section C.10.b.i., add to the end of the first sentence, "or other such trash assessment method as the Executive Director may approve in writing in order to facilitate development of trash source reduction measures including, but not limited to, those listed in Section C.10.a.viii."	See Response above to StopWaste.org #2	
Suisun City	1	C.10	Major Concerns with Trash	Our review of the Revised TO indicates that Water Board staff has	The minimum Trash Capture requirements have been	

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			Requirements Still Exist	made modifications and improvements relative to the previous versions of the MRP, particularly the "core" municipal stormwater management program elements that address municipal and industrial operations, construction inspection, public information and outreach. However, we still have some major concerns with the trash requirements. The Revised TO requires that capture devices be installed to drain a total of 30% of the retail/wholesale/commercial land use amount for the City. This proposed approach to solving the trash problem is overly prescriptive, and does not recognize a variety of possible trash and litter problems (e.g., homelessness living by creeks) within the City.	significantly reduced for the First TO. This level of trash capture is necessary to begin to meet MEP and to make significant progress toward meeting the Trash Discharge Prohibition A.2. and Receiving Water Limitations by Year 12, and the Short Term Trash Loading Reduction Requirement of 40% by July 1, 2014.	
Suisun City	24	C.10.a(iv)	Clarify Definition of TALs	A trash action level (TAL) is consistent with the concept developed by a panel of experts assembled by the State Board. As defined, a TAL is a numerical goal that defines a threshold for the potential need for further management actions. It is not a water quality objective or numeric effluent limit. We request that language be revised to make the TAL definition more clear. In addition, we recommend that the TAL be set at 100	The TAL is not included in the Trash Provision C.10 in the Final TO. A 40% reduction in Trash Loads by July 1, 2014 and the installation of minimum trash capture devices, along with annual assessment and cleanup of Trash Hot Spots are the main requirements.	

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				pieces of trash or less per 100 foot of creek/shoreline instead of the proposed SCVURPPP "urban optimal" category. Having the number of trash items as the TAL is more consistent with the goal statement presented in provision C.10.a (i). It permits less subjectivity than the Urban Rapid Trash Assessment Protocol. In addition, it allows Permittees to focus on reducing the level of trash at a hot spot to a defined endpoint.		
Suisun City	25	C.10.a(vii)	Why percentage credit for sea booms changed?	The previous version of the draft MRP Tentative Order allowed non-tidal booms or sea curtains to receive credit for 25% of the area draining to the booms/curtain. It is unclear why the percentage credit was reduced to 10% in the Revised TO. We request that the original percentage (i.e., 25%) be reinstated as the percentage of the draining area required to be addressed by full trash capture devices.	The Final TO does require 40% reduction in trash loads by July 1, 2014. Trash booms or sea curtains are no longer credited as trash capture devices, except for non-population based Permittees, but the trash loads removed will be credited toward the trash load reduction requirement.	
Suisun City	26	C.10.b(i)	Change Assessment Methods and Frequency	It is unclear what scientific basis was used to establish the frequency of twice per year for conducting assessments at each approved trash hot spot. Based on the numerous trash assessments conduct by other stormwater programs (i.e., SCVURPPP) within the Bay Area, we	The required Hot Spot assessment frequency has been revised to once per year. The TAL is no longer in the Final TO revision of Provision C.10.	

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				believe that this frequency could be reduced to once a year and still achieve the objectives stated above. In addition, if the TAL is based on the number of trash items per 100 feet of creek/shoreline, it is unclear why Rapid Trash Assessments (RTAs) are needed. As a result, we request that the assessment method require the quantification of trash items at hot spots but RTAs not be conducted. RTAs require additional time, resources and yield subjective data that are not specifically needed to address the TAL.		
Vallejo Sanitation and Flood Control District	3	C.10.b.	Proposal for Alternative Trash Assessment Methodology	In the recent 303(d) State's listing process the Board recommended that Rindler Creek in Vallejo be added to the states 303(d) list for impairment due to trash. No field data were collected to reach this impairment recommendation. The decision was based entirely on the analysis of a small number of photographs submitted to the Water Board. This methodology was then supported in the Board's response to our comments: *"We did not merely look at the photos and make an impressionistic listing call based on gut reaction. Rather, as we described in the Staff Report, we*	In the Final TO revision of the Trash C.10 Provision, Trash Hot Spot assessments during annual cleanup consists of photo documentation before and after cleanup, recording of the volume of trash collected, and the general types of trash collected.	

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				methodically inspected every photo and applied the systematic and quantitative trash assessment methodology to the photos. The rigorous application of the trash assessment methodology to the photos produces data that can be quantified and qualified. Therefore, our use of photographic information is not merely "descriptive, estimated, or projected" and, as such, can be used as the primary line of evidence to support listing." The District would be able to save considerable staff time and resources if allowed to use the SCVURRPP Urban Rapid Trash Assessment (RTA) methodology on photographs of suspected trash hot spots in lieu of performing RTA in the field. Given that this methodology has been used by Water Board Staff and defended as scientifically reputable and repeatable, we are requesting the Water Board to consider revising Section C.10.b.i to allow the inspection of suspected trash hot spot photographs as an alternative to onsite Urban RTA's.		
Walnut Creek	4	C.10	Flexibility to Achieve Trash Reduction Goals	The proposed Trash Reduction provision was based on a flawed assumption that litter problems occur in all cities in the Bay areas. It does not recognize progressive efforts	The Minimum Trash Capture requirement is necessary to meet MEP and to make significant progress toward the Trash Load Reduction of 40% in July 1, 2014.	

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				already implemented by those cities that have successfully controlled litters and illegal dumping problems. In the current economic crisis faced by many municipalities, investing in full-capture devices as the ultimate mechanism to control trash or litters is a waste of financial resources for some cities. This provision should allow some flexibility for cities to choose the appropriate best management practices to achieve the established trash reduction goal.		
Walnut Creek	5	C.10	Clarify TALs Trigger not Water Quality Objective or Numeric Effluent Limit	Moreover the MRP must clarify that the proposed Trash Action Level (TAL) of "100 trash items per 100 feet of creek" is a goal and potential trigger for follow-up BMP-based actions and not a water quality objective or numeric effluent limit. Having a specific number of trash items established as the TAL goal is more consistent with the goal statement provided in Provision C.10.a.(i) and allows less subjectivity that the Urban Rapid Trash Assessment Protocol.	The TAL is no longer included in Final TO revision of the C.10 Trash Provision.	
Daly City	17	C.10.a.i.& ii.	Goal Statement and Trash Hot Spot Selection	The Board should define what they mean by "Storm." For example, they could define it as precipitation exceeding .x inches in a 24 hour period.	The Trash booms or sea curtains are no longer credited as trash capture devices, except for non-population based Permittees, but the trash volume removed by maintenance is credited toward	

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					the 40% in July 1, 2014 Trash Load Reduction requirement. Therefore it is no longer necessary to define storm for this Provision.	
Daly City	18	C.10.a.ii.	Trash Hot Spot Selection	Trash Hot Spots are defined as at least 100 yards of creek length or 200 yards of shoreline length. They should be accessible aquatic sites that are most impacted by accumulation of trash. Daly City's system is mostly subterranean. We have no aquatic sites or shorelines that are within the city's borders. Our system discharges into systems within and under the control of the cities of San Francisco, Brisbane, South San Francisco, and Pacifica. The city does not believe it can meet the mandates of this section or other sections related to this section.	Daly City can present this information when the Trash Hot Spot Selection proposals are due. Daly City may want to consider proposing an alternative activity to reduce trash loads.	
Daly City	19	C.10.d.ii.	Reporting	Annual Report directs Permittees to report adoption and implementation of all existing and relevant local laws and ordinances which impact on how solid waste, trash and litter are managed and litter reduction enforced. Why is the Board pushing each Municipality impacted by the MRP to enact local laws and ordinances for trash litter management and reduction?	The Final TO revision of the Trash C.10 Provision does not require trash prevention measures in the form of laws and ordinances, but these actions may be granted significant credit toward the Trash Load Reduction requirement of 40% in 4 years.	
Mountain View	12	C.10.a.iv	Trash Hot Spot	The Regional Permit requires the City	The Trash Action Level (TAL) is	

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			Clean-Up to Trash Action Level	to identify a prescribed number of trash hot spots, then achieve and maintain cleanup of those sites to a "trash action level (TAL)." The clean-up TAL is less than 100 pieces of trash per 100' assessment reach and that there is no visual impact from trash within the assessment reach. Examples of some of the trash hot spots that could be identified are homeless encampments and locations that attract graffiti. These areas are often difficult to access and patrol, so maintaining the hot spots to the TAL level will be resource intensive and costly. It is the City's position that the TAL cannot be achieved consistently at some of the trash hot spots. The City recommends revising the Regional Permit to include a TAL that can be achieved, or establishes the TAL as a goal instead of an enforceable limit.	no longer included in the Third TO revision of the Trash C.10 Provision. The Short Term Trash Load Reduction requirement will be 40% reduction by July 1, 2014.	
Mountain View	13	C.10a.v	Trash Capture Requirement	The Regional Permit requires the City to install full trash-capture devices to treat a catchment area draining a total of 30 percent of the retail/wholesale commercial land use area. Installation and maintenance of these full trash-capture devices is costly and only treats storm water-related trash sources. The City believes that the Regional	The Final TO Provision C.10 includes greater flexibility for Permittees to demonstrate reduced trash loads. The trash capture requirement is retained, however, as the requirement for installation is relatively incremental and trash capture technology has proven effective in Permittee cities.	

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				Permit should be modified to allow the flexibility to implement cost-effective trash controls that are appropriate for local conditions and severity of trash problem areas. Is supporting data available showing that installation of full trash-capture devices will effectively remove trash to a level that will cause noticeable improvements to water quality?		
Palo Alto	12	C.10.a.(iv)	Trash Hot Spot Clean Up to Trash Action Level	Trash Hot Spot Clean Up to Trash Action Level be revised to make clear that: 1) the Trash Action Level (TAL) of "100 trash items per 100 feet of creek" is a goal or a trigger for actions, not a water quality objective or numeric effluent limitation; and 2) the TAL be a number of pieces per 100 feet of creek as opposed to the SCVURPPP "Urban Optimal Level", which includes more subjective metrics that could create consistency issues among programs/cities.	The TAL is not included in the Final TO Provision C.10. Primary accountability for trash load reduction will be assessed with a trash load tracking methodology proposed by the Permittees.	
Palo Alto	13	C.10a.v	Trash Capture requirement	Trash Capture Requirement be revised to allow for potential revision of the 5mm mesh screen standard in the event that Permittees identify a trash removal device or technique that successfully achieves the goal of removing visible trash from storm water runoff without attaining compliance with the 5mm standard.	This standard has been and is being implemented on a massive scale in the Los Angeles region, so not only represents MEP for California, but is the specification that the devices readily available on the market are designed to meet. While this specification will not stop all trash, it removes a	

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					major portion down to cigarette butts in size, and still allows appreciable water flow to avoid flooding.	
Palo Alto	14	C.10.b(i)	Frequency of assessment	The frequency of assessment in Provision C.10.b(i) be reduced to "at least once per year at each approved trash hot spot". The current requirement is two times per year.	The assessment frequency for Trash Hot Spots has been reduced to once a year.	
San Jose Attachment A	4	C.10	Trash Reduction	The Water Board staff has modified the trash reduction provisions of the TO and revised some of the prescriptive and redundant trash solutions previously proposed. What remains, however, is still an exceptionally aggressive program to identify, assess, and clean-up specified 'Hot Spots.' Under the proposed provision, San José will be responsible for 33 Hot Spots and required to remedy the trash and litter problem in these areas within the five-year permit term. The scale of this effort is tremendous and the record is lacking in evidence that this is an appropriate requirement for the storm water program, given the significant non-stormwater sources to trash in these hotspots and the multiple pathways of trash to creeks. These factors also mean that the City's ability to remedy the trash problem at all 33	The requirement for 33 Trash Hot Spots for a Permittee with a population of nearly one million is not excessive. Trash Hot Spots can be placed closely together in large impacted reaches of streams or long shoreline impact areas. The Trash Load Reduction Tracking Method combined with establishment of Trash Baseline Loads will be the primarily accountability system for demonstration of trash load reduction in the short term of this permit.	

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				Hot Spots within five years is tenuous. While staff acknowledges that appropriate efforts will include structural controls, increased maintenance practices, and enhanced pollution prevention, the provision as set forth in the Permit would almost certainly result in the City falling into non-compliance during the permit cycle. San José requests that the Trash Provision be modified to set a framework for demonstrable improvements to be made related to trash impacts in creeks, in a manner that establishes a clear and achievable path for permittee compliance. Most notably, the proposed "trash action level" should be clarified as a programmatic goal and potential trigger for follow-up actions and the expectations for follow up designated in this permit should be limited to trash conveyed through a permittee storm sewer system. Additionally, San José requests that the number of Hot Spots for San José be reduced, to provide greater opportunity to focus efforts on high value sites with demonstrable connection to the storm water system as a source of trash in the creeks. San José looks forward to working with		

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				Water Board staff and local stakeholders to advance a reasonable and successful approach to controlling trash in our creeks.		
San Jose	Attachment A 23	C.10.b.i (pg. 80-81)	Trash action level	Requirements to "achieve Trash Action Level" by 2012 may be unachievable in many locations that are accumulation points for very large portions of the watershed which include many sources of trash from outside the MS4. The City requests language clarifying the TAL as a goal against which the effects of corrective actions can be measured be added to the provision.	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	
San Jose	Attachment A 24	C.10.c (pg. 82)	Trash transport	The development of a long term plan should be limited to addressing the impacts of trash transported through MS4 systems.	The Final TO can only address trash discharged through the MS4, which includes the curb and gutter of streets, and some reaches of open creeks and streams.	
Santa Clara County	22	C.10	Trash Action Level	The County acknowledges the need to assess trash accumulation areas potentially associated with stormwater and the need for enhanced actions to reduce trash to our water bodies. The Revised TO requires the County to "achieve [Trash Action Level (TAL)] by July 1, 2012 at [our] hot spots, and then maintain at least that level". The TO does not take into account that trash may be coming from an	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	

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				uncontrollable source and will most likely result in noncompliance during the permit cycle, despite our best efforts to seek compliance.		
Santa Clara County	23	C.10.a.ii	Trash Hot Spot Selection	Under this section it states "Trash Hot Spots shall be at least 100 yards of creek length or 200 yards of shoreline length…." To prevent inconsistencies in the Revised TO, this sentence should be revised to use feet instead of yards.	The unit yards is correct in the TO.	
Santa Clara County	24	C.10.a.iv	Trash Hot Spot Clean Up to Trash Action Level (TAL)	The SCVURPPP "Urban Optimal Level" includes more subjective metrics than simply a specific threshold of pieces of trash and this could potentially create inconsistencies among programs and cities. We request that the TAL number not be defined with the "Urban Optimal Level" but be based on the number of pieces of trash per 100 feet of creek. We also ask that there be some clarification that the TAL of "100 pieces of trash per 100 feet of creek" is a goal or a trigger for action, not a water quality objective or numeric effluent limitation.	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	
Santa Clara	25	C.10.viii	Trash Source Reduction	This section says if "…implementation of significant new, or implementation of existing legal measures to reduce trash and litter at the source by 2012 Annual Report will reduce the	The 20% reduction credit is not included in the Final TO revision of Provision C.10. The primary accountability for Provision C.10 is the Trash Load Reduction	

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				Permittee's trash capture installation requirements by 20%, upon approval by the Executive Officer." The revised TO will require the County to install 2 full capture devices. Under this section the revised TO states " [a]doption and implementation of significant new, or implementation of major existing legal measures to reduce trash and litter at the source by 2012 Annual Report will reduce the Permittee's trash capture installation requirements by 20%, upon approval by the Executive Officer." If the County gains Executive Officer approval we will still be required to install 2 full capture devices because 20% of 2 devices is only a faction of a device. This 20% reduction in installation requirements is not an incentive for the County to reduce trash at the source. We request that this section be revised to clarify that Permittees will be relieved from installing a minimum of one full capture devices.	Tracking Method, which will be proposed by the Permittees. It is anticipated that under this tracking method, a load reduction credit will be counted toward the Short Term Trash Load Reduction of 40% by July 1, 2012 for source control measures such as adoption of an ordinance limiting use of disposal plastic bags.	
SCVURPPP	6	C.10	Trash Action Level	The Santa Clara Program concurs with the need for systematically assessing trash accumulation areas potentially associated with stormwater and then, based on what is learned in the assessment process, developing enhanced actions to better address controllable sources and/or	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed	

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				conveyance of stormwater-related trash affecting such areas. We appreciate some of the modifications that the Water Board staff has made in this regard. However, to make it feasible and pragmatic, Provision C.10 still needs more refinement, including with regard to: Clarification that the proposed Trash Action Level (TAL) of "100 trash items per 100 feet of creek" is a goal and potential trigger for follow up BMP-based actions and not a numeric effluent limitation; Clarification that the TAL refers only to the number of pieces of trash observed per 100 feet of creek (as opposed to the SCVURPPP "Urban Optimal Level," which includes more subjective metrics that could create consistency issues among programs/cities); Provide flexibility to Co-permittees to reduce the twice per year frequency of the hot spot assessment requirement and the level of assessment required.	by the Permittees.	
SCVURPPP	Attachment A #49	C.10.a(i)	Goal Statement	We appreciate the Water Board staff including a Goal Statement in Provision C.10.a(i), however, much of the text is superfluous and should either be reduced or removed and included in the findings (see Attachment B).	Provision C.10 has been simplified in the Final TO.	

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SCVURPPP	Attachment A #50	C.10.a(ii)	Trash Hot Spot Selection	The minimum number of trash hot spots for large permittees (e.g., San Jose) is extremely high compared to permittees with medium and small-sized populations. Similar to the full capture treatment exemption (C.10.a(vi)) for small permittees, the Santa Clara Program recommends that language be added to Provision C.10.a(ii) that creates a maximum number of hot spots (i.e., 20) that are required to be addressed during the permit term. This number of hot spots will still require large permittees to implement significant resources and attempt to significantly reduce trash at these hot spots, but the lower number of hot spots will allow an increased effort per hot spot, thus allowing large permittees to more effectively use resources on the highest priority problem areas.	The requirement for 33 Trash Hot Spots for a Permittee with a population of nearly one million is not excessive. The Trash Hot Spot basis is proportional to population and amount of Commercial Wholesale/Retail land. Trash Hot Spots can be placed closely together in large impacted reaches of streams or long shoreline impact areas. The Trash Load Reduction Tracking Method combined with establishment of Trash Baseline Loads will be the primarily accountability system for demonstration of trash load reduction in the short term of this permit.	
SCVURPPP	Attachment A #51	C.10.a.(iv)	Trash Hot Spot Cleanup to Trash Action Level	If properly determined in the manner they recommended, a numeric trash action level (TAL) could be consistent with the concept of municipal action levels developed by a panel of experts assembled by the State Board. As defined by the experts, a TAL would be an upper end numerical goal that helps identify situations all would readily agree on and triggers the need for further management actions to	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees.	

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				address them. In the experts' view, unlike what is proposed in the TO, a TAL would not serve as a broadly applicable initial cleanup goal based on an underlying water quality objective; nor, like the Fact Sheet may be read by some to suggest, would it ever be used like a numeric effluent limit. Accordingly, we request that language of the TO be revised to avoid confusion and recommend that the operative term be changed from TAL to Trash Hot Spot Goal ("THSG"). Additionally, we recommend that the THSG be set at 100 pieces of trash or less per 100 foot of creek/shoreline, instead of the Santa Clara Program's previously proposed "urban optimal" category. Having a specific number of trash items established as the THSG is more consistent with the goal statement presented in C.10.a(i) and allows less subjectivity than the Urban Rapid Trash Assessment Protocol.		
SCVURPPP	Attachment A #52	C.10	Trash Capture Requirements for Non-Population Based Permittees	The full capture requirement for non-population based permittees effectively leaves them with options for either trash booms, which are not and do not receive credit for full capture, or outfall-based devices. The non-population based Permittee in Santa Clara County (i.e., Santa Clara Valley Water District) does not own	The term "equivalent measures" has been added to the trash capture requirements for non-population based Permittees, though it is anticipated that booms or other capture devices will be installed, possibly in collaboration with adjacent Permittees.	

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				stormwater outfalls and therefore cannot utilize the aforementioned devices to meet the full capture requirement. To allow non-population based permittees to address hot spots, we recommend that the following language be added instead of the prescriptive language in the Revised TO: "Non-population based permittees shall address the hot spots they assess which do not meet the THSG with equivalently effective measures."		
SCVURPPP	Attachment A #53	C.10.a.(vii)	Booms or Sea Curtains	The previous version of the TO allowed non-tidal booms or sea curtains to receive credit for 25% of the area draining to the booms/curtain. It is unclear why the percent credit was reduced to 10%. In light of this, we request that the following language be included in the Revised TO: "Booms or sea curtains receive credit for up to 25% of the area required to be addressed by Full Trash Capture Devices"	Booms or Sea Curtains are not longer specifically described in the Final TO, except with regard to non-population based Permittees. While these devices will not count toward full trash capture installation, the trash removed will count toward the trash load reduction.	
SCVURPPP	Attachment A #54	C.10.b.(i)	Trash Assessment and Reporting	It is unclear what scientific basis was used to establish the frequency of 2 times per year, every year, for trash assessments. Based on the numerous trash assessments conducted by Santa Clara Program's Co-permittees, we believe that this frequency could be reduced and still	The frequency for clean-up and assessment of Trash Hot Spots in the Final TO is one per year.	

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				achieve the objectives stated above. Additionally, if the THSG is based on the number of trash items per 100 feet of creek/shoreline, then the need for Rapid Trash Assessments (RTA) is unclear. Alternatively, we request that the assessment method require the quantification of trash items at hot spots and not RTAs, the latter of which require additional time, resources and yield subjective data that are not specifically needed to address the THSG.		
SCVURPPP	Attachment A #55	C.10.c.	Long Term Plan for Trash Impact Abatement	Trash in water bodies is a complex issue that requires multiple efforts and understanding of trash sources, pathways, and effective control measures. Trash is arguably more complex than PCBs or mercury, which have been allowed 20-year time frames to achieve TMDL load allocations. Therefore, we request that the timeframe allowed to reach the goal of "no trash impacts" be extended to at least 2029, as opposed to 2024. This timeframe is consistent with approved TMDLs for Bay Area water bodies.	The 2022 target for achieving no impact to receiving waters from trash is appropriate. The necessary actions and control measures are relatively well understood, and therefore implementation is the primary challenge. While littering and trash production may continue to occur, keeping it out of waters is a more narrowly defined goal.	
SCVWD	6	C.10	Data collected by other waterboards	We are specifically concerned that Water Board staff did not take full advantage of data collected by other Water Boards relative to trash	We will continue to study the progress made in the L.A. region of addressing trash loads and control measures. Trash capture	

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				challenges in southern California. Some of this trash data may provide a greater understanding on pathways and control of sources, in a fiscally prudent fashion, that will still lead to reasonable reduction of the pollutant.	device installation is a major component of trash abatement efforts in Southern California.	
SCVWD	9	C.10	Installation of trash booms or outfall devices	Table 10-1 prescribes the installation of either trash booms or outfall devices as a requirement of permit compliance for the District. The District does not own or have jurisdiction of any outfalls, and it is inappropriate to require the District to install trash nets on them. The District believes the use of Start at the Source strategies, improved product stewardship, enforcement of existing anti litter laws, legislative controls (single use bag ban) and the use of full capture devices prior to the end of pipe, are more appropriate to combat trash rather than installing booms in the creeks. Booms present CEQA challenges, are potential threats to wildlife, and will need to be removed during the rainy season since they could become flood water conveyance hazards. The District and other co-permittees are planning to conduct an evaluation of up to two trash booms in our systems but these booms would be removed in the winter. Also, the District should not be burdened with the maintenance costs	The term "equivalent measures" has been added to the trash capture requirements for non-population based Permittees, though it is anticipated that booms or other capture devices will be installed, possibly in collaboration with adjacent Permittees.	

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				associated with operation of the booms when a full capture device in some part of the MS4 system is more appropriate.		
SCVWD	10	C.10	Trash Assessment	The total number of trash assessments in a given watershed should be based on population. Requiring additional trash assessments for flood control districts places a greater burden on taxpayers in those communities by directing them to fund additional assessments above the requirements already placed on the cities. A better approach is to reduce a city's number of trash assessments if an agreement can be reached that the flood control agency will share in the workload to complete a portion of the cities assessments.	The number of Trash Hot Spots assigned to the non-population based Permittees is relatively small, and since the Permittees are flood management agencies with great access to streams, this is an appropriate requirement.	
SCVWD	11	C.10	District has the following specific recommendations for modification	Provide language that makes it clear that some flood control districts do not own storm drain outfalls and therefore shall not be required to install full capture devices on the property of other co-permittees.	Permittee specific requirements always apply directly to Permittee jurisdiction.	
SCVWD	12	C.10		Provide language that indicates that Water Board staff is aware of the potential problems booms can cause to fish and wildlife and during rain events and acknowledge that booms are a last resort and not a full capture	Booms do have drawbacks, and may be a barrier to fish passage if blocking the entire water column, which is not a typical installation. They are not full capture devices.	

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				device.		
SCVWD	13	C.10		Clarify that the Trash Action Level (TAL) of "100 trash items per 100 feet of creek" is a goal, or a trigger, for actions, and remove the implication that it is a water quality objective or numeric effluent limitation.	The TAL has been removed from the Final TO revision.	
SCVWD	14	C.10		Clarify that the TAL be the number of pieces per 100 feet of creek, as opposed to the SCVURPPP "Urban Optimal Level," which includes more subjective metrics that could create consistency issues among programs/cities.	The TAL has been removed from the Final TO revision.	
SCVWD	15	C.10		Reduce the twice per year frequency of assessment requirement to "at least one per year at each approved trash hot spot." The resources needed to conduct a second round of trash assessments could be better spent on installation of full capture devices, or on working out the enforcement challenges.	The Trash Hot Spot clean-up and assessment frequency has been reduced to once a year.	
SCVWD	23	C.10		prescribes trash capture devices across jurisdictional boundaries and imposes very prescriptive use of trash booms without consideration of CEQA and flood conveyance issues, and	The Final TO does not require trash capture devices be installed across jurisdictional boundaries.	
Sunnyvale	9	C.10	Trash	A focused and cost-effective effort to address trash that is in stormwater, or likely to be conveyed by it into our	The Permittees are expected to employ their knowledge of the local nature of trash impacts to	

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				waterways. This should include using our existing data for assessments and analyses as to the nature and location for measures to be implemented.	water bodies, and local trash load sources.	
Sunnyvale	49	C.10.a.(iv)	Trash Hot Spot Clean-up to Trash Action Level(TAL)	Sunnyvale supports SCVURPPP's request that the TAL be defined as a numerical goal to define a threshold for further management actions, and not a water quality objective or numeric effluent limit. Sunnyvale also supports SCVURPPP's recommendations to set the TAL at 100 pieces of trash or less, per 100 feet of creek or shoreline rather than the "urban optimal" category. Based on Sunnyvale staff's experience with performing the URTA in multiple locations over the past four years, we believe it will reduce the subjectivity of some of the URTA questions/assessment categories. As stated by SCVURPP, this will allow permittees to reduce trash to a specific and measurable endpoint.	The TAL has been removed from the Final TO. The primary accountability for Provision C.10 is no longer focused in the Trash Hot Spot cleanup and assessment, but on the Trash Load Reduction Tracking Method, which will be proposed by the Permittees. The Permittees can continue to use the RTA or Urban RTA for assessment, but also have the option to use volume and dominant types of trash collected	
Sunnyvale	50	C.10.a (v)	Trash Capture Requirement	Sunnyvale is one of the two SCVURPPP cities to have participated in the pilot trash retrofit of storm drain inlets (SDIs) using "Full Capture" devices (Storm Tek inserts) as defined by the Los Angeles Regional Water Board.	Some grant funding has recently been secured to assist Permittees in trash capture device installation. As the requirement for trash capture installation is before 2014, Permittees will be able to phase	

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				Requiring the use of a device approved for use in Los Angeles may be problematic for communities to fully adopt for our area. This comment is based on Sunnyvale's experience with the pilot testing with SCVURPPP and the City of San Jose over the last year. Based on preliminary data and experiences with installing the full-capture devices in Sunnyvale, it will be very difficult, if not impossible to retrofit all the inlets in a particular "retail, wholesale, or commercial" area within a city to cover 30% of the ABAG 2005 land use by July 1, 2013 for the following reasons: Of the 5 types of treatment BMPs that have been certified by the LA Regional Water Quality Control Board, possibly only two of them will be suitable for use by cities in their urban, highly developed, commercial areas, as required by the permit. These are the inserts developed by the City of Glendale and the inserts developed by Advanced Solutions (Storm Tek devices used by Sunnyvale and San Jose in the local Pilot Project). The use of the other larger area treatment options such as the end-of pipe trash nets, linear radial gross solids removal device or the inclined screen gross solids removal device, all require	installations to avoid a bottleneck of manufacturers supply capabilities. Also, it is anticipated that qualified manufacturers will join the business as demand increases. There are several optional trash capture devices, so storm drain inlet capture devices will not be the only type installed.	

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				substantial land or open space to install. With the very limited choices for cities to select from, it will be extremely difficult for all 76 cities coming under the MRP requirements to obtain these devices in the quantities needed in the time frame prescribed. To obtain and install the 13 Storm Tek units in Sunnyvale took almost a full year's time from when the sites were selected until installations were complete. According to the MRP (Fact Sheet Attachment10.1), Sunnyvale may need to install upwards of 200 units within the commercial/retail areas of the city to meet the 4.45% of retail-commercial land treatment requirement. Given the fact that the Storm Tek devices must be custom made to fit each inlet, it takes a significant amount of time just to manufacture them and install them. (Also, based on our experiences in Sunnyvale, even with careful measurements and photographs, we had to send two of the 13 units back for remanufacture, as they did not fit the SDIs appropriately.) Considering the demand of 76 cities on one business for meeting the July 1, 2013 deadline in the permit does not seem		

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				reasonable. The cost for purchase and installation of the approximately 200 units for Sunnyvale to comply with this requirement will likely be in excess of $250,000 (based on 2007 dollars). This figure does not include the increased annual costs for maintenance of retrofitted SDIs. We are in the process of determining what those costs will be as part of the SCVURPPP pilot project. However, preliminary indications are that some retrofitted SDIs will need to be cleaned out more frequently than one time per year, which is our currently budgeted inspection and clean out frequency. In areas with numerous street trees, maintenance may need to be as frequent as monthly during the leaf-drop season from November – February in order to prevent street flooding during significant storm events. Sunnyvale requests that the requirement to install full capture devices in such a large portion (30% of acreage) of a city's commercial/retail areas be reconsidered until there are more options available for full capture devices in highly urbanized commercial/retail areas. Either the number required needs to be reduced,		

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				or additional time must be granted to incorporate the funding into capital budgets and allow for their manufacture and installation within the permittees' cities.		
Sunnyvale	51	C.10.a.vii	Trash Source Reduction	An example of an ordinance change in this provision refers to the implementation of parking restriction ordinances to clear curbs on street sweeping days. In order to comply with such a requirement, "no parking" signage would be required prior to street sweeping. It is unclear whether the signage would need to be permanent or not, which would help to determine the added costs to the city to meet this provision. Posting permanent signage would be a significant capital cost along with the added clean up (i.e., graffiti removal) costs for the signs. If the signs were temporary (i.e., posted the day before sweeping and removed after) the costs could be significant as well, since staff would be needed to post signage before sweeping and remove it afterwards. Also, using the posting of streets for sweeping as an example for source reduction does not seem to be an actual source reduction activity as it is not preventing litter in the same way that the other examples are (e.g., single-use bag ordinances).	The Final TO does not include any street sweeping or parking restriction requirements. Street sweeping to the curb may be a trash load reduction bmp that will remove more trash loading from the MS4, however.	

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Sunnyvale	52	C.10.b.(i)	Trash Hot Spot Assessment	Sunnyvale supports the SCVURPPP comment regarding the of the Urban Rapid Trash Assessment score, due to the subjectivity of some of the items of the URTA. A quantification of actual numbers of trash items at hot spots will provide less subjective data that is useful in addressing the TAL of 100 pieces of trash per 100 ft. section of waterway.	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with a trash load accounting methodology proposed by the Permittees. Assessment of Trash Hot Spot cleanup has been revised to be more flexible.	
Sunnyvale	53	C.10.c	Long Term Plan for Trash Impact Abatement	Sunnyvale supports the SCVURPPP comment on extending the goal of "no trash impacts" to a 20-year time frame to 2029, to be more consistent with the requirements of TMDLs that have been approved for the Bay Area waterbodies.	The Final TO Provision C.10 date to achieve compliance with Discharge Prohibition A.2 and no impact of trash to waters is 2022, over 12 years from now. This is a reasonable time frame to abate this pollutant impact. The means for addressing trash impacts are straightforward, including trash capture, increased bmps, source control and increased outreach. It is the implementation of those means that represents the challenge. While preventing all littering is a major challenge, keeping that litter out of waters is a more narrowly focused problem.	
Sunnyvale	54	C.10.d.(ii) & (iii)	Reporting – 2010 & 2011 Annual Reports	In section (ii) it is not clear why the city should be reporting on the laws or ordinances implemented to deal with displacement of creek-side homeless	We agree that to the extent such trash impacts are not related to the MS4, they cannot be required to be abated under the Final TO.	

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				encampments under the storm water discharge permit requirements. While the issue of homeless encampments and their impacts on waterways can be significant, requiring a stormwater discharge permittee to report on this activity is not appropriate, since these trash sources in waterways that are not coming from stormwater outfalls. We request that this reference be removed from this provision. In section (iii) there is a reference to "establishing pilot full trash capture device installations". It is our understanding that the requirement of this permit to install full capture devices is not a "pilot" effort, and we suggest that this reference be removed.	However, efforts to reduce such impact on waters could be credited under the Trash Load Reduction Tracking Method. The reference in question is not in the Final TO revision of Provision C.10.	
West Valley Clean Water	#11	C10	Trash	The draft revised permit needs to prioritize the highly aggressive and many new requirements in this section, with the combined efforts of all permit requirements; Priority focus to be on cost-effective efforts to address trash in or likely to be conveyed by stormwater conveyance systems into our waterways, with assessment work and data analysis driving the nature and location of the measures to be implemented;	These changes are evident in the Final TO revision of Provision C.10. Permittees can choose the trash load reduction bmps that are most efficient in their jurisdictions. The minimum trash capture requirements have been retained, however.	
ACCWP	#1	C.2., C.3.,	Deleted	We appreciate many of the changes	Noted.	

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		C.4, and C.10	requirements-certain type of street sweepers, trash, etc.	incorporated in the Revised Tentative Order, in particular: (1) the deletion of the requirement to purchase certain types of street sweepers; (2) the deletion of the requirement to install treatment systems for road reconstruction projects within the existing footprint; (3) the deletion of the requirement to conduct an impervious surface data collection pilot project; (4) the deletion of the prescriptive list of businesses requiring inspections; and, (5) the deletion of some of the prescriptive trash requirements. However, many of our concerns with the previous Tentative Order have not been addressed and some of the new requirements in the Revised Tentative Order are of great concern.		
ACCWP	23	C.10.	Trash Controls	As with the TMDL pollutants, trash reduction is an appropriate focus for this permit term. We recognize that municipalities need to play a role in reducing the amount of trash entering our creeks and the Bay. However, this is not a problem municipalities can solve by themselves. We agree with the suggestion made by your board several years ago that a statewide task force including State and local representatives should be formed to address the trash problem.	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with a trash load accounting methodology proposed by the Permittees. There are more flexible options for assessment of cleaned hot spots in the Final TO.	

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				We appreciate the increased flexibility provided in the Revised Tentative Order. We also appreciate the reduced scope of the structural control requirements. As with other pollutants we believe that source control is more cost effective than treatment and we appreciate the flexibility to pursue source control measures in addition to the implementation of structural controls. Again, these are extremely difficult economic times for our municipalities and the installation and maintenance of the required structural controls place a somewhat unknown and potentially severe economic burden on our municipalities. We also have concerns regarding the Trash Action Level and the Rapid Trash Assessment requirements. Trash Action Level: We have two concerns with the Trash Action Level. The first is that we believe terminology may cause confusion between a Trash Action Level and a Municipal Action Level or a Water Quality Standard. The Trash Action Level is not intended to be either. Proposed Resolution: To avoid this possible misinterpretation, we request		

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				that the terminology be changed to "Trash Hot Spot Reduction Goal."		
ACCWP	Comment #24	C.10.	Hot spot reduction	Our second concern is that we do not believe that the hot spot reduction target of 100 pieces of trash per 100 feet of creek will be attainable in all cases. As an example, in 2008, the Program conducted the Rapid Trash Assessment Protocol at ten sites throughout the county. (A technical memo summarizing the results is included as Attachment 4.) At one of the sites, approximately 3,000 pieces of trash were collected from a 100 foot stretch of creek. Almost all of the pieces were very small Styrofoam pellets that had been trapped in the ivy on the banks. These pellets are trapped along the creek bank for a long distance upstream of this site as well due to an illicit discharge that has now been corrected. At this site it will be nearly impossible to meet the pieces of trash per 100 feet target for the foreseeable future. Proposed Resolution: Express the Trash Hot Spot Reduction Goal as "either 100 pieces per 100 feet or an 80% reduction from the baseline level."	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with a trash load accounting methodology proposed by the Permittees. There are more flexible options for assessment of cleaned hot spots in the Final TO.	
ACCWP	25	C.10	Rapid Trash	The Revised Tentative Order would	There are more flexible options	

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			Assessment:	require that these assessments would be conducted at each hot spot twice per year for five years. We have two concerns with this requirement. The first is that the protocol is very labor intensive and not necessary to determine if the trash hot spot reduction target is being met. The second concern is that the protocol is still evolving and there may be more effective methods of assessing the trash. Proposed Resolution: Revise provision to require only counting the pieces of trash rather than categorizing them, and reduce the number of assessments required to once per year.	for assessment of cleaned hot spots in the Final TO. Volume of removed trash can be recorded, and the major or dominant types of trash collected reported. Some categorization is necessary to learn about possible sources for effective bmps.	
ACCWP Attachment-1	62	C.10	Trash	Allow green streets pilot projects to count toward trash capture. Given the effort and expense that various municipalities will make if the green streets provision is kept in the permit, these projects should count toward trash capture. Filtering roadway runoff through a bioretention area or swale before it enters the storm drain system naturally filters out trash. This would be in keeping with the Water Board staff's preference for landscape-based systems over mechanical systems.	Bio-retention stormwater treatment technology would meet the trash capture standard, as far as we are currently aware. We have not analyzed the hydraulic specifications for equivalency yet, but that analysis can be easily done.	

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ACCWP Attachment-1	63	C.10	Trash	The requirements of this section cannot be met financially by the Permittees. Water Board staff has estimated a $6.06 per capita cost to Permittees which in actuality is $27,473,822.04. Permittees, just like the State, are in massive budget deficit and the stormwater programs even this depression was already under funded due to Prop 13 restrictions on increasing revenues. State and/or Federal funding for this un-funded mandate must be in place before placing this requirement on local public agency Permittees.	Some grant money for initial trash capture installation has been secured. The requirement for trash capture was given a long time (2014) to phase in so that there would be sufficient time to secure adequate resources.	
ACCWP Attachment-1	64	C.10.a.i.	Trash Reduction	"While Permittees have completed some assessment of trash impacts in Santa Clara and San Mateo counties…" Add Alameda to the list of counties.	Noted.	
ACCWP Attachment-1	65	C.10.a.ii.	Trash Hot Spot selection & commercial/retail acres	The data in the 2005 ABAG Land Use database is inaccurate. One problem that is on their description web page is that all their land area calculations are to the middle of the public street. Arbitrary doubling of population based hot spot locations for San Leandro from 2 to 4 is out of line with the majority of other agencies. It appears	The street is of key concern with regard to trash impact generation. We have adjusted the Commercial land amount for San Leandro based on the information that a large portion of that total was submerged under the Bay.	

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				that the variance between population and retail/wholesale acreages for most agencies is 1 or less.		
ACCWP Attachment-1	66	C.10.a.v.	Trash Capture	Previously Installed Trash Capture Device Credit: "Credit can be claimed for trash full capture devices…" Other devices such as sea curtains that have been previously installed should be eligible for credit as well. Revise to clarify that trash capture devices other than full capture devices are also eligible for credit.	Booms or sea curtains can be credited by the amount of trash volume removed or captured by these devices. This will be included in the Trash Load Reduction Tracking Method.	
ACCWP Attachment-3	30	C.10.b	Hot Spot Assessment	Eliminate photo documentation requirement, due to cost, difficulty of submitting with report, and questionable value in showing true condition of site. Also, correct the typo (10 pieces should be 100 pieces, in accordance with URTA standards for "optimal".	We disagree. The photographic information is very valuable, and before and after cleanup photos will give strong evidence of cleanup to no visual impact, and the pre-cleanup condition of the Hot Spot.	
ACCWP Attachment-3	31	C.10.d.(ii-v)	Annual Reports	Requirements for reporting on existing laws related to trash is vague, overly broad, and difficult to achieve. Restrict to reporting on any new laws or ordinances created by Permittees that are relevant to trash reduction.	This language has been removed. Under the Final TO revisions, the Permittees will document such actions and ordinance adoptions to gain credit toward trash load reduction to meet the 40% trash load reduction by July 1, 2014.	
ACCWP Legal	3	C.1. C.8. C.10.	"triggers"	Provisions where "triggers" have been added to expand the scope of Provision C.1 are in Provision C.8	The language under comment here has been removed. The TAL has been removed from the	

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				Monitoring (Table 8.1 Status Monitoring triggers; Table 8-3 Long Term Monitoring triggers; C.8.e.i stressor source identification; C.8.h.i reporting) and in Provision C.10 Trash (C.10.d.iv 2012 Annual Report). The language of C.1 already requires notification to the Water Board where a determination has been made that discharges are causing or contributing to an exceedance of a water quality standard and already requires submission of BMP related reporting for most exceedances. The addition of the new triggers in the Provision C.8 monitoring requirement and Provision C.10 trash requirement cited above adds confusion to the well drafted and more comprehensive requirements of Provision C.1. Recommended Action In addition we request that the second sentence of Provision C.10.d.iv be deleted. Provision C.1 would remain unchanged.	Final TO revision of Provision C.10.	
ACCWP Legal	4	C.10.	Monitoring and reporting	Federal regulations require that all permits shall specify required monitoring including "type, intervals, and frequency sufficient to yield data which are representative of the monitored activity." 40 CFR	The monitoring and assessment program under Provision C.10 in the Final TO is simple and straightforward, and allows the Permittees greater flexibility than in the previous TO.	

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				§122.48(b). This is the general legal guidance for the scope of required monitoring requirements for NPDES permits, but there is little specific regulatory guidance on how this should be applied in the context of municipal stormwater permitting. The Fact Sheet/Rationale Technical Report ("Fact Sheet") points out that each stormwater permit should include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations for subsequent permits. We contend that the monitoring program proposed in the Revised Tentative Order is neither effectively coordinated nor cost-effective – it is overly prescriptive and requires considerably more resources than required by law. Furthermore, no priorities have been established in order to provide better focus for the monitoring program. The Fact Sheet continues to specify the same legal, technical and policy rationale for the Revised Tentative Order provisions as in the initial		

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				Tentative Order. The rationale given in the Fact Sheet for the very detailed monitoring provisions of the proposed permit is essentially as follows: Water quality monitoring requirements in previous permits were less detailed than the requirements in this Permit; and under previous permits, each program could design its own monitoring program with few permit guidelines. The Fact Sheet then cites the case of San Francisco Baykeeper vs. Regional Water Quality Control Board17 for the proposition that monitoring programs in the MRP must be detailed and extensive. In the Baykeeper case, the trial court held that the monitoring programs in that case, which were essentially non-existent as the permits at issue only contained a directive for the Permittee to design its own monitoring program (very different from what the Bay Area municipal stormwater dischargers are proposing), did not sufficiently specify the type, intervals, and frequency sufficient to yield data that are representative of the monitoring activity. That decision was decided on the specific facts before the court. It is important to note that trial court		

[17] Consolidated Case No. 500527 (November 14, 2003).

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				decisions such as the Baykeeper case do not serve as precedent as do cases decided by the Courts of Appeal and the Supreme Court. The Fact Sheet fails to acknowledge the non-precedential character of the trial court decision in the Baykeeper case and further fails to discuss or disclose the more recent appellate case of Divers' Environmental Conservation Organization v. SWRCB decided by the California Court of Appeal, Fourth District that does serve as precedent.18 In that case the appellate court carefully analyzed the Clean Water Act requirements for municipal and industrial stormwater discharges and concluded that the Act provides the permitting authority broad discretion to use BMPs for stormwater discharges and provides wide flexibility in designing stormwater controls. In contrast to the trial court's opinion in Baykeeper, the Divers' case held as a precedential matter that so long as the permit provides sufficient details and standards, management plans and monitoring plans can be developed by permittees. Neither the Baykeeper opinion nor the		

[18] See 145 Cal.App.4th 246.

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				Divers' case requires the extensive monitoring provisions and the revised and expanded requirements proposed in the Revised Tentative Order. To the contrary - as a matter of law, the Divers' appellate decision provides Permittees and the Water Board extremely broad discretion in formulating monitoring programs. The Revised Tentative Order goes considerably beyond the federal regulatory requirement of providing for monitoring that would include the type, intervals, and frequency sufficient to yield data which are representative of the monitored activity. In fact, as detailed in comments by other Bay Area stormwater Programs and Permittees, the staff proposal imposes significantly expanded monitoring requirements that result in additional resource burden on the Permittees beyond that required by law. The result is an overly detailed, unduly burdensome, and highly prescriptive monitoring program that is unaffordable, impracticable, goes beyond assuring water quality improvement/protection and is destined to create much data that will serve little useful purpose. Meaningful compliance data can be		

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				provided by the Permittees that satisfies federal regulations with a much less prescriptive and less detailed monitoring program than that required by the revised Tentative Order and that would be consistent with the Divers appellate court decision and the non-precedential Baykeeper decision. Recommended Action: We request that a more reasonable monitoring program be included in the MRP as has been set forth in comments submitted in the comments of the ACCWP.		
ACCWP Legal	5	C.10	Trash Action Levels	As stated in the ACCWP comments, we agree that trash reduction is an appropriate primary focus for this permit term and the Program is ready to take significant steps in toward this objective. Revised Provision C.10 requires attainment of Trash Action Levels ("TALs"), terminology that is used throughout this provision. The term "Action Levels" is not defined in the Glossary and no justification is given in the Fact Sheet for the use of	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with a trash load accounting methodology proposed by the Permittees. There are more flexible options for assessment of cleaned hot spots in the Final TO.	

[19] See Storm Water Panel Recommendations to the California State Water Resources Control Board – the Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities – June 19, 2006

[20] The draft Ventura permit addresses trash in a manner requiring implementation of BMPs to achieve trash waste load allocations in certain named watersheds, not with Action Levels.

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				trash requirements as TALs. In June 2006 a blue ribbon State Storm Water Panel made recommendations to the State Water Board regarding the feasibility of numerical effluent limitations applicable to stormwater discharges.19 While the Panel found that it is not feasible at this time to set enforceable numeric effluent criteria for municipal urban runoff, it stated that it may be possible that Action Levels could be developed for certain catchments not treated by a structure or treatment BMPs. It noted that such Action Levels could be developed using three different approaches – a consensus based approach, ranked percentile distributions and statistically based population parameters. The Panel then went on to describe each approach in detail. The Revised Tentative Order fails to follow any of these recommended State Storm Water Panel approaches in arriving at the TALs. Action Levels may be appropriate as an interim approach where they are scientifically defensible and where adequate data is available to establish them. However, this data has not been proposed nor		

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				evaluated in order to develop appropriate TALs for the MRP. Even the much-discussed third draft of the Ventura MS4 NPDES Permit uses "Action Levels" for some pollutants in a carefully prescribed manner – they do not apply Action Levels to trash.20 The Ventura draft establishes Municipal Action Levels ("MALs") to identify subwatersheds requiring additional BMPs to reduce pollutant loads and prioritize implementation of additional BMPs. MALs for selected pollutants would be based on carefully selected and referenced protocols. The State Board Panel recommended protocols have not been followed in the Revised Tentative Order to establish TALs. In addition to the inappropriate use of TALs as a trash reduction measure, the revised Tentative Order incorrectly refers to a trash "water quality standard" (C.10a.i) and a trash "water quality objective" (C.10.a.iv). Water quality standards and water quality objectives are defined in the Glossary. Neither a water quality objective nor a water quality standard has been established for trash in the Basin Plan. Thus, such references are		

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				inappropriate. In summary, use of TALs is not an appropriate way to require trash reduction in the MRP at this time. Trash reduction, while being an important objective of the MRP with which the ACCWP is in accord, could better be referred to as trash Hot Spot Reduction Goals to be achieved. Recommended Action We request that reference to Trash Action Levels ("TALs") be deleted in the MRP and replaced with the term, trash Hot Spot Reduction Goals. In addition, references to trash water quality standards and water quality objectives should be deleted.		
Alameda City	7	C.10	Trash capture	The Provision C.10.a requirement for the installation and maintenance of trash capture devices with a five-millimeter mesh screen is highly impractical in the City of Alameda and should be eliminated as it will create a real likelihood of upstream flooding and damages to public and private property.	The trash capture devices referred to include and overflow system to avoid flooding. In addition, regular maintenance to remove captured trash will also prevent flooding potential.	
Alameda City	8	C.10.a.iv.	Trash Action Level	The Provision C.10.a.iv requirement for Trash Action Level goals at identified Trash Hot Spots should be modified to exempt trash swept into	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with a trash load accounting	

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				the shoreline by tides because they are outside a jurisdiction's ability to control and reduce.	methodology proposed by the Permittees. If the Permittee removes trash from hot spots, whatever the source, the trash will count toward the Permittees Trash Load Reduction Tracking credit toward achieving the 40% trash reduction by July 1, 2014.	
Alameda City	16	C.10	Trash Reduction	Provision C.10, Trash Reduction, requires enhanced trash management control measures. These efforts will require additional City staff time. No funding mechanism is identified for the additional municipal expense to support the implementation of these new trash control requirements. The estimated annual increase in municipal staffing to implement, track, and assess the increased trash management control measures is approximately 10% of a full-time staff person.	Compliance with the Clean Water Act, and the stormwater regulations is no contingent on the Cities funding conditions. Also, the Discharge Prohibition A.2. is not funding contingent.	
Alameda City	17	C.10.a.iv	Trash Hot Spot Clean Up to Trash Action Level,	Provision C.10.a.iv, Trash Hot Spot Clean Up to Trash Action Level, requires the achievement of Trash Action Level goals at identified Trash Hot Spots. Results of a 2008 trash pilot study in which the City volunteered to participate indicate that litter along the Alameda shoreline is largely a result of tidal action. It was also noted that the type of litter found	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with the Trash Load Reduction Tracking method proposed by the Permittees. However, all trash that the Permittee removes from the shoreline will be credited toward the requirement of 40% trash load reduction by July 1,	

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				on city streets does not correlate with the type of litter found along the shoreline sites. It is observed that the achievement of shoreline trash action levels are not exclusively within City control, and the City should not be held to a regulatory standard for trash swept in by tides. The City recommends that the RWQCB devise appropriate accountability standards that reflect the regional nature of the trash problem.	2014.	
Alameda City	18	C.10.a.v.	Trash Capture Requirement	Provision C.10.a.v, Trash Capture Requirement, requires the installation and maintenance of trash capture devices meeting a five-millimeter (5mm) mesh screen criteria. The installation of any device with a 5mm mesh screen is highly impractical in the City of Alameda as it will create a real likelihood of upstream flooding and damage to public and private property. This concern is further substantiated by the City of Los Angeles' technical report stating their observation that 5mm screen openings are problematic, as they tend to clog with minimal debris and may result in local ponding21. Furthermore, the City's estimated cost for purchasing	The trash capture devices referred to include and overflow system to avoid flooding. In addition, regular maintenance to remove captured trash will also prevent flooding potential. We agree that new resources will be required to meet the trash capture installation and maintenance requirements, however the requirements are phased to July 1, 2014 which should provide time to secure resources. In addition, some grant funds have been secured to assist with early installation of trash capture devices.	

[21] Catch Basin Inserts Technical Report: Method to Determine CB Inserts Act as Full Capture Devices, Watershed Protection Division, Department of Public Works, Bureau of Sanitation, City of Los Angeles, June 2006: http://www.lastormwater.org/Siteorg/program/poll_abate/PilotStudyInsert.pdf

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				and installing vertical trash capturing devices, such as the ones used by the City of Los Angeles, will amount to about $13,50022. Additionally, the estimated annual increase in Maintenance staff time for maintaining these devices is approximately 5% of a full-time staff person. Therefore, the City recommends that this very specific engineering specification be modified to require the installation of trash racks to capture trash and to allow flexibility for local jurisdictions to adequately size the opening of the trash capture devices consistent with proven and workable engineering standards, and any existing State standards. In addition, the RWQCB or the SWRCB should provide a new revenue stream to fund this infrastructure mandate.		
Alameda Co Flood Control Zone 7	1	C.10.iii.	Non-population based permittees	Provision C.10.iii requires non-population based permittees, which include flood control management agencies and sanitation districts, to install either trash booms or outfall devices in order to reduce trash. The number of trash capture devices is based upon the service area population and development density.	The requirements for non-population based Permittees have been expanded in the Final TO Provision C.10 to all installation of booms, outfall capture devices or equivalent measures, which could include partnering with adjacent Permittee for collaborative trash	

[22] Based on 2007 data released in Catch Basin Inserts report by Santa Clara Valley Urban Runoff Pollution Prevention Program: http://www.scvurppp-w2k.com/trash_bmp_toolbox_2007.htm

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				Provision C.10.iv allows cost-sharing between municipalities and non-population based permittees to install these devices. However, in these cases, the provision requires the obligations of municipalities and non-population based permittees be combined. Zone 7, a county flood protection agency in east Alameda County, has flood control facilities that receive stormwater discharges generated within both city limits and unincorporated areas. Provision C.10 requires municipalities identify hot-spots within its service area and install trash reduction devices. With that being said, our trash hot-spots will be what the municipalities deem as hot-spots. As such, combining obligations for these trash devices would require installing more trash capture devices than needed in designated hot-spots. Combining the obligations creates unnecessary redundancy and is cost-prohibitive. Furthermore, the outfalls are typically owned by the local municipality. In addition, streams reaches are not necessarily owned by flood management agents but are owned by the local municipality. Hence installing outfall devices and	capture projects.	

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				trash booms (in some cases) may not be feasible for non-population based permittees. Zone 7 recommends that non-population based permittees be required to coordinate with the local municipalities within its service area to evaluate hot-spots and alternative methods appropriate to address the municipalities obligations under this provision.		
Alameda County	5	C.10.a.v.	Trash Capture Requirements	Concern: The Revised Tentative Order reads "Previously Installed Trash Capture Device Credit- Credit can be claimed for trash full capture devices…" Other devices such as sea curtains and booms, used more commonly by the Flood Control District, that have been previously installed should be eligible for credit as well. Proposed Solution: Revise to clarify that trash capture devices other than full capture devices are also eligible for credit.	The full trash capture standard remains the requirement for trash capture devices in the Final TO revised Provision C.10.	
Alameda County City Mgr's Assoc		C.10.	Strategic Approach Necessary:	An extension of the current permit would provide us all the opportunity to hopefully benefit from a recovering economy, as well as develop longer term solutions to what are certainly	The resource intensive requirements in the Trash Load Reduction Provision C.10 are not required until July 1, 2014, allowing time for funding	

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				issues of mutual concern to the Board as well as our member cities. The objectives are clearer than the steps to effective implementation: we need a strategic approach to the latter to reach our desired outcomes in a reasoned and realistic way. The most significant problems are in the areas of conditionally exempt dischargers, increased monitoring and new development (c.3) requirements. Solutions that are based on quantifiable scientific data that can be measured over time to determine their efficacy, as well as a balance in the financial implications of such solutions, is essential to support and strength of any proposal. Examples of the types of productive, state-wide efforts and initiatives that could be jointly pursued by municipalities, stormwater agencies, Regional Board staff, and State Water Resources Control Board staff during the extension period might be: Address trash and litter with a more comprehensive strategy that incorporates all of the sources (including highways via the Cal-Trans Stormwater Permit), provides a funding mechanism, and addresses the social issues associated with littering through state-wide education	development.	

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				and outreach. Focusing only on cleaning up the end result of this nagging social problem without a corresponding effort to address the cause is short-sighted and unfairly burdens local government.		
Berkeley	1	C.2., C.3., C.4., and C.10.	Deleted requirements	The City appreciates many of the changes incorporated in the Revised Tentative Order, in particular: (1) the deletion of the requirement to purchase certain types of street sweepers; (2) the deletion of the requirement to conduct an impervious surface data collection pilot project; (3) the deletion of the prescriptive list of businesses requiring inspections; and, (4) the deletion of some of the prescriptive trash requirements.	Noted.	
Berkeley	21	C.10.	Trash Controls	As with the TMDL pollutants, trash reduction should be a primary focus for this permit term. The City recognizes that municipalities need to play a role in reducing the amount of trash in urban runoff entering creeks and the Bay. However, this is not a problem municipalities can solve by themselves. The City agrees with the suggestion made by your board several years ago that a statewide task force including State and local representatives should be formed to	Noted.	

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				address the trash problem. Increased flexibility has been incorporated in the Revised Tentative Order. The City also appreciates the reduced scope of the structural control requirements. As with other pollutants the City believes that source control is more cost effective than treatment and we appreciate the flexibility to pursue source control measures in addition to the implementation of structural controls.		
Berkeley	22	C.10	Full Trash Capture Devices	As stated above, these are extremely difficult economic times for municipalities and the installation and maintenance of the required structural controls will place an economic burden on the City. The City's estimate for installing, cleaning, and maintaining simple screens as Full Trash Capture Devices to serve 30% of the commercial area over the 5 year term of this permit is $570,000. This represents the low-end cost, if other devices beyond simple screens are needed, the cost quickly escalates to over $1.5 million for the 5 year term of the permit. The size of the pilot project is excessive and can actually be considered to be premature full implementation of full trash capture. The size of the pilot project needs to be reduced from 30% to a more	The minimum amount of trash capture required has already been reduced for the previous TO. Grant funding to assist with trash capture funding has recently been secured. The resource intensive requirements in the Trash Load Reduction Provision C.10 are not required until July 1, 2014, allowing time for funding development.	

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				manageable 5% of the commercial area for each permittee. Alternatively, the pilot project can be spread over the entire region instead of overly burdening each individual permittee and eliminate duplicative pilot projects. Proposed Resolution: The size of the pilot full trash capture needs to be reduced to a manageable level for the individual permittee. This can be accomplished by reducing the size of the pilot area from 30% to 5%, or making the pilot projects a regional responsibility effectively reducing the burden to each permittee.		
Berkeley	23	C.10.	Trash Action Level	We have two concerns with the Trash Action Level. The first is that we believe terminology may cause confusion between a Trash Action Level and a Municipal Action Level or a Water Quality Standard. The Trash Action Level is not intended to be either. Proposed Resolution: To avoid this possible misinterpretation, we request that the terminology be changed to "Hot Spot Reduction Goal."	The TAL has been removed from the Final TO. Primary trash load reduction will be assessed with a trash load accounting methodology proposed by the Permittees.	
Berkeley	24	C.10.	Hot spot reduction	The second concern is that we do not believe that the hot spot reduction target of 100 pieces of trash per 100	The TAL with a trigger value of 100 trash pieces per 100 feet has been removed from the Final TO.	

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				feet of creek will be attainable in all cases. As an example, in 2008, the Program conducted the Rapid Trash Assessment Protocol at ten sites throughout the county. (A technical memo summarizing the results in included as Attachment 3.) At one of the sites, approximately 3,000 pieces of trash were collected from a 100-foot stretch of creek. Almost all of the pieces were very small Styrofoam pellets that had been trapped in the ivy on the banks. These pellets are trapped along the creek bank for a long distance upstream of this site as well due to an illicit discharge that has now been corrected. At this site it will be nearly impossible to meet the pieces of trash per 100 feet target for the foreseeable future. Proposed Resolution: Express the Hot Spot Reduction Goal as "either 100 pieces per 100 feet or an 80% reduction from the baseline level."	Primary trash load reduction will be assessed with a trash load tracking methodology proposed by the Permittees.	
Berkeley	25	C.10.	Rapid Trash Assessment	The Revised Tentative Order would require that these assessments would be conducted at each hot spot twice per year for five years. We have two concerns with this requirement. The first is that the protocol is very labor intensive and not necessary to determine if the trash hot spot	The Final TO revision of Provision requires one assessment per trash hot spot cleanup each year, and the options for assessment are flexible, including simply reporting the volume of trash removed and the dominant types of trash	

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				reduction target is being met. The second concern is that the protocol is still evolving and there may be more effective methods of assessing the trash. Proposed Resolution: Revise provision to require only counting the pieces of trash rather than categorizing them, and reduce the number of assessments required to once per year.	collected.	
Berkeley Attachment 1	62	C.10.	Allow green streets pilot projects to count toward trash capture.	Install trash capture devices on catchment area equal to 30% of the Retail/Wholesale Commercial Land use as defined by ABAG 2005 Land Use Statistics. Trash capture devices shall be designed to retain particles by 5mm mesh screen with hydraulic capacity of not less than peak flow rate resulting from a one-year, one-hour storm event in the drainage catchment area. Allow green streets pilot projects to count toward trash capture. Given the effort and expense that various municipalities will make if the green streets provision is kept in the permit, these projects should count toward trash capture. Filtering roadway runoff through a bioretention area or swale before it enters the storm drain system	Bio-retention stormwater treatment technology would meet the trash capture standard, as far as we are currently aware. We have not analyzed the hydraulic specifications for equivalency yet, but that analysis can be easily done.	

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				naturally filters out trash. This would be in keeping with the Water Board staff's preference for landscape-based systems over mechanical systems.		
Berkeley Attachment 1	63	C.10.	funding	The requirements of this section cannot be met financially by the Permittees. Water Board staff has estimated a $6.06 per capita cost to Permittees which in actuality is $27,473,822.04. Permittees, just like the State, are in massive budget deficit and the stormwater programs even this depression was already under funded due to Prop 13 restrictions on increasing revenues. State and/or Federal funding for this un-funded mandate must be in place before placing this requirement on local public agency Permittees.	Grant funding to assist with trash capture funding has recently been secured. The resource intensive requirements in the Trash Load Reduction Provision C.10 are not required until July 1, 2014, allowing time for funding development.	
Berkeley Attachment 1	64	C.10.a.i.	Assessment of trash impacts	"While Permittees have completed some assessment of trash impacts in Santa Clara and San Mateo counties…" Add Alameda to the list of counties,	Noted.	
Berkeley Attachment 1	65	C.10.a.ii.	2005 ABAG Land Use database is inaccurate	The data in the 2005 ABAG Land Use database is inaccurate. One problem that is on their description web page is that all their land area calculations are to the middle of the public street.	The street is of key concern with regard to trash impact generation. We have adjusted the Commercial land amount for San Leandro based on the	

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				Arbitrary doubling of population based hot spot locations for San Leandro from 2 to 4 is out of line with the majority of other agencies. It appears that the variance between population and retail/wholesale acreages for most agencies is 1 or less.	information that a large portion of that total was submerged under the Bay.	
Berkeley Attachment 1	66	C.10.a.v.	Previously Installed Trash Capture Device Credit	Previously Installed Trash Capture Device Credit: "Credit can be claimed for trash full capture devices…" Other devices such as sea curtains that have been previously installed should be eligible for credit as well. Revise to clarify that trash capture devices other than full capture devices are also eligible for credit.	The full trash capture standard remains the requirement for trash capture devices in the Final TO revised Provision C.10.	
Berkeley Attachment 1	31	C.10.b.	Overly detailed reporting.	Eliminate photo documentation requirement, due to cost, difficulty of submitting with report, and questionable value in showing true condition of site. Also, correct the typo (10 pieces should be 100 pieces, in accordance with URTA standards for "optimal".	We disagree. The photographic information is very valuable, and before and after cleanup photos will give strong evidence of cleanup to no visual impact, and the pre-cleanup condition of the Hot Spot.	
Berkeley Attachment 2	32	C.10.d.(ii-v)	Requirements for reporting on existing laws related to trash	Requirements for reporting on existing laws related to trash is vague, overly broad, and difficult to achieve. Restrict to reporting on any new laws or ordinances created by Permittees that are relevant to trash reduction.	This language has been removed. Under the Final TO revisions, the Permittees will document such actions and ordinance adoptions to gain credit toward trash load reduction to meet the 40% trash load	

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					reduction by July 1, 2014.	
Brisbane	11	C.10.	trash clean up (action) level	The permit proposes a trash clean up (action) level for what it terms "trash hotspots"; the permit should be modified so this action is expressed as a goal and not an inflexible mandate due to uncertainty about what levels of trash reduction are needed to protect beneficial uses, and what levels are reasonably achievable.	The language under comment here has been removed. The TAL has been removed from the Final TO revision of Provision C.10.	
Brisbane	12	C.10.	Requirement to install full capture trash control devices.	The City supports the revisions in the Tentative Order exempting small municipalities from the requirement to install full capture trash control devices. Small municipalities should also be provided an opportunity to be exempted from hot spot assessment and cleanup if they can document that they do not have any hot spots.	The Trash Hot Spot Selection report is due by July 1, 2010. If a Permittee seeks to document that there are no Trash Hot Spots within their jurisdiction, they can attempt to make that case on or before that deadline.	
Brisbane	13	C.10.	trash in hot spots originating from the storm drain system.	Municipalities should only be required to address trash in hot spots originating from the storm drain system. Any requirement to address trash generated by other sources such as illegal dumping, homeless encampments, or wind should be deleted.	We agree that the Final TO requires abatement of trash loads discharged through the MS4. Any trash removed, regardless of the source will be credited in the trash load reduction tracking method in the revised Provision C.10 in the Final TO.	
Burlingame	5	C.10.	trash cleanup (action) level	The permit proposes a trash cleanup (action) level for what it terms trash hotspots that should be expressed as a goal and not an inflexible mandate because of uncertainty about what	The TAL has been removed from the Final TO Provision	

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				levels of trash reduction are needed to protect beneficial uses and what levels are reasonably achievable.		
Burlingame	6	C.10.	full capture devices	The requirement to install full capture devices on 30% of the ABAG 2005 Retail/ Wholesale Commercial Land Use area is too ambitious. There is no funding available to implement this requirement. We request that this be either delayed or scaled back for implementation.	The requirement does not have to be met until July 1, 2014, allowing time to develop funding. Also, grant money has been secured for early installation of trash capture devices.	
Fremont Attachment	35	C.10.a.iv.	"no visual impact from trash within assessment reach"	The statement that there should be "no visual impact from trash within assessment reach" is subjective. A person impacted visually from the assessment reach is based on each person's subjective decision. Once trash is seen no matter the magnitude, it becomes a visual impact. Eliminate "that there be no visual impact from trash within the assessment reach" from the language.	While this is a somewhat subjective standard, there should not great ambiguity concerning when it is attained. The cleanup requirement for Trash Hot Spots remains to no visual impact. Photographs will be included as verification of cleanup to this requirement.	
Fremont Attachment	36	C.10.b.i	Due date of first assessment as part of the Hot Spot selection process	Due date of first assessment as part of the Hot Spot selection process. Late summer of 2009 Revise due date to match C.10.ii Feb. 1, 2010.	The first assessment will now occur in the dry season of 2010.	
Fremont Attachment	50	C.10	Actual Number of Trash Items Found,	Attachment I Provision C.10. SCVURPPP URTA Methodology	The requirement to use the RTA or Urban RTA has been removed from the Final TO.	

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			The description of scoring doesn't match the worksheet on page I-9.	Attachment I page I-4 & I-8 Trash Assessment Parameters #2: Actual Number of Trash Items Found, The description of scoring doesn't match the worksheet on page I-9. Modify scoring on the URTA Worksheet on page I-9 to match that of the description on page I-4.		
Newark	1	C.2., C.3., C.4., and C.10.	deletion of the requirements	The City of Newark is appreciative of many of the changes incorporated in the Revised Tentative Order, including: (1) the deletion of the requirement to purchase certain types of street sweepers as well as deletion of prescriptive street sweeping and catch basin cleaning requirements; (2) the deletion of the requirement to install treatment systems for road reconstruction and rehabilitation projects within the existing footprint; (3) the deletion of the requirement to conduct an impervious surface data collection pilot project; (4) the deletion of the prescriptive list of businesses requiring inspections; and, (5) the deletion of some of the prescriptive trash reduction requirements. Regional Board staff should be commended for these modifications.	Noted.	
Newark	4	C.2.d.iii., C.3.b.v.(1), C.3.b.v.(2),	Reporting and Recordkeeping Requirements	There have been improvements to the reporting and recordkeeping requirements, including removal of the	We have made further simplifications in reporting requirements. The reporting	

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		C.3.c.iii., C.3.e.iv., C.3.f.iii., C.3.g.iv., C.3.h.iv., C.3.i.iii, C.4.b.ii.(6), C.4.b.iii., C.4.c.iii., C.4.d.iii., C.5.e.iii., C.5.f.ii., C.6.a.iii., C.6.e.ii.(4), C.6.e.iii., C.6.f.iii., C.7.e.iii., C.7.f.iii., C.7.g.iii., C.7.h.iii., C.9.b.iii., C.9.c.iii., C.9.d.ii., C.9.e.ii., C.10.b, C.10.d.ii-v., C.13.a.ii, C.13.b.ii., & C.13.d.ii		reporting template. However, these requirements are still onerous and many do not provide significant improvements for accountability. Examples of excessive reporting and recordkeeping requirements include: (1) for each construction site inspection, record the inches of rain since the last inspection (Provision C.6.e.ii.(4).(d)); (2) many of the Public Information and Outreach provisions include extensive reporting and evaluation requirements; (3) Provision C.15, monthly reporting on planned and unplanned potable water discharges; and (4) unrealistically short timeframes for submitting monitoring data and reports.	requirements remaining are required for compliance determination.	
Newark	15	C.10	Trash Reduction	As with the TMDL pollutants, trash reduction should be a primary focus for this permit term. We recognize that local agencies need to play a role in	Noted.	

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				reducing the amount of trash entering our creeks and the Bay. However, this is not a problem that Newark and other municipalities can solve on our own. We agree with the suggestion made by your Board several years ago that a statewide task force including State and local representatives should be formed to address trash reduction.		
Newark	16	C.3. and C.10	reduced scope of the structural control requirements	We appreciate the increased flexibility and the reduced scope of the structural control requirements provided in the Revised Tentative Order. As with other pollutants, source control is more cost effective than treatment and the increased flexibility to pursue source control measures in addition to the implementation of structural controls is a move in the right direction. However, as previously stated, these are very difficult economic times for Newark and the installation and maintenance of the required structural controls places an additional and potentially severe economic burden on the City. We are currently estimating at least $100,000 in additional annual costs to treat 30% of our commercial retail/wholesale areas within the 5-year period, assuming a significant contribution through redevelopment. There is simply no funding available given	Grant funding has been secured to assist Permittees with initial trash capture device installation. Full capture minimum installations must be completed by July 1, 2014, which allows significant time to develop funding. The Minimum Trash Capture Requirements have been reduced from the first TO requirements, and if further reduced would not have impact on the trash loads in the short term.	

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				current economic conditions. We also have serious concerns regarding the impact to flood control capacity with the required installation of screening with 5-millimeter openings.		
Newark	17	C.10	Eliminating trash	Eliminating all trash from local creeks and the Bay is a lofty, noble goal, but it is not one that can be accomplished solely be local agencies. Anti-litter efforts have been in place for decades, but have not eliminated what is a societal problem. Pilot trash assessments have indicated that trash in waterways is more often due to random, windblown littering instead of direct transport via storm drain systems. Permit compliance should not be dependent upon correction of a problem by local agencies over which they do not have full control. The C.10 provision will be very expensive and will not eliminate the problem. The Board staff acknowledges as much in the current permit under C.10.a.i. by stating: "The actions required in this 5-year permit term are unlikely to eliminate the impact of trash on beneficial uses or achieve the Basin Plan water quality standard for this pollutant after five years."	The Final TO revision of Provision C.10 requires abatement of trash loads that are conveyed through the MS4. The Permittees can also obtain credit toward trash load reduction for removal of other trash, which was not conveyed by the MS4. Trash load reduction can not be deferred. The Clean Water Act was adopted in 1978, and the Stormwater regulations were enacted in 1982, so significant time has passed since the requirements were put into place.	

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				We request that the entire C.10 trash reduction requirements be deferred until this problem can be addressed on a statewide basis. However, if the Board intends to move forward with the current MRP, we have additional specific comments related to the Trash Action Level and the Rapid Trash Assessment requirements.		
Newark	18	C.10	Trash Action Level	We have two concerns with the Trash Action Level. The first is that we believe terminology may cause confusion between a Trash Action Level and a Municipal Action Level or a Water Quality Standard. The Trash Action Level is not intended to be either. Proposed Resolution: To avoid this possible misinterpretation, we request that the terminology be changed to "Hot Spot Reduction Goal."	The TAL has been removed from the Final TO.	
Newark	19	C.10	hot spot reduction	Our second concern is that we do not believe that the hot spot reduction target of 100 pieces of trash per 100 feet of creek will be attainable in all cases. As an example, in 2008, the ACCWP conducted the Rapid Trash Assessment Protocol at ten sites throughout the Alameda County. (A technical memo summarizing the results is included as Attachment 4 in	The TAL is no longer included in the Final TO version of the C.10 Trash Provision. There is the requirement for 40% Trash Load reduction by July 1, 2014. We have allowed more flexible trash assessments including reporting of volume of trash collected in Trash Hot Spot cleanups, rather than the more labor intensive	

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				the ACCWP letter.) At one of the sites, approximately 3,000 pieces of trash were collected from a 100-foot stretch of creek. Almost all of the pieces were very small Styrofoam pellets that had been trapped in the ivy on the banks. These pellets are trapped along the creek bank for a long distance upstream of this site as well due to an illicit discharge that has now been corrected. At this site it will be nearly impossible to meet the pieces of trash per 100 feet target for the foreseeable future. Proposed Resolution: Express the Hot Spot Reduction Goal as "either 100 pieces per 100 feet or an 80% reduction from the baseline level."	RTA or Urban RTA.	
Newark	20	C.10	Rapid Trash Assessment	The Revised Tentative Order would require that these assessments would be conducted at each hot spot twice per year for five years. We have two concerns with this requirement. The first is that the protocol is very labor intensive and not necessary to determine if the trash hot spot reduction target is being met. The second concern is that the protocol is still evolving and there may be more effective methods of assessing the trash.	In the Final TO revision or Provision C.10 the frequency for trash hot spot cleanup and assessment is once per year. We have allowed more flexible trash assessments including reporting of volume of trash collected in Trash Hot Spot cleanups, rather than the more labor intensive RTA or Urban RTA.	

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				Proposed Resolution: Revise provision to require only counting the pieces of trash rather than categorizing them, and reduce the number of assessments required to once per year.		
Newark Attachment	86	C.10.	trash capture	Allow green streets pilot projects to count toward trash capture. Given the effort and expense that various municipalities will make if the green streets provision is kept in the permit, these projects should count toward trash capture. Filtering roadway runoff through a bioretention area or swale before it enters the storm drain system naturally filters out trash. This would be in keeping with the Water Board staff's preference for landscape-based systems over mechanical systems.	Bio-retention stormwater treatment technology would meet the trash capture standard, as far as we are currently aware. We have not analyzed the hydraulic specifications for equivalency yet, but that analysis can be easily done.	
Newark Attachment	87	C.10.	un-funded mandate	The requirements of this section cannot be met financially by the City. Water board staff has estimated a $6.06 per capita cost to each Permittee which equates to $27,473,822.04. Permittees, just like the State, are experiencing significant budget shortfalls in stormwater program revenues Increased revenues are highly unlikely due to the restrictions imposed by Prop 218. The City's general fund cannot absorb the treatment costs associated with this	Some grant money for initial trash capture installation has been secured. The requirement for trash capture was given a long time (2014) to phase in so that there would be sufficient time to secure adequate resources.	

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				provision. State and/or Federal funding for this un-funded mandate must be in place before placing this requirement on local public agency Permittees.		
Newark Attachment	88	C.10.b.	Overly detailed reporting.	Eliminate photo documentation requirement, due to cost, difficulty of submitting with report, and questionable value in showing true condition of site. Also, correct the typo (10 pieces should be 100 pieces, in accordance with URTA standards for "optimal".	The photo documentation of the condition of Trash Hot Spots can be submitted electronically, on CD or DVD to save paper, ink and staff cost. Photos will be essential in documenting the condition of Trash Hot Spots, before and after cleanup.	
Newark Attachment	89	C.10.d.	Requirements for reporting on existing laws related to trash	Requirements for reporting on existing laws related to trash is vague, overly broad, and difficult to achieve. Restrict to reporting on any new laws or ordinances created by Permittees that are relevant to trash reduction.	The intent was for only laws and ordinances related to trash and litter. In the Final TO, credit for these actions would be through the Trash Load Reduction Tracking Method, which the Permittees will propose.	
Oakland	1	C.2., C.3., & C.10	eliminating requirements to purchase specific types of street sweepers	We also thank the Board for many of the changes incorporated in the Revised Tentative Order, including eliminating requirements to purchase specific types of street sweepers, install treatment systems for road reconstruction projects within the existing footprint, implement an impervious surface data collection pilot project, and perform prescriptive trash requirements. We appreciate the	Noted.	

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				Board's willingness to address some of our previous concerns.		
Oakland	13	C.10.	Trash Controls	As with the TMDL pollutants, trash reduction is an appropriate focus for this permit term. We recognize that municipalities need to play a role in reducing the amount of trash entering our creeks and the Bay. However, this is not a problem municipalities can solve by themselves. We agree with the suggestion made by the Board several years ago that a Statewide task force including State and local representatives should be formed to address the trash problem. We appreciate the increased flexibility provided in the Revised Tentative Order. We also appreciate the reduced scope of the structural control requirements. As with other pollutants, source control is considered more cost effective than treatment. We appreciate the flexibility to pursue source control measures in addition to the implementation of structural controls. We are concerned that the hot spot reduction target of 100 pieces of trash per 100 feet of creek for targeted trash hotspots may not be attainable or the most effective strategy for reducing	The TAL has been removed from the Final TO.	

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				trash. Using the Urban Rapid Trash methodology, each piece of broken glass or pieces of paper may count as an individual trash item. It may be impossible for any urban site to meet this standard. Proposed Resolution: Express the Trash Hot Spot Reduction Goal as "either 100 pieces per 100 feet or an 80% reduction from the baseline level."		
Oakland Attachment #1	64	C.10.	State and/or Federal funding for this un-funded mandate	The requirements of this section cannot be met financially by the Permittees. Water Board staff has estimated a $6.06 per capita cost to Permittees which in actuality is $27,473,822.04. Permittees, just like the State, are in massive budget deficit and the stormwater programs even this depression was already under funded due to Prop 13 restrictions on increasing revenues. State and/or Federal funding for this un-funded mandate must be in place before placing this requirement on local public agency Permittees.	Some grant money for initial trash capture installation has been secured. The requirement for trash capture was given a long time (2014) to phase in so that there would be sufficient time to secure adequate resources.	
Oakland Attachment #1	65	C.10.a.i.	Trash Reduction	"While Permittees have completed some assessment of trash impacts in Santa Clara and San Mateo	Noted.	

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				counties…" Add Alameda to the list of counties.		
Oakland Attachment #1	66	C.10.a.v.	Trash Capture	Previously Installed Trash Capture Device Credit: "Credit can be claimed for trash full capture devices…" Other devices such as sea curtains that have been previously installed should be eligible for credit as well. Revise to clarify that trash capture devices other than full capture devices are also eligible for credit.	In the Final TO, full trash capture devices are credited toward the requirement, regardless of installation date. Non-full trash capture devices are not eligible for credit, though trash removed by these devices, such as booms, can count toward the 40% trash load reduction requirement.	
Oakland Attachment #2	31	C.10.b.	Hot Spot Assessment Overly detailed reporting.	Eliminate photo documentation requirement, due to cost, difficulty of submitting with report, and questionable value in showing true condition of site. Also, correct the typo (10 pieces should be 100 pieces, in accordance with URTA standards for "optimal".	The photo documentation of the condition of Trash Hot Spots can be submitted electronically, on CD or DVD to save paper, ink and staff cost. Photos will be essential in documenting the condition of Trash Hot Spots, before and after cleanup. The Urban RTA is not required in the Final TO.	
Oakland Attachment #2	32	C.10.d.(ii-v)	Annual Reports	Requirements for reporting on existing laws related to trash is vague, overly broad, and difficult to achieve. Restrict to reporting on any new laws or ordinances created by Permittees that are relevant to trash reduction.	The intent was for only laws and ordinances related to trash and litter. In the Final TO, credit for these actions would be through the Trash Load Reduction Tracking Method, which the Permittees will propose.	
Pleasanton	4	C.10.	"hot spots"	Under the Permit, the City would be required to identify trash "hot spots"	Reporting requirements have been simplified and trash hot spot	

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				and develop measures to abate trash in these areas, as well as treat 30 percent of its commercial/ retail area with full trash capture devices. The Permit also requires that the City conduct ongoing surveying, photo documentation, and other monitoring of the sites, and report on the findings each year. The monitoring includes counting of individual trash pieces by type, number, and locations. Survey of trash problem areas can be completed in ways that are far less time intensive than detailed counting of trash pieces, and the reporting requirements can be far less exact without compromising cleanup efforts.	assessments have been streamlined in the Final TO revision of the Provision C.10.	
Pleasanton	5	C.10.	Long Term Trash Management Plan	The requirement for development of a Long Term Trash Management Plan by 2013 with the goal of "no" impacts to beneficial uses needs to be realistic in terms of municipalities' ability to control trash. Based on our past years community coastal clean up day events, the source of trash in waterways was primarily generated from windblown from other locations in particular from freeways or school sites (over which the City has no code enforcement authority), as opposed to direct transport to the waterway by the City's storm drain system.	We agree that to the extent such trash impacts are not related to the MS4, they cannot be required to be abated under the Final TO. However, efforts to reduce such impact on waters could be credited under the Trash Load Reduction Tracking Method.	

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				It does not seem appropriate that Permit compliance is requiring municipalities to manage or correct a problem over which the City does not have control. It seems much more productive to use other public funds and agencies, other than the municipalities, to inform the travelling public and key trash target areas about the need to eliminate this problem.		
San Leandro	18	C.10.	Trash	The requirements of this section cannot be met financially by the Permittees. Water Board staff has estimated a $6.06 per capita cost to Permittees which in actuality is $27,473,822 just to comply with section C.10.a.v. This estimate may be considerably low as based on our estimates accounting for some known variables; including discrepancies in the acreage requirement and costs per acre; the per capita cost range could be as high as $22.84 per capita down to $6.26 per capita. Permittees, just like the State, are in a massive budget deficit and the stormwater programs, even before this economic collapse, were already under funded due to Proposition 13 and 218 restrictions on increasing revenues. With our own small agency facing an $11.3 million budget deficit in	Some grant money for initial trash capture installation has been secured. The requirement for trash capture was given a long time (2014) to phase in so that there would be sufficient time to secure adequate resources.	

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				FY09-10; it cannot absorb the estimated $1.8 million treatment costs. State and/or Federal funding for this un-funded mandate must be in place before placing this requirement on local public agency Permittees.		
San Leandro	19	C.10.a.ii. & v.	Trash Hot Spot selection & commercial/retail acres	The data in the 2005 ABAG Land Use database is inaccurate. One fallacy that is right on their description web page is that all their land area calculations are to the middle of the public street. Where their other data errors are is unclear due to the lack of a map based on their data. However, in reviewing their full data many of their land use categories for which our City has land so categorized is shown as zero acreage in the ABAG data. Using the City's current General Plan data and GIS mapping system; the City is providing 2009 data in the appendix of this document. Raw and summarized data is also available as a separate excel workbook. The latest published (2008) General Plan land use data and map, found in chapter 3.1, is available on the City Web Site at http://www.ci.san-leandro.ca.us/pdf/slgpchap3_1.pdf. Using 2009 updated general plan data; Urban land area (Acres) should be listed at 7353, Total land area at 9915,	The street is of key concern with regard to trash impact generation. We have adjusted the Commercial land amount for San Leandro based on the information that a large portion of that total land area in the ABAG data was submerged under the Bay.	

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				Total commercial land area at 721, Retail/wholesale commercial only land area at 662 and 30% of retail/commercial at 199 acres respectively. What appears to be arbitrary doubling of population based hot spot locations from 2 to 4 is out of line with the majority of other agencies. It appears that the variance between population and retail/wholesale acreages for most agencies is 1 or less. The number of hot spot locations, given the current population and flaws in the ABAG acreage data, should be set at 3, not 4 in the fact sheet table Attachment 10.1. (ABAG 2005 Land Use Date, City of San Leandro 2009 Data, and General Plan Land Use Map**could not be included*)		
San Leandro	20	C.10.b.i.	Trash hot spot assessment & reporting	Typo error on results criteria of "If a trash assessment scores less than 10 pieces of trash per 100 feet." This should be changed to 100 pieces of trash per 100 feet; as this would be consistent with the urban optimal listed in section C.10.a iv and the urban RTA tool guide.	The RTA and Urban RTA are not required in the Final TO revision of the Provision C.10.	
Union City	5	C.10.	Trash Reduction –	This provision requires the permittees to implement a wider set of trash management and trash capture tools	Some grant money for initial trash capture installation has been secured. The requirement for	

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				to prevent trash, litter and debris impact by installation of 5mm mesh screen at the inlets or catch basins. This requirement place significant financial burdens on the City with installation, maintenance, and reporting costs. In addition, flooding risk to the public and private properties may be increased due to potential clogging of the inlets. The City recommends the Board removing this provision.	trash capture was given a long time (2014) to phase in so that there would be sufficient time to secure adequate resources. The trash capture devices are designed with overflow capacity to prevent flooding.	
US EPA	7	C.10.	Trash Control	EPA is encouraged that the tentative order includes requirements to address trash impairments in San Francisco Bay and its watersheds. However, EPA believes that the permit should include measurable and enforceable goals for trash reduction. For additional Federal regulatory support for the fact sheet, we suggest you also cite 40 CFR 122.26(d)(2)(iv)(A)(1) which requires the following for a stormwater management program: A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers (emphasis added)	The Final TO revision of Provision C.10 contains a requirement for 40% reduction of Trash Loads for the baseline by July 1, 2014.	

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US EPA	8	C.10.	Trash Control	Commenters on the December 2007 version of the draft permit frequently expressed concern about the costs of the trash control program. For example, BASMAA in its comments to the Board estimated costs of $8.6 to $265 million (average of $128 million) for member agencies to implement "full capture devices" for just the 5% of the Bay Area urbanized areas for which such devices would have been required by the previous draft permit. However, these cost estimates are not supported by the experiences of the City of Los Angeles, which as noted in the fact sheet, intends to install such devices in the entire City of Los Angeles (with an area roughly comparable to the area to be covered by the Bay Area permit) for $72 million.	Noted.	
US EPA	9	C.10.	Trash Control	We recognize that in Los Angeles the requirements are being driven by TMDL requirements and similar requirements have yet to be developed for the Bay Area. However, the fact sheet for the Bay Area permit provides good support for the need for additional controls to reduce trash in Bay Area waterways, and the regulatory basis for the additional controls. Further, the San Francisco Bay Regional Board's draft 303(d) list	The Final TO revision of Provision C.10 contains a requirement for 40% reduction of Trash Loads for the baseline by July 1, 2014. The Long Term Trash Load Reduction Plan must propose a strategy to achieve 70% reduction by 2017 and cleanup and abatement of trash impacts to waters by 2022.	

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				includes a long list of waters (the Bay shoreline and 24 tributaries) impaired for trash, which may well lead to TMDLs for trash in the near future. Given the accomplishments thus far in the Los Angeles area, and the data provided to the Regional Board that justified the draft 303(d) listings, we believe that setting a percent load reduction over each year of the permit life for all proposed listed waterbodies, at a minimum, would be necessary for compliance with the requirements for trash control to the maximum extent practicable (MEP) of section 402(p)(3)(B) of the Clean Water Act. We believe that the proposed "hot spot" identification and methodology in the draft permit language is unnecessary and not based on already identified impairment. We encourage trash control efforts in commercial and industrial areas in addition to the waterbodies identified on the draft 303(d) list as impaired for trash.		
US EPA	10	C.10.	Trash Control	Moreover, trash-control requirements in the previous MS4 permit were not completed, and thus it may be yet more compelling for the permittees to take more direct implementation actions to achieve reductions in loadings. This could be an optimal time to put in place already-tested	Noted.	

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				methods from others and have a successful approach in place well before future trash TMDL adoption.		
CA Senator Leland Yee	4	C.10.	Trash Control	Specifically, I believe that the highest priority during the upcoming permit's five-year permit period should be to reduce the amounts of trash and litter that are reaching local waterways through stormwater conveyances.	Noted. Trash Load Reduction is a major priority in the Final TO.	
Carlino, Tom	1	C.10.	Trash Control	I would like to comment for the upcoming discussion on standards for trash in the Bay Area waterways. I have been a contributor of photos of some of the trash hot spots to Save the Bay and I have some recent updates of one particularly bad spot that I would like to bring to your attention to graphically illustrate the seriousness of the problems. I think that viewing the photos will make it clear why I am in favor of badly needed cleanup, much higher standards and strong enforcement. The area is along the east bank of Coyote Creek north of Bailey Avenue at the north end of Coyote Valley. In more than 2 years since I first documented the site there has been no change, and it appears to me now that the extent of the trash is much greater than I had originally believed. Attached are recent photos taken on	We agree that trash impacts to receiving waters is a major problem in the region. The Final TO includes major enforceable actions to reduce trash loads.	

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				Mar 8, 2009. Attachments: Six Photos of Coyote Creek at Bailey Avenue **not included here**		
Dublin	13	C.10.	Trash hotspots	Under the Permit, the City of Dublin would be required to identify four (4) trash "hot spots" and develop measures to abate trash in these areas, as well as treat 30% of its' commercial/ retail area with full trash capture devices. The City participated with several other local agencies in Alameda County in a pilot trash assessment study. Based on this study, as well as ongoing business inspections and discharge response, staff has identified a number of sites that marginally meet the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPP) "hot spot" criteria of 100 pieces of trash per 100' of creek length, as required in the permit. Nevertheless, the City of Dublin will attempt to meet the Permit requirements for trash reduction in these areas. However, in addition to trash abatement, the Permit requires that the City conduct ongoing surveying, photo documentation, and other monitoring of the sites, and report on the findings each year. The monitoring includes counting of	Reporting requirements have been simplified and trash hot spot assessments have been streamlined in the Final TO revision of the Provision C.10.	

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				individual trash pieces by type, number, and location, as required by the SCVURPPP criteria. Based on the pilot trash assessment that was completed in 2008, survey of trash problem areas can be completed in ways that are far less time intensive than detailed counting of trash pieces, and the reporting requirements can be less rigorous without compromising cleanup efforts.		
Dublin	14	C.10.	Long Term Trash Management Plan	Furthermore, the requirement for development of a Long Term Trash Management Plan by 2013 with the goal of "no" impacts to beneficial uses needs to be realistic in terms of municipalities' ability to control trash. Based on the pilot trash assessment, the City found that the source of trash in waterways was more often than not due to random littering, windblown from other locations, or generated from freeways or school sites (over which the City has no code enforcement authority), as opposed to direct transport to the waterway by a storm drain. It is not appropriate that Permit compliance is dependent upon a municipalities' correction of a problem over which it does not have full control. The added cost of the reporting	We agree that to the extent such trash impacts are not related to the MS4, they cannot be required to be abated under the Final TO. However, efforts to reduce such impact on waters could be credited under the Trash Load Reduction Tracking Method. The reporting has been streamlined in the Final TO, the requirement for a Long Term Trash Load Reduction Plan remains.	

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				requirements for abating trash "hot spots" is estimated at $2,000 per year. The cost of developing the Long Term Trash Management Plan is estimated at over $8,000.		
Friends of Five Creeks	6	C.10.	Trash	This next cause appears to be trash. Others will comment in detail on the proposed measures to curb trash pollution. I will only say that, as with low-impact development, the Board should not adopt a cumbersome framework, vague long-term goals, and weak actual requirements and then move on thinking that the job is done.	We believe the framework is simple, the long term goals are clear, and the actual requirements are strong and straightforward.	
Hayward	2	C.10.	Trash Reduction	One major concern is the trash reduction component of the MRP, found in Provision C.10. The City recognizes that litter is a pervasive environmental problem and the City continues to make strides in its efforts and commitment to reduction of trash. The City appreciates the Board's acquiescence in removing the rigid requirements of the Enhanced Trash Management Control Measures, replacing it with the more flexible menu of Trash Source Reduction management tools. Cost-effective measures such as public outreach should also be included as optional tools. The requirement to conduct	The Trash Hot Spot assessments have been streamlined to allow recording of volume and dominant types of trash cleaned up in the Final To revision of Provision C.10.	

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				trash assessments at trash hot spots, as per the prescribed methodology, dedicates staff resources that can be better utilized elsewhere. At a minimum, the City recommends documenting the weight of trash collected versus tabulating the number of individual pieces of trash deposited in these hot spots.		
Hayward	3	C.10.	Trash reduction	Further, the requirement to install full trash capture devices on a catchment area equal to 30% of Retail/Wholesale Commercial Land is of significant concern to the City. These structural devices are very costly to install and maintain.	Grant funds have been secured to assist with early installation of trash capture devices. The requirement is phased to July 1, 2014 to allow time for funding development.	
Hayward	4	C.10.	Trash Capture	In addition, the requirement of full trash capture devices to screen materials 5 mm in size poses significant flood risks when these devices become obstructed with leaves or debris during storm events.	The full trash capture devices are designed with overflow bypass features to prevent flooding.	
Hayward	5	C.10.	trash hot spots	Finally, determination of the number of trash hot spots and area required to drain to full trash capture devices is determined by Association of Bay Area Governments (ABAG) 2005 land use statistics. The City has found significant disparity between ABAG 2005 land use data and City records documenting retail/wholesale commercial land acreage statistics.	If the Permittee can present and document the sound basis for correction of this discrepancy, we can consider revising the acreage figure.	

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Livermore	13	C.10	Trash Reduction:	This provision also requires that permittees identify "Trash Hot Spots". Permittees must identify one "hot spot" per 100 acres of Retail/Wholesale Commercial Land as defined by ABAG 2005 Land Use Statistics. The "hot spots" must be at least 100 yards of creek length and spaced no more closely than ¼ mile from each other. By February 1, 2010, permittees must report the following: (1) Hot Spots' Name/Location, and (2) Submit 4 photos documenting each hot spot's upstream, downstream, and midstream conditions. These "Trash Hot Spots" will be posted on the Board's website for public comment. By July 1, 2012, permittees shall achieve the "Trash Action Level" as defined as the Urban Optimal Level from SCVURPPP. Thus, permittees will be required to maintain these sites so that there exist less than 100 pieces of trash per 100 ft. of assessment reach and no visual impact from trash.	Noted.	
Livermore	14	C.10.v.ii.	Trash Source Reduction:	This provision requires permittees to take efforts to adopt, strengthen, and increase enforcement of local laws governing solid waste and litter. If permittees adopt significant laws (i.e. plastic bag or Styrofoam product bans) by 2012, the trash capture device	Noted. This sub-provision has been removed from the Final TO revision of Provision C.10. If Permittees do enact these types of trash source control measures (ordinances or laws reducing trash and litter), credit can be	

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				requirement can be reduced from 30% to 20%.	proposed under the Trash Load Reduction Tracking Method, which the Permittees will propose in 2012.	
Livermore	15	C.10.b	Trash Source Reduction	This provision requires permittees to utilize the SCVURPPP "Urban Rapid Trash Assessment" model to assess "Trash Hot Spots" twice per year at the beginning and end of the dry season commencing Summer 2009. The entire C.10 Trash Reduction provisions place significant financial burdens on the City in terms of capital costs (installation of trash capture devices), operational costs (trash capture device service and maintenance), increased record-keeping costs, and represents an ineffective and inefficient use of staff time to inspect creeks to count and categorize trash. Furthermore, the installation of devices which screens materials 5 millimeters in size poses significant risks in terms of flooding and damage to private property, as well as associated financial liabilities, when these devices become obstructed with leaves or debris during normal storm events. Provision C.10 is unrealistically ambitious and fails to recognize the	The RTA and Urban RTA are no longer required for Trash Hot Spot assessment in the Final TO. We disagree that the requirements of revised C.10 are ineffective and inefficient. Revisions in the Final TO simplify the requirements, and place great flexibility in the hands of the Permittees to effectively reduce trash loading within their jurisdictions. Grant funds have been secured to assist with early installation of trash capture devices. The requirement is phased to July 1, 2014 to allow time for funding development. The trash capture devices are designed with overflow bypasses to prevent flooding. The 2022 target for achievement	

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				last 40 years of anti-littering efforts that have been unable to eliminate this societal problem. The Regional Board itself acknowledges that this provision will not effectively reduce trash or improve water quality as indicated by the following quote which prefaces this provision in the Tentative Order: "The actions required in this 5-Year permit term are unlikely to eliminate the impact of trash or beneficial uses or achieve the Basin Plan Water Quality Standards for this pollutant….." (C.10.a) While removing all trash from our creeks is a noble goal, it is simply not one that municipalities can afford at this time, and there is great uncertainty whether our communities would be willing to support with increased funding when asked. Costly requirements that are known to be ineffective, such as the C.10 Trash Provision, must be removed from the Tentative Order.	of abatement of trash impacts to receiving waters is achievable, as the major challenges are implementation of known workable solutions in the trash source areas of each Permittee's jurisdiction. While littering and trash production may continue to occur, keeping it out of waters is a more narrowly defined goal.	
Millbrae	15	C.10.	Trash Control	The permit proposes a trash clean up (action) level for what it terms trash hotspots that should be expressed as a goal and not an inflexible mandate because of uncertainty about what	The TAL has been removed from the Final TO.	

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				levels of trash reduction are needed to protect beneficial uses and what levels are reasonably achievable.		
Millbrae	16	C.10.	Trash Control	The requirement to install full capture devices on 30% of the ABAG 2005 Retail/Wholesale Commercial Land Use area is too ambitious at this stage. The installation of full capture on 20% of this land use is a reasonable level of implementation as part of what the permit characterizes as an initial pilot scale deployment.	In our judgment, 30% of Retail/ Wholesale Commercial Land is a relatively small segment of trash and litter generating urban land, so should not be further reduced.	
Newark Mayor	2	C.10.	Trash Control	It also requires co-permittees to implement costly but ineffective trash controls that may adversely impact flood control protection. These controls would require a constant level of maintenance that local jurisdictions cannot afford to provide.	Trash capture devices are effective, and the cost for installation and maintenance is reasonable (See Fact Sheet Provision C.10). The trash capture devices have overflow bypass features to prevent flooding.	
San Mateo	9	C.10.	Trash Control	We believe the permit should not be used to address trash and litter in creeks from direct dumping and littering and wind transport, as these sources are outside the definition of a "municipal storm sewer system" as defined in the Federal Clean Water Act. The City would continue to clean up these deposits as we always have.	We agree that to the extent such trash impacts are not related to the MS4, they cannot be required to be abated under the Final TO. However, efforts to reduce such impact on waters could be credited under the Trash Load Reduction Tracking Method. The reference in question is not in the Final TO revision of Provision C.10.	
San Mateo	10	C.10.	trash clean up	The permit proposes a trash clean up	The TAL has been removed from	

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			(action) level	(action) level for what it terms trash hotspots that should be expressed as a goal and not an inflexible mandate because of uncertainty about what levels of trash reduction is needed to protect beneficial uses and what levels are reasonably achievable.	the Final TO.	
San Mateo	11	C.10.	full capture devices	We believe the requirement to install full capture devices on 30% of the ABAG 2005 Retail/Wholesale Commercial Land Use area is too ambitious and does not guarantee meaningful trash reduction. As indicated above, direct littering and dumping into waterways can be a more significant source. We concur with the countywide Program comments that the installation of full capture on 20% of this land use is a reasonable level of implementation as part of what the permit characterizes as an initial pilot scale deployment.	In our judgment, 30% of Retail/ Wholesale Commercial Land is a relatively small segment of trash and litter generating urban land, so should not be further reduced.	

Response to Comments on February 11, 2009 Revised Tentative Order Provision C.11. – Mercury Controls & C.12 PCB Controls

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Campbell	2	C.11/C.12	Phase in provisions	The MRP's proposed requirements for polychlorinated biphenols and mercury should be phased in more gradually and over a longer period of time than what is currently proposed.	The requirements for these pollutants are intended to result in reduction of loads, eventually sufficient to meet TMDL load allocations. Requirements are taken or derived from TMDL implementation plans. Pilot scale implementation represents an appropriate beginning to this endeavor. However, in view of the fact that these load allocations must be met within 20 years, phasing in pilot projects is simply an inadequate level of effort. The pilot projects required in the permit must be implemented this permit term so we can gain experience. It is very likely that even more effort will be required in subsequent permit terms. We have provided additional time to complete certain elements of several C.11/C.12 provisions. We acknowledge that all pilot projects may not be completed by the 2013 Annual Report, but it is critical to report on progress and lessons learned in this report to inform actions in the subsequent permit.	We provided an additional year to develop training program for C.12.a. We provided an additional year to report on current regulations for C.12.b as well as an additional year to prepare the final report for this same provision. We provided an additional year to identify candidate drainages for C.11.c/C.12.c as well as an additional year to complete the surveys for these drainages. We provided flexibility in the early components for C.11.d/C.12.d and provided an additional year to identify candidate locations and treatment types for C.11.e/C.12.e.
FSSD	27					
SMCWPPP	8					
Suisun City	27					
Sunnyvale	8					

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Campbell	3	C.11/C.12	Reduce or delay	New requirements for water quality monitoring, special studies, and pilot projects need to be reduced or delayed.	See response to Campbell comment 2.	
Mountain View	14	C.11/C.12	Defer actions	The investigation and abatement requirements in the Regional Permit would require significant staff and budget and most likely would need to be conducted by professionals with specialized training investigating these sites. The City believes that completion of the activities to address legacy pollutants should be deferred until subsequent municipal storm water NPDES permits, which will allow municipal agencies to complete higher-priority tasks.	See response to Campbell comment 2.	
NRDC & Baykeeper	58	C.11/C.12	Include allocations	Once a TMDL has been adopted, NPDES permits are required to include WLAs and contain effluent limitations and conditions consistent with the assumptions and requirements of the TMDL from which they are derived. (40 C.F.R. §122.44(d)(1)(vii)(B).) However, nowhere in the Tentative Order is there any reference to specific	The fact sheet states the aggregate and individual mercury WLAs for stormwater programs. The PCBs TMDL has not yet been approved by the State Board or USEPA so there are no applicable WLA yet in force.	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				WLAs for the two TMDLs that apply to the Permittees, nor is there any evidence to show that the Tentative Order has been drafted consistent with the requirements of the TMDLs.		
NRDC & Baykeeper	58	C.11	Insufficiency of provisions	The Tentative Order never references any controls to achieve WLAs or reduce mercury-related risks. However, Provision C.11. fails to require, or provide substantiation for, any specific control measures designed to meet the requirement above, granting instead almost unfettered discretion to the Permittees and requiring little more than the preparation of numerous plans and studies identified as "additional requirements for urban runoff management agencies" by the TMDL. The U.S. Environmental Protection Agency has recently stated that a permit should "explicitly state that the wasteload allocations (WLAs) established by . . . TMDLs are intended to be enforceable permit effluent limitations and	The TMDL provides a time period of 20 years to achieve the load allocations. Therefore, the mercury control measures, in total, required through this permit do not have to result in achievement of the allocations. We disagree with the commenter's statement of the permittees having almost unfettered discretion regarding compliance with the permit requirements. On the contrary, there are measures of expected effort for every provision. The sum total of actions in provisions C.11 and C.12 represents a substantial level of effort and expense and a strong beginning toward achieving the load allocations in future permit terms. Finally, there is no requirement to employ the urban runoff load allocations as enforceable effluent limitations.	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				that compliance is a permit requirement."		
Palo Alto Santa Clara County SCVURPPP BASMAA attachment SCVWD BASMAA FSSD CCCWP Sunnyvale West Valley Clean Water Program ACCWP Berkeley attachment 1 Newark Oakland Oakland attachment 1 Berkeley Contra Costa Board of	15, 16 26 7, Attachment A 56 72 16 60 33 39, 49 55 12 67 67 21 12 67 20 49	C.11/C.12	Combine C.11/C.12	Combine C.11 and C.12 into one provision to eliminate duplication and inconsistencies.	There are some benefits to combining these provisions, but drawbacks as well – especially as these provisions are adapted in future permits. And, there are elements that currently only apply to mercury or only to PCBs so combining provisions will be unwieldy in this respect. Our preference is to leave them separate and ensure consistency as much as possible. We have endeavored to remedy any inconsistencies between the two provisions.	

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Provision C.11. – Mercury Controls & C.12 PCB Controls

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Supervisors attachment SMCWPPP	89					
Palo Alto	17	C.11.c-f /C.12.c-f	Fewer retrofits and pilots	Due to the unknown effectiveness and pilot nature of retrofits, we request that the number of locations be reduced from 10 to 4 throughout the Permittee's jurisdictions (regional) and language be added to allow existing treatment systems to be utilized where applicable. Commenters also want number of all pilot projects in C.11 and C.12 reduced to 4 throughout the region.	There are three lines of argument supporting the level of effort required in the revised TO. First, POCs have been identified as a high priority for this permit so aggressive efforts here are warranted. Second, a large number of pilot projects need to be implemented during this permit term so that we have an opportunity to learn about technical details, costs, benefits and feasibility. Third, there needs to be early and sustained progress toward achieving TMDL load allocations. There is sufficient information available to allow Permittees to identify 5 suitable locations to implement pilot projects for C.11.d/C.12.d and 10 suitable locations to pilot test retrofits (C.11.e/C.12.e) ***throughout the entire Bay Area.*** Because there are several types of treatment retrofits, it is important to have multiple instances of these types of solutions so we gain experience. Scaling back the effort as suggested jeopardizes progress toward achieving load allocations in 20	We have provided some flexibility in timing as mentioned in response to Campbell comment 2. We have also provided some flexibility in provision C.11.e/C.12.e in that 2 of the 10 treatment systems to be evaluated can be pre-existing such that now 8 must be newly installed.
Santa Clara County	27					
CCCWP attachment	41, 43					
BASMAA attachment	64, 67, 69					
SCVURPPP	7, attachment A 60, 62					
FSSD	37, 38, 39					
Pacifica	29, 31					
San Pablo	11					
SMCWPPP	91, 95, 97					
ACCWP attachment, Berkeley attachment and Oakland attachment 1	74, 75, Attachment 1 78, 79, Berkeley attachment 1 comment 75, Oakland attachment					

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
	1 comment 75, 78, 79				years.	
Contra Costa Board of Supervisors attachment A	50					
Palo Alto	18	C.11.f/C.12.f	Diversions	Proposed conditions require that a feasibility study on the diversion of dry weather and first flush flows to the sanitary system be conducted, and require implementation of a flow diversion pilot without regard for results and findings of the feasibility study. It is clear from even preliminary exploratory discussions that any potential storm water Diversion to the sanitary system will pose significant engineering, regulatory, financial, legal and institutional challenges. Therefore, we request that during this permit term a feasibility study be conducted and requirements in subsequent permits consider the findings of the feasibility study prior to requiring implementation of dry weather or first flush diversions.	We acknowledge that full scale diversion of stormwater has many challenges. This is why the TO calls for pilot scale implementation as a means to evaluate these challenges. Individual co-Permittees have, in the past, applied for state grant funding to implement a flow diversion project. We therefore can conclude project proponents had already confirmed feasibility of the project. Otherwise, they would never have applied for state resources to carry it out. We are likewise confident that there will be other feasible locations in the Bay Area where flow diversion can be implemented. Because TMDL load allocations must be achieved within 20 years, it is not appropriate merely to explore feasibility of control options during this permit term. Pilot tests must be conducted this permit term so	
Santa Clara County	27					
Pacifica	30, 32					
San Mateo	12					
ACCWP attachment 1, Oakland attachment 1	81					
SCVURPPP	7, attachment A 63					
West Valley Clean	14					

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Water Program					we can gain knowledge about the role of such retrofits in the overall strategy for pollutants of concern.	
SMCWPPP	99					
Burlingame	9					
Millbrae	17					
Sunnyvale	56					
San Jose	5	C.11/C.12	Diversions	Commenters request that more time be allowed for coordination with POTWs on this issue, that additional time be allowed for implementation of the feasibility study, and that subsequent requirements for implementation be contingent on the findings of the feasibility study.	Numerous parties submitted similar comments on the original TO. Please see responses to the following comments from the original TO: SMCWPPP 15 and 16, Hayward 6 through 8, Santa Clara 2, and San Jose attorney 10, 24, and 76. See also the response to Palo Alto comment 18 on this revised tentative order.	
SCVWD	17					
San Jose attachment A	25	C.11.e/C.12.b/C.12.e	Criteria for pilots	The City believes that a superior approach would be to base the location and number of sample sites on more objective, science-based considerations of variability, costs, and certainty needs.	This is identical to a comment submitted on the original tentative order. See response to San Jose comment 73 on the original TO.	
San Jose attachment A	26	C.11/C.12	Do feasibility	Implementation of diversion must be contingent on the results of the feasibility evaluation. This provision does not follow a logical course of action and is inconsistent with TMDLs. It assumes that	These comments are also identical to ones submitted on the original TO. Please see responses to San Jose Attachment A comment 25 above as well as our responses to comments received on the original TO cited in our response to San Jose comment 5	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				feasible opportunities for diversion to pump stations will be found in all counties, although we have little reason to believe that this is true. The City is committed to reducing the delivery of PCBs and Mercury to receiving waters in keeping with TMDLs, including possible diversions to the sanitary system when feasible, however we also believe that significant risk of non-compliance exists within these provisions as written if no or too few feasible diversion opportunities are found. The provision is inconsistent with the PCB TMDL. The TMDL states that opportunities for targeted diversions should be investigated, pilot tested and implemented where feasible, and further states under Regulatory Analysis (page 93): "No specific project to route stormwater to a wastewater treatment plant is currently required." Any such evaluation should be advanced methodically and specific requirements for diversion should be contingent on the	above.	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				results of the feasibility evaluation.		
SCVURPPP attachment A	57	C.11/C.12	Phase in	Based on cost estimates, it is clear that prioritizing and phasing these requirements over several permit terms is absolutely necessary. Thus, we have geared our suggested comments below and the redline/strike-out (see Attachment B) to address our concerns.	We consider the cited Attachment B as supplementary material and not comments requiring individual responses. Regarding suggestion of phasing in, see response to Campbell comment 2.	
SCVURPPP attachment A	58	C.11/C.12	Dates	The Water Board staff has not updated the dates in many of the provisions from the December 2007 TO. In Attachment B (redline/strike-out) we have included reasonable updates to the dates contained in the February 2009 Revised TO that are consistent with the time frames anticipated.	We have indeed updated the dates in an appropriate manner. We consider the cited SCVURPPP Attachment B as supplementary material and not comments requiring individual responses.	
CCCWP	50					
FSSD	35					
SCVURPPP attachment A	61	C.11.d/C.12.d	Do feasibility first	We request revision to specify an initial feasibility study and cost analysis of enhanced sediment management practices, including street sweeping, using existing information. This requirement should further be revised to require pilot testing of appropriate enhanced sediment	Making these requirements contingent on results of a feasibility study and cost analysis is not an acceptable level of accountability. Such an approach is not consistent with the efforts needed to address these pollutants of concern to achieve TMDL load allocations. There is already a good deal of information available about what practices to pilot and	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				management practices (selected based on the results of the feasibility study) in no more than four drainages.	where to pilot them, and it is time to do pilot studies. See also response to Campbell 2.	
West Valley Clean Water Program	13	C.11/C.12	Reduce Pilots	Reduce the number of regional pilot projects and investigations and add language such that existing treatment systems can be utilized where applicable.	See response to Palo Alto 17.	
San Jose Attachment A	27	C.12.b	Demolition Wastes	The City requests that this Provision be contingent on the results of the sampling and analysis efforts. If PCBs are not found in meaningful amounts in demolition wastes, this Provision should be omitted. The City requests rewording this Provision to be dependent upon the results of the sampling and analysis activities	This is identical to comment 79 submitted by the same party on the original TO. See response to that comment.	
San Jose Attachment A	28	C.12.b	Demolition Wastes	The City requests that explicit mention of ongoing grant-funded projects by SFEI and others to address PCB BMP effectiveness and PCBs in demolition materials be made in regard to these Provisions. The City also requests that participation in these projects be considered to satisfy these requirements. If not, please explain why.	This is identical to comment 80 submitted by the same party on the original TO. See response to that comment.	

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Provision C.11. – Mercury Controls & C.12 PCB Controls

File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
San Jose Attachment A	29	C.12.e	Treatment retrofits	This requirement may conflict with results of the technical and economic feasibility assessment if assessment recommendations do not "span treatment types and drainage characteristics." The City requests adding "as possible within the constraints of the feasibility assessment outcomes in C.12.e.i." Moreover, each county is now expected to do at least one, regardless of the outcome of the feasibility study. Requirements for implementation should be contingent upon the outcome of that study.	This is identical to comment 81 submitted by the same party on the original TO. See response to that comment.	
SCVURPPP attachment A	59	C.12.b	Demolition Wastes	– As written, the requirements for these pilot projects are overly prescriptive and do not allow for consistency with the scope and stakeholder process of an ongoing Proposition 50 grant-funded project that addresses the objectives of this provision. We request that these requirements are replaced with a requirement that BASMAA continues to participate in the Proposition 50 project as a stakeholder and project partner. In addition, it is extremely	This is essentially identical to comment 75 submitted by this party on the original TO. Please refer to that response.	

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				important to note that the sampling required by this subprovision could possibly lead to immediate abatement orders to protect human health at some sampling sites. This possibility will make it difficult or impossible to obtain permission to sample due to the potential liability to property owners. The Proposition 50 project is currently working with EPA and other parties to explore ways to resolve this issue, but an easy resolution is not anticipated. It is possible that any program to identify and abate PCBs in buildings will initially be driven by on-site human health risks rather than water quality concerns.		
BASMAA attachment	61, 73	C.12	Quantify loads	All references to quantifying pollutant loads and/or loads avoided should state "prepare quantitative estimates of loads and/or loads avoided" or something similar	The existing language communicates the intent adequately as written.	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
BASMAA attachment	74	C.12.b	Less Prescriptive	Revise provision to be performance-based and much less prescriptive (i.e., it should state the required outcome and when it needs to be accomplished by, but it should not prescribe the exact methods and schedule for each step along the way) as this will facilitate coordinating this provision with the Proposition 50-funded "Taking Action for Clean Water" project, since the methods and schedule for the Proposition 50-funded project will largely be developed during its implementation through a stakeholder/advisory committee process	The virtues of the current phrasing of the provision (accountability in content and timing) outweigh purported benefits of the suggested changes. Prescribing our expectations for the nature of the provision and the pace of its accomplishment ***is*** a specification of expected performance.	
SMCWPPP	90					
BASMAA attachment	75	C.12.b.iii	Change Dates	Dates should be one year later.	We will provide an additional year for the report on the evaluation of current regulations and will provide an additional year to submit the final report on pilot program effectiveness evaluation. All other reporting dates remain unchanged.	We will provide an additional year for the report on the evaluation of current regulations and will provide an additional year to submit the final report on pilot program effectiveness evaluation.
ACCWP attachment, Berkeley attachment 1, Oakland attachment 1	73					

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
BASMAA attachment	66, 76	C.12.c	Permittee responsibility	Delete last sentence "Permittees are responsible for contaminants located on public rights-of-way and the stormwater conveyance system." as unacceptable language to state that permittees are solely responsible for contaminants located on public right-of-way and in the stormwater conveyance system	The language is factually correct as written and purposeful. The language does not say "solely responsible". It may be true that other parties may have a role to play in addressing the origin of the pollutants when that origin is on private property. This fact is even explicitly stated in this provision.	
CCCWP attachment	42					
BASMAA attachment	77	C.12.c	Jurisdiction	Change language to eliminate phrase "under their jurisdiction" as this could refer to private properties located within a city that are not necessarily owned by that city	Language earlier in this provision has been clarified as to where permittee responsibility concerning contaminants on private property. The suggested edit is not necessary.	
SMCWPPP	94					
BASMAA attachment	68, 78	C.12.d.iv	Delete Provision	Delete provision as the PCBs TMDL Basin Plan Amendment specifies that PCBs actions during the five-year permit term should consist of cost-effective pilot studies, not implementation actions.	The commenter's interpretation that the meaning of "pilot project" does not include actually implementing the pilot project is inconsistent with the commonly understood meaning of pilot project. See also response to Palo Alto comment 17 above.	
Contra Costa Board of Supervisors attachment A	48	C.12.a.ii	Unreasonable Provision	It is unreasonable to refer locations of PCBs or PCB-related equipment to state agencies. Any Pacific Gas & Electric corporation yard or substation has transformers that may contain PCBs. There is little to be gained from making	This Provision is about far more than referring locations of PCBs to state agencies. We encourage the commenter to read the provision more carefully and consult the local stormwater program for background on how these types of sites may contribute to water quality impairment.	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
				such reports when these locations that may have reasonable presence of PCB containing equipment can be located by industry type or hazardous waste manifests already being routinely sent to DTSC for tracking purposes.		
Contra Costa Board of Supervisors attachment A	50	C.12.h	Do work under RMP	Fate and Transport Project in particular is more appropriate if undertaken by the RMP.	See response to CCCWP attachment, comment 58 concerning provision C.14.	
CCCWP attachment	48					
FSSD	36	C.12.b	Too Prescriptive	As written, the requirements for these pilot projects are overly prescriptive and do not allow for consistency with the scope and stakeholder process of an ongoing Proposition 50 grant-funded project that addresses the objectives of this provision. We request that these requirements are replaced with a requirement that BASMAA continues to participate in the Proposition 50 project as a stakeholder and project partner.	This comment is nearly identical to SCVURPPP comment 75 on the original TO. See response to that comment.	
ACCWP attachment, Berkeley attachment 1, Oakland attachment 1	71					

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
Pittsburg	12	C.12.e	DTSC Permits	Removal of PCBs via on- site retrofit of existing storm drain systems may require permitting through the Department of Toxic Substances Control.	If levels of PCBs captured in on-site retrofits are high enough to require oversight and permitting by DTSC, then you will be removing large quantities of PCBs and making good progress toward achieving the load allocation.	
SMCWPPP	92	C.11.c/C.12.c	Permittee Authority	Modify the permit to state that the permittees will attempt to identify private properties that may be contributing to contamination of their MS4s, and will forward this information to the Water Board staff, and as appropriate other authorities, for their use in investigating and remediating potential contamination sources.	The suggested wording ("will attempt to identify") could be satisfied by permittees by sending an email or letter to a private property owner. This would be an inadequate accountability mechanism for ensuring cleanup of contaminated sites. However, the permit language can be clarified regarding permittee responsibility for either doing clean-up or by notifying authorities.	Permit language has been edited to clarify how permittees may carry out their responsibilities for contamination found on private property.
Brisbane	16					
Pacifica	34					
San Mateo	13					
Millbrae	18					
Burlingame	10					
SMCWPPP	93	C.11.c/C.12.c	Permittee Responsibility	The permit states that municipalities are responsible for contamination located on public right-of-way and the stormwater conveyance system. Contamination may occur on these properties that has not resulted from any actions by the municipalities, and the permit should not assign municipalities this responsibility. Delete language from the permit that states: "Permittees are	By the logic of this comment, stormwater programs should be allowed to discharge wastes at any level whatever as long as the contaminants were not the direct result of actions by the permittee. This is a problematic interpretation of state and federal water quality regulations governing permitted discharges. There are virtually no cases in which the bulk of contaminants in stormwater discharges is due to the actions by	

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				responsible for contaminants located on public rights-of-way and the stormwater conveyance system."	municipalities. Nevertheless, permittees have an affirmative responsibility for the presence of those contaminants in stormwater.	
SMCWPPP	96	C.11.d/C.12.d	Pilot	The permittees should not be required to implement projects that are more than pilot scale unless it is demonstrated that this will make sense. A date for implementation should not be set in the permit because the pilot scale projects may determine that the benefits of removing sediment are not worthwhile.	This comment can be addressed by the response to Palo Alto comment 17.	
SMCWPPP	98	C.11.e/C.12.e	Dates	The permit should be modified to require that progress on the pilot project be described in the 2013 Annual Report and that the final report be completed and submitted on the same schedule as the 2014 Annual Report.	We acknowledge that all pilot projects may not be completed by the 2013 Annual Report, but it is critical to report on progress and lessons learned in this report because one of the chief motivations of doing the pilot projects during this permit term is to inform actions in the subsequent permit. It will not be satisfactory or helpful to receive the final report on these pilot projects until after the next permit should be adopted. This does not allow enough time to review results and craft appropriate provisions for the next permit term,	
Pacifica	33					

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SMCWPPP	100	C.11.h/C.12.h	Fate and Transport	Modify the permit to include a clear description of the questions that these studies need to address. In addition, the permit should state that the types of studies needed will be handled through the existing financial contributions to the Regional Monitoring Program.	The permit contains sufficient details as to the categories of questions to be addressed. This provision comes directly from mercury and PCBs TMDLS so much more background can be found in those reports. Regarding suggestion of doing work through RMP, see response to CCCWP attachment, comment 58 concerning provision C.14.	
SMCWPPP	101	C.11.i/C.12.i	Risk Reduction	The permit's task description has broadened the scope of the work to include reducing mercury related risks to humans. This contrasts with the pervious draft permit that focused on reducing risks from consuming bay fish. The previous focus on reducing risks from consuming bay fish should be restored, and this change is consistent with the description of the task contained in section ii.	This Provision was re-written to be identical to language already appearing in NPDES wastewater permits and is consistent with the mercury and PCBs TMDLs implementation plans.	
BASMAA attachment	71	C.11.i	Risk Reduction	Focus scope on public education efforts that reflects the recent discussions with Water Board staff and approach described in the BACWA status report.	See response to SMCWPPP 101.	

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SMCWPPP	102	C.11.i/C.12.i	Risk Reduction	Modify the permit to allow permittees to comply with this task by participating in regionwide public outreach and education efforts conducted in cooperation with other agencies, such as BASMAA, BACWA, Water Board staff, and WSPA, to address risks from consuming bay fish.	The permit already explicitly allows collaborative efforts and thus provides adequate flexibility in this respect.	
ACCWP attachment 1, Oakland attachment 1	82					
ACCWP	22	C.11/C.12	Various	We request the Provisions C.11 and C.12 be combined into one provision to make it clear what is required. We also request that it be made explicit that a pilot project can be credited towards more than one provision (for example, a pump station diversion project could be credited toward both C.12.d and C.12.f.) and that ongoing projects such as the Ettie Street Project could be credited toward completion of the required pilot projects.	See response to Sunnyvale comment 55 regarding combining provisions. There may be cases when C.12.f projects may be credited toward satisfaction of C.12.d requirements. But, this is not universally true. There is currently no language in the permit that precludes such double credit for a diversion project.	
Berkeley	20					
Oakland	12					
Newark	21					

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
ACCWP attachment, Berkeley attachment 1, Oakland attachment 1	69	C.12.a	Region Wide Implementation	Per our previous comments, we disagree with the Fact Sheet assertion that "there is enough experience and/or background knowledge" to go directly to region-wide implementation. This is inconsistent with the Basin Plan Amendment recently adopted for the PCB TMDL which states "in the first five-year permit term, stormwater Permittees will be required to implement control measures on a pilot scale to determine their effectiveness and technical feasibility." The Water Board appears to be attempting to mandate local agencies to circumvent existing hazardous waste laws such as RCRA & CIRCLA at the federal level and CCRs at the state level. Building inspectors and stormwater industrial facility inspectors do not have authority or jurisdiction in this area. Revise title of provision to "Conduct Pilot Projects" and make following revisions to text: Section i – Task Description – delete the last sentence "Permittees shall incorporate	This is the only provision implemented region wide, and the implementation consists of training industrial inspectors to look for presence of PCBs. Thus, it is building on a program already in place. The Water Board is not mandating the circumvention of existing hazardous waste laws. Indeed, referral to these agencies upon finding PCBs is explicitly stated. All of the editorial changes suggested by the commenter are totally inappropriate as they intentionally undermine the scope, intent and effectiveness of the provision. We have provided some flexibility in developing the training program.	The permittees are expected to develop and report on training program in the 2010 Annual Report and report on continuing training program development as well as the inspections in annual reports thereafter.
San Leandro	23					

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				such PCB identification into industrial inspection programs." Scope should be limited to a few pilot projects in different communities reflecting the diversity of organizational approaches and experience with inspection and hazardous waste management. Section ii – Implementation Level – delete "document incident in inspection report and" as under the law a CUPA, Environmental Health Inspector or DTSC has no action it can take just because a facility has PCB containing electrical components on its site. Section iii – change to "Permittees shall report successes and failures with training and intra-discipline efforts of expanding knowledge regarding PCB containing materials.		
ACCWP attachment, Berkeley attachment 1, Oakland	72	C.12.b	Editorial	Revise the first sentence of the Fact Sheet to "PCBs were historically used in a variety of building materials…" and revise C.12.b.i Task Description to	This suggested revision does not improve the clarity of the provision. The commenter is fully aware that Permittees will be piggy-backing on work completed through a grant-	

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File	Comment No.	Provision No.	Key Word(s)	Comment	Response	Proposed MRP Revision
attachment 1				read "Permittees shall evaluate potential presence of PCBs in legacy construction materials such as caulks and adhesives at construction sites…"	funded project, and there is no confusion about the materials being targeted.	
ACCWP attachment, Berkeley attachment 1, Oakland attachment 1	74	C.11.c	Editorial	C.11.c inconsistent with C.12.c, with inappropriate reference to private property and incorrect section numbering. If not combined with C.12 per above recommendation, revise title of provision C.11.c to delete the words "private property". Second section numbered i should be ii. Third section numbered ii should be iii.	We will make the editorial changes suggested.	Edit header of C.11.c to strike word 'private property', and edit roman numerals for sub-elements of C.11.c.
BASMAA attachment	63					
ACCWP attachment, Oakland attachment 1	76	C.11.c/C.12.c	Liability	Requirement that Permittees "must ensure that cleanup occurs" is ambiguous and may imply excessive liability for Permittees. The Water Board has no authority via this permit to change federal law enacted via CERLA regarding who is a potentially responsible party due to a release or spill and	The Water Board is not changing federal law through this permit. The permit merely states the responsibility that municipalities already have to manage pollutants in their stormwater infrastructure and public rights-of-way as well as responsibility to ensure that private entities within their geographical boundaries are being managed so as not to be a source of	
BASMAA attachment	65					

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San Leandro	22, 25			contamination. As holders of public lands in trust for its constituency, local agencies who exercise due diligence and perform all appropriate inquiries are actually protected from being named responsible parties. Deleting out the word parties after responsible from the previous draft does not change the context or make this statement legal. c) Revise provision C.11/12.c.ii(1) to reflect limits of Permittees' authority. Delete the last sentence of section ii, "Permittees are responsible for contaminants located on public right-of-way and the stormwater conveyance system.	pollutants to stormwater. Having responsibility to ensure oversight is not the same thing as having liability for the pollutants on private properties. See also responses to BASMAA attachment comment 76 and SMCWPPP comment 92.	
ACCWP attachment, Oakland attachment 1	77	C.11.d/C.12.d	Dates	Final reporting date has been updated in c.12.d.v but other dates for compliance or reporting are unchanged from previous version. This is a concern since it was assumed the initial evaluations would incorporate reports and analyses from the Proposition 13-funded Urban Runoff BMPs project.	See response to Campbell comment 2.	

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				Revise C.12.d.iii and iv so that reporting dates are 1 year later, and to recognize uncertainty in actual availability dates for grant-funded products.		
ACCWP attachment 1, Oakland attachment 1	80	C.11.f/C.12.f	Diversions	The infrastructure and system to cross connect stormwater pump stations to POTWs does not exist and there is no funding to accomplish this. POTWs are designed to treat conventional pollutants; i.e. BOD, TSS, Fecal Coliform and minimal pH stabilization. They are not designed to treat the priority pollutants of concern in this MRP. Hence the very restrictive NPDES limits on the	There will need to be expenditures for infrastructure. The remaining comments are nearly identical to those received by various parties on the original TO. See response to Santa Clara comment 2, and San Jose comments 24, 25 on the original TO.	

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San Leandro	26			POTW discharge and the mandated need for a pretreatment program and local limits implementation. The response to comments stating that it is the intent to use excess capacity of the POTW to treat stormwater appears to have a disconnect with the functional operation of POTWs in order to not violate their NPDES Permits. POTWs in order to meet their effluent limits and remain in compliance have already allocated all capacities. The only excess capacity in the allocation methodology is a safety factor that the Water Board sets standards for. The only way to add additional capacity is to expand the POTW and the only way to allocate existing capacity to stormwater is completely redevelop local limits, permanently providing allocation to stormwater and permanently removing that allocation from the industrial discharger sector to the POTW.		
ACCWP attachment 1	80	C.11.f/C.12.f	Diversions	"Capacity and effluent limit considerations should be addressed during feasibility	There is no need to add the language regarding capacity and effluent considerations. The language does	

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				assessment component of these provisions. There is no requirement for POTWs to expand their capacity. The intent is to use existing spare capacity where it exists." We ask that this language also be incorporated in the Fact Sheet along with recognition that capacity limitations other than flow volume, mercury or PCBs may affect feasibility. In addition, C.11/12.ii(1) and/or the Fact Sheet should be modified to emphasize the importance of developing consensus on a consolidated strategy between BASMAA, BACWA, all Permittees and all POTWs during the term of this permit, as the prerequisite to pilot studies.	not preclude such consideration, and it is not necessary to spell out every aspect of the feasibility assessment in every document associated with the permit. This is already implied in the provision itself anyway. Likewise, the permit already states the need to work with the wastewater agencies. It is not necessary to add the suggested language.	
ACCWP Legal Comment	15	C.11.f/C.12.f	Diversions	It must be clarified that diversions and pilot projects are only required if the coordination with the relevant POTWs find that such diversions and pilot projects are legally, technically and economically feasible. We request that this be clarified either with additional language	Based on knowledge of planned diversion projects, the Water Board suggests that it will be possible to find 5 pilot diversion candidates in the entire Bay Area region that meet the criteria of feasibility that will be good opportunities for pollutant removal. See also response to Palo Alto 18.	

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				in these provisions or in further responses to comments.		
Alameda City	25	C.12.c	Exempt	This provision should be revised to specifically exempt areas such as former Alameda Naval Air Station (now known as Alameda Point) and the Naval Fleet Industrial Supply Center – Alameda (FISC-Alameda) where the RWQCB, the Department of Toxic Substances Control, and/or other state or federal environmental agencies already have responsibility for overseeing or implementing site remediation efforts for PCBs. Alameda Point and FISC-Alameda are federal facilities undergoing current (and recent) environmental remediation for contaminants including PCBs.	This comment was submitted in identical form on the original TO. See response to comment 25 from this commenter on original TO.	
Newark Attachment	91, 92	C.11.a	Mercury Recycling	Mercury is already regulated in accordance with the universal waste law, which is enforced at the local level by Certified Unified Program Agency (CUPA) staff and at the state level by the Department of Toxic Substances Control (DTSC). It is redundant to place these overly prescriptive requirements	This provision is not at all onerous and provides an excellent opportunity to quantify load reductions that may be credited toward mercury load allocations.	

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				on Permittees. Acknowledge existing regulations and encourage Permittees to coordinate and cooperate with local and state regulators. The requirement to report an estimate of the mass of mercury collected is unreasonable. Mercury is collected at county run household hazardous waste sites and businesses routinely recycle mercury-containing wastes under the Universal Waste regulations implemented by DTSC. Permittees have no way of obtaining or tracking the amount removed from all the sources at the local level. Eliminate the requirement to report an estimate of the mass of mercury collected. Water Board staff should consult with DTSC to determine amounts of mercury waste managed as a universal waste.		
San Leandro	24	C.12.a	Inspection	Since electrical components or	This provision represents a very	

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Pittsburg	11			other equipment containing PCBs are already hazardous waste; it is assumed that the author is try to mandate the development of a program, via this board order, similar to current asbestos or lead based paint identification, containment and abatement programs. Local agencies do not possess the resources or expertise to accomplish this task and it has no place being pushed down to the local level. There are OSHA, employee (site worker), resident or occupant and adjacent property issues that local agencies cannot address. As in the case of asbestos or lead based paint there is a legal process to develop this at the state or federal level to put the force of law in place. Mandating it via this permit is not the legal process and does not involve all the stakeholders. Delete this section or revise to allow for Permittees to collaborate in research and development of knowledge to assist the Water Board in taking lead in developing state wide law commensurate with	modest effort to add a component to the existing industrial inspections whereby inspectors look for PCBs and PCB-containing equipment. This NPDES permit is an appropriate mechanism to require such an effort for PCBs.	

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				Permittees ability to do so.		
U.S. EPA	11, 14	C.11/C.12	WLAs	Pursuant to 40 CFR 122.44(d)(1)(vii)(B), Water Quality-Based Effluent Limits (WQBELs) in NPDES permits must be consistent with the assumptions and requirements of all applicable TMDL Waste Load Allocations (WLAs) approved by EPA. The fact sheet for the permit notes the EPA policy memo of November 22, 2002 which recommends BMPs as the effluent limits for most municipal stormwater permits when complying with TMDLs and the WLAs assigned to MS4 permittees. The policy memo stated that when using BMPs as the effluent limits, the fact sheet needs to demonstrate	Consistent with the TMDLs for these pollutants, this permit requires implementation of Best Management Practices and control measures designed to achieve the load allocations or accomplish the load reductions derived from the allocations. However, this will be accomplished over the course of 20 years. We further note that applying numeric limits for stormwater discharges for the entire Bay Area is highly impractical owing to the immense expense required to determine compliance with those limits. In general, pollutants of concern are attached to sediment particles and mobilized during rain events. Monitoring suspended sediment and associated	

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				that the BMPs are expected to be sufficient to comply with the WLAs. However, given the uncertainties in the performance of many of the BMPs commonly used for stormwater pollution control, it is often difficult to make such a demonstration. As such, for WLAs such as those applicable to the Bay Area MS4s, Region 9 encourages the use of numeric limits because these will provide greater assurance of consistency with the WLAs and will enhance the enforceability of the permit with regards to the WLAs.	contaminants is extremely resource intensive. There are efforts to measure these quantities strategically and ultimately develop robust models of region-wide loading, but it is not practical or useful to regulate according to those load estimates at this time. The permit requirements are consistent with the phased implementation plan of the TMDLs that recognizes current limited knowledge on BMP effectiveness and the need to identify and evaluate BMPs on a permit term basis.	
U.S. EPA	12, 13	C.11	WLAs	It is our position that the permit should include the numeric 10-year and 20-year WLAs for mercury for the MS4s even though the compliance deadlines for these WLAs extend beyond the anticipated term of the permit. In a letter from Region 9 to the State Board and the Regional Board dated October 31, 2007, Region 9 included a guidance memo from EPA Headquarters dated May 10, 2007 which stated that to ensure enforceability of a	There is no 10-year WLA for mercury. The intermediate load reduction goal discussed in the Basin Plan is an interim loading milestone, not a WLA. The WLA needs to be achieved in 20 years. See also response to EPA comment 11.	

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				compliance schedule, a permit must include the full schedule, even if it extends beyond the term of the permit. This will ensure the requirements of the schedule can be enforced even in the event the permit is not reissued in a timely manner.		
Dublin	12	C.12.a	Inspections	The Permit requires that local agencies identify Polychlorinated Biphenyls (PCB's) on private property as part of ongoing clean water business inspections, and coordination with State/ Federal regulatory agencies to facilitate removal of PCB's. Local agency action should be limited to reporting knowledge of potential PCB releases or contamination on private property to the appropriate State and Federal agencies, with abatement of the problem by those agencies.	This Provision presents permittees with an excellent opportunity to take advantage of their ongoing industrial inspection program to potentially prevent releases of PCBs before they occur. See also response to San Leandro comment 24.	
Dublin	12	C.11.i/C.12.i	Risk Reduction	The Permit requires that local agencies develop or participate in a PCB and mercury health risk reduction program for fish consumed from San Francisco Bay. Again, this is an activity that is the responsibility of County, State, and Federal	This comment is nearly identical to comment 50 by ACCWP submitted regarding the original TO. See that response.	

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				public health agencies, and should not be delegated to the local level.		
Hayward	6	C.11.f/C.12.f	Diversions	Another major concern is the requirement to conduct pilot projects to divert discharges from stormwater pump stations to the sanitary sewer, found in Provisions C.8, C.11, and C.12. These requirements assume that local POTWs have the hydraulic and treatment capacity to handle stormwater discharges and the infrastructure in place to carry stormwater to the sanitary sewer, which is far from the case for many local jurisdictions. In addition, wastewater treatment plants are designed to treat biological waste and not the pollutants that the MRP is trying to address with the required diversion pilot projects (mercury and PCBs). Diverting such pollutants to the POTW could affect treatment processes and result in NPDES effluent limitation violations.	This comment is nearly identical to one submitted by the same commenter on the original TO. See response to comments 6-8 by Hayward on original TO.	
Livermore	16	C.11.f	Diversions	The diversion of dry weather stormwater pump station flows fails to acknowledge the technical and legal restrictions	See responses to other comments regarding diversions in this table. There is no contradiction as	

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				on the use of POTW infrastructure and capacity for stormwater. Furthermore, since POTWs are not designed to treat or remove pollutants such as mercury and PCBs, this is not an overall practical environmental solution to this perceived problem. The net result of such a diversion merely results in a media transfer of the pollutant. Also, since Bay Area POTWs are being required to develop mercury reduction plans under the Mercury TMDL for San Francisco Bay, it seems contradictory that POTWs are now being asked to both reduce and accept mercury-containing discharges by separate Regional Board actions. Based on the draft MRP, Livermore will be modifying our mercury control plan for the Livermore Water Reclamation Plant to include a prohibition on dry weather stormwater diversions.	suggested by the commenter. The overall goal of the mercury TMDL is to reduce total mercury discharges, not just those of POTWs or stormwater. Further, the degree of reductions required of POTWs are extremely modest compared to those required of stormwater dischargers. There may be some situations where POTWs have sufficient capacity to accommodate diversions. For those situations where the same entity manages stormwater and wastewater discharges, diversions may provide an effective way to reduce the overall loading of mercury to receiving waters. That this commenter would recommend a pre-emptive prohibition against exploration of ways to reduce pollutants of concern to receiving waters is disappointing.	

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ACCWP attachment 1, Berkeley attachment 1, Oakland attachment 1	68	C.11.a	Recycling	Through BACWA and CIWMB efforts consumer mercury is already being collected. Due to data gaps and in order to assist the Water Board most agencies are already making significant progress and reporting this requested information via BACWA's BAPPG committee and in individual NPDES P2 reports. Section i should be changed to acknowledge the existing program and consolidate those few stormwater Permittees into the existing framework and effort to facilitate efficiency and consistency. Section ii should contain an exemption for Permittees that are already reporting this information to the Water Board in their P2 reports or via BACWA regional reporting to eliminate double reporting and costs associated with the inefficient government mandates.	There are opportunities for collaboration in reporting this information. This reporting issue can be resolved via the permit annual report format requirement.	
San Leandro	21					
ACCWP attachment 1, Berkeley	70	C.11.b	Methyl Mercury	Sampling method is inconsistent with updated C.8.f.iv. Revise provision to reference methods	Provision does not describe sampling method and explicitly refers to C.8.f already.	

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attachment 1, Oakland attachment 1				in C.8.f		
ACCWP Legal Comment	14	C.11.c/C.12.c	Private Property	It is our understanding that the pilot projects for mercury and PCBs in Provision C.12.c are being treated in a similar manner. In the heading for PCB Provision C.12.c the reference to "Private Property" has been deleted in response to our previous comments, but not in the similar heading for Provision C.11.c. For consistency and to avoid confusion, we request that the reference to "Private Property" be deleted in C.11.c heading as well.	We will make this change.	We deleted "private property" from the header of C.11.c as requested.
Alameda City	19	C.11	Burden	Considering the current economic situation, we suggest distributing the monitoring requirements over more than one permit cycle through prioritization of monitoring activities based on stormwater discharge relevance and an analysis of the water quality benefits and the costs associated with these proposed monitoring activities.	See response to Campbell comment 2.	

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NOAA	19	C.11/C.12	Support	We strongly support these provisions related to mercury controls especially the provisions related to retrofitting treatment systems and diverting dry weather and first flush flows to publically owned treatment works. We also strongly support similar provisions found later in the permit for polychlorinated biphenols (PCBs). These are novel, and needed, provisions to determine the effectiveness of the actions toward minimizing stormwater impacts to the maximum extent practicable.	Noted	
BASMAA attachment	62	C.11.b	Methyl Mercury	Data from study will not be useful; not smart expenditure.	Methyl mercury is the form of mercury that is most toxic and that bioaccumulates in fish, wildlife, and humans, and we have very little information on loads of methyl mercury from stormwater. Further, the remand of the SF Bay Hg TMDL specifically requires methyl mercury monitoring of all NPDES dischargers to the Bay.	
BASMAA attachment	70	C.11.f	Diversion	Unclear if section (2) is a repeat of section (1) or additional work.	Section (1) requires the feasibility study, and section (2) requires selection of the candidate sites from the feasibility study.	

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Caltrans	10	C.11.j	Caltrans allocation	[Caltrans proposed addition:] Alternatively, Caltrans may choose to implement load reduction actions on a watershed or regionwide basis in lieu of sharing a portion of an urban runoff management agency's allocation, In such a case, the Water Board will consider a separate allocation for Caltrans for which they may demonstrate progress toward attaining an allocation or load reduction in the same manner mentioned previously for municipal programs.	This language quoted directly from the Basin Plan amendment for the mercury TMDL will be added.	This text will be added.
CCCWP attachment	44	C.11.d,C.12.d	Inconsistent	Most of the text in this sub-provision does not match that in provision, C.12.d.i. This is another example of the inconsistencies between the two provisions that could be remedied by simply combining the two provisions into one.	On the contrary, the text matches very well. The provisions are consistent.	
CCCWP attachment	45	C.11.d/C.12.d	Inconsistent	Reporting deadlines given in this section do not match those contained in provision, C.12.d.iii. This is another example of the inconsistencies between the two provisions that could be remedied by simply combining the two provisions into one.	Reporting deadlines are the same. C.12.d has additional directive to implement beginning in 2011 that will also obviously apply to C.11.d, but dates of reporting are the same.	

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CCCWP attachment	46, 47	C.11.e/C.12.e/C.11.f, C.12.f	Delete Provision	Delete this provision. As written, it is not even possible for us to develop credible cost estimates to carry out these studies, especially at 10 locations. If Water Board staff intends for this provision to be carried out with funds in part derived from Prop 84, a statement to that effect should be added. It would be more feasible to carry out these provisions if they were explicitly linked to Prop 84 funding, to accurately convey Water Board staff's stated intentions and provide a reasonable explanation to the public for any delays in implementation should Prop 84 funding not be available to the pilot projects, or delayed because of the state's current fiscal situation.	This Provision is not contingent on obtaining Prop 84 monies. See also response to CCCWP attachment comments 41, and 43.	
CCCSD	3	C.11.d,C.12.d	Consider Issues for Diversion	If this alternative management practice becomes widespread, CCCSD considers this diversion of potential stormwater pollutants to its system to be a change in sources that should enable the RWQCB to incorporate allowances into the CCCSD NPDES Permit (e.g.	Comment Noted.	

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				process a SSO based copper limit in lieu of current final limit, current and future allocations of pollutants regulated through Total Maximum Daily Loads).		
CCCSD	4	C.11.f/D.12.f	Diversions	CCCSD does not consider these proposed diversions to be feasible due to: • Structural limitations related to collection system capacity; • Risk of maintaining compliance with our NPDES Permit; and • Risk of maintaining compliance with the Waste Discharge Requirements regarding controlling Sanitary Sewer Overflows (SSOs). In addition, accepting these flows would consume available capacity of the CCCSD treatment plant's permitted capacity that would restrict residential and commercial development in the CCCSD service area. The standards incorporated into CCCSD's NPDES Permit are very strict for certain pollutants (e.g. mercury, dioxin	This comment is identical to that submitted by the commenter on the original TO. Please see the response to that original comment (CCCSD comment 9).	

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				compounds, copper). Accepting uncontrollable sources of stormwater flows could jeopardize CCCSD's ability to comply with the current effluent limits. A significant amount of CCCSD's pretreatment and pollution prevention program resources are used to control sources of pollutants from commercial, industrial and residential users. Adding stormwater flows with unknown and potentially variable pollutant loadings without requiring pretreatment technologies to be employed and without any allowances in the NPDES standards would set back many years of progress in identifying and controlling pollutant loading to the CCCSD treatment plant. RWQCB and US EPA expectations for CCCSD, and other POTWs, are to reduce, if not eliminate, SSOs from the collection system. Accepting stormwater flows would significantly increase the risk of SSOs occurring during the diversion of stormwater flows to the CCCSD collection system.		

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				Recommendation: Revise these Conditions to redirect the emphasis away from POTWs accepting these stormwater flows to having the Permittees implement appropriate pollution prevention measures to control mercury and PCB sources, and then conduct studies of the pollutant loadings to evaluate multi-year trends. Limit the use of dry season and first flush diversions to sanitary sewer agencies for temporary discharges to enable abatement of known contaminated sources of mercury and/or PCBs runoff from specific locations for limited durations.		
Contra Costa Board of Supervisors attachment A	44	C.11	Big Picture	The County is requesting consideration for the "bigger picture" of mercury contamination, which will yield better results in addressing this issue. The Delta is the sink for legacy mercury and it is inappropriate for the MRP to address only those relatively small sources that are under Permittees control, while ignoring historic activities,	The "bigger picture" was considered during the TMDL process, and it was determined that urban runoff represents one of the largest loads of mercury to the Bay at roughly 160 kg/yr. The MRP addresses MS4s responsibilities under the TMDL, and the TMDL itself addresses the other sources noted by the commenter.	

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				naturally mercury-enriched soils atmospheric deposition, and geothermal springs.		
Contra Costa Board of Supervisors attachment A	45	C.11.d	Consistency	As noted in comments regarding C.2, the requirement to evaluate the effectiveness of municipal BMPs (including street sweeping and catch basin cleaning) indicates that the Water Board expects Permittees to continue to undertake some level of these activities, which are no longer required by C.2. It should be noted that sanitary sewer districts may be unwilling to allow Permittees to discharge street cleaning wash water without some form of pretreatment and acquisition of permits (which appears to be expected by the MRP).	The provisions referenced explicitly encourage working with sanitary sewer districts on issues of discharge of street wash water.	
Contra Costa Board of Supervisors attachment A	46	C.11.b	Methyl Mercury	Methylmercury sources should not be regulated until methylmercury controls have been developed. Permittees should not be required to undertake development of methylmercury controls.	Methyl mercury is not being regulated, but monitoring is required. There is no requirement to undertake methyl mercury controls	

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Contra Costa Board of Supervisors attachment A	47	C.11.g	Control Plan	It is not appropriate to require a control plan for the San Francisco Bay Areas until a control plan is in place for the upstream water bodies.	There are TMDLs either in process or already being implemented upstream of SF Bay. State and Federal law requires that all sources to the Bay must be managed to reduce the threat of mercury to fish, wildlife, and humans.	
FSSD	40	C.11.e/C.12.e	Why Solano?	City of Vallejo and the FSURMP only serve a combined 5% of the population covered by the Revised TO. We request that this requirement be revised to indicate that "the Permittees in Solano County that are covered under the Revised TO may comply with this provision by contributing their fair-share financially to these efforts."	It is implicit that permit requirements that apply to all permittees such as these will necessitate some form of responsibility and cost sharing among permittees. However, rather than prescribing a cost-sharing condition, we defer to the permittees to work out these arrangements among themselves.	
FSSD	41	C.11.f,C.12.f	Diversions	These requirements are premature, overly prescriptive and require actions outside of the jurisdiction and control of municipal stormwater agencies. In addition, the requirements are presumptuous in that they assume that the findings of the feasibility study will determine that diversions are feasible. In order to allow an iterative approach to be followed in this provision, we request that the language be revised to indicate	See response to FSSD 40 regarding the Solano County issue. See response to Palo Alto 18 concerning feasibility.	

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				that ability of stormwater programs to implement a minimum number of diversions (one per county-wide program) will be based upon the required feasibility study. Because the Permittees in Solano County are not "county-wide" programs, we request that this requirement be revised to indicate that "the Permittees in Solano County that are covered under the Revised TO may comply with this provision by contributing their fair-share financially to these efforts."		
Kolb and James	55	C.11/C.12	Multiple Pollutant	A strategy of addressing a host of pollutants of concern through implementation of BMPs is strongly supported and this strategy should be aggressively pursued rather than multiple programs targeting individual pollutants. Several of the devices including the CDS technology used to capture trash also are effective in capturing and retaining sediments. Over 600 of these types of devices have been installed in the Bay Area and quantification and characterization of the	Yes, we agree that required actions should, by design, yield benefits on a number of pollutants although some provisions do need to be targeted to known areas of contamination (e.g. PCBs).	

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				sediments can provide an initial and early assessment of the devices capability to remove sediment bound TMDL pollutants. Devices installed at Oakland, San Leandro, Port of Oakland, South San Francisco, San Francisco and Port of San Francisco can be used for this initial assessment from samples collected during routine maintenance operations.		
San Pablo	10	C.11-C.14	Pilot Studies	Since there are two TMDLs for the Bay Area, the pilot studies should focus on these two, mercury and PCBs.	The pilot studies do focus on mercury and PCBs, but there are requirements for other pollutants of concern that may not originate in TMDLs. There is also a pesticide toxicity TMDL, a selenium TMDL in development, and a copper site-specific objective requiring implementation actions.	

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ACCWP Attachment-1	83	C.13.a	Architectural copper	Post-construction activities cannot be reasonably controlled by Permittees.	We disagree. Ensuring that installed copper architectural features are not constituting an ongoing copper source is fundamentally no different than myriad other activities stormwater programs already do for other pollutants. This can be accomplished without much effort.	
Berkeley attachment 1	77					
Berkeley attachment 2	33					
Newark attachment	93					
Oakland attachment 1	83					
Oakland attachment 2	33					
ACCWP Attachment-1	84	C.13.a	Architectural copper	Fact sheet implies that copper is a feature of most or all roofs, gutters and downspouts. Revise Fact Sheet provision to refer to "some roofs, gutters and downspouts"	The fact sheet is not factually incorrect and does not need to be revised. Wording of the fact sheet has no detrimental effect concerning interpretation of associated provision.	
Berkeley attachment 1	77					
Oakland attachment 1	84					
ACCWP Attachment-1	85	C.13.b	Redundant	Eliminate requirement or insert text in provision or Fact Sheet to clarify that this is a reference to source control activities already incorporated elsewhere in the permit (C.3 provision).	C.3 and C.13 are not redundant. C.3 governs only new and redevelopment and speaks only to swimming polls. C.13 governs pool, spa, and fountain discharge containing copper. These are complementary provisions, not redundant.	
Berkeley attachment 2	34					
Newark attachment	94					
Oakland attachment 1	85					
Oakland attachment 2	34					
ACCWP	86	C.13.c	Fact Sheet	Fact sheet does not mention recent	Fact sheet does not need to be	

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Attachment-1				introduction of proposed legislation (SB 346-Kehoe) to phase out copper in vehicle brake pads sold in California. Revise Fact sheet to refer to "voluntary or legislated reductions"	changed. Provision specifically mentions legislation already.	
Berkeley attachment 1	79		Change			
Oakland attachment 1	86					
ACCWP Attachment-1	87	C.13.d	Redundant	Eliminate requirement or insert text in provision or Fact Sheet to clarify that this is a reference to source control activities already incorporated elsewhere in the permit (C.4).	It is true that C.13.d will be implemented largely by implementing C.4. Still, the presence of C.13.d serves a purpose to inform the C.4 inspection to be vigilant regarding facilities that are likely copper sources. Therefore, keeping C.13.d as a distinct provision serves a useful purpose.	
Berkeley attachment 1	80					
Berkeley attachment 2	35					
Newark attachment	95					
Oakland attachment 1	87					
Oakland attachment 2	35					
ACCWP Attachment-1	88	C.13.e	More Time	Date for submitting proposed work plan has been updated but not reporting date for findings and results. Revise last sentence to specify report on findings in 2013 Annual Report.	We will make the requested edit.	We will make the requested edit.
Berkeley attachment 1	81					
Oakland attachment 1	88					
Alameda City	20	C.13.b	Pools, Spas	Provision requires the installation of sanitary sewer discharge connections for new pools, spas, and fountains. This requirement may create undue long-term	Provision provides option to avoid connection to sanitary sewer. Thus, alleged financial hardship can be avoided.	

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				financial hardship for the City as we have a fixed allocation for discharges to the East Bay Municipal Utilities District (EBMUD) sanitary system. Furthermore, the City is not aware that EBMUD is in concurrence with this requirement and we recommend that the RWQCB seek approval from EBMUD prior to mandating this treatment method in the City.		
Alameda City	26, 27	C.13.a, b	No funding	This requirement will cause the City to incur additional staffing expense. While the City may not have any objection to adopting such an ordinance, no funding mechanism is identified for the additional staff time to enforce this requirement. The estimated annual increase in municipal staffing to approve and implement this ordinance effort is approximately 5% of a full-time staff person.	The Water Board is not required to identify funding mechanisms for permittees to comply with permit requirements.	
U.S. EPA	11	C.13	WLA	Pursuant to 40 CFR 122.44(d)(1)(vii)(B), Water Quality-Based Effluent Limits (WQBELs) in NPDES permits must be consistent with the assumptions and requirements of all applicable TMDL Waste Load Allocations (WLAs) approved by EPA. The fact sheet for the permit notes the EPA policy memo of November 22,	There is no TMDL for copper in our region so there are no WLAs with which to derive WQBELS.	

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				2002 which recommends BMPs as the effluent limits for most municipal stormwater permits when complying with TMDLs and the WLAs assigned to MS4 permittees. The policy memo stated that when using BMPs as the effluent limits, the fact sheet needs to demonstrate that the BMPs are expected to be sufficient to comply with the WLAs. However, given the uncertainties in the performance of many of the BMPs commonly used for stormwater pollution control, it is often difficult to make such a demonstration. As such, for WLAs such as those applicable to the Bay Area MS4s, Region 9 encourages the use of numeric limits because these will provide greater assurance of consistency with the WLAs and will enhance the enforceability of the permit with regards to the WLAs.		
Dublin	15	C.13	Copper not a problem	The Permit requires additional copper-reduction measures, including specific changes to the municipal code regarding washing of buildings with copper architectural features. This is in spite of the San Francisco Estuary Institutes' 2007 Regional Monitoring Report indicating that copper levels in the Bay are below	All C.13 provisions come directly from the Basin Plan amendment for copper site-specific objectives and are intended to insure that copper levels remain below levels of concern. In order to justify raising the copper objectives in the Bay, we had to establish a credible implementation program that included copper control measures	

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				allowable health standard levels, and that copper was removed as a contributing pollutant to the Bay's status as an impaired water body under Section 303(d) of the Clean Water Act. This was further substantiated by the 2008 Regional Monitoring Report, which did not even mention copper as a pollutant of current concern. Copper removal from storm runoff will continue under existing local agency activities; in fact, copper removal may be enhanced as a result of other required activities for mercury, PCB's, etc.	on known sources.	
Dublin	16	C.13	Copper measures not worth cost	The Permit requires continued participation by local agencies in the Brake Pad Partnership, which is developing means of reducing copper content in brake pads. This is a current cost and may achieve measurable statewide benefits. However, the Permit also requires copper-specific activities along with specific record keeping and reporting requirements, none of which contribute to copper or other pollutant removal or overall water quality improvements. Some of the requirements (such as an ordinance prohibiting washing of buildings with exterior copper) would impact a very limited source	See response to Dublin comment 15.	

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				of copper and would be impractical to enforce. The added cost of copper reduction is estimated at $16,000 per year.		
San Jose	30	C.13	Adaptive management	The City requests that this Provision, and all other provisions, allow for adaptive management. If it is demonstrated that a waste stream listed in Provision C.13 is not a significant source of copper to the receiving waters, Permittees should be permitted to adapt efforts to make controls commensurate with the potential water quality threat.	These copper provisions were selected from a larger list of candidate actions when developing the copper site-specific objective Basin Plan amendment. Instead of requiring effort on a large number of copper sources, the Water Board and stakeholders decided to focus on a smaller number of measures. In exchange for this focus, meaningful efforts on this smaller set of actions must be maintained. The commenter's proposal to reduce effort on any of the remaining sources is not consistent with the copper implementation plan. Also see response to Dublin comment 15.	
San Jose	31	C.13.a	Ordinance not needed	The City requests removal of the requirement to adopt a separate ordinance prohibiting the discharge of washwater from copper architectural features. The City does not believe that the effort to establish and execute a new program to prohibit washwater from copper architectural features is commensurate with any water	The continued appearance of copper architectural features throughout the region suggests that "discouragement" of such features is not sufficient. If such features are allowed to come into existence, the resultant copper-containing wastewater must be kept out of stormdrains. See also response to San Jose comment 30.	

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				quality benefit achieved by it. Discouraging the use of architectural copper and requiring BMPs to manage this source is sufficient.		
San Jose	32	C.13.b	Conflict with existing ordinance	The City requests deletion of the phrase "…including connection for filter backwash…" as it conflicts with sanitary sewer ordinances prohibiting the discharge of solids/debris to the sanitary sewer.	See response to San Jose comment 86 on the original TO.	
SCVURPPP attachment A	64	C.13	Too burdensome	Given that there is no longer a situation of copper impairment in receiving waters, we request that this Provision be made less burdensome. See Attachment B for requested language changes.	See response to Dublin comment 15 and San Jose comment 30. We consider SCVURPPP's Attachment B as supporting documentation rather than comments. Therefore we will not be responding to suggestions in that attachment.	
Sunnyvale	13	C.13	Need more time	The requirement to certify that all legal authority is in place by the September 2010 annual report deadline will be difficult, if not impossible to comply with, given all the other potential ordinance changes that are being required as part of the MRP. Consideration should be provided for the amount of time ordinance changes take within a city. Providing additional time for compliance at the outset will reduce a city's need to provide justification as to why the deadline for certification of legal authority	We will provide an additional year to accomplish this task.	We will provide an additional year to accomplish this task.

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				could not be met, and not put a city in jeopardy of permit non-compliance.		
CCCWP Attachment	57	C.13.e	Studies	Performing studies to reduce uncertainties related to impacts from copper are a legitimate subject of study. However, we believe it is not appropriate to conduct such a study as part of an NPDES permit, but rather belongs under the RMP, as a special study. The Program requests Regional Board staff state that this requirement may be fulfilled by an RMP special study, and commit to supporting the special studies at the RMP technical committee and steering committee.	This comment is identical to one submitted by the commenter on the original TO. See response to CCCWP comments 115-117 on the original TO.	
Central Contra Costa Sanitary District	5	C.13.a	Copper Waste	Wastewater generated during post-construction cleaning, treating, and washing of architectural copper features could be disposed to the CCCSD system. The MRP text has been modified to instruct Permittees to develop BMPs on how to manage the wastes generated from post-construction activities. Consider adding text to instruct Permittees to work with sanitary sewer agencies when developing the disposal BMPs for these	It is implicit that any BMP which results in discharge to a sanitary sewer system must be developed and implemented with its participation.	

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				wastes.		
Central Contra Costa Sanitary District	6	C.13.b	Copper Waste	Add use of non copper-based chemicals as a primary implementation strategy to avoid having to employ more restrictive, and potentially more costly, strategies. Reorder the implementation strategies so that discharge of water with copper-based chemicals to sanitary sewer with a permit is the last option. Modify text to remove reference to connection to sanitary sewer and change it to discharge to sanitary sewer with a permit from the POTW. If the reference to connecting to the sanitary sewer is retained at this location, use the same text C.15.b.iv.(1)(c) to clarify that the connection is to facilitate draining events.	The local ordinances developed by Permittees can advocate for the use of alternatives. This provision is only concerned with discharges containing copper. The order of the control strategies does not indicate preference. The suggested modification regarding the sanitary sewer discharge does not materially change the provision and is not necessary.	
Contra Costa Board of Supervisors Attachment A	51	C.13.d	Inspection	Since inspectors have no feasible way of identifying and controlling elevated copper discharges without sampling, which cannot reasonably be conducted for every project, and is surely not the intent of the Water Board. While the County can ensure that adequate BMPs to prevent copper discharge are in	Provision states explicitly that "Permittees shall ensure industrial facilities do not discharge elevated levels of copper to storm drains by ensuring, **through industrial facility inspections, that proper BMPs are in place.** The Provision does not require sampling.	

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				place, it will not be possible to ensure that discharges do not occur. The language of this provision should be modified accordingly.		
Contra Costa Board of Supervisors Attachment A	52	C.13.e	Studies	Any studies to investigate copper sediment toxicity will be irrelevant due to the "mothball fleet" of retired vessels in the Carquinez Strait. According to a study conducted in 2007, more than 21 tons of lead, zinc, and copper have fallen into the Bay from peeling paint from these ships. Until these ships have been removed, no technical study on copper sediment toxicity will be of any value.	There is value to these studies irrespective of the date of the mothball fleet, and these studies are required. See response to CCCWP comments 115-117 on the original TO.	
Pacifica	35	C.13.e	Studies	The language in this provision is vague and the responsibility of conducting such an investigation should lie with the Board, not the permittees.	See response above to CCCWP attachment comment 57.	

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Provision C.14. – Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides and Selenium

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San Jose Attachment A	33	C.14.a	Data already exists	The City believes that pre-existing data and the monitoring requirements listed in the Water Quality Monitoring Provision (C.8) will provide sufficient data to comply with the intent of this provision. The City requests revision of this provision to clarify that data collected as part of Provision C.8 and related data previously collected by BASMAA will be sufficient to demonstrate compliance with this provision.	This comment was addressed in response to comment 90 by San Jose on the original tentative order.	
San Jose Attachment A	34	C.14.a	Selenium not a problem	Since previous data have shown that selenium is not problematic in most urban creeks, the City requests that selenium be removed from this Provision.	This comment was addressed in response to comment 91 by San Jose on the original tentative order.	
San Jose Attachment A	35	C.14.a.v and C.14.a.vi	Consistency with fact sheet	The City requests that these provisions be modified to remain consistent with the fact sheet, which states this is primarily an information gathering exercise.	The Provision is already consistent with the fact sheet.	
SCVURPPP Attachment A	65	C.14	Too burdensome	Given that these are at most emerging issues and that other priorities will require resources, we request that this Provision be eliminated or made less burdensome. See Attachment B for requested language changes.	The timeline has been extended to make this Provision easier to accomplish. We consider Attachment B as supporting documentation rather than comments.	
SCVWD	7	C.14	Information already collected	The District also believes a more thorough review of data submitted to the Water Board from the	This comment was addressed in response to comment 90 by San Jose on the original tentative	

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				SCVURPPP in the last several annual reports may provide the information to answer the management questions regarding other legacy pollutants. Significant public resources have already been expended on studies, and to respond to existing or previous permit requirements. It is prudent to maximize this information in the development of regulations for the Revised TO rather than expending additional new resources for this purpose.	order.	
Sunnyvale	58	C.14		Sunnyvale support SCVURPPP's suggested edits on the redline/strikeout draft provided with their comments.	We consider SCVURPPP's Attachment B as supporting documentation rather than comments. Therefore we will not be responding to suggestions in that attachment.	
CCCWP Attachment	58	C.14	Should be RMP work	This type of investigation into emerging pollutants is a legitimate subject for study. However, we believe it is not appropriate to conduct such a study as part of an NPDES permit bur rather belongs under the RMP, as a special study. The Program requests Regional Board staff simply state that this requirement may be fulfilled by an RMP special study, and commit to supporting the special studies at the RMP technical committee and	It may be possible to accomplish this work through the RMP, but Permittees, rather than the RMP, have a responsibility to see that the work is accomplished. The RMP is not a regulated party under the stormwater permit.	

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				steering committee.		
CCCWP Attachment	59	C.14	Restrict jurisdiction	The permit reads "Characterize the representative distribution of PBDEs, legacy pesticides, and selenium in the urban areas of the entire Bay Region to determine:" Does the Water Board really intend to have Stormwater Programs conduct investigations in Bay Area counties that are not even included in the MRP? The Program requests that the language be changed to restrict it to only those counties and areas covered in the MRP.	The permit will be clarified in this section that "Bay Region" means the areas covered by this permit.	We will clarify that the requirements apply to areas covered by this permit.
Contra Costa Board of Supervisors Attachment	53	C.14	No Value to Provision	While compliance with many sections of the MRP will be expensive, they will yield water quality results. It appears, however, that money would be better spent on current challenges that will have an impact on our environment today and tomorrow rather than on legacy pesticides.	Permittees have a responsibility to manage all pollutants in stormwater. This Provision requires collection of information concerning a number of important pollutants.	

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Provision C.15. – Exempted and Conditionally Exempted Discharges

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CALTRANS	11	C.15.	Define	*Define "unpolluted" in the goal statement using the state definition.*	The California Water Code does not have a definition for "unpolluted".	
Pacifica	5	C.15.	Duplicative to Wastewater Permit Requirements	With its own wastewater NPDES Permit, City should be required to comply with that permit's illicit discharge reporting, exempted and non exempted discharges, and water quality/testing associated with water processed via the POTW.	MRP levels the playing field for all Phase 1 stormwater programs in the Region. Illicit discharged into a POTW will most likely get some treatment while illicit discharge into a storm drain gets no treatment. City's wastewater permit does not have the most current Standard Provisions.	None.
Pacifica	4	C.15.	Significant Increase in Staff Resources	The fiscal crisis has frozen and deleted positions forcing remaining staff workloads to increase. This Provision is asking for huge new amounts of monitoring, tracking, and reporting. There are no staff resources or funding to implement this.	We have reduced the monitoring and tracking in the Final TO.	See revisions in Final TO.
Moraga Oakley	2 2	C.15.	Too Expensive and Burdensome	Too expensive and burdensome.	We have reduced the monitoring and tracking in the Final TO.	See revisions in Final TO.
Palo Alto Santa Clara County	19 28	C.15.	Too Many Requirements with No Justification	Already commented that TO contained numerous new requirements for conditionally exempted discharges, and that it is unclear what specific problems have arisen to justify the inclusion of these proposed changes in the existing municipal program. SCVURPPP asked that the implementation of BMPs for certain types of discharges	Pumped groundwater, foundation drains, and water from crawl space pumps and footing drains; and potable water discharges are the only two categories of conditionally exempted discharges that do not contain similar BMPs to SCVURPPP's *Conditionally Exempted Discharges Classification and Control Measures*. Untreated	The following has been added to C.15.b.iii.(1) and C.15.b.iii.(2), "…Permittees who are water purveyors must implement the following requirements on portions of the

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				be flexible, scaled to the nature of the threat posed, and subject to a municipality's discretion to require as appropriate and necessary given the threat posed (and secondary to public health and safety issues). Revised TO contains no changes to address these very important concerns. The changes made to this section simply provide more detail on how the monitoring, tracking and reporting of the various discharges needs to be done.	potable water discharges have caused fish kills and pumped groundwater from uncontaminated sites with no known plumes have tested high for some pollutants. It is not clear if municipalities have determined that all of the conditionally exempt discharges are not sources of pollutants to the receiving water and/or if the BMPs implemented for the conditionally exempt discharges minimize the adverse effects of the discharges. Should such data exist, please submit them. Final TO removes the responsible of Permittees to oversee potable water dischargers who are not Permittees.	system they are responsible for…
SCVURPPP	66	C.15.	Too Many Requirements with No Justification	Already commented that TO contained numerous new and highly prescriptive and unworkable requirements for conditionally exempted discharges and asked that the implementation of BMPs for certain types of discharges be left flexible, scaled to the nature of the water quality threat posed (if any), and subject to a municipality's discretion to require as appropriate and necessary to avoid threats to water quality (with due consideration to more pressing public health and safety needs where applicable). Revised TO has even more prescription on how the monitoring, tracking and reporting of the various discharges are to be done. It also does not allow for the grandfathering of previously approved and		

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				successfully implemented conditionally		
Daly City Pacifica San Bruno	5 2 4	C.15.	Too Much Tracking, Monitoring, and Reporting	Requires too much staff time to deal with an unnecessary amount of information tracking and reporting unrelated to improving water quality.	We have reduced the monitoring and tracking in the Final TO.	See revisions in Final TO.
San Jose	6	C.15.	Too Prescriptive	This provision is highly burdensome and prescriptive. The requirements would pose a significant impact to City operations. There is no justification as to why the need to depart from the current, approved BMP approach to these discharges. *Revise this provision, emphasizing the implementation of BMPs in lieu of new regulatory programs.*	Pumped groundwater, foundation drains, and water from crawl space pumps and footing drains; and potable water discharges are the only two categories of conditionally exempted discharges that do not contain similar BMPs to SCVURPPP's *Conditionally Exempted Discharges Classification and Control Measures.* Untreated potable water discharges have caused fish kills and pumped groundwater from uncontaminated sites with no known plumes have tested high for some pollutants. If San Jose has data to demonstrate that its BMPs in *Conditionally Exempted Discharges Classification and Control Measures* have been successful in showing that conditionally exempted discharges are not sources of pollutants to the receiving water and/or if the BMPs implemented for the conditionally exempt discharges minimize the adverse effects of the discharges, please submit them.	
San Mateo	14	C.15.	Too Prescriptive	Provision is overly prescriptive, unnecessary, and disproportionate to the threat posed by these types of non-stormwater discharges. *Simplify Provision using the table entitled "BMPs and Implementation Procedures for Conditionally Exempted Discharges" that was prepared by the Countywide Program and approved by the Water Board in 2004 as an amendment to the Countywide Program's Permit.*		
SMCWPPP	9	C.15.	Too Prescriptive	This Provision contains approximately seven pages of proposed requirements that are overly prescriptive, unnecessary, and disproportionate to the threat		

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				posed by these minor types of non-stormwater discharges. *Rewrite and simply Provision similar to the enclosed table titled "BMPs and Implementation Procedures for Conditionally Exempted Discharges" that was prepared by the Countywide Program and approved by the Water Board in 2004 as an amendment to the Countywide Program's permit.*		
Sunnyvale	59	C.15.	Too Prescriptive	Already commented that the revised MRP and the previous TO is overly burdensome for conditionally exempt discharges to storm drains. Revised TO does not address comments just more details on how things are to be done. *Rewrite to include a simplified list of practical and effective BMPs for each type of conditionally exempt discharge.*		
NRDC & SF Baykeeper	63	C.15. Legal Comment	Clean Water Act Requires Prohibition of all Non-Stormwater Discharges	Fails to include provisions that effectively prohibit all non-stormwater discharges, as required by the Clean Water Act. TO creates a host of non-stormwater discharge categories that are either categorically or conditionally exempt from prohibitions against non-stormwater discharge to the MS4 system. These exceptions violate of the clear language of the CWA.	We agree that the intent of the regulatory language is to prohibit all "polluted" non-stormwater discharges. It would be wholly impracticable to prohibit all non-stormwater discharges that pass through the MS4, as the MS4 in many circumstances has captured streams and existing baseflow present before the construction of the MS4. As the commenters state:	

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				Section 402(p)(3)(B)(ii) requires that permits for discharge from municipal sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers." 33 U.S.C. § 1342(p)(3)(B)(ii). Citing to the CWA's implementing regulations under 40 C.F.R. § 122.26(d), however, the Fact Sheet asserts that "we recognize that certain types of non-stormwater discharges may be exempted from this prohibition if they are unpolluted and do not violate water quality standards. Other types of non-stormwater discharges may be conditionally exempted from Prohibition A.1. if the discharger employs appropriate control measures and BMPs prior to discharge and monitors and reports on the discharge." TO creates limited control measures designed to reduce the potential impacts of these discharges but it does not prohibit them, as required by the CWA. Section 402(p) places a clear, mandatory duty on the Permittee to prohibit non-stormwater discharges to the MS4 system. The Permittee, or Regional Board, has no discretion to deviate from this requirement. The TO's attempt to allow	"A clear reading of the statute, and one that elaborates on Section 402(p)(3)(B)(ii) of the Clean Water Act rather than contradicting it, is that while non-stormwater discharges must be prohibited by the text of the Act, illicit discharge enforcement programs need only specifically address the enumerated list of non-stormwater discharges set forth in the regulations where such discharges have been identified as a source of pollutants." C.15 simply clarifies the standard for determining these enumerated discharges are not sources of pollutants.	

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				exemptions to the prohibition against non-stormwater discharges to MS4 systems is not supported by 40 C.F.R. § 122.26(d)(2)(iv)(B)(1), as the Fact Sheet implies. This provision merely states the circumstances under which the Permittee must specifically design a program to prevent certain illicit discharges. The cited regulation, providing for an enforcement program to "prevent illicit discharges," simply does not support staff's surmise, as stated in the Fact Sheet, that "certain types of non-stormwater discharges may be exempted from this prohibition if they are unpolluted and do not violate water quality standards." Interpretation adopted in the TO is not found in the plain language of the regulation. The TO is inconsistent with both the regulations and the statute that they purport to implement. Even if the Permittees were afforded authority under 40 C.F.R. § 122.26(d) to exempt non-stormwater sources from the discharge prohibitions required by the CWA, the TO unlawfully allows exemption of irrigation water from lawns, gardens, or landscaping even though pollutants from these source are a		

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				known, significant source of impairment in the Bay Area. Neither a finding that irrigation discharges are "not sources of pollutants to receiving waters," nor an exemption based on the other conditions set forth in the TO, would be consistent with facts in the record.		
Alameda County Water District	1	C.15.a	Exempt Groundwater from Drinking Water Wells	*Pumped groundwater which satisfies the following conditions should be included in C.15.a:* a) *Groundwater pumped from a well perforated in a drinking water aquifer(s) that is regularly tested for water quality parameters in accordance to California Department of Public Health (CDPH) requirements.* b) *Groundwater pumped from monitoring wells used for groundwater basin management purposes provided there are no known sources of contamination are present in the immediate vicinity of the well where groundwater is being pumped.* c) *Groundwater discharge activities which comply with Provision C.15.b.i(1)(i).*	a) We have evaluated 3-years worth of data submitted by Zone 7 for its drinking water aquifers. The wells are tested three times a year in accordance to CDPH. The data shows that nearly all the parameters meet the benchmarks in CAG912004, and readily meet the benchmarks for pH and turbidity. Deep drinking water aquifers are not readily influenced by contamination. Therefore, C.15. exempts pumped groundwater from drinking water aquifers. Permittees who qualify for this exemption are advised to ensure that the detection limits used for the CDPH samples meet the benchmarks in CAG912004. b) Pumped groundwater from drinking water aquifer is exempted. Pumped groundwater from the shallower aquifers tend to be more readily influenced by contamination. Recognizing how often these wells from the shallow	a) C.15.a.i.(7) exempts pumped groundwater from drinking water aquifers. b) C.15.b.i.(1) is specific to pumped groundwater from non drinking water aquifers used for groundwater basin management.

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					aquifers need to be purged, monitoring has been reduced for these specific wells in a new C.15.b.i.(1). c) In addition, the groundwater discharge activities must meet the benchmarks in the Water Board's NPDES General Permits: CAG912002, CAG912003, CAG912004.	
BASMAA	79	C.15.b.	Burdensome for Conditionally Exempt Discharges	Discharges are of minor concern to require such monitoring.	Discharges can only be exempted if known to be or demonstrated unpolluted. The rudimentary monitoring and reporting in C.15.b., which has been reduced in the Final TO, is to accomplish this.	
ACCWP Fremont Newark Oakland	10 5 22 6	C.15.b.	Conditionally Exempt Residential Car Washing	Residential car washing has not been included in the list of conditionally exempt discharges.	Residential car washing was inadvertently deleted from the list of conditionally exempted non-stormwater discharges. It has been added to the list again as the new C.15.b.iii. This is essentially the same as the December 2007 TO language for residential car wash conditional exemption.	See new C.15.b.iii. – Individual Residential Car Washing.
ACCWP Berkeley Hayward Newark	11 9 8 22.e.	C.15.b.	Conditionally Exempt Residential Car Washing	Federal Register that adopted the stormwater permitting requirements states "…in general, municipalities will not be held responsible for prohibiting some specific components of discharges or flows listed below [list includes 'individual residential care washing'] through their municipal separate storm sewer system even though such components may be considered non-storm water discharges, unless such discharges are specifically identified		

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				on a case-by-case basis as needing to be addressed." (Vol.55, No.22, Friday, Nov. 16, 1990, page 47995) *Continue to conditionally exempt individual residential car washing as long as minimal amounts of water and pollutants are generated.*		
ACCWP Attachment-1 Berkeley Attachment 1 Newark Attachment SMCWPPP	98 91 106 112	C.15.b.	Conditionally Exempt Residential Car Washing	Individual residential car washing has been removed from this Provision. Fact Sheet does not explain why it was removed. Some of the language formerly in this Provision moved to C.7.e.i. *Residential car washing should continue to be conditionally exempt.*		
ACCWP Legal Comment	16	C.15.b.	Conditionally Exempt Residential Car Washing	Residential car washing is exempted in current permit. *Conditionally exempt residential car washing.*		
Alameda City	21	C.15.b.	Conditionally Exempt Residential Car Washing	Individual residential car washing has been deleted as conditionally exempt. The Federal Register of November 16, 1990, publishing the final rules for the Federal storm water program states, "It is unlikely Congress intended to require municipalities to effectively prohibit individual car washing or discharges resulting from efforts to extinguish a building fire and other seemingly innocent flows that are characteristic of human existence in urban environments and which discharge		

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				to municipal separate storm sewers." *Restore this conditionally exempt discharge.*		
Brisbane Burlingame	7 2	C.15.b.	Conditionally Exempt Residential Car Washing	Inappropriate to delete. Water Board adopted the Countywide Program's BMPs and Implementation Procedures for Conditionally Exempted Discharges, which includes individual car washing. *Recognize that individual residential car washing will occur and promote the use of appropriate BMPs.*		
Fremont	47	C.15.b.	Conditionally Exempt Residential Car Washing	Some of the language formerly in the Provision has been moved to C.7.e.i. This conditionally exempted discharge should continue to be allowed provided minimal amounts of water and pollutants are generated. *Restore this conditionally exempted discharge to the MRP.*		
Millbrae Pacifica San Mateo	20 8 16	C.15.b.	Conditionally Exempt Residential Car Washing	In 2004, the Water Board adopted the Countywide Program's BMPs and Implementation Procedures for Conditionally Exempted Discharges, which includes residential car washing. *Recognize that residential car washing will occur.* *Promote the use of appropriate BMPs.*		
Oakland	5.e.	C.15.b.	Conditionally Exempt Residential	Residential car washing is not included in t he list of conditionally exempt discharges. This may be too		

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			Car Washing	ubiquitous and burdensome to enforce. It is more appropriate to address through public education. *Add residential car washing to the list of conditionally exempt discharges.*		
Oakland Attachment #1	98	C.15.b.	Conditionally Exempt Residential Car Washing	Individual residential car washing has been removed from this Provision. Fact Sheet does not explain why it was removed. *Residential car washing should continue to be conditionally exempt.*		
NOAA	21	C.15.b.	Consider Dilution in Receiving Water	*Planned discharges should determine how much dilution, if any, is available in a receiving waterbody prior to the discharge. This examination may obviate the need for repeated chlorine concentration monitoring at some locations. In areas where regularly scheduled discharges may affect aquatic life (especially in streams that support ESA listed species), exploring alternative means of capturing the discharges may be warranted (e.g., flushing fire hydrants into a tanker truck).*	We would welcome this proposal in a reduced monitoring plan.	
Palo Alto Santa Clara County SCVURPPP SCVWD Sunnyvale	23 32 70 19.b. 59.b.	C.15.b.	Grandfather SCVURPPP's Conditionally Exempted Discharges Report	*Provision needs to emphasize the implementation of BMPs. Grandfather SCVURPPP's Conditionally Exempted Discharges submitted and approved by Water Board staff in 2000.*	The MRP levels the playing field for all Phase 1 Permittees. If the Permittees had data that the BMPs in the SCVURPPP's *Conditionally Exempted Discharges Classification and Control Measures* are	

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West Valley Clean Water Program	15				effectively removing pollutants, we would welcome the data.	
San Jose Attachment A	36	C.15.b.	Grandfather SCVURPPP's Conditionally Exempted Discharges Report	*Use the established non-stormwater conditionally exempt discharge programs previously approved by the Executive Officer.*		
SCVURPPP	8	C.15.b.	Grandfather SCVURPPP's Conditionally Exempted Discharges Report	Provision C.15.b. continues to be a set of highly prescriptive and burdensome requirements being imposed in the absence of any evidence that the existing Santa Clara Program approach to conditionally exempted discharges is insufficient in terms of protecting water quality. *Clarify that continued implementation of current program is sufficient for compliance; prescriptive approaches in the revised TO for specified subcategories are optional or are only required when there is evidence that the discharges in question are polluted to the point of threatening receiving water quality.*		
CCCWP CCCWP Attachment	12 60	C.15.b.	Meeting Please	In the comments submitted for the December 2007 Draft TO, CCCWP requested a meeting with the Water Board staff and other stakeholders to review and discuss a proper regulatory framework for addressing	Water Board staff met with BASMAA on July 1, 2009 to discuss Proposed Major Changes for C.15. CCCWP's representative to BASMAA was at this meeting.	

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				the listed conditionally exempted discharges. Summary Response to Comments acknowledges the request and stated that Water Board staff met with water utilities in February 2008 during the public comment period and substantial changes were incorporated into the February 2009 Draft TO as a result of that meeting. Water Board staff ignored CCCWP's meeting request, Water Board's directive to "work with the cities", "consult with municipalities", "come up with a more balance approach", etal. *Request meeting.*		
San Leandro	28	C.15.b.	Monitoring Too Expensive	In these days of massive budget deficits and declining revenue sources, local agencies cannot meet the monitoring requirements on the scale proposed. Permittees have been asking for two years that the Water Board prioritize and remove lower priority requirements. *Delete what cannot be financially accomplished.*	Deleted third party oversight of potable water purveyors.	See changes in C.15.b.iii.
Central Contra Costa Sanitary District	1.b.	C.15.b.	Reimburse Costs for Accepting & Treating Diverted Flows	Sanitary sewer agency cannot be required to accept a diverted flow from the stormwater system that would jeopardize its ability to comply with its requirements to comply with its NPDES Permits and standards to prevent SSOs. If diverted flow is	We understand.	

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				accepted, the sanitary sewer agencies' costs for accepting and treating the diverted flows need to be reimbursed by the business or Permittee responsible for diverting the approved flow.		
Contra Costa Brd of Sups Attch A	54	C.15.b.	Requirements Have No Water Quality Benefits	Provision requires Permittees to develop authorities where it may not be possible and requirements are burdensome to Permittees and property owners without real corresponding water quality benefits. *Water Board should regulate potable water dischargers.*	Deleted third party oversight of potable water purveyors. The Water Board intends to regulate potable water dischargers with a separate NPDES permit in the near future.	See changes in C.15.b.iii.
Central Contra Costa Sanitary District	1	C.15.b.	Thanks for Recognizing Sanitary Sewer Agencies' Authority	Appreciates the deferral to the sanitary sewer agency's authority to accept or reject diverted flows from the stormwater systems. TO promotes positive communications between Permittees and sanitary sewer agencies.	Noted	
Millbrae	3	C.15.b.	Too Prescriptive	Overly prescriptive and requires additional staff time to deal with a voluminous amount of information tracking and reporting, none which seems related to improving water quality.	If the City has data that the BMPs in the SMCPPPP's *BMPs and Implementation Procedures for Conditionally Exempted Discharges* are effectively removing pollutants, we could consider reduced monitoring.	
CCCWP	60.b.	C.15.b.i.	Crawl Space Pumps and Footing Drains	Unacceptable and bad public policy	Single family home's pumped groundwater, foundation drains, and water from crawl space pumps and footing drains are exempted in the	Single family home's pumped groundwater, foundation drains,

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ACCWP Berkeley Newark Oakland	12 10 23 7	C.15.b.i.	Exempt Single Family Homes' Crawl Space Pumps and Footing Drains	There are thousands of these in the county. Many are from single family residences. Monitoring and reporting from these are not feasible. *Delete requirement.* *Summary Response to Comments states that new language is likely to be added to the Provision to exempt discharges from single family homes and other small, temporary, and unpolluted discharges.* *Include detailed revised language in a supplemental Executive Officer report prior to the May 13th hearing.*	Final TO as long as the discharge is unpolluted. If there is any potential for pollutants in the groundwater, it should be referred to the Water Board.	and water from crawl space pumps and footing drains exempted in C.15.a.i.(6).
ACCWP Fremont Newark Oakland	10.b. 5.b. 22.b. 6.b.	C.15.b.i.	Exempt Single Family Homes' Crawl Space Pumps and Footing Drains	Monitoring and reporting should not be required for crawl space pumps and footing drains.		
Brisbane	4	C.15.b.i.	Exempt Single Family Homes' Crawl Space Pumps and Footing Drains	Unreasonable to require monitoring and treatment of pumped groundwater from foundation drains, crawl space pumps, and footing drains because there are a large number of residential properties that have them. *These types of discharges should be considered exempt unless the municipality has reason to believe the groundwater may contain pollutants.*		
Danville	8.g.	C.15.b.i.	Exempt	Monitoring of this Provision would		

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			Single Family Homes' Crawl Space Pumps and Footing Drains	consume a disproportionate amount of resources. *Delete requirements.*		
Fairfield Fairfield Suisun City SCVURPPP	28 42 28 67	C.15.b.i.	Exempt Single Family Homes' Crawl Space Pumps and Footing Drains	Continues to be too prescriptive and burdensome. This Provision can be interpreted to apply to discharges from residential foundation drains.		
San Jose	6.b.	C.15.b.i.	Exempt Single Family Homes' Crawl Space Pumps and Footing Drains	Permitting and monitoring of non-stormwater discharges such as pumped groundwater, foundation drains, water from crawl spaces, and footing drains to the storm drain system would be a new function of the City. Overly prescriptive monitoring requirements that would be cost-prohibitive and could create a situation where more unauthorized non-stormwater discharges occur. *Revise this provision, emphasizing the implementation of BMPs in lieu of new regulatory programs.*		
San Mateo	17	C.15.b.i.	Exempt Single Family Homes' Crawl Space Pumps and Footing Drains	Many San Mateo neighborhoods have natural springs and high water tables year-round. So sump pumps and drains are common and numerous. *Don't require monitoring unless they are proven to be sources of pollution.*		
Alameda Co	2	C.15.b.i.	Exempt	Unclear if discharges from municipal	Based on data submitted by Zone 7,	C.15.a.i.(7) exempts

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Flood Cntrol Zone 7			Municipal Groundwater Production Wells	groundwater production wells would require monitoring consistent with this Provision. At startup, municipal groundwater production wells may require discharge of untreated groundwater into a storm drain prior to pumping the water into the system for chemical addition and delivery. At shutdown, wells may discharge into the storm drain but only after chemical addition has ceased.	C.15. exempts pumped groundwater from drinking water aquifers. Permittees who qualify for this exemption are advised to ensure that the detection limits used for the CDPH samples meet the benchmarks in CAG912004.	pumped groundwater from drinking water aquifers.
Daly City	20	C.15.b.i.	Exempt Potable Drinking Water Wells and Irrigation Wells	Pumped groundwater could be potable drinking water wells and irrigation wells which do not contain chlorine or other added chemicals and are considered safe. *Exempt potable drinking water from ground water wells.*	Based on data submitted by Zone 7, C.15. exempts pumped groundwater from drinking water aquifers. Permittees who qualify for this exemption are advised to ensure that the detection limits used for the CDPH samples meet the benchmarks in CAG912004. Please note, aquatic standards are lower than drinking water standards.	C.15.a.i.(7) exempts pumped groundwater from drinking water aquifers.
Fairfield Fairfield Suisun City	29 43 29	C.15.b.i. C.15.b.iv.	Too Much Tracking, Monitoring, and Reporting	Too much tracking, monitoring, and reporting of relatively minor discharges. This is a huge burden with little water quality benefit.	The Revised TO does not require reporting for pumped groundwater or for swimming pool discharges. In response to comments, the Final TO exempts single family home's pumped groundwater, foundation drains, and water from crawl space pumps and footing drains. Monitoring is necessary for the other pumped groundwater, foundation drains, and water from crawl space pumps and footing drains because	Single family home's pumped groundwater, foundation drains, and water from crawl space pumps and footing drains exempted in C.15.a.i.(6). The following underlined words have been added to

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					high levels of pollutants have been found in groundwaters from uncontaminated sites and sites with no known or nearby plumes. Pool waters are highly chlorinated, may contain copper sulfate as an algaecide, and could cause downstream erosion. We want assurance that these conditionally exempted discharge is not a source of pollutants to the receiving water and the BMPs implemented does minimize the adverse effects of the discharges.	C.15.b.iv.(2): "Permittees shall keep records of the authorized major discharges of dechlorinated pool, hot tubs, spa and fountain water to the storm drain, including BMPs employed; such records shall be available for inspection to the Water Board."
Palo Alto Santa Clara County	20 29	C.15.b.i. and C.15.b.iv.	Burdensome Tracking, Monitoring, and Reporting	The amount of tracking, monitoring, and reporting for minor discharges such as pumped groundwater and swimming pool discharges is burdensome.	The Revised TO does not require reporting for pumped groundwater or for swimming pool discharges. In response to comments, the Final TO exempts single family home's pumped groundwater, foundation drains, and water from crawl space pumps and footing drains. Monitoring is necessary for the other pumped groundwater, foundation drains, and water from crawl space pumps and footing drains because high levels of pollutants have been found in groundwaters from uncontaminated sites and sites with no known or nearby plumes. We want assurance that this conditionally exempted discharge is not a source of pollutants to the	Single family home's pumped groundwater, foundation drains, and water from crawl space pumps and footing drains exempted in C.15.a.i.(6). The following underlined words have been added to C.15.b.iv.(2): "Permittees shall keep records of the authorized major discharges of dechlorinated pool, hot tubs, spa and

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					receiving water and the BMPs implemented does minimize the adverse effects of the discharges.	fountain water <u>to the storm drain</u>, including BMPs employed; such records shall be available for inspection to the Water Board."
ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment Newark Attachment Oakland Attachment #1 SMCWPPP	89 82 37 96 89 103	C.15.b.i.(1)(a)	Language Change	Requirement to "render pumped groundwater free of pollutants" is unnecessarily onerous and inconsistent with Discharge Prohibition A.1. *Modify the language to qualify that the discharge should not have pollutants of concern at concentrations that cause an exceedance of water quality standards.*	The standard for exemption under C.15.b. is "unpolluted" water. The language is consistent with that requirement.	
San Jose Attachment A	37	C.15.b.i.(1)(b)	10,000 gallons/day, General Permit	*Those who discharge more than 10,000 gallons per day should be subject to the requirements in NPDES No. R2.2007-0033, NPDES No. CAG912004.*	We agree.	C.15.b.i.(1)(b) says, "Proposed new discharges of uncontaminated groundwater at flows of 10,000 gallons/day or more and all new discharges of potentially contaminated groundwater shall be reported to the

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						Water Board so that they can be subject to general NPDES permitting requirements."
ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment Newark Attachment Oakland Attachment #1 SMCWPPP	90 83 38 97 90 104	C.15.b.i.(1) (b)	Delete Language	NPDES-permitted discharges are exempt from the discharge prohibition. *Delete language about being "consistent with Order No. R2-2007-022 NPDES No. CAG912004 requirements."*	Language has been deleted.	C.15.b.i.(1)(b) says, "Proposed new discharges of uncontaminated groundwater at flows of 10,000 gallons/day or more and all new discharges of potentially contaminated groundwater shall be reported to the Water Board so that they can be subject to general NPDES permitting requirements."
San Jose Attachment A	38	C.15.b.i.(1) (c)	Less than 10,000 gallons/day	*If a Permittee determines that a proposed non-stormwater discharge of less than 10,000 gallons/day constitutes a significant source of pollutants, than the Permittee shall require the discharge to meet water quality standards consistent with the existing effluent limitations in the Water Board's NPDES General Permit.*	All potentially contaminated groundwater shall be reported to the Water Board.	C.15.b.i.(2)(a) has been added, "Proposed new discharges of uncontaminated groundwater at flows of 10,000 gallons/day or more and all new discharges of

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						potentially contaminated groundwater shall be reported to the Water Board…"
Alameda County Water District	2	C.15.b.i.(1) (c)-(d)	Analytical Data, Municipal Groundwater Production Wells	Groundwater basin management will no longer be economically feasible because of the analytical cost. For example, in order for ACWD's Groundwater Basin Monitoring Program to comply with this Provision, over 200 wells per year will have to be sampled for total suspended solids, total petroleum hydrocarbons, volatile organic compounds, and metals. Stringent water quality testing is continually being conducted at ACWD drinking water supply wells as required by CDPH and at ACWD Aquifer Reclamation Program and Salinity Barrier Protection wells as required by Regional Board. *Existing water quality data from representative wells, such as production wells, should be accepted to fulfill the analytical requirements in this Provision. Another alternative is to allow sampling of a representative monitoring well from each aquifer instead of requiring sampling at every discharge point from the same aquifer.*	We have evaluated 3-years worth of data submitted by Zone 7 for its drinking water aquifers. Deep drinking water aquifers are not readily influenced by contamination. Therefore, C.15. exempts pumped groundwater from drinking water aquifers. Permittees who qualify for this exemption are advised to ensure that the detection limits used for the CDPH samples meet the benchmarks in CAG912004. Pumped groundwater from the shallower aquifers tends to be more readily influenced by contamination. Recognizing how often these wells from the shallow aquifers need to be purged, monitoring has been reduced for these specific wells in a new C.15.b.i.(1). Monitoring is reduced to twice a year for each aquifer.	C.15.a.i.(7) exempts pumped groundwater from drinking water aquifers. C.15.b.i.(1) is specific to pumped groundwater from non drinking water aquifers used for groundwater basin management.

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Central Contra Costa Sanitary District	9	C.15.b.i.(1)(d)	8260, Solid Waste Analytical Method	USEPA Method 8260 is a solid waste analytical method and not approved as a Water/Wastewater method according to 40CRF Part 136. In the wastewater field, use of methods not approved as Water/Wastewater methods can result in noncompliance. *Specify that water samples used to demonstrate compliance must be analyzed using approved Water/Wastewater methods.*	USEPA Method 8260 is approved for groundwater. This subprovision is for groundwater from pumped groundwater, foundation drains, water from crawl space pumps, and footing drains.	
ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment Newark Attachment Oakland Attachment #1 Palo Alto SMCWPPP Santa Clara County	91 84 39 98 91 21 105 30	C.15.b.i.(1)(d)-(e)	Monitoring Burdensome	Unnecessary and burdensome to monitor the full suite of chemicals listed at the frequency of a minimum of once a month for small, incidental discharges of pumped groundwater, foundation drains, crawl space pumped water, and footing drains. *Require monitoring only for the rare situations of large discharge of potentially contaminated water.*	Monitoring is necessary for the other pumped groundwater, foundation drains, and water from crawl space pumps and footing drains because high levels of pollutants have been found in groundwaters from uncontaminated sites and sites with no known or nearby plumes. Revised TO exempts single family home's pumped groundwater, foundation drains, and water from crawl space pumps and footing drains It was not intended to require monitoring of full suite of chemicals each month. C.15.b.(2) in the Revised TO has been reformatted to show the intended relationships.	Single family home's pumped groundwater, foundation drains, and water from crawl space pumps and footing drains exempted in C.15.a.i.(6). See clarification changes made to C.15.b.(2).
Alameda County Water District	3	C.15.b.i.(1)(f)	Turbidity, Municipal Groundwater	Groundwater turbidity is strongly related to groundwater extraction processes and is not always	We have evaluated 3-years worth of data submitted by Zone 7 for its drinking water aquifers. Turbidity	C.15.a.i.(7) exempts pumped groundwater from

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			Production Wells	indicative of the water quality. Turbidity meters work by measuring the amount of light scattered by particles in the sample. Errors are introduced when large amount of air is entrained into the water sample. During well development, groundwater is surged up and down the well, which tends to trap air in the water and causes unreliable turbidity readings. *Turbidity may not be a good indicator of water quality for pumped groundwater.*	from those samples are well below the benchmark of 50 NUT. C.15. exempts pumped groundwater from drinking water aquifers.	drinking water aquifers.
San Jose Attachment A	40	C.15.b.i.(1)(g) and C.15.b.iii.(1)(c)(ii)	Increase pH	*To accommodate Hetch Hetchy water supply, increase the upper pH benchmark to accommodate the pH range commonly reported from Hetch Hetchy water supply.*	A pH of 9 or above violates water quality objectives and is not consistent with the Basin Plan, which requires a pH range between 6.5 and 8.5.	
Central Contra Costa Sanitary District	7	C.15.b.i.(1)(h)	Limit Dewatering into Sanitary Sewer to Contaminated Water	Permit assumes that water is contaminated until proven otherwise. In practice, the vast majority of subsurface drains do not intercept contaminated water. *Limit discharge to sanitary sewer to cases where contamination is known or suspected and only when the contamination is abated.*	The Revised and Final TOs only specifically require new and rebuilt pools, hot tubs, spas and fountains to have a connection to the sanitary sewer. Pool water is known to have high levels of chlorine.	
Alameda Co Flood Cntrol Zone 7	3	C.15.b.i.(b)	10,000 gallons/day of Pumped Groundwater	Municipal groundwater production wells are used to meet demands during peak times or when a surface drinking water treatment facility is offline. Therefore, there will be times	We have evaluated 3-years worth of data submitted by Zone 7 for its drinking water aquifers. Turbidity from those samples are well below the benchmark of 50 NUT. C.15.	C.15.a.i.(7) exempts pumped groundwater from drinking water aquifers.

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				where wells are started up and shut down daily. *Clarify whether each startup or shutdown discharge is considered a "new" discharge and subject to the notification requirements.*	exempts pumped groundwater from drinking water aquifers.	
Alameda Co Flood Cntrol Zone 7	4	C.15.b.i.(b)	10,000 gallons/day of Pumped Groundwater	Order No. R2-2007-0033 states that "new discharges of uncontaminated groundwater at flows of 10,000 gallons/day or more…" must comply with the Permit. This could be interpreted that discharges of 10,000 gallons/day or more which occur intermittently from an existing source such as a drinking water production well which is started up and directed to discharge to the stormwater system for a given period of time before being operated to feed into the drinking water system could be considered "new" and thus require notification to the Board every time they discharge for short time and likely at very infrequent intervals. *Should only apply to new "long term" discharges which were not before present as sources and are expected to discharge for extended periods of time.*	Final TO has new subprovision for groundwater from drinking water aquifers. It reduces the monitoring to twice a year for each aquifer.	See C.15.b.i.(1)
Contra Costa Brd of Sups Attch A	55	C.15.b.i.-ii.	Too many to Oversee	Not acceptable for County to oversee all discharges from all foundation drains, crawl space	Single family home's pumped groundwater, foundation drains, and water from crawl space pumps and	Single family home's pumped groundwater,

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				pumps, footing drains, air conditioner condensate. Inappropriate to require property owners to conduct expensive monitoring of such discharges. Sanitary sewer agencies may not be willing to accept these sources to discharge into their systems. May not have the legal authority to regulate these types of discharges and does not maintain inventories of these types of mechanisms. Tt would be an extremely inefficient means of improving/protecting water quality. *Source control requirements should only apply to new/replaced devices, and ongoing monitoring should only be required for devices that discharge in excess of 10,000 gallons per day. Less than 10,000 gallons per day should be listed in C.15.a.i as exempt discharges. County can provide public information and outreach regarding appropriate BMPs to minimize any water quality impacts associated with these discharges.*	footing drains are exempted in the Final TO as long as the discharge is unpolluted. If there is any potential for pollutants in the groundwater, it should be referred to the Water Board. Requirements only applicable to new sources. Monitoring is necessary for the other pumped groundwater, foundation drains, and water from crawl space pumps and footing drains because high levels of pollutants have been found in groundwaters from uncontaminated sites and sites with no known or nearby plumes. Air Conditioning Condensate BMPs should already be part of the Permittees current list of BMPs as required by the Contra Costa's Permit, 99-058.	foundation drains, and water from crawl space pumps and footing drains exempted in C.15.a.i.(6). See clarification changes made to C.15.b.(2).
ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment	92 85 40	C.15.b.ii.(1)(b)	Allow Discharges from Air Conditioning into Storm Drains	Discharges from air conditioning units are only allowed into landscaped areas or sanitary sewers if allowed by the local sanitary sewer agency. This is more stringent than for air conditioning condensate.	C.15.b.ii. is entitled "Air Conditioning Condensate." We have removed all references to discharges from air conditioning units. Air conditioning condensate is clean water. Both the San Mateo Countywide Pollution	C.15.b.ii. states, "Condensate from air conditioning units shall be directed to landscaped areas or the ground. If this is

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Newark Attachment 1 Oakland Attachment #1 SMCWPPP	99 92 106			*Allow discharges from air conditioning units into the storm drain as long as it does not cause an exceedance of a water quality standard.*	Prevention Program's "BMPs and Implementation Procedures for Conditionally Exempted Discharges" and the Santa Clara Valley Urban Runoff Pollution Prevention Program's Conditionally Exempted Discharges: Classification and Control Measures" list widely accepted BMPs for air conditioning condensate.	not feasible, condensate lines shall be plumbed to the sanitary sewer, with the sanitary sewer agency's approval. The storm drain should be the last disposal option for the condensate.
ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment Newark Attachment 1 Oakland Attachment #1 SMCWPPP	93 86 41 100 93 107	C.15.b.ii.(1)(c)	Allow Air Conditioning Condensate into Storm Drains	Discharge Prohibition A.1. only requires that the discharge not impact beneficial uses or cause exceedances of water quality standards. Air conditioning condensate should not be prohibited to discharge to storm drains only when "adequate treatment measures are in place to meet water quality standards. *Allow air conditioning condensate to be discharged into storm drains provided it doesn't cause an exceedance of water quality standards.*		
Central Contra Costa Sanitary District	8	C.15.b.ii.(1)(c)	Allow Air Conditioning Condensate to Landscape	Air conditioning condensate is unpolluted and does not need to be discharged to the sanitary sewer. It can supplement potable water use for landscape irrigation during the dry season. *Require discharge from larger air conditioning units to landscape areas and only allow discharge to the sanitary sewer if landscape is not an option and it is allowed by the sanitary sewer agency.*		

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Sunnyvale	60	C.15.b.ii.-v.	No Phase In Period	There is no phase in period. Some will require ordinance changes. *Need at least a year from adoption date to address ordinance changes required to implement C.15.b.ii.-v.*	It is unclear why the City would need a year to comply with C.15.b.ii. since it is already doing what the Provision requires. According to the City's website, small air conditioning units drain to a landscaped area or to the sanitary sewer line (SMC 16.24.040). It also states "New building should be designed so that all discharges from air conditioner condensation lines drain to the sanitary sewer." C.15.b.iii. has been modified so that Permittees do not have to implement if they are not water purveyors. City's website already tells residents to discharge pools into the sanitary sewer. C.15.b.v. is similar to the requirements in SCVURPPP's *Condition Exempted Discharges – Classification and Control Measures.*	
Sunnyvale	61	C.15.b.iii.	Burdensome Reporting	City's Water Utility would need to report on 1,600 hydrant flushes, 500 blow-offs, and the 250 meter tests it conducts each year. Lots of staff time needed to enter all the data required in provision (iii) as well as the ancillary costs of database development, quality control, and report preparation. It does not seem to provide any real benefit to	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially treated. Monitoring is necessary until we have enough data points to show that BMPs are treating appropriately.	Added C.15.b.iii.(1)(c)(iv) states "After 18 months of consecutive data gathering and depending on those results, the Permittees can propose monitoring

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				demonstrate compliance with the implementation of BMPs to reduce relatively minor impacts of potable water to aquatic systems. *Eliminate or greatly reduce reporting.*	In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then propose to monitor only at "high-risk" or "environmentally sensitive" areas.	only at specific "high-risk" or "environmentally sensitive" areas, including areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species, or provide aquatic habitat with proven effective BMPs."
SCVWD	24	C.15.b.iii.	Burdensome Reporting and Notification	Utility discharge programs that are already fully and effectively functioning in Santa Clara County. No need to increase reporting and notification requirements.	If SCVWD already has 18 months of consecutive data for planned and unplanned discharges as prescribed in the Revised TO, please submit it ASAP. Depending on the data, SCVWD can propose monitoring only at specific "high-risk" or "environmentally sensitive" areas, including areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species, or provide aquatic habitat with proven effective BMPs.	
Berkeley EBMUD Fremont Oakland	7 8 4 5	C.15.b.iii.	Burdensome Reporting and Recordkeeping	Monthly reporting on planned and unplanned potable water discharge is burdensome and not necessary to measure program compliance.	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because	

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					the water was not treated or partially treated. Monitoring is necessary until we have enough data points to show that BMPs are treating appropriately.	
EBMUD	1	C.15.b.iii.	Burdensome Testing and Reporting	Imposes burdensome and labor intensive analytical testing and reporting requirements on discharges that pose a limited threat to water quality. Bay Area water utilities have developed and implemented BMPs that have been field tested and shown to be practical and effective for a wide range of planned and unplanned potable water discharges.	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially treated. We would welcome 18 consecutive months of existing data from EBMUD's planned and unplanned discharges.	
Brisbane	6	C.15.b.iii.	Delete Monitoring and Notification Requirements	While dechlorination systems and BMPs to protect downstream storm drain inlets are deployed, they do little to improve turbidity as long as the positive line pressure continues. *Requirements for monitoring and notification should be deleted. Municipalities who operate potable water systems should just be required to implement dechlorination, inlet protection BMPs, and post-event cleanup during unplanned discharges.*	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially treated. Monitoring is necessary until we have enough data points to show that BMPs are treating appropriately. Should excavation be necessary to repair line breaks, it is imperative to deploy appropriate sediment controls. If the storm drain inlet protections do little to improve turbidity then alternative BMPs, such as settling	

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					tanks, should be used.	
Mountain View	15	C.15.b.iii.	Excessive Record-Keeping	Significantly increase fieldwork-related record-keeping task thus impeding operational efficiency. Is there information showing that discharges from municipal water utility operations are contributing to receiving water pollution and additional monitoring and controls are necessary? *Regulate discharges from municipal water utility operations by continuing to require BMPs during routine and nonroutine activities.*	There have been potable water releases that have caused fish kill because the water was not treated or partially treated. Monitoring is necessary until we have enough data points to show that BMPs are treating appropriately. In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then propose to monitor only at "high-risk" or "environmentally sensitive" areas.	Added C.15.b.iii.(1)(c)(iv) states "After 18 months of consecutive data gathering and depending on those results, the Permittees can propose monitoring only at specific "high-risk" or "environmentally sensitive" areas, including areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species, or provide aquatic habitat with proven effective BMPs."
Pittsburg	13	C.15.b.iii.	Exempt Planned Discharges from Turbidity Monitoring	City's planned discharges involve flushing of potable water sources. *Exempt potable water discharges from turbidity monitoring.*	Turbidity monitoring is for the receiving water, when feasible.	
Fairfield Fairfield Suisun City	30 44 30	C.15.b.iii.	Monitoring and Reporting Too	Too prescriptive monitoring and reporting of planned, unplanned, and emergency discharges.	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There	

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			Prescriptive	*Revised to emphasize the implementation of BMPs.*	have been potable water releases that have caused fish kill because the water was not treated or partially treated. Monitoring is necessary until we have enough data points to show that BMPs are treating appropriately.	
ACCWP Berkeley Newark Oakland	13 11 24 8	C.15.b.iii.	No Authority	Permittees do not have the resources to monitor and report on all of the planned and unplanned discharges from a potable water source. Permittees do not have the mechanism to require these agencies to report to the Water Board. *Delete requirements.* *Water Board should regulate potable water agencies directly.*	In response to comments, C.15.b.iii. is only applicable to Permittees who are water purveyors. Permittees who are not water purveyors are required to report all unplanned discharges discovered by the Permittees or reported to the Permittees to the water purveyor. The Water Board intends to regulate potable water purveyors with a General Permit in the near future.	Language has been added to C.15.b.iii. to clarify that it is only applicable to Permittees who are water purveyors.
ACCWP Legal Comment CCCWP	17 12.b.	C.15.b.iii.	No Authority	Permittees may not have jurisdiction within special water supply districts to implement requirements. *Regulate through Water Board general permit, individual permit, or in the Phase II Permitting process.*		
Contra Costa Brd of Sups Attch A Contra Costa Co Flood Control Attch A San Pablo	56 12 10	C.15.b.iii.	No Authority	Does not have the legal authority to require compliance from water districts and fire districts to require monitoring and reporting. *Should be regulated by the Water Board or State Board through a General Permit.*		
Danville	8	C.15.b.iii.	No Authority	Municipalities do not have the		

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				authority to oversee and regulate planned and unplanned potable water discharges from special districts. *Delete requirements.*		
San Leandro	27	C.15.b.iii.	No Authority	Potable water purveyors are not part of the ACCWP Permittees group. These special districts should be included under the Phase II Permit. ACCWP Permittees have limited to no authority and will never be able to achieve these prescribed requirements on independent special districts. *The notification & reporting requirements and monitoring requirements should be eliminated allowing current Permittees to continue to develop and work with future Phase II agencies on proper BMP implementation within in their jurisdiction.*		
Alameda City	30	C.15.b.iii.	Not Responsible for 3rd Parties	*Modify this language to make it clear that local agencies must only notify and report to the Water Board information about planned discharges of potable water that they are responsible for implementing.*	We agree.	Language has been added to C.15.b.iii. to clarify that it is only applicable to Permittees who are water purveyors.
ACCWP Attachment-1 Berkeley Attachment 1 Fremont	95 88 43	C.15.b.iii.	Not Responsible for 3rd Parties	Permitttees should not have to monitor or require third parties to monitor. *Permittees should only be responsible for monitoring of potable*		

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Attachment Newark Attachment Oakland Attachment #1 SMCWPPP	102 95 109			*water discharges that they are responsible for and not discharges by third parties.*		
Palo Alto Santa Clara County	22 31	C.15.b.iii.	Not Responsible for 3rd Parties	Prescriptive monitoring and reporting requirements will have significant impacts on municipal water operations and maintenance staff. *Change language to say that permittees should only be responsible for BMP usage, notifications, reporting, and monitoring of discharges they are responsible for and not discharges by potable water dischargers who are not Permittees.*		
ACCWP Fremont Newark Oakland	10.c. 5.c. 22.c. 6.c.	C.15.b.iii.	Planned & Unplanned Potable Water Discharge	Permittees are put in the position of managing potable water supply agencies.	In response to comments, C.15.b.iii. is only applicable to Permittees who are water purveyors. Permittees who are not water purveyors are required to report all unplanned discharges discovered by the Permittees or reported to the Permittees to the water purveyor.	Language has been added to C.15.b.iii. to clarify that it is only applicable to Permittees who are water purveyors.
BASMAA	80	C.15.b.iii.	Planned and Unplanned Potable Water Discharge	Inclusion of requirements on non-MS4 systems in an MS4 permit is inappropriate and unworkable.		
CCCWP	60.c.	C.15.b.iii.	Planned and Unplanned Potable Water	Unacceptable and bad public policy		

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			Discharge			
Pacifica	7	C.15.b.iii.	Redirection of Code Enforcement	Provision would force Code Enforcement Officer to shift focus from abating illicit discharge as defined in the existing NPDES permit to focus on less significant discharges in C.15.	Unclear why it would require the City to shift focus. Most of C.15. is already in SMCPPP's *BMPS and Implementation Procedures for Conditionally Exempted Discharges.*	
Sunnyvale	63	C.15.b.iii.	Too Much Monitoring	The monitoring outlined requires all water department employees to obtain training to a higher certification level (D-3). In most cases this will require up to two years of time for an individual to complete and cost the city upwards of $2,000 per employee. No basis has been provided for the overly prescriptive requirements for monitoring these minor types of non-stormwater discharges that pose very limited threats to waterbodies. *Limited monitoring to what is in the SCVURPPP Conditionally exempted Discharges Report.*	Untreated potable water discharges have caused fish kills. C*onditionally Exempted Discharges Classification and Control Measures* refers to the WUDPPP. The WUDPPP recommends potable water discharges to storm drains and creeks if the chlorine level is less than 1.5 mg/l. 1.5 mg/l exceeds acute toxicity thresholds for many aquatic species. If Sunnyvale has data to show that potable water discharges are not sources of pollutants to the receiving water and/or if the BMPs implemented minimize the adverse effects of the discharges, please submit them.	
SCVWD	18	C.15.b.iii.	Too Much Tracking and Monitoring	The District and SCVURPPP developed a series of water utility discharge guidance documents, which include training materials. These documents have been shared with Water Board staff and have not received any critical comments. *Have co-permittees across the permit area adopt a similar Water*	Staff training on the uses of appropriate BMPs is vital. At the same time, there needs to be monitoring to demonstrate that the BMPs are effective. In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then	Added C.15.b.iii.(1)(c)(iv) states "After 18 months of consecutive data gathering and depending on those results, the Permittees can

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				Utility Discharge program rather than implementing the new tracking and monitoring requirements.	propose to monitor only at "high-risk" or "environmentally sensitive" areas. If SCVWD already has the data, please submit them.	propose monitoring only at specific "high-risk" or "environmentally sensitive" areas, including areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species, or provide aquatic habitat with proven effective BMPs."
San Jose	6.c.	C.15.b.iii.	Too Prescriptive and Costly	New monitoring requirements will have significant impacts on the operations of the City of San José Municipal Water System (MWS) and other water retailers and would require the City to monitor discharges from the system at point-of-discharge and at receiving waters. The MWS may also be at risk of exceeding the discharge benchmark for pH in some instances, due to the pH of Hetch Hetchy water, which can be outside the specified benchmark range. Meeting these provisions would require an investment in equipment and personnel that would have to be passed on to the MWS rate payers. Financial impacts of this provision	Untreated or partially treated potable water discharges have caused fish kills. If municipalities have data to demonstrate that its BMPs have been successful in showing that conditionally exempted discharges are not sources of pollutants to the receiving water and/or if the BMPs implemented for the conditionally exempt discharges minimize the adverse effects of the discharges, please submit them. The dechlorination process tends to move pH a bit towards alkaline.	Added C.15.b.iii.(1)(c)(iv) and C.15.b.iii.(2)(d)(iii) which state "After 18 months of consecutive data gathering and depending on those results, the Permittees can propose monitoring only at specific "high-risk" or "environmentally sensitive" areas, including areas that are prone to erosion and excess

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				will extend to the customers of the City's two private water retailers as well. *Revise this provision, emphasizing the implementation of BMPs in lieu of new regulatory programs.*		sedimentation at high flows, support rare or endangered species, or provide aquatic habitat with proven effective BMPs."
SCVURPPP	69	C.15.b.iii.	Too Prescriptive Monitoring and Reporting	Prescriptive monitoring and reporting requirements will have significant impacts on municipal water operations and maintenance staff.	Monitoring is necessary to demonstrate the effectiveness of BMPs. In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then propose to monitor only at "high-risk" or "environmentally sensitive" areas.	Added C.15.b.iii.(1)(c)(iv) states "After 18 months of consecutive data gathering and depending on those results, the Permittees can propose monitoring only at specific "high-risk" or "environmentally sensitive" areas, including areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species, or provide aquatic habitat with proven effective BMPs."
ACCWP Attachment-1	94	C.15.b.iii.	Water Board Should Adopt	Permittees should only be responsible for reporting their own	In response to comments, C.15.b.iii. is only applicable to Permittees who	Language has been added to C.15.b.iii.

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Berkeley Attachment 1 Fremont Attachment Newark Attachment Oakland Attachment #1 SMCWPPP	87 42 101 94 108		General Permit	activities to the Water Board. Permittees should not be required to notify and report specific information by potable water dischargers nor should Permittees be required to require potable water discharger report to the Water Board. *Notification and reporting by third parties should be handled by the Water Board through a NPDES Permit or other regulatory mechanism.* *Modify language to make it clear that Permittees must notify and report to the Water Board information about these discharges only if they are responsible for implementing.*	are water purveyors. Permittees who are not water purveyors are required to report all unplanned discharges discovered by the Permittees or reported to the Permittees to the water purveyor.	to clarify that it is only applicable to Permittees who are water purveyors.
Millbrae Pacifica San Mateo	19 6 15	C.15.b.iii.	Water Board Should Adopt General Permit	Should not be required to make sure that local potable water purveyors who discharge potable water conduct the burdensome amount of sampling, testing, and reporting required. *Water Board should adopt a general permit for potable water dischargers who are not municipalities.*		
SCVWD	19	C.15.b.iii. (1)(b)(i)	Water Board Should Adopt General Permit	This notification procedure cannot be policed by Permittees. *Remove notification procedure from the Revised TO.* *Issues relative to private water purveyors should be handled in a separate NPDES permit issued to*		

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				those private water purveyors.		
Brisbane	5	C.15.b.iii.(1)(b)	Emergency Discharges Would Not Meet 7 day Notification Requirement	In cases where a water quality emergency arises that requires a planned, timely discharge of a water line or storage reservoir, the City may not be able to provide a week's notice prior to discharging. *Notification and reporting requirements should be deleted. Water Board should regulate non-municipal potable water discharge through a general permit.*	An emergency discharge is not from routine operations and maintenance that can be scheduled in advance. An emergency discharge is an unplanned potable water discharge. The Water Board intends to regulate potable water purveyors with a General Permit in the near future.	
Alameda City	22	C.15.b.iii.(1)(b)-(c)	Planned Potable Water Discharge	Monitoring and reporting for all planned discharges of potable water would be highly infeasible and time-consuming. *Clarify if the monitoring and reporting requirements only apply to discharges greater than or equal to 250,000 gallons per day, 500,000 gallons total, or for all volumes.*	All routine operation and maintenance in the potable water distribution system will need to be monitored. In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then propose to monitor only at "high-risk" or "environmentally sensitive" areas. Notification requirements apply to discharges of 250,000 gallons per day or a total volume of 500,000 gallons.	Added C.15.b.iii.(1)(c)(iv) states "After 18 months of consecutive data gathering and depending on those results, the Permittees can propose monitoring only at specific "high-risk" or "environmentally sensitive" areas, including areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species, or provide

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						aquatic habitat with proven effective BMPs."
EBMUD	2	C.15.b.iii.(1)(b)(i)	Planned Potable Water Discharge	Thank you for including specific and appropriate thresholds for planned discharge notifications (>250,000 gpd or >500,000 gallons total), which greatly reduces uncertainties in providing such notifications.	Comment noted.	
Contra Costa Co Water District	1	C.15.b.iii.(1)(b)(ii)	Monthly Reporting Burdensome	The information prescribed for monthly reports will be provided in the annual self-audit summary report. If the intent of the annual report is to provide a "self-audit", it makes more sense to present the planned discharge information in the annual report as the basis to discuss the self-audit. *Eliminate monthly reporting requirement.*		Monthly reporting deleted from C.15.b.iii.(1)(b).
Contra Costa Co Water District	2	C.15.b.iii.(1)(b)(ii)	No Specified Reporting Period or Annual Report Due Date	Provision does not specify a reporting period or annual report submittal date. *Reporting period and submittal date should be consistent with the reporting period and submittal date (9/15) of the MRP.*	C.16. states that Annual Reports are due on September 16th of each calendar year. The reporting period is from June 1st of the previous year to July 31st of the current year.	
San Jose Attachment A	39	C.15.b.iii.(1)(b)(ii)-(iii) and C.15.b.iii.(1)(c)	Reporting and Monitoring for Large Discharges Only	The reporting requirements as currently proposed significantly impact operational efficiency and costs. With no volume threshold for this element, stringent and costly BMPs and control measures	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially	C.15.b.iii.(1)(c)iv. added to reduce monitoring of planned discharges to 18 months. Monthly reporting

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				requiring an increased amount of resources would be needed for every instance, which is not proportionate to the potential for water quality impairment. *Reporting and monitoring requirements should only apply to discharges as defined in Provision C.15.b.iii.(1).(b).(i).* *Reporting should be provided with the Annual Report while maintaining records for review at the request of the Board.*	treated. Monitoring is necessary on all planned discharges until we have enough data points to show that BMPs are treating appropriately. In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then propose to monitor only at "high-risk" or "environmentally sensitive" areas. In response to comments, we have eliminated monthly reporting.	deleted from C.15.b.iii.(1)(b).
Cupertino	5	C.15.b.iii.(1)(b)ii.	Excessive Reporting	Monthly reporting is too much an unnecessary. It shifts focus from eliminating adverse water quality impacts to figuring out how to stretch municipal resources to hire staff to set up a database, collect data, and enter data.		Monthly reporting deleted from C.15.b.iii.(1)(b).
Alameda City	31	C.15.b.iii.(1)(c)	Not Responsible for 3rd Parties	*Modify this language to make it clear that local agencies must only monitor planned discharges of potable water that they are responsible for implementing.*	In response to comments, C.15.b.iii. is only applicable to Permittees who are water purveyors. Permittees who are not water purveyors are required to report all unplanned discharges discovered by the Permittees or reported to the Permittees to the water purveyor.	Language has been added to C.15.b.iii. to clarify that it is only applicable to Permittees who are water purveyors.
San Jose Attachment A	39.b.	C.15.b.iii.(1)(c)(i)	Monitoring of Receiving Water Can Be Unsafe	The proposed monitoring requirements are problematic because any attempt to monitor receiving waters could be unsafe, would result in lengthy and	Turbidity monitoring is only required were feasible.	

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				unpredictable work delays, do not account for flow from multiple inputs along the stormwater system, require a considerable increase in resources and associated costs, and would provide negligible water quality benefit. *Remove references to monitoring requirements at the receiving waters.*		
Contra Costa Co Water District	3	C.15.b.iii.(1)(c)(i)-(ii)	Language Inconsistent	The language in the first Provision implies that the monitoring results are compared to standards. The next Provision states that the benchmarks are used to evaluate BMPs effectiveness. CCWD believes the intent of the monitoring is to assess effectiveness, and report the findings accordingly in the annual self-audit summary report. *Revise as follows: "Permittees shall monitor or require monitoring of Planned Discharges…at the point where the discharge enters the receiving water to* ***assess*** *effectiveness of the employed BMPs."*	Monitoring should verify that employed BMPs meet the benchmarks.	C.15.b.iii.(1)(c)(i) revised to state just required monitoring parameters.
ACCWP Berkeley Newark Newark Oakland	14 12 25 105 9	C.15.b.iii.(2)	Make Hydrant Shearing an Emergency Discharge	Requirement to treat, monitor, and report on fire hydrant shearing discharges are not appropriate and place an unnecessary burden on fire fighters. Treatment of discharge is infeasible due to the large volume	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially	

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				and uncontrolled nature of the discharge. Since there is no treatment of the flow, there should be no monitoring or reporting. The chlorine and pH of the discharge will be typical of the potable water source. *Move fire hydrant shearing from C.15.b.iii.(2) into C.15.b.iii(3).*	treated. Because of the large volume released from hydrant shearing, dechlorination really is necessary. It is also necessary to have erosion controls in place.	
ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment Newark Attachment 1 Oakland Attachment #1 SMCWPPP	96 89 44 103 96 110	C.15.b.iii.(2)	Not Responsible for 3rd Parties	Permittees cannot be asked to require potable water dischargers to implement BMPs, notify, monitor, and report to the Water Board on unplanned potable water discharges. *Permittees should not be responsible for discharges by potable water dischargers who are not Permittees.*	In response to comments, C.15.b.iii. is only applicable to Permittees who are water purveyors. Permittees who are not water purveyors are required to report all unplanned discharges discovered by the Permittees or reported to the Permittees to the water purveyor.	Language has been added to C.15.b.iii. to clarify that it is only applicable to Permittees who are water purveyors.
ACCWP Fremont Newark Oakland	10.d. 5.d. 22.d. 6.d.	C.15.b.iii.(2)	Onerous Monitoring and Reporting	Onerous monitoring and reporting requirements for sheared fire hydrants.	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially treated. Because of the large volume released from hydrant shearing, dechlorination really is necessary. It is also necessary to have erosion controls in place.	
San Jose	41	C.15.b.iii.(	Set Threshold	*Recommends a minimum threshold*	It is unclear why it would be	

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Attachment A		2)		*of 50,000 gallons or more.*	appropriate to set the minimum threshold at 50,000 gallons. If San Jose has monitoring data, please submit it.	
ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment Newark Attachment Oakland Attachment #1 SMCWPPP	97 90 45 104 97 111	C.15.b.iii.(2)	Too Prescriptive	Notifying the Board within two hours of becoming aware of any aquatic impacts and reporting times of discovery, notification, and responding crew arrival time are overly prescriptive and may interfere with responding to the unplanned discharge. Monitoring may be infeasible because it may be unsafe or the discharge may have ceased prior to being able to monitor. *Eliminate overly prescriptive record keeping and reporting that interferes with responding to unplanned potable water discharges. Monitoring requirements should be conditioned with the qualifier that the monitoring should only be done to the extent that time and resources allow and only where and when it is safe to do.*	Notification is necessary because we do get calls from concerned citizens. In response to comments, C.15.b.iii. is only applicable to Permittees who are water purveyors. Permittees who are not water purveyors must report to the responsible water purveyor all unplanned discharges discovered by the Permittees or reported to the Permittees. Monitoring is necessary to verify effectiveness of BMPs. Monitoring is required only on 10% of the unplanned potable water discharges.	Language has been added to C.15.b.iii. to clarify that it is only applicable to Permittees who are water purveyors.
Daly City	21	C.15.b.iii.(2)(c)	Onerous Reporting	This onerous reporting is not reasonable and is almost identical to reporting of sewage overflows. *Delete.*	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially treated. Monitoring is necessary on all planned discharges until we have	C.15.b.iii.(1)(c)iv. added to reduce monitoring of planned discharges to 18 months.

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					enough data points to show that BMPs are treating appropriately. In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then propose to monitor only at "high-risk" or "environmentally sensitive" areas. In response to comments, we have eliminated monthly reporting.	
Palo Alto Santa Clara County SCVURPP	22.b. 31.b. 68	C.15.b.iii.(2)(c)-(d)	Too Prescriptive	*Eliminate overly prescriptive record keeping and reporting that interferes with responding to unplanned potable water discharges.* *Require monitoring only to the extent that time and resources allow and only where and when it is safe to do so.*	Monitoring is necessary to verify effectiveness of BMPs. Monitoring is required only on 10% of the unplanned potable water discharges.	
San Jose Attachment A	42	C.15.b.iii.(2)(c)(i)	More Time to Notify	Allow time for resources to focus efforts on responding to potential endangerment of public health and safety. *Change notification to within 24 hours after becoming aware of any aquatic impacts.*	We need to be aware of discharges that cause aquatic impacts or public health as soon as possible because of public inquiry.	
EBMUD	3	C.15.b.iii.(2)(c)(i)	Too Prescriptive	District field crews are trained and equipped to minimize potential impacts to public health and safety and consistently do so. *Eliminate the requirement to notify Water Board staff when unplanned discharges might endanger or*	We need to be aware of discharges that cause aquatic impacts or public health as soon as possible because of public inquiry.	

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				compromise public health and safety because this is a highly subjective judgment and does not seem to be a water quality issue under the Water Board's jurisdiction.		
EBMUD	4	C.15.b.iii.(2)(c)(ii)	Too Prescriptive	This requirement is burdensome, particularly given the requirement to report all unplanned discharges monthly under Provision No. C.15.b.iii(2)(c)(iv). The reportable quantity for chlorine under water quality regulations is 10 pounds, which is equivalent to approximately 600,000 gallons of distribution system water having a chlorine concentration of 2 mg/l. *Eliminate the requirement to notify Water Board staff as soon as possible, but not later than 24 hours after becoming aware of any unplanned discharge having a total chorine residual >0.08 mg/L and >50,000 gallons.*	2 mg/l of chlorine residual is drinking water standard. This way exceeds the acute toxicity thresholds for many aquatic species including ESA listed salmonids. Notification is necessary because we do get calls from concerned citizens.	Monthly reporting deleted from C.15.b.iii.(1)(b).
EBMUD	5	C.15.b.iii.(2)(c)(iii)	Language Revision	*To be consistent with the comment to eliminate the requirement for notifications within 24 hours, change the requirement to document and report complaints and corrective actions from "within 5 working days after the 24-hour telephone or e-mail report" to "within 5 working days after receiving the complaint"*	Revised TO language not changed.	
Contra Costa	4	C.15.b.iii.(	Burdensome	Monthly reports are unnecessary		Monthly reporting

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Co Water District		2)(c)(iv)	Reporting	burdens that add no value since they contain the same information as the annual reports. *Remove requirement for monthly reporting.*		deleted from C.15.b.iii.(1)(b).
San Jose Attachment A	43	C.15.b.iii.(2)(c)(iv)	Monthly Reporting Burdensome	Too burdensome to report monthly and inconsistent with the rest of the reporting requirements in the TO. *Reporting should be done in the Annual Report while maintaining records for review at the request of the Board.*		Monthly reporting deleted from C.15.b.iii.(1)(b).
Contra Costa Co Water District	4.b.	C.15.b.iii.(2)(c)(iv)	No Specified Reporting Period or Annual Report Due Date	Provision does not specify a reporting period or annual report submittal date. *Reporting period and submittal date should be consistent with the reporting period and submittal date (9/15) of the MRP.*	C.16. states that Annual Reports are due on September 16th of each calendar year. The reporting period is from June 1st of the previous year to July 31st of the current year.	
EBMUD	6	C.15.b.iii.(2)(c)(v)	Too Prescriptive	Requiring all of this information for all unplanned discharges is extremely burdensome and of limited value. Obtaining and documenting this information is difficult and resource intensive, and some of these estimates will be imprecise and subject to uncertainty. *Eliminate the requirements to identify and report receiving water body(ies), duration of discharge, estimated volume, time of discharge discovery, time of notification, and time of inspector/responding crew arrival*	Potable water contains chlorine or chloramines, two very toxic chemicals to aquatic life. There have been potable water releases that have caused fish kill because the water was not treated or partially treated. Monitoring is necessary on all planned discharges until we have enough data points to show that BMPs are treating appropriately. In response to comments, we have added language that allows the Permittees to monitor 18 consecutive months and then	C.15.b.iii.(1)(c)iv. added to reduce monitoring of planned discharges to 18 months. Monthly reporting deleted from C.15.b.iii.(1)(b).

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				times for all unplanned discharges.	propose to monitor only at "high-risk" or "environmentally sensitive" areas. In response to comments, we have eliminated monthly reporting.	
NOAA	20	C.15.b.iii.(2)(d)(i)	0.080 ppm Chlorine Residual too High	Allowable chlorine residual of 0.080 ppm is too high to ensure the protection of aquatic life. Best available data show that this concentration exceeds acute toxicity thresholds for many aquatic species including ESA listed salmonids and their prey items. *Explore or cause to be explored available test kits and determine which kits with lower detection limits are reliable enough to be used for this permit.* *Require the generation of lab data to validate the performance of the field tests and dechlorination BMPs.*	Many field test kits can get down to 0.02 mg/L. However, it requires calibration, which may not be available out in the field. But we have lowered the allowable chlorine residual to 0.05 mg/L to be consistent with the San Francisco Public Utilities Commission Permit, Order No. R2-2008-0102. By the time a sample reaches a lab, it will no longer be a representative sample for chlorine.	We have lowered the allowable chlorine residual to 0.05 mg/L.
Contra Costa Co Water District	5	C.15.b.iii.(2)(d)(i)	Hard to Monitor Unplanned Discharges	Unplanned discharges cannot be anticipated. With only one field turbidimeter, it would be difficult to mobilize and sample turbidity of unplanned discharges. MRP language should recognize that a 10% minimum objective may not always be achievable. We also believe that the intent of the monitoring is to assess rather than verify the BMPs' effectiveness, relative to the turbidity benchmarks.	Sampling 10% of these unplanned discharges is reasonable and will provide a representative set of data. If BMPs do not meet benchmarks, other BMPs need to be employed.	

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				*Revise as follows: "Pre and post-BMP turbidity in NTU shall **attempt to** be measured **for** at least 10% of the unplanned discharges to **evaluate** the effectiveness of the BMPs employed."*		
EBMUD	6	C.15.b.iii.(2)(d)(i)	Unplanned Potable Water Discharge	Requirement to conduct pre- and post-BMP monitoring of "turbidity in NTU" for at least 10% of all unplanned discharges is highly burdensome, resource intensive, and of limited benefit. Significant concerns regarding the types of BMP improvements that the Water Board might consider for unplanned discharges if pH, chlorine residual, or turbidity are outside ranges. Corrosion control within water conveyance and distribution systems is of critical importance and unplanned discharges, by their nature, cannot be anticipated. Significant practical and technical limitations exist in implementing pH and sediment control BMPs for unplanned discharges. *Reduce % of unplanned discharges to be sampled for turbidity.*	122.26(d)(2)(iv)(B)(1) requires a program to prevent illicit discharges to the municipal separate storm sewer system. Potable water sources can be identified as illicit discharges if they are identified as sources of pollutants to waters of the United States. In the past, we have conditionally exempted discharges from potable water sources as long as BMPs were implemented. But we have no data indicating the BMPs are effective. We know that potable water's chlorine residual exceeds acute toxicity thresholds for many aquatic species including ESA listed salmonids. We know that unplanned discharges, such as line breaks, flushes large volumes of sediment out into the streets when excavation is done to repair the lines. There must be data to show that potable water discharges are not a source of pollutants. EBMUD, alone, has between 300-550 unplanned discharges each month. Sampling 10% of these unplanned	

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					discharges is reasonable and will provide a representative set of data. Water purveyors have the flexibility to determine appropriate and effective BMPs to meet the pH, chlorine residual, and turbidity benchmarks when the potable water is discharged.	
Contra Costa Co Water District	6	C.15.b.iii.(2)(d)(ii)	Revise Data Gathering Period to Reflect Permit Changes	If monthly reporting is eliminated per our recommendations in Comments #1 & #3, the data gathering period language should be revised. *Revise as follows: "After **2 consecutive reporting years** of data gathering and depending on those results, the dischargers can propose monitoring…"*	Anytime the Permittee has 18 consecutive months of data, it may propose a reduced monitoring plan.	
Dublin	17	C.15.b.iii.(3)	Can Control Third Parties	Many of these exempted non-stormwater discharges are beyond the control of local agencies (the Permit includes a requirement that fire departments consider storm inlet protection prior to conducting firefighting activities). Failure to monitor and control activities by other agencies could put local agencies in noncompliance with the Permit. Cost of monitoring and recordkeeping estimated at $8,000.	40 CFR 122.26(d)(2)(iv)(B)(1) requires Permittees to address flows from fire fighting activities if the discharges are identified as significant sources of pollutants to waters of the United States. Highly chlorinated potable water used in fire fighting activities is known to be toxic to aquatic life. In addition if there are toxic substances on the property where the fire is, this discharge is toxic to aquatic life. Therefore, Permittees should already be addressing flows from fire fighting activities. Reporting for this provision is on a case by case	Final TO has the underlined language added to C.15.b.iii.(3)(b), "Permittees shall implement or require fire fighting personnel to implement effective BMPs."

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					basis. Also, the priority for implementing BMPs is last, after efforts have been directed toward life and property. However, in response to this comment, we have added language so that this subprovision has more BMP orientation.	
Fremont Attachment	46	C.15.b.iii.(3)	Emergency Discharge	In an emergency situation, diverting resources to focus on pollution prevention and BMPs is not feasible. *Eliminate requirement.*	C.15.b.iii.(3)(b) gives a priority on what efforts should be directed towards in a emergency.	
Contra Costa Brd of Sups Attch A	57	C.15.b.iv.	Can't Monitor All Pool Discharges	Unreasonable for County to monitor all discharges from swimming pools, spas, hot tubs and fountains located on private property. The County does not maintain an inventory of these features, and may not have the legal authority to regulate these discharges (especially for existing facilities). Permit language presumes that sanitary sewer agencies will be willing to accept discharges from these sources. The sanitary sewer agencies may not be willing to even accept filter backwash discharges, and are even more likely to object to accepting discharges associated with pool draining events. *County should just continue providing information regarding appropriate BMPs to prevent water quality impacts.*	40 CFR 122.26(d)(2)(iv)(B)(1) requires a program to prevent illicit discharges to the municipal separate storm sewer system. Pool water tends to be highly chlorinated and may contain a copper algaecide, both shown to be toxic to aquatic life and therefore can be considered an illicit discharge. But instead of listing such waters as illicit discharges, we are continuing to list these discharges as conditionally exempted because sanitary sewer agencies have given indications that they are willing to accept pool discharges. Many POTWs, especially those who are also Permittees, already except pool discharge through a clean out.	

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ACCWP Attachment-1 Berkeley Attachment 1 Fremont Attachment Newark Attachment Oakland Attachment #1 SMCWPPP	99 92 48 107 99 113	C.15.b.iv.(1)(c)	Don't Require Permittees to Work With POTW	Enabling "the installation of a sanitary sewer discharge location to allow draining events for pools, spas, and fountains to occur with the proper permits from the local sanitary sewer agency" is unclear. *Permittees should only be responsible for providing owners of these features with information about how they may apply for the proper permits to discharge into the sanitary sewer.*	40 CFR 122.26(d)(2)(iv)(B)(1) requires a program to prevent illicit discharges to the municipal separate storm sewer system. Pool water tends to be highly chlorinated and may contain a copper algaecide, both shown to be toxic to aquatic life and therefore can be considered an illicit discharge, not allowed into the sanitary sewer. But instead of listing such waters as illicit discharges, we are continuing to list these discharges as conditionally exempted because sanitary sewer agencies have given indications that they are willing to accept pool discharges.	
Livermore	17.b.	C.15.b.iv.(1)(c)	Water Board Should Work to Change Plumbing Code	*Requirement to have drains for pools and spas would be more effectively addressed through a change in the plumbing code rather than adding it to stormwater permits.* *As with pesticide usage, the Board should work with other state agencies to address this issue statewide.*	We agree. But at the same time 40 CFR 122.26(d)(2)(iv)(B)(1) requires a program to prevent illicit discharges to the municipal separate storm sewer system. Pool water tends to be highly chlorinated and may contain a copper algaecide, both shown to be toxic to aquatic life and therefore can be considered an illicit discharge, not allowed into the sanitary sewer. But instead of listing such waters as illicit discharges, we are continuing to list these discharges as conditionally exempted because sanitary sewer agencies have given indications that	C.15.b.v.(1)(c) has a footnote that says, "This connection could be a drain in the pool or could be a sanitary sewer clean out located close enough to the pool so that a hose can readily direct the pool discharge into the sanitary sewer clean out."

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					they are willing to accept pool discharges. A drain in the pool/spa, or a hose or other temporary system directed to the sewer clean out would facilitate the discharge.	
Livermore	17	C.15.b.iv.(2)	Recordkeeping Unnecessary	Recordkeeping for authorized major discharges of dechlorinated pool, spa and fountain water, including BMPs employed, is cumbersome, unnecessary, and have no beneficial impact on water quality. *Remove requirement.*	Pool water tends to be highly chlorinated and may contain a copper algaecide, both shown to be toxic to aquatic life and therefore can be considered an illicit discharge, not allowed into the sanitary sewer. If they are being discharged into the storm drain, they must be employing BMPs. We modified the Final TO to clearly state that only authorized discharges to the storm drain need a record.	See addition to C.15.b.v.(2).
Contra Costa Brd of Sups Attch A	57.b.	C.15.b.iv.(c)	Prohibits Pools from Being Built	This Provision seems to prohibit pools from being constructed in areas that do not have sanitary sewer systems, which accounts for much of the unincorporated portion of Contra Costa County.	The Revised TO requires that swimming pools, spas, hot tubs, and fountains be connected to sanitary sewer systems where it is feasible and if approved by local sanitary sewer agencies. In remote areas, where there is no access to sanitary sewer systems, these types of discharges shall be directed to landscaping or vegetated areas away from water ways.	
NRDC & SF Baykeeper	66	C.15.b.v.	Conditional Exemption Violates CWA	The BMPs under C.15.b.v. are vague and fail to set out any measurable requirement, and violates the clear requirements of the	The overwhelming majority of discharges from irrigation runoff within the jurisdictions covered by the permit will be from single family	

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				Clean Water Act and its implementing regulations. These BMPs that will not result in non-stormwater irrigation flows free of pollutants under 40 C.F.R. § 122.26. The TO does not provide any evidence to support that BMPs will either effectively prohibit such discharges or even allow water quality standards to be met. The provisions of C.15.b.v, requiring that Permittees promote "conservation programs that minimize discharges" or send "outreach messages regarding use of less toxic options," are not in themselves management practices. They constitute proposals for categories of BMPs to be developed. They have been introduced in previous permits and that have been tried—and failed—to prevent impacts to receiving waters from irrigation runoff. Pollution from pesticides and other contaminants constitutes a serious and ongoing problem in receiving waters under the jurisdiction of the Permittees.	residential lots. A program of prohibition may be simple and straightforward, but would be extremely difficult to enforce. In times of severe drought such enforcement is attempted with varying results. The approach in this permit is primarily educational outreach to these residential users. The presence of nutrient or pesticide pollutants in irrigation runoff is not certain, however, runoff is apt to contain chlorine or chloramines if it is excessive and above seepage level. This discharge is on par with residential car washing, which is also controlled through education rather than enforcement in this permit.	
NRDC & SF Baykeeper	65	C.15.b.v.	Does Not Effectively Prohibit Non-Stormwater Discharges As Required in CWA	There has been no evidence that the BMPs required under Provision C.15.b.v. are sufficient to meet the regulatory requirements of the CWA. 40 C.F.R. § 122.26 provides that illicit discharge programs must address non-stormwater discharges	We agree that the intent of the regulatory language is to prohibit all "polluted" non-stormwater discharges. It would be wholly impracticable to prohibit all non-stormwater discharges that pass through the MS4, as the MS4 in	

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				"where such discharges are identified by the municipality as sources of pollutants." It does not provide that requiring BMPs may supplant the requirement that discharges contain "no pollutants," nor is TO's approach equivalent to "effectively prohibit[ing] non-stormwater discharges into the storm sewers." (33 U.S.C. § 1342(p)(3)(B)(ii).)	many circumstances has captured streams and existing baseflow present before the construction of the MS4. As the commenters state: "A clear reading of the statute, and one that elaborates on Section 402(p)(3)(B)(ii) of the Clean Water Act rather than contradicting it, is that while non-stormwater discharges must be prohibited by the text of the Act, illicit discharge enforcement programs need only specifically address the enumerated list of non-stormwater discharges set forth in the regulations where such discharges have been identified as a source of pollutants." C.15 simply clarifies the standard for determining these enumerated discharges are not sources of pollutants.	
NRDC & SF Baykeeper	64	C.15.b.v.	Irrigation and Lawn Water should not be Exempt	Studies have consistently shown that non-stormwater discharges from irrigation water or lawn water are a significant source of pollutants for which SF Bay region waters are impaired. A non-source of pollutants finding is contrary to this.	We agree that the intent of the regulatory language is to prohibit all "polluted" non-stormwater discharges. It would be wholly impracticable to prohibit all non-stormwater discharges that pass through the MS4, as the MS4 in	

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				The TO notes that violations of water quality standards are a problem for "pesticide associated toxicity in all urban creeks," (Tentative Order, at Finding 11), and garden use has been identified as one of the main sources of pesticides found in urban streams. Lawns have further been identified as a "hot spot" for nutrient contamination in urban watersheds—lawns "contribute greater concentrations of Total N, Total P and dissolved phosphorus than other urban source areas … source research suggests that nutrient concentrations in lawn runoff can be as much as four times greater than other urban sources such as streets, rooftops or driveways." *Remove exemption for irrigation and lawn water.*	many circumstances has captured streams and existing baseflow present before the construction of the MS4. As the commenters state: "A clear reading of the statute, and one that elaborates on Section 402(p)(3)(B)(ii) of the Clean Water Act rather than contradicting it, is that while non-stormwater discharges must be prohibited by the text of the Act, illicit discharge enforcement programs need only specifically address the enumerated list of non-stormwater discharges set forth in the regulations where such discharges have been identified as a source of pollutants." C.15 simply clarifies the standard for determining these enumerated discharges are not sources of pollutants.	
Fremont Attachment	49	C.15.b.v.(1)(e)	Ongoing, Large–Volume Landscape Irrigation Runoff	Corrective action and enforcement for ongoing, large-volume landscape irrigation runoff to the MS4 falls under the authority of the water supply entity as part of their water conservation program. *Modify so this requirement applies to the water supply entity. Permittee will notify the water supply entity of any noticeable discharge of this type.*	Many Permittees already provide education for irrigation and watering. We added language that allows Permittees to also work with the potable water purveyor to promote BMPs.	See modifications to C.15.b.vi.

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Sunnyvale	62	C.15.b.v.(e)	Too Prescriptive	City will need to include Illicit Discharge enforcement actions for "large volume landscape irrigation runoff" to the MS4. No definition is provided as to what is considered a "large volume" discharge. This is overly prescriptive requirement and requires cities to devote limited resources to responding to relatively minor potential impacts of irrigation water discharges. *Remove from permit and allow cities to continue to promote good irrigation practices and the wise use of water resources.*	Irrigation water and lawn water can be sources of pollutants if pesticides and fertilizers are used and then water at inappropriate times. TO continues to require Permittees to promote good irrigation practices and wise use of water. Should there be ongoing, large volumes of irrigation water, then the Permittee can proceed with enforcement. "Large" is not defined so that Permittees have flexibility and discretion.	

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CCCWP	2	General	30 Days to Review Final Revised TO and Response to Comments	Regulated community must be provided a sufficient and reasonable period of time for its review. The Program requests it be provided a minimum of 30 days, prior to the adoption hearing, for review of the final TO and for review of the anticipated formal and complete response to comments.	By law, we are only required to provide a 30-day comment period. We provided a 50-day comment period, well beyond the requirement. By law, we are not required to provide a response to comments on the TO. The response to comments is provided as a courtesy.	
Kolb, Larry and James, Roger	4	General	Add language to C1	PROVISION C.1.a.-page 9 This provision must also apply to "violation of discharge prohibitions" by adding this phrase after "exceedance of applicable WQS".	Water quality-based prohibitions are subject to the iterative stormwater compliance process per the applicable State Water Board Order WQ 1999-05.	
Kolb, Larry and James, Roger	3	General	Add language to Finding 16	FINDING 16-page 7 While Permittees have limited jurisdiction over certain pollutants, they are the ultimate dischargers and responsible for compliance water quality standards and discharge prohibitions. This should also be noted in this finding.	As this finding does not state that this circumstance removes any responsibility from the Permittees, the change is not necessary.	
ACCWP Berkeley Newark	9 8 5	General	Annual Reporting Format	Cumulative burden of all the reporting requirements can be overwhelming and onerous, especially for municipalities with shrinking staff resources. Annual Reports are very time-consuming to produce and difficult to review. Annual Reports have been given very little if any timely review.	The MRP requires submittal of specific information and data that demonstrates accountability and success towards reducing pollutants. In many ways, this should reduce the volume of materials submitted by	

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				Water Board has broad authority to request additional information from specific Permittees as may be needed in specific situations.	Permittees. This will relieve municipalities of compiling hundreds of pages of all street sweeping reports, all inspection forms, stormwater pollution prevention plans, site plans, public education materials, reports, etc. each year. This type of materials, currently submitted, don't necessarily demonstrate the level of program implementation or success of the program towards reducing pollutants. We used the information provided in the Annual Reports to develop the MRP.	
Berkeley Attachment 2 Oakland Attachment 2	1 1	General	Annual Reporting Format	Concerned with proposed approach of developing annual reporting forms by way of a collaborative process between Board staff and the Permittees, with final approval by the Executive Officer. Annual reporting process should not impose a significant incremental burden on local agency staff with little, if any, resulting benefit to water quality. The annual reporting forms to be negotiated with Water Board staff should substantially decrease the reporting requirements to the level of summary presentations of the least amount of relevant material needed to document compliance with permit requirements		
Campbell	6	General	Assist with Getting Grants and Loans	Assist local governments in obtaining federal and state grants and forgivable loans that may be used to help local public agencies with their efforts to improve stormwater quality.	The Water Board is attempting to assist some MRP efforts through grant funding.	
Monte Sereno	2	General	Assist with Getting Grants and Loans	Assist local governments in obtaining federal and state grants and forgivable loans that may be used to help local public agencies with their efforts to improve stormwater quality.		
West Valley Clean	3	General	Assist with Getting Grants and Loans	Assist local governments in obtaining federal and state grants and forgivable		

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Water Program				loans that may be used to help local public agencies with their efforts to improve stormwater quality.		
Alameda County City Manager's Assoc.	4B	General	Balance Cost with Benefit	The most significant problems are in the areas of conditionally exempt dischargers, increased monitoring and new development (c.3) requirements. Solutions that are based on quantifiable scientific data that can be measured over time to determine their efficacy, as well as a balance in the financial implications of such solutions, is essential to support and strength of any proposal	Comment noted.	
Berg and Berg	1	General	C.3. Costly and Prescriptive	Projected costs of compliance with the 2001 Santa Clara County dischargers NPDES permit dwarf the acreage/unit fees for municipal area storm water fees and sanitary sewer fees. MRP should consider decreasing requirements and rolling back requirements, not increasing requirements. Projects should be allowed the election to pay reasonable in lieu fees. Municipalities should be able to bank in lieu fees and apply them to projects at their discretion and timing. Parcels of 5 acres and less should be totally exempt. Requirements for redevelopment of existing projects with no change in land use are equally if not more onerous because of trying to retrofit existing systems and should be exempted from	We cannot verify the accuracy of your cost estimates or your statements. Current permits requirements already require implementation of C.3. if redevelopment projects add or replace 10,000 square feet or more. Neither the Permittees nor the developers have expressed the commenter's concerns. We have worked closely with NRDC, BASMAA, Homebuilders, and EPA on the MRP.	

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				the permit regulation. Cost of TO compliance is significantly above historical storm and sewer fees, indicating there is a very high incremental compliance cost that fails the cost/benefit test. Meaningful regional mitigation/restoration projects would lower compliance costs and produce significantly better results. Significant hidden costs in the form of additional municipal staffing and inspection fees, additional permit processing time and resultant land carry cost, additional engineering consultant costs, loss of site design flexibility, loss of land, loss of units or building area, diminution of property values near treatment/detention facilities, additional storm line footage to divert waters to central detention/retention areas, higher ongoing maintenance costs , vector control, health related costs due to West Nile and Malaria, firms that might otherwise redevelop existing industrial facilities will defer making improvements due to the onerous nature requirements		
Alameda County City Manager's Assoc.	4C	General	Collaborate to Modify Prop 218 Limitations	Municipalities, stormwater agencies, Regional Board staff, and State Water Resources Control Board should jointly pursue modifications to Proposition 218 requirements, as well as changes to the State Revolving Fund Loan	We are willing to assist in any such effort.	

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				program to provide funding for any infrastructure associated with the MRP, such as "full-capture" trash controls.		
Danville	2	General	Collaborative Approach to Implementation	Take a practical and collaborative approach to implementing the new MRP, especially in the areas of water quality monitoring, pilot projects, trash assessments, data gathering and annual reporting.	We are always willing to assist implementation in a collaborative manner.	
SCVWD	5	General	Completed Studies Not Used to Establish Pollutant Reduction Strategies	Concerned that studies completed by the SCVURPPP, its co-permittees, other scientific agencies and institutions, and even other Water Boards, have not been fully utilized to determine current water quality characteristics, and pollutant reduction strategies, in a fiscally responsible way.	We can review previous studies to guide future work, where appropriate.	
Sunnyvale	4	General	Compliance Deadlines too Aggressive	Timelines for implementation for new or expanded requirements as written are very short. Adequate time is needed where changes to ordinances, municipal plans or significant capital expenditures are required. With the current timelines for certain provisions in this TO, it is very likely that the City will not be able to meet compliance deadlines for some provisions.	The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and are based on current implementation levels. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the	
SCVWD	2	General	Compliance Not Achievable /Fiscal Crisis	Concerned with several sections, and feel compliance may not be achievable in the time frame indentified in the Revised TO. Fiscal crisis reduces resources.		

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					next permit term.	
Daly City	7	General	Compliance Unpredictable	Control actions needed to comply with some of the TO's requirements are unpredictable because they may be triggered by monitoring results, such as Provision C.8.e.i.(3). Trash and litter clean up level is arbitrary and potentially unrealistic.	Noted. The TAL has been removed from the Final TO.	
Sunnyvale	7	General	Concern About Performance Standards	Concerned about consistent implementation of current performance standards	It is unclear what specific current performance standards the commenter is concerned with. Most of the requirements in the Revised TO are based on current implementation levels. In addition, the MRP is intended to level the playing field.	
San Leandro Mayor	1	General	Costly and Prescriptive With Little Benefit to Water Quality	Revised TO remains unnecessarily prescriptive in many areas and requires the co-permittees to implement costly and ineffective new mandates. As drafted, this TO has significant cost implications and operational impacts on the City and other co-permittees, while offering very limited benefits in terms of improving water quality when compared to existing permit requirements.	The Revised TO already eliminated the lower priority requirements, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide flexibility while maintaining accountability. And most of these requirements are set at current levels of implementation. The Final TO scales back and/or pushes off into future years	
Dublin	4	General	Costly Without Water Quality Improvement	As expressed in our comment letter from last year, many requirements of the Permit will result in questionable or marginal improvements to actual water		

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				quality, and may detract from local agencies' ability to carry out existing or improved local clean water programs due to demands on funding, staff, and other resources.	of the next permit term new requirements, monitoring, and studies. The MRP requirements level the playing field for all Phase 1 Permittees and reflect some improvements over existing requirements to reflect MEP. We believe that the requirements will have significant water quality impact.	
Millbrae	3	General	Costly Without Water Quality Improvement	A number of the permit's provisions, such as Provisions C.3, C.6, and C.15, remain overly prescriptive and will require additional staff time dealing with a voluminous amount of information tracking and reporting which seems unrelated to improving water quality.		
Newark	2	General	Costly Without Water Quality Improvement	In addition to the remaining concerns with the previous TO that were not addressed, there are many new requirements in the Revised TO that we find unacceptable. Many of these requirements impose significant cost without providing a commensurate improvement in water quality.		
Newark Mayor	3	General	Costly Without Water Quality Improvement	MRP still has significant cost implications and operational impacts, while offering very limited benefits in terms of improving water quality standards relative to the existing permit requirements.		
Oakland	2	General	Costly Without Water Quality Improvement	New elements in Revised TO may be costly and at the same time may not contribute significantly to improving water quality.		
Pleasanton	2	General	Costly Without Water	Revised TO has significant additional		

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			Quality Improvement	cost implications and operational impacts to the City and other co-permittees while offering very limited benefits in improving water quality over and above those urban water quality measures, programs and requirements that we are currently imposing on residents and businesses under our existing NPDES stormwater permit. To costly during fiscal crisis.		
Mountain View	16	General	Data to Show Sources Before Increased Requirements	Revised TO will be the fourth Municipal NPDES Storm Water Permit that the City will implement. Mountain View has a comprehensive storm water pollutions prevention program and is committed to implementing measures to reduce pollutants found to cause impairment to local waterways and San Francisco Bay. The City also supports using comprehensive and conclusive data to show that a source exists and that the required measures will effectively control the pollutant of concern. The City's position is that this data should be used as the basis for the enhanced requirements in the Regional Permit.	Noted. The requirements of the TO are all necessary for protection or improvement of water quality.	
Newark Mayor	4	General	Delay Adoption and Work With Permittees/Fiscal Crisis	Delay adoption of Revised TO and direct staff to continue to work with co-permittees to develop a practical and effective permit that gives appropriate consideration to fiscal crisis.	We have been working with BASMAA and other stakeholders.	
ACCWP Legal	1	General	Short Public	We appreciate the revisions made by	By law, we are only required	

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			Comment Period	your staff to the TO. While some progress has been made in the 15 months since that TO was issued, substantial technical, resource and legal issues remain unresolved and are not effectively addressed by the Revised TO. Preparation of these comments have been made more difficult due to the compressed formal comment period (less than 60 days) and the late issuance of the summary response to our comments that were made at the end of February 2008 – Comments and Responses Summary were not provided until March 18, 2009. Under these circumstances, the ACCWP and Co-Permittees have made their best efforts to assure adequate internal staff review and seek guidance from their elected public officials.	to provide a 30-day comment period. We provided a 50-day comment period, well beyond the requirement. By law, we are not required to provide a response to comments on the TO. The response to comments is provided as a courtesy.	
SCVWD	21	General	Does Not Consider Existing Information	Revised TO did not fully consider existing information from recent federal, state and local studies.	There is adequate basis for the requirements in the TO with respect to previous applicable water quality studies.	
NRDC and SF Baykeeper	12	General	Does Not Effectively Prevent Non-Stormwater Discharge	Revised TO fails to effectively prohibit non-storm water discharges, as required by the Clean Water Act, including toxic discharges to urban streams that are well-known to the Regional Board.	We disagree. The TO does adequately prohibit polluted non-stormwater discharges.	
NRDC and SF	13	General	Does Not Ensure	Revised TO does not ensure	We disagree. Through the	

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Baykeeper			Compliance With Water Quality Standards	compliance with water quality standards and is designed not to ensure compliance, contrary to state and federal law.	provisions, the Final TO does ensure compliance with water quality standards.	
NRDC and SF Baykeeper	14	General	Does Not Require Compliance with Wasteload Allocations	Revised TO does not require compliance with wasteload allocations in adopted TMDLs, contrary to law.	We disagree. Through the provisions the Final TO requires compliance with wasteload allocations in adopted TMDLs.	
Burlingame	1	General	Don't Shift State Responsibilities on Locals	Permit cannot shift Water Board pollutant control and cleanup responsibility to local public agencies.	The Final TO places appropriate requirements on the Permittees.	
SCVURPPP Legal Supplemental	1	General	Edit Attachment J	Proposed TO Attachment J (Standard Provisions for Stormwater) appears to be overbroad and contains a number of subprovisions that go beyond the standard provisions required by US EPA under the NPDES regulations and are otherwise irrelevant to or not appropriate for -- and likely not intended to apply to -- municipal stormwater dischargers. The Santa Clara Program therefore requests that Attachment J be edited to exclude such inappropriate provisions (for example, without limitation,).	We agree. Portions of the Standard Provisions that obviously apply to sewage or industrial wastewater treatment plants, rather that municipal stormwater NPDES permitted entities do not apply, and have been removed. We have removed all of subprovision B, subprovision C.5, and many of the definitions in subprovision E	
SCVURPPP Legal Supplemental	2	General	Edit C.18 Language	The phrase "to the extent they are reasonably applicable to municipal stormwater programs covered by this Permit (as distinct from separately permitted facilities that discharge stormwater) and are not otherwise addressed through the Provisions set	We agree. Portions of the Standard Provisions that obviously apply to sewage or industrial wastewater treatment plants, rather that municipal stormwater NPDES permitted entities	

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				forth herein" should also be inserted at the end of the current language in Permit Provision C.18.	do not apply, and have been removed. Rather than change Provision C.18, we have removed all of subprovision B, subprovision C.5, and many of the definitions in subprovision E	
Concord	3	General	Excessive Reporting	Revised TO has over 100 new reports, databases, tabular files, inspections and records. Almost every page of the 191 page permit specifies something the City would have to start maintaining or sending to the Regional Board. The City's 2007-2008 annual report was excessively long, 1,200 pages. The Revised TO would expand reporting requirements even more and does not gain anything.	The MRP requires submittal of specific information and data that demonstrates accountability and success towards reducing pollutants. In many ways, this should reduce the volume of materials Permittees feel they need to submit to comply. This will relieve municipalities of compiling hundreds of pages of all street sweeping reports, all inspection forms, stormwater pollution prevention plans, site plans, public education materials, reports, etc. each year. This type of materials, currently submitted, don't necessarily demonstrate the level of program implementation or success of the program towards reducing pollutants.	
Alameda City	1	General	Extend Current	Considering the costs and fiscal	We cannot extend the	

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Alameda City San Leandro Mayor	2 3		Permit	challenges, extend current permit for 3-years. Extension would allow for the development of statewide approaches to fund stormwater programs such as water quality monitoring, stormwater treatment, and trash controls.	current permits. Two of permits already expired in 1999. We cannot reissue the existing permit either since they are not MEP. But recognizing the fiscal crisis, the Final TO scales back and/or pushes off into future years new requirements, monitoring, and studies. We have also worked with stakeholders to build consensus.	
Alameda County City Manager's Assoc.	2, 4A	General	Extend Current Permit	Extend or reissue the existing permit for up to three years to allow economic recover. Allow time to develop longer term solutions to issues of mutual concern to the Board as well as our member cities. Need time to understand onerous requirements.		
Alameda Co City Mgr's Assoc	3	General		An extension of the current permit would provide us all the opportunity to hopefully benefit from a recovering economy, as well as develop longer term solutions to what are certainly issues of mutual concern to the Board as well as our member cities. The objectives are clearer than the steps to effective implementation: we need a strategic approach to the latter to reach our desired outcomes in a reasoned and realistic way. The most significant problems are in the areas of conditionally exempt dischargers, increased monitoring and new development (c.3) requirements. Solutions that are based on quantifiable scientific data that can be measured over time to determine their efficacy, as well as a balance in the financial implications of such solutions,		

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				is essential to support and strength of any proposal.		
Livermore	4	General	Extend Current Permit	Regional Board could reissue or extend the current stormwater permits for an interim period of perhaps 3 years to allow economic conditions to stabilize before undertaking a new permit with significant new requirements.		
Pleasanton	3	General	Extend Current Permit	Extend existing permit for three years because of fiscal crisis. Decision to extend the permit will provide the following benefits: 1) Bay Area countywide clean water programs have been operating under successfully under current permit; 2) allow time for board staff and stakeholders to collectively address and solve the technical and implementable challenges that still exist in the Revised MRP; and 3) allow public agencies to weather fiscal crisis without the extra financial and workload burden of this unfunded mandate. Existing permits have been successfully implemented by all programs and this implementation has made great benefits to water quality in the Bay Area. Or the Regional Board could reissue the current stormwater permits for three years to allow economic conditions to stabilize before		

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				undertaking a new permit with significant new requirements.		
San Leandro	2	General	Extend Current Permit	Extend existing permit so that there is more time to come up with a viable TO.		
Daly City	8	General	Extend Reporting Dates	Some of the permit's implementation and reporting dates are unrealistic and should be extended.	The commenter did not provide specific provisions where the dates are unrealistic.	
ACCWP	3	General	Fiscal Crisis	Fiscal Crisis	We do recognize the economic situation for all Permittees. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Alameda County	1	General	Fiscal Crisis	With the serious decline in government revenues over the past few years, local agencies are having difficulty funding the current stormwater programs and do not have the resources to take on additional costly and burdensome requirements.		
Alameda County City Managers Assoc	1	General	Fiscal Crisis	While the Revised TO is an improvement, it fails to recognize or account for the fiscal crisis. Future permits must recognize local governments' constraints in our ability to fund such requirements		
Antioch	4	General	Fiscal Crisis	Already at maximum assessment for storm water funding. Based on current budget estimates, a contribution from the General Fund may be necessary as soon as next Fiscal Year 2009-10 (FY 09-10) just to maintain compliance with existing NPDES provisions. However, the City of Antioch has a more critical financial situation. The City foresees three (3) possible		

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				scenarios if these permit provisions are passed in current form: 1) Additional reductions in General Fund expenditures will be necessary to meet compliance. Reductions will come from public safety; 2) The City will operate with a fixed storm water budget and risk non-compliance; and/or, 3) The City maintains current public safety funding levels and provides a contribution from the General Fund to cover added MRP costs. If this occurs, the City will be operating below a prudent level of reserves. MRP is contributing unnecessarily to the financial crisis. The Regional Board is obligated, if not legally than morally, to look at the financial impacts of these provisions		
CA Assembly Member Jerry Hill	1	General	Fiscal Crisis	Request that you consider the economic hardships faced by many local governments as part of the national recession.		
CA Senator Leland Yee	1	General	Fiscal Crisis	Work with the municipal storm-water staff to modify Revised TO. The objective is to make reasonable progress in protecting water quality while recognizing the fiscal challenges/limitations and declining revenues facing California's local governments in light of what most expect to be a prolonged economic downturn.		

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Dublin	1	General	Fiscal Crisis	A year ago, we would have described many of the requirements in the permit as fiscally unreasonable; today we must describe them as fiscally unrealistic.		
Livermore	1	General	Fiscal Crisis	Fiscal crisis. The decision to issue a MRP that includes significant new costs and requirements at a time when local agencies are already facing an unprecedented fiscal crisis is particularly troubling; especially since there appears to be no overwhelming or immediate need to issue the permit now.		
Newark	3	General	Fiscal Crisis	Fiscal crisis. The increased costs associated with the Revised TO and the realities of budget shortfalls continue to be minimized by Regional Board staff. Given current economic conditions, we simply cannot afford to implement costly requirements that provide little or no relative water quality benefits.		
San Leandro Mayor	2	General	Fiscal Crisis	Fiscal crisis. The decision to issue a Municipal Regional Permit that includes significant new costs and requirements at a time when local agencies are already facing an unprecedented fiscal crisis is not prudent public policy.		
San Ramon	1	General	Fiscal Crisis	Fiscal crisis. Local assessments for funding stormwater activities have reached their maximum while the cost		

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				of providing services continue to increase. The prospect of increasing the existing assessment, or creating a new assessment to provide additional funding, is dim during the current and deepening recession.		
Cupertino	2	General	Fiscal Crisis and Compliance Deadlines too Aggressive	Cupertino, like other local government agencies, is facing fiscal challenges on an unprecedented scale. Myriad of new stormwater requirements create deadlines that barely provide time for training, as well as the difficult tasks of developing guidance for stakeholders and introducing new ordinances to Council. Each of these implementation efforts requires extensive staff time and cost, in addition to the resources City staff already devotes to maintaining, evaluating and improving the current stormwater standards that the City has worked hard to achieve.		
Saratoga	1	General	Fiscal Crisis and MEP is Flexible	Modified MRP to better harmonize making reasonable further progress in protecting water quality with the long term fiscal crisis in mind. Such a modification appears to be fully consistent with the federal Clean Water Act as it provides the Board with considerable flexibility in identifying what comprises a "MEP" level of effort for reducing pollutants in discharges of stormwater from municipal separate storm sewer systems		

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Burlingame	12	General	Fiscal Crisis and Unfunded Mandates	Revised TO should take into consideration the current economic crisis and not break the small cities back by enforcing these unfunded mandates as many cities are struggling to provide basic public health and safety services and the City cannot afford to add this work program at this time.		
ACCWP Legal	9	General	Fiscal Crisis, Phase Implementation, and Unfunded Mandates	Revised TO imposes many obligations that both exceed those set forth in federally-issued municipal stormwater permits and that exceeds those required by federal law, making them State mandates for "new programs and/or higher levels of service" intended to provide greater benefits to the public. Unless state funding is provided for the implementation of these state imposed obligations by local governments for these aspects of the MRP, they will violate Article XIIIB, Section 6, of the California Constitution. Many of the new programs and higher levels of service envisioned in the Revised TO are extremely expensive, staff intensive, or otherwise impracticable without such measures moderating their burden on local governments. These burdens have been explained at length in comments separately submitted by the Bay Area municipalities, Countywide Stormwater	The Revised TO does not impose unfunded mandates. The requirements in the Revised TO are necessary to comply with the federal requirement that stormwater permits control discharges of pollutants to the maximum extent practicable. Mandates imposed by federal law are exempt from the requirement that the local agency's expenditures be reimbursed. The State Constitution's prohibition on unfunded mandates applies only to a new program or a higher level of service. Many of the challenged provisions are continuations of requirements already in permits previously issued to Permittees.	

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				Programs, and the Bay Area Stormwater Management Agencies Association. Regional Board staff members have acknowledged the significant funding problems facing local governments. To avoid contentious advocacy proceedings that may consume large amounts of resources on detailed administrative appeals and litigation that could instead be spent on water quality improvement, the Revised TO should be further modified in a manner reflecting consensus with Bay Area local governments on priorities and realistic implementation timetables (which in some cases may have to be phased into future permit terms) and/or the relevant requirements must be conditioned on the receipt of State funding guaranteed to help the municipalities staff and finance their implementation. This approach could be a significant benefit for the improvement of water quality and beneficial uses in the San Francisco Bay area. Examples of some of the more obvious required new programs and/or higher levels of service are the following: green streets pilot projects (Provision C.3.b.iii); low impact development requirements (Provision C.3.c); site design measures for small projects (Provision C.3.i); various monitoring		

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				mandates (Provisions C.8.b-g); various trash control mandates (Provisions C.10.a-d); mercury and PCB control Programs (Provisions C.11&12); and BMP/control measure requirements for conditionally exempted non-stormwater discharges (Provision C.15.b). Regional Board should either (1) direct staff to revise those aspects of the Revised TO that exceed federal minimum requirements in a manner reflective of a consensus with local governments concerning priority-setting and phasing over time, or (2) absent the achievement of such a consensus, condition the effectiveness of such discretionarily imposed stormwater management, monitoring, and reporting requirements on local government receipt of funding from the State.		
Union City	7	General	Fiscal Crisis/Delay Implementation	The City is urged the Board to consider delaying the implementation measures due to the currently financial challenges.	We do recognize the economic situation for all Permittees. The Revised TO eliminated some lower priority tasks, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already	
Fremont	1	General	Fiscal Crisis/Limit New Requirements	TO comments not addressed. Alarmed at some of the new requirements added in the Revised TO. Increased requirements come at a time of shrinking municipal budgets and declining resources. Issuing a permit that ignores fiscal reality will likely put many jurisdictions in a position of non-compliance. Local		

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				governments must focus their efforts on retaining effective core stormwater management programs and limit new initiatives to high priority items such as trash reduction.	implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term. The major new requirements are phased over several years. The requirements have been further streamlined in the Final TO. The requirements in the Final TO represent the highest priorities. The major new requirements are phased over several years. The requirements have been further streamlined in the Final TO.	
Menlo Park	2	General	Fiscal Crisis/Phase Implementation	City staff attended your presentation at the San Mateo County Board of Supervisors' Environmental Quality Committee meeting on November 18, 2008. We were encouraged by your remarks that the MRP would allow for implementation over a four-year period as your agency was cognizant of the financial limitations of the permittees.		
BASMAA	6	General	Fiscal Crisis/Prioritize	We need a smarter permit – one that is affordable, cost-effective, based on a real prioritization of objectives/new requirements, reflects a phased approach to addressing them in the next five years and across several future permit terms, and provides the biggest environmental benefit-for-the-buck. Fiscal constraints and competing local needs make it **critical** to both prioritize and phase municipal stormwater program actions so the most important issues and legal mandates (including TMDLs adopted by the Regional Water Board) are addressed.		
Concord	4	General	Fiscal Crisis/Prioritize	Reduce reporting, recordkeeping, inspecting, and monitoring so that it will free up resources to do things that		

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				have a real impact like creek repair, drainage systems maintenance, and public education. Stormwater program has a limited budget and faces significant economic, procedural, and political restrictions to increasing budgets to address new permit requirements – we need and are prepared to support a permit that is affordable. We need a smarter permit – one that is affordable, cost-effective, based on a real prioritization of objectives/new requirements, reflects a phased approach to addressing them in the next five years and across several future permit terms, and provides the biggest environmental benefit-for-the-buck.		
San Bruno	7,8,9	General	Fiscal Crisis/Prioritize	The MRP is not sufficiently prioritized; thereby demonstrating both a lack of understanding by the State of cities' limited resources as well not recognizing the near impossibility of municipalities gaining new financial resources through the ballot box. The City recommends the following improvements. Focus should continue to be placed on the most cost effective measures. For example, BMPs and regulations such as SWPPPs for new housing construction development, basins for sediment removal, and grassy swales to capture parking lot runoff have made		

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				a positive impact with modest cost implications. The most important water quality issues should be addressed first; with prioritization based on scientific studies of the local receiving waters and not by observation or assumptions. A permit that does not focus on local issues lessens that permit's effectiveness, reduces resources by remedying less critical issues and curtails a municipality's ability to accomplish the greatest public and environmental good.		
Santa Clara County	1	General	Fiscal Crisis/Prioritize	Permit needs to account for the current economic downturn and consider the most cost-effective measures to fulfill the base stormwater management measure requirements, thus focusing on the following priority areas: Consistent and cost-effective implementation of current performance standards; Phase-in implementation of measures consistent with currently adopted pesticides, mercury and PCB TMDLs; Focus on cost-effective efforts to address trash in or likely to be conveyed by stormwater in our waterways, with assessment work and data analysis informing the nature and location of the measures implemented; and, Limit cost-effective monitoring linked to		

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				relevant management questions.		
Vallejo Sanitation and Flood Control District	1	General	Fiscal Crisis/Work With Permittees	Fiscal crisis limits funding sources. Work collaboratively with BASMAA and other permittee representatives to limit the fiscal impact of the MRP.	We do recognize the fiscal crisis of the Permittees and have been working with BASMAA on the Final TO.	
ACCWP Berkeley	6 5	General	Focus on TMDL Pollutants	Board member McGrath stated at the March 11, 2008 hearing that his first priority is TMDL pollutants. We agree, and believe the monitoring requirements should be focused on those pollutants. Monitoring provision has costly requirements that are not a priority, such as: sampling for and conducting taxonomic identification of algae; sampling for silica, dry weather suspended sediment concentration, temperature, and pathogens; and, additional sediment chemistry and toxicity monitoring to evaluate ambient conditions. Many of these requirements need to be reduced or deferred to allow us to have the resources necessary to accomplish high priority objectives such as mercury and PCB TMDL implementation and trash reduction. Estimate a $750,000 per year increase in monitoring costs plus an additional $250,000 per year to cover the mercury and PCB provisions. Our current annual budget for the entire Program is $1.8 million. Our member agencies cannot afford a 55% increase	The Final TO does place a strong emphasis on implementing TMDL Waste Load Allocations. The monitoring requirements represent priority work aimed answering specific water quality management questions. The costs are reasonable and conform to MEP.	

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				in their contributions to the Program to cover these additional costs.		
Daly City	1	General	Implementation Cost Excessive	The costs to implement the provisions contained within the MRP are significant. A preliminary cost analysis conducted by staff for the 2007 version indicates that costs for just the City's program will be upwards of $3.6 million for labor and approximately $8.2 million for capital during the 5-year permit cycle. It is estimated that this new version reduces that amount by only 10%, retaining upwards of $3.24 million for labor and just under $7.4 million for capital improvements.	We cannot verify the accuracy of your cost estimates.	
Danville	1	General	Implementation Cost Excessive	Requirements still represent a significant unfunded cost liability for local agencies. Preliminary estimates prepared indicate that the new MRP requirements will increase program costs for Danville approximately $221,000 annually or $1,105,000 over the permit cycle. The magnitude of these increased costs represents a 33% increase over the current 2008-09 stormwater budget. Absent the ability to identify a dedicated revenue source, municipalities are not in a position to support and fund additional requirements on a permanent, on-going basis.	We cannot verify the accuracy of your cost estimates. The Revised TO does not impose unfunded mandates. The requirements in the Revised TO are necessary to comply with the federal requirement that stormwater permits control discharges of pollutants to the maximum extent practicable. Mandates imposed by federal law are exempt from the requirement that the local agency's expenditures be reimbursed.	

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					The State Constitution's prohibition on unfunded mandates applies only to a new program or a higher level of service. Many of the challenged provisions are continuations of requirements already in permits previously issued to Permittees.	
Santa Clara County Creeks Coalition	1	General	Include Finding Regarding Stream Erosion	Please include the following finding in the MRP permit: In many streams, reducing the erosive impacts of stormwater discharge will require utilizing four tools: (1) re-shaping the streams to a more hydro-geomorphically stable condition, (2) preventing increases in the erosive force of stormwater discharges from new development and (3) reducing the erosive force of stormwater discharges from existing development and (4) acquiring sufficient riparian corridor width to allow for stable stream conditions. This permit addresses only the impacts of stormwater discharge from large new development and re-development projects and therefore will not address the erosive impacts of stormwater discharges in many streams. A comprehensive approach to stormwater discharges will require implementation of other planning and permit processes to complement the	2 and 3 are addressed through the requirements in Provision C.3.g. 1 and 4 are outside the scope of this permit. The LID requirements will assist with this also.	

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				actions of this permit.		
Santa Clara County Creeks Coalition	2	General	Include Requirement Regarding Stream Erosion	Or please include the following requirement in the MRP Permit: Submit an analysis of erosion in streams and a conceptual plan for reducing that erosion to create physically stable streams to the extent that such erosion is related to the discharge of stormwater.	This concern is addressed through the requirements in Provision C.3.g to the extent in currently falls within stormwater regulation. The LID requirements will assist with this also.	
Mountain View	1	General	Increased Costs	Some of the proposed requirements will result in increased demands on City resources and significant increases to the City's budget. These cost increases would be realized in the need for additional staff due to increased service levels, installation and maintenance of costly control mechanisms and increased cost to participate in SCVURPPP, which anticipates an increased operating budget of as much as 40% increase.	We do recognize the economic situation for all Permittees. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Pittsburg	1	General	Inspection, Monitoring, and Reporting Requirements Costly	Additional responsibilities for permittees have been added, with respect to reporting and monitoring. It is unclear what objectives the Water	We do understand the fiscal crisis and have prioritized and scaled back on the requirements. C.2.- C.7.	

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				Board hopes to achieve with the extensive reporting. The amount of effort required for compliance with these provisions is disproportionate to the availability of City staff. Added inspection requirements require specialized staff; our staff does not possess the expertise or the qualifications required for these types of inspections. These extensive requirements would be very costly for this City to meet, as we would be forced to expend already severely depleted resources to seek the services of consultants to meet them.	have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. It is unclear what are the added inspections referenced in the comments. Monitoring has been scaled back and/or pushed off into future years of the next permit term.	
SF Baykeeper	1	General	Lacks Accountability	Baykeeper has always advocated for a permit that is transparent, holds permittees accountable, and has quantifiable endpoints that can determine effectiveness and compliance. Vague language has plagued each iteration of this Permit. While this draft Permit limits vagueness and permittee discretion, many sections of the Permit still appear confusing and lack accountability. The Permit's prescriptive measures have been gutted (according to the Response to Comments, this was done to facilitate implementation) but the Regional Board has failed to provide any clearly enforceable regulation in place of the deleted measures. The end result is a	We believe that the Revised TO contains clear expectations and accountability while allowing for necessary flexibility. 1. We believe that the Revised TO complies with the Clean Water Act's mandate to require pollution reduction to the MEP. 2. We believe that the Revised TO includes requirements to protect and improve water quality by requiring clear expectations and accountability. 3. The provisions expressly	

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				permit that is weak and relies too heavily on suggested activities with no real measure of compliance or assurance of water quality improvements. The Permit contains many significant flaws, including: 1. C.3 provisions that do not achieve the MEP standard. 2. Permit provisions/requirements that are not designed to protect or improve water quality. 3. Permit Provisions that do not require progress towards attainment of TMDL WLAs. 4. Receiving Water Limitations and Discharge Prohibitions that are inconsistent with state and federal authorities. 5. A failure to estimate pollutant reductions as required by the Clean Water Act regulations governing MS4 permit applications. 6. Findings wholly insufficient to support a conclusion that the provisions comply with federal and state Clean Water Act requirements.	require progress toward implementation of TMDL WLAs. 4. The commenter did not provide facts in this comment as to the nature of the problems asserted to exist. It is not possible to respond substantively. 5. Estimates of pollutant reductions are not practical to accomplish with the current state of knowledge, with the possible exception of trash. 6. We disagree. The findings and Fact Sheet are sufficient to support compliance with Federal Clean Water Act requirements.	
Save the Bay	1	General	Lacks Enforceable Provisions and Numeric Effluent Limits	Revised TO fails to provide the measurable, enforceable provisions necessary to make progress on attaining the water quality standards required by law. Revised TO does not	We believe that the Revised TO contains clear expectations and accountability while allowing for necessary flexibility.	

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				ensure the beneficial uses of water bodies within the Board's jurisdiction. Each successive draft of the MRP has moved farther away from achieving water quality standards. Revised TO lacks numeric effluent limits for several key pollutants of concern, including mercury and pesticides, and its Low Impact Development provisions also lack quantitative requirements.		
San Bruno	1	General	Limited Funding for Opportunities	City's stormwater parcel tax generates $540,000 to fund stormwater activities, which is used to comply or exceed compliance with existing regulations. Existing stormwater permit is the result of a well-intentioned and thoughtful process based on building and adopting best management practices. MRP does not seem to have been thoughtfully developed with sufficient consideration to cost and outcomes. MRP significantly increases compliance costs due to new requirements such as new drainage plans, new ordinances, new engineering standards, new pump station inspections, increased inspection of stormwater treatment devices, new stormwater quality measures on redevelopment projects, and new trash control measures. Fiscal crisis makes passage of a parcel tax increase or other financial burden on the public a low level of success.	We do understand the fiscal crisis and have prioritized and scaled back on the requirements. In the Revised TO, C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. Monitoring, studies, new requirements have been scaled back and/or pushed off into future years of the next permit term.	

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BASMAA	1	General	Limited Funding Opportunities	Because of fiscal crisis, Permit needs to be affordable. Proposition 218 requires local voter approval of certain stormwater related fees and assessments. Over the last 15+ years the requirements and scope of the stormwater quality program have increased significantly from simply developing stormwater management programs as envisioned in USEPA's regulations. Increased requirements have significantly increased the cost of compliance for cities and counties. Many local governments have reached the maximum funding levels approved for funding their stormwater management programs, and Proposition 218 and other factors severely constrain local governments' ability to fund at higher than current levels. Over the last six years, there have been three attempts to pass State legislation (ACA 10, ACA 13, and SCA 12) that would allow the State to place before California voters for approval a State Constitutional Amendment on the ballot. None of the three legislative attempts were successful in moving the bills out of their house of origin. In addition, while we appreciate the efforts of the Regional Water Board staff to help seek funding for stormwater, including grant funds, those funds, if received are small and	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	

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				short-lived when compared to the very significant and long-term capital and operations and maintenance expenditures necessary to address the plethora of requirements that have been included in the Revised TO. Potential funding for stormwater quality, such as the State's $90 million Proposition 84 Storm Water Grant Program have vanished. $140 million in potential funding from the Federal government's American Recovery and Reinvestment Act of 2009 has been diverted from flowing to local governments for new water-related projects to covering State obligations.		
CCCWP	3	General	Limited Funding Opportunities	Program established in 1993 a Stormwater Utility Assessment to pay all associated costs. This assessment has provided a dedicated source of revenue for implementation of our NPDES permits and stormwater quality protection programs over the past 15 years. The permit requirements and scope of our stormwater quality protection programs have increased dramatically. The Program presently spends approximately **$16 million per year** to implement its current NPDES Permit. Co-permittees are at their maximum allowable assessment rates. The revised TO will most likely double the compliance costs over the next five years. Fiscal crisis makes it too	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	

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				difficult to ask for more assessment. General Fund for program reduces even more the public safety programs that are already impacted by fiscal crisis. MRP can be more affordable and implementable over the next five to ten years and still achieve our water quality objectives.		
San Bruno	6	General	Limited Funding Opportunities	New requirements will likely double San Bruno's stormwater operating costs to nearly $1,000,000. Fiscal crisis and the restrictions for raising revenue under Proposition 218 make finding resources to meet these overly prescriptive requirements in a short time frame impossible.	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	
ACCCWP Legal	8	General	Limited Funding Opportunities and Fiscal Crisis	Revised TO significantly increases cost of stormwater program; stormwater-specific costs and also to funding of certain other municipal programs that are beneficial to achievement of stormwater related water quality improvements. Certain fee increases and assessments for stormwater improvement must go through a vote as mandated by Prop 218. Grant funding requires up front money and is not guaranteed. State grants are not currently available. Even when	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	

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				available, grants are limited and the application process for grants can be very time consuming - many costs are not eligible for reimbursement; matching funding is often required; the applicant must advance funds; and there is no guarantee of receiving a grant. Potential funding under the federally enacted American Recovery and Reinvestment Act is of limited value as few municipal stormwater related projects are "shovel ready" and may not have satisfied relevant NEPA requirements. With so little funding available from grants, decreasing municipal revenues, and general revenues being constrained by competing service demands, it is a monumental task to fund new or increased stormwater programs. Situation has become worse since the last public comment period. While Water Board staff in the Fact Sheet to some extent have acknowledged the financial difficulties and challenges, Revised TO stops far short of adequately recognizing it. Reduce the scope of new requirements for this permit term.		
Brisbane	1	General	Limited Funding Opportunities and Fiscal Crisis	Fiscal crisis is worsening. We continue to face severe restrictions under Proposition 218 from increasing our local stormwater management fees, yet were subjected to higher	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new	

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				stormwater permit fees to cover a portion of the State Water Resources Control Board's budget shortfall.	requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	
Hayward	2	General	Limited Funding Opportunities and Fiscal Crisis	Fiscal crisis. Agencies' ability to increase stormwater fees to fund additional requirements is severely hampered by Proposition 218's amendment to the California Constitution.	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	
Menlo Park	1	General	Limited Funding Opportunities and Fiscal Crisis	Mandating additional unfunded needs during fiscal crisis creates a "Catch 22" for cities that will be very difficult, if not impossible, to overcome. Need to balance the budget while remaining responsive to community and infrastructure needs. Additional financial burdens placed upon municipalities will cause other critical needs to go unmet. Revised TO will add over $300,000 each year in new costs, an increase of over 60%. Stormwater program management is	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	

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				primarily funded through a regulatory fee which does not contain provisions for increases. Any stormwater program budget increases will need to be borne by the General Fund until a future successful Proposition 218 vote. An independent funding needs report prepared for the SMCWPPP indicated that passage of a vote for stormwater increases is not probable now.		
Millbrae	12	General	Limited Funding Opportunities and Fiscal Crisis	Fiscal crisis. Does not object to many of the proposed MRP requirements if the State funds them or provides us the ability to increase fees to support them which do no require a vote of the taxpayers. Proposition 218 does not make an exception for storm water fees as it does for water and waste water and garbage. Millbrae's only source of storm water management revenues is from a pre-Proposition 218 parcel tax. .	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	
Oakland	3	General	Limited Funding Opportunities and Fiscal Crisis	Fiscal crisis. Proposition 218 limits the ability of public agencies to raise stormwater fees and other fees that help to pay for stormwater quality activities. It is more important now that regulations focus on activities that benefit water quality because municipalities simply don't have the funds. We have attempted to focus our comments on creating efficiencies and promoting water	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist	

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				quality benefits while reducing financial burdens.	implementation.	
Santa Clara County	4	General	Limited Funding Opportunities and Fiscal Crisis	Revised TO has several new requirements and programs that will require a significant amount of funding, which is difficult during this fiscal crisis. Limited options to help offset the cost of implementing a stormwater quality program. Proposition 218 severely limits the County's ability to levy new taxes to pay for the stormwater quality program. Fiscal crisis significantly precludes the County's ability to consider imposing new fees and taxes to fund any new program requirements. In the nearly 20 years of stormwater permits, the requirements and scope of the stormwater quality programs have significantly increased from simply developing stormwater management programs as envisioned in USEPA's regulations. Program costs for compliance with the NPDES Permit have also increased. County is faced with having to make major cuts in staff and services. Potential funding for stormwater quality, such as the State's Proposition 84 Storm Water Grant Program are currently unavailable and we cannot be certain if these funds will ever be available to us. The Federal Government's American Recovery and Reinvestment Act has diverted funding	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	

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				for local governments for new water-related projects to cover State obligations. No alternative funding sources are available to the County.		
Sunnyvale	13	General	Limited Funding Opportunities and Fiscal Crisis	Requirements have increased significantly during the past 15 years from simply developing stormwater management programs as envisioned by US EPA's regulations. Increased requirements have significantly increased the cost of compliance for cities. Maximum funding levels available to their stormwater management programs have been reached. Proposition 218 severely constrain local governments' ability to fund at higher than current levels. Fiscal crisis limits funding options and cuts into current services. State's $90 million Proposition 84 Storm Water Grant Program have vanished. The approximately $140 million in potential funding from the Federal government's American Recovery and Reinvestment Act of has been diverted from flowing to local governments for new water-related projects to covering State obligations. There is no "new money" to be found. A permit with a significant jump in the cost, while the cost and expenditures of every other aspect of government are being held at current levels or reduced, does not demonstrate a sound public policy	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	

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				direction.		
Daly CIty	10	General	Limited Funding Opportunities, Fiscal Crisis, Don't Shift POC Responsibility to Locals	Need a permit that is practical, predictable, and cost-effective. City is fiscal crisis. Proposition 218 vote to raise funds is futile. A number of aspects contained within the MRP require additional and focused work aimed toward achieving water quality benefits that will increase costs by 100% in some cases. Permit cannot shift Water Board pollutant control and cleanup responsibility to local public agencies.	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation.	
NRDC and SF Baykeeper	4	General	List of Entities Receiving Portions of MRP Revised TO Prior to Adoption	Request that the Regional Board state prior to the conclusion of the adoption hearing on this matter whether any person or entity (other than Regional Board staff) received a copy of the Tentative Order or any section or provision contained therein prior to the release of the Tentative Order to the general public on or about February 11, 2009.	No person or entity (other than Regional Board staff) received a copy of the Tentative Order or any section or provision contained therein prior to the release of the Tentative Order to the general public on or about February 11, 2009.	
Hayward	1	General	Little Improvement to Water Quality for Cost	While the City appreciates many of the changes included in the MRP since the initial 2007 Tentative Order, the draft MRP, as recently revised, still contains many new requirements that are potentially very costly and may be of questionable efficacy in addressing stormwater pollution.	We do understand the fiscal crisis and have prioritized and scaled back on the requirements. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the	
Livermore	2,5	General	Little Improvement to	TO has significant cost implications		

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			Water Quality for Cost	and operational impacts on the City and other co-permittees, while offering very limited benefits in terms of improving water quality when compared to existing permit requirements. If the Board and staff are intent on moving forward with the permit despite the economic realities of the day, then significant changes to the requirements are still needed. In these troubling times, it becomes even more imperative that we utilize public funds and resources in the most prudent, efficient, and effective manner possible. With these facts in mind, it is very interesting to note the following quote taken from the TO regarding the Trash Provision in section C.10.a.: "The actions required in this 5-Year permit term are unlikely to eliminate the impact of trash on beneficial use or achieve the Basin Plan Water Quality Standards for this pollutant...."	Revised TO requires. Monitoring has been scaled back and/or pushed off into future years of the next permit term.	
SCVWD	25	General	Make Requirements Less Stringent	Revised TO could use less stringent requirements. They are cumbersome and will be problematic for the District and SCVURPPP co-permittees.	It is unclear which portions of the Revised TO could use less stringent requirements. We have already scaled back on the requirements in recognition of the fiscal crisis.	
SMCWPPP	10	General	MEP Different Now	Fiscal crisis already provides significant challenges in providing existing levels of service for	We agree that obtaining sufficient resources for stormwater programs	

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				stormwater program. Even more challenging to finance stepped-up stormwater pollutant and flow-duration controls. Revenues have declined and state is diverting funds. Layoffs and furloughs are in effect. In June 2008, Countywide Program hired HFH Consultants to evaluate potential stormwater funding options. The report concludes, in part, the following: "Surveys indicate the public is unwilling to pay fees directly for stormwater requirements. Significant lead time (e.g., multiple years rather than months) is required to try to secure these funds with no guarantee of success. In the current economic environment and given the recent results of public surveys, success will probably be minimal." Appreciates the Water Board staff's willingness to try to help municipalities secure grant and federal stimulus funding for the new stepped-up pollutant controls. New funding resources from state grants are currently on hold because of the state's lack of creditworthiness. Few pollutants have completed the total maximum daily loads process necessary to be eligible to compete for grant funds. The Federal American Recovery and Reinvestment Act of 2009 subsidy funds, will be used primarily to restart	implementation is a challenge. The requirements in the MRP are reasonable and are fundable under the current economy. In addition, requirements in the MRP cannot be tied to funding availability. We have worked with BASMAA on the Final TO.	

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				State Water Resources Control Board projects that lost previously committed state grants or will be directed to other priorities. It is important that the Water Board recognize that what is now considered "maximum extent practicable" is less than it was when the December 2007 TO was released for public comment.		
CA Senator Leland Yee	2	General	MEP is Flexible	MEP in the Clean Water Act gives the Board the flexibility to recognize the fiscal crisis and reduce the requirements.	All dischargers of pollutants must comply with the federal Clean Water Act. The requirement that they comply with the Clean Water Act is as a result of their status as persons who discharge pollutants to waters of the United States. The programmatic requirements are in lieu of a traditional discharge permit with strict numerical effluent limitations, and operate to allow municipalities to comply with the Clean Water Act in a more flexible manner than other dischargers. If the municipalities so requested, the Regional Board could issue them a permit without any of the programmatic requirements, but that permit would require strict	
Campbell	4	General	MEP is Flexible	MEP in the Clean Water Act gives the Board the flexibility to recognize the fiscal crisis and reduce the requirements.		
SMCWPPP	10	General	MEP Needs Recognition	Revised TO does not recognize what is MEP during this current economic conditions. The federal Clean Water Act requires, in part, that permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable…" The types of factors that the State Water Resources Control Board's staff has identified as needing to be considered in achieving the maximum extent practicable standard include regulatory compliance, public acceptance, cost, and technical feasibility.		
Sunnyvale	19	General	Continue Program Expansion	Continual expansion of stormwater requirements is burdensome because		

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			Burdensome	staff must devote additional time and resources, at the expense of overall project quality and other project features. Although water quality and stormwater issues are important, they are among dozens of other critical issues that must be addressed in project planning and review.	compliance, in-stream or end of pipe, with the requirements of the Clean Water Act. Therefore, requirements in the MRP cannot be tied to funding availability.	
CCCWP	4	General	Monitoring Requirements Unaffordable	The proposed water quality monitoring and POC requirements in the revised MRP represent the single most significant increase in requirements and the Program's compliance costs. The MRP water quality monitoring and pollutants of concern requirements are estimated to increase the Program's monitoring costs nearly 300% over the next five years (from approximately $2 million to almost $6 million). We will not be able to afford the required monitoring, special studies, and pilot projects with our current fiscal resources.	The monitoring requirements in the Final TO have been further reduced and streamlined, are affordable, and represent MEP.	
NRDC and SF Baykeeper	5	General	MRP Does Not Adequately Protect Water Quality, Meet MEP, or other CA MS4 Permits	Objects to the Revised TO because it is inadequate to control pollution and protect the region's waters. Revised TO is inconsistent with state and federal law in numerous respects, including failing to meet the MEP Standard and failing to ensure compliance with applicable water quality standards. Revised TO is out-of-step with similar permits in California and elsewhere in the nation.	We believe that the Revised TO complies with the Clean Water Act's mandate to require pollution reduction to the maximum extent practicable. Without the commenters stating specifics, the Revised TO, as a whole, is equivalent to other stormwater permits in California.	

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NRDC and SF Baykeeper	1	General	MRP Inconsistent with State and Federal Law and Far Weaker than 2007 TO	Revised TO inconsistent with state and federal law and is also far weaker than the TO released over one year ago. Indeed, it appears that the considerable time period between drafts has been devoted to serially weakening a large number of provisions. A principle purpose of staff's response to comments appears to be making clear that the TO is generally weaker than previous drafts: "We have reviewed requirements in each Provision and eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. Each Provision that contains new requirements has effective dates later than the MRP effective date to allow adequate time for implementation.	We believe that the Revised TO complies with the Clean Water Act's mandate to require pollution reduction to the maximum extent practicable. Scaling back and prioritizing does not necessarily make the Revised TO weaker. Changes were made to the Revised TO to allow the necessary flexibility in the day-to-day Permit implementation for each Permittee, thus easier to implement. However, there is an end accountability and achievement "hook" for each Provision. Permittees need time to implement new requirements. They need to get resources together, provide training to staff and the public, change ordinances, and/or change standard operating procedures.	
NRDC and SF Baykeeper	28	General	MRP Requirements Too Vague	As noted in our February 29, 2008, letter, the TO's fact sheet establishes the need for "more specificity in NPDES permit language and requirements," including the creation of "a specific level of implementation for each action or set of actions." The TO	The MRP levels the playing field for all Phase 1 Permittees. The requirements and expectations are the same for all Phase 1 Permittees under the MRP. We believe	

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				also notes that "Water Board staff found it difficult to determine the permittees' compliance with the current permits, due to the lack of specific requirements and measurable outcomes of some required actions." This observation comports with our observations and the observations of governmental agencies, as mentioned above. Despite this acknowledgement and our repeated attempts to call attention to the vague language of the TO, however, the new draft falls far short of establishing the "specific requirements and measurable outcomes" whose necessity no one questions and which are necessary for the TO to be lawful.	that the requirements in the Revised TO are specific enough to provide the required outcomes.	
NRDC and SF Baykeeper	57	General Provision C.1	MRP Will Not Ensure the Attainment of or Progress Towards Water Quality Standards	Revised TO must impose stormwater mitigation to prevent discharges from causing or contributing to violations of water quality standards. All NPDES permits, including those for MS4s, must require controls to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).) Federal regulations also state that "no permit may be issued" when "the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States." (40 C.F.R. § 122.4(d) (emphasis added).) In a precedential order, the State Board elaborated on this	While it is very difficult to state with certainty that water quality standards will be met within this permit term, all of the actions required in the Final TO are specifically designed and supported within the Fact Sheet and response to comments as intended to meet those standards. The actions represent MEP, which is the regulatory standard for required actions to address attainment of water quality	

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				requirement and determined that municipal stormwater permits must prohibit discharges of pollution that cause or contribute to a violation of water quality standards, and the program to meet this requirement must be designed to achieve compliance. The MRP itself identifies stormwater discharges as "significant sources of certain pollutants that cause or may be causing or threatening to cause or contribute to water quality impairments." (TO, at Finding 11.) It further states that the Permittees shall achieve compliance with the requirement not to cause or contribute to violations of water quality standards through implementation of the TO. (See TO C.1.) The TO, Fact Sheet and Response to Comments are devoid of analysis demonstrating the beneficial impacts of the TO's requirements as a whole or the post-construction requirements specifically. There is no evidence whatsoever that the TO's provisions C.2 through C.15 will lead to compliance with water quality standards or that the provisions are reasonably designed to attain compliance. The Regional Board has no idea how, or even whether, the TO will ensure the attainment of water quality standards.	standards. Monitoring will allow us to examine the success of those efforts, and determine if further actions are required.	
SF Baykeeper	2	General	Municipal Action	Incorporate Municipal Action Levels	MALs are not included in	

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			Levels	("MALs") into the Permit because they are a key step towards creating a permit that is effective and accountable, and that also provides the Clean Water Agencies with the flexibility they desire in implementing stormwater management plans.	the Final TO. In one sense, the water quality standards, through Provision C.1 serve as MALs.	
San Ramon	4	General	Need More Flexibility	TO forces city to reduce services that have proven to be effective in order to attempt to implement unproven and potentially cost prohibitive mandates included in the Revised TO. The Revised TO does not provide flexibility to implement programs.	It is unclear which requirements in the Revised TO does not provide flexibility. We believe that the Revised TO affords the necessary flexibility for Permittees to customize their programs while providing the necessary accountability. The Final TO contains a great deal of flexibility in the provisions for Permittees to use efficient actions to address polluted runoff.	
Sunnyvale	3	General	Need More Flexibility	The highly prescriptive nature of the TO limits the permittees' ability to evaluate local alternatives and implement cost-effective methods to achieve water quality improvements in their jurisdiction. The financial burden to the municipalities and agencies who must implement these requirements is significant, and flexibility must be allowed in order for permittees to maximize water quality benefits with limited resources.		
US EPA	1	General	Need Prescriptive Requirements	The revised draft permit needs additional, prescriptive requirements related to low impact development, trash control, and incorporation of TMDLs. EPA may consider objecting to the permit, if these issues cannot be addressed satisfactorily.	We have been working with the commenter and believe that we have reached consensus in this Final TO.	

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				Audit reports from nearly 50 MS4 programs in Region repeatedly show the need for prescriptive requirements to clarify the permits and to ensure measurable, enforceable requirements.		
Alameda City	32	General	No Funding	Revised TO does not include or identify any State funding mechanisms to implement proposed new initiatives. Unless the Water Board provides for a new revenue stream to fund these additional mandates, the City will not be able to implement new requirements within our financially constrained resources without ceasing other stormwater quality protection efforts.	The major requirements in the Final TO are phased to allow time to secure funding. We are assisting with securing grant funding for some aspects of the permit.	
NRDC and SF Baykeeper	11	General	No Numeric Effluent or Narrative Effluent Limits	Many provisions of the Revised TO do not contain either numeric or narrative effluent limits, a minimum requirement of law, but merely require that unspecified limitations (in the form of BMPs) be developed in the future, contrary to law.	The programmatic requirements are in lieu of a traditional discharge permit with strict numerical effluent limitations, and comply with the Clean Water Act.	
Dublin	19	General	No Response to Comments	Most of these issues have been raised in previous letters from the City on November 30, 2006, July 13, 2007, and February 6, 2008. None of which has received a reply.	Staff has said it would not provide response to comments on the Administrative Drafts. Rather, those comments were incorporated as appropriate into subsequent drafts. We are not required by law to provide a response to comments on	

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					the TO. The response to comments is provided as a courtesy.	
Millbrae	1	General	No Response to Comments and Extend Comment Period	Disappointed with decision to publish the Revised TO without first addressing previous comments. The response to comments was finally released on March 18, 2009, over a month after the TO was released for public comments. Extend the comment deadline by another 30 days to allow more time for review and comment on the voluminous document.	We are not required by law to provide a response to comments on the TO. The response to comments is provided as a courtesy. By law, we are only required to provide a 30-day comment period. We provided a 50-day comment period, well beyond the requirement.	
Dublin	3	General	No Response to Comments and Limited Opportunity for Comment	While Board staff has provided "previews" of the revised Permit over the last year, there has been little opportunity for input from stakeholders. Although a full year has passed since the public hearing, a response to comments has not been received from the Board. Board staff had indicated that a 60-day comment period would be provided for the new Permit; given that extensive comments on the last Permit and the substantial rewrites; we believe that this provided marginal time for review and comment. However, when the Permit was issued on February 13, the deadline for submittal of written comments was listed as April 3, which is only a 50-day comment period.	Permittees were represented through the meetings we have had with BASMAA. If Permittees didn't feel that BASMAA represented their views or positions well, they should have told their respective BASMAA representative that they rather represent themselves at the meetings. We are not required by law to provide a response to comments on the TO. The response to comments is provided as a courtesy. We made our best attempt to provide a longer than required comment period. As stated by the	

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					commenter, we provided 50 days but we are only required to provide 30 days.	
CCCWP	1	General	No Response to Comments and Too Short of Comment Period	It has taken nearly five years for development of the February 11, 2009 Revised TO. Program has yet to receive comments on the December 2007 draft MRP. The February 11, 2009 "Revised MRP Transmittal" letter states: "We have included a summary of the major changes made in response to comment, and we also plan to distribute by the first week in March more comprehensive responses to comments received on the December 14, 2007 Tentative Order." On March 18, 2009 (third week in March), Water Board staff released "General Comments and Responses – MRP November 2007 Tentative Order." With this submittal, Water Board staff indicated: "This Summary of Responses to Comments is provided in advance of the comprehensive responses to comments that will accompany the Tentative Order that the Water Board will consider at its adoption hearing." Revised TO contains many significant revisions and new provisions. The short public review period, and the confusing, fragmented and incomplete response to comments made municipal review of the revised MRP a very	We are not required by law to provide a response to comments on the TO. The response to comments is provided as a courtesy. We made our best attempt to provide a longer than required comment period. As stated by the commenter, we provided 50 days but we are only required to provide 30 days.	

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				hurried and difficult process. We assume the reference to a "November 2007 Tentative Order" above is an error (i.e., should be "December 2007 Tentative Order".) Without the benefit of formal comprehensive responses to our comments municipalities have not been able to fully evaluate why certain previous comments were not addressed or why other additions and revisions are being proposed. This is unacceptable. Water Board staff's March 18, 2009 release of "General Comments and Responses," less than 3 weeks before the April 3, 2009 written comment deadline, did provide some insight into Water Board staff's proposed changes; however, these comments are "general" and incomplete. Many of the responses completely fail to respond to the specific comments. Municipalities have had less than 60 days (i.e., 51 days) to review over 650 pages (see below) of revised and/or new complex and highly technical permit provisions.		
SF Baykeeper	3	General	Numeric Effluent Limits	Stormwater permits must ensure that permittees take sufficient actions to protect water quality. The most effective way to achieve this is through the establishment of numeric effluent limits. In the absence of numeric effluent limits, there is currently no means to objectively assess how	MALs are not included in the Final TO. In one sense, the water quality standards, through Provision C.1 serve as MALs.	

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				effective permittees' strategies have been or whether permittees are in compliance with their permits. In 2005, the State Water Resources Control Board ("SWRCB") released the findings of a panel of experts that evaluated the feasibility of including numeric effluent limits in MS4 permits – the panel recommended that numeric effluent limits were not currently feasible, but recommended that as an interim step towards developing rigorous scientific and legally defensible numeric effluent limits, that permits should adopt Municipal Action Levels. It proposed setting MALs at "an 'upset' value, which is clearly above the normal observed variability" of storm water. This approach has been proposed by the Los Angeles Regional Water Quality Control Board ("LA Regional Board") for its draft MS4 permit for Ventura County. Despite objections from municipalities both inside and outside of the county, the draft Ventura permit continues to include what are apparently first-in-the-nation numeric limits on discharges of certain pollutants—total suspended solids (TSS), nitrates and nitrite, copper, zinc, and lead–from stormwater systems. Implementation of MALs in this permit would provide a quantifiable measure of program effectiveness, while at the same time		

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				helping to prioritize which stormdrain catchments require immediate management actions.		
NRDC and SF Baykeeper	3	General	Opposed to Removal of Street Sweeping and Storm Drain Cleaning	TO fails to reflect well-established water-pollution-reduction science and practice. One example illustrates issues that arise many times in the TO: the failure to fully utilize core best management practices that actually reduce mass emissions of pollutants and are standard operating procedure for Phase I and II MS4 permits. As these excerpts from the Response to Comments demonstrate, staff have entirely deleted commonplace practices such as street sweeping and storm drain inlet cleaning: "Street Sweeping Frequency - The entire sub-Provisions C.2.a and C.2.b., which contain the street sweeping related requirements, are deleted from the Revised TO." " Inlet Cleaning - The entire Provision C.2.f. is deleted from the TO."	Permittees will sweep and clean storm drains without the requirements in stormwater permits. These tasks are part of their municipal activities. If they didn't sweep on time or adequately, Permittees will hear personally from their residents. If they don't clean storm drains, it will cause flooding and the Permittees will have to answer to their residents and elected officials.	
Saratoga	4	General	PCBs and Mercury Should be Lower Priority	"Legacy" pollutants, polychlorinated biphenols and mercury, should be phased in over a longer period of time.	TMDLs and WLAs exist for PCBs and Mercury, and must be implemented.	
Kolb, Larry and James, Roger Attachment	1	General	Permit Not Regional	The Tentative MRP is not regional in that it does not include Marin, Sonoma, Napa and Solano Counties and the non–CSO portion of the City and County of San Francisco, Caltrans, BART and the public agencies listed in	The MRP covers the Phase 1 communities in the Bay Area. It was never intended to cover the Phase 2 communities in this permit term. The commenter has	

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				Attachment 3 to the SWRCB's Phase II NPDES Permit as permittees. There are over 170 public agencies listed in Attachment 3 that are not regulated by storm water programs. Many of these facilities mimic smaller municipalities that are regulated by the TO and are primarily schools, community colleges and universities. They have extensive operations with impervious surfaces including buildings, roadways, large parking lots, paved playgrounds, athletic facilities, maintenance operations, etc. They generate huge volumes of traffic. The schools, community colleges and universities represent the single largest entity in a municipality with the largest area of impervious surface. It will be extremely difficult for the Permittees to comply with the MRP Prohibitions and Water Quality Standards unless these agencies implement programs comparable to those required by the MRP.	named Phase 2 municipalities that are covered or can be covered under the State's Phase 2 Permit.	
Santa Clara County	5	General C.11, C.12	Phase Implementation	Adopting a permit with significant new costs, while cost and expenditures of every other aspect of government are being held at current levels or reduced, is not sound public policy. All jurisdictions need an opportunity to successfully achieve permit compliance by allowing an adequate phase-in period to allow jurisdictions	The Final TO adds additional phase-in periods for new requirements.	

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				the possibility to secure additional funding; this is particularly applicable for Provisions C.11 and C.12.		
Sunnyvale	14	General	Phase Implementation	The Water Board should recognize that municipalities such as Sunnyvale need an opportunity to achieve permit compliance by allowing an adequate phase-in period to attempt to secure additional sources of revenue. This is especially true for the Trash Reduction – full capture device retrofit requirements in provision C.10 and POC requirements in provisions C.11 (mercury) and C.12 (PCBs).		
CA Assembly Member Jerry Hill	2	General	Phase Implementation, Allow Flexibility, and Work with Permittees	During such fiscal crisis, allow phasing and flexibility. This will allow local governments to focus their limited resources on priority water quality and stormwater management efforts. Work with Permittees to develop a road map for stormwater permitting requirements in future permit terms that ensures strong water quality regulation and at the same time recognizes the significant resource limitations facing these programs.	We do recognize the economic situation for all Permittees. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term. Ahead of	

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					the release of the Final TO, we have worked with the Permittees' representative, BASMAA.	
Fairfield Fairfield Suisun City Suisun City	2 4 2 4	General	Phase Implementation/Fiscal Crisis	Fiscal crisis limits funding options for new significant permit requirements. Need an adequate phase-in period to secure sources of revenue and to achieve permit compliance. In some cases, particularly for trash, phasing should be over more than one Permit term.	We do recognize the economic situation for all Permittees. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Sunnyvale	5	General	Phase Implementation/Fiscal Crisis	Phasing is needed to reflect the fiscal crisis and revise existing programs to meet new provision requirements. The permit's compliance dates should be adjusted to acknowledge the need to secure and accrue funding for significant new permit requirements.		
San Jose	1	General	Positive Changes	Considerable improvements made to several of the permit provisions, which are responsive to our previous comments. Requirements related to treatment measures for trails and road rehabilitation projects have been redirected in a manner that successfully addresses previous concerns. Revised TO includes	Comment noted.	

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				greater flexibility in how permittees meet objectives for several established programs in municipal maintenance and enforcement inspection programming.		
SCVURPPP	2	General	Positive Changes	Acknowledges considerable modifications and improvements to Revised MRP that provide flexibility, in particular municipal and industrial operations, construction inspection and public information and outreach. Appreciates clear improvements to the Revised TO's trash section.	Comment noted.	
Sunnyvale	6	General	Positive Changes	Previous comments that resulted in the following changes: • Allowing the city to select street sweeping equipment to meet sweeping requirements • Focusing on more significant impervious surface data collection rather than on small "unregulated" development or redevelopment projects • Modifying some of the most prescriptive requirements of Enforcement Response Plans for provisions C.4 and C.5 • Focusing on developing BMPs for mobile business operations and their inspections on an as-needed basis.	Comment noted.	
Daly City	9	General	Prescriptive, Lacks Prioritization, and Too	Revised TO continues to establish unnecessary, prescriptive and	The Revised TO eliminated the lower priority ones,	

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			Aggressive With Implementation	inflexible approaches to stormwater regulations and encompasses a number of performance deadlines for implementation that are unreasonably aggressive to accomplish both from available local resources and the technology now in practice. The element is especially evident as it pertains to the monitoring effort and expense that is anticipated absent any real substantive benefit to water quality. Comments on the TO is not an objection of its responsibility to improve water quality, but rather what can be reasonably accomplished in the next five years. Needs to be prioritized and phased in over a number of permit cycles, not just one in order to gain success and desired improvements	scaled back on others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Union City	1,2	General	Prescriptive/Fiscal Crisis	Too burdensome during fiscal crisis. City is very concerned that many requirements of the Revised TO will have marginal improvement to our water quality but will result in huge a financial burden to the City.	We do recognize the economic situation for all Permittees. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. We believe that the requirements will result in water quality improvement. The commenter did not provide specifics on which requirements will have little water quality improvement	

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Palo Alto	1	General	Priorities for City	In our previous comments, we requested that the TO focus on the following priority areas: • Consistent implementation of current performance standards; • Phased-in implementation of measures consistent with currently adopted pesticide, mercury and PCB TMDLs; • Focused and cost-effective efforts to address trash in or likely to be conveyed by storm water into our waterways, with assessment work and data analysis informing the nature and location of the measures to be implemented; • Limited, streamlined reporting based on summary presentations of the least amount of relevant material needed to document compliance with permit requirements; and • Limited and cost-effective monitoring linked to relevant management questions.	The Final TO does address all of these priority comments.	
Santa Clara County	3	General	Prioritize	Establish priorities among POC control programs and monitoring. Phase-in requirements over several permit cycles.	The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the	
Sunnyvale	1, 2	General	Prioritize and Link Entire Permit	In our previous comments on the Tentative Order issued on December 4, 2007 we requested: The linkages between new or expanded requirements need to be practical,		

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				understandable, and address the implementation of efforts that will benefit water quality. There is a need for prioritization of any new or expanded requirements. (This means prioritization across all the requirements of the permit, not just amongst those within a specific provision.)	next permit term.	
Cupertino	3	General	Prioritize and Phase Implementation	Has worked with Board staff over the past four years to create a regional permit that achieves consistency throughout the Bay Area. This intensive effort is truly worthwhile. But it is doubtful that we will successfully implement every water quality and watershed restoration if we make each a top priority and rush to implement all of them.		
Cupertino	6	General	Prioritize and Phase Implementation	Strongly second the comments from SCVURPPP Management, SCVURPPP Legal Counsel and BASMAA's Chair to phase in certain of the proposed provisions over a longer period, carefully prioritize or consider others before their inclusion in the MRP and provide a reasonable threshold for implementation		
Fairfield Suisun City	2 3	General	Prioritize and Phase Implementation	Revised TO does not attempt to set priorities among the many new requirements; and requires the "immediate implementation" or implementation within the first few		

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				years of the revised TO.		
Fairfield Suisun City	45 31	General	Prioritize and Phase Implementation	Revised TO includes many potential new or significantly expanded requirements that would represent a significant inequitable expenditure of District and FSURMP resources that are not available and are unlikely to produce increased water quality benefits. Revised TO must be prioritized to address known, significant water quality problems and phased-in over time based on a realistic assessment of current resources and other burdens already being placed on the District and the FSURMP at this time.		
Fairfield-Suisun Sewer District	2	General	Prioritize and Phase Implementation	The Revised TO does not attempt to set priorities among the many new special studies and pilot projects required. Allow for sufficient phasing of associated requirements in the non-core stormwater management program areas over more than one Permit term.		
Monte Sereno	1	General	Prioritize and Phase Implementation	Need to prioritize and focus on cost-effective stormwater management measures. MRP lacks priorities and lacks phase-in of requirements over several permit cycles. Many individual measures, which may well be aimed to improve water quality, cause an aggregate burden that would place a considerable strain on public agency resources	We do recognize the economic situation for all Permittees. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide	

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				without likely, significant improvement to water quality (i.e., stringent and prescriptive controls on conditionally exempted discharges). In addition, the proposed permit lacks priority among high-cost resource allocation and capital costs requirements (i.e., multiples of special studies, pilot projects, new monitoring requirements, and structural controls). We request the following modifications to the proposed MRP: • Prioritize requirements and propose improvements or enhancements of existing municipal stormwater programs; • Implement requirements, particularly those already in place, consistent with current (already approved) performance standards, which have been developed for nearly every element of our current permit and have effectively served as guiding principles for MEP • Scale back or further phasing out the more fiscally burdensome of these requirements into future permits	feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term. Should the commenter have data to demonstrate that its performance standards are effectively reducing, it should have submitted it.	
Saratoga	2	General	Prioritize and Phase Implementation	Specific requirements need to be better prioritized and the more fiscally burdensome of these requirements need to be scaled back or further phased out into future permit rounds.	The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to	
~~SCVURPPP~~	~~1~~	~~General~~	~~Prioritize and Phase~~	Achieve consistent implementation		

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			Implementation	across the Bay Area with respect to "core" municipal stormwater management program elements (as reflected in Provisions C.2 to C.7 and C.9, C.13, and C.15), with only limited prescriptiveness so that unnecessary and costly changes to the Santa Clara Program's existing, award-winning MEP-based performance standards can be avoided. Limit the expansion of the proposed Permit's monitoring requirements to more affordable levels reflective of the Santa Clara Program's already-leading monitoring and assessment efforts (as judged by EPA) and linking them to relevant management questions. Focus the proposed Permit's trash management requirements (Provision C.9) more specifically on trash entering our waterways from municipal stormwater conveyances, with assessment work and data analysis (based on our Trash Tool Box) first informing the nature and location of the measures to be implemented so as to try and ensure they will be cost effective. Phase-in over a more extended time period extending beyond this Permit's term, the implementation of measures addressing the mercury and PCB TMDLs and limit the number of special studies and pilot projects so as to make those efforts more affordable	provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. New requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term. The requirements in the Final TO represent the highest priorities. The major new requirements are phased over several years. The requirements have been further streamlined in the Final TO	

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				given the remainder of the MRP's proposed requirements and other priorities (e.g., such as trash).		
Sunnyvale	16	General	Prioritize and Phase Implementation	TO needs to be prioritized to address identified, significant water quality problems (i.e., TMDLs and trash) and be phased in over time based on fiscal crisis.		
West Valley Clean Water Program	1	General	Prioritize and Phase Implementation	Prioritize and focus on cost-effective stormwater management measures in the. In general we request the following modifications to the draft MRP: • Implement requirements consistent with current ones, which have been developed for nearly every element of our current permit and have effectively served as guiding principles for MEP; • Prioritize requirements • Scale back or further phase out the more fiscally burdensome of these requirements into future permits; particularly measures consistent with currently adopted pesticide, mercury and PCB TMDLs. Revised TO lacks priorities and lacks phasing-in of requirements over several permit cycles, to take into consideration the fiscal crisis.		
Palo Alto Santa Clara County	25 33	General	Prioritize and Phase Implementation and Work with Permittees	Revised TO includes many potential new or significantly expanded requirements that: (1) are not mandated by law or reflected in USEPA-issued municipal storm water	The programmatic requirements are in lieu of a traditional discharge permit with strict numerical effluent limitations, and operate to	

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				permits; (2) would represent a significant expenditure of public resources that are not available at the local level; and (3) with a few notable exceptions involving pollutants of concern are unlikely to produce a significant return in terms of increased water quality benefits. It is essential that the MRP requirements be prioritized to address identified, significant water quality problems (TMDLs and trash) and phased over time based on the fiscal crisis. Work with Permittees to eliminate elements that lack the potential for real water quality benefits, prioritize, and allow phase-in over several permit cycles in light of the fiscal crisis.	allow municipalities to comply with the Clean Water Act in a more flexible manner than other dischargers. If the municipalities so requested, the Regional Board could issue them a permit without any of the programmatic requirements, but that permit would require strict compliance, in-stream or end of pipe, with the requirements of the Clean Water Act. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. We do recognize the fiscal crisis. In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term. We have worked closely with BASMAA in this Final TO.	
Mountain View	3	General	Prioritize and Phase Implementation/Fiscal Crisis	Individually, many of the increased requirements included in the Regional Permit would not be hard to accomplish. Requiring implementation	The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks	

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				of all of these requirements, especially with respect to the requirements related to mercury, PCBs and other legacy pollutants, during one 5-year permit cycle represents a significant impact to the City's resources and operating budget. *Reevaluate priorities. Prioritizing major goals and long-term phasing of these requirements over a 10-year period will provide municipalities the opportunity to successfully accomplish the challenge of meeting the enhanced requirements using a phased approach. Phasing will be critical in an increasingly difficult financial climate. Defer the special studies and pilot programs related to mercury, PCBs and other legacy pollutants until future NPDES permits.*	that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. We do recognize the fiscal crisis. In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Palo Alto	3	General C11, C12	Prioritize and Phase Implementation/Fiscal Crisis	Monitoring and POC Control Programs were not adequately addressed or prioritized to allow phasing-in of requirements over several permit cycles to take into consideration limited municipal resources. Local governments face very real and serious fiscal challenges not only with respect to funding new permit requirements, but in continuing to implement current programs. Requirements and scope of the storm water program have increased significantly from simply developing	We agree that it is difficult to secure new funding resources under the State's laws and the current fiscal climate. The major new requirements in the Final TO are phased to allow implementation time, and we are seeking and have assisted in obtaining some grant funding to assist implementation. The requirements in the	

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				storm water management programs as envisioned in USEPA's regulations. These increased requirements have significantly increased the cost of compliance for cities and counties. But the City's available resources for its storm water program are constrained by the provisions of its property owner-approved funding source and Proposition 218. In light of current economic conditions, securing property owner approval for higher fees cannot be considered a feasible alternative at this time. Can't raise funds and recession is deepening. Local agencies are being forced to make major cuts in staffing and services. Potential funding for storm water quality protection measures, such as the State's $90 million Proposition 84 Storm Water Grant Program and $140 million in funding from the Federal government's American Recovery and Reinvestment Act of 2009 have vanished There is no "new money" to be found and designing and adopting a permit with a significant increase in compliance costs, while the cost and expenditures of every other aspect of government are being held at current levels or reduced, does not demonstrate sound public policy direction. Allow phase-in period for municipalities to attempt to secure additional revenue	Final TO represent the highest priorities. The major new requirements are phased over several years. The requirements have been further streamlined in the Final TO	

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				to successfully implement program, especially for the C.11 (Mercury) and C.12 (PCBs).		
San Jose	7	General	Prioritize and Phase Implementation/Fiscal Crisis	New regulatory requirements need to be prioritized to address identified, significant water quality problems and be phased over time, based on a realistic assessment of municipal resources.	We do recognize the fiscal crisis. In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
SCUVRPPP	3	General	Prioritize and Phase Implementation/Fiscal Crisis	Monitoring requirements, mercury and PCB-specific programs, and conditionally exempted discharge requirements have not yet been adequately addressed. Not sufficient effort to set priorities among the many new special studies and pilot projects being required in this Permit. Not sufficient phasing of some associated requirements in the non-core stormwater management program areas to a point beyond this Permit's term (so as to provide more time to reflect on the lessons to be learned over the next five years and to take into consideration the current limits on municipalities abilities to raise resources, particularly in the absence of State-provided funding).	Monitoring requirements, mercury and PCB-specific programs, and conditionally exempted discharge requirements have all been revised in the Final TO to some extent after extensive discussions with stakeholders. The requirements are phased to allow time for resource development.	
SCVWD	2	General	Prioritize and Phase Implementation/Fiscal Crisis	Very challenging to fund the requirements of the Revised TO. Permit should prioritize pollutants that need to be addressed through this or	We do recognize the fiscal crisis. The Revised TO eliminated the lower priority ones, scaled back on	

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				several permit cycles.	others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Sunnyvale	12	General	Prioritize and Phase Implementation/Fiscal Crisis	Prioritize and phase in so that Permittees can ramp up as more resources become available. Very concerned that the very tight compliance timelines are unattainable, given the fiscal crisis.		
Brisbane	2	General	Prioritize and Reduce Requirements	Prioritization and pruning of the proposed permit requirements must occur to prevent overwhelming municipal resources.		
Berkeley	3	General	Prioritize and Work with Permittees/Fiscal Crisis	Fiscal Crisis. Cities and agencies cannot afford to implement costly requirements that provide little or no water quality benefits. The City hopes that the Board realizes this depressed financial situation will require many years to return to normal and that the Board will allow the permittees to work with the Board in establishing a prioritized plan to attack urban runoff pollution that accounts for the available finances.	We do recognize the fiscal crisis. In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term. We also disagree that the requirements provide little or no water quality benefits. The requirements reflect improvement over existing requirements. We believe that the MRP requirements will have significant water quality impact.	
Sunnyvale	11	General	Prioritize Monitoring, Trash and	Previous concerns expressed by the City and SCVURPPP related to	We disagree. We have prioritized and phased. The	

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			POCs/Fiscal Crisis	monitoring requirements, POC programs for mercury and PCB controls, and trash control requirements were not adequately addressed in the Revised TO. There is no prioritization to allow phase in over more than one permit cycle and to take into consideration the fiscal crisis. The combination of all these requirements places a considerable strain on the city's resources, given that storm sewer infrastructure changes would need to be addressed as part of the TO requirements (e.g., pump station connections or storm drain collection system retrofits to meet trash full-capture criteria).	Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability. To take into consideration the current economic situation, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term in the Final TO.	
Antioch	1	General	Prioritize Requirements	Draft permit continues to lack focus and prioritization. Lack of focus and prioritization is exasperated by the number of required pilot and study projects as well as monitoring requirements.	We disagree that the MRP continues to lack focus and prioritization. The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. We do recognize the fiscal crisis. In the Final TO, new	

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					requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
CA Senator Leland Yee	3, 5	General	Prioritize Requirements	Prioritize Revised TO. The many new requirements for water quality monitoring, special studies, and pilot projects need to be reduced so that local governments can focus their limited and likely declining streams of available resources on continuing to implement their existing core stormwater management programs while making further concrete progress on trash.	In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Campbell	1	General	Prioritize Requirements	Specific requirements proposed for improvements in existing municipal stormwater programs need to be better prioritized and the more fiscally burdensome of these requirements need to be scaled back or further phased out into future permits.	The requirements in the Final TO are prioritized.	
Concord	1	General	Prioritize Requirements	Permit requirements should be prioritized.	The Revised TO eliminated the lower priority ones, scaled back on others, and replaced some with tasks that are easier to implement. C.2.- C.7. have already been scaled back to provide feasibility while maintaining accountability and most Permittees are	
SCVWD	20	General	Prioritize/Fiscal Crisis	Revised TO contains new or significantly expanded requirements that would represent a significant financial burden during fiscal crisis. Prioritize TO to address identified, significant water quality problems (TMDLs and trash), and phased over time bearing in mind fiscal crisis.		

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					already implementing what the Revised TO requires. In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term.	
Palo Alto Mountain View	24 2	General	Pump Station Diversions to POTW	Revised TO requires Bay Area municipalities to monitor pump stations and study the feasibility of diverting first-flush and dry-weather flows from storm water pump stations to POTWs. Revised TO outlines monitoring and feasibility investigations but presumes that pump station diversions would be beneficial and feasible by requiring diversions from five pilot pump stations. Diversions from storm water pump stations would not only be potentially costly to implement, but would increase POTW treatment costs. Recommends modifications to the Revised TO which would allow municipalities and POTWs the opportunity to evaluate the potential benefits, impact and cost implications of proposed diversions to POTWs in an organized, controlled and fiscally responsible manner.	Diversions from stormwater pump stations to the sanitary sewer are pilot projects for the TMDL waste load allocation implementation, and are only to be explored where they are reasonable, low risk and high benefit.	
Saratoga	5	General	Reduce Monitoring, Special Studies and Pilot Projects	Reduce water quality monitoring, special studies, and pilot projects so that local governments can focus on implementing their existing core	New requirements, monitoring, and studies have been scaled back and/or pushed off into future	

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				stormwater management programs while making further concrete progress on trash.	years of the next permit term in the Final TO.	
Newark	1	General	Reduce Recordkeeping	There have been improvements to the reporting and recordkeeping requirements, including removal of the reporting template. However, these requirements are still onerous and many do not provide significant improvements for accountability. Examples of excessive reporting and recordkeeping requirements include: (1) for each construction site inspection, record the inches of rain since the last inspection (Provision C.6.e.ii.(4).(d)); (2) many of the Public Information and Outreach provisions include extensive reporting and evaluation requirements; (3) Provision C.15, monthly reporting on planned and unplanned potable water discharges; and (4) unrealistically short timeframes for submitting monitoring data and reports.	Reporting and record keeping has been reduced and streamlined in the Final TO.	
Kolb, Larry and James, Roger	1	General	Reduce Use of "As Appropriate"	The MRP would benefit from a through editorial review to delete language that is redundant or unclear, that could lead to endless debates when requirements are interpreted or enforced. Wherever we can we should avoid providing attorneys the opportunity to later debate the meaning of the MRP language, or give Permittees and their consultants the chance to use studies	We have reduced us of these conditional phrases in the Final TO.	

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				to delay solutions. There are over 50 places where "appropriate" is used and an additional 50 where words - like timely, proper, adequate, effectively, improper, reasonably, as needed, significant, if needed, make efforts, substantial, should and as necessary - are used to specify permit requirements. We found that in almost every instance "appropriate" can be eliminated. The other words or phrases will only serve to create debate of the original intent or allow Permittees to argue that their efforts, no matter how minimal, comply with the permit.		
San Jose Attachment A	44	General	Remove Attachment J	The Standard Provisions included as Attachment J are not written for application to a municipality but rather a single facility discharger. The City recommends removal of this Attachment.	We have removed the non-applicable parts of the Standard Provisions in response to this and other comments.	
NRDC and SF Baykeeper	2	General	Request for Information Regarding Meeting Dates	We request that the Regional Board provide us with a list of the dates of all meetings held between the Regional Board, or any member(s) of its staff, and any interested stakeholder regarding the Tentative Order. We further request that any agenda, list of attendees, or any other documents created or exchanged with any such stakeholders(s) be provided to us. We request that all such information be included in the administrative record	We will include all relevant information in the administrative record regarding this permit adoption and make it available to and any interested stakeholder	

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				regarding this matter.		
BASMAA	3	General	Requirements Expose Permittees and RWQCB to Legal Liability	Specific provisions create untenable legal liability for or assume non-existent legal authority of both the permittees and the Regional Water Board; or are inconsistent with Clean Water Act and Porter-Cologne.	We disagree with this general assertion.	
Danville	3	General	Requirements Too Aggressive and Costly	Many of the new requirements are still too aggressive and costly, and will not translate to a commensurate improvement in water quality for our community. Requirements need to give tangible benefits for community in cost effective ways.	We disagree. The requirements reflect some improvements over existing requirements to reflect MEP. We believe that the MRP requirements will have significant water quality impact.	
Dublin	18	General	Requirements Too Expensive, Reduce Costs	The City of Dublin has completed an analysis of the fiscal and staffing impacts of the Permit. The City of Dublin currently spends approximately $179,000 per year on activities directly related to its water-quality program, including staff time, materials, and the contribution to the Alameda County Clean Water Program. This amount does not include an additional $203,000 per year for maintenance activities such as street sweeping, storm drain inlet cleaning, spill cleanup, and trash removal from City parks, nor does it include costs associated with review of land development which are reimbursed by developers. Based on new or	We cannot verify the accuracy of your cost estimates. Nevertheless the Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies.	

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				enhanced activities required under the new permit, it is estimated that the annual cost of clean water activities will increase to $403,000, an annual increase of $224,000 or 125%. This cost does not include likely proportionate cost increases in maintenance and development review. City is dependent upon its General Fund to provide funding for stormwater activities. General Fund is used to fund numerous other municipal services, including public safety. There is no "surplus" of funds available for increased stormwater costs under the new Permit. In order to achieve compliance with the requirements of the Permit, the City will need to transfer funds currently used for other services, which will result in a cutback of those services. Modifying the Permit to address the items discussed above would reduce the increased annual costs to the City by up to $89,000, without significantly reducing the effectiveness of water quality programs provided by the City.		
Berkeley	2	General	Significant Cost Without Benefit To Water Quality	Many of the City's concerns with the previous Tentative Order have not been addressed and some of the new requirements in the Revised TO are of great concern. Many of these concerns regard requirements that impose significant costs to implement without	We disagree. The requirements reflect some improvements over existing requirements to reflect MEP. We believe that the MRP requirements will have significant water quality	

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				providing a commensurate improvement in water quality.	impact.	
Fremont	2	General	Significant Cost Without Benefit To Water Quality	It is essential that additional changes be made to the Revised Tentative Order to eliminate requirements that are either costly without providing a commensurate improvement in water quality, or that are fiscally unfeasible for jurisdictions to undertake at this time.	The requirements reflect some improvements over existing requirements to reflect MEP. We believe that the MRP requirements will have significant water quality impact. The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies.	
Dublin	2	General	Stakeholder Process	At the March 2008 public hearing held by the Regional Board on the prior version of the Permit, the City of (along with numerous other local agencies) expressed concerns regarding many prescriptive and costly components of the Permit that did little to improve water quality. The Board directed their staff to revise the Permit to take into consideration the comments expressed at the meeting, and to set up a process whereby stakeholders could provide input to the revisions. Over a year later, we must express our deep disappointment in both in the process used to develop the current version of the Permit and the content of the Permit.	Board staff has held numerous meetings with stakeholders. Permittees were represented by BASMAA. If Permittees didn't feel that BASMAA represented their views or positions well, they should have told their respective BASMAA representative that they rather represent themselves at the meetings. The Revised TO already eliminated the lower priority requirements, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been	

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					scaled back to provide feasibility while maintaining accountability and most Permittees are already implementing what the Revised TO requires. In the Final TO, new requirements, monitoring, and studies have been scaled back and/or pushed off into future years of the next permit term	
Crabbe, David	1	General	Support MRP Requirements Would Pay More Property Taxes	San Carlos resident adamantly disagrees with City Council's position against the Revised TO to strengthen requirements for keeping storm water pollution out of San Francisco Bay. Willing to pay a little more on my local property taxes to support a cleaner and healthier bay and find City Council's negative position totally irresponsible.	Comment noted.	
Palo Alto Santa Clara County	2 2	General	Support Flexibility C2, C4, C5, C6	We appreciate that Water Board staff made significant changes to the standard operational components of the permit (i.e. Provisions C.2., C.4., C.5., and C.6.), allowing flexibility in implementation toward stated goals and outcomes.	Comment noted.	
Friends of Five Creeks	1	General	Supports Revised TO	Revised TO is simpler and more flexible than current rules or earlier drafts – probably too simple and too flexible in some areas. The overall trend is desirable. Supports adoption	Comment noted.	

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				of this TO.		
NOAA	1	General	Supports Revised TO	Supports Revised TO. Revised TO should result in significant improvement to water quality over time with benefits to the aquatic life related beneficial uses logically following. Expects these improvements to aid in the recovery of ESA listed salmonids and an improvement of EFH conditions.	Comment noted.	
CA Assembly Member Jerry Hill	3	General	Tie Requirements to Receipt of Grants and Loans	Assist local governments in obtaining federal and state grants and forgivable loans that may be used to help local public agencies with their efforts to improve stormwater quality and to tie the most fiscally demanding new permit requirements to the receipt of such funds.	The Revised TO already eliminated the lower priority requirements, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide feasibility while maintaining accountability. The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies. The requirements in the MRP are reasonable and are fundable under the current economy. Requirements in the MRP cannot be tied to funding availability. The Water Board is attempting to assist some MRP efforts through grant funding.	
CA Senator Leland Yee	7	General	Tie Requirements to Receipt of Grants and Loans	Assist local governments in obtaining federal and state grants and forgivable loans that may be used to help local public agencies with their efforts to improve stormwater quality and to tie the most fiscally demanding new permit requirements to the receipt of such funds.		
Saratoga	6	General	Tie Requirements to Receipt of Grants and Loans	Assist local governments in obtaining federal and state grants and forgivable loans that may be used to help local public agencies with their efforts to improve stormwater quality and to tie the most fiscally demanding new permit requirements to the receipt of		

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				such funds.		
SCVWD	4	General	Tiered Approach	A more tiered approach to implementing the monitoring, trash, and other requirements is recommended to incorporate better studies, and pollutant reduction results, through the adaptive management concepts the Water Board encouraged in the past.	The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies.	
NRDC and SF Baykeeper	16	General	TO Based on Incomplete Application	Revised TO is based on an incomplete application, which deprived the Regional Board of critical estimates of pollution control to be achieved and renders its subsequent decisions not to include effective pollution control provisions arbitrary and unsupported.	The application does not contain the cited information and no application nationwide would as this is not obtainable in any meaningful fashion with the current state of knowledge.	
Contra Costa Board of Sups	2	General	Too Costly Without Additional Funding	Now more than ever the Regional Board should not be promulgating such costly regulation without providing offsetting funds and flexibility. Work with municipalities to develop funding sources and to develop implementation schedule as funding is available. Allow municipalities flexibility on how to meet goals. Allow Permittees to work with Board to de develop the most effective implementation measures to the extent our resources will allow.	The Revised TO already eliminated the lower priority requirements, scaled back on others, and replaced some with tasks that are easier to implement. C.2.-C.7. have already been scaled back to provide flexibility while maintaining accountability. And most of these requirements are set at current levels of implementation. The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring,	

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					and studies. The requirements in the MRP are reasonable and are fundable under the current economy. Requirements in the MRP cannot be tied to funding availability.	
Daly City	3,4	General	Too Much	Level of effort required to accomplish the numerous tasks is overly ambitious and limits the permittees ability to be successful. An exemption needs to be included when a permit requirement is considered unattainable (such as trash requirements when pipes are mostly subterranean).	We cannot pre-exempt from the permit requirements. The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies.	
Cupertino SCVWD	1 22	General	Too Prescriptive and Burdensome Monitoring	Far too prescriptive and burdensome monitoring program with a compressed time frame that will likely not allow for adaptive management, and is unlikely to produce a significant return in terms of water quality benefits.	We disagree. The requirements reflect some improvements over existing requirements to reflect MEP. We believe that the MRP requirements will have significant water quality impact. The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies.	
Burlingame	11	General	Too Prescriptive and Costly	City believes that the draft permit is excessively prescriptive, cost prohibitive, and cannot be fully implemented in the time frame as currently written.	The Revised TO already eliminated the lower priority requirements, scaled back on others, and replaced some with tasks that are	

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Livermore	1	General	Too Prescriptive and Costly	Revised TO is unnecessarily prescriptive in many areas, requires the implementation of costly pilot projects of dubious utility, and mandates the development of numerous written plans, ordinances, and databases which don't enhance water quality. It also requires the co-permittees to implement costly and ineffective trash controls, which are likely to increase the risks of flooding and damage to private property without a level of constant maintenance that cities and counties simply cannot afford or provide.	easier to implement. C.2.-C.7. have already been scaled back to provide flexibility while maintaining accountability. And most of these requirements are set at current levels of implementation. The requirements in the MRP are reasonable and are fundable under the current economy. The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies.	
Newark Mayor	1	General	Too Prescriptive and Costly	The draft permit remains overly prescriptive in many areas, requires implementation of very costly pilot projects of questionable value, and mandates the creation of numerous written plans, ordinances, and databases that do not serve to enhance water quality.	In the Revised TO, C.2.-C.7. have already been scaled back to provide flexibility while maintaining accountability. Most of these requirements are set at current levels of implementation. After over 15 years of program implementation, municipalities should already have ordinances and written standard operating procedures. We feel strongly that written standard operating procedures are necessary	

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					to ensure that the investment that municipalities make into its staff is continued when staff leaves. The Final TO scales back and/or pushes off into future years of the next permit term new requirements, monitoring, and studies.	
Menlo Park	5	General	Too Short of Comment Period	Comment period allowed for this version of the MRP was insufficient and unreasonable given the extent of the changes made by the Regional Board without consultation with the permittees.	We made our best attempt to provide a longer than required comment period. We provided 50 days but we are only required by law to provide 30 days.	
West Valley Clean Water Program	2	General	Too Stringent	Most of the TO puts a considerable strain on public agency resources without likely improvement to water quality (i.e., stringent and prescriptive controls on conditionally exempted discharges).	Discharges can only be exempted if known to be or demonstrated unpolluted. The rudimentary monitoring and reporting in C.15.b., which has been reduced in the Final TO, is to accomplish this.	
Campbell Saratoga	5 3	General	Trash and Litter Should be Highest Priority	Highest priority for TO should be to reduce the amounts of trash and litter that are reaching local waterways through stormwater conveyances	Noted. Trash Load Reduction is a high priority in the Final TO.	
Daly City	2	General	Trash, Social Issue	It is not appropriate to saddle permittees for personal and individual behaviors (littering) or for distributing legal products (plastic bags, Styrofoam; pesticides etc.) The MRP	The Trash Load Reduction requirements in the Final TO are appropriate.	

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				attempts to have agencies cure these societal issues. Daly City has conducted a study session to look at various options to reduce this type of waste. There is an informal policy that bans the use of Styrofoam at city facilities. The City Council is in the process of determining if a Citywide ban is achievable.		
Brisbane Millbrae Pacifica San Mateo	3 2 1 1	General	Unfunded Mandate	Essential to have a permit that is practical, predictable, and cost-effective. Important to us that the permit avoid placing an unfunded mandate on local public agencies for regional pollutant control and cleanup.	The Revised TO does not impose unfunded mandates. The requirements in the Revised TO are necessary to comply with the federal requirement that stormwater permits control discharges of pollutants to the maximum extent practicable. Mandates imposed by federal law are exempt from the requirement that the local agency's expenditures be reimbursed. The State Constitution's prohibition on unfunded mandates applies only to a new program or a higher level of service. Many of the challenged provisions are continuations of requirements already in permits previously issued to Permittees. All dischargers	
Menlo Park	4	General	Unfunded Mandate	MRP create potential conflicts with California Government Code §65300, et seq. (City's General Plan authority), the California Building Code, California drainage law and the Americans with Disability Act. New provisions require significant legal interpretation, along with technical and economic analyses by the Regional Board, prior to being incorporated into the permit. The Porter-Cologne Water Quality Control Act (§ 13241, Water quality objectives) requires the Regional Board to factor economic considerations into its water quality control plans. The draft TO issued to the Ventura County Watershed Protection District, et al, attempts to argue that the order is not an "unfunded mandate" by citing court		

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				decisions that include such statements as "permittees…voluntarily availed themselves of the permit" and "…permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order subject to certain voting requirements contained in the California Constitution." These arguments are unconvincing when considered in light of the fact that neither discharging stormwater nor levying fees subject to voting requirements are activities the City would initiate on a voluntary basis.	of pollutants must comply with the federal Clean Water Act. The requirement that they comply with the Clean Water Act is as a result of their status as persons who discharge pollutants to waters of the United States. The programmatic requirements are in lieu of a traditional discharge permit with strict numerical effluent limitations, and operate to allow municipalities to comply with the Clean Water Act in a more flexible manner than other dischargers. If the municipalities so requested, the Regional Board could issue them a permit without any of the programmatic requirements, but that permit would require strict compliance, in-stream or end of pipe, with the requirements of the Clean Water Act.	
Sunnyvale	15	General	Unfunded Mandates	TO includes many potential new or significantly expanded requirements that: (1) Are not mandated by law or reflected in USEPA-issued municipal stormwater permits; (2) Would represent a significant expenditure of public resources that are not available at the local level; and (3) With a few notable exceptions involving pollutants of concern (which still need to be fine-tuned to avoid wasting resources), are unlikely to produce a significant return in terms of increased water quality benefits.		
NRDC and SF Baykeeper	10	General	Unlawful Allowance of Pollutants from New Sources	Revised TO unlawfully would allow the discharge of pollutants from new sources or dischargers to impaired waters.	We disagree that the Final TO must prohibit all new sources. Provision C.3 requires pollutants from new	

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					development be treated.	
Kolb, Larry and James, Roger	2	General	Update for Recent 303d Listings	FINDING 11-page 5 This finding must be updated to reflect the recent listing of impaired water bodies. A table of the 26 water bodies impaired by trash and the Permittees in each water body's watershed must be included.	The listing has been proposed, but is not final.	
NRDC and SF Baykeeper	15	General	Violates "Anti-backsliding" Provisions	Revised TO violates the Clean Water Act's "anti-backsliding" provisions by weakening previously adopted effluent limits.	We are not aware of any provisions that are weaker than previously adopted effluent limits.	
BASMAA	2	General	Work with Permittees	Staff needs to work collaboratively with BASMAA and permittee representatives to: 1) remove unnecessary and burdensome prescriptive requirements (e.g., C.15); 2) limit the expansion of the proposed monitoring requirements (C.8) to more affordable levels and to answering existing questions directly linked to adaptively managing stormwater discharges; 3) focus the trash requirements (C.10) to try and ensure they will be cost-effective; and 4) better coordinate between, and phase-in over a more extended time period the implementation of measures addressing the mercury and PCBs TMDLs (C.11 and 12) and limiting the number of special studies and pilot	We have worked with BASMAA as well as other stakeholders.	

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				projects so as to make those efforts more affordable considering other priorities in this proposed permit (e.g., such as trash).		
CA Senator Leland Yee	6	General	Work with Permittees	Direct your staff to work with the municipal storm-water staff too determine the appropriate phasing and reduction in the proposed requirements for monitoring, PCB's and mercury consistent with resource limitations.	We have worked with the Permittees through BASMAA.	
Danville	9	General	Cost of Implementation Excessive, Phase Requirements	The following table summarizes additional costs associated with the revised five year MRP, above and beyond the Town's current $662,000 annual budget.	We are not certain that these cost estimates are reasonable. Some new resources will be required. The Final TO requirements are phased allowing time to develop new funding resources.	
Menlo Park	6	General	Work with Permittees	Direct staff to meet with the permittees to discuss appropriate modifications to the permit, and to consider this and other comment letters submitted by members of SMCWPPP, the List of Issues Table included with the SMCWPPP comment letter, comments submitted by the BASMAA, and the Santa Clara Valley Urban Runoff Pollution Prevention Program's comments.	Water Board Staff met extensively with stakeholders to discuss comments and issues.	

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NRDC & SF Baykeeper	8	C.3.c.i.(4)-(6)	Unlawful delegation	The New Development and Redevelopment provisions unlawfully delegate authority to the Executive Officer to determine key control requirements of the Tentative Order;	The commenter has not provided specific information in this comment as to the facts regarding what measures are asserted improperly delegate authority to the Executive Officer so it is not possible to respond substantively.	
NRDC & SF Baykeeper	9	C.1		The Receiving Water Limitations provisions are inconsistent with State Board precedential orders and fail to require that the Tentative Order and municipal compliance documents ensure compliance with water quality standards;	The commenter did not provide facts in this comment as to the nature of the problems asserted to exist. It is not possible to respond substantively.	
NRDC & SF Baykeeper	17		Inadequate evidentiary support	The Tentative Order must be supported by evidence that justifies the Regional Board's decision to include, or not to include, specific requirements....[It must] contain findings that explain the reasons why certain control measures and standards have been selected and others omitted.... The administrative decision must be accompanied by findings that allow the court reviewing the order or decision to "bridge the analytic gap between the raw evidence and ultimate decision or order." Topanga Ass'n for a Scenic Cmty. v. County of Los Angeles (1974) 11 Cal.3d 506, 515....Currently, the Tentative Order's provisions are not supported by more than anecdotal evidence, as discussed below, and the Regional Board has failed to explain its decision not to adopt control measures and standards that have been adopted by other jurisdictions and proven by scientific studies to be more	We agree that the Topanga decision cited by the commenter requires that a public agency such as the Regional Board must bridge the analytical gap between the evidence before it and the requirements in its order. We disagree that the Topanga case requires the Board to include findings explaining why it rejected alternative proposals. We believe that the order is supported by substantial evidence and that the record contains the analytical bridge between the Tentative Order's requirements and the evidence.	

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				effective than the control measures and standards in the Tentative Order. The lack of substantial evidence to support the Tentative Order renders it unlawful. See, e.g., Bangor Hydro-Elec. Co. v. F.E.R.C. (D.C. Cir. 1996) 78 F.3d 659, 664.		
NRDC & SF Baykeeper	21		MEP standard not met	The Tentative Order…[fails] to require pollution reduction to the maximum extent practicable, as mandated by the Clean Water Act;	Board staff believes that the Tentative Order complies with the Clean Water Act's mandate to require pollution reduction to the maximum extent practicable. This comment does not provide any facts to support a contrary conclusion.	
NRDC & SF Baykeeper	22		Inconsistent with CWA	The Tentative Order's failure to impose stormwater mitigation BMPs pursuant to the requirements of the Clean Water Act….	Staff believes that the Tentative Order complies with the Clean Water Act's requirements, including those related to imposition of BMPs. This comment does not provide any facts to support a contrary conclusion.	
NRDC & SF Baykeeper	24		Anti-backsliding	The Tentative Order…violat[es]… the Clean Water Act's anti-backsliding prohibition through the alternative compliance program…	The commenters noted this comment without an explanation because they apparently intended it as a summary of a comment raised separately in their letter. Please refer to our response below to that other comment. The alternate compliance provision of C.3 does not constitute backsliding, as the C.3 d. water quality stormwater volume is treated at an alternate	

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					location in the watershed.	
NRDC & SF Baykeeper	32	C.3	MEP not met	Despite this lack of a numeric performance requirement, the Fact Sheet states in conclusory fashion that the hierarchy of treatment measures will ensure that "the amount of runoff stored and recycled or infiltrated … and treated[sic] by landscape-based measures is maximized." (Fact Sheet, at 25.) Such conclusory statements are a hallmark of this Tentative Order's supporting documentation, and by failing to define a level of performance as is explicitly required by federal and state law, the Tentative Order would allow far less than the Tentative Order's self-proclaimed "maximization" of recycling, infiltration, and treatment by landscape-based measures and could be interpreted in numerous ways that conflict with the Clean Water Act's mandate.[1] The Tentative Order's failure to define "MEP" in a meaningful way is particularly problematic because it allows the Permittees to self-regulate by defining for themselves what constitutes MEP. This is poor policy and flatly unlawful. (See, e.g., Environmental Defense Center, Inc. v. U.S. E.P.A. (9th Cir. 2003) 344 F.3d 832, 855-56.)	Staff believes that the proposed order meets applicable legal requirements and does not allow inappropriate self-regulation. The revised TO includes enhanced LID requirements that are more specific than those included in the original TO. They would require that the C.3.d design storm runoff be treated by LID with few exceptions. It is necessary to incorporate some flexibility in the C.3 requirements so that Permittees can work with developers, while maintaining minimum implementation levels commensurate with MEP.	
NRDC & SF Baykeeper	38		EO approval	The general lack of guidance in these notification/approval provisions would allow the Permittees and the Executive Officer to	We disagree that the proposed TO would be inconsistent with the Environmental Defense Center	

[1] The first option in the hierarchy, provision (e), omits a standard altogether, although presumably this was a typographical error and the practicability standard should have been applied to this section, as well.

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				make all meaningful decisions related to stormwater mitigation. Under *Environmental Defense Center, Inc.*, this type of self-regulatory system is unlawful, as explained above and in previous comment letters. (See 344 F.3d at 854-56.) State law also does not allow the Regional Board to delegate the aforementioned decision-making powers to the Executive Officer. (Cal. Water Code § 13223(a).) Such a delegation would constitute, in effect, the "issuance [or] modification . . . [of a] waste discharge requirement" because the Executive Officer would have the broad authority to determine what level of stormwater mitigation is required of Regulated Projects. The Tentative Order, in contrast, would preclude both because neither the public nor the Regional Board could currently determine what the likely result of the Tentative Order's provisions would be—the meaningful requirements, such as what percentage of a Regulated Project's stormwater runoff will be treated with LID techniques, are left entirely to the discretion of the Permittees and/or the Executive Officer. (Tentative Order ¶ C.3.c.1(2).)	case. It would not allow impermissible self-regulation because this provision has been significantly revised, and there is no longer an issue subject to EO determination.	
NRDC & SF Baykeeper	40	C.3	Post-construction & MEP	Our February 9, 2008, letter discussed various failings of the Tentative Order that prevent it from meeting the MEP standard. Little has changed from the prior draft of the Tentative Order, unfortunately, as noted above, and the Tentative Order's post-construction provisions are still far from legally adequate.	Many changes have been made to the prior draft Tentative Order. Staff believes that the proposed post-construction provisions were and are legally adequate. This comment is too general to allow for a specific response.	

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NRDC & SF Baykeeper	40a	C.3	Post-construction & MEP	Section 402(p) of the Clean Water Act establishes the MEP standard as a requirement for pollution reduction in stormwater permits. Regional Board staff have failed to implement this standard, apparently believing that it grants them unbridled discretion and allows them to exclude effective practices commonly implemented....[I]n the Bay Area, we have demonstrated that an onsite retention standard based on the effective impervious area of a site would be a technologically feasible approach that would reduce stormwater discharges and pollution far more than the measures contained in the Tentative Order.[2] We have even called to the Regional Board's attention an EPA study which found that LID practices are frequently less costly than conventional stormwater BMPs,[3] and we have submitted our own technical analyses highlighting the cost savings that accrue from saving water through LID.[4] [Note: Footnotes omitted from summary.] Additionally, no one has offered concrete evidence that a single site in the Bay Area could not meet this standard, assuming that—as we have	We have revised C.3 to require that 100% of the C.3.d design storm runoff to be treated with LID measures, with a few exceptions.	

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				consistently recommended—the Tentative Order includes an appropriate infeasibility provision tied to a technically equivalent alternative compliance requirement. The Tentative Order, as written, fails to uphold the MEP standard because it does not impose anything close to the maximum technologically practicable, but not disproportionately expensive, stormwater management BMPs with an accompanying quantitative performance requirement.		
NRDC & SF Baykeeper	61		TMDLs	Approval of the Tentative Order will authorize the discharge of pollutants to impaired water bodies from "new sources" or "new dischargers" in violation of the CWA's implementing regulations. 40 C.F.R. § 122.4(i) explicitly prohibits discharges from these sources Under 40 C.F.R. § 122.2, a "new discharger" is defined as "any building, structure, facility, or installation: (a) From which there is or may be a 'discharge of pollutants;' . . . (c) Which is not a 'new source;' and (d) Which has never received a finally effective NDPES permit for discharges at that 'site.'" (40 C.F.R. § 122.2.) A "new source" is defined as "any building, structure, facility, or installation from which there is or may be a 'discharge of pollutants . .	The commenter in effect argues that the Tentative Order may not authorize the development or redevelopment of any building or structure if its runoff would add any pollutant to discharges from the MS4 that "will cause or contribute to the violation of water quality standards" for a water body impaired for that pollutant. The commenter asserts that all such discharges are "new discharges" from "new dischargers" under the federal regulations. We disagree. New buildings, developments, and construction projects are not in fact "new sources" or "new dischargers"	

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				.'" that may be subject to applicable standards of performance under section 306 of the Clean Water Act. (40 C.F.R. § 122.2.) Thus, the Tentative Order may not authorize the development or redevelopment of any building or structure, including, without limitation, a new subdivision, industrial facility, or commercial structure, within the Permittees' jurisdiction, if runoff from the new discharge adds any pollutant to discharges from the MS4 that "will cause or contribute to the violation of water quality standards" for a water body impaired for that pollutant. Furthermore, the applicant for the permit must prove the availability of any exception to this provision, as set forth above. In Friends of Pinto Creek v. U.S. E.P.A., ((9th Cir. 2007) 504 F.3d 1007), the Ninth Circuit Court of Appeals vacated an NPDES permit issued by the U.S. Environmental Protection Agency to a new discharger on the grounds that the Permittees' "discharge of dissolved copper into a waterway that is already impaired by an excess of the copper pollutant" would violate the CWA. (Id. at 1011.) Citing to 40 C.F.R. § 122.4(i), the court stated that "The plain language of the first sentence of the regulation is very clear that no permit may be issued to a new discharger if the discharge will contribute to the violation of water quality standards." (Id. at 1012.) The court noted that	under the Clean Water Act or the federal regulations unless there is a discharge of a pollutant to waters of the United States from a "point source". The definition of "new discharger" quoted by the commenter was not intended to reach each and every construction project up gradient of an MS4 permitted discharge point. Construction projects and municipal separate storm sewer systems are regulated under the federal permitting program, but not under Clean Water Act section 402(a) and (b) as urged by the commenter, but rather under section (402)(p)(2)(E) and (p)(3). The Friends of Pinto Creek case cited by the commenter is inapplicable to the MRP because the case involved a new point source's discharge directly into waters of the United States rather than into a municipal separate storm sewer system.	

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				a single exception to this rule exists where a TMDL has been performed, and the "new source can demonstrate that, under the TMDL, the plan is designed to bring the waters into compliance with applicable water quality standards." (Id.) Thus, where no TMDL has been completed for a specified water body and pollutant, new discharges that add pollutants that will cause or contribute to a violation of water quality standards are prohibited absolutely. Further, the court in Pinto Creek observed that unless a TMDL explicitly provides that existing discharges into the impaired water body are "subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards," issuance of a permit for new discharge was also prohibited under 40 C.F.R. § 122.4(i). (Id. at 1013.) In effect, a permit for new discharges may not be issued even when a TMDL for the relevant pollutant exists, unless it firmly establishes that "there are sufficient remaining pollutant load allocations under existing circumstances." (Id. at 1012.) Under this holding, the Regional Board is prohibited from approving a permit that allows new sources or discharge of any pollutant to water bodies already impaired by that pollutant, unless an existing TMDL specifically provides sufficient waste load allocations for the discharge. There are "more than 270 listings in 88 water bodies"[5] identifying water bodies or water body		

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				segments as impaired for one or more pollutants within the jurisdiction of the San Francisco Regional Board. Many of these are located in jurisdictions and municipalities covered by the Tentative Order.[6] Water bodies within the Permittees' jurisdictions are impaired for, among other pollutants, mercury, PCBs, bacteria, nutrients, pesticides, and metals, including selenium. The Tentative Order fully acknowledges that these and other pollutants of concern are known contaminants within stormwater in the San Francisco Bay region. Tentative Order Finding 15 states that "[p]ollutants of concern in these discharges are certain heavy metals; excessive sediment production from erosion due to anthropogenic activities; petroleum hydrocarbons from sources such as used motor oil; microbial pathogens of domestic sewage origin from illicit discharges; certain pesticides associated with acute aquatic toxicity; excessive nutrient loads, which can cause or contribute to the depletion of dissolved oxygen and/or toxic concentrations of dissolved ammonia; trash, which impairs beneficial uses including, but not limited to, support for aquatic life; and other pollutants which can cause aquatic toxicity in the receiving waters." The Tentative Order itself emphasizes that "stormwater discharges from urban and developing areas in the San Francisco Bay Region" have been found by the Water Board "to be significant sources of		

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				certain pollutants that cause or may be threatening to cause or contribute to water quality impairment in waters of the Region." (Tentative Order, at Finding 11.) Specifically, "the Water Board has found that there is a reasonable potential that municipal stormwater discharges cause or may cause or contribute to an excursion above water quality standards for the following pollutants: mercury, PCBs, furans, dieldrin, chlordane, DDT, and selenium in San Francisco Bay segments; pesticide associated toxicity in all urban creeks; and trash and low dissolved oxygen in Lake Merritt, in Alameda County." (Id.) ....[The commenters went on to discuss some of the pollutants found in stormwater.] ....As no TMDLs have been adopted to address water quality impairments formally identified by the Regional Board and U.S. EPA and caused by pollutants including bacteria, nutrients, pesticides, PCBs, and metals such as selenium, any new discharge of these pollutants would violate the terms of 40 C.F.R. § 122.4(i) and the court's holding in Pinto Creek. Such discharges are prohibited. Furthermore, the Tentative Order states that "two TMDLs . . . have been fully approved and are effective for the Permittees. These TMDLs apply to pesticide-related toxicity in urban creeks and mercury in San Francisco Bay."[7] Following the court's holding in Pinto Creek, a permit allowing new dischargers or sources of mercury or pesticides could be approved and issued only in the event that the applicable		

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				TMDL explicitly establishes that (1) existing discharges into the impaired water body are "subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards," and (2) additional allocations are available for the specified water body. (Pinto Creek, 504 F.3d at 1013.) The Tentative Order does not establish that such allocations exist and are available. As a result, new discharges of mercury or pesticides to impaired water bodies are prohibited, and there is no authority for the Regional Board to issue the Tentative Order. In order to be lawful, the Tentative Order must establish measures to ensure that stormwater discharges, from existing or future sources, do not cause or contribute to such impairments, and the Tentative Order has not done so.		
NRDC & SF Baykeeper	62	C.1	Receiving water limitations	The Tentative Order's Receiving Water Limitations exclude language required by U.S. EPA and addressed by the State Water Resources Control Board in Water Quality Order No. 99-05 ("Order 99-05"). Specifically, the State Board ordered that the "following receiving water limitation language shall be included in future municipal storm water permits."[8] Order 99-05 then sets forth language that includes the following: "the	We agree that the Tentative Order does not include the quoted sentence from the State Board's order. The omitted language pertained to SWMPs but dischargers are no longer required to submit SWMPs so the language is no longer relevant. We also agree with the commenters' observation that the Tentative	

[8] Water Quality Order 99-05 at 2.

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				SWMP shall be designed to achieve compliance with Receiving Water Limitations."[9] However, Tentative Order provisions C.1 and C.1.a exclude the required sentence, substituting instead a reference to certain substantive provisions of the Tentative Order. This alteration is impermissible because it deviates materially from language that the State Board ordered "shall be included in future municipal storm water permits."[10] The included language is not comparable because the cited sections of the Tentative Order are not designed to achieve compliance with water quality standards, and there is, likewise, no finding or evidence in the record that would even tend to support any other conclusion. Moreover, many provisions of the Tentative Order would require the development of compliance plans not yet before the Regional Board, rendering premature any judgment about their adequacy to "achieve Receiving Water Limitations." Indeed, the Tentative Order includes dozens of provisions that require the development of substantive pollution control requirements. (See, e.g., Tentative Order ¶ C.5.d.)	Order includes other language instead that references "certain substantive provisions of the Tentative Order". Those provisions are the specific "pollutants of concern" provisions. We disagree that the referenced language is "not designed to achieve compliance with water quality standards". In fact all of the "pollutants of concern" provisions are intended to achieve such compliance, albeit through iterative MEP-based steps.	

[9] *Id.*

[10] *Id.*

[11] Water Quality Order 99-05, at 3 (emphasis added).

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				Tentative Order Provision C.1.a not only excludes required restrictions, but it also includes new language that weakens the Tentative Order in a fashion inconsistent with precedential state decisions. Provision C.1.a would allow Permittees to cause or contribute to violations of water quality standards for "pesticides, trash, mercury, polychlorinated biphenols, copper polybrominated diphenyl ethers, and selenium" without submitting a report to the Regional Water Board or proposing new BMPs to eliminate the violation(s). This loophole threatens public health and the environment. It is irreconcilable with the explicit requirement in Order 99-05 stating that "discharges" that are "causing or contributing to an exceedence of any applicable WQS" trigger notification and submittal of a plan setting forth "additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedence of WQSs."[11]		
NRDC & SF Baykeeper	63	C.15	Conditionally exempted discharges	[T]he Tentative Order itself, and supporting sections of the Fact Sheet, create a host of non-stormwater discharge categories that are either categorically or conditionally exempt from prohibitions against non-stormwater discharge to the MS4 system. These exceptions violate of the clear language of the Clean Water Act. Section 402(p)(3)(B)(ii)	Staff believes that the exceptions are proper, and the provisions as a whole implement the requirement to "effectively" prohibit nonstorm water discharges into the storm sewers. Discharges from NPDES permitted facilities are as a matter	

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				requires that permits for discharge from municipal sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers." 33 U.S.C. § 1342(p)(3)(B)(ii).[12] Citing to the CWA's implementing regulations under 40 C.F.R. § 122.26(d), however, the Fact Sheet asserts that "we recognize that certain types of non-stormwater discharges may be exempted from this prohibition if they are unpolluted and do not violate water quality standards. Other types of non-stormwater discharges may be conditionally exempted from Prohibition A.1. [of the Tentative Order] if the discharger employs appropriate control measures and BMPs prior to discharge and monitors and reports on the discharge." Section C.15 of the Tentative Order creates "Exempted and Conditionally Exempted Discharges" for non-stormwater, with a stated objective to "exempt unpolluted non-stormwater discharges from Discharge Prohibition A.1. and to conditionally exempt non-stormwater discharges that are potential sources of pollutants." (Tentative Order, at 102.) .... While the Tentative Order creates limited control measures designed to reduce the potential impacts of these discharges, it does	of law required to comply with water quality standards. The remaining exceptions only apply if the discharges are not a source of pollutants that exceed standards. The word "effectively" recognizes the limitations of the existing infrastructure and provides the flexibility to authorize some types of non-storm water drainage when it does not adversely affect the quality of storm water in the MS4. The commenter neglects to recognize the import of the words "identified by the municipality..." in the analysis. The commenter has offered no proposals on how the Regional Board would implement the law and regulations as interpreted by the commenter.	

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				not prohibit them, as required by the CWA. Section 402(p) places a clear, mandatory duty on the Permittee to prohibit non-stormwater discharges to the MS4 system. The Permittee, or Regional Board, has no discretion to deviate from this requirement.... The Tentative Order's attempt to allow exemptions to the prohibition against non-stormwater discharges to MS4 systems is not supported by 40 C.F.R. § 122.26(d)(2)(iv)(B)(1), as the Fact Sheet implies....A clear reading of the statute, and one that elaborates on Section 402(p)(3)(B)(ii) of the Clean Water Act rather than contradicting it, is that while non-stormwater discharges must be prohibited by the text of the Act, illicit discharge enforcement programs need only specifically address the enumerated list of non-stormwater discharges set forth in the regulations where such discharges have been identified as a source of pollutants. As written, the entire scheme in the Tentative Order is inconsistent with both the regulations and the statute that they purport to implement. Further, even if the Permittees were afforded authority under 40 C.F.R. § 122.26(d) to exempt non-stormwater sources from the discharge prohibitions required by the CWA, the Tentative Order unlawfully allows exemption of irrigation water from lawns, gardens, or landscaping even though pollutants from these source are a known,		

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				significant source of impairment in the Bay Area. Neither a finding that irrigation discharges are "not []sources of pollutants to receiving waters," (Tentative Order Fact Sheet, at 85), nor an exemption based on the other conditions set forth in the Tentative Order, would be consistent with facts in the record.		
NRDC & SF Baykeeper	67a		Incomplete application	The permit application is significantly incomplete, as it fails to include information required under 40 C.F.R. § 122.26(d)(2) that is necessary to ensure that the selection of controls for reducing the discharge of pollutants is not arbitrary and capricious. A permit application for discharge from a large- or medium-sized MS4 must contain an assessment of controls, including "[e]stimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program." (40 C.F.R. § 122.26(d)(2)(v).)	The application does not contain the cited information on estimates of pollutant load reduction from BMPs as we do is not believe it is obtainable with the current state of stormwater management knowledge. Broad estimates for PCBs and Hg load allocations for Stormwater permits are contained in the background materials for provisions C.11 and C.12. However, we do not know what actions will be required to obtain those load reductions. Trash discharges to receiving waters are to be abated by 2022, but that is a proposed requirement, not an estimate of trash pollutant reduction based on knowledge of actions and their effectiveness.	
NRDC & SF Baykeeper	67b		Incomplete application	Rather than providing such estimates, neither the application, the Tentative Order, nor the Fact Sheet includes any required information or other discussion of the amount of pollution	Measures are selected because in our judgement they are MEP. We will be addressing in specific technical comments related to	

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				that will be reduced through its controls. In effect, the Tentative Order and its provisions have evidently been selected, and other provisions rejected, based on arbitrary guesswork.	choices of certain BMPs were included, in the context of specific comments.	
NRDC & SF Baykeeper	67c		Incomplete application	The lack of information related to pollutant loadings not only contravenes the requirements of 40 C.F.R. 122.26(d)(2) but also exposes an underlying flaw of the Tentative Order as a whole—it has diminished the extent of, and in many instances entirely deleted, effective BMPs without evidence that management practices included in the Tentative Order are adequate to meet relevant requirements and standards. The approval of the Tentative Order without this information fundamentally violates basic precepts of administrative procedure, not only because required evidence in the record is lacking, but also because the findings and related subfindings in the record are totally devoid of necessary guideposts as to why and how provisions were included or rejected.	There is no legal requirement that the Board explain why provisions were rejected. Board staff believes that the record adequately explains why measures were included as requirements.	
NRDC & SF Baykeeper	67d		Incomplete application	Permittees may have relied on guidance from EPA purporting to "allow[] permitting authorities to develop flexible reapplication requirements that are site-specific." (61 F.R. 41698.) However, nothing in the CWA's implementing regulations permits such flexibility, and the guidance cannot reduce or remove the regulatory requirement that the Tentative Order include estimated reductions in pollutant loadings....In order for the Tentative Order application to meet the	We disagree that this is a first time permit application. All permittees have been through several permit cycles and the requirements are quite "mature". The application does not contain the cited information on estimates of pollutant load reduction from BMPs as we do is not believe it is obtainable with the current state of stormwater management	

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				requirements of the CWA, the Tentative Order must include an estimate of the pollutant load reduction that it is expected to achieve. Even if the guidance were not in direct conflict with the regulations, the guidance does not in itself specifically exempt permits from including this information. The guidance states that "as a practical matter, most first-time permit application requirements are unnecessary for purposes of second round MS4 permit application;" it does not state that all such information is unconditionally unnecessary. (61 F.R. 41698 (emphasis added).) The omitted pollutant reduction estimates represent a fundamentally different type of information from that required by most of the other provisions of 40 C.F.R. § 122.26(d)(2), such as identifying already identified "major outfalls," for which repeating the exercise "would be needlessly redundant," especially "where it has already been provided and has not changed." (61 F.R. 41698.) However, the required pollutant load reduction estimates, which apply when a new application for a new permit is received, are not like "most" provisions addressed in the guidance and are, instead, self-evidently relevant to crafting and assessing the core requirements of the new permit. Such estimates are an essential means of determining whether or not the permit will ensure that water quality standards will be met and what improvements can be expected; they are not merely an	knowledge. Broad estimates for PCBs and Hg load allocations for Stormwater permits are contained in the background materials for provisions C.11 and C.12. However, we do not know what actions will be required to obtain those load reductions.	

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				administrative detail that has no effect on the permit's functionality. This information is further indispensible when, as here, staff have rejected more effective BMPs, since—absent information that such BMPs are not necessary to meet fundamental Clean Water Act goals—this rejection is entirely arbitrary. Additionally, the first issuance of a regional stormwater permit makes the required estimated reduction in pollutant load particularly critical. Here, the area and entities covered by the MRP and the requirements imposed on the Permittees have changed from the last round of adopted permits. The MRP is, essentially, a first-time application for a permit that will largely determine the level of urban runoff control in most of the Bay Area. Given this, the necessity of basing the Tentative Order on information about its estimated efficacy should be obvious and the inapplicability of guidance to the contrary equally clear.		
NRDC & SF Baykeeper	68		Insufficient findings	….An administrative decision must be accompanied by findings that allow a court reviewing the order or decision to "bridge the analytic gap between the raw evidence and ultimate decision or order." (Topanga Ass'n for a Scenic Cmty. v. County of Los Angeles (1974) 11 Cal.3d 506, 515.)…. However, far from revealing lines of factual and legal conclusion or providing a means to "bridge the analytic gap" between evidence and decision, the Tentative Order, as	The permit is supported by adequate findings in compliance with the Topanga decision cited by the commenter. The Fact Sheet discusses compliance with water quality standards numerous times. It identifies the water quality standards that provide the general basis for the permit's requirements (pp. 7-9), then details the specific requirements that are	

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				previously noted, contains only a bare minimum of findings overall and absolutely no findings with respect to critical areas of the Tentative Order, such as compliance with water quality standards, consistency with the MEP standard, section C.3, which details the requirements for new development and redevelopment, or C.15, which details the exemption or conditional exemption of certain non-stormwater sources from the Tentative Order's discharge prohibitions. In this respect as well, the Tentative Order is deficient and unlawful. This violation is particularly glaring because the lack of information on how decisions were made as to the contents of the Tentative Order obfuscates the basis of decision-making and acts as a barrier to transparency. By not attempting to support the Tentative Order or showing clearly why it includes certain practices and excludes others that have been well-supported, the Regional Board avoids laying out clearly for the public the basis of its actions.	implemented for each provision. Further it explains that the draft TO does not require strict compliance with water quality standards and cites the precedential order issued by the State Water Resources Control Board. (SWRCB Order No. WQ 2001-15.) That order indicates that stormwater permits issued by Regional Boards do not need to "not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs....[T]here is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. Instead, the iterative approach is consistent with U.S. EPA's general approach to storm water regulation, which relies on BMPs instead of numeric effluent limitations." The Fact Sheet cites the legal basis for the MEP standard and	

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					contains numerous references to the "Maximum Extent Practicable" (MEP) standard. It explains that permittees' implementation of technically and economically feasible control measures will reduce pollutants in stormwater discharges to the maximum extent practicable. The Fact Sheet further explains the basis for C.3 and C.15, which are the other permit provisions cited by the commenter. C.3 has been revised partly in response to NRDC and BayKeeper's comments. C.15 is adequately reflective of MEP requirements for the exempted non-stormwater pollutants addressed in that provision.	
NRDC & SF Baykeeper	69		General	For the many aforementioned reasons, the Tentative Order is unlawful under federal and state law. It is a long way from legally adequate and needs broad and significant revisions, as well as more thorough documentation, to pass legal muster. We urge the Regional Board to reject the Tentative Order and provide staff with clear direction on the numerous modifications that are required, as discussed above.	Staff believes that the Tentative Order complies with federal and state laws as discussed above in response to the commenters' specific comments	
San Jose	1		Insufficient evidence	We do not believe that the record demonstrates that many of the provisions identified in the City's technical comments meet either the "nexus" requirement that is	The commenter asserts that the Tentative Order is inconsistent with a "nexus" standard in two sections of the Water Code.	

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				required under the Porter-Cologne Act (Cal. Water Code §§13241 and 13263) or the maximum extent practicable ("MEP") standard, which is the applicable statutory standard governing the substance of permits regulating municipal stormwater discharges under the Clean Water Act ("CWA"). Many of the provisions referenced in the City's technical comments are deficient under these standards. Of special concern are provisions that are costly or will increase workload or with no demonstrable water quality benefit, such as Provisions CA.b.ii.1.g, C.6.e.ii.(4)(d); C.13.a, C.14, C.15.b.i & ii.	Neither of the sections identified by the commenter includes the word "nexus". The cited provisions impose requirements that apply to the Board's issuance of NPDES permits (which include stormwater permits). The California Supreme Court has held that the statutes' requirements to requirements in those permits to the extent that the requirements exceed the requirements of the federal Clean Water Act. (*City of Burbank v. State Water Resources Control Board* (2005) 35 Cal. 4th 613, 627.) As discussed above the Clean Water Act requires that stormwater permits include requirements that will result in reductions of discharge of pollutants in stormwater to the maximum extent practicable. The commenter asserts that many of the Tentative Order's requirements do not meet that standard. The staff believes that the Tentative Order complies with the maximum extent practicable standard. Although the commenter has identified some permit provisions that are asserted not to comply with the standard, the comment does not include any details about how	

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					those specific provisions are believed to exceed the maximum extent practicable standard under federal law.	
San Jose	2		Prescriptive requirements	Porter-Cologne specifically prohibits the Board from specifying the "design, location, type of construction, or particular manner in which compliance may be had ...." Cal. Water Code §13360. Most of the provisions in the Revised Tentative Order violate this prohibition by prescribing, sometimes in minute detail, how the City should conduct municipal operations or operate local programs. The overly prescriptive nature of the provisions related to exempted and conditionally exempted discharges [Provo C.15] and provisions which do not sufficiently allow for Adaptive Management [Table8.1, Provisions C.11.e & f, C.12. b & e, C.13] or preclude use of Alternative Compliance [Provision C.3.e.i]	We disagree that the proposed permit would violate Water Code section 13360, which provides that a water board shall not specify in an order the "design, location, type of construction, or particular manner in which compliance may be had". First, the proposed permit does not specify such matters as design, location, type of construction or particular manner of compliance. Even if the proposed permit were to include such specifications, it would not violate section 13360. The Court of Appeal held in *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal. App. 4th1377 held that section 13360 is not applicable to issuance of a stormwater permit issued under the federal Clean Water Act. (id., at 1389.)	
San Jose	3		Unfunded mandate	The legal basis for the City's unfunded mandate objection, including an analysis of why many of the provisions included in the City's technical comments go beyond the	The commenter references comments submitted by Mr. Falk. We have responded to Mr. Falk's comments separately.	

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				requirements of the federal CWA, is set forth in Mr. Falk's comment letter.		
San Jose	4		Economic impacts	For the provisions in the Revised Tentative Order that go beyond requirements of the federal CWA, the Board is required to conduct an analysis of economic impacts and burdens pursuant to sections 13241 and 13263 of the Porter-Cologne Act. *See City* of *Burbank v. State Water Resources Control Board,* 35 Cal. 4th 613 (2005). Although the TO Fact sheet purports to contain an economic analysis, the studies cited did not address the requirements of this TO and there is no analysis of the extent to which the programs included in those studies are comparable to the requirements in this TO. As indicated in more detail in the City's technical comments, specific provisions that are of particular economic concern to San Jose include: [Provisions C.3.b.iii., C.10, C.11 & *12.e* & f.]	The staff does not agree that any provisions of the permit exceed the requirements of federal law thus we do not agree that an economic analysis is needed under the case cited by the commenter. The City's technical comments and concerns are responded to elsewhere.	
San Jose	5		CEQA	The California Environmental Quality Act (CEQA) applies to permits issued by the Regional Board to the extent the permit contains provisions which are not required under the federal CWA. *City of Arcadia v. State Board,* 135 Cal. App. 4th 1392 (2006). As indicated above, many provisions in the Tentative Order are not required by the CWA. The need for a CEQA analysis is particularly relevant for provisions which specify the manner in which the permitees can and cannot construct public improvements and those which require the permitees to implement specific public improvement projects, even if	The commenter asserts that the Board is required to comply with CEQA when it issues a permit to the extent that the permit includes provisions which are not required by federal law. In fact, Water Code section 13389 exempts the Board from complying with CEQA when it issues an NPDES permit (including a stormwater permit). (See State Water Resources Control Board Order No. WQ 2000-11, *In the Matter of the Cities of Bellflower et al.*) The	

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				they are only pilot projects.	case cited by the commenter concerns a Regional Board's obligations to comply with CEQA when it adopts a TMDL. The Board's adoption of a TMDL is not subject to the CEQA exemption that applies to NPDES permits thus the case is inapplicable to the proposed permit.	
San Jose	6		Board lacks authority	As a state agency, the Regional Board only has the regulatory authority delegated to it by statute. The scope of this delegated authority does not include jurisdiction over local land uses decisions under state or federal law. Provision C.3 of the Revised Tentative Order contains numerous instances where the Regional Board is exceeding its statutory authority, with the following provisions being of specific concern as indicated in the City's technical comments: Provisions C.3.b.ii(1) and C.3.c.i.(4)-(6).	We agree that the Board does not have the authority to regulate land use but disagree that the Tentative Order includes provisions that impermissibly regulate the use of land. While local governments make decisions on what land uses they will permit within their jurisdictions, the Board regulates those local governments' discharge of stormwater. The proposed provisions at issue would require the permittees to in turn require that new development in their jurisdictions meet certain technical requirements related to reducing the discharge of pollutants into stormwater to the maximum extent practicable. Those provisions would not result in the Board usurping local governments' authority to make land use decisions. The commenter has	

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					not explained otherwise.	
San Jose	6		C.2 and C.10	The Regional Board is also limited in this proceeding to dealing with municipal storm water discharges. There are several provisions in the Revised Tentative Order which attempt to regulate activities simply on the basis of impact on water quality, even though there is no demonstrated connection between these activities and the permittees' storm sewer systems, including Provisions C.2.c. d &e and C.10.a.ii.2	The commenter has cited two permit provisions to support her assertion that the Tentative Order would regulate activities that may not be connected with discharges to the permittees' storm sewer systems. To the extent that the discharges in the cited sections in the Permittees' jurisdictions do not fit within the broadly defined MS4, those discharges are not regulated by the Final TO	
SCVURPP	Legal 1a		Receiving water limitations and C.!	The Proposed TO represents a substantial improvement over prior drafts of the MRP (especially with regard to its "core" municipal stormwater management program provisions C.2-C.7), and it largely addresses the prior legal deficiencies entailed in the Permit's Discharge Prohibitions, Receiving Water Limitations and C.1 Provision. As set forth in the non-legal comments being submitted by the Santa Clara Program, several aspects of the Proposed TO (including, but not limited to, certain aspects of the Trash, Pollutant-specific, Monitoring, and Conditionally Exempt Discharge Provisions) nevertheless continue to require additional streamlining and/or phasing into future permits in order to make the MRP feasible absent State-provided funding for such "add-ons," however desirable they may arguably be from a potential water quality improvement perspective. In addition	We agree that the proposed permit has been revised but disagree that there were legal deficiencies in the previously proposed Tentative Order. The commenter also notes that the Santa Clara Program has submitted comments that suggest that several aspects of the proposed Tentative Order require additional changes. To the extent that those submittals constitute comments, staff will respond to those comments separately.	

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				to this fundamental policy-level issue, there are also a number of wording changes the Santa Clara Program is suggesting that are needed to better clarify the scope or intent of various requirements.		
SCVURPPP	Legal 1b		Finding 1	The TO's proposed Finding Number 1's attempt to "incorporate" the entire Fact Sheet (which, among other things, is not composed entirely of subject matter appropriate for findings, will not be considered by the Water Board members in a manner enabling them to legally make findings, and which has numerous errors and omissions within it) and responses to comments into the Permit itself (as opposed incorporating these documents into the record associated with the Permit) by reference needs to be revised to avoid a potentially substantial legal procedural and significant abuse of discretion problem that could undermine adoption of the TO.	Staff believes that it is proper to incorporate the Fact Sheet by reference. The commenter has not cited any State Board orders or judicial precedent to support the claim that the practice is legally improper.	
SCVURPPP	Legal 2		C.1	The revisions to the Permit's Discharge Prohibitions, Receiving Waters Limitations, and C.1 Provision have corrected serious potential legal deficiencies, represent substantial improvement, and are to be commended. (That said, we request clarification of the intent of the particular placement of the exemption language currently appearing in Provision C.1.a and, as shown in Attachment 1, believe it would make more sense for it to appear earlier in the same paragraph.)	The intent is of the "exemption language" is to recognize the permit's specific pollutants of concern provisions (C.8 - C.14) as the requirements for Permittees' actions during this permit term to manage their causes and contributions to exceedances of water quality standards (WQSs) associated with those pollutants. As such, there is no need to submit an additional report. However, Permittees must still	

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					notify the Board when they determine they are causing or contributing to an exceedance of a WQS in order to explicitly associate the exceedance with a specific pollutant of concern provision. As such, it is in the Permittees' interest to notify the Board whenever they have new evidence of an exceedance of an applicable WQS in order to associate it with the appropriate C.8 - C.14 provision, and to explicitly claim the safe harbor provided.	
SCVURPPP	Legal 3		C.2-C.7	Provisions C.2 through C.7 of the Permit have been substantially improved by reducing prescriptiveness, increasing co-permittee flexibility, and by providing for a substantial reduction of data gathering and reporting requirements (at least initially with respect to the latter – see comment concerning Provision C.16's Annual Reporting requirements below). There are still, however, a few specific aspects of these Provisions that either exceed the Clean Water Act's maximum extent practicable ("MEP") standard for municipal stormwater NPDES permitting and/or go beyond the existing NPDES municipal stormwater	We disagree that the cited permit provisions "*either exceed the Clean Water Act's maximum extent practicable ("MEP") standard for municipal stormwater NPDES permitting and/or go beyond the existing NPDES municipal stormwater permitting program as defined by US EPA and represent discretionarily-imposed new program elements or higher levels of service constituting State unfunded mandates.*" As explained in the	

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				permitting program as defined by US EPA and represent discretionarily-imposed new program elements or higher levels of service constituting State unfunded mandates.[13] In fact, among others, the following subprovisions of the Core Program Provisions are particularly subject to this legal comment and should be either be eliminated or expressly conditioned on the co-permittees' *receipt* of funding from the State: • Provision C.3.b.iii (Required Municipal Implementation of State Conceived Green Streets Pilot Projects) • Provision C.3.c (Required Municipal Implementation of State-Created Low Impact Development Mandates)[14] • Provision C.3.h (Required Municipal Recordkeeping, Inspection and Reporting on Operation and Maintenance of Private Stormwater Treatment Systems) • Provision C.3.i (Required Municipal Implementation of State Conceived Site Design Measures for Small Projects and Detached Single-Family Home Projects)	proposed permit's unfunded mandates finding, this permit provisions are required under federal law. Staff disagrees that the cited provision are unfunded mandates subject to subvention, and will respond accordingly if a claim is filed with Commission on State Mandates.	

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				• Provision C.6.e (Required Highly Prescriptive Municipal Implementation of State Conceived Inspection, Notification, Recordkeeping, and Reporting Requirements related to Construction Inspections).[15]		
SCVURPPP	Legal 4		C.8	Provision C.8, as currently crafted, continues to represent a vast expansion of stormwater discharge-related monitoring effort by the co-permittees, the scope of which goes far beyond that demanded by under the Clean Water Act or which appears in municipal stormwater permits US EPA has issued.[16] The proposed expansion of the Santa Clara Program's existing monitoring program therefore represents a discretionary imposition of additional requirements by the State that needs to be scaled back or expressly conditioned on the co-permittees' *receipt* of State-provided funding for their implementation. A number of the requirements that focus on assessment of the condition of receiving waters (such as subprovision C.8.d) as opposed to the municipal stormwater discharges or their confluence with receiving waters also go beyond the Clean Water Act and represent an illegal attempt to delegate the Water Board's own data gathering and analysis responsibilities to the co-permittees without an	The monitoring requirements adhere to the federal MEP standard, and the scope of monitoring is appropriate to determine the impacts of the Permittees' discharges of stormwater runoff through the MS4 into the receiving waters.	

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				associated advanced provision of State funding for the task to be accomplished. Further, the State's own collection of permit fees ostensibly to be used in part for purposes of funding such broad-based monitoring and subsequent attempt to require the co-permittees to again fund these efforts through the imposition of monitoring requirements in the MRP amounts to double-dipping from the same pot and adds insult to municipal injury.		
SCVURPPP	Legal 5		C.9	Provision C. 9 of the Permit contains at least one element (subsection C.9.e) that should be eliminated as it extends well beyond efforts contemplated under the NPDES permit program and illegally attempts to require inter-agency cooperation and compel free speech.	The requirements of Provision C.9 are within the federal standard of MEP and also implement the actions previously adopted in the Urban Pesticides TMDL.	
SCVURPPP	Legal 6		C.10	While the Santa Clara Program and its co-permittees recognize the importance of better trash control to the Bay Area community and endorse a decision by the Water Board to make a reduction in floatables in Bay Area waters a priority, they have a number of legal concerns regarding proposed Provision C.10. **First**, the scope of the Provision as currently drafted extends well beyond the improved management and reduction of trash conveyed through their municipal separate storm sewer systems, which is the limit of the reach of the Clean Water Act's NPDES permit program. **Management/reduction of trash that**	Staff disagrees that the permit would impose unfunded mandates. Provision C.10 requirements are focused on trash discharged through the MS4. Lack of permitting for other entities in the region is no excuse for delaying these requirements. Installation of trash capture devices falls within the definition of MEP, and is therefore not and	

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				reaches Bay Area waters through other means (including, but not limited to, wind) constitutes non-point source pollution (not a control on the discharge of a pollutant from a point source).[17] **Second,** to the extent the proposed requirements reach into **trash that ends up in receiving waters via non-point sources, they require analysis for technical feasibility and economic reasonableness** pursuant to sections 13263 and 13241 of the Water Code and constitute non-federal mandates which must be conditioned on the prior receipt of State funding.[18] **Third, there is no reason why the Water Board should impose trash pollution control requirements on some Bay Area municipalities in an NPDES permit** (which, among other things is potentially enforceable via citizens suits)**, while other Bay Area municipalities whose occupants' activities contribute trash directly to the Bay or its tributaries have no parallel federally enforceable Clean Water Act permit requirements** imposed on them – such practice is not just bad policy in terms of creating an unlevel playing field among Bay Area municipalities, it offends the fundamental principle of equal treatment under the law.[19]	unfounded mandate. The TAL has been removed from the Final TO.	

[19] As an alternative, the Water Board should consider issuing, under its authorities under the Water Code, a separate set of region-wide Waste Discharge Requirements containing trash control requirements applicable to *all* Bay Area municipalities.

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				Fourth, the Permit's Trash Provision goes beyond even the broadest interpretation of the legal authority conveyed to an NPDES permit writer under Clean Water Act section 402(p)(3)(B)(iii) by making **receiving water conditions that are in large part beyond the permittees' control** and which may be affected by other point and non-point sources of trash pollution the relevant parameter to be addressed. **Fifth, Provision C.10's requirement to install full capture devices**, is not only an unfunded mandate unheard of in US EPA-issued municipal stormwater permits, it illegally specifies the manner of performance in violation of Water Code section 13360. **Finally, the Fact Sheet concerning this Provision confuses the concept of a trash action level ("TAL") with a numeric effluent limitation**; does not explain basis for the calculation of the particular TAL proposed or contain an analysis of its feasibility or economic reasonableness; and ignores the views expressed by the panel of experts previously assembled by the State Water Board in assessing how an action level of this nature might properly be set for use in a municipal stormwater permit.		
SCVURPPP	Legal 7		C.11 & C.12	Permit Provisions C.11 and C.12 contain a number of requirements that go beyond the NPDES municipal stormwater permitting program, are unfunded State mandates, and/or which represent an illegal attempt to	The requirements of C.11 and C.12 fall within the federal MEP regulatory basis and are therefore not unfunded mandates. The actions in these Provisions also	

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				delegate the Water Board's own assigned responsibilities to the co-permittees without providing State funding for such tasks in advance. As shown in Attachment 1, US EPA-issued municipal stormwater permits contain no requirements to study or remediate mercury, PCBs, or any other specific pollutant – indeed, unlike CERCLA, RCRA, or the Water Code's provisions concerning waste discharges to land that threaten surface or ground waters, the Clean Water Act's NPDES program is not intended to be a vehicle for effectuating corrective action/site cleanup for historical releases of hazardous substances/wastes be them from cinnabar mine tailings or fluids used in electrical transformers. Nor is there any authority under the NPDES municipal stormwater permitting program for requiring municipalities to effect abatement of mercury or PCBs on private properties (as opposed to just prohibiting the discharge into their storm sewers). Subprovisions C.11.f's and C.12.f's requirements for co-permittees to divert certain non-sanitary waste discharges to POTWs is also unprecedented in terms of US EPA's permitting practices, flies in the face of the NPDES regulations' directive for them to eliminate cross-connections between the separate stormwater and sanitary sewer systems, and specifies the manner of	follow the implementation actions specified in the Mercury and PCB TMDLs.	

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				performance in violation of Water Code section 13360.[20] In terms of sub-provisions C.11.h, C.12.h and C.11.j, the monitoring requirements that may be imposed through the NPDES program do not extend to conducting fate and transport studies in complex downstream waters on behalf of state agencies like the Water Board that have been assigned responsibilities for setting, evaluating, or effectuating attainment of water quality standards, including through promulgating TMDLs and devising waste load and load allocations – these tasks, as well as undertaking public health programs like those specified under subprovisions C.11.i and C.12.i for subsistence fishers, are beyond the scope of the NPDES program, US EPA's own municipal stormwater permitting practices, and, if they are to be imposed on local governments via the Water Code, require the advanced provision of necessary funding from the State.		
SCVURPPP	Legal 8		C.13	Since Bay Area receiving waters are no longer identified under Clean Water Act section 303(d) as impaired for copper, these pollutant-specific requirements should either be eliminated or must be the manifestation of discretionary requirements based on the Water Board's discretionary authority which necessitates the *advanced* provision of funding for them from the State. US EPA-	As copper remains a pollutant of concern in the South Bay, the actions required are commensurate with the federal regulatory standard of MEP. Ongoing actions are required to maintain the receiving waters status that allowed for delisting of copper.	

[20] This also applies with regard to subprovision C.2.d's pump station to POTW requirements.

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				issued municipal stormwater permits contain no parallel or broadly sweeping copper-specific requirements.[21] In addition to being beyond the NPDES scope, subprovision C.13.c's attempt to direct the co-permittees to participate in the Brake Pad Partnership and to advocate for associated legislation illegally attempts to require inter-agency cooperation and compel free speech. Subprovision C.13.e's command for the co-permittees to conduct studies on copper's sediment toxicity and sub-lethal effects on salmonids is not tied to municipal stormwater or existing water quality impairment, and represents yet another beyond-NPDES attempt to delegate the Water Board's own work or wishes to local governments without the advanced provision of State funding for the tasks involved.		
SCVURPPP	Legal 9		C.14	This Provision [C.14] should be eliminated in its entirety. Its requirements represent a beyond-NPDES attempt to delegate the Water Board's own potential pre-303d listing/TMDL work to local governments without the advanced provision of State funding for the tasks involved; it illegally attempts to require inter-agency cooperation; and there is no evidence in the record that ties these pollutants to the Santa Clara Program's co-permittees' municipal storm sewers or reasonably related conditions of water quality impairment so as to establish a legal	Selenium pollutant impacts are of concern. The actions in Provision C.14 are consistent with the federal regulatory standard of MEP.	

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				foundation for the imposition of these requirements under State law.		
SCVURPPP	Legal 10		C.15	There is no evidence in the record that the Santa Clara Program's existing conditionally exempt discharge program, which was previously approved by the Water Board staff, has not achieved effective control over the discharge of pollutants in non-stormwater. US EPA's municipal stormwater permits do not contain prescriptive requirements for conditionally exempt non-stormwater discharges absent an affirmative and specific showing in the record that they have proven to be sources of pollutants at levels that affect receiving water quality. The proposed requirements of subprovisions C.15.b.1-v are therefore unnecessary, unjustified, and represent a demand by the State for a higher level of local government service than the NPDES program and its MEP standard requires and necessitate the advanced provision of State funding if they are to be imposed.	We disagree that the cited requirements would result in an unfunded mandate. Provision C.15 represents a consistent approach for exempting unpolluted non-stormwater discharges. The requirements meet the federal regulatory standard of MEP.	
SCVURPPP	Legal 11		C.16	With respect to annual reports beyond that required for 2009, under both the NPDES regulations and fundamental principles of due process, the Permit may not legally command compliance with requirements to be established in the future (even if through a collaborative process) and which are not available to the Santa Clara Program and its	The format of the annual reports does not constitute a new requirement, the reporting requirements are included in the individual provisions. Provision C.16 provides for the development of a convenient template that all of the Permittees will use, thus	

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				co-permittees for review and comment in advance of the MRP's adoption. Accordingly, the Permit should include a reopener if annual reporting formats or requirements are changed in the future.	increasing efficiency and reducing redundant work.	
SCVURPPP	Table			Table comparing other permits issued directly by EPA rather than the States. Table primarily indicates that there are no similar provisions that are comparable in other permits presented.	These permits are for different regions of the country, that may not be facing similar impairing pollutant issues to our region.	
ACCWP	Legal #7		C.3	Provision C.3.c.i sets forth minimum Low Impact Development ("LID") measures that must be implemented for all regulated projects. However, C.3.c.i.(6) then further provides that the Executive Officer must approve any regulated project that proposes to install vault-based treatment systems to provide primary treatment for more than 50% of the total Provision C.3.d specified runoff. The Fact Sheet states "Executive Officer approval of projects will ensure that vault-based systems are installed only at sites with site constraints that make landscaped-based measures truly infeasible." However, no standards for determining "infeasibility" are set forth. Further, there is no indication that such systems would contribute to water quality problems. In effect, this required approval inappropriately attempts to transfer local planning approval authority away from local governments and is contrary to Water Code section 13360. Assurances and	The approval by the EO of LID measures has been removed from the Final TO. Under the Final TO, the Permittees will report on the manner that infeasibility is determined eighteen months after the permit effective date.	

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				determinations regarding these treatment systems can be provided to the Permittees and they can make these decisions much more expeditiously in accord with the other requirements of this Provision. The ACCWP and some of its Co-Permittees provide in their comments why such an additional requirement of Executive Officer approval is cumbersome and in some cases unworkable. Recommended Action We request that the Executive Officer approval as set forth in Provision C.3.c.i.(6) be deleted		
ACCWP	Legal #6		C.15.b	The Revised Tentative Order Provisions C.15.b.i-vii describe various non-stormwater "discharge types" that may be entitled to conditional exemptions from the discharge prohibition and therefore allowed to discharge to the storm drain system. However, these conditional exemptions as set forth in Provisions C.15.b.i-vii are narrowly drawn and are overly prescriptive in nature, thus, going well beyond requirements of federal law. In fact the Revised Tentative order not only fails to respond to our previous comments but is more detailed and prescriptive in many respects than the previously issue Tentative Order.	Provision C.15 has been revised to streamline and reduce requirements. For instance, groundwater discharged from single family residences is exempted outright. We disagree that the revised introductory paragraph is necessary to clarify Provision C.15. In the Final TO, the revisions have sufficiently clarified and reduced previously burdensome requirements.	

[22] The ACCWP comments note that that there are thousands of these discharges in the Alameda County area alone.

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				NPDES Municipal Stormwater Permits issued by the Environmental Protection Agency ("EPA") address this issue by simply permitting these types of non-stormwater discharges unless there is an affirming showing that they are a source of pollution. In contrast with the EPA approach, the Revised Tentative Order sets up detailed requirements described therein to allow these discharges regardless of whether it is known or suspected of being a source of pollutants. Provision C.15.b.i provides a good example of this overly prescriptive and cumbersome approach - for a very common type of non-stormwater discharge: pumped groundwater, foundation drains, water from crawl space pumps and footing drains.[22] Regardless of the nature or magnitude of threat of the non-stormwater discharge to water quality posed from these common discharges, unless the Tentative Order is revised so as to made clear that municipalities have discretion in determining the extent to which they are appropriately applied to the situation, the BMPs would have to include 1) treatment if necessary to remove total suspended solids or silt to allowable levels (levels not specified) with methods suggested; 2) reporting of uncontaminated groundwater at flows greater than 10,000 gallons per day before		

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				discharging; 3) assurance that the discharges must meet water quality standards consistent with effluent limits in Water Board general permits; 4) required monitoring with prescribed methods for a required duration; 5) attainment of prescribed turbidity levels; 6) attainment of prescribed pH limits; 7) dewatering discharges to be discharged to landscape areas or the sanitary sewer if available; 8) erosion prevention requirements; and 9) maintenance of records of the discharges, BMPs implemented and monitoring activity. Finally, if the dischargers are unable to comply with these requirements, the dischargers would be directed to the Water Board for approval. Other categories of conditionally exempted non-stormwater discharges set forth in Provision C.15.b of the Revised Tentative Order contain similar control measures and requirements. The Revised Tentative Order in effect sets up an entirely new and detailed permitting system that must now be implemented by the Permittees requiring lengthy applications, water quality sampling, monitoring and reporting. The municipalities must be allowed more discretion in the determination of the applicable control measures relating to discharges that may be sources of pollutants to receiving waters as envisioned in and as intended by the federal regulations.		

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				Recommended Action: We request that the introductory paragraph of Provision C.15.b. be revised to read as follows: "The following non-stormwater discharges are also exempt from Discharge Prohibition A.1 if they are either identified by the Permittees or the Executive Officer as not being sources of pollutants to receiving waters, or if they are identified as sources of pollutants to receiving waters, that BMPs/control measures are developed and implemented, as the Permittee deems appropriate to address the threat posed to water quality, including consideration of the tasks and implementation levels of each category of Provision C.15.b.i-vii below." The language of each of the discharge types should also be modified accordingly.		

Supplemental for Item 7.

Municipal Regional Stormwater NPDES Permit – Final Tentative Order

We have made revisions to the Final Tentative Order that are clarifications and typographic corrections, and do not include any substantive changes to the requirements of the Final Tentative Order.

This Supplemental consists of:

A table of the revisions to the Final Tentative Order including the specific section or provision, page number, and reason for the revision.

and

The Final Tentative Order with the supplemental revisions in redline/strikeout.

Final Tentative Order Supplemental Revisions

Municipal Regional Stormwater Permit
NPDES No. CAS612008

Section / Provision No.	Page No.	Proposed Changes to Final Tentative Order dated September 24, 2009	Reason
Add new Finding 16.	7	**16. Federal, State or regional entities within the Permittees' boundaries, not currently named in this Order, operate storm drain facilities and/or discharge stormwater to the storm drains and watercourses covered by this Order. The Permittees may lack jurisdiction over these entities. Consequently, the Water Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. The Water Board will consider such facilities for coverage under its NPDES permitting scheme pursuant to US EPA Phase II stormwater regulations. Under Phase II, the Water Board can permit these federal, State, and regional entities through use of the Statewide Phase II NPDES General Permit.**	Clarification
Findings 16-18	7	Change numbering to Findings 17-19	Following change above
Finding 18. (new Finding 19)	7	Change Permit Effective Date from July 1, 2009, to **December 1, 2009**	Typo
C.3.b.ii.(1)(e)&(f)	19	Change C.3.b.ii.(1)(i)-(iv) to C.3.b.ii.(1)**(a)**(i)-(iv)	Typo
C.3.b.ii.(1) Effective Date	19	Change C.3.b.i.(1) to C.3.b.**ii**.(1)	Typo
C.3.e.iv.(1)	34	Change C.3.c.i-ii to C.3.**e**.i-ii	Typo
C.3.e.iv.(4)	34	Change C.3.e.i to C.3.e.**i-ii**	Typo
C.3.g.v.(3) 1st bullet	38	Change C.3.g.vi.(2) to C.3.g.**v**.(2)	Typo
C.8.a 3rd sentence, 3rd paragraph	64	Add "**Long-Term Monitoring**." This sentence was/is intended to provide flexibility in the design of C.8.e monitoring, both Pollutants of Concern and Long-Term Monitoring.	Clarification
C.8.b	65	Replace RMP monitoring objectives with management questions: **Are chemical concentrations in the Estuary potentially at levels of concern and are associated impacts likely?** **What are the concentrations and masses of contaminants in the Estuary and its segments?** **What are the sources, pathways, loadings, and processes leading to contaminant related impacts in the Estuary?** **Have the concentrations, masses, and associated impacts of**	Update to current information about the Regional Monitoring Program

Final Tentative Order Supplemental Revisions

Municipal Regional Stormwater Permit
NPDES No. CAS612008

Section / Provision No.	Page No.	Proposed Changes to Final Tentative Order dated September 24, 2009	Reason
		contaminants in the Estuary increased or decreased? **What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?** Likewise, change footnote 20 on page 65 to reference "management questions" agreed upon in the RMP Steering Committee meeting of 5-09-08.	
Table 8.1	67, 69	For Biological Assessment; Toxicity – Bedded Sediment; and Pollutants – Bedded Sediment: Change references to Attachment G and Table G-1 in last column to Attachment **H** and Table **H**-1	Label error
Table 8.1	67	Footnote 24: add "…**for a subset of sites where sediment chemistry and toxicity samples are collected as required in Table 8.1**"	Clarification
Table 8.1	67	Footnote 28: after "Technical Report 563" insert: "…**and current SWAMP-approved updates to Standard Operating Procedures therein**."	Clarification
Table 8.1	68	Footnote 29: delete "and stream depth", as was previously done to Footnote 25.	Error
Table 8.1	69	Pathogen Indicators row, last column: delete phrase in parentheses "this involves multiple values".	Clarification
Table 8.1	69	Footnote 33: delete analyte list and accompanying reference. Toxicity testing does not involve analytes.	Error
Table 8.1	69	Footnote 34: insert "**et al. 2000**" after "MacDonald" and reference **Table 8.4** after the word "pyrethroids" at the end of the first sentence. Add the MacDonald reference information.	Clarification
Table 8.1	69	Footnote 36: **reference EPA 2004 FINAL guidance, March 2004**.	Clarification
Table 8.2	70	Add **San Francisquito Creek and tributaries** to SCVURPPP column.	Oversight
C.8.d.(iii)(3)	73	Replace reference to provision C.8.g.(iii) with C.8.g.(**v**).	Error
C.8.e.(iii) 2nd paragraph	74-75	Change "Permittees shall conduct Long-Term monitoring pursuant to Table 8.4 Categor**y 3** ~~and 4~~. Change subsequent Category 4 references to Category 3.	Simplification
Table 8.4	75-76	Place "**Category 3 – Toxicity–Water Colum**n" parameters into Category 1, so that all wet-weather sampling is in one category.	Simplification

Final Tentative Order Supplemental Revisions

Municipal Regional Stormwater Permit
NPDES No. CAS612008

Section / Provision No.	Page No.	Proposed Changes to Final Tentative Order dated September 24, 2009	Reason
C.8.g.i. End of paragraph	77	Add: "**The preceding reporting requirements shall not apply to continuing or recurring exceedances of water quality standards previously reported to the Water Board or to exceedances of pollutants that are to be addressed pursuant to Provisions C.8 through C.14 or this Order in accordance with Provision C.1**."	Clarification
Provision C.8.g.iii. First sentence	77	Change due dates: the initial report due March 15, 20~~11~~**12**, unless the Permittees choose to monitor through a regional collaborative, in which case the due date is March 15, 20~~12~~**13**.	Error
C.9	80	Include TMDL Waste Load Allocation information in introductory paragraph.	Clarification
C.11	88	Include TMDL Waste Load Allocation information in introductory paragraph.	Clarification
C.11.c.ii.(1) C.12.c.ii.(1)	89, 97	Delete last sentence: "Permittees are responsible for contaminants located on Permittees' public right-of-ways and the stormwater…"	Clarification
Provision C.11 and C.12	90-94 96 98-101	Change final reporting submittal for all C.11 and C.12 sub-provisions from "2013 Annual Report" (due on September 15, 2013), to "March 15, 2014" (Integrated Monitoring Report due date) to allow more time for monitoring results to be analyzed. Replace the reference to "2013 Annual Report" with March 15, 2014 Integrated Monitoring Report" in the following Provisions. • C.11.d.(iii)(2) • C.11.e.(iii)(2) • C.11.f.(iii)(3) • C.11.g.(iii)(2) • C.11.h.(iii) • C.11.i.(iii) • C.11.j.(ii) • C.12.b.(iii)(4) • C.12.c.(iii)(4) • C.12.d.(v) • C.12.e.(iv)(2) • C.12.f.(iii)(3) • C.12.h.(iii) • C.12.i.(iii)	Allow additional time for report preparation
C.15. 1st paragraph	108	Change the second sentence as follows: "In order for ~~exempt~~ non-stormwater discharges to be conditionally exempted from Discharge Prohibition A.1., Permittees must identify appropriate BMPs, monitor the non-stormwater discharges where necessary, and ensure implementation of effective control measures **– as listed below –** to eliminate …"	Clarification

Final Tentative Order Supplemental Revisions

Municipal Regional Stormwater Permit
NPDES No. CAS612008

Section / Provision No.	Page No.	Proposed Changes to Final Tentative Order dated September 24, 2009	Reason
C.16	117	Insert "**and in paper copy upon request**" and delete "hard copy" in the first sentence.	Clarification
C.20	118	To avoid a lapse in permit coverage immediately upon adoption, add language shown in bold below: "Order Nos. 99-058, 99-059, 01-024, R2-2003-0021, and R2-2003-0034 are hereby rescinded **on the effective date of this order, which shall be December 1, 2009, provided that the Regional Administrator of USEPA, Region IX, does not object."**	Clarification
Attachment A	A-3 A-4 A-6	Update sample entries, footnotes, and instructions for Provision C.3.b. Sample Reporting Table to reflect alternative compliance options in Provision C.3.e. of the Final Tentative Order.	Oversight
Attachment B	B-4 B-5	Correct HM Map references in text and add labels to HM Maps	Label error
Attachment D	D-3	Correct HM Map references in text and add labels to HM Maps	Label error
Attachment E	E-3	Correct HM Map references in text and add labels to HM Maps	Label error
Attachment F	F-3	Correct HM Map references in text and add labels to HM Maps	Label error
Attachment H	H-2	Change references from "G-1" to "**H**-1".	Typo
Attachment K	K-1 to K-12	Remove General Provisions B, C.5, C.6.c.ii. and E.1,2,7,8,9,10,16 and 17. Re-number remaining Provisions. Replace reference to "Regional Board" with "**Water Board**."	Clarification
Throughout		Minor spelling and format edits, including references to "the" Permittees	Typo

California Regional Water Quality Control Board
San Francisco Bay Region
Municipal Regional Stormwater NPDES Permit

Final Tentative Order R2-2009-XXXX
NPDES Permit No. CAS612008
October 14, 2009

California Regional Water Quality Control Board
San Francisco Bay Region
Municipal Regional Stormwater NPDES Permit

FINAL TENTATIVE ORDER R2-2009-XXXX
NPDES PERMIT NO. CAS612008

Issuing Waste Discharge Requirements and National Pollutant Discharge Elimination System (NPDES) Permit for the discharge of stormwater runoff from the municipal separate storm sewer systems (MS4s) of the following jurisdictions and entities, which are permitted under this San Francisco Bay Municipal Regional Stormwater Permit (MRP):

The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County, the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District, which have joined together to form the Alameda Countywide Clean Water Program (Alameda Permittees)

The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, the Contra Costa County Flood Control and Water Conservation District, which have joined together to form the Contra Costa Clean Water Program (Contra Costa Permittees)

The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District, and Santa Clara County, which have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (Santa Clara Permittees)

The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco, the towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the San Mateo County Flood Control District, and San Mateo County, which have joined together to form the San Mateo Countywide Water Pollution Prevention Program (San Mateo Permittees)

The cities of Fairfield and Suisun City, which have joined together to form the Fairfield-Suisun Urban Runoff Management Program (Fairfield-Suisun Permittees)

The City of Vallejo and the Vallejo Sanitation and Flood Control District (Vallejo Permittees)

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The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter referred to as the Water Board) finds that:

FINDINGS

Incorporation of Fact Sheet

1. The Fact Sheet for the San Francisco Bay Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (Appendix I) includes cited regulatory and legal references and additional explanatory information in support of the requirements of this Permit. This information, including any supplements thereto, and any future response to comments on the Revised Tentative Order, is hereby incorporated by reference.

Existing Permits

2. **Alameda County—**The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County (Unincorporated area), the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District have joined together to form the Alameda Countywide Clean Water Program (hereinafter collectively referred to as the Alameda Permittees) and have submitted a permit application (Report of Waste Discharge), dated July 26, 2007, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Alameda Permittees' jurisdictions. The Alameda Permittees are currently subject to NPDES Permit No. CAS0029831 issued by Order No. R2-2003-0021 on February 19, 2003, and amended by Order No. R2-2007-0025 on March 14, 2007, to the Alameda Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

3. **Contra Costa County—**The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, and the Contra Costa County Flood Control and Water Conservation District have joined together to form the Contra Costa Clean Water Program (hereinafter collectively referred to as the Contra Costa Permittees) and have submitted a permit application (Report of Waste Discharge), dated September 30, 2003, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Contra Costa Permittees' jurisdictions. The Contra Costa Permittees are currently subject to NPDES Permit No. CAS0029912 issued by Order No. 99-058 on July 21, 1999, amended by Order No. R2-2003-0022 on February 9, 2003, amended by Order Nos. R2-2004-059 and R2-2004-0061 on July 21, 2004, and amended by Order No. R2-2006-0050 on July 12, 2006, to the Contra Costa Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

4. **San Mateo County—**The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco, the towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the San Mateo County Flood Control District and San Mateo County have joined together to form the San Mateo Countywide Water Pollution Prevention

Program (hereinafter collectively referred to as the San Mateo Permittees) and have submitted a permit application (Report of Waste Discharge), dated January 23, 2004, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the San Mateo Permittees' jurisdictions. The San Mateo Permittees are currently subject to NPDES Permit No. CAS0029921 issued by Order No. 99-059 on July 21, 1999, amended by Order No. R2-2003-0023 on February 19, 2003, amended by Order Nos. R2-2004-0060 and R2-2004-0062 on July 21, 2004, and amended by Order R2-2007-0027 on March 14, 2007, to the San Mateo Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

5. **Santa Clara County—**The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District, and the County of Santa Clara have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (hereinafter collectively referred to as the Santa Clara Permittees) and have submitted a permit application (Report of Waste Discharge), dated February 25, 2005, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Santa Clara Permittees' jurisdictions. The Santa Clara Permittees are currently subject to NPDES Permit No. CAS029718 issued by Order No. 01-024 on April 21, 2001, amended by Order No. 01-119 on October 17, 2001, and Order No. R2-2005-0035 on July 20, 2005, to the Santa Clara Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

6. **Fairfield-Suisun—**The cities of Fairfield and Suisun City have joined together to form the Fairfield-Suisun Urban Runoff Management Program (hereinafter referred to as the Fairfield-Suisun Permittees) and have submitted a permit application (Report of Waste Discharge), dated October 17, 2007, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Fairfield-Suisun Permittees' jurisdictions. The Fairfield-Suisun Permittees are currently subject to NPDES Permit No. CAS0612005 issued by Order No. R2-2003-0034 on April 16, 2003, and amended by Order R2-2007-0026 on March 14, 2007, to the Fairfield-Suisun Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

7. **Vallejo—**The City of Vallejo and the Vallejo Sanitary District (hereinafter referred to as the Vallejo Permittees) are currently subject to NPDES Permit No. CAS612006 issued by United States Environmental Protection Agency (USEPA) on April 27, 1999, and that became effective on May 30, 1999 for the discharge of stormwater runoff from storm drains and watercourses within the Vallejo Permittees' jurisdictions.

8. The Alameda, Contra Costa, San Mateo, Santa Clara, Fairfield-Suisun, and Vallejo Permittees are hereinafter referred to in this Order as Permittees.

Applicable Federal, State and Regional Regulations

9. Section 402(p) of the federal Clean Water Act (CWA), as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, USEPA published regulations (40 CFR Part 122), which prescribe permit application requirements for MS4s pursuant to CWA 402(p). On May 17, 1996, USEPA published an Interpretive Policy

Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s.

10. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board (State Board), Office of Administrative Law and the USEPA, where required.

11. The Water Board finds stormwater discharges from urban and developing areas in the San Francisco Bay Region to be significant sources of certain pollutants that cause or may be causing or threatening to cause or contribute to water quality impairment in waters of the Region. Furthermore, as delineated in the CWA section 303(d) list, the Water Board has found that there is a reasonable potential that municipal stormwater discharges cause or may cause or contribute to an excursion above water quality standards for the following pollutants: mercury, PCBs, furans, dieldrin, chlordane, DDT, and selenium in San Francisco Bay segments; pesticide associated toxicity in all urban creeks; and trash and low dissolved oxygen in Lake Merritt, in Alameda County. In accordance with CWA section 303(d), the Water Board is required to establish TMDLs for these pollutants to these waters to gradually eliminate impairment and attain water quality standards. Therefore, certain early pollutant control actions and further pollutant impact assessments by the Permittees are warranted and required pursuant to this Order.

12. The San Francisco Estuary Project, established pursuant to CWA Section 320, culminated in June 1993 with completion of its Comprehensive Conservation and Management Plan (CCMP) for the preservation, restoration, and enhancement of the San Francisco Bay-Delta Estuary. The 2007 update of the CCMP includes new and revised actions, while retaining many of the original plan's actions. The CCMP includes recommended actions in the areas of aquatic resources, wildlife, wetlands, water use, pollution prevention and reduction, dredging and waterway modification, land use, public involvement and education, and research and monitoring. Recommended actions which may, in part, be addressed through implementation of this Permit include, but are not limited to, the following:

    (1) ACTION AR-9.1 (New 2007)
    Improve understanding of sources, types, and impacts of marine debris in the Estuary.

    (5) ACTION AR-9.2 (New 2007)
    Expand existing marine debris prevention and cleanup programs and develop new initiatives to reduce discharge of debris to waterways.

    (10) ACTION PO-1.2 (Revised 2007)
    Recommend institutional and financial changes needed to place more focus on pollution prevention.

    (12) ACTION PO-1.6 (Revised 2007)
    Implement a comprehensive strategy to reduce pesticides coming into the Estuary.

    (13) ACTION PO-1.7.1 (New 2007)
    Develop product stewardship program for new commercial products to minimize future pollutant releases.

(14) ACTION PO-1.8 (New 2007)
Develop and implement programs to prevent pollution of the Estuary by other harmful pollutants like trash, bacteria, sediments, and nutrients.

(15) ACTION PO-2.1 (Revised 2007)
Pursue a mass emissions strategy to reduce pollutant discharges into the Estuary from point and nonpoint sources and to address the accumulation of pollutants in estuarine organisms and sediments.

(16) ACTION PO-2.4 (Revised 2007)
Improve the management and control of urban runoff from public and private sources.

(18) ACTION PO-3.3 (New 2007)
Accomplish large-scale improvements to Bay-Delta area infrastructure and implement pollution prevention strategies to prevent pollution threats to public health and wildlife.

(19) ACTION PO-4.1 (New 2007)
Increase regulatory incentives for municipalities, through urban runoff and other programs, to invest in projects that restore or enhance stream and wetland functions.

(20) ACTION LU-1.1 (Revised 2007)
Local land use jurisdiction's General Plans should incorporate watershed protection goals for wetlands and stream environments and to reduce pollutants in runoff.

(21) ACTION LU-1.1.1 (New 2007): Provide assistance to local agencies to ensure that applicable nonpoint source control elements are incorporated into local government and business practices.

(22) ACTION LU-1.5 (LU-3.2 in 1993 CCMP; Revised 2007)
Provide incentives and promote the use of building, planning, and maintenance guidelines for site planning and implementation of best management practices (BMPs) as related to stormwater and encourage local jurisdictions to adopt these guidelines as local ordinances.

(23) ACTION LU-1.6 (New 2007)
Continue and enhance training and certification for planners, public works departments, consultants, and builders on sustainable design and building practices with the goal of preventing or minimizing alteration of watershed functions (e.g., flood water conveyance, groundwater infiltration, stream channel and floodplain maintenance), and preventing construction-related erosion and post-construction pollution.

(24) ACTION LU-2.7 (New 2007)
Adopt and implement policies and plans that protect and restore water quality, flood water storage, and other natural functions of stream and wetland systems.

(25) ACTION LU-3.1 (New 2007)
Promote, encourage, and support collaborative partnerships with broad stakeholder representation, such as watershed councils, in order to develop diverse community-based approaches to long-term stewardship.

(26) ACTION LU-4.1 (Revised 2007)
Educate the public about how human actions impact the Estuary and its watersheds.

(28) ACTION PI-2.5 (Revised 2007)
Assist in the development of long-term educational programs designed to prevent pollution to the Estuary's ecosystem and provide assistance to other programs as needed.

13. Under section 13389 of the California Water Code, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA).

Nature of Discharges and Sources of Pollutants

14. Stormwater runoff is generated from various land uses in all the hydrologic sub basins in the Basin and discharges into watercourses, which in turn flow into Central, Lower and South San Francisco Bay.

15. The quality and quantity of runoff discharges vary considerably and are affected by hydrology, geology, land use, season, and sequence and duration of hydrologic events. Pollutants of concern in these discharges are certain heavy metals; excessive sediment production from erosion due to anthropogenic activities; petroleum hydrocarbons from sources such as used motor oil; microbial pathogens of domestic sewage origin from illicit discharges; certain pesticides associated with acute aquatic toxicity; excessive nutrient loads, which can cause or contribute to the depletion of dissolved oxygen and/or toxic concentrations of dissolved ammonia; trash, which impairs beneficial uses including, but not limited to, support for aquatic life; and other pollutants which can cause aquatic toxicity in the receiving waters.

16. Federal, state or regional entities within the Permittees' boundaries, not currently named in this Order, operate storm drain facilities and/or discharge stormwater to the storm drains and watercourses covered by this Order. The Permittees may lack jurisdiction over these entities. Consequently, the Regional Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. The Regional Board will consider such facilities for coverage under its NPDES permitting scheme pursuant to United States Environmental Protection Agency (US EPA) Phase II stormwater regulations. Under Phase II, the Regional Board can permit these federal, state, and regional entities through use of the Statewide Phase II NPDES General Permit.

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~~16.~~17. Certain pollutants present in stormwater and/or urban runoff can be derived from extraneous sources over which the Permittees have limited or no direct jurisdiction. Examples of such pollutants and their respective sources are polycyclic aromatic hydrocarbons (PAHs), which are products of internal combustion engine operation and other sources; heavy metals, such as copper from vehicle brake pad wear and zinc from vehicle tire wear; dioxins as products of combustion; polybrominated diphenyl ethers that are incorporated in many household products as flame retardants; mercury resulting from atmospheric deposition; and naturally occurring minerals from local geology. All these pollutants, and others, can be deposited on paved surfaces, rooftops, and other impervious surfaces as fine airborne particles—thus yielding stormwater runoff pollution that is unrelated to the activity associated with a given project site.

~~17.~~18. The Water Board will notify interested agencies and interested persons of the availability of reports, plans, and schedules, including Annual Reports, and will provide interested persons with an opportunity for a public hearing and/or an opportunity to submit their written views and recommendations. The Water Board will consider all comments and may modify the reports, plans, or schedules or may modify this Order in accordance with applicable law. All submittals required by this Order conditioned with acceptance by the Water Board will be subject to these notification, comment, and public hearing procedures.

~~18.~~19. This Order supersedes and rescinds Order Nos. 99-058, 99-059, 01-024, R2-2003-0021, R2-2003-0034, and supersedes NPDES Permit Nos. CAS0029831, CAS0029912, CAS0029921, CAS029718, CAS0612005, and CAS612006.

This Order serves as a NPDES permit, pursuant to CWA section 402, or amendments thereto, and shall become effective ~~July~~ December 1, 2009, provided the Regional Administrator, USEPA, Region 9, has no objections.

IT IS HEREBY ORDERED that the Permittees, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder and the provisions of the Clean Water Act as amended and regulations and guidelines adopted hereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

A.1. The Permittees shall, within their respective jurisdictions, effectively prohibit the discharge of non-stormwater (materials other than stormwater) into, storm drain systems and watercourses. NPDES-permitted discharges are exempt from this prohibition. Provision C.15 describes a tiered categorization of non-stormwater discharges based on potential for pollutant content that may be discharged upon adequate assurance that the discharge contains no pollutants of concern at concentrations that will impact beneficial uses or cause exceedances of water quality standards.

A.2. It shall be prohibited to discharge rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas.

B. RECEIVING WATER LIMITATIONS

B.1. The discharge shall not cause the following conditions to create a condition of nuisance or to adversely affect beneficial uses of waters of the State:

- **a.** Floating, suspended, or deposited macroscopic particulate matter, or foam;
- **b.** Bottom deposits or aquatic growths;
- **c.** Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
- **d.** Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
- **e.** Substances present in concentrations or quantities that would cause deleterious effects on aquatic biota, wildlife, or waterfowl, or that render any of these unfit for human consumption.

B.2. The discharge shall not cause or contribute to a violation of any applicable water quality standard for receiving waters. If applicable water quality objectives are adopted and approved by the State Board after the date of the adoption of this Order, the Water Board may revise and modify this Order as appropriate.

C.1. Compliance with Discharge Prohibitions and Receiving Water Limitations

The Permittees shall comply with Discharge Prohibitions A.1 and A.2 and Receiving Water Limitations B.1 and B.2 through the timely implementation of control measures and other actions as specified in Provisions C.2 through C.15.

If exceedance(s) of water quality standards or water quality objectives (collectively, WQSs) persist in receiving waters, the Permittees shall comply with the following procedure:

C.1.a. Upon a determination by either the Permittee(s) or the Water Board that discharges are causing or contributing to an exceedance of an applicable WQS, the Permittee(s) shall notify, within no more than 30 days, and thereafter, except for any exceedances of WQSs for pesticides, trash, mercury, polychlorinated biphenols, copper, polybrominated diphenyl ethers, and selenium that are addressed pursuant to Provisions C.8 through C.14 of this Order, submit a report to the Water Board that describes BMPs that are currently being implemented, and the current level of implementation, and additional BMPs that will be implemented, and/or an increased level of implementation, to prevent or reduce the discharge of pollutants that are causing or contributing to the exceedance of WQSs. The report may be submitted in conjunction with the Annual Report, unless the Water Board directs an earlier submittal, and shall constitute a request to the Water Board for amendment of this NPDES Permit. The report and application for amendment shall include an implementation schedule. The Water Board may require modifications to the report and application for amendment; and

C.1.b. Submit any modifications to the report required by the Water Board within 30 days of notification.

As long as the Permittees have complied with the procedures set forth above, they do not have to repeat the same procedure for continuing or recurring exceedances of the same WQSs unless directed by the Water Board to develop additional control measures and BMPs and reinitiate the Permit amendment process.

C.2. Municipal Operations

The purpose of this provision is to ensure development and implementation of appropriate BMPs by all Permittees to control and reduce non-stormwater discharges and polluted stormwater to storm drains and watercourses during operation, inspection, and routine repair and maintenance activities of municipal facilities and infrastructure.

C.2.a. Street and Road Repair and Maintenance

i. Task Description – Asphalt/Concrete Removal, Cutting, Installation and Repair - The Permittees shall develop and implement appropriate BMPs at street and road repair and/or maintenance sites to control debris and waste materials during road and parking lot installation, repaving or repair maintenance activities, such as those described in the California Stormwater Quality Association's Handbook for Municipal Operations.

ii. Implementation Levels

(1) The Permittees shall require proper management of concrete slurry and wastewater, asphalt, pavement cutting, and other street and road maintenance materials and wastewater to avoid discharge to storm drains from such work sites. The Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer system is available for the wastewater generated from these activities provided that appropriate approvals and pretreatment standards are met.

(2) The Permittees shall require sweeping and/or vacuuming to remove debris, concrete, or sediment residues from such work sites upon completion of work. The Permittees shall require cleanup of all construction remains, spills and leaks using dry methods (e.g., absorbent materials, rags, pads, and vacuuming), as described in the Bay Area Stormwater Management Agencies Association's (BASMAA's) Blueprint for a Clean Bay.

iii. Reporting – The Permittees shall report on implementation of and compliance with these BMPs in the Annual Report

C.2.b. Sidewalk/Plaza Maintenance and Pavement Washing

i. Task Description – The Permittees shall implement, and require to be implemented, BMPs for pavement washing, mobile cleaning, pressure wash operations in such locations as parking lots and garages, trash areas, gas station fueling areas, and sidewalk and plaza cleaning, which prohibit the discharge of polluted wash water and non-stormwater to storm drains. The Permittees shall implement the BMPs included in BASMAA's Mobile Surface Cleaner Program. The Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer is available for the wastewater generated from these activities provided that appropriate approvals and pretreatment standards are met.

ii. Reporting – The Permittees shall report on implementation of and compliance with these BMPs in their Annual Report.

C.2.c. Bridge and Structure Maintenance and Graffiti Removal

i. Task Description

(1) The Permittees shall implement appropriate BMPs to prevent polluted stormwater and non-stormwater discharges from bridges and structural maintenance activities directly over water or into storm drains.

(2) The Permittees shall implement BMPs for graffiti removal that prevent non-stormwater and wash water discharges into storm drains.

ii. Implementation Levels

(1) The Permittees shall prevent all debris, including structural materials and coating debris, such as paint chips, or other debris and pollutants generated in bridge and structure maintenance or graffiti removal from entering storm drains or water courses.

(2) The Permittees shall protect nearby storm drain inlets before removing graffiti from walls, signs, sidewalks or other structures. The Permittees shall prevent any discharge of debris, cleaning compound waste, paint waste or wash water due to graffiti removal from entering storm drains or watercourses.

(3) The Permittees shall determine the proper disposal method for wastes generated from these activities. The Permittees shall train their employees and/or specify in contracts about these proper capture and disposal methods for the wastes generated.

iii. Reporting – The Permittees shall report on implementation of and compliance with these BMPs in their Annual Report.

C.2.d. Stormwater Pump Stations

The objective of this sub-provision is to prevent the discharge of water with low dissolved oxygen (DO) from pump stations, and to explore the use of pump stations for trash capture and removal from waters to protect beneficial uses of receiving waters.

i. Task Description – Operation and Maintenance of Stormwater Pump Stations – The Permittees shall develop and implement measures to operate, inspect, and maintain these facilities to eliminate non-stormwater discharges containing pollutants, and to reduce pollutant loads in the stormwater discharges to comply with WQSs.

ii. Implementation Levels – The Permittees shall comply with the following implementation measures to reduce polluted water discharges from Permittee-owned or operated pump stations:

(1) Complete an inventory of pump stations within each Permittee's jurisdiction, including locations, and key characteristics[1] by March 1, 2010.

(2) Inspect and collect DO data from all pump stations twice a year during the dry season after July 1, starting in 2010. DO monitoring is exempted where all discharge from a pump station infiltrates into a dry creek immediately downstream.

(3) If DO levels are at or below 3 milligrams per liter (3 mg/L), apply corrective actions, such as continuous pumping at a low flow rate, aeration, or other appropriate methods to maintain DO concentrations of the discharge above 3 mg/L. Verify corrective actions are effective by increasing DO monitoring interval to weekly until two weekly samples are above 3 mg/L.

(4) Starting in fall 2010, inspect pump stations a minimum of two times during the wet season in the first business day after ¼-inch and larger storm events after a minimum of a two week antecedent period with no precipitation. Post-storm inspections shall collect and report presence and quantity estimates of trash, including presence of odor, color, turbidity, and floating hydrocarbons. Remove debris and trash and replace any oil absorbent booms, as needed.

iii. Reporting – The Permittees shall report information resulting from C.2.d.ii.(2)-(4), including DO monitoring data and subsequent corrective actions taken to verify compliance with the 3 mg/L implementation level, in their Annual Report, and maintain records of inspection and maintenance activities and volume or mass of waste materials removed from pump stations.

C.2.e. Rural Public Works Construction and Maintenance

i. Task Description – Rural Road and Public Works Construction and Maintenance - For the purpose of this provision, rural means any watershed or portion thereof that is developed with large lot home-sites, such as one acre or larger, or with primarily agricultural, grazing or open space uses. The Permittees shall implement and require contractors to implement BMPs for erosion and sediment control during and after construction for maintenance activities on rural roads, particularly in or adjacent to stream channels or wetlands. The Permittees shall notify the Water Board, the California Department of Fish and Game and the U.S. Army Corps of Engineers, where applicable, and obtain appropriate agency permits for rural public works activities before work in or near creeks and wetlands.

[1] Characteristics include name of pump station, latitude and longitude in WGS 84, number of pumps, drainage area in acres, dominant land use(s), first receiving water body, maximum pumping capacity of station in gallons per minute (gpm), flow measurement capability (Y or N), flow measurement method, average wet season discharge rate in gpm, dry season discharge (Y, N, or unknown), nearest municipal wastewater treatment plant, wet well storage capacity in gallons, trash control (Y or N), trash control measure, and date built or last updated.

ii. Implementation Level

(1) The Permittees shall develop, where they do not already exist, and implement BMPs for erosion and sediment control measures during construction and maintenance activities on rural roads, including developing and implementing appropriate training and technical assistance resources for rural public works activities, by April 1, 2010.

(2) The Permittees shall develop and implement appropriate BMPs for the following activities, which minimize impacts on streams and wetlands in the course of rural road and public works maintenance and construction activities:

(a) Road design, construction, maintenance, and repairs in rural areas that prevent and control road-related erosion and sediment transport;

(b) Identification and prioritization of rural road maintenance on the basis of soil erosion potential, slope steepness, and stream habitat resources;

(c) Construction of roads and culverts that do not impact creek functions. New or replaced culverts shall not create a migratory fish passage barrier, where migratory fish are present, or lead to stream instability;

(d) Development and implementation of an inspection program to maintain rural roads' structural integrity and prevent impacts on water quality;

(e) Maintenance of rural roads adjacent to streams and riparian habitat to reduce erosion, replace damaging shotgun culverts and excessive erosion;

(f) Re-grading of unpaved rural roads to slope outward where consistent with road engineering safety standards, and installation of water bars as appropriate; and

(g) Replacement of existing culverts or design of new culverts or bridge crossings shall use measures to reduce erosion, provide fish passage and maintain natural stream geomorphology in a stable manner.

(3) The Permittees shall develop or incorporate existing training and guidance on permitting requirements for rural public works activities so as to stress the importance of proper planning and construction to avoid water quality impacts.

(4) The Permittees shall provide training incorporating these BMPs to rural public works maintenance staff at least twice within this Permit term.

iii. Reporting – The Permittees shall report on the implementation of and compliance with BMPs for the rural public works construction and maintenance activities in their Annual Report, including reporting on increased maintenance in priority areas.

C.2.f. Corporation Yard BMP Implementation

i. Task Description – Corporation Yard Maintenance

(1) The Permittees shall prepare, implement, and maintain a site specific Stormwater Pollution Prevention Plan (SWPPP) for corporation yards, including municipal vehicle maintenance, heavy equipment and maintenance vehicle parking areas, and material storage facilities to comply with water quality standards. Each SWPPP shall incorporate all applicable BMPs that are described in the California Stormwater Quality Association's Handbook for Municipal Operations and the Caltrans Storm Water Quality Handbook Maintenance Staff Guide, May 2003, and its addenda, as appropriate.

(2) The requirements in this provision shall apply only to facilities that are not already covered under the State Board's Industrial Stormwater NPDES General Permit.

(3) The site specific SWPPPs for corporation yards shall be completed by July 1, 2010.

ii. Implementation Level

(1) Implement BMPs to minimize pollutant discharges in stormwater and prohibit non-stormwater discharges, such as wash waters and street sweeper, vactor, and other related equipment cleaning wash water. Pollution control actions shall include, but not be limited to, good housekeeping practices, material and waste storage control, and vehicle leak and spill control.

(2) Routinely inspect corporation yards to ensure that no non-stormwater discharges are entering the storm drain system and, during storms, pollutant discharges are prevented to the maximum extent practicable. At a minimum, an inspection shall occur before the start of the rainy season.

(3) Plumb all vehicle and equipment wash areas to the sanitary sewer after coordination with the local sanitary sewer agency and equip with a pretreatment device (if necessary) in accordance with the requirements of the local sanitary sewer agency.

(4) Use dry cleanup methods when cleaning debris and spills from corporation yards. If wet cleaning methods must be used (e.g., pressure washing), the Permittee shall ensure that wash water is collected and disposed in the sanitary sewer after coordination with the local sanitary sewer agency and in accordance with the requirements of the local sanitary sewer agency. Any private companies hired by the Permittee to perform cleaning activities on Permittee-owned property shall follow the same requirements. In areas where sanitary sewer connection is not available, the Permittees shall collect and haul the wash water to a municipal

wastewater treatment plant, or implement appropriate BMPs and dispose of the wastewater to land in a manner that does not adversely impact surface water or groundwater.

(5) Outdoor storage areas containing waste pollutants shall be covered and/or bermed to prevent discharges of polluted stormwater runoff or run-on to storm drain inlets.

iii. Reporting – The Permittees shall report on implementation of SWPPPs, the results of inspections, and any follow-up actions in their Annual Report.

C.3. New Development and Redevelopment

The goal of Provision C.3 is for the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

C.3.a. New Development and Redevelopment Performance Standard Implementation

i. Task Description – At a minimum each Permittee shall:

(1) Have adequate legal authority to implement all requirements of Provision C.3;

(2) Have adequate development review and permitting procedures to impose conditions of approval or other enforceable mechanisms to implement the requirements of Provision C.3. For projects discharging directly to CWA section 303(d)-listed waterbodies, conditions of approval must require that post-development runoff not exceed pre-development levels for such pollutants that are listed;

(3) Evaluate potential water quality effects and identify appropriate mitigation measures when conducting environmental reviews, such as under CEQA;

(4) Provide training adequate to implement the requirements of Provision C.3 for staff, including interdepartmental training;

(5) Provide outreach adequate to implement the requirements of Provision C.3, including providing education materials to municipal staff, developers, contractors, construction site operators, and owner/builders, early in the planning process and as appropriate;

(6) For all new development and redevelopment projects that are subject to the Permittee's planning, building, development, or other comparable review, but not regulated by Provision C.3, encourage the inclusion of adequate site design measures that may include minimizing land disturbance and impervious surfaces (especially parking lots); clustering of structures and pavement; directing roof runoff to vegetated areas; use of micro-detention, including distributed landscape-based detention; preservation of open space; protection and/or restoration of riparian areas and wetlands as project amenities;

(7) For all new development and redevelopment projects that are subject to the Permittee's planning, building, development, or other comparable review, but not regulated by Provision C.3, encourage the inclusion of adequate source control measures to limit pollutant generation, discharge, and runoff. These source control measures should include:

- Storm drain stenciling.

- Landscaping that minimizes irrigation and runoff, promotes surface infiltration where possible, minimizes the use of pesticides and fertilizers, and incorporates appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping.
- Appropriate covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas.
- Covered trash, food waste, and compactor enclosures.
- Plumbing of the following discharges to the sanitary sewer, subject to the local sanitary sewer agency's authority and standards:
  - Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants.
  - Dumpster drips from covered trash and food compactor enclosures.
  - Discharges from outdoor covered wash areas for vehicles, equipment, and accessories.
  - Swimming pool water, if discharge to onsite vegetated areas is not a feasible option.
  - Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option.

(8) Revise, as necessary, General Plans to integrate water quality and watershed protection with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and policies (e.g., referencing the Bay-Friendly Landscape Guidelines).

ii. Implementation Level – Most of the elements of this task should already be fully implemented because they are required in the Permittees' existing stormwater permits.

Due Dates for Full Implementation – Immediate for C.3.a.i.(1)-(5), May 1, 2010 for C.3.a.i.(6)-(7), and December 1, 2010 for C.3.a.i.(8). For Vallejo Permittees: December 1, 2010 for C.3.a.i.(1)-(8)

iii. Reporting – Provide a brief summary of the method(s) of implementation of Provisions C.3.a.i.(1)–(8) in the 2011 Annual Report.

C.3.b. Regulated Projects

i. Task Description – The Permittees shall require all projects fitting the category descriptions listed in Provision C.3.b.ii below (hereinafter called Regulated Projects) to implement LID source control, site design, and stormwater treatment onsite or at a joint stormwater treatment facility[2] in accordance with Provisions C.3.c and C.3.d, unless the Provision C.3.e alternate compliance options are evoked. For adjacent Regulated Projects that will discharge runoff to a joint stormwater treatment facility, the treatment facility must be completed by

[2] **Joint stormwater treatment facility** – Stormwater treatment facility built to treat the combined runoff from two or more Regulated Projects located adjacent to each other,

the end of construction of the first Regulated Project that will be discharging runoff to the joint stormwater treatment facility.

Regulated Projects, as they are defined in this Provision, do not include detached single-family home projects that are not part of a larger plan of development.

ii. Regulated Projects are defined in the following categories:

(1) **Special Land Use Categories**

(a) **New Development or redevelopment projects** that fall into one of the categories listed below and that create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site). This category includes development projects of the following four types on public or private land that fall under the planning and building authority of a Permittee:

(i) Auto service facilities, described by the following Standard Industrial Classification (SIC) Codes: 5013, 5014, 5541, 7532-7534, and 7536-7539;

(ii) Retail gasoline outlets;

(iii) Restaurants (SIC Code 5812); or

(iv) Uncovered parking lots that are stand-alone or part of any other development project. This category includes the top uncovered portion of parking structures unless drainage from the uncovered portion is connected to the sanitary sewer along with the covered portions of the parking structure.

(b) For redevelopment projects in the categories specified in Provision C.3.b.ii.(1)(a)(i)-(iv), specific exclusions are:

(i) Interior remodels;

(ii) Routine maintenance or repair such as:

- roof or exterior wall surface replacement,
- pavement resurfacing within the existing footprint.

(c) Where a redevelopment project in the categories specified in Provision C.3.b.ii.(1)(a)(i)-(iv) results in an alteration of **more than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire redevelopment project).

(d) Where a redevelopment project in the categories specified in Provision C.3.b.ii.(1)(a)(i)-(iv) results in an alteration of **less than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the new and/or replaced impervious surface of the project).

(e) For any private development project in the categories specified in Provisions C.3.b.ii.(1)(a)(i)-(iv) for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, the lower 5000 square feet impervious surface threshold (for classification as a Regulated Project) shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, for the 5000 square feet threshold, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the lower 5000 square feet impervious surface threshold specified in Provision C.3.b.ii.(1).

(f) For any private development project in the categories specified in Provisions C.3.b.ii.(1)(a)(i)-(iv) with an application deemed complete after the Permit effective date, the lower 5000 square feet impervious surface threshold (for classification as a Regulated Project) shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011, for the 5000 square feet threshold.

(g) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the lower 5000 square feet of impervious surface threshold (for classification as a Regulated Project) shall not apply.

Effective Date – Immediate, except December 1, 2010, for Vallejo Permittees.

Beginning December 1, 2011, all references to 10,000 square feet in Provision C.3.b.ii.(1) change to 5,000 square feet.

(2) **Other Development Projects**

New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single-family home subdivisions, multi-family attached subdivisions (town homes), condominiums, and apartments), mixed-use, and public projects. This category includes development projects on public or private land that fall under the planning and building authority of a Permittee. Detached single-family home projects that are not part of a larger plan of development are specifically excluded.

Effective Date – Immediate, except December 1, 2010, for Vallejo Permittees.

(3) **Other Redevelopment Projects**

Redevelopment projects that create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single-family home subdivisions, multi-family attached subdivisions (town homes), condominiums, and apartments), mixed-use, and public projects. Redevelopment is any land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a site on which some past development has occurred. This category includes redevelopment projects on public or private land that fall under the planning and building authority of a Permittee.

Specific exclusions to this category are:

- Interior remodels.
- Routine maintenance or repair such as:
  - roof or exterior wall surface replacement, or
  - pavement resurfacing within the existing footprint.

(a) Where a redevelopment project results in an alteration of **more than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire redevelopment project).

(b) Where a redevelopment results in an alteration **of less than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the new and/or replaced impervious surface of the project).

Effective Date – Immediate, except December 1, 2010, for Vallejo Permittees.

(4) **Road Projects**

Any of the following types of road projects that create 10,000 square feet or more of newly constructed contiguous impervious surface and that fall under the building and planning authority of a Permittee:

(a) Construction of new streets or roads, including sidewalks and bicycle lanes built as part of the new streets or roads.

(b) Widening of existing streets or roads with additional traffic lanes.

(i) Where the addition of traffic lanes results in an alteration of **more than 50 percent** of the impervious surface of an existing street or road that was not subject to Provision C.3, **the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design** (i.e.,

stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire street or road that had additional traffic lanes added).

(ii) Where the addition of traffic lanes results in an alteration **of less than 50 percent** of the impervious surface of an existing street or road that was not subject to Provision C.3, **only the new and/or replaced impervious surface of the project must be included in the treatment system design** (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from only the new traffic lanes). However, if the stormwater runoff from the existing traffic lanes and the added traffic lanes cannot be separated, any onsite treatment system must be designed and sized to treat stormwater runoff from the entire street or road. If an offsite treatment system is installed or in-lieu fees paid in accordance with Provision C.3.e, the offsite treatment system or in-lieu fees must address only the stormwater runoff from the added traffic lanes.

(c) Construction of impervious trails that are greater than 10 feet wide or are creek-side (within 50 feet of the top of bank).

(d) Specific exclusions to Provisions C.3.b.ii.(4)(a)-(c) are:

- Sidewalks built as part of new streets or roads and built to direct stormwater runoff to adjacent vegetated areas.
- Bicycle lanes that are built as part of new streets or roads but are not hydraulically connected to the new streets or roads and that direct stormwater runoff to adjacent vegetated areas.
- Impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or towards the outboard side of levees.
- Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.[3]
- Caltrans highway projects and associated facilities.

(e) For any private road or trail project described by Provisions C.3.b.ii.(4)(b) or (c) for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, the requirements of Provisions C.3.b.ii.(4)(b) or (c) to classify the project as a Regulated Project shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, for Provisions C.3.b.ii.(4)(b) and (c), the project applicant has not taken

[3] **Permeable surfaces** include pervious concrete, porous asphalt, unit pavers, and granular materials.

any action to obtain the necessary approvals from the Permittee, the project will then be classified as a Regulated Project under Provisions C.3.b.ii.(4)(b) or (c).

(f) For any private road or trail project with an application deemed complete after the Permit effective date, the requirements of Provisions C.3.b.i.(4)(b) or (c) to classify the project as a Regulated Project shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011, for Provisions C.3.b.ii.(4)(b) and (c).

(g) For any public road or trail project for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provisions C.3.b.i.(4)(b) or (c) to classify the project as a Regulated Project shall not apply.

Effective Date – Immediate for C.3.b.ii.(4)(a) and (d)-(g), and December 1, 2011, for C.3.b.ii.(4)(b) and (c). For Vallejo Permittees: Immediate for C.3.b.ii.(4)(d)-(g), and December 1, 2011 for C.3.b.ii.(4)(a)-(c).

iii. Green Street Pilot Projects

The Permittees shall cumulatively complete ten pilot green street projects that incorporate LID techniques for site design and treatment in accordance with Provision C.3.c and that provide stormwater treatment sized in accordance with Provision C.3.d. It is also desirable that they meet or exceed the Bay-Friendly Landscape Scorecard minimum requirements (see www.BayFriendly.org).

(1) Parking lot projects that provide LID treatment in accordance with Provisions C.3.c and Provision C.3.d. for stormwater runoff from the parking lot and street may be considered pilot green street projects.

(2) A Regulated Project (as defined in Provision C.3.b.ii) may not be counted as one of the ten pilot green street projects.

(3) At least two pilot green street projects must be located in each of the following counties: Alameda, Contra Costa, San Mateo, and Santa Clara.

(4) The Permittees shall construct the ten pilot green street projects in such a manner that they, as a whole:

(a) Are representative of the various types of streets: arterial, collector, and local; and

(b) Contain the following key elements:

(i) Stormwater storage for landscaping reuse or stormwater treatment and/or infiltration for groundwater replenishment through the use of natural feature systems;

(ii) Creation of attractive streetscapes that enhance neighborhood livability by enhancing the pedestrian environment and introducing park-like elements into neighborhoods;

(iii) Service as an urban greenway segment that connects neighborhoods, parks, recreation facilities, schools, mainstreets, and wildlife habitats;

(iv) Parking management that includes maximum parking space requirements as opposed to minimum parking space requirements, parking requirement credits for subsidized transit or shuttle service, parking structures, shared parking, car sharing, or on-street diagonal parking;

(v) Meets broader community goals by providing pedestrian and, where appropriate, bicycle access; and

(vi) Located in a Priority Development Area as designated under the Association of Bay Area Government's and Metropolitan Transportation Commission's FOCUS[4] program.

(5) The Permittees shall conduct appropriate monitoring of these projects to document the water quality benefits achieved. Appropriate monitoring may include modeling using the design specifications and specific site conditions.

Due Date – All pilot green street projects shall be completed by December 1, 2014.

iv. Implementation Level – All elements of Provision C.3.b.i.-iii shall be fully implemented by the effective/due dates set forth in their respective sub-provision, and a database or equivalent tabular format shall be developed and maintained that contains all the information listed under Reporting (Provision C.3.b.v.).

Due Dates for Full Implementation – See specific Effective Dates listed under Provisions C.3.b.ii& iii. .The database or equivalent tabular format required by Provision C.3.b.iv shall be developed by December 1, 2010. (For Vallejo Permittees: ~~December~~ December 1, 2011)

v. Reporting

(1) **Annual Reporting – C.3.b.ii. Regulated Projects**

For each Regulated Project approved during the fiscal year reporting period, the following information shall be reported electronically in the fiscal year Annual Report, in tabular form (as set forth in the attached Provision C.3.b. Sample Reporting Table):

(a) Project Name, Number, Location (cross streets), and Street Address;

(b) Name of Developer, Phase No. (if project is being constructed in phases, each phase should have a separate entry), Project Type (e.g., commercial, industrial, multiunit residential, mixed-use, public), and description;

(c) Project watershed;

(d) Total project site area and total area of land disturbed;

[4] FOCUS is a regional incentive-based development and conservation strategy for the Bay Area.

(e) Total new impervious surface area and/or total replaced impervious surface area;

(f) If redevelopment or road widening project, total pre-project impervious surface area and total post-project impervious surface area;

(g) Status of project (e.g., application date, application deemed complete date, project approval date);

(h) Source control measures;

(i) Site design measures;

(j) All post-construction stormwater treatment systems installed onsite, at a joint stormwater treatment facility, and/or at an offsite location;

(k) Operation and maintenance responsibility mechanism for the life of the project.

(l) Hydraulic Sizing Criteria used;

(m) Alternative compliance measures for Regulated Project (if applicable)

(i) If alternative compliance will be provided at an offsite location in accordance with Provision C.3.e.i.(1), include information required in Provision C.3.b.v.(a) – (l) for the offsite project; and

(ii) If alternative compliance will be provided by paying in-lieu fees in accordance with Provision C.3.e.i.(2), provide information required in Provision C.3.b.v.(a) – (l) for the Regional Project. Additionally, provide a summary of the Regional Project's goals, duration, estimated completion date, total estimated cost of the Regional Project, and estimated monetary contribution from the Regulated Project to the Regional Project; and

(n) Hydromodification (HM) Controls (see Provision C.3.g.) – If not required, state why not. If required, state control method used.

(2) **Pilot Green Streets Project Reporting - Provision C.3.b.iii.**

(a) On an annual basis, the Permittees shall report on the status of the pilot green street projects.

(b) For each completed project, the Permittees shall report the capital costs, operation and maintenance costs, legal and procedural arrangements in place to address operation and maintenance and its associated costs, and the sustainable landscape measures incorporated in the project including, if relevant, the score from the Bay-Friendly Landscape Scorecard.

(c) The 2013 Annual Report shall contain a summary of all green street projects completed by January 1, 2013. The summary shall include for each completed project the following information:

(i) Location of project

(ii) Size of project, including total impervious surface treated

(iii) Map(s) of project showing areas where stormwater runoff will be treated by LID measures

(iv) Specific type(s) of LID treatment measures included
(v) Total and specific costs of project
(vi) Specific funding sources for project and breakdown of percentage paid by each funding source
(vii) Lessons learned, including recommendations to facilitate funding and building of future projects
(viii) Identification of responsible party and funding source for operation and maintenance.

C.3.c. Low Impact Development (LID)

The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as rain barrels and cisterns, green roofs, permeable pavement, preserving undeveloped open space, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.

Task Description

i. The Permittees shall, at a minimum, implement the following LID requirements:

(1) **Source Control Requirements**

Require all Regulated Projects to implement source control measures onsite that at a minimum, shall include the following:

(a) Minimization of stormwater pollutants of concern in urban runoff through measures that may include plumbing of the following discharges to the sanitary sewer, subject to the local sanitary sewer agency's authority and standards:

- Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants;
- Dumpster drips from covered trash, food waste and compactor enclosures;
- Discharges from covered outdoor wash areas for vehicles, equipment, and accessories;
- Swimming pool water, if discharge to onsite vegetated areas is not a feasible option; and
- Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option;

(b) Properly designed covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas;

(c) Properly designed trash storage areas;

(d) Landscaping that minimizes irrigation and runoff, promotes surface infiltration, minimizes the use of pesticides and fertilizers, and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping;

(e) Efficient irrigation systems; and

(f) Storm drain system stenciling or signage.

(2) **Site Design and Stormwater Treatment Requirements**

(a) Require each Regulated Project to implement at least the following design strategies onsite:

(i) Limit disturbance of natural water bodies and drainage systems; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;

(ii) Conserve natural areas, including existing trees, other vegetation, and soils;

(iii) Minimize impervious surfaces;

(iv) Minimize disturbances to natural drainages; and

(v) Minimize stormwater runoff by implementing one or more of the following site design measures:

- Direct roof runoff into cisterns or rain barrels for reuse.
- Direct roof runoff onto vegetated areas.
- Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
- Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
- Construct sidewalks, walkways, and/or patios with permeable surfaces.[3]
- Construct driveways, bike lanes, and/or uncovered parking lots with permeable surfaces.[3]

(b) Require each Regulated Project to treat 100% of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility.

(i) LID treatment measures are harvesting and re-use, infiltration, evapotranspiration, or biotreatment.

(ii) A properly engineered and maintained biotreatment system may be considered only if it is infeasible to implement harvesting and re-use, infiltration, or evapotranspiration at a project site.

(iii) Infeasibility to implement harvesting and re-use, infiltration, or evapotranspiration at a project site may result from conditions including the following:

- Locations where seasonal high groundwater would be within 10 feet of the base of the LID treatment measure.
- Locations within 100 feet of a groundwater well used for drinking water.
- Development sites where pollutant mobilization in the soil or groundwater is a documented concern.
- Locations with potential geotechnical hazards.
- Smart growth and infill or redevelopment sites where the density and/or nature of the project would create significant difficulty for compliance with the onsite volume retention requirement.
- Locations with tight clay soils that significantly limit the infiltration of stormwater.

(iv) By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report on the criteria and procedures the Permittees shall employ to determine when harvesting and re-use, infiltration, or evapotranspiration is feasible and infeasible at a Regulated Project site. This report shall, at a minimum, contain the information required in Provision C.3.c.iii.(1).

(v) By December 1, 2013, the Permittees, collaboratively or individually, shall submit a report on their experience with determining infeasibility of harvesting and re-use, infiltration, or evapotranspiration at Regulated Project sites. This report shall, at a minimum, contain the information required in Provision C.3.iii.(2).

(vi) Biotreatment systems shall be designed to have a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate. The planting and soil media for biotreatment systems shall be designed to sustain plant growth and maximize stormwater runoff retention and pollutant removal. By December 1, 2010, the Permittees, working collaboratively or individually, shall submit for Water Board approval, a proposed set of model biotreatment soil media specifications and soil infiltration testing methods to verify a long-term infiltration rate of 5 to 10 inches/hour. This submittal to the Water Board shall, at a minimum, contain the information required in Provision C.3.c.iii.(3). Once the Water Board approves biotreatment soil media specifications and soil infiltration testing methods, the Permittees shall ensure that biotreatment systems installed to meet the requirements of Provision C.3.c and d comply with the Water Board-approved minimum specifications and soil infiltration testing methods.

(vii) Green roofs may be considered biotreatment systems that treat roof runoff only if they meet certain minimum specifications. By May 1, 2011, the Permittees shall submit for Water Board approval, proposed minimum specifications for green roofs.

This submittal to the Water Board shall, at a minimum, contain the information required in Provision C.3.c.iii.(4). Once the Water Board approves green roof minimum specifications, the Permittees shall ensure that green roofs installed to meet the requirements of Provision C.3.c and d comply with the Water Board-approved minimum specifications.

(c) Require any Regulated Project that does not comply with Provision C.3.c.i.(2)(b) above to meet the requirements established in Provision C.3.e for alternative compliance.

ii. Implementation Level – All elements of the tasks described in Provision C.3.c.i shall be fully implemented.

Due Date for Full Implementation – December 1, 2011

(1) For any private development project for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, Provision C.3.c.i shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the requirements of Provision C.3.c.i.

(2) For any private development project with an application deemed complete after the Permit effective date, the requirements of Provision C.3.c.i shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011.

(3) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provision C.3.c.i shall not apply.

iii. Reporting

(1) Feasibility/Infeasibility Criteria Report - By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:

- Literature review and discussion of documented cases/sites, particularly in the Bay Area and California, where infiltration, harvesting and reuse, or evapotranspiration have been demonstrated to be feasible and/or infeasible.
- Discussion of proposed feasibility and infeasibility criteria and procedures the Permittees shall employ to make a determination of when biotreatment will be allowed at a Regulated Project site.

(2) Status Report on Application of Feasibility/Infeasibility Criteria – By December 1, 2013, the Permittees shall submit a report to the Water Board containing the following information:

- Discussion of the most common feasibility and infeasibility criteria employed since implementation of Provision C.3.c requirements, including site-specific examples;
- Discussion of barriers, including institutional and technical site specific constraints, to implementation of harvesting and reuse, infiltration, or evapotranspiration, and proposed strategies for removing these identified barriers;
- If applicable, discussion of proposed changes to feasibility and infeasibility criteria and rationale for the changes; and
- Guidance for the Permittees to make a consistent and appropriate determination of the feasibility of harvesting and reuse, infiltration, or evapotranspiration for each Regulated Project.

(3) Model Biotreatment Soil Media Specifications - By December 1, 2010, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:

- Proposed soil media specifications for biotreatment systems;
- Proposed soil testing methods to verify a long-term infiltration rate of 5-10 inches/hour;
- Relevant literature and field data showing the feasibility of the minimum design specifications;
- Relevant literature, field, and analytical data showing adequate pollutant removal and compliance with the Provision C.3.d hydraulic sizing criteria; and
- Guidance for the Permittees to apply the minimum specifications in a consistent and appropriate manner.

(4) Green Roof Minimum Specifications - By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:

- Proposed minimum design specifications for green roofs;
- Relevant literature and field data showing the feasibility of the minimum design specifications;
- Relevant literature, field, and analytical data showing adequate pollutant removal and compliance with the Provision C.3.d hydraulic sizing criteria;
- Discussion of data and lessons learned from already installed green roofs;
- Discussion of barriers, including institutional and technical site specific constraints, to installation of green roofs and proposed strategies for removing these identified barriers; and

- Guidance for the Permittees to apply the minimum specifications in a consistent and appropriate manner.

(5) Report the method(s) of implementation of Provisions C.3.c.i above in the 2012 Annual Report. For specific tasks listed above that are reported using the reporting tables required for Provision C.3.b.v, a reference to those tables will suffice.

C.3.d. Numeric Sizing Criteria for Stormwater Treatment Systems

i. Task Description – The Permittees shall require that stormwater treatment systems constructed for Regulated Projects meet at least one of the following hydraulic sizing design criteria:

(1) **Volume Hydraulic Design Basis** – Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to:

(a) The maximized stormwater capture volume for the area, on the basis of historical rainfall records, determined using the formula and volume capture coefficients set forth in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175–178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or

(b) The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Section 5 of the California Stormwater Quality Association's Stormwater Best Management Practice Handbook, New Development and Redevelopment (2003), using local rainfall data.

(2) **Flow Hydraulic Design Basis** – Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat:

(a) 10 percent of the 50-year peak flowrate;

(b) The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or

(c) The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

(3) **Combination Flow and Volume Design Basis** – Treatment systems that use a combination of flow and volume capacity shall be sized to treat at least 80 percent of the total runoff over the life of the project, using local rainfall data.

ii. Implementation Level – The Permittees shall immediately require the controls in this task.

Due Date for Full Implementation – Immediate, except December 1, 2010, for Vallejo Permittees.

iii. Reporting – Permittees shall use the reporting tables required in Provision C.3.b.v.

iv. Limitations on Use of Infiltration Devices in Stormwater Treatment Systems

(1) For Regulated Projects, each Permittee shall review planned land use and proposed treatment design to verify that installed stormwater treatment systems with no under-drain, and that function primarily as infiltration devices, should not cause or contribute to the degradation of groundwater quality at project sites. An infiltration device is any structure that is deeper than wide and designed to infiltrate stormwater into the subsurface and, as designed, bypass the natural groundwater protection afforded by surface soil. Infiltration devices include dry wells, injection wells, and infiltration trenches (includes french drains).

(2) For any Regulated Project that includes plans to install stormwater treatment systems which function primarily as infiltration devices, the Permittee shall require that:

(a) Appropriate pollution prevention and source control measures are implemented to protect groundwater at the project site, including the inclusion of a minimum of two feet of suitable soil to achieve a maximum 5 inches/hour infiltration rate for the infiltration system;

(b) Adequate maintenance is provided to maximize pollutant removal capabilities;

(c) The vertical distance from the base of any infiltration device to the seasonal high groundwater mark is at least 10 feet. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, a greater vertical distance from the base of the infiltration device to the seasonal high groundwater mark may be appropriate, and treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors in the overall analysis of groundwater safety);

(d) Unless stormwater is first treated by a method other than infiltration, infiltration devices are not approved as treatment measures for runoff from areas of industrial or light industrial activity; areas subject to high vehicular traffic (i.e., 25,000 or greater average daily traffic on a main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (e.g., bus, truck); nurseries; and other land uses that pose a high threat to water quality;

(e) Infiltration devices are not placed in the vicinity of known contamination sites unless it has been demonstrated that increased infiltration will not increase leaching of contaminants from soil, alter groundwater flow conditions affecting contaminant migration in groundwater, or adversely affect remedial activities; and

(f) Infiltration devices are located a minimum of 100 feet horizontally away from any known water supply wells, septic systems, and

underground storage tanks with hazardous materials. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, a greater horizontal distance from the infiltration device to known water supply wells, septic systems, or underground storage tanks with hazardous materials may be appropriate, and treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors in the overall analysis of groundwater safety).

C.3.e. Alternative or In-Lieu Compliance with Provision C.3.c.

i. The Permittees may allow a Regulated Project to provide alternative compliance with Provision C.3.c in accordance with one of the two options listed below:

(1) **Option 1: LID Treatment at an Offsite Location**

Treat a portion of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility **and** treat the remaining portion of the Provision C.3.d runoff with LID treatment measures at an offsite project in the same watershed. The offsite LID treatment measures must provide hydraulically-sized treatment (in accordance with Provision C.3.d) of an equivalent quantity of both stormwater runoff and pollutant loading and achieve a net environmental benefit.

(2) **Option 2: Payment of In-Lieu Fees**

Treat a portion of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility **and** pay equivalent in-lieu fees[5] to treat the remaining portion of the Provision C.3.d runoff with LID treatment measures at a Regional Project.[6] The Regional Project must achieve a net environmental benefit.

(3) For the alternative compliance options described in Provision C.3.e.i.(1) and (2) above, offsite projects must be constructed by the end of construction of the Regulated Project. If more time is needed to construct the offsite project, for each additional year, up to three years, after the construction of the Regulated Project, the offsite project must provide an additional 10% of the calculated equivalent quantity of both stormwater runoff and pollutant loading. Regional Projects must be completed within three years after the end of construction of the Regulated Project. However, the timeline for completion of the Regional Project may be

[5] **In-lieu fees** – Monetary amount necessary to provide both hydraulically-sized treatment (in accordance with Provision C.3.d) with LID treatment measures of an equivalent quantity of stormwater runoff and pollutant loading, and a proportional share of the operation and maintenance costs of the Regional Project.

[6] **Regional Project –** A regional or municipal stormwater treatment facility that discharges into the same watershed that the Regulated Project does.

extended, up to five years after the completion of the Regulated Project, with prior Executive Officer approval. Executive Officer approval will be granted contingent upon a demonstration of good faith efforts to implement the Regional Project, such as having funds encumbered and applying for the appropriate regulatory permits.

ii. Special Projects

(1) When considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and automobile-related pollutant impacts. Incentive LID treatment reduction credits approved by the Water Board may be applied to these types of Special Projects.

(2) By December 1, 2010, the Permittees shall submit a proposal to the Water Board containing the following information:

- Identification of the types of projects proposed for consideration of LID treatment reduction credits and an estimate of the number and cumulative area of potential projects during the remaining term of this Permit for each type of project;
- Identification of institutional barriers and/or technical site-specific constraints to providing 100% LID treatment onsite that justify the allowance for non-LID treatment measures onsite;
- Specific criteria for each type of Special Project proposed, including size, location, minimum densities, minimum floor area ratios, or other appropriate limitations;
- Identification of specific water quality and environmental benefits provided by these types of projects that justify the allowance for non-LID treatment measures onsite;
- Proposed LID treatment reduction credit for each type of Special Project and justification for the proposed credits. The justification shall include identification and an estimate of the specific water quality benefit provided by each type of Special Project proposed for LID treatment reduction credit; and
- Proposed total treatment reduction credit for Special Projects that may be characterized by more than one category and justification for the proposed total credit.

iii. Effective Date – December 1, 2011.

iv. Implementation Level

(1) For any private development project for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, Provisions C.3.e.i-ii shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary

approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the requirements of Provision C.3.~~e~~e.i-ii.

(2) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provisions C.3.e.i-ii shall not apply.

(3) Provisions C.3.e.i-ii supersede any Alternative Compliance Policies previously approved by the Executive Officer

(4) For all offsite projects and Regional Projects installed in accordance with Provision C.3.e.i-ii, the Permittees shall meet the Operation & Maintenance (O&M) requirements of Provision C.3.h.

v. Reporting –The Permittees shall submit the ordinance/legal authority and procedural changes made, if any, to implement Provision C.3.e with their 2012 Annual Report. Annual reporting thereafter shall be done in conjunction with reporting requirements under Provision C.3.b.v.

Any Permittee choosing to require 100% LID treatment onsite for all Regulated Projects and not allow alternative compliance under Provision C.3.e, shall include a statement to that effect in the 2012 Annual Report and all subsequent Annual Reports.

C.3.f. Alternative Certification of Stormwater Treatment Systems

i. Task Description – In lieu of reviewing a Regulated Project's adherence to Provision C.3.d, a Permittee may elect to have a third party conduct detailed review and certify the Regulated Project's adherence to Provision C.3.d. The third party reviewer must be a Civil Engineer or a Licensed Architect or Landscape Architect registered in the State of California, or staff of another Permittee subject to the requirements of this Permit.

ii. Implementation Level – Any Permittee accepting third-party reviews must make a reasonable effort to ensure that the third party has no conflict of interest with regard to the Regulated Project in question. That is, any consultant or contractor (or his/her employees) hired to design and/or construct a stormwater treatment system for a Regulated Project shall not also be the certifying third party. The Permittee must verify that the third party certifying any Regulated Project has current training on stormwater treatment system design (within three years of the certification signature date) for water quality and understands the groundwater protection principles applicable to Regulated Project sites.

Training conducted by an organization with stormwater treatment system design expertise (such as a college or university, the American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, California Water Environment Association (CWEA), BASMAA, National Association of Flood & Stormwater Management Agencies, California

Stormwater Quality Association (CASQA), or the equivalent, may be considered qualifying training.

iii. Reporting – Projects reviewed by third parties shall be noted in reporting tables for Provision C.3.b.

C.3.g. Hydromodification Management

i. Hydromodification Management (HM) Projects are Regulated Projects that create and/or replace one acre or more of impervious surface and are not specifically excluded within the requirements of Attachments B–F. A project that does not increase impervious surface area over the pre-project condition is not an HM Project. All HM Projects shall meet the Hydromodification Management Standard of Provision C.3.g.ii.

ii. HM Standard

Stormwater discharges from HM Projects shall not cause an increase in the erosion potential of the receiving stream over the pre-project (existing) condition. Increases in runoff flow and volume shall be managed so that post-project runoff shall not exceed estimated pre-project rates and durations, where such increased flow and/or volume is likely to cause increased potential for erosion of creek beds and banks, silt pollutant generation, or other adverse impacts on beneficial uses due to increased erosive force. The demonstration that post-project stormwater runoff does not exceed estimated pre-project runoff rates and durations shall include the following:

(1) **Range of Flows to Control:** For Alameda, Contra Costa, San Mateo, and Santa Clara Permittees, HM controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10 % of the pre-project 2-year peak flow[7] up to the pre-project 10-year peak flow. For Fairfield-Suisun Permittees, HM controls shall be designed such that post-project stormwater discharge rates and durations shall match from 20 percent of the 2-year peak flow up to the pre-project 10-year peak flow. Contra Costa Permittees, when using pre-sized and pre-designed Integrated Management Practices (IMPs) per Attachment C of this Order, are not required to meet the low-flow criterion of 10% of the 2-year peak flow. These IMPs are designed to control 20% of the 2-year peak flow. After the Contra Costa Permittees conduct the required monitoring specified in Attachment C, the design of these IMPs will be reviewed.

(2) **Goodness of Fit Criteria:** The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10 percent

[7] Where referred to in this Order, the 2-year peak flow is determined using a flood frequency analysis based on USGS Bulletin 17 B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35-50 years of data) is run through a continuous simulation hydrologic model, the annual peak flows are identified, rank ordered, and the 2-year peak flow is estimated. Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers' Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

over more than 10 percent of the length of the curve corresponding to the range of flows to control.

(3) **Precipitation Data:** Precipitation data used in the modeling of HM controls shall, at a minimum, be 30 years of hourly rainfall data representative of the area being modeled. Where a longer rainfall record is available, the longer record shall be used.

(4) **Calculating Post-Project Runoff:** Retention and detention basins shall be considered impervious surfaces for purposes of calculating post-project runoff. Pre- and post-project runoff shall be calculated and compared for the entire site, without separating or excluding areas that may be considered self-retaining.

(5) **Existing HM Control Requirements:** The Water Board has adopted HM control requirements for all Permittees (except for the Vallejo Permittees), and these adopted requirements are attached to this Order as listed below. The Permittees shall comply with all requirements in their own Permittee-specific Attachment, unless otherwise specified by this Order. In all cases, the HM Standard shall be achieved.

- Attachment B for Alameda Permittees
- Attachment C for Contra Costa Permittees
- Attachment D for Fairfield-Suisun Permittees
- Attachment E for San Mateo Permittees
- Attachment F for Santa Clara Permittees

iii. Types of HM Controls

Projects shall meet the HM Standard using any of the following HM controls or a combination thereof.

(1) **Onsite HM controls** are flow duration control structures and hydrologic source controls that collectively result in the HM Standard being met at the point(s) where stormwater runoff discharges from the project site.

(2) **Regional HM controls** are flow duration control structures that collect stormwater runoff discharge from multiple projects (each of which shall incorporate hydrologic source control measures as well) and are designed such that the HM Standard is met for all the projects at the point where the regional HM control discharges.

(3) **In-stream measures** shall be an option only where the stream, which receives runoff from the project, is already impacted by erosive flows and shows evidence of excessive sediment, erosion, deposition, or is a hardened channel.

In-stream measures involve modifying the receiving stream channel slope and geometry so that the stream can convey the new flow regime without increasing the potential for erosion and aggradation. In-stream measures are intended to improve long-term channel stability and prevent erosion by reducing the erosive forces imposed on the channel boundary.

In-stream measures, or a combination of in-stream and onsite controls, shall be designed to achieve the HM Standard from the point where the project(s) discharge(s) to the stream to the mouth of the stream or to achieve an equivalent degree of flow control mitigation (based on amount of impervious surface mitigated) as part of an in-stream project located in the same watershed. Designing in-stream controls requires a hydrologic and geomorphic evaluation (including a longitudinal profile) of the stream system downstream and upstream of the project. As with all in-stream activities, other regulatory permits must be obtained by the project proponent.[8]

iv. Reporting

For each HM Project approved during the reporting period, the following information shall be reported electronically in tabular form. This information shall be added to the required reporting information specified in Provision C.3.b.v.

(1) Device(s) or method(s) used to meet the HM Standard, such as detention basin(s), biodetention unit(s), regional detention basin, or in-stream control;

(2) Method used by the project proponent to design and size the device or method used to meet the HM Standard; and

(3) Other information as required in the Permittee's existing HM requirements, as shown in Attachments B–F.

v. Vallejo Permittees shall complete the following tasks in lieu of complying with Provisions C.3.g.i-iv.

(1) Develop a Hydrograph Modification Management Plan (HMP) for meeting the requirements of Provisions C.3.g.i–iv. The Vallejo Permittees' HMP shall be subject to approval by the Water Board.

(2) Vallejo Permittees shall include the following in their HMP:

(a) A map of the City of Vallejo, delineating areas where the HM Standard applies. The HM Standard shall apply in all areas except where a project:

- discharges stormwater runoff into creeks or storm drains that are concrete-lined or significantly hardened (e.g., with rip-rap, sackrete) downstream to their outfall in San Francisco Bay;
- discharges to an underground storm drain discharging to the Bay; or
- is located in a highly developed watershed.[9]

[8] In-stream control projects require a Stream Alteration Agreement from the California Department of Fish & Game, a CWA section 404 permit from the U.S. Army Corps of Engineers, and a section 401 certification from the Water Board. Early discussions with these agencies on the acceptability of an in-stream modification are necessary to avoid project delays or redesign.

[9] Within the context of Provision C.3.g., "highly developed watersheds" refers to catchments or subcatchments that are 65% impervious or more.

However, plans to restore a creek reach may reintroduce the applicability of HM controls, and would need to be addressed in the HMP;

(b) A thorough technical description of the methods project proponents may use to meet the HM Standard. Vallejo Permittees shall use the same methodologies, or similar methodologies, to those already in use in the Bay Area to meet the HM Standard. Contra Costa sizing charts may be used on projects up to ten acres after any necessary modifications are made to the sizes to control runoff rates and durations from ten percent of the pre-project 2-year peak flow to the pre-project 10-year peak flow, and adjustments are made for local rainfall and soil types;

(c) A description of any land use planning measures the City of Vallejo will take (e.g., stream buffers and stream restoration activities, including restoration-in-advance of floodplains, revegetation, and use of less-impacting facilities at points of discharge) to allow expected changes in stream channel cross sections, stream vegetation, and discharge rates, velocities, and/or durations without adverse impacts on stream beneficial uses;

(d) A description of how the Vallejo Permittees will incorporate these requirements into their local approval processes, and a schedule for doing so; and

(e) Guidance for City of Vallejo project proponents explaining how to meet the HM Standard.

(3) Vallejo Permittees shall complete the HMP according to the schedule below. All required documents shall be submitted acceptable to the Executive Officer, except the HMP, which shall be submitted to the Water Board for approval. Vallejo Permittees shall report on the status of HMP development and implementation in each Annual Report and shall also provide a summary of projects incorporating measures to address Provision C.3.g and the measures used.

- By April 1, 2011, submit a detailed workplan and schedule for completion of the information required in Provision C.3.g.~~vi~~v.(2).
- By December 1, 2011, submit the map required in Provision C.3.g.v.(2)(a).
- By April 1, 2012, submit a draft HMP.
- By December 1, 2012, provide responses to Water Board comments on the draft HMP so that the final HMP is submitted for Water Board approval by July 1, 2013.
- Upon adoption by the Water Board, implement the HMP, which shall include the requirements of this measure. Before approval of the HMP by the Water Board, Vallejo Permittees shall encourage early implementation of measures likely to be included in the HMP.

C.3.h. Operation and Maintenance of Stormwater Treatment Systems

i. Task Description – Each Permittee shall implement an Operation and Maintenance (O&M) Verification Program.

ii. Implementation Level – At a minimum, the O&M Verification Program shall include the following elements:

(1) Conditions of approval or other legally enforceable agreements or mechanisms for all Regulated Projects that, at a minimum, require at least one of the following from all project proponents and their successors in control of the Project or successors in fee title:

(a) The project proponent's signed statement accepting responsibility for the O&M of the installed onsite, joint, and/or offsite stormwater treatment system(s) and HM control(s) (if any) until such responsibility is legally transferred to another entity;

(b) Written conditions in the sales or lease agreements or deed for the project that requires the buyer or lessee to assume responsibility for the O&M of the onsite, joint, and/or offsite installed stormwater treatment system(s) and HM control(s) (if any) until such responsibility is legally transferred to another entity;

(c) Written text in project deeds, or conditions, covenants and restrictions (CCRs) for multi-unit residential projects that require the homeowners association or, if there is no association, each individual owner to assume responsibility for the O&M of the installed onsite, joint, and/or offsite stormwater treatment system(s) and HM control(s) (if any) until such responsibility is legally transferred to another entity; or

(d) Any other legally enforceable agreement or mechanism, such as recordation in the property deed, that assigns the O&M responsibility for the installed onsite, joint, and/or offsite treatment system(s) and HM control(s) (if any) to the project owner(s) or the Permittee.

(2) Coordination with the appropriate mosquito and vector control agency with jurisdiction to establish a protocol for notification of installed stormwater treatment systems and HM controls.

(3) Conditions of approval or other legally enforceable agreements or mechanisms for all Regulated Projects that require the granting of site access to all representatives of the Permittee, local mosquito and vector control agency staff, and Water Board staff, for the sole purpose of performing O&M inspections of the installed stormwater treatment system(s) and HM control(s) (if any).

(4) A written plan and implementation of the plan that describes O&M (including inspection) of all Regional Projects and regional HM controls that are Permittee-owned and/or operated.

(5) A database or equivalent tabular format of all Regulated Projects (public and private) that have installed onsite, joint, and/or offsite stormwater

treatment systems. This database or equivalent tabular format shall include the following information for each Regulated Project:

(a) Name and address of the Regulated Project;

(b) Specific description of the location (or a map showing the location) of the installed stormwater treatment system(s) and HM control(s) (if any);

(c) Date(s) that the treatment system(s) and HM controls (if any) is/are installed;

(d) Description of the type and size of the treatment system(s) and HM control(s) (if any) installed;

(e) Responsible operator(s) of each treatment system and HM control (if any);

(f) Dates and findings of inspections (routine and follow-up) of the treatment system(s) and HM control(s) (if any) by the Permittee; and

(g) Any problems and corrective or enforcement actions taken.

(6) A prioritized plan for inspecting all installed stormwater treatment systems and HM controls. At a minimum, this prioritized plan must specify the following for each fiscal year:

(a) Inspection by the Permittee of all newly installed stormwater treatment systems and HM controls within 45 days of installation to ensure approved plans have been followed;

(b) Inspection by the Permittee of at least 20 percent of the total number (at the end of the preceding fiscal year) of installed stormwater treatment systems and HM controls;

(c) Inspection by the Permittee of at least 20 percent of the total number (at the end of the preceding fiscal year) of installed vault-based systems; and

(d) Inspection by the Permittee of all installed stormwater treatment systems subject to Provision C.3, at least once every five years.

iii. Maintenance Approvals: The Permittees shall ensure that onsite, joint, and offsite stormwater treatment systems and HM controls installed by Regulated Projects are properly operated and maintained for the life of the projects. In cases where the responsible party for a stormwater treatment system or HM control has worked diligently and in good faith with the appropriate State and federal agencies to obtain approvals necessary to complete maintenance activities for the treatment system or HM control, but these approvals are not granted, the Permittees shall be deemed to be in compliance with this Provision. Permittees shall ensure that constructed wetlands installed by Regulated Projects and used for urban runoff treatment shall abide by the Water Board's Resolution No. 94-102: Policy on the Use of Constructed Wetlands for Urban Runoff Pollution Control and the O&M requirements contained therein.

Due Date for Full Implementation: Immediate for Provisions C.3.h.i, C.3.h.ii.(1), and C.3.h.iii, and December 1, 2010, for Provisions C.3.h.ii.(2)-(6). For Vallejo Permittees: December 1, 2010, for Provisions C.3.h.i-iii.

iv. Reporting: Beginning with the 2010 Annual Report

(1) For each Regulated Project inspected during the reporting period (fiscal year) the following information shall be reported to the Water Board electronically in tabular form as part of the Annual Report (as set forth in the Provision C.3.h. Sample Reporting Table attached):

- Name of facility/site inspected.
- Location (street address) of facility/site inspected.
- Name of responsible operator for installed stormwater treatment systems and HM controls.
- For each inspection:
  - Date of inspection.
  - Type of inspection (e.g., initial, annual, follow-up, spot).
  - Type(s) of stormwater treatment systems inspected (e.g., swale, bioretention unit, tree well, etc.) and an indication of whether the treatment system is an onsite, joint, or offsite system.
  - Type of HM controls inspected.
  - Inspection findings or results (e.g., proper installation, proper operation and maintenance, system not operating properly because of plugging, bypass of stormwater because of improper installation, maintenance required immediately, etc.).
  - Enforcement action(s) taken, if any (e.g., verbal warning, notice of violation, administrative citation, administrative order).

(2) On an annual basis, before the wet season, provide a list of newly installed (installed within the reporting period) stormwater treatment systems and HM controls to the local mosquito and vector control agency and the Water Board. This list shall include the facility locations and a description of the stormwater treatment measures and HM controls installed.

(3) Each Permittee shall report the following information in the Annual Report each year:

(a) A discussion of the inspection findings for the year and any common problems encountered with various types of treatment systems and/or HM controls. This discussion should include a general comparison to the inspection findings from the previous year.

(b) A discussion of the effectiveness of the Permittee's O&M Program and any proposed changes to improve the O&M Program (e.g., changes in prioritization plan or frequency of O&M inspections, other changes to improve effectiveness of program).

C.3.i. Required Site Design Measures for Small Projects and Detached Single-Family Home Projects

i. Task Description – The Permittees shall require all development projects, which create and/or replace $\geq$ 2500 ft^2 to < 10,000 ft^2 of impervious surface, and

detached single-family home projects,[10] which create and/or replace 2,500 square feet or more of impervious surface, to install one or more of the following site design measures:

- Direct roof runoff into cisterns or rain barrels for reuse.
- Direct roof runoff onto vegetated areas.
- Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
- Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
- Construct sidewalks, walkways, and/or patios with permeable surfaces.[3]
- Construct bike lanes, driveways, and/or uncovered parking lots with permeable surfaces.[3]

This provision applies to all development projects that require approvals and/or permits issued under the Permittee's' planning, building, or other comparable authority.

ii. **Implementation Level** – All elements of this task shall be fully implemented by December 1, 2012.

iii. **Reporting** – On an annual basis, discuss the implementation of the requirements of Provision C.3.i, including ordinance revisions, permit conditions, development of standard specifications and/or guidance materials, and staff training.

iv. **Task Description** – The Permittees shall develop standard specifications for lot-scale site design and treatment measures (e.g., for roof runoff and paved areas) as a resource for single-family homes and small development projects.

v. **Implementation Level** – This task may be fulfilled by the Permittees cooperating on a countywide or regional basis.

Due Date for Full Implementation – December 1, 2012.

vi. **Reporting** – A report containing the standard specifications for lot-scale treatment BMPs shall be submitted by December 1, 2012.

[10] **Detached single-family home project** – The building of one single new house or the addition and/or replacement of impervious surface to one single existing house, which is not part of a larger plan of development.

C.4. Industrial and Commercial Site Controls

Each Permittee shall implement an industrial and commercial site control program at all sites which could reasonably be considered to cause or contribute to pollution of stormwater runoff, with inspections and effective follow-up and enforcement to abate actual or potential pollution sources consistent with each Permittee's respective Enforcement Response Plan (ERP), to prevent discharge of pollutants and impacts on beneficial uses of receiving waters. Inspections shall confirm implementation of appropriate and effective BMPs and other pollutant controls by industrial and commercial site operators.

C.4.a. Legal Authority for Effective Site Management

i. Task Description – Permittees shall have sufficient legal enforcement authority to obtain effective stormwater pollutant control on industrial sites. Permittees shall have the ability to inspect and require effective stormwater pollutant control and to escalate progressively stricter enforcement to achieve expedient compliance and pollutant abatement at commercial and industrial sites within their jurisdiction.

ii. Implementation Level

(1) Permittees shall have the legal authority to oversee, inspect, and require expedient compliance and pollution abatement at all industrial and commercial sites which may be reasonably considered to cause or contribute to pollution of stormwater runoff. Permittees shall have the legal authority to require implementation of appropriate BMPs at industrial and commercial to address pollutant sources associated with outdoor process and manufacturing areas, outdoor material storage areas, outdoor waste storage and disposal areas, outdoor vehicle and equipment storage and maintenance areas, outdoor parking areas and access roads, outdoor wash areas, outdoor drainage from indoor areas, rooftop equipment, and contaminated and erodible surface areas, and other sources determined by the Permittees or Water Board Executive Officer to have a reasonable potential to contribute to pollution of stormwater runoff.

(2) Permittees shall notify the discharger of any actual or potential pollutant sources and violations and require problem correction within a reasonably short and expedient time frame commensurate with the threat to water quality. Permittees shall require timely correction of problems involving rapid temporary repair, and may allow longer time periods for implementation of more permanent solutions, if these require significant capital expenditure or construction. Violations shall be corrected prior to the next rain event or within 10 business days after the violations are noted. If more than 10 business days are required for correction, a rationale shall be given in the tabulated sheets.

C.4.b. Industrial and Commercial Business Inspection Plan (Inspection Plan)

i. Task Description – Permittees shall develop and implement an inspection plan that will serve as a prioritized inspection workplan. This inspection plan will allow inspection staff to categorize the commercial and industrial sites within the Permittee's jurisdiction by pollutant threat and inspection frequency, change inspection frequency based on site performance, and add and remove sites as businesses open and close.

The Inspection Plan shall contain the following information:

(1) Total number and a list of industrial and commercial facilities requiring inspection, within each Permittee's jurisdiction, to be determined on the basis of a prioritization criteria designed to assign a more frequent inspection schedule to the highest priority facilities per Section C.4.b.ii. below.

(2) A description of the process for prioritizing inspections and frequency of inspections. If any geographical areas are to be targeted for inspections due to high potential for stormwater pollution, these areas should be indicated in the Inspection Plan. A mechanism to include newly opened businesses that warrant inspection shall be included.

ii. Implementation Level – Each Permittee shall annually update and maintain a list of industrial and commercial facilities in the Inspection Plan to inspect that could reasonably be considered to cause or contribute to pollution of stormwater runoff. The following are some of the functional aspects of businesses and types of businesses that shall be included in the Inspection Plans:

(1) Sites that include the following types of functions that may produce pollutants when exposed to stormwater include, but are not limited to:
- (a) Outdoor process and manufacturing areas
- (b) Outdoor material storage areas
- (c) Outdoor waste storage and disposal areas
- (d) Outdoor vehicle and equipment storage and maintenance areas
- (e) Outdoor wash areas
- (f) Outdoor drainage from indoor areas
- (g) Rooftop equipment
- (h) Other sources determined by the Permittee or Water Board to have a reasonable potential to contribute to pollution of stormwater runoff

(2) The following types of Industrial and Commercial businesses that have a reasonable likelihood to be sources of pollutants to stormwater and non-stormwater discharges:
- (a) Industrial facilities, as defined at 40 CFR 122.26(b)(14), including those subject to the State General NPDES Permit for Stormwater Discharges Associated with Industrial Activity (hereinafter the Industrial General Permit);

(b) Vehicle Salvage yards;
(c) Metal and other recycled materials collection facilities, waste transfer facilities;
(d) Vehicle mechanical repair, maintenance, fueling, or cleaning;
(e) Building trades central facilities or yards, corporation yards;
(f) Nurseries and greenhouses;
(g) Building material retailers and storage;
(h) Plastic manufacturers; and
(i) Other facilities designated by the Permittee or Water Board to have a reasonable potential to contribute to pollution of stormwater runoff.

(3) **Prioritization of Facilities**
Facilities of the types described in Provision 4.b.ii.(2) above and identified by the Permittees as having the reasonable potential to contribute to pollution of stormwater runoff shall be prioritized on the basis of the potential for water quality impact using criteria such as pollutant sources on site, pollutants of concern, proximity to a waterbody, violation history of the facility, and other relevant factors.

(4) **Types/Contents of Inspections**
Each Permittee shall conduct inspections to determine compliance with its ordinances and this Permit. Inspections shall include but not be limited to the following:
(a) Prevention of stormwater runoff pollution or illicit discharge by implementing appropriate BMPs;
(b) Visual observations for evidence of unauthorized discharges, illicit connections, and potential discharge of pollutants to stormwater;
(c) Noncompliance with Permittee ordinances and other local requirements; and
(d) Verification of coverage under the Industrial General Permit, if applicable.

(5) **Inspection Frequency** – Permittees shall establish appropriate inspection frequencies for facilities based on Provision 4.b.ii (3) priority, potential for contributing pollution to stormwater runoff, and commensurate with the threat to water quality.

(6) **Record Keeping** – For each facility identified in Provision 4.b.ii, the Permittee shall maintain a database or equivalent of the following information at a minimum:
(a) Name and address of the business and local business operator;
(b) A brief description of business activity including SIC code;
(c) Inspection priority and inspection frequency; and
(d) If coverage under the Industrial General Permit is required.

iii. Reporting – The Permittees shall include the following in the Annual Report:

(1) The list of facilities identified in Provision 4.b.ii in the 2010 Annual Report and revisions or updates in subsequent annual reports; and

(2) The list of facilities scheduled for inspection during the current fiscal year.

C.4.c. Enforcement Response Plan (ERP)

i. Task Description – Permittees shall develop and implement an ERP that will serve as a reference document for inspection staff to take consistent actions to achieve timely and effective compliance from all commercial and industrial site operators.

ii. Implementation Level – The ERP shall contain the following:

(1) **Required enforcement actions** – including timeframes for corrections of problems – for various field violation scenarios. The ERP will provide guidance on appropriate use of the various enforcement tools, such as verbal and written notices of violation, citations, cleanup requirements, administrative and criminal penalties.

(2) **Timely Correction of Violations** – All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded in the electronic database or equivalent tabular system.

A description of the Permittee's procedures for follow-up inspections and enforcement actions or referral to another agency, including appropriate time periods for each level of corrective action.

(3) **Referral and Coordination with Water Board** – Each Permittee shall enforce its stormwater ordinances as necessary to achieve compliance at sites with observed violations. For cases in which Permittee enforcement tools are inadequate to remedy the noncompliance, the Permittee shall refer the case to the Water Board, district attorney or other relevant agencies for additional enforcement.

(4) **Recordkeeping** – Permittees shall maintain adequate records to demonstrate compliance and appropriate follow-up enforcement responses for facilities inspected.

Permittees shall maintain an electronic database or equivalent tabular system that contains the following information regarding industrial commercial site inspections:

(a) Name of Facility/Site Inspected
(b) Inspection Date
(c) Industrial General Permit coverage required (Yes or No)
(d) Compliance Status
(e) Type of Enforcement (if applicable)
(f) Type of Activity or Pollutant Source

Examples: Outdoor process/manufacturing areas, Outdoor material storage areas, Outdoor waste storage/disposal areas, outdoor vehicle and equipment storage/maintenance areas, Outdoor parking areas and access roads, Outdoor wash areas, Rooftop equipment, Outdoor drainage from indoor areas

(g) Specific Problems

(h) Problem Resolution

(i) Additional Comments

The electronic database or equivalent tabular system shall be made readily available to the Executive Officer and during inspections and audits by the Water Board staff or its representatives.

(5) The ERP shall be developed and implemented by April 1, 2010.

iii. Reporting – Permittees shall include the following information in each Annual Report:

(1) Number of inspections conducted, Number of violations issued (excluding verbal warnings), Percentage of sites inspected in violation, and number and percent of violations resolved within 10 working days or otherwise deemed resolved in a longer but still timely manner;

(2) Frequency and Types/categories of violations observed, Frequency and type of enforcement conducted;

(3) Summary of types of violations noted by business category; and

(4) Facilities that are required to have coverage under the Industrial General Permit, but have not filed for coverage.

C.4.d. Staff Training

i. Task Description

Permittees shall provide focused training for inspectors annually. Trainings may be Program-wide, Region-wide, or Permittee-specific.

ii. Implementation Level

At a minimum, train inspectors, within the 5-year term of this Permit, in the following topics:

(1) Urban runoff pollution prevention;

(2) Inspection procedures;

(3) Illicit Discharge Detection, Elimination and follow-up; and

(4) Implementation of typical BMPs at Industrial and Commercial Facilities.

Permittees, either countywide or regionally, if they have not already done so, are encouraged to create or adopt guidance for inspectors or reference existing inspector guidance including the California Association of Stormwater Quality Agencies (CASQA) Industrial BMP Handbook.

iii. Reporting

The Permittees shall include the following information in the Annual Report:

(1) Dates of trainings;

(2) Training topics that have been covered; and

(3) Percentage of Permittee inspectors attending training.

C.5. Illicit Discharge Detection and Elimination

The purpose of this provision is to implement the illicit discharge prohibition and to ensure illicit discharges are detected and controlled that are not otherwise controlled under provision C4, Industrial and Commercial Site Controls and C6, Construction Site Controls. Permittees shall develop and implement an illicit discharge program that includes an active surveillance component and a centralized complaint collection and follow-up component to target illicit discharge and non-stormwater sources. Permittees shall maintain a complaint tracking and follow-up data system as their primary accountability reporting for this provision.

C.5.a. Legal Authority

i. Task Description – Permittees shall have the legal authority to prohibit and control illicit discharges and escalate stricter enforcement to achieve expedient compliance.

ii. Implementation Level

(1) Permittees shall have adequate legal authority to address stormwater and non-stormwater pollution associated with, but not limited to the following:

(a) Sewage;

(b) Discharges of wash water resulting from the cleaning of exterior surfaces and pavement, or the equipment and other facilities of any commercial business, or any other public or private facility;

(c) Discharges of runoff from material storage areas, including containing chemicals, fuels, or other potentially polluting or hazardous materials;

(d) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;

(e) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and

(f) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

(2) Permittees shall have adequate legal authority to prohibit, discover through inspection and surveillance, and eliminate illicit connections and discharges to storm drains.

(3) Permittees shall have adequate legal authority to control the discharge of spills, dumping, or disposal of materials other than storm water to storm drains.

C.5.b. Enforcement Response Plan (ERP)

i. Task Description – Permittees shall develop and implement an ERP that will serve as guidance for inspection staff to take consistent actions to achieve timely and effective abatement of illicit discharges.

ii. Implementation Level – The ERP shall contain the following:

(1) Recommended responses and enforcement actions – including timeframes for corrections of problems – for various types and degree of violations. The ERP shall provide guidelines on when to employ the range of regulatory responses from warnings, citations and cleanup and cost recovery, to administrative or criminal penalties.

(2) Timely Correction of Violations: All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded in the electronic database or equivalent tabular system. Immediate correction can be temporary and short-term if a long-term, permanent correction will involve significant resources and construction time. An example would be replumbing of a wash area to the sanitary sewer, which would involve an immediate short-term, temporary fix followed by permanent replumbing.

(3) If corrective actions are not implemented promptly or if there are repeat violations, Permittees shall escalate responses as needed to achieve compliance, including referral to other agencies were necessary.

(4) The ERP shall be developed and implemented by April 1, 2010.

C.5.c. Spill and Dumping Response, Complaint Response, and Frequency of Inspections

i. Task Description – Permittees shall have a central contact point, including a phone number for complaints and spill reporting, and publicize this number to both internal Permittee staff and the public. If 911 is selected, also maintain and publicize a staffed, non-emergency phone number with voicemail, which is checked during normal business hours.

Permittees shall develop a spill/dumping response flow chart and phone tree or contact list for internal use that shows the various responsible agencies and their contacts, who would be involved in illicit discharge incident response that goes beyond the Permittees immediate capabilities. The list shall be maintained and updated as changes occur.

Permittees shall conduct reactive inspections in response to complaints and follow-up inspections as needed to ensure that corrective measures have been implemented to achieve and maintain compliance.

ii. Implementation Level – Permittees will have the phone number and contact information available and integrated into training and outreach both to Permittee staff and the public by July 1, 2010.

iii. Reporting – Submit the complaint and spill response phone number and spill contact list with the 2010 Annual Report and update annually if changes occur.

C.5.d. Control of Mobile Sources

i. Task Description – The purpose of this section is to establish oversight and control of pollutants associated with mobile business sources.

ii. Implementation Level – Each Permittee shall develop and implement a program to reduce the discharge of pollutants from mobile businesses.

(1) The program shall include the following:

(a) Development and implementation of minimum standards and BMPs to be required for each of the various types of mobile businesses such as automobile washing, power washing, steam cleaning, and carpet cleaning. This guidance can be developed via county-wide or regional collaboration.

(b) Development and implementation of an enforcement strategy which specifically addresses the unique characteristics of mobile businesses.

(c) Outreach to mobile businesses operating within the Permittee's jurisdiction with minimum standards and BMP requirements and local ordinances through an outreach and education strategy.

(d) Inspection of mobile businesses as needed.

(2) Permittees should cooperate regionally in developing and implementing their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action information, and education.

iii. Reporting – Permittees shall report on implementation of minimum standards and BMPs for mobile business and their enforcement strategy in each Annual Report.

C.5.e. Collection System Screening - Municipal Separate Storm Sewer System (MS4) Map Availability

i. Task Description – Permittees shall perform routine surveys for illicit discharges and illegal dumping in above ground check points in the collection system including elements that are typically inspected for other maintenance purposes, such as end of pipes, creeks, flood conveyances, storm drain inlets and catch basins, in coordination with public works/flood control maintenance surveys, video inspections of storm drains, and during other routine Permittee maintenance and inspection activities when Permittee staff are working in or near the MS4 system.

ii. Implementation Level – Permittees shall develop and implement a screening program utilizing the USEPA/Center for Watershed Protection publication, "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessment." Permittees shall implement the screening program by conducting a survey of strategic collection system check points (one screening point per square mile of Permittee urban and suburban jurisdiction area, less open space) including some key major outfalls draining industrial areas as defined in 40 CFR 122.26 (b)(5) once each year in dry weather conditions meaning no significant rainfall within the past 3 weeks. Routine surveys that occur on an ongoing basis during regular conveyance system inspections may be credited toward this requirement. Make maps of the MS4 publicly available, either electronically or in hard copy by July 1, 2010. The public availability shall be through a publicized single point of contact that

is convenient for the public, such as a staffed counter or web accessible maps. The MS4 map availability shall be publicized through Permittee directories and web pages.

iii. Reporting – Permittees shall provide a summary of their collection screening program, a summary of problems found during collection system screening, and any changes to the screening program in each Annual Report.

C.5.f. Tracking and Case Follow-up

i. Task Description – All incidents or discharges reported to the complaint/spill system that might pose a threat to water quality shall be logged to track follow-up and response through problem resolution. The data collected shall be sufficient to demonstrate escalating responses for repeated problems, and inter/intra-agency coordination, where appropriate.

ii. Implementation Level – Create and maintain a water quality spill and discharge complaint tracking and follow-up in an electronic database or equivalent tabular system by April 1, 2010.

The spill and discharge complaint tracking system shall contain the following information:

(1) Complaint information:
- (a) Date and time of complaint
- (b) Type of pollutant
- (c) Problem Status (potential or actual discharge.)

(2) Investigation information:
- (a) Date and time started
- (b) Type of pollutant
- (c) Entered storm drain and/or receiving water
- (d) Date abated
- (e) Type of enforcement (if applicable)

(3) Response time (days)
- (a) Call to investigation
- (b) Investigation to abatement
- (c) Call to abatement

The electronic database or equivalent tabular system shall be made available to Water Board staff as needed for review of enforcement response through problem resolution.

iii. Reporting – Permittees shall provide the following information in the Annual Report:

(1) Number of discharges reported;

(2) Number of discharges reaching storm drains and/or receiving waters;

(3) Number and percentage of discharges resolved in a timely manner; and

(4) Summary of major types of discharges and complaints.

C.6. Construction Site Control

Each Permittee shall implement a construction site inspection and control program at all construction sites, with follow-up and enforcement consistent with each Permittee's respective Enforcement Response Plan (ERP), to prevent construction site discharges of pollutants and impacts on beneficial uses of receiving waters. Inspections shall confirm implementation of appropriate and effective erosion and other construction pollutant controls by construction site operators/developers; and reporting shall demonstrate the effectiveness of this inspection and problem solution activity by the Permittees.

C.6.a. Legal Authority for Effective Site Management

i. Task Description – Permittees shall have the ability to require effective stormwater pollutant controls, and escalate progressively stricter enforcement to achieve expedient compliance and clean up at all public and private construction sites.

ii. Implementation Level

(1) Permittees shall have the legal authority to require at all construction sites year round effective erosion control, run-on and runoff control, sediment control, active treatment systems (as appropriate), good site management, and non storm water management through all phases of construction (including but not limited to site grading, building, and finishing of lots) until the site is fully stabilized by landscaping or the installation of permanent erosion control measures.

(2) Permittees shall have the legal authority to oversee, inspect, and require expedient compliance and clean up at all construction sites year round.

iii. Reporting – Permittees shall certify adequacy of their respective legal authority in the 2010 Annual Report.

C.6.b. Enforcement Response Plan (ERP)

i. Task Description – Permittees shall develop and implement an ERP that will serve as a reference document for inspection staff to take consistent actions to achieve timely and effective compliance from all public and private construction site owners/operators.

ii. Implementation Level

(1) The ERP shall include required enforcement actions – including timeframes for corrections of problems – for various field violation scenarios. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded in the electronic database or equivalent tabular system.

(2) If site owners/operators do not implement appropriate corrective actions in a timely manner, or if violations repeat, Permittees shall take progressively stricter responses to achieve compliance. The ERP shall include the structure for progressively stricter responses and various violation scenarios that evoke progressively stricter responses.

(3) The ERP shall be developed and implemented by April 1, 2010.

C.6.c. Best Management Practices Categories

i. Task Description – Permittees shall require all construction sites to have site specific, and seasonally- and phase-appropriate, effective Best Management Practices (BMPs) in the following six categories:

- Erosion Control
- Run-on and Run-off Control
- Sediment Control
- Active Treatment Systems (as necessary)
- Good Site Management
- Non Stormwater Management.

Theses BMP categories are listed in State General NPDES Permit for Stormwater Discharges Associated with Construction Activities (hereinafter the Construction General Permit).

ii. Implementation Level

The BMPs targeting specific pollutants within the six categories listed in C.6.c.i. shall be site specific. Site specific BMPs targeting specific pollutants from the six categories listed in C.6.c.i. can be a combination of BMPs from:

- California BMP Handbook, Construction, January 2003.
- Caltrans Stormwater Quality Handbooks, Construction Site Best Management Practices Manual, March 2003, and addenda.
- California Regional Water Quality Control Board, San Francisco Bay Region, Erosion and Sediment Control Field Manual, 2002.
- New BMPs available since the release of these Handbooks.

C.6.d. Plan Approval Process

i. Task Description – Permittees shall review erosion control plans for consistency with local requirements, appropriateness and adequacy of proposed BMPs for each site before issuance of grading permits for projects. Permittees shall also verify that sites disturbing one acre or more of land have filed a Notice of Intent for coverage under the Construction General Permit.

ii. Implementation Level – Before approval and issuance of local grading permits, each Permittee shall perform the following:

(1) Review the site operator's/developer's erosion/pollution control plan or Stormwater Pollution Prevention Plan (SWPPP) to verify compliance with the Permittee's grading ordinance and other local requirements. Also review the site operator's/developer's erosion/pollution control plan or SWPPP to verify that seasonally appropriate and effective BMPs for the six categories listed in C.6.c.i. are planned;

(2) For sites disturbing one acre or more of soil, verify that the site operators/developers have filed a Notice of Intent for permit coverage under the Construction General Permit; and

(3) Provide construction stormwater management educational materials to site operators/developers, as appropriate.

C.6.e. Inspections

i. Task Description – Permittees shall conduct inspections to determine compliance with local ordinances (grading and stormwater) and determine the effectiveness of the BMPs in the six categories listed in C.6.c.i.; and Permittees shall require timely corrections of all actual and threatened violations of local ordinances observed.

ii. Implementation Level

(1) **Wet Season Notification**

By September 1st of each year, each Permittee shall remind all site developers and/or owners disturbing one acre or more of soil to prepare for the upcoming wet season.

(2) **Frequency of Inspections**

Inspections shall be conducted monthly during the wet season[11] at the following sites:

(a) All construction sites disturbing one or more acre of land; and

(b) **High Priority Sites** – Other sites determined by the Permittee or the Water Board as significant threats to water quality. In evaluating threat to water quality, the following factors shall be considered:

(i) Soil erosion potential or soil type;

(ii) Site slope;

(iii) Project size and type;

(iv) Sensitivity or receiving waterbodies;

(v) Proximity to receiving waterbodies;

(vi) Non-stormwater discharges; and

(vii) Any other relevant factors as determined by the local agency or the Water Board.

[11] For the purpose of inspections, the wet season is defined as October through April, but sites need to implement seasonally appropriate BMPs in the six categories listed in C.6.c.i throughout the year.

(3) **Contents of Inspections**

Inspections shall focus on the adequacy and effectiveness of the site specific BMPs implemented for the six categories listed in C.6.c.i. Permittees shall require timely corrections of all actual and potential problems observed. Inspections of construction sites shall include, but are not limited to, the following:

(a) Assessment of compliance with Permittee's ordinances and permits related to urban runoff, including the implementation and maintenance of the verified erosion/pollution control plan or SWPPP (from C.6.d.ii.(1));

(b) Assessment of the adequacy and effectiveness of the site specific BMPs implemented for the six categories listed in C.6.c.i.;

(c) Visual observations for:

- actual discharges of sediment and/or construction related materials into stormdrains and/or waterbodies.
- evidence of sediment and/or construction related materials discharges into stormdrains and/or waterbodies.
- illicit connections.
- potential illicit connections.

(d) Education on stormwater pollution prevention, as needed.

(4) **Tracking**

All inspections must be recorded on a written or electronic inspection form. Inspectors shall follow the ERP if a violation is noted and shall require timely corrections of all actual and threatened violations of local ordinances observed. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded on the inspection form.

Permittees shall track in an electronic database or tabular format all inspections. This electronic database or tabular format shall be made readily available to the Executive Officer and during inspections and audits by the Water Board staff or its representatives. This electronic database or tabular format shall record the following information for each site inspection:

(a) Site name;

(b) Inspection date;

(c) Weather during inspection;

(d) Has there been rainfall with runoff since the last inspection?;

(e) Enforcement Response Level (Use ERP);

(f) Problem(s) observed using Illicit Discharge and the six BMP categories listed in C.6.c.i.;

(g) Specific Problem(s) (List the specific problem(s) within the BMP categories);

(h) Resolution of Problems noted using the following three standardized categories: Problems Fixed, Need More Time, and Escalate Enforcement; and

(i) Comments, which shall include all Rationales for Longer Compliance Time, all escalation in enforcement discussions, and any other information that may be relevant to that site inspection.

iii. Reporting

(1) In each Annual Report, each Permittee shall summarize the following information:

(a) Total number of active sites disturbing less than one acre of soil requiring inspection;

(b) Total number of active sites disturbing 1 acre or more of soil;

(c) Total number of inspections conducted;

(d) Number and percentage[12] of violations in each of the six categories listed in C.6.c.i.;

(e) Number and percentage[13] of each type of enforcement action taken as listed in each Permittee's ERP;

(f) Number of discharges, actual and those inferred through evidence, of sediment or other construction related materials;

(g) Number of sites with discharges, actual and those inferred through evidence, of sediment or other construction related materials;

(h) Number and percentage[14] of violations fully corrected prior to the next rain event but no longer than 10 business days after the violations are discovered or otherwise considered corrected in a timely, though longer period; and

(i) Number and percentage[15] of violations not fully corrected 30 days after the violations are discovered.

(2) In each Annual Report, each Permittee shall evaluate its respective electronic database or tabular format and the summaries produced in C.6.e.ii.(4) above. This evaluation shall include findings on the program's strength, comparison to previous years' results, as well as areas that need

[12] Percentage shall be calculated as number of violations in each category divided by total number of violations in all six categories.

[13] Percentage shall be calculated as number of each type of enforcement action divided by the total number of enforcement actions.

[14] Percentage shall be calculated as follows: number of violations fully corrected prior to the goal of the next rain event but no later than10 business days after the violations are discovered divided by the total number of violations for the reporting year.

[15] Percentage shall be calculated as follows: number of violations not fully corrected 30 days after the violations are discovered divided by the total number of violations for the reporting year.

more focused education for site owners, operators, and developers the following year.

(3) The Executive Officer may require that the information recorded and tracked by C.6.e.ii.(4) be submitted electronically or in a tabular format. Permittees shall submit the information within 10-working days of the Executive Officer's requirement. Submittal of the information in tabular form for the reporting year is not required in each Annual Report but encouraged.

C.6.f. Staff Training

i. Task Description – Permittees shall provide training or access to training for staff conducting construction stormwater inspections.

ii. Implementation Level – Permittees shall provide training at least every other year to municipal staff responsible for conducting construction site stormwater inspections. Training topics will include information on correct uses of specific BMPs, proper installation and maintenance of BMPs, Permit requirements, local requirements, and ERP.

iii. Reporting – Permittees shall include in each Annual Report the following information: training topics covered, dates of training, and the percentage of Permittees' inspectors attending each training. If no training in that year, so state.

C.7. Public Information and Outreach

Each Permittee shall increase the knowledge of the target audiences regarding the impacts of stormwater pollution on receiving water and potential solutions to mitigate the problems caused; change the waste disposal and runoff pollution generation behavior of target audiences by encouraging implementation of appropriate solutions; and involve various citizens in mitigating the impacts of stormwater pollution.

C.7.a. Storm Drain Inlet Marking

i. Task Description – Permittees shall mark and maintain at least 80 percent of municipally-maintained storm drain inlets with an appropriate stormwater pollution prevention message, such as "No dumping, drains to Bay" or equivalent. At least 80% of municipally-maintained storm drain inlet markings shall be inspected and maintained at least once per 5-year permit term. For newly approved, privately maintained streets, Permittees shall require inlet marking by the project developer upon construction and maintenance of markings through the development maintenance entity. Markings shall be verified prior to acceptance of the project.

ii. Implementation Level

(1) Inspect and maintain markings of at least 80 percent of municipality maintained inlets to ensure they are legibly labeled with a no dumping message or equivalent once per permit term.

(2) Verify that newly developed streets are marked prior to acceptance of the project.

iii. Reporting

(1) In the 2013 Annual Report, each Permittee shall report prior years' annual percentages of municipality maintained inlet markings inspected and maintained as legible with a no dumping message or equivalent.

(2) In the 2013 Annual Report, each Permittee shall report prior years' annual number of projects accepted after inlet markings were verified.

C.7.b. Advertising Campaigns

i. Task Description – Permittees shall participate in or contribute to advertising campaigns on trash/litter in waterways and pesticides with the goal of significantly increasing overall awareness of stormwater runoff pollution prevention messages and behavior changes in target audience.

ii. Implementation Level

(1) Target a broad audience with two separate advertising campaigns, one focused on reducing trash/litter in waterways and one focused on reducing the impact of urban pesticides. The advertising campaigns may be coordinated regionally or county-wide.

(2) Permittees shall conduct a pre-campaign survey and a post-campaign survey to identify and quantify the audiences' knowledge, trends, and

attitudes and/or practices; and to measure the overall population's awareness of the messages and behavior changes achieved by the two advertising campaigns. These surveys may be done regionally or county-wide.

iii. Reporting

(1) In the Annual Report following the pre-campaign survey, each Permittee (or the Countywide Program, if the survey was done county-wide or regionally) shall provide a report of the survey completed, which at a minimum, shall include the following:

- A summary of how the survey was implemented.
- A copy of the survey.
- A copy of the survey results.
- An analysis of the survey results.
- A discussion of the outreach strategies based on the survey results.
- A discussion of the planned or future advertising campaigns to influence awareness and behavior changes regarding trash/litter and pesticides.

(2) In the Annual Report following the post campaign survey, each Permittee (or the Countywide Program, if survey was done county-wide or regionally) shall provide a report of the survey completed, which at minimum shall include the information required in the pre-campaign report (C.7.b.iii.(1)) and the following:

- A discussion of the campaigns.
- A discussion of the measurable changes in awareness and behavior achieved.
- An update of outreach strategies based on the survey results.

C.7.c. Media Relations – Use of Free Media

i. Task Description – Permittees shall participate in or contribute to a media relations campaign. Maximize use of free media/media coverage with the objective of significantly increasing the overall awareness of stormwater pollution prevention messages and associated behavior change in target audiences, and to achieve public goals.

ii. Implementation Level – Conduct a minimum of six pitches (e.g., press releases, public service announcements, and/or other means) per year at the county-wide program, regional, and/or local levels.

iii. Reporting – In each Annual Report, each Permittee (or the Countywide Program, if the media relations campaign was done county-wide or regionally) shall include the details of each media pitch, such as the medium, date, and content of the pitch.

C.7.d. Stormwater Point of Contact

i. Task Description – Permittees shall individually or collectively create and maintain a point of contact, e.g., phone number or website, to provide the public with information on watershed characteristics and stormwater pollution prevention alternatives.

ii. Implementation Level – Maintain and publicize one point of contact for information on stormwater issues. Permittees may combine this function with the complaint/spill contact required in C.5.

iii. Reporting – In the 2010 Annual Report, each Permittee shall discuss how this point of contact is publicized and maintained. If any change occurs in this contact, report in subsequent annual report.

C.7.e. Public Outreach Events

i. Task Description – Participate in and/or host events such as fairs, shows, workshops, (e.g., community events, street fairs, and farmers' markets), to reach a broad spectrum of the community with both general and specific stormwater runoff pollution prevention messages. Pollution prevention messages shall include encouraging residents to (1) wash cars at commercial car washing facilities, (2) use minimal detergent when washing cars, and (3) divert the car washing runoff to landscaped area.

ii. Implementation Level – Each Permittee shall annually participate and/or host the number of events according to its population, as shown in the table below:

Table 7.1 Public Outreach Events[16]

Permittee Population	Number of Outreach Events
< 10,000	2
10,001– 40,000	3
40,001 – 100,000	4
100,001 – 175,000	5
175,001 – 250,000	6
> 250,000	8
Non-population-based Permittees[17]	6

Should a public outreach event contain significant citizen involvement elements, the Permittee may claim credit for both Public Outreach Events (C.7.e.) and Citizen Involvement Events (C.7.g.).

iii. Reporting – In each Annual Report, each Permittee shall list the events (name of event, event location, and event date) participated in and assess the effectiveness

[16] Permittees may claim individual credits for all events in which their Countywide Program or BASMAA participates, supports, and/or hosts, which are publicized to reach the Permittees jurisdiction.

[17] Alameda County Flood Control and Water Conservation District, Contra Costa Flood Control and Water Conservation District, Santa Clara Valley Water District, Vallejo Sanitation and Flood Control District, and Zone 7 of the Alameda County Flood Control and Water Conservation District

of efforts with appropriate measures (e.g., success at reaching a broad spectrum of the community, number of participants compared to previous years, post-event survey results, quantity/volume materials cleaned up and comparisons to previous efforts).

C.7.f. Watershed Stewardship Collaborative Efforts

i. Task Description – Permittees shall individually or collectively encourage and support watershed stewardship collaborative efforts of community groups such as the Contra Costa Watershed Forum, the Santa Clara Basin Watershed Management Initiative, "friends of creek" groups, and other organizations that benefit the health of the watershed such as the Bay-Friendly Landscaping and Gardening Coalition. If no such organizations exist, encourage and support development of grassroots watershed groups or engagement of an existing group, such as a neighborhood association, in watershed stewardship activities. Coordinate with existing groups to further stewardship efforts.

ii. Implementation Level – Annually demonstrate effort.

iii. Reporting – In each Annual Report, each Permittee shall state the level of effort, describe the support given, state what efforts were undertaken and the results of these efforts, and provide an evaluation of the effectiveness of these efforts.

C.7.g. Citizen Involvement Events

i. Task Description – Permittees shall individually or collectively, support citizen involvement events, which provide the opportunity for citizens to directly participate in water quality and aquatic habitat improvement, such as creek/shore clean-ups, adopt-an-inlet/creek/beach programs, volunteer monitoring, service learning activities such as storm drain inlet marking, community riparian restoration activities, community grants, other participation and/or host volunteer activities.

ii. Implementation Level – Each Permittee shall annually sponsor and/or host the number of citizen involvement events according to its population, as shown in the table below:

Table 7.2 Community Involvement Events[18]

Permittee Population	Number of Involvement Events
< 10,000	1
10,001 – 40,000	1
40,001 – 100,000	2
100,001 – 175,000	3
175,001 – 250,000	4
> 250,000	5
Non-population-based Permittees	2

[18] Permittees can claim individual credit for all events sponsored or hosted by their Countywide Program or BASMAA, which are publicized to reach the Permittee's jurisdiction.

Should a citizen involvement event contain significant public outreach elements, the Permittee may claim credit for both Citizen Involvement Events (C.7.g.) and Public Outreach Events (C.7.e.).

iii. Reporting – In each Annual Report, each Permittee shall list the events (name of event, event location, and event date) participated in and assess the effectiveness of efforts with appropriate measures (e.g., success at reaching a broad spectrum of the community, number of participants compared to previous years, post-event survey results, number of inlets/creeks/shores/parks/and such adopted, quantity/volume materials cleaned up, data trends, and comparisons to previous efforts).

C.7.h. School-Age Children Outreach

i. Task Description – Permittees shall individually or collectively implement outreach activities designed to increase awareness of stormwater and/or watershed message(s) in school-age children (K through 12).

ii. Implementation Level – Implement annually and demonstrate effectiveness of efforts through assessment.

iii. Reporting – In each Annual Report, each Permittee shall state the level of effort, spectrum of children reached, and methods used, and provide an evaluation of the effectiveness of these efforts.

C.7.i. Outreach to Municipal Officials

i. Task Description – Permittees shall conduct outreach to municipal officials. One alternative means of accomplishing this is through the use of the Nonpoint Education for Municipal Officials program (NEMO) to significantly increase overall awareness of stormwater and/or watershed message(s) among regional municipal officials.

ii. Implementation Level – At least once per permit cycle, or more often.

iii. Reporting – Permittees shall summarize efforts in the 2013 Annual Report.

C.8. Water Quality Monitoring

C.8.a. Compliance Options

i. Regional Collaboration – All Permittees shall comply with the monitoring requirements in C.8, however, Permittees may choose to comply with any requirement of this Provision through a collaborative effort to conduct or cause to be conducted the required monitoring in their jurisdictions. Where all or a majority of the Permittees collaborate to conduct water quality monitoring, this shall be considered a regional monitoring collaborative.

Where an existing collaborative body has initiated plans, before the adoption of this Permit, to conduct monitoring that would fulfill a requirement(s) of this Provision, but the monitoring would not meet this Provision's due date(s) by a year or less, the Permittees may request the Executive Officer adjust the due date(s) to synchronize with such efforts.

The types, quantities, and quality of data required within Provision C.8~~.~~ establish the minimum level-of-effort that a regional monitoring collaborative must achieve. Provided these data types, quantities, and quality are obtained, a regional monitoring collaborative may develop its own sampling design. For Pollutants of Concern and Long-Term monitoring required under C.8.e, an alternative approach may be pursued by Permittees provided that: either similar data types, data quality, data quantity are collected with an equivalent level of effort described under C.8.e; or an equivalent level of monitoring effort is employed to answer the management information needs stated under C.8.e.

ii. Implementation Schedule – Monitoring conducted through a regional monitoring collaborative shall commence data collection by October 2011. All other Permittee monitoring efforts shall commence data collection by October 2010. By July 1, 2010, each Permittee shall provide documentation to the Water Board, such as a written agreement, letter, or similar document that confirms whether the Permittee will conduct monitoring individually or through a regional monitoring collaborative.[19]

iii. Permittee Responsibilities – A Permittee may comply with the requirements in Provision C.8~~.~~ by performing the following:

(1) Contributing to its stormwater countywide program, as determined appropriate by the Permittee members, so that the stormwater countywide Program conducts monitoring on behalf of its members;

(2) Contributing to a regional collaborative effort;

[19] This documentation will allow the Water Board to know when monitoring will commence for each Permittee. Permittees who commit to monitoring individually may join the regional monitoring collaborative at any time. Any Permittee who discontinues monitoring through the regional collaborative must commence complying with all requirements of Provision C.8 immediately.

(3) Fulfilling monitoring requirements within its own jurisdictional boundaries; or

(4) A combination of the previous options, so that all requirements are fulfilled.

iv. Third-party Monitoring – Permittees may choose to fulfill requirements of Provision C.8~~.~~ using data collected by citizen monitors or other third-party organizations, provided the data are demonstrated to meet the data quality objectives described in Provision C.8.h. Where an existing third-party organization has initiated plans to conduct monitoring that would fulfill a requirement(s) of this Provision, but the monitoring would not meet this Provision's due date(s) by a year or less, the Permittees may request that the Executive Officer adjust the due date(s) to synchronize with such efforts.

C.8.b. San Francisco Estuary Receiving Water Monitoring

With limited exceptions, urban runoff from the Permittees' jurisdictions ultimately discharges to the San Francisco Estuary. Monitoring of the Estuary is intended to answer questions[20] such as:

~~•Describe the distribution and trends of pollutant concentrations in the Estuary~~

~~•Project future contaminant status and trends using best understanding of ecosystem processes and human activities~~

~~•Describe sources, pathways, and loading of pollutants entering the Estuary~~

~~•Measure pollution exposure and effects on selected parts of the Estuary ecosystem~~

~~•Compare monitoring information to relevant benchmarks, such as TMDL targets, tissue screening levels, water quality objectives, and sediment quality objectives.~~

- Are chemical concentrations in the Estuary potentially at levels of concern and are associated impacts likely?
- What are the concentrations and masses of contaminants in the Estuary and its segments?
- What are the sources, pathways, loadings, and processes leading to contaminant related impacts in the Estuary?
- Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased?
- What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?

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[20] ~~These are the objectives of the Regional Monitoring Program (RMP) as stated at http://www.sfei.org/rmp/rmp_prog_info.html#objectives on June 12, 2009. While the stated objectives may change over time, the intent of this provision is for Permittees to continue contributing financially and as stakeholders in such a program as the RMP, which monitors the quality of San Francisco Bay.~~

Permittees shall participate in implementing an Estuary receiving water monitoring program, at a minimum equivalent to the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP), by contributing their fair-share financially on an annual basis.

C.8.c. Status Monitoring/Rotating Watersheds

i. Status Monitoring is intended to answer these questions: Are water quality objectives, both numeric and narrative, being met in local receiving waters, including creeks, rivers and tributaries? Are conditions in local receiving waters supportive of or likely to be supportive of beneficial uses?

ii. **Parameters and Methods** – Permittees shall conduct Status Monitoring using the parameters, methods, occurrences, durations, and minimum number of sampling sites as described in Table 8.1. Spring sampling shall be conducted during the April - June timeframe; dry weather sampling shall be conducted during the July - September timeframe. Minor variations of the parameters and methods may be allowed with Executive Officer concurrence.

iii. **Frequency** – Permittees shall complete the Status Monitoring in Table 8.1 at the following frequencies:

- Alameda Permittees – annually
- Contra Costa Permittees – annually
- Fairfield-Suisun Permittees – twice during the Permit term
- San Mateo Permittees – annually
- Santa Clara Permittees – annually
- Vallejo Permittees – once during the Permit term

Table 8.1 Status Monitoring Elements

Status Monitoring Parameter	Sampling and/or Analytical Method[21]	Minimum Sampling Occurrence[22]	Duration of Sampling	Minimum # Sample Sites to Monitor/Yr[23] Santa Clara & Alameda Permittees/ Contra Costa & San Mateo Permittees/ Fairfield-Suisun & Vallejo Permittees	Result(s) that Trigger a Monitoring Project in Provision C.8.d.i.
Biological Assessment[24] (Includes Physical Habitat Assessment and General Water Quality Parameters[25]) Nutrients (total phosphorus, dissolved orthophosphate, total nitrogen, nitrate,	SWAMP Std Operating Procedure[26,27,28] for Biological Assessments & PHab;	1/yr (Spring Sampling)	Grab sample	Spring 20 / 10 / 4	BMI metrics that indicate substantially degraded community as per Attachment ~~G~~H, Table ~~G~~H-1 For Nutrients: 20% of results in one waterbody exceed one

21 Refers to field protocol, instrumentation and/or laboratory protocol.

22 Refers to the number of sampling events at a specific site in a given year.

23 The number of sampling sites shown is based on the relative population in each Regional Stormwater Countywide Program and is listed in this order: Santa Clara & Alameda Countywide / Contra Costa & San Mateo Countywide / Vallejo & Fairfield-Suisun Programs.

24 The same general location must be used to collect benthic community, sediment chemistry, and sediment toxicity samples. General Water Quality Parameters need ~~not be~~ collected twice, where it is collected by a multi-parameter probe at a subset of these sample sites (see next row of Table 8.1).

25 Includes dissolved oxygen, temperature, conductivity, and pH. General Water Quality Parameters need not be collected twice, where it is collected by a multi-parameter probe at a subset of these sample sites (see next row of Table 8.1)~~.~~.

26 Ode, P.R. 2007. Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California, California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP), as subsequently revised (http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/phab_sopr6.pdf). Permittees may coordinate with Regional Board staff to modify their sampling procedures if these referenced procedures change during the Permit term.

27 Biological assessments shall include benthic macroinvertebrates and algae. Bioassessment sampling method shall be multihabitat reach-wide. Macroinvertebrates shall be identified according to the Standard Taxonomic Effort Level I of the Southwestern Association of Freshwater Invertebrate Taxonomists, using the most current SWAMP approved method. Current methods are documented in (1) SWAMP Standard Operating Procedure (SOP) and Interim Guidance on Quality Assurance for SWAMP Bioassessments, Memorandum to SWAMP Roundtable from Beverly H. van Buuren and Peter R. Ode, 5-21-07, and (2) Amendment to SWAMP Interim Guidance on Quality Assurance for SWAMP Bioassessments, Memorandum to SWAMP Roundtable from Beverly H. van Buuren and Peter R. Ode, 9-17-08. For algae, include mass (ash-free dry weight), chlorophyll a, diatom and soft algae taxonomy, and reachwide algal percent cover. Physical Habitat (PHab) Assessment shall include the SWAMP basic method plus 1) depth and pebble count + CPOM, 2) cobble embeddedness, 3) discharge measurements, and 4) in-stream habitat. Permittees may coordinate with Regional Board staff to modify these sampling procedures if SWAMP procedures change during the Permit term.

28 Algae shall be collected in a consistent timeframe as Regional SWAMP. For guidance on algae sampling and evaluation: Fetscher, A. and K. McLaughlin, May 16, 2008. Incorporating Bioassessment Using Freshwater Algae into California's Surface Water Ambient Monitoring Program (SWAMP). Technical Report 563 and current SWAMP-approved updates to Standard Operating Procedures therein. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/563_periphyton_bioassessment.pdf.

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Status Monitoring Parameter	**Sampling and/or Analytical Method**[21]	**Minimum Sampling Occurrence**[22]	**Duration of Sampling**	**Minimum # Sample Sites to Monitor/Yr**[23] Santa Clara & Alameda Permittees/ Contra Costa & San Mateo Permittees/ Fairfield-Suisun & Vallejo Permittees	**Result(s) that Trigger a Monitoring Project in Provision C.8.d.i.**
ammonia, silica, chloride, dissolved organic carbon, suspended sediment concentration)	SWAMP comparable methods for Nutrients				or more water quality standard or established threshold
General Water Quality[29]	Multi-Parameter Probe	2/yr (Concurrent with bioassessment & during the Aug. - Sept. timeframe)	15-minute intervals for 1-2 weeks	3 / 2 / 1	20% of results in one waterbody exceed one or more water quality standard or established threshold
Chlorine (Free and Total)	USEPA Std. Method 4500 Cl F[30]	2/yr Spring & Dry Seasons	Grab sample	Spring 20 / 10 / 2 Dry 3 / 2 / 1	After immediate resampling, concentrations remain > 0.08 mg/L
Temperature	Digital Temperature Logger	60-minute intervals	60-minute intervals April through Sept.	8 / 4 / 1	20% of results in one waterbody exceed applicable temperature threshold[31]
Toxicity – Water Column[32]	Applicable SWAMP Comparable Method	2/yr (1/Dry Season & 1 Storm Event)	Grab or composite sample	3 / 2 / 1	If toxicity results < 50% of control results, repeat sample. If 2nd sample yields < 50% of control results, proceed to C.8.d.i.

[29] Includes dissolved oxygen, temperature, conductivity, and pH ~~and stream depth~~.

[30] The method of analysis shall achieve a method detection limit at least as low as that achieved by the Amperometric Titration Method (4500-Cl from *Standard Methods for Examination of Water and Wastewater*, Edition 20).

[31] If temperatures exceed applicable threshold (e.g., Maximum Weekly Average Temperature, Sullivan K., Martin, D.J., Cardwell, R.D., Toll, J.E., Duke, S. 2000. *An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implications for Selecting Temperature Criteria, Sustainable Ecosystem Institute*) or spike with no obvious natural explanation observed.

[32] *US EPA three species toxicity tests: Selenastrum* growth and *Ceriodaphnia* and *Pimephales* with lethal and sublethal endpoints. Also H*yalella azteca with lethal endpoint.*

Status Monitoring Parameter	**Sampling and/or Analytical Method**[21]	**Minimum Sampling Occurrence**[22]	**Duration of Sampling**	**Minimum # Sample Sites to Monitor/Yr**[23] Santa Clara & Alameda Permittees/ Contra Costa & San Mateo Permittees/ Fairfield-Suisun & Vallejo Permittees	**Result(s) that Trigger a Monitoring Project in Provision C.8.d.i.**
Toxicity– Bedded Sediment, Fine-grained[33]	Applicable SWAMP Comparable Method	1/yr	Grab sample	3 / 2 / 1 At fine-grained depositional area at bottom of watershed	See Attachment ~~G~~H, Table ~~G~~H-1
Pollutants – Bedded Sediment,[34] fine-grained	Applicable SWAMP Comparable Method inc. grain size	1/yr	Grab sample	3 / 2 / 1 At fine-grained depositional area at bottom of watershed	See Attachment ~~G~~H, Table ~~G~~H-1
Pathogen Indicators[35]	U.S. EPA protocol[36]	1/yr (During Summer)	Follow U.S. EPA protocol	5 / 5 / * *Fairfield-Suisun & Vallejo Permittees: 3 sites twice in permit term	Exceedance of USEPA criteria ~~(this involves multiple values)~~
Stream Survey (stream walk & mapping)[37]	USA[38] or equivalent	1 waterbody/yr	N/A	9 / 6 / 3 stream miles/year	N/A

[33] Bedded sediments should be fine-grain from depositional areas. Grain size and TOC must be reported. ~~Analytes shall include all of those reported in MacDonald (including copper, nickel, mercury, PCBs, DDT, chlordane, dieldrin) as well as pyrethroids.~~ Coordinate with TMDL Provision requirements as applicable~~. MacDonald, D.D., G.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environ. Contamination and Toxicology* 39(1):20–31~~

[34] Bedded sediments should be fine-grain from depositional areas. Grain size and TOC must be reported. Analytes shall include all of those reported in MacDonald et al. 2000 (including copper, nickel, mercury, PCBs, DDT, chlordane, dieldrin) as well as pyrethroids (see Table 8.4 for list of pyrethroids). Coordinate with TMDL Provision requirements as applicable. MacDonald, D.D., G.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environ. Contamination and Toxicology* 39(1):20–31.

[35] Includes fecal coliform and *E. Coli.*

[36] Rather than collecting samples over five separate days, Permittees may use Example #2, pg. 54, of USEPA's *Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, ~~May 2002 Draft~~March 2004 Final.

[37] The Stream Surveys need not be repeated on a watershed if a Stream Survey was completed on that waterbody within the previous five years. The number of stream miles to be surveyed in any given year may be less than that shown in Table 8-1 in order to avoid repeating surveys at areas surveyed during the previous five years.

[38] Center for Watershed Protection, Manual 10: *Unified Stream Assessment: A User's Manual*, February 2005.

iv. Locations – For each sampling year (per C.8.c.iii.), Permittees shall select at least one waterbody to sample from the applicable list below. Locations shall be selected so that sampling is sufficient to characterize segments of the waterbody(s). For example, Permittees required to collect a larger number of samples should sample two or more waterbodies, so that each sampling effort represents a reasonable segment length and/or type. Samples shall be collected in reaches that receive urban stormwater discharges, except in possible infrequent instances where non-urban-impacted stream samples are needed for comparison[39]. Waterbody selection shall be based on factors such as watershed area, land use, likelihood of urban runoff impacts, and existing monitoring data.

Table 8.2 Status Monitoring Locations – Waterbodies

SCVURPPP	ACCWP	CCCWP	SMCWPPP	FSUMRP	VALLEJO
Coyote Creek and tributaries	Arroyo Valle (below Livermore or lower)	Kirker Creek	San Pedro Creek and tributaries	Laurel Creek	Chabot Creek
Guadalupe River and tributaries	Arroyo Mocho	Mt. Diablo Creek	Pilarcitos Creek	Ledgewood Creek	Austin Creek & tributaries
San Tomas Creek and tributaries	Tassajara Creek	Walnut Creek and tributaries	Colma Creek		
Calabazas Creek	Alamo Creek	Rodeo Creek	San Bruno Creek and tributaries		
Permanente Creek and tributaries	Arroyo de la Laguna	Pinole Creek	Millbrae Creek and tributaries		
Stevens Creek and tributaries	Alameda Creek (at Fremont or below)	San Pablo Creek	Mills Creek and tributaries		
Matadero Creek and tributaries	San Lorenzo Creek & tribs	Alhambra Creek	Easton Creek and tributaries		
Adobe Creek	San Leandro Creek & tribs	Wildcat Creek	Sanchez Creek and tributaries		
Lower Penitencia Creek and tributaries	Oakland, Berkeley, or Albany Creeks		Burlingame Creek and tributaries		
Barron Creek			San Mateo Creek (below dam only)		
San Francisquito Creek & tributaries			Borel Creek & tributaries		
			Laurel Creek & tribs		
			Belmont Creek & tribs		
			Pulgas Creek & tribs		
			Cordilleras & tributaries		
			Redwood Creek & tribs		
			Atherton Creek & tribs		
			San Francisquito Creek and tributaries		

[39] Sampling efforts shall focus on stream reaches with urban stormwater system discharges. Sampling upstream of urban outfalls is not precluded where needed to meet sampling plan objectives.

v. Status Monitoring Results – When Status Monitoring produces results such as those described in the final column of Table 8.1, Permittees shall conduct Monitoring Project(s) as described in C.8.d.i.

C.8.d. Monitoring Projects – Permittees shall conduct the Monitoring Projects listed below.

i. Stressor/Source Identification – When Status results trigger a follow-up action as indicated in Table 8.1, Permittees shall take the following actions, as also required by Provision C.1. If the trigger stressor or source is already known, proceed directly to step 2. The first follow-up action shall be initiated as soon as possible, and no later than the second fiscal year after the sampling event that triggered the Monitoring Project.

(1) Conduct a site specific study (or non-site specific if the problem is wide-spread) in a stepwise process to identify and isolate the cause(s) of the trigger stressor/source. This study should follow guidance for Toxicity Reduction Evaluations (TRE)[40] or Toxicity Identification Evaluations (TIE).[41] A TRE, as adapted for urban stormwater data, allows Permittees to use other sources of information (such as industrial facility stormwater monitoring reports) in attempting to determine the trigger cause, potentially eliminating the need for a TIE. If a TRE does not result in identification of the stressor/source, Permittees shall conduct a TIE.

(2) Identify and evaluate the effectiveness of options for controlling the cause(s) of the trigger stressor/source.

(3) Implement one or more controls.

(4) Confirm the reduction of the cause(s) of trigger stressor/source.

(5) Stressor/Source Identification Project Cap: Permittees who conduct this monitoring through a regional collaborative shall be required to initiate no more than ten Stressor/Source Identification projects during the Permit term in total, and at least two must be toxicity follow-ups, unless monitoring results do not indicate the presence of toxicity. If conducted through a stormwater countywide program, the Santa Clara and Alameda

[40] USEPA. August 1999. *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*. EPA/833B-99/002. Office of Wastewater Management, Washington, D.C.

[41] Select TIE methods from the following references after conferring with SWAMP personnel: For sediment: (1) Ho KT, Burgess R., Mount D, Norberg-King T, Hockett, RS. 2007. *Sediment toxicity identification evaluation: interstitial and whole methods for freshwater and marine sediments*. USEPA, Atlantic Ecology Division/Mid-Continental Ecology Division, Office of Research and Development, Narragansett, RI, or (2) Anderson, BS, Hunt, JW, Phillips, BM, Tjeerdema, RS. 2007. *Navigating the TMDL Process: Sediment Toxicity*. Final Report- 02-WSM-2. Water Environment Research Federation. 181 pp. For water column: (1) USEPA. 1991. *Methods for aquatic toxicity identification evaluations. Phase I Toxicity Characterization Procedures.* EPA 600/6-91/003. Office of Research and Development, Washington, DC., (2) USEPA. 1993. *Methods for aquatic toxicity identification evaluations. Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*. EPA 600/R-92/080. Office of Research and Development, Washington, DC., or (3) USEPA. 1996. *Marine Toxicity Identification Evaluation (TIE), Phase I Guidance Document*. EPA/600/R-95/054. Office of Research and Development, Washington, DC.

Permittees each shall be required to initiate no more than five (two for toxicity); the Contra Costa and San Mateo Permittees each shall be required to initiate no more than three (one for toxicity); and the Fairfield-Suisun and Vallejo Permittees each shall be required to initiate no more than one Stressor/Source Identification project(s) during the Permit term.

(6) As long as Permittees have complied with the procedures set forth above, they do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed to do so by the Water Board.

ii. BMP Effectiveness Investigation – Investigate the effectiveness of one BMP for stormwater treatment or hydrograph modification control. Permittees who do this project through a regional collaborative are required to initiate no more than one BMP Effectiveness Investigation during the Permit term. If conducted through a stormwater countywide program, the Santa Clara, Alameda, Contra Costa, and San Mateo Permittees shall be required to initiate one BMP Effectiveness Investigation each, and the Fairfield-Suisun and Vallejo Permittees shall be exempt from this requirement. The BMP(s) used to fulfill requirements of C.3.b.iii., C.11.e. and C.12.e. may be used to fulfill this requirement, provided the BMP Effectiveness Investigation includes the range of pollutants generally found in urban runoff. The BMP Effectiveness Investigation will not trigger a Stressor/Source Identification Project. Data from this Monitoring Project need not be SWAMP-comparable.

iii. Geomorphic Project – This monitoring is intended to answer the questions: How and where can our creeks be restored or protected to cost-effectively reduce the impacts of pollutants, increased flow rates, and increased flow durations of urban runoff?

Permittees shall select a waterbody/reach, preferably one that contains significant fish and wildlife resources, and conduct one of the following projects within each county, except that only one such project must be completed within the collective Fairfield-Suisun and Vallejo Permittees' jurisdictions:

(1) Gather geomorphic data to support the efforts of a local watershed partnership[42] to improve creek conditions; or

(2) Inventory locations for potential retrofit projects in which decentralized, landscape-based stormwater retention units can be installed; or

(3) Conduct a geomorphic study which will help in development of regional curves which help estimate equilibrium channel conditions for different-sized drainages. Select a waterbody/reach that is not undergoing changing land use. Collect and report the following data:

- Formally surveyed channel dimensions (profile), planform, and cross-sections. Cross-sections shall include the topmost floodplain terrace and

[42] A list of local watershed partnerships may be obtained from Water Board staff.

be marked by a permanent, protruding (not flush with ground) monument.

- Contributing drainage area.
- Best available information on bankfull discharges and width and depth of channel formed by bankfull discharges.
- Best available information on average annual rainfall in the study area.

Permittees shall complete the selected geomorphic project so that project results are reported in the Integrated Monitoring Report (see Provision C.8.g.~~iii.~~v).

C.8.e. Pollutants of Concern and Long-Term Trends Monitoring

Pollutants of Concern (POC) monitoring is intended to assess inputs of Pollutants of Concern to the Bay from local tributaries and urban runoff, assess progress toward achieving wasteload allocations (WLAs) for TMDLs and help resolve uncertainties associated with loading estimates for these pollutants. In particular, there are four priority management information needs toward which POC monitoring must be directed: 1) identifying which Bay tributaries (including stormwater conveyances) contribute most to Bay impairment from pollutants of concern; 2) quantifying annual loads or concentrations of pollutants of concern from tributaries to the Bay; 3) quantifying the decadal-scale loading or concentration trends of pollutants of concern from small tributaries to the Bay; and 4) quantifying the projected impacts of management actions (including control measures) on tributaries and identifying where these management actions should be implemented to have the greatest beneficial impact.

Permittees shall implement the following POC monitoring components or pursue an alternative approach that addresses each of the aforementioned management information needs. An alternative approach may be pursued by Permittees provided that: either similar data types, data quality, data quantity are collected with an equivalent level of effort described; or an equivalent level of monitoring effort is employed to answer the management information needs.

Long-Term monitoring is intended to assess long-term trends in pollutant concentrations and toxicity in receiving waters and sediment, in order to evaluate if stormwater discharges are causing or contributing to toxic impacts on aquatic life. Permittees shall implement the following Long-Term monitoring components or, following approval by the Executive Officer, an equivalent monitoring program.

i. Pollutants of Concern Loads Monitoring Locations – Permittees shall conduct Pollutants of Concern monitoring at stations listed below. Permittees may install these stations in two phases providing at least half of the stations are monitored in the water year beginning October 2010, and all the stations are monitored in the water year beginning October 2012. Upon approval by the Executive Officer, Permittees may use alternate POC monitoring locations.

(1) Castro Valley Creek S3 at USGS gauging station in Castro Valley

(2) Guadalupe River

(3) Zone 4 Line A at Chabot Road in Hayward

(4) Rheem Creek at Giant Road in Richmond

(5) Walnut Creek at a downstream location

(6) Calabazas Creek at Lakeside Drive in Sunnyvale, at border with Santa Clara

(7) San Mateo Creek at downstream location

(8) Laurel Creek at Laurie Meadows park, off Casanova Drive in City of San Mateo.

ii. Long-Term Monitoring Locations – Permittees shall conduct Long-Term monitoring at stations listed below. After conferring with the Regional SWAMP program, and upon approval by the Executive Officer, Permittees may use alternate Long-Term monitoring locations.

Table 8.3. Long-Term Monitoring Locations

Stormwater Countywide Program	Waterbody	Suggested Location
Alameda Permittees	Alameda Creek OR	East of Alvarado Blvd*
	Lower San Leandro Creek	Empire Road*
Contra Costa Permittees	Kirker Creek OR	Floodway*
	Walnut Creek	Concord Avenue*
Santa Clara Permittees	Guadalupe River OR	USGS Gaging Station 11169025*
	Coyote Creek	Montague*
San Mateo Permittees	San Mateo Creek	Gateway Park*

* SWAMP is scheduled to collect sediment toxicity and sediment chemistry samples annually at these stations during the month of June.

iii. Parameters and Frequencies – Permittees shall conduct Pollutants of Concern sampling pursuant to Table 8.4, Categories 1 and 2. In Table 8.4, Category 1 pollutants are those for which the Water Board has active water quality attainment strategies (WQAS), such as TMDL or site-specific objective projects. Category 2 pollutants are those for which WQAS are in development. The lower monitoring frequency for Category 2 pollutants is sufficient to develop preliminary loading estimates for these pollutants.

Permittees shall conduct Long-Term monitoring pursuant to Table 8.4, ~~Categories~~ Category 3 ~~and 4~~. SWAMP has scheduled collection of Category ~~4~~ 3 data at the Long-Term monitoring locations stated in C.8.e.ii. As stated in Provision C.8.a.iv., Permittees may use SWAMP data to fulfill Category ~~4~~ 3 sampling requirements.

iv. Protocols – At a minimum, sampling and analysis protocols shall be consistent with 40 CFR 122.21(g)(7)(ii).

v. Methods – Methyl mercury samples shall be grab samples collected during storm events that produce rainfall of at least 0.10 inch, shall be frozen immediately upon collection, and shall be kept frozen during transport to the laboratory. All other Category 1, and 2~~, and 3~~ samples shall be wet weather flow-weighted composite samples, collected during storm events that produce rainfall of at least 0.10 inch. Sampled storms should be separated by 21 days of dry weather, but, at a minimum, sampled storms must have 72 hours of antecedent dry weather. Samples must include the first rise in the hydrograph. Category 3 ~~and 4~~ monitoring data shall be SWAMP-comparable.

Table 8.4 Pollutants of Concern Loads & Long-Term Monitoring Elements

Category/Parameter	Sampling Years	Minimum Sampling Occurrence	Sampling Interval
Category 1 • Total and Dissolved Copper • Total Mercury[43] • Methyl Mercury • Total PCBs[44] • Suspended Sediments (SSC) • Total Organic Carbon • Toxicity – Water Column • Nitrate as N • Hardness	Annually	Average of 4 wet weather events per year For methyl mercury only: average of 2 wet & 2 dry weather events per year	Flow-weighted composite For methyl mercury only: grab samples collected during the first rise in the hydrograph of a storm event.
Category 2 • Total and Dissolved Selenium • Total PBDEs (Polybrominated Diphenyl Ethers) • Total PAHs (Poly-Aromatic Hydrocarbons) • Chlordane • DDTs (Dichloro-Diphenyl-Trichloroethane) • Dieldrin • Nitrate as N • Pyrethroids - bifenthrin, cyfluthrin, beta-cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda-cyhalothrin, permethrin, and tralomethrin • Carboryl and fipronil • Total and Dissolved Phosphorus	Oct. 2010 - 2011 water year and Oct. 2012 - 2013 water year	2 times per year	Flow-weighted composite

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[43] The monitoring type and frequency shown for mercury is not sufficient to determine progress toward achieving TMDL load allocations. Progress toward achieving load allocations will be accomplished by assessing loads avoided resulting from treatment, source control, and pollution prevention actions.

[44] The monitoring type and frequency shown for PCBs is not sufficient to determine progress toward achieving TMDL load allocations. Progress toward achieving load allocations will be accomplished by assessing loads avoided resulting from treatment, source control, and pollution prevention actions.

Category/Parameter	Sampling Years	Minimum Sampling Occurrence	Sampling Interval
~~**Category 3**~~ ~~•Toxicity – Water Column~~ • ~~Nitrate as N~~[45]	~~Annually~~	~~Average of 4 wet weather events per year~~	~~Flow-weighted composite~~
Category 43 Toxicity – Bedded Sediment, fine-grained[46] Pollutants – Bedded Sediment, fine-grained	Biennially, Coordinate with SWAMP	Once per year, during April-June, coordinate with SWAMP	Grab sample

vi. Sediment Delivery Estimate/Budget – The objective of this monitoring is to develop a strong estimate of the amount of sediment entering the Bay from local tributaries and urban drainages. By July 1, 2011, Permittees shall develop a design for a robust sediment delivery estimate/sediment budget in local tributaries and urban drainages. Permittees shall implement the study by July 1, 2012.

vii. Emerging Pollutants – Permittees shall develop a work plan and schedule for initial loading estimates and source analyses for emerging pollutants: endocrine-disrupting compounds, PFOS/PFAS (Perfluorooctane Sulfonates (PFOS), Perfluoroalkyl sulfonates (PFAS); these perfluorocompounds are related to Teflon products), and NP/NPEs (nonylphenols/nonylphenol esters —estrogen-like compounds). This work plan, which is to be implemented in the next Permit term, shall be submitted with the Integrated Monitoring Report (see Provision C.8.g.).

C.8.f. Citizen Monitoring and Participation

i. Permittees shall encourage Citizen Monitoring.

ii. In developing Monitoring Projects and evaluating Status & Trends data, Permittees shall make reasonable efforts to seek out citizen and stakeholder information and comment regarding waterbody function and quality.

iii. Permittees shall demonstrate annually that they have encouraged citizen and stakeholder observations and reporting of waterbody conditions. Permittees shall report on these outreach efforts in the annual Urban Creeks Monitoring Report.

C.8.g. Reporting

i. Water Quality Standard Exceedence – When data collected pursuant by C.8.a.-C.8.f. indicate that stormwater runoff or dry weather discharges are or may be causing or contributing to exceedance(s) of applicable water quality

[45] Nitrate sampling need not be duplicated where Pollutant of Concern and Long-Term monitoring are done at the same station(s).

[46] If Ceriodaphnia, H*yalella azteca,* or Pimephales survival or Selenastrum growth is < 50% of control results, repeat wet weather sample. If 2nd sample yields < 50% of control results, proceed to C.8.d.i.

standards, including narrative standards, a discussion of possible pollutant sources shall be included in the Urban Creeks Monitoring Report. When data collected pursuant by C.8.a.-C.8.f. indicate that discharges are causing or contributing to an exceedance of an applicable water quality standard, Permittees shall notify the Water Board within no more than 30 days of such a determination and submit a follow-up report in accordance with Provision C.1 requirements. The preceding reporting requirements shall not apply to continuing or recurring exceedances of water quality standards previously reported to the Water Board or to exceedances of pollutants that are to be addressed pursuant to Provisions C.8 through C.14 of this Order in accordance with Provision C.1.

ii. **Status & Trends Electronic Reporting** – Permittees shall submit an Electronic Status & Trends Data Report no later than January 15 of each year, reporting on all data collected during the foregoing October 1–September 30 period. Electronic Status & Trends Data Reports shall be in a format compatible with the SWAMP database.[47] Water Quality Objective exceedances shall be highlighted in the Report.

iii. **Urban Creeks Monitoring Report** – Permittees shall submit a comprehensive Urban Creeks Monitoring Report no later than March 15 of each year, reporting on all data collected during the foregoing October 1–September 30 period, with the initial report due March 15, 201~~1~~2, unless the Permittees choose to monitor through a regional collaborative, in which case the due date is March 15, 201~~2~~3. Each Urban Creeks Monitoring Report shall contain summaries of Status, Long-Term, Monitoring Projects, and Pollutants of Concern Monitoring including, as appropriate, the following:

(1) Maps and descriptions of all monitoring locations;

(2) Data tables and graphical data summaries; Constituents that exceed applicable water quality standards shall be highlighted;

(3) For all data, a statement of the data quality;

(4) An analysis of the data, which shall include the following:

- Calculations of biological metrics and physical habitat endpoints.
- Comparison of biological metrics to:
  - Each other
  - Any applicable, available reference site(s)
  - Any applicable, available index of biotic integrity
  - Physical habitat endpoints.
- Identification and analysis of any long-term trends in stormwater or receiving water quality.

[47] See http://mpsl.mlml.calstate.edu/swdataformats.htm. Permittees shall maintain an information management system that will support electronic transfer of data to the Regional Data Center of the ***California Environmental Data Exchange Network*** **(*CEDEN*)**, located within the San Francisco Estuary Institute.

(5) A discussion of the data for each monitoring program component, which shall:

- Discuss monitoring data relative to prior conditions, beneficial uses and applicable water quality standards as described in the Basin Plan, the Ocean Plan, or the California Toxics Rule or other applicable water quality control plans.
- Where appropriate, develop hypotheses to investigate regarding pollutant sources, trends, and BMP effectiveness.
- Identify and prioritize water quality problems.
- Identify potential sources of water quality problems.
- Describe follow-up actions.
- Evaluate the effectiveness of existing control measures.
- Identify management actions needed to address water quality problems.

iv. Monitoring Project Reports – Permittees shall report on the status of each ongoing Monitoring Project in each annual Urban Creeks Monitoring Report. In addition, Permittees shall submit stand-alone summary reports within six months of completing BMP Effectiveness and Geomorphic Projects; these reports shall include: a description of the project; map(s) of project locations; data tables and summaries; and discussion of results.

v. Integrated Monitoring Report – No later than March 15, 2014, Permittees shall prepare and submit an Integrated Monitoring Report through the regional collaborative monitoring effort on behalf of all participating Permittees, or on a countywide basis on behalf of participating Permittees, so that all monitoring conducted during the Permit term is reported.[48] This report shall be in lieu of the Annual Urban Creeks Monitoring Report due on March 15, 2014.

The report shall include, but not be limited to, a comprehensive analysis of all data collected pursuant to Provision C.8., and may include other pertinent studies. For Pollutants of Concern, the report shall include methods, data, calculations, load estimates, and source estimates for each Pollutant of Concern Monitoring parameter. The report shall include a budget summary for each monitoring requirement and recommendations for future monitoring. This report will be part of the next Report of Waste Discharge for the reissuance of this Permit.

vi. Standard Report Content –All monitoring reports shall include the following:

- The purpose of the monitoring and briefly describe the study design rationale.
- Quality Assurance/Quality Control summaries for sample collection and analytical methods, including a discussion of any limitations of the data.
- Brief descriptions of sampling protocols and analytical methods.

[48] Permittees who do not participate in the Regional Monitoring Group or in a stormwater countywide program must submit an individual Integrated Receiving Water Impacts Report.

- Sample location description, including waterbody name and segment and latitude and longitude coordinates.
- Sample ID, collection date (and time if relevant), media (e.g., water, filtered water, bed sediment, tissue).
- Concentrations detected, measurement units, and detection limits.
- Assessment, analysis, and interpretation of the data for each monitoring program component.
- Pollutant load and concentration at each mass emissions station.
- A listing of volunteer and other non-Permittee entities whose data are included in the report.
- Assessment of compliance with applicable water quality standards.
- A signed certification statement.

vii. Data Accessibility – Permittees shall make electronic reports available through a regional data center, and optionally through their web sites. Permittees shall notify stakeholders and members of the general public about the availability of electronic and paper monitoring reports through notices distributed through appropriate means, such as an electronic mailing list.

C.8.h. Monitoring Protocols and Data Quality

Where applicable, monitoring data must be SWAMP comparable. Minimum data quality shall be consistent with the latest version of the SWAMP Quality Assurance Project Plan (QAPP)[49] for applicable parameters, including data quality objectives, field and laboratory blanks, field duplicates, laboratory spikes, and clean techniques, using the most recent Standard Operating Procedures. A Regional Monitoring Collaborative may adapt the SWAMP QAPP for use in conducting monitoring in the San Francisco Bay Region, and may use such QAPP if acceptable to the Executive Officer.

[49] The current SWAMP QAPP at the time of Permit issuance is dated September 1, 2008, and is available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf.

C.9. Pesticides Toxicity Control

To prevent the impairment of urban streams by pesticide-related toxicity, Permittees shall implement a pesticide toxicity control program that addresses their own and others' use of pesticides within their jurisdictions that pose a threat to water quality and that have the potential to enter the municipal conveyance system. This provision implements requirements of the TMDL for Diazinon and Pesticide related Toxicity for Urban Creeks in the region. The TMDL includes urban runoff allocations for Diazinon of 100 ng/l and for pesticide related toxicity of 1.0 Acute Toxicity Units (TUa) and 1.0 Chronic Toxicity Units (TUc) to be met in urban creek waters. However, urban runoff management agencies (i.e., the Permittees) are not solely responsible for attaining the allocations because their authority to regulate pesticide use is constrained by federal and state law. Accordingly, the Permittees' requirements for addressing the allocations are set forth in the TMDL implementation plan and are included in this provision.

Pesticides of concern include: organophosphorous pesticides (chlorpyrifos, diazinon, and malathion); pyrethroids (bifenthrin, cyfluthrin, beta-cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda-cyhalothrin, permethrin, and tralomethrin); carbamates (e.g., carbaryl); and fipronil. Permittees may coordinate with BASMAA, the Urban Pesticide Pollution Prevention Project, the Urban Pesticide Committee, the Bay-Friendly Landscaping and Gardening Coalition, and other agencies and organizations in carrying out these activities.

C.9.a. Adopt an Integrated Pest Management (IPM) Policy or Ordinance

i. Task Description – In their IPM policies or ordinances, Permittees shall include provisions to minimize reliance on pesticides that threaten water quality and to require the use of IPM in municipal operations and on municipal property.

ii. Implementation Level – If not already in place, Permittees shall adopt IPM policies or ordinances no later than July 1, 2010.

iii. Reporting – Permittees shall submit a copy of their IPM ordinance(s) or policy(s) in the 2010 Annual Report.

C.9.b. Implement IPM Policy or Ordinance

i. Task Description – Permittees shall establish written standard operating procedures for pesticide use that ensure implementation of the IPM policy or ordinance and require municipal employees and contractors to adhere to the IPM standard operating procedures.

ii. Reporting

(1) In the Annual Report, Permittees shall report on IPM implementation by showing trends in quantities and types of pesticide used, and suggest reasons for increases in use of pesticides that threaten water quality, specifically organophosphorous pesticides, pyrethroids, carbaryl, and fipronil.

(2) Permittees shall maintain pesticide application standard operating procedures and submit them upon request.

C.9.c. Train Municipal Employees

i. Task Description – Permittees shall ensure that all municipal employees who, within the scope of their duties, apply or use pesticides that threaten water quality are trained in IPM practices and the Permittee's IPM policy. This training may also include other training opportunities such as Bay-Friendly Landscape Maintenance Training & Qualification Program and EcoWise Certified.

ii. Reporting

(1) In the Annual Report, Permittees shall report the percentage of municipal employees who apply pesticides who have received training in IPM policy and IPM standard operating procedures within the last three years.

(2) Permittees shall submit training materials (e.g., course outline, date, attendees) upon request.

C.9.d. Require Contractors to Implement IPM

i. Task Description – Permittees shall hire IPM-certified contractors or include contract specifications requiring contractors to implement IPM no later than July 1, 2010.

ii. Reporting – In the Annual Report, Permittees shall submit documentation to confirm compliance, such as the Permittee's standard contract specification or copy of contractors' certification(s).

C.9.e. Track and Participate in Relevant Regulatory Processes (may be done jointly with other Permittees, such as through CASQA or BASMAA and/or the Urban Pesticide Pollution Prevention Project)

i. Task Description

(1) Permittees shall track USEPA pesticide evaluation and registration activities as they relate to surface water quality, and when necessary, encourage USEPA to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the CWA and to accommodate water quality concerns within its pesticide registration process;

(2) Permittees shall track California Department of Pesticide Regulation (DPR) pesticide evaluation activities as they relate to surface water quality, and when necessary, encourage DPR to coordinate implementation of the California Food and Agriculture Code with California Water Code and to accommodate water quality concerns within its pesticide evaluation process;

(3) Permittees shall assemble and submit information (such as monitoring data) as needed to assist the California DPR and County Agricultural Commissioners in ensuring that pesticide applications comply with water quality standards; and

(4) As appropriate, Permittees shall submit comment letters on USEPA and California DPR re-registration, re-evaluation, and other actions relating to pesticides of concern for water quality.

ii. Reporting – In the Annual Report, Permittees who participate in a regional effort to comply with C.9.e. may reference a regional report that summarizes regional participation efforts, information submitted, and how regulatory actions were affected. All other Permittees shall list their specific participation efforts, information submitted, and how regulatory actions were affected.

C.9.f. Interface with County Agricultural Commissioners

i. Task Description – Permittees shall maintain regular communications with county agricultural commissioners (or other appropriate State and/or local agencies) to (1) get input and assistance on urban pest management practices and use of pesticides, (2) inform them of water quality issues related to pesticides, and (3) report violations of pesticide regulations (e.g., illegal handling) associated with stormwater management.

ii. Reporting – In the Annual Report, Permittees shall summarize improper pesticide usage reported to county agricultural commissioners and report follow-up actions to correct violations.

C.9.g. Evaluate Implementation of Source Control Actions Relating to Pesticides

i. Task Description – Permittees shall evaluate the effectiveness of the control measures implemented, evaluate attainment of pesticide concentration and toxicity targets for water and sediment from monitoring data (Provision C.8.), and identify improvements to existing control measures and/or additional control measures, if needed, to attain targets with an implementation time schedule.

ii. Reporting – In the 2013 Annual Report, Permittees shall report the evaluation results, and if needed, submit a plan to implement improved and/or new control measures.

C.9.h. Public Outreach (may be done jointly with other Permittees, such as through CASQA or BASMAA and/or the Urban Pesticide Pollution Prevention Project or the Bay-Friendly Landscaping & Gardening Coalition).

i. Point of Purchase Outreach: Permittees shall:

(1) Conduct outreach to consumers at the point of purchase;

(2) Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control; and

(3) Participate in and provide resources for the "Our Water, Our World" program or a functionally equivalent pesticide use reduction outreach program.

ii. Reporting – In the Annual Report, Permittees who participate in a regional effort to comply with C.9.h.i. may reference a report that summarizes these

actions. All other Permittees shall summarize activities completed and document any measurable awareness and behavior changes resulting from outreach.

iii. Pest Control Contracting Outreach: Permittees shall conduct outreach to residents who use or contract for structural or landscape pest control and shall:

(1) Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control, including IPM;

(2) Incorporate IPM messages into general outreach;

(3) Provide information to residents about "Our Water, Our World" or functionally equivalent program;

(4) Provide information to residents about EcoWise Certified IPM certification in Structural Pest Management, or functionally equivalent certification program; and

(5) Coordinate with household hazardous-waste programs to facilitate appropriate pesticide waste disposal, conduct education and outreach, and promote appropriate disposal.

iv. Reporting – In the 2013 Annual Report, Permittees who participate in a regional effort to comply with C.9.h.iii. may reference a report that summarizes these actions. All other Permittees shall document the effectiveness of their actions in the 2013 Annual Report. This documentation may include percentages of residents hiring certified IPM providers and the change in this percentage.

v. Outreach to Pest Control Operators: Permittees shall conduct outreach to pest control operators (PCOs) and landscapers; Permittees are encouraged to work with DPR, county agricultural commissioners, UC-IPM, BASMAA, the Urban Pesticide Committee, the EcoWise Certified Program (or functionally equivalent certification program), the Bio-integral Resource Center and others to promote IPM to PCOs and landscapers.

vi. Reporting – In each Annual Report, Permittees who participate in a regional effort to comply with C.9.h.v. may reference a report that summarizes these actions. All other Permittees shall summarize how they reached PCOs and landscapers and reduced pesticide use.

C.10. Trash Load Reduction

Permittees shall demonstrate compliance with Discharge Prohibition A.2 and trash-related Receiving Water Limitations through the timely implementation of control measures and other actions to reduce trash loads from municipal separate storm sewer systems (MS4s) by 40% by 2014, 70% by 2017, and 100% by 2022 as further specified below.

During this permit term, Permittees shall develop and implement a Short-Term Trash Load Reduction Plan. This includes implementation of a mandatory minimum level of trash capture; cleanup and abatement progress on a mandatory minimum number of Trash Hot Spots; and implementation of other control measures and best management practices, such as trash reduction ordinances, to prevent or remove trash loads from MS4s to attain a 40% reduction in trash loads by July 1, 2014. Permittees shall also develop and begin implementation of a Long-Term Trash Load Reduction Plan to attain a 70% reduction in trash loads from their MS4s by 2017 and 100% by 2022. Flood management agencies, which are non-population-based Permittees that do not have jurisdiction over urban watershed land, are not subject to these trash reduction requirements except for minimum full trash capture and Trash Hot Spot requirements, as specified in subsections C.10.a.iii and C.10.b below.

C.10.a. Short-Term Trash Load Reduction

i. **Short-Term Trash Loading Reduction Plan** – Each Permittee shall submit a Short-Term Trash Load Reduction Plan, including an implementation schedule, to the Water Board by February 1, 2012. The Plan shall describe control measures and best management practices, including any trash reduction ordinances, that are currently being implemented and the current level of implementation and additional control measures and best management practices that will be implemented, and/or an increased level of implementation designed to attain a 40% trash load reduction from its MS4 by July 1, 2014.

   The Short-Term Trash Load Reduction Plan shall account for required mandatory minimum Full Trash Capture devices called for in Provision C.10.a.iii and Trash Hot Spot Cleanup called for in Provision C.10.b.

ii. **Baseline Trash Load and Trash Load Reduction Tracking Method** – Each Permittee, working collaboratively or individually, shall determine the baseline trash load from its MS4 to establish the basis for trash load reductions and submit the determined load level to the Water Board by February 1, 2012, along with documentation of methodology used to determine the load level. The submittal shall also include a description of the trash load reduction tracking method that will be used to account for trash load reduction actions and to demonstrate progress and attainment of trash load reduction levels. The submittal shall account for the drainage areas of a Permittee's jurisdiction that are associated with the baseline trash load from its MS4, and the baseline trash load level per unit area by land use type and drainage area characteristics used to derive the total baseline trash load level for each Permittee.

   In the determination of applicable areas that generate trash loads for inclusion in the Baseline Trash Load, Permittees may propose areas for exclusion, with supporting documentation, which meet Discharge Prohibition A.2 and trash-

related Receiving Water Limitations. Documentation demonstrating no material trash presence or adverse impact may include data from the maintenance of existing trash capture devices, data from trash flux measurements in the MS4 and the water column of streams during wet weather, Trash Hot Spot assessments, and litter audits of street curb and gutter areas in high pedestrian traffic and high commercial activity areas.

If proposed areas for exclusion are commercial, industrial, or high density residential areas, or adjacent to schools or event venues, the Permittee shall collect and submit by February 1, 2013 an additional year of documentation to further support the basis for the exclusion. If the data continue to support the exclusion determination, further trash reduction actions are not required in these areas, unless the Water Board notifies the Permittee otherwise.

Each Permittee shall submit a progress report by February 1, 2011, that indicates whether it is determining its baseline trash load and trash load reduction method individually or collaboratively with other Permittees and a summary of the approach being used. The report shall also include the types and examples of documentation that will be used to propose exclusion areas, and the land use characteristics and estimated area of potentially excluded areas.

iii. Minimum Full Trash Capture – Except as excluded below, population-based Permittees shall install and maintain a mandatory minimum number of full trash capture devices by July 1, 2014, to treat runoff from an area equivalent to 30% of Retail/Wholesale Land[50] that drains to MS4s within their jurisdictions (see Table 10.1 in Attachment J). If the sum of the areas that generate trash loads determined pursuant to C.10.a.ii above is a smaller acreage than the required trash capture acreage, a population-based Permittee may reduce its minimum full trash capture requirement to the smaller acreage. A population-based Permittee with a population less than 12,000 and retail/wholesale land less than 40 acres, or a population less than 2000, is exempt from this trash capture requirement. The minimum number of trash capture devices required to be installed and maintained by non-population-based Permittees is included in Attachment J.

All installed devices that meet the following full trash capture definition may be counted toward this requirement regardless of date of installation. A full capture system or device is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate Q resulting from a one-year, one-hour, storm in the sub-drainage area.

C.10.b. Trash Hot Spot Selection and Cleanup

Trash Hot Spots in receiving waters shall be cleaned annually to achieve the multiple benefits of beginning abatement of these impacts as mitigation and to learn more about the sources and patterns of trash loading.

[50] [http://quake.abag.ca.gov/mitigation/pickdbh2.html] and Association of Bay Area Governments, 2005 ABAG Land Use Existing Land Use in 2005: Report and Data for Bay Area Counties

i. **Hot Spot Cleanup and Definition** – Permittees shall cleanup selected Trash Hot Spots to a level of "no visual impact" at least one time per year for the term of the permit. Trash Hot Spots shall be at least 100 yards of creek length or 200 yards of shoreline length.

ii. **Hot Spot Selection** – Population-based Permittees shall identify high trash-impacted locations on State waters totaling at least one Trash Hot Spot per 30,000 population, or one per 100 acres of Retail/Wholesale Commercial Land Area, within their jurisdictions based on Association of Bay Area Governments (ABAG) 2005 data1, whichever is greater. If the hot spot number by one of the two determination methods is more than twice that determined by the other method, double the smaller hot spot number shall be used. Otherwise, the larger hot spot number determined by the two methods shall be the Trash Hot Spot assignment for a population-based Permittee. Each population-based Permittee shall select at least one Trash Hot Spot. The Permittees shall each submit selected Trash Hot Spots to the Water Board by July 1, 2010. The list should include photo documentation (one photo per 50 feet) and initial assessment results for the proposed hot spots. The minimum number of Trash Hot Spots per Permittee is included in Attachment J for population and non-population-based Permittees. Permittees shall proceed with cleanup of selected Trash Hot Spots unless informed otherwise by the Water Board.

iii. **Hot Spot Assessments** – Permittees shall quantify the volume of material removed from each Trash Hot Spot cleanup, and identify the dominant types of trash (e.g., glass, plastics, paper) removed and their sources to the extent possible. Documentation shall include the trash condition before and after clean up of the entire hot spot using photo documentation with a minimum of one photo per 50 feet of hot spot length. Trash Hot Spots may also be assessed using either the Rapid Trash Assessment (RTA v.8) or the SCVURPPP Urban RTA variation of that method.

C.10.c. Long-Term Trash Load Reduction

Each Permittee shall submit a Long-Term Trash Load Reduction Plan, including an implementation schedule, to the Water Board by February 1, 2014. The Plan shall describe control measures and best management practices, including any trash reduction ordinances, that are being implemented and the level of implementation and additional control measures and best management practices that will be implemented, and/or an increased level of implementation designed to attain a 70% trash load reduction from its MS4 by July 1, 2017, and 100% by July 1, 2022.

C.10.d. Reporting

i. In each Annual Report, each Permittee shall provide a summary of its trash load reduction actions (control measures and best management practices) including the types of actions and levels of implementation, the total trash loads and dominant types of trash removed by its actions, and the total trash loads and dominant types of trash for each type of action. The latter shall include each Trash Hot Spot selected pursuant to C.10.b. Beginning with the 2012 Annual Report, each Permittee shall also report its percent annual trash load reduction relative to its Baseline Trash Load.

ii. Permittees shall retain records for review providing supporting documentation of trash load reduction actions and the volume and dominant type of trash removed from full trash capture devices, from each Trash Hot Spot cleanup, and from additional control measures or best management practices implemented. Data may be combined for specific types of full trash capture devices deployed in the same drainage area. These records shall have the specificity required for the trash load reduction tracking method established pursuant to subsection C.10.a.iii.

C.11. Mercury Controls

The Permittees shall implement the following control programs for mercury. The Permittees shall perform the control measures and provide reporting on those control measures according to the provisions below. The purpose of this provision is to implement the urban runoff requirements of the San Francisco Bay mercury TMDL and reduce mercury loads to make substantial progress toward achieving the urban runoff mercury load allocation established for the TMDL. The aggregate, regionwide, urban runoff wasteload load allocation is 82 kg/yr. This allocation should be achieved by February 2028 and, as a way to measure progress, an interim loading milestone of 120 kg/yr, halfway between the current load and the allocation, should be achieved by February 2018. If the interim loading milestone is not achieved, Permittees shall demonstrate reasonable and measurable progress toward achieving the milestone. The Permittees may comply with any requirement of this provision through a collaborative effort.

C.11.a. Mercury Collection and Recycling Implemented throughout the Region

i. **Task Description** – The Permittees shall promote, facilitate, and/or participate in collection and recycling of mercury containing devices and equipment at the consumer level (e.g., thermometers, thermostats, switches, bulbs).

ii. **Reporting** – The Permittees shall report on these efforts in their Annual Report, including an estimate of the mass of mercury collected.

C.11.b. Monitor Methylmercury

i. **Task Description** – The Permittees shall monitor methymercury in runoff discharges. The objective of the monitoring is to investigate a representative set of drainages and obtain seasonal information and to assess the magnitude and spatial/temporal patterns of methylmercury concentrations.

ii. **Implementation Level** – The Permittees shall analyze aqueous grab samples already being collected for total mercury analysis for methylmercury as specified in Provision C.8.f.

iii. **Reporting** – The Permittees shall report monitoring results annually beginning with their 2010 Annual Report.

C.11.c. Pilot Projects To Investigate and Abate Mercury Sources in Drainages, Including Public Rights-Of-Way, and Stormwater Conveyances with Accumulated Sediment that Contains Elevated Mercury Concentrations.

i. **Task Description** – The Permittees shall investigate and abate mercury sources in or to their storm drain systems in conjunction with the Water Board and other appropriate regulatory agencies with investigation and cleanup authorities. The purpose of this task is to implement and evaluate the benefit of a suite of abatement measures at five pilot project locations. The Permittees shall document the knowledge and experience gained through pilot implementation,

and this documentation will provide a basis for determining the scope of abatement implementation in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads abated resulting from implementation of these measures.

ii. **Implementation Level** – Reducing loads of PCBs is the main pilot location selection factor for this Provision, and reducing loads of mercury is a secondary criterion. Accordingly, for PCB pilot project locations selected as part of Provision C.12.c, the Permittees shall conduct reconnaissance in the pilot project drainage areas. The Permittees shall test sediments in storm drains and conveyances to characterize the extent and magnitude of mercury concentrations. They shall evaluate monitoring data and determine if a mercury sediment abatement program would reduce mercury loading significantly. If so determined, the Permittees shall cause abatement activities to be conducted at those sites under Permittee jurisdiction with identified remedial activities. When contamination is located on private property, a Permittee must either exercise direct authority to require cleanup or notify and request other appropriate authorities to exercise their cleanup authority. ~~The Permittees are responsible for contaminants located on public rights-of-way and the stormwater conveyance system.~~

iii. **Reporting** – Report on mercury-related aspects of work and loads abated as part of reporting requirements for Provision C.12.c.

C.11.d. Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices

i. **Task Description** – The Permittees shall jointly evaluate ways to enhance mercury load reduction benefits of operation and maintenance actives that remove or manage sediment. The purpose of this task is to implement these management practices at the pilot scale in five drainages during this permit term. The knowledge and experience gained through pilot implementation will be used to determine the implementation scope of enhanced sediment removal and management practices in subsequent permit terms. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of enhanced sediment removal management practices in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads removed or avoided resulting from implementation of these measures.

ii. **Implementation Level** – In all pilot program drainages selected as part of Provision C.12.c, the Permittees shall jointly evaluate ways to enhance existing sediment removal and management practices such as municipal street sweeping, curb clearing parking restrictions, inlet cleaning, catch basin cleaning, stream and stormwater conveyance system maintenance, and pump station cleaning via increased effort and/or retrofits for the control of mercury. This evaluation shall also include consideration of street flushing and capture, collection, or routing to the sanitary sewer (in coordination and consultation with local sanitary sewer

agencies) as a potential enhanced management practice in coordination and consultation with local sanitary sewer agencies.

Beginning July 1, 2011, the Permittees shall implement pilot studies for the most potentially effective measures(s) based on the evaluation of Provision C.11.d.ii in all drainages for which PCB pilot projects are being conducted.

iii. Reporting

(1) The Permittees shall present a progress report on the results of the evaluation in their 2010 Annual Report and the final evaluation results in their 2011 Annual Report.

(2) In their March 15, 2014 Integrated Monitoring Report ~~2013 Annual Report~~, the Permittees shall report the effectiveness of enhanced practices pilot implementation, report estimates of loads reduced, and present a plan and schedule for possible expanded implementation for subsequent permit terms.

C.11.e. Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit

i. Task Description – The Permittees shall evaluate and quantify the removal of mercury by on-site treatment systems via retrofit of such systems into existing storm drain systems. The purpose of this task is to implement on-site treatment projects at the pilot scale in ten locations during this permit term. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of on-site treatment retrofits in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads removed or avoided resulting from implementation of these measures.

ii. Implementation Level – The Permittees, working collaboratively, shall identify at least ten locations throughout the Permittees' jurisdictions that present opportunities to install and evaluate[51] on-site treatment systems (e.g., detention basins, bioretention units, sand filters, infiltration basins, treatment wetlands) and shall assess best treatment options for those locations. Every county (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano) should have at least one location. This effort shall identify potential locations draining a variety of land uses; evaluate technical feasibility; and discuss economical feasibility. The pilot locations may be the same as those chosen for Provision C.12.e, but consideration should be given to areas of elevated mercury concentrations.

On the basis of the Provision C.11.e.ii report, the Permittees shall select sites to perform pilot studies and shall conduct pilot studies in ten selected locations. Pilot studies shall span treatment types and drainage characteristics.

iii. Reporting –

[51] Permittees may evaluate a maximum of two pre-existing treatment systems of the ten total required systems to be evaluated provided that these existing treatment systems are applicable to the intent of this provision..

(1) In their 2011 Annual Report, the Permittees shall report on candidate locations and types of treatment retrofit for each location. The report shall include assessment of at least ten locations.

(2) In their March 15, 2014 Integrated Monitoring Report ~~2013 Annual Report~~, the Permittees shall report status, results, mercury removal effectiveness, and lessons learned from the ten pilot studies and their plan for implementing this type of treatment on an expanded basis throughout their jurisdictions during the next permit term.

C.11.f. Diversion of Dry Weather and First Flush Flows to Publicly Owned Treatment Works (POTWs)

i. Task Description – The Permittees shall evaluate the reduced loads of mercury from diversion of dry weather and first flush stormwater flows to sanitary sewers. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of urban runoff diversion projects in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads removed or avoided resulting from implementation of these measures.

ii. Implementation Level – The Permittees shall implement pilot projects to divert dry weather and first flush flows to POTWs to address these flows as a source of PCBs and mercury to receiving waters. The Permittees are strongly encouraged to make use of stormwater pump stations in this effort because pump station characterization work performed pursuant to Provisions C.2 and C.10, addressing dissolved oxygen depletion and trash impacts, may be efficiently leveraged for the initial phase of these diversion pilot projects. The objectives of this Provision are to: implement five pilot projects for urban runoff diversion from stormwater pump stations to POTWs; evaluate the reduced loads of mercury and PCBs resulting from each diversion; and gather information to guide the selection of additional diversion projects in future permits. Collectively, the Permittees shall select five stormwater pump stations and five alternates by evaluating drainage characteristics and the feasibility of diverting flows to the sanitary sewer.

(1) The Permittees should work with local POTWs on a watershed, county, or regional level to evaluate feasibility and to establish cost sharing agreements. The feasibility evaluation shall include, but not be limited to, costs, benefits, and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather and first flush flows.

(2) From this feasibility evaluation, the Permittees shall select five pump stations and five alternates for pilot diversion studies. At least one urban runoff diversion pilot project shall be implemented in each of the five counties (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano). The pilot and alternate locations should be located in industrially-

dominated catchments where elevated PCB concentrations are documented.

(3) The Permittees shall implement flow diversion to the sanitary sewer at five pilot pump stations. As part of the pilot studies, the Permittees shall monitor, measure, and report mercury load reduction.

iii. Reporting

(1) The Permittees shall summarize the results of the feasibility evaluation in their 2010 Annual Report, including:

- Selection criteria leading to the identification of the five candidate and five alternate pump stations for pilot studies.
- Time schedules for conducting the pilot studies.
- A proposed method for distributing mercury load reductions to participating wastewater and stormwater agencies.

(2) The Permittees shall report annually on the status of the pilot studies in each subsequent Annual Report.

(3) The Permittees shall include in their March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~:

- Evaluation of pilot program effectiveness.
- Mercury loads reduced.
- Updated feasibility evaluation procedures to guide future diversion project selection.

C.11.g. Monitor Stormwater Mercury Pollutant Loads and Loads Reduced

i. Task Description – The Permittees shall develop and implement a monitoring program to quantify mercury loads and loads reduced through source control, treatment and other management measures as required in Provision C.8.f.

ii. Implementation Level – The Permittees shall demonstrate progress toward (a) the interim loading milestones, or (b) attainment of the program area allocations, by using the following methods:

(1) Quantify through estimates the annual average mercury load reduced by implementing pollution prevention, source control and treatment control efforts required by the provisions of this permit or other relevant efforts; or

(2) Quantify the mercury load as a rolling five-year annual average using data on flow and water column mercury concentrations; or

(3) Quantitatively demonstrate that the mercury concentration of suspended sediment that best represents sediment discharged with urban runoff is below the target of 0.2 mg mercury/kg dry weight.

iii. Reporting

(1) The Permittees shall report in their 2010 Annual Report methods used to assess progress toward meeting WLA goals and a full description of the measurement and estimation methodology and rationale for the approaches.

(2) The Permittees shall report in their March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~ results of chosen monitoring/measurement approach concerning loads assessment and estimation of loads reduced.

C.11.h. Fate and Transport Study of Mercury in Urban Runoff

i. Task Description – The Permittees shall conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of mercury discharged in urban runoff to San Francisco Bay and tidal areas.

ii. Implementation Level – The specific information needs include understanding the in-Bay transport of mercury discharged in urban runoff, the influence of urban runoff on the patterns of food web mercury accumulation, and the identification of drainages where urban runoff mercury is particularly important in food web accumulation.

iii. Reporting – The Permittees shall submit in their 2010 Annual Report a work plan describing the specific manner in which these information needs will be accomplished and describing the studies to be performed with a schedule. The Permittees shall report on status of these studies in their 2010, 2011, and 2012 Annual Reports. In the March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~, the Permittees shall report the findings and results of the studies completed, planned, or in progress as well as implications of studies on potential control measures to be investigated, piloted or implemented in future permit cycles.

C.11.i. Development of a Risk Reduction Program Implemented Throughout the Region.

i. Task Description – The Permittees shall develop and implement or participate in effective programs to reduce mercury-related risks to humans and quantify the resulting risk reductions from these activities.

ii. Implementation Level – The risk reduction activities shall include investigating ways to address public health impacts of mercury in San Francisco Bay/Delta fish, including activities that reduce actual and potential exposure of health impacts to those people and communities most likely to be affected by mercury in San Francisco Bay-caught fish, such as subsistence fishers and their families. Such strategies should include public participation in developing effective programs in order to ensure their effectiveness. The Permittees may include studies needed to establish effective exposure reduction activities and risk communication messages as part of their planning. The risk reduction activities

may be performed by a third party if the Permittees wish to provide funding for this purpose. This requirement may be satisfied by a combination of related efforts through the Regional Monitoring Program or other similar collaborative efforts.

iii. **Reporting** – The Permittees shall submit in their 2010 Annual Report the specific manner in which these risk reduction activities will be accomplished and describe the studies to be performed with a schedule. The Permittees shall report on the status of the risk reduction efforts in their 2011 and 2012 Annual Reports. The Permittees shall report the findings and results of the studies completed, planned, or in progress as well as the status of other risk reduction actions in their March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~.

C.11.j. Develop Allocation Sharing Scheme with Caltrans.

i. **Task Description** – The wasteload allocations for urban stormwater developed through the San Francisco Bay mercury TMDL implicitly include California Department of Transportation (Caltrans) roadway and non-roadway facilities within the geographic boundaries of urban runoff management agencies. Consistent with the TMDL, the Permittees are required to develop an equitable mercury allocation-sharing scheme in consultation with Caltrans to address the Caltrans facilities in the program area, and report the details to the Water Board. Alternatively, Caltrans may choose to implement mercury load reduction actions on a watershed or regionwide basis in lieu of sharing a portion of an urban runoff management agencies' mercury allocation. In such a case, the Water Board will consider a separate allocation for Caltrans for which it may demonstrate progress toward attaining an allocation or load reduction in the same manner as municipal programs.

ii. **Reporting** – The Permittees shall report on the status of the efforts to develop this allocation sharing scheme in their 2010, 2011, and 2012 Annual Reports. The Permittees shall submit in their March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~ the manner in which the urban runoff mercury TMDL allocation will be shared between the Permittees and Caltrans.

C.12. Polychlorinated Biphenols (PCBs) Controls

Permittees shall implement the following control programs for PCBs. Permittees shall perform the control measures and provide reporting on those control measures according to the provisions below. The purpose of these provisions is to implement the urban runoff requirements of the PCBs TMDL and reduce PCBs loads to make substantial progress toward achieving the urban runoff PCBs load allocation. Permittees may comply with any requirement of this Provision through a collaborative effort.

C.12.a. Implement Project throughout Region to Incorporate PCBs and PCB-Containing Equipment Identification into Existing Industrial Inspections

i. Task Description – Permittees shall develop training materials and train municipal industrial building inspectors to identify, in the course of their existing inspections, PCBs or PCB-containing equipment. Permittees shall incorporate such PCB identification into industrial inspection programs.

ii. Implementation Level – Where inspectors identify during inspections PCBs or PCB-containing equipment, Permittees shall document incident in inspection report and refer to appropriate regulatory agencies (e.g. county health departments, Department of Toxic Substances Control, California Department of Health Services, and the Water Board) as necessary.

iii. Reporting – Permittees shall report the results of training in the 2010 Annual Report and report on both ongoing training development and inspections for PCB identification in the 2011, and following Annual Reports.

C.12.b. Conduct Pilot Projects to Evaluate Managing PCB-Containing Materials and Wastes during Building Demolition and Renovation (e.g., Window Replacement) Activities

i. Task Description – Permittees shall evaluate potential presence of PCBs at construction sites, current material handling and disposal regulations/programs (e.g., municipal ordinances, RCRA, TSCA) and current level of implementation.

ii. Implementation Level –

(1) Permittees shall develop a sampling and analysis plan to evaluate PCBs at construction sites that involve demolition activities (including research on when, where, and which materials potentially contained PCBs).

(2) Permittees shall implement a sampling and analysis plan at a minimum of 10 sites distributed throughout the combined Permittees' jurisdiction areas.

(3) Permittees shall develop/select BMPs to reduce or prevent discharges of PCBs during demolition/remodeling. The BMPs will focus on methods to identify, handle, contain, transport and dispose of PCB-containing building materials.

(4) Permittees shall develop model ordinances or policies, train and deploy inspectors, and pilot test BMPs at 5 sites.

iii. Reporting –

(1) In the 2010 Annual Report, Permittees shall submit the sampling and analysis plan (of Provision C.12.b.ii.).

(2) In the 2010 Annual Report, Permittees shall submit a status report on sampling and analysis along with whatever sampling results are available.

(3) In the 2011 Annual Report, Permittees shall submit the results of the evaluation (Provision C.12.b.i.) of current regulations, level of implementation, and regulatory gaps as well as the final sampling and analysis report, a list of appropriate BMPs, BMP training program, and model ordinances and policies to prevent PCB discharges from building demolition and improvement activities.

(4) In the March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~, Permittees shall submit the results of pilot program effectiveness evaluation.

C.12.c. Pilot Projects to Investigate and Abate On-land Locations with Elevated PCB Concentrations, Including Public Rights-of-way, and Stormwater Conveyances with Accumulated Sediments with Elevated PCBs Concentrations.

i. Task Description – Permittees shall investigate and abate PCBs sources in or to their storm drain systems in conjunction with the Water Board and other appropriate regulatory agencies with investigation and cleanup authorities. The purpose of this task is to implement and evaluate the benefit of a suite of abatement measures at five pilot project locations. Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of abatement projects in subsequent permit terms. Permittees shall also quantify and report the amount of PCBs loads abated resulting from implementation of these measures.

ii. Implementation Level –

(1) Permittees, working collaboratively, shall identify 5 drainage areas that contain high levels of PCBs and conduct pilot projects to investigate and abate these high PCB concentrations. To accomplish this, Permittees shall interview municipal staff and review municipal databases, data collected or compiled through grant-funded efforts, other agency files, and other available information to identify potential PCB source areas and areas where PCB-contaminated sediment accumulates, including within stormwater conveyances. Permittees shall qualitatively rank and map potential PCB source areas within each drainage. Investigation of mercury (Provision C.11.c.) shall be included in these efforts unless not appropriate. When contamination is located on private property, Permittees must either exercise direct authority to require cleanup or

notify and request other appropriate authorities to exercise their cleanup authority. ~~Permittees are responsible for contaminants located on public rights-of-way and the stormwater conveyance system.~~

(2) Permittees shall conduct reconnaissance surveys of the identified drainages and gather information concerning past or current use of PCBs to further identify potential source areas and determine whether runoff from such locations is likely to convey soils/sediments with PCBs to municipal stormwater conveyances.

(3) Permittees shall validate existence of elevated PCB concentrations through surface soil/sediment sampling and analysis where visual inspections and/or other information suggest potential source areas within each drainage.

Where data confirm significantly elevated PCB concentrations in surface soils/sediments within the subject pilot drainage, Permittees shall provide available information on current site conditions and owner/operators and other potentially responsible parties to Water Board and other appropriate regulatory agencies to facilitate their issuance of orders for further investigation and remediation of subject sites. Permittees shall assist the Water Board and other appropriate agencies to identify/evaluate funding to perform abatement and/or responsible parties and abatement options.

(4) Permittees shall identify areas for expedited abatement on the basis of loading potential including factors such as PCB concentration, mass of sediment, and mobilization potential and/or human health protection thresholds, such as California Human Health Screening Levels.

(5) Permittees shall conduct an abatement program in portions of drainages under their jurisdiction in conjunction with the Water Board and other appropriate agencies.

iii. Reporting

(1) Permittees shall report on the identified suspect drainage areas [Provision C.12.c.ii (1)] in the 2010 Annual Report and results of the surveys [Provision C.12.c.ii.(2)] in the 2011 Annual Report.

(2) Permittees shall report sampling and chemical analysis results at pilot locations [Provision C.12.c.ii.(3)] in the 2011 Annual Reports.

(3) Permittees shall report on proposed abatement opportunities and activities [Provision C.12.c.ii.(4) and (5)], responsible parties, funding, agency oversight, and schedules in the 2012 Annual Report.

(4) Permittees shall report results of abatement program effectiveness and estimates of loads reduced (see C.11.g) in the March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~.

C.12.d. Conduct Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices

i. **Task Description** – Permittees shall jointly evaluate ways to enhance PCBs load reduction benefits of operation and maintenance activities that remove or manage sediment. The purpose of this task is to implement these management practices at the pilot scale in five drainages during this permit term. Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of enhanced sediment removal and management practices in subsequent permit terms. Permittees shall also quantify and report the amount of PCBs loads removed or avoided resulting from implementation of these measures.

ii. **Implementation Level** – In all pilot program drainages selected as part of Provision C.12.c, Permittees shall jointly evaluate ways to enhance existing sediment removal and management practices such as municipal street sweeping, curb clearing parking restrictions, inlet cleaning, catch basin cleaning, stream and stormwater conveyance system maintenance, and pump station cleaning via increased effort and/or retrofits. This evaluation shall also include consideration of street flushing and capture, collection, or routing to the sanitary sewer (in coordination and consultation with local sanitary sewer agency) as a potential enhanced management practice. Permittees shall also jointly evaluate existing information on high-efficiency street sweepers. The goal is to evaluate the cost-effectiveness of high-efficiency street sweeping relative to reducing pollutant loads. Permittees shall develop recommendations for follow-up studies to be conducted.

iii. **Reporting** – Permittees shall submit a progress report on the results of these two evaluations in the 2010 Annual Report and the final evaluation results in the 2011 Annual Report.

iv. Beginning July 1, 2011, Permittees shall implement pilot studies for the most potentially effective measure(s) based on the evaluation of Provision C.12.d. ii. throughout the region.

v. **Reporting** – Permittees shall report effectiveness of enhanced practices pilot implementation in the March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~, and their plan for implementing enhanced practices in the next permit term.

C.12.e. Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit

i. **Task Description** – Permittees shall evaluate and quantify the removal of PCBs by on-site treatment systems via retrofit of such systems into existing storm drain systems. The purpose of this task is to implement on-site treatment projects at the pilot scale in ten locations during this permit term. Permittees shall document the knowledge and experience gained through pilot

implementation, and this documentation will provide a basis for determining the implementation scope of on-site treatment retrofits in subsequent permit terms.

ii. Implementation Level – Permittees, working collaboratively, shall identify at least 10 locations throughout the Permittees' jurisdictions that present opportunities to install and evaluate[52] on-site treatment systems (e.g., detention basins, bioretention units, sand filters, infiltration basins, treatment wetlands) and shall assess the best treatment options for those locations. Every county (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano) should have at least one location. This assessment shall identify potential locations draining a variety of land uses, discuss technical feasibility, and discuss economical feasibility. Permittees shall choose pilot study locations primarily on the basis of elevated PCBs concentrations with additional consideration to mercury concentrations.

iii. On the basis of the Provision C.12.e.ii. report, Permittees shall select sites to perform pilot studies and shall conduct pilot studies in selected locations. Taken as a group, these 10 pilot study locations should span treatment types and drainage characteristics.

iv. Reporting –

(1) In the 2011 Annual Report, Permittees shall report on candidate locations with types of treatment retrofit for each location. The report shall include assessment of at least 10 locations.

(2) In the March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~, Permittees shall report status, results, PCBs-removal effectiveness, and lessons learned from the pilot studies and their plan for implementing this type of treatment on an expanded basis throughout the region during the next permit term.

C.12.f. Diversion of Dry Weather and First Flush Flows to POTWs

i. Task Description – Permittees shall evaluate the reduced loads of PCBs from diversion of dry weather and first flush stormwater flows to sanitary sewers. The knowledge and experience gained through pilot implementation will be used to determine the implementation scope of urban runoff diversion in subsequent permit terms. Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of urban runoff diversion projects in subsequent permit terms.

ii. Implementation Level – Permittees shall implement pilot projects to address the role of pump stations as a source of pollutants of concern (primarily PCBs and secondarily mercury). This work is in addition to Provisions C.2 and C.10 that address dissolved oxygen depletion and trash impacts in receiving waters. The objectives of this provision are: to implement five pilot projects for urban

[52] Permittees may evaluate a maximum of two pre-existing treatment systems of the ten total required systems to be evaluated provided that these existing treatment systems are applicable to the intent of this provision.

runoff diversion from stormwater pump stations to POTWs; evaluate the reduced loads of mercury and PCBs resulting from the diversion; and gather information to guide the selection of additional diversion projects required in future permits. Collectively, Permittees shall select 5 stormwater pump stations and 5 alternates by evaluating drainage characteristics and the feasibility of diverting flows to the sanitary sewer.

(1) Permittees should work with the local POTW on a watershed, program, or regional level to evaluate feasibility and to establish cost sharing agreements. The feasibility evaluation shall include, but not be limited to, costs, benefits, and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather and first flush flows.

(2) From this feasibility evaluation, Permittees shall select 5 pump stations and 5 alternates for pilot diversion studies. At least one urban runoff diversion pilot project shall be implemented in each of the five counties (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano). The pilot and alternate locations should be located in industrially dominated catchments where elevated PCB concentrations are documented.

(3) Permittees shall implement flow diversion to the sanitary sewer at the 5 pilot pump stations. As part of the pilot studies, they shall monitor and measure PCBs load reduction.

iii. Reporting –

(1) Permittees shall summarize the results of the feasibility evaluation in the 2010 Annual Report, including:

- Selection criteria leading to the identification of the 5 candidate and 5 alternate pump station for pilot studies.
- Time schedules for conducting the pilot studies.
- A proposed method for distributing PCBs load reductions to participating wastewater and stormwater agencies.

(2) Permittees shall report annually on the status of the pilot studies in each subsequent annual report.

(3) The March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~ shall include:

- Evaluation of pilot program effectiveness.
- PCBs loads reduced.
- Updated feasibility evaluation procedures to guide future diversion project selection.

C.12.g. Monitor Stormwater PCB Pollutant Loads and Loads Reduced

Permittees shall develop and implement a monitoring program as required in Provision C.8.f. to quantify PCBs loads and loads reduced (see C.11.g for details)

through the source control, treatment and other management measures implemented as part of the pilot studies of C.12.a through C.12.f.

C.12.h. Fate and Transport Study of PCBs in Urban Runoff

i. **Task Description** – Permittees shall conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of PCBs discharged in urban runoff.

ii. **Implementation Level** – The specific information needs include understanding the in-Bay transport of PCBs discharged in urban runoff, the influence of urban runoff on the patterns of food web PCBs accumulation, and the identification of drainages where urban runoff PCBs are particularly important in food web accumulation.

iii. **Reporting** – Permittees shall submit in the 2010 Annual Report a workplan describing the specific manner in which these information needs will be accomplished and describing the studies to be performed with a schedule. Permittees shall report on status of the studies in the 2011, and 2012 Annual Reports. Permittees shall report in the March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~ the findings and results of the studies completed, planned, or in progress as well as implications of studies on potential control measures to be investigated, piloted or implemented in future permit cycles.

C.12.i. Development of a Risk Reduction Program Implemented throughout the Region

i. **Task Description** – Permittees shall develop and implement or participate in effective programs to reduce PCBs-related risks to humans and quantify the resulting risk reductions from these activities.

ii. **Implementation Level** – The risk reduction activities shall include investigating ways to address public health impacts of PCBs in San Francisco Bay/Delta fish, including activities that reduce actual and potential exposure of health impacts to those people and communities most likely to be affected by PCBs in San Francisco Bay-caught fish, such as subsistence fishers and their families. Such strategies should include public participation in developing effective programs in order to ensure their effectiveness. The Permittees may include studies needed to establish effective exposure reduction activities and risk communication messages as part of their planning. The risk reduction activities may be performed by a third party if the Permittees wish to provide funding for this purpose. This requirement may be satisfied by a combination of related efforts through the Regional Monitoring Program or other similar collaborative efforts.

iii. **Reporting** – Permittees shall submit in the 2010 Annual Report the specific manner in which these risk reduction activities will be accomplished and describe the studies to be performed with a schedule. Permittees shall report on status of the studies in the 2011, and 2012 Annual Reports. Permittees shall report the findings and results of the studies completed, planned, or in progress as well as the status of other risk reduction actions in the March 15, 2014 Integrated Monitoring Report~~2013 Annual Report~~.

C.13. Copper Controls

The control program for copper is detailed below. Permittees shall implement the control measures and accomplish the reporting on those control measures according to the provisions below. The purpose of these provisions is to implement the control measures identified in the Basin Plan amendment necessary to support the copper site-specific objectives in San Francisco Bay. Permittees may comply with any requirement of C.13 Provisions through a collaborative effort.

C.13.a. Manage Waste Generated from Cleaning and Treating of Copper Architectural Features, Including Copper Roofs, during Construction and Post-Construction.

i. Task Description – Permittees shall ensure that local ordinance authority is established to prohibit the discharge of wastewater to storm drains generated from the installation, cleaning, treating, and washing of the surface of copper architectural features, including copper roofs to storm drains.

ii. Implementation Level

(1) Permittees shall develop BMPs on how to manage the waste during and post-construction.

(2) Permittees shall require use of appropriate BMPs when issuing building permits.

(3) Permittees shall educate installers and operators on appropriate BMPs.

(4) Permittees shall enforce against noncompliance.

iii. Reporting

(1) Permittees shall certify adequate legal authority in the 2011 Annual Report or otherwise provide justification for schedule not to exceed one year to comply.

(2) Permittees shall report annually, starting with 2012 Annual Report, on training, permitting and enforcement activities.

(3) In the 2013 Annual Report, Permittees shall evaluate the effectiveness of these measures, including BMP implementation and propose any additional measures to address this source.

C.13.b. Manage Discharges from Pools, Spas, and Fountains that Contain Copper-Based Chemicals

i. Task Description – By adopting local ordinances, Permittees shall prohibit discharges to storm drains from pools, spas, and fountains that contain copper-based chemicals.

ii. Implementation Level – Permittees shall either: 1) require installation of a sanitary sewer discharge connection for pools, spas, and fountains, including connection for filter backwash, with a proper permit from the POTWs; or 2) require diversion of discharge for use in landscaping or irrigation.

iii. Reporting – Permittees shall certify adequate legal authority in the 2011 Annual Report or otherwise provide justification for schedule not to exceed one year to comply.

C.13.c. Vehicle Brake Pads

i. Task Description – Permittees shall engage in efforts to reduce the copper discharged from automobile brake pads to surface waters via urban runoff.

ii. Implementation Level – Permittees shall participate in the Brake Pad Partnership (BPP) process to develop California legislation phasing out copper from certain automobile brake pads sold in California.

iii. Reporting – Permittees shall report on legislation development and implementation status in Annual Reports during the permit term. In the 2013 Annual Report, Permittees shall assess status of copper water quality issues associated with automobile brake pads and recommend brake pad-related actions for inclusion in subsequent permits if needed.

C.13.d. Industrial Sources

i. Task Description – Permittees shall ensure industrial facilities do not discharge elevated levels of copper to storm drains by ensuring, through industrial facility inspections, that proper BMPs are in place.

ii. Implementation Level –

(1) As part of industrial site controls required by Provision C.4, Permittees shall identify facilities likely to use copper or have sources of copper (e.g., plating facilities, metal finishers, auto dismantlers) and include them in their inspection program plans.

(2) Permittees shall educate industrial inspectors on industrial facilities likely to use copper or have sources of copper and proper BMPs for them.

(3) As part of the industrial inspection, inspectors shall ensure that proper BMPs are in place at such facilities to minimize discharge of copper to storm drains, including consideration of roof runoff that might accumulate copper deposits from ventilation systems on-site.

iii. Reporting

Permittees shall highlight copper reduction results in the industrial inspection component in the C.13 portion of each Annual Report beginning September of 2010.

C.13.e. Studies to Reduce Copper Pollutant Impact Uncertainties

i. Task Description – Permittees shall conduct or cause to be conducted technical studies to investigate possible copper sediment toxicity and technical studies to investigate sub-lethal effects on salmonids.

ii. Implementation Level – Technical uncertainties regarding copper effects in the Bay are described in the Basin Plan's implementation program for copper site-specific objectives. These uncertainties include toxicity to Bay benthic organisms possibly caused by high copper concentrations as well as possible impacts to the olfactory system of salmonids. Permittees shall ensure that these studies are supported and conducted. Similar requirements are included in NPDES permits for wastewater discharges. Permittees shall submit in the 2010 Annual Report the specific manner in which these information needs will be accomplished and describe the studies to be performed with a schedule. Permittees shall report the findings and results of the studies completed, planned, or in progress in the 2012 Annual Report.

C.14. Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides and Selenium

The control program for PBDEs, legacy pesticides, and selenium is detailed below. Permittees shall perform the control measures and accomplish the reporting on those control measures according to the provisions below. The purpose of these provisions is to gather concentration and loading information on a number of pollutants of concern (e.g., PBDEs, DDT, dieldrin, chlordane, selenium) for which TMDLs are planned or are in the early stages of development. Permittees may comply with any requirement of C.14 Provisions through a collaborative effort.

C.14.a. Control Program for PBDEs, Legacy Pesticides, and Selenium.

i. **Task Description** – To determine if urban runoff is a conveyance mechanism associated with the possible impairment of San Francisco Bay for PBDEs, legacy pesticides (such as DDT, dieldrin, and chlordane), and selenium, Permittees shall work with the other municipal stormwater management agencies in the Bay Region to implement a plan (PBDEs/Legacy Pesticides/Selenium Plans) to identify, assess, and manage controllable sources of PBDEs, legacy pesticides, and selenium found in urban runoff, if any. The Water Board recognizes that these three pollutants are distinct in terms of origin and transport, but they have been grouped into a single permit provision because the requirements are identical. The Water Board anticipates that some of the control measures that are developed for PCBs consistent with aforementioned efforts warrant consideration for the control of PBDEs and possibly legacy pesticides.

ii. **Implementation Level** – The PBDEs/Legacy Pesticides/Selenium Plan shall include actions to do the following:

Characterize the representative distribution of PBDEs, legacy pesticides, and selenium in the urban areas of the Bay Region covered by this permit to determine:

(1) If PBDEs, legacy pesticides, and selenium are present in urban runoff;

(2) If PBDEs, legacy pesticides, or selenium are distributed relatively uniformly in urban areas; and

(3) Whether storm drains or other surface drainage pathways are sources of PBDEs, legacy pesticides, or selenium in themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PBDEs, legacy pesticides, or selenium to San Francisco Bay via urban runoff conveyance systems.

iii. Report on progress in 2010 and 2011 Annual Reports. Submit in the 2012 Annual Report a report with the results of the characterization of PBDEs, legacy pesticides, and selenium in urban areas throughout the Bay Region.

iv. Provide information to allow calculation of PBDEs, legacy pesticides, and selenium loads to San Francisco Bay from urban runoff conveyance systems.

v. Submit in the 2013 Annual Report a report with the information required to compute such loads to San Francisco Bay of PBDEs, legacy pesticides, and selenium from urban runoff conveyance systems throughout the Bay.

vi. Identify control measures and/or management practices to eliminate or reduce discharges of PBDEs, legacy pesticides, or selenium conveyed by urban runoff conveyance systems.

vii. Submit in the 2013 Annual Report a report identifying such control measures/management practices.

C.15. Exempted and Conditionally Exempted Discharges

The objective of this provision is to exempt unpolluted non-stormwater discharges from Discharge Prohibition A.1 and to conditionally exempt non-stormwater discharges that are potential sources of pollutants. In order for ~~exempt~~ non-stormwater discharges to be conditionally exempted from Discharge Prohibition A.1, the Permittees must identify appropriate BMPs, monitor the non-stormwater discharges where necessary, and ensure implementation of effective control measures – as listed below – to eliminate adverse impacts to waters of the State consistent with the discharge prohibitions of the Order.

C.15.a. Exempted Non-Stormwater Discharges (Exempted Discharges):

i. Discharge Type – In carrying out Discharge Prohibition A.1, the following unpolluted discharges are exempted from prohibition of non-stormwater discharges:

(1) Flows from riparian habitats or wetlands;

(2) Diverted stream flows;

(3) Flows from natural springs;

(4) Rising ground waters;

(5) Uncontaminated and unpolluted groundwater infiltration;

(6) Single family homes' pumped groundwater, foundation drains, and water from crawl space pumps and footing drains;

(7) Pumped groundwater from drinking water aquifers; and

(8) NPDES permitted discharges (individual or general permits).

ii. Implementation Level – The non-stormwater discharges listed in Provision C.15.a.i above are exempted unless they are identified by the Permittees or the Executive Officer as sources of pollutants to receiving waters. If any of the above categories of discharges, or sources of such discharges, are identified as sources of pollutants to receiving waters, such categories or sources shall be addressed as conditionally exempted discharges in accordance with Provision C.15.b below.

C.15.b. Conditionally Exempted Non-Stormwater Discharges:

The following non-stormwater discharges are also exempt from Discharge Prohibition A.1 if they are either identified by the Permittees or the Executive Officer as not being sources of pollutants to receiving waters, or if appropriate control measures to eliminate adverse impacts of such sources are developed and implemented in accordance with the tasks and implementation levels of each category of Provision C.15.b.i-viii below.

i. Discharge Type – Pumped Groundwater, Foundation Drains, and Water from Crawl Space Pumps and Footing Drains

(1) **Pumped Groundwater from Non Drinking Water Aquifers** –

Groundwater pumped from monitoring wells, used for groundwater basin management, which are owned and/or operated by the Permittees who pump groundwater as drinking water. These aquifers tend to be shallower, when compared to drinking water aquifers.

(a) **Implementation Level** – Twice a year (once during the wet season and once during the dry season), representative samples shall be taken from each aquifer that potentially will discharge or has discharged into a storm drain. Samples collected and analyzed for compliance in accordance with self-monitoring requirements of other NPDES permits or sample data collected for drinking water regulatory compliance may be submitted to comply with this requirement as long as they meet the following criteria:

(i) The water samples shall meet water quality standards consistent with the existing effluent limitations in the Water Board's NPDES General Permits, such as NPDES Nos. CAG912002 and CAG912003 for Discharge or Reuse of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by fuel and VOCs, respectively, and NPDES No. CAG912004 for discharges of low-level, incidental, and potentially contaminated groundwater.

(ii) The water samples shall be analyzed using approved USEPA Methods (e.g., (a) USEPA Method 160.2 for total suspended solids; (b) USEPA Method 8015 Modified for total petroleum hydrocarbons; (c) USEPA Method 8260B and 8270C or equivalent for volatile and semi-volatile organic compounds; and (d) USEPA Method 3005 for metals.

(iii) The water samples shall be analyzed for pH and turbidity.

(iv) If a Permittee is unable to comply with the above criteria, the Permittee shall notify the Water Board upon becoming aware of the compliance issue.

(b) **Required BMPs** – When uncontaminated (meeting the criteria in C.15.b.i.(1)(a)(i)) groundwater is discharged from these monitoring wells, the following shall be implemented:

(i) Discharges shall be properly controlled and maintained to prevent erosion at the discharge point and at a rate that avoids scouring of banks and excess sedimentation in the receiving waterbody.

(ii) Appropriate BMPs shall be implemented to remove total suspended solids and silt to allowable discharge levels. Appropriate BMPs may include filtration, settling, coagulant application with no residual coagulant discharge, minor odor or color removal with activated carbon, small scale peroxide addition, or other minor treatment.

(iii) Turbidity of the discharged groundwater shall be maintained below 50 NTUs for discharges to dry creeks, 110 percent of the ambient stream turbidity for a flowing stream with turbidities

greater than 50 NTU, or 5 NTU above ambient turbidity for flowing streams with turbidities less than or equal to 50 NTU.

(iv) pH of the discharged groundwater shall be maintained within the range of 6.5 to 8.5.

(c) **Reporting** – The Permittees shall maintain records of these discharges, BMPs implemented, and any monitoring data collected.

(2) **Pumped[53] Groundwater, Foundation Drains, and Water from Crawl Space Pumps and Footing Drains**

(a) Proposed new discharges of uncontaminated groundwater at flows of 10,000 gallons/day or more and all new discharges of potentially contaminated groundwater shall be reported to the Water Board so that they can be subject to NPDES permitting requirements.

(b) Proposed new discharges of uncontaminated groundwater at flows of less than 10,000 gallons/day shall be encouraged to discharge to a landscaped area or bioretention unit that is large enough to accommodate the volume.

(c) If the discharge options in C.15.b.i.(2)(b) above are not feasible and these discharges must enter a storm drain, sampling shall be done to verify that the discharge is uncontaminated.

(i) The discharge shall meet water quality standards consistent with the existing effluent limitations in the Water Board's NPDES General Permits, such as NPDES Nos. CAG912002 and CAG912003 for Discharge or Reuse of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by fuel and VOCs, respectively, and NPDES No. CAG912004 for discharges of low-level, incidental, and potentially contaminated groundwater.

(ii) The Permittees shall require that water samples from these discharge types be analyzed using approved USEPA Methods (e.g., (a) USEPA Method 160.2 for total suspended solids; (b) USEPA Method 8015 Modified for total petroleum hydrocarbons; (c) USEPA Method 8260B and 8270C or equivalent for volatile and semi-volatile organic compounds; and (d) USEPA Method 3005 for metals.

(d) **Required BMPs** – When the discharge has been verified as uncontaminated per sampling completed in C.15.b.i.(2)(c) above, the Permittees shall require the following during discharge:

(i) Proper control and maintain to prevent erosion at the discharge point and at a rate that avoids scouring of banks and excess sedimentation in the receiving waterbody.

(ii) Appropriate BMPs to render pumped groundwater free of pollutants and therefore exempted from prohibition may include the following: filtration, settling, coagulant application with no

[53] Pumped groundwater not exempted in C.15.a or conditionally exempted in C.15.b.i.(1).

residual coagulant discharge, minor odor or color removal with activated carbon, small scale peroxide addition, or other minor treatment.

(iii) Testing of water samples for turbidity and pH on the first two consecutive days of dewatering.

(iv) Turbidity of discharged groundwater shall be maintained below 50 NTU for discharges to dry creeks, 110 percent of the ambient stream turbidity for a flowing stream with turbidities greater than 50 NTU, or 5 NTU above ambient turbidity for a flowing stream with turbidities less than or equal to 50 NTU.

(v) pH of discharged water shall be maintained within the range of 6.5 to 8.5.

(e) If a Permittee determines that a discharger or a project proponent is unable to comply with the above criteria, the discharger shall be directed to obtain approval or permits directly from the Water Board.

(f) **Reporting** – The Permittees shall maintain records of these discharges, BMPs implemented, and any monitoring data collected.

ii. Discharge Type – Air Conditioning Condensate

Required BMPs – Condensate from air conditioning units shall be directed to landscaped areas or the ground. Discharge to a storm drain system may be allowed if discharge to landscaped areas or the ground is not feasible.

iii. Discharge Types – Planned,[54] Unplanned,[55] and Emergency Discharges of the Potable Water System

(1) **Planned Discharges** – Planned discharges are routine operation and maintenance activities in the potable water distribution system that can be scheduled in advance, such as disinfecting water mains, testing fire hydrants, storage tank maintenance, cleaning and lining pipe sections, routine distribution system flushing, reservoir dewatering, and water main dewatering activities. The following requirements only apply to those Permittees that are water purveyors and pertain to their planned discharges of potable water to their storm drain systems.

(a) **Required BMPs**[56] – The Permittees shall implement appropriate BMPs for dechlorination, and erosion and sediment controls for all planned potable water discharges.

(b) **Notification Requirements**

(i) The Permittees shall notify the Water Board staff at least one week in advance for planned discharges with a flow rate of

[54] Planned discharges typically result from required routine operation and maintenance activities that can be scheduled in advance. Planned discharges are easier to control than unplanned discharges, and the BMPs are significantly easier to plan and implement.

[55] Unplanned discharges are non-routine, the result of accidents or incidents that cannot be scheduled or planned for in advance.

[56] Reference for BMPs, monitoring methods: *Guidelines for the Development of Your BMP Manual for Drinking Water System Releases.* Developed by the California-Nevada Sections of the American Water Works Association (CA-NV AWWA), Environmental Compliance Committee (ECC) 2005.

250,000 gallons per day or more, or a total volume of 500,000 gallons or more. The Permittees shall also notify other interested parties who may be impacted by planned discharges, such as flood control agencies, downstream jurisdictions, and non-governmental organizations such as creek groups, before discharge. The notification shall include the following information, but is not limited to: (1) project name; (2) type of discharges; (3) receiving waterbody(ies); (4) date of discharge; (5) time of discharge (in military time); (6) estimated volume (gallons); and (7) estimated flow rate (gallons per day); and (8) monitoring plan of the discharges and receiving water. If receiving water monitoring is infeasible or is not practicable, justification shall be provided.

(c) **Monitoring and Reporting Requirements**

(i) The Permittees shall monitor planned discharges for pH, chlorine residual, and turbidity.

(ii) The following discharge benchmarks shall be used to evaluate the effectiveness of BMPs for all planned discharges:

- Chlorine residual 0.05 mg/L using the field test (Standard Methods 4500-Cl F and F) or equivalent
- pH ranges between 6.5 and 8.5
- Turbidity of 50 NTU post-BMPs or limit increase in turbidity above background level as follows:

Receiving Water Background	Incremental Increase
Dry Creek	50 NTU
< 50 NTU	5 NTU
50–100 NTU	10 NTU
> 100 NTU	10% of background

(iii) The Permittees shall submit the following information with the Annual Report in tabular form for all planned discharges. Reporting content shall include, but is not limited to the following parameters: (1) project name; (2) type of discharge; (3) receiving waterbody(ies); (4) date of discharge; (5) duration of discharge (in military time); (6) estimated volume (gallons); (7) estimated flow rate (gallons per day); (8) chlorine residual (mg/L); (9) pH; (10) turbidity (NTU) for receiving water where feasible and point of discharge, and (11) description of implemented BMPs or corrective actions.

(2) **Unplanned Discharges** – Unplanned discharges are non-routine activities such as water line breaks, leaks, overflows, fire hydrant shearing, and emergency flushing. The following requirements only apply to those Permittees that are water purveyors and pertain to their unplanned discharges of potable water to their storm drain systems.

(a) **Required BMPs** – The Permittees shall implement appropriate BMPs for dechlorination and erosion and sediment control for all unplanned

discharges upon containing the discharge and attaining safety of the discharge site.

(b) **Administrative BMPs** – In some instances, the Permittees shall implement Administrative BMPs, such as source control measures, managerial practices, operations and maintenance procedures, or other measures to reduce or prevent potential pollutants from being discharged during unplanned discharges upon containing the discharge and attaining safety of the discharge site.

(c) **Notification Requirements**

(i) The Permittees shall report to the State Office of Emergency Services as soon as possible, but no later than two hours after becoming aware of (1) any aquatic impacts (e.g., fish kill) as a result of the unplanned discharges, or (2) when the discharge might endanger or compromise public health and safety.

(ii) The Permittees shall report to Water Board staff, by telephone or email as soon as possible, but no later than 24 hours after becoming aware of any unplanned discharges, where the total chlorine residual is greater than 0.05 mg/L and the total volume is approximately 50,000 gallons or more.

- Within five working days after the 24-hour telephone or email report, the Permittees shall submit a report documenting the discharge and corrective actions taken to Water Board staff and other interested parties.

(d) Monitoring and Reporting Requirements

(i) The Permittees shall monitor at least 10% of their unplanned discharges for pH and chlorine residual, and visually assess each discharge for turbidity immediately downstream of implemented BMPs to demonstrate their effectiveness. After the implementation of appropriate BMPs, the discharge pH levels outside the discharge ranges (below 6.5 and above 8.5), chlorine residual above 0.05 mg/l, or moderate and high turbidity shall trigger BMP improvement. If the Permittees monitor more than 10% of the unplanned discharges, all monitoring results shall be included in the Annual Report.

(ii) The Permittees shall submit the following information with the Annual Report in tabular form for all unplanned discharges. The reporting format and content shall be as described in Provision C.15.b.ii.(1)(c)(iii) of the Planned Discharges above. In addition, these reports shall also state the time of discharge discovery, notification time, inspector arrival time, and responding crew arrival time.

(iii) After 18 months of consecutive data gathering, a Permittee may propose, to the Executive Officer, a reduced monitoring plan targeting specific “high-risk” or “environmentally sensitive” areas (i.e., areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species,

or provide aquatic habitat with proven effective BMPs). Until the Executive Officer approves the reduced monitoring plan, the Permittee shall continue the monitoring plan prescribed in C.15.b.iii.(2)(d)(i).

(3) **Emergency Discharges** – Emergency discharges are the result of firefighting, unauthorized hydrant openings, natural or man-made disasters (e.g., earthquakes, floods, wildfires, accidents, terrorist actions).

Required BMPs

(a) The Permittees shall implement or require fire fighting personnel to implement BMPs for emergency discharges. However, the BMPs should not interfere with immediate emergency response operations or impact public health and safety. BMPs may include, but are not limited to, the plugging of the storm drain collection system for temporary storage, the proper disposal of water according to jurisdictional requirements, and the use of foam where there may be toxic substances on the property the fire is located.

(b) During emergency situations, priority of efforts shall be directed toward life, property, and the environment (in descending order). The Permittees or fire fighting personnel shall control the pollution threat from their activities to the extent that time and resources allow.

(c) **Reporting Requirements** – Reporting requirements will be determined by Water Board staff on a case-by-case basis, such as for fire incidents at chemical plants.

iv. Discharge Type – Individual Residential Car Washing

Required BMPs

(1) The Permittees shall discourage through outreach efforts individual residential car washing within their jurisdictional areas that discharge directly into their MS4s.

(2) The Permittees shall encourage individuals to direct car wash waters to landscaped areas, use as little detergent as necessary, wash cars at commercial car wash facilities, etc.

v. Discharge Type – Swimming Pool, Hot Tub, Spa, and Fountain Water Discharges

(1) **Required BMPs**

(a) The Permittees shall prohibit discharge of water that contains chlorine residual, copper algaecide, filter backwash or other pollutants to storm drains or to waterbodies. Such polluted discharges from pools, hot tubs, spas, and fountains shall be directed to the sanitary sewer (with the local sanitary sewer agency's approval) or to landscaped areas that can accommodate the volume.

(b) Discharges from swimming pools, hot tubs, spas and fountains shall be allowed into storm drain collection systems only if there are no other feasible disposal alternatives (e.g., disposal to sanitary sewer or landscaped areas) and if the discharge is properly dechlorinated to

non-detectable levels of chlorine consistent with water quality standards.

(c) The Permittees shall require that new or rebuilt swimming pools, hot tubs, spas and fountains within their jurisdictions have a connection[57] to the sanitary sewer to facilitate draining events. The Permittees shall coordinate with local sanitary sewer agencies to determine the standards and requirements necessary for the installation of a sanitary sewer discharge location to allow draining events for pools, hot tubs, spas, and fountains to occur with the proper permits from the local sanitary sewer agency.

(d) The Permittees shall improve their public outreach and educational efforts and ensure implementation of the required BMPs and compliance in commercial, municipal, and residential facilities.

(e) The Permittees shall implement the Illicit Discharge Enforcement Response Plan from C.5.b for polluted (contains chlorine, copper algaecide, filter backwash, or other pollutants) swimming pool, hot tub, spa, or fountain waters that get discharged into the storm drain.

(2) **Reporting** – The Permittees shall keep records of the authorized major discharges of dechlorinated pool, hot tubs, spa and fountain water to the storm drain, including BMPs employed; such records shall be available for inspection by the Water Board.

vi. Discharge Type – Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering

(1) **Required BMPs** – The Permittees shall promote measures that minimize runoff and pollutant loading from excess irrigation via the following:

(a) Promoting and/or working with potable water purveyors to promote conservation programs that minimize discharges from lawn watering and landscape irrigation practices;

(b) Promoting outreach messages regarding the use of less toxic options for pest control and landscape management;

(c) Promoting and/or working with potable water purveyors to promote the use of drought tolerant, native vegetation to minimize landscape irrigation demands;

(d) Promoting and/or working with potable water purveyors to promote outreach messages that encourage appropriate applications of water needed for irrigation and other watering practices; and,

(e) Implementing the Illicit Discharge Enforcement Response Plan from C.5.b, as necessary, for ongoing, large-volume landscape irrigation runoff to their MS4s.

(2) **Reporting** – The Permittees shall provide implementation summaries in their Annual Report.

[57] This connection could be a drain in the pool to the sanitary sewer or a sanitary sewer clean out located close enough to the pool so that a hose can readily direct the pool discharge into the sanitary sewer clean out.

vii. Additional Discharge Types –The Permittees shall identify and describe additional types and categories of discharges not yet listed in Provision C.15.b that they propose to conditionally exempt from Prohibition A.1 in periodic submissions to the Executive Officer. For each such category, the Permittees shall identify and describe, as necessary and appropriate to the category, either documentation that the discharges are not sources of pollutants to receiving waters or circumstances in which they are not found to be sources of pollutants to receiving waters. Otherwise, the Permittees shall describe control measures to eliminate adverse impacts of such sources, procedures and performance standards for their implementation, procedures for notifying the Water Board of these discharges, and procedures for monitoring and record management.

viii. Permit Authorization for Exempted Non-Stormwater Discharges

(1) Discharges of non-stormwater from sources owned or operated by the Permittees are authorized and permitted by this Permit, if they are in accordance with the conditions of this provision.

(2) The Water Board may require dischargers of non-stormwater, other than the Permittees, to apply for and obtain coverage under an NPDES permit and to comply with the control measures pursuant to Provision C.15.b. Non-stormwater discharges that are in compliance with such control measures may be accepted by a Permittee and are not subject to Prohibition A.1.

(3) The Permittees may propose, as part of their annual updates consistent with the requirements of Provision C.15.b of this Permit, additional categories of non-stormwater discharges with BMPs, to be included in the exemption to Prohibition A.1. Such proposals may be subject to approval by the Executive Officer as a minor modification of the Permit.

C.16. Annual Reports

C.16.a. The Permittees shall submit Annual Reports electronically and in paper copy upon request ~~hard copy~~ by September 15 of each year. Each Annual Report shall report on the previous fiscal year beginning July 1 and ending June 30. The annual reporting requirements are set forth in Provisions C.1 – C.15. The Permittees shall retain documentation as necessary to support their Annual Report. The Permittees shall make this supporting information available upon request within a timely manner, generally no more that ten business days unless otherwise agreed to by the Executive Officer.

C.16.b. The Permittees shall collaboratively develop a common annual reporting format for acceptance by the Executive Officer by April 1, 2010. The resulting Annual Report Form, once approved, shall be used by all Permittees. The Annual Report Form may be changed by April 1 of each year for the following annual report, to more accurately reflect the reporting requirements of Provisions C.1 – C.15, with the agreement of the Permittees and by the approval of the Executive Officer.

C.16.c. The Permittees shall certify in each Annual Report that they are in compliance with all requirements of the Order. If a Permittee is unable to certify compliance with a requirement, it must submit in the Annual Report the reason for failure to comply, a description and schedule of tasks necessary to achieve compliance, and an estimated date for achieving full compliance.

C.17. Modifications to this Order

This Order may be modified, or alternatively, revoked or reissued, before the expiration date as follows:

C.17.a. To address significant changed conditions identified in the technical or Annual Reports required by the Water Board, or through other means or communication, that were unknown at the time of the issuance of this Order;

C.17.b. To incorporate applicable requirements of statewide water quality control plans adopted by the State Board or amendments to the Basin Plan approved by the State Board; or

C.17.c. To comply with any applicable requirements, guidelines, or regulations issued or approved under section 402(p) of the CWA, if the requirement, guideline, or regulation so issued or approved contains different conditions or additional requirements not provided for in this Order. The Order as modified or reissued under this paragraph shall also contain any other requirements of the CWA then applicable.

C.18. Standard Provisions

Each Permittee shall comply with all parts of the Standard Provisions contained in Attachment K of this Order.

C.19. Expiration Date

This Order expires on November 30, 2014, five years from the effective date of this Order. The Permittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, not later than 180 days in advance of such date as application for reissuance of waste discharge requirements.

C.20. Rescission of Old Orders

Order Nos. 99-058, 99-059, 01-024, R2-2003-0021, and R2-2003-0034 are hereby rescinded on the effective date of this Order, which shall be December 1, 2009, provided that the Regional Administrator of USEPA, Region IX, does not object.

C.21. Effective Date

The Effective Date of this Order and Permit shall be December 1, 2009, provided that the Regional Administrator of USEPA, Region IX, does not object.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on XX, 2009.

_____

Bruce H. Wolfe
Executive Officer

Appendix I: Municipal Regional Stormwater Permit Fact Sheet
Attachment A: Provision C.3.b. Sample Reporting Table
Attachment B: Provision C.3.g. Alameda Permittees' Hydromodification Requirements
Attachment C: Provision C.3.g. Contra Costa Permittees' Hydromodification Requirements
Attachment D: Provision C.3.g. Fairfield-Suisun Permittees' Hydromodification Requirements
Attachment E: Provision C.3.g. San Mateo Permittees' Hydromodification Requirements
Attachment F: Provision C.3.g. Santa Clara Permittees' Hydromodification Requirements
Attachment G: Provision C.3.h. Sample Reporting Table
Attachment H: Provision C.8. Status & Trends Followup Analysis and Actions
Attachment I: Provision C.8. Standard Monitoring Provisions
Attachment J: Provision C.10. Minimum Trash Capture Area and Minimum Number of Trash Hot Spots
Attachment K: Standard NPDES Stormwater Permit Provisions

ACRONYMS & ABBREVIATIONS

ACCWP	Alameda Countywide Clean Water Program
BAHM	Bay Area Hydrology Model
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
BASMAA	Bay Area Stormwater Management Agencies Association
BMPs	Best Management Practices
CASQA	California Stormwater Quality Association
CCC	California Coastal Commission
CCCWP	Contra Costa Clean Water Program
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CSBP	California Stream Bioassessment Procedures
CWA	Federal Clean Water Act
CWC	California Water Code
DCIA	Directly Connected Impervious Area
ERP	Enforcement Response Plan
FR	Federal Register
GIS	Geographic information System
HBANC	Homebuilders Association of Northern California
HM	Hydromodification Management
HMP	Hydromodification Management Plan
IC/ID	Illicit Connections and Illicit Discharges
IPM	Integrated Pest Management
LID	Low Impact Development
MEP	Maximum Extent Practicable
MRP	Municipal Stormwater Regional Permit
MS4	Municipal Separate Storm Sewer System
MTC	Metropolitan Transportation Commission

NAFSMA	National Association of Flood & Stormwater Management Agencies
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
O&M	Operation and Maintenance
PBDE	Polybrominated Diphenyl Ether
POTW	Publicly Owned Treatment Works
RCRA	Resource Conservation and Recovery Act
RMP	Regional Monitoring Program
ROWD	Report of Waste Discharge
RTA	Rapid Trash Assessment
SARA	Superfund Amendments and Reauthorization Act
SCURTA	Santa Clara Urban Rapid Trash Assessment
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SIC	Standard Industrial Classification
SMWPPP	San Mateo Countywide Water Pollution Prevention Program
SOP	Standard Operating Procedure
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TIE	Toxicity Identification Evaluation
TMDLs	Total Maximum Daily Loads
TSCA	Toxic Substances Control Act
USEPA	Unites States Environmental Protection Agency
Water Board	San Francisco Bay Regional Water Quality Control Board
WLAs	Wasteload Allocations

GLOSSARY

Arterial Roads	Freeways, multilane highways, and other important roadways that supplement the Interstate System. Arterial roads connect, as directly as practicable, principal urbanized areas, cities, and industrial centers.
Beneficial Uses	The uses of water of the state protected against degradation, such as domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation and preservation of fish and wildlife, and other aquatic resources or preserves.
Collector Roads	Major and minor roads that connect local roads with arterial roads. Collector roads provide less mobility than arterial roads at lower speeds and for shorter distances.
Commercial Development	Development or redevelopment to be used for commercial purposes, such as office buildings, retail or wholesale facilities, restaurants, shopping centers, hotels, and warehouses.
Construction Site	Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, paving, disturbances to ground such as stockpiling, and excavation. Construction sites are all sites with disturbed or graded land area not protected by vegetation, or pavement, that are subject to a building or grading permit.
Conditionally Exempted Non-Stormwater Discharge	Non-stormwater discharges that are prohibited by A.1. of this permit, unless such discharges are authorized by a separate NPDES permit or are not in violation of water quality standards because appropriate BMPs have been implemented to reduce pollutants to the maximum extent practicable, consistent with Provision C.15.
Discharger	Any responsible party or site owner or operator within the Permittees' jurisdiction whose site discharges stormwater runoff, or a non-stormwater discharge
Detached Single-family Home Project	The building of one single new house or the addition and/or replacement of impervious surface associated with one single existing house, which is not part of a larger plan of development.
Development	Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project (whether single-family, multi-unit, or planned unit development); or industrial, commercial, retail or other nonresidential project, including public agency projects.
Estate Residential Development	Development zoned for a minimum 1 acre lot size
Emerging Pollutants	Pollutants in water that either: (1) May not have been thoroughly studied to date but are suspected by the scientific community to be a source of impairment of beneficial uses and/or present a health risk; or (2) Are not yet part of a monitoring program.
Erosion	The diminishing or wearing away of land due to wind, or water. Often the eroded debris (silt or sediment) becomes a pollutant via stormwater runoff. Erosion occurs

	naturally, but can be intensified by land disturbing and grading activities such as farming, development, road building, and timber harvesting.
Full Trash Capture Device	Full trash capture systems are defined as "any device or series of devices that traps all particles retained by a 5mm mesh screen and has a design treatment capacity of not less than the peak flow rate resulting from a one-year, one-hour, storm in the tributary drainage catchment area." Trash collection booms and sea curtains do not meet this definition, but are effective for removal of floating trash if properly maintained. Because these devices do not meet the Full Trash Capture Device definition, only ¼ of the catchment area treated by these measures is credited toward meeting the trash management area requirement of C.10.a.
General Permits	Waste Discharge Requirements or NPDES Permits containing requirements that are applicable to a class or category of dischargers. The State of California has general stormwater permits for construction sites that disturb soil of 1 acre or more; industrial facilities; `Phase II smaller municipalities (including nontraditional Small MS4s, which are governmental facilities, such as military bases, public campuses, and prison and hospital complexes); and small linear underground/overhead projects disturbing at least 1 acre, but less than 5 acres (including trenching and staging areas).
Grading	The cutting and/or filling of the land surface to a slope or elevation.
Hydrologic source control measures	Site design techniques that minimize and/or slow the rate of stormwater runoff from the site.
Hydromodification	The modification of a stream's hydrograph, caused in general by increases in flows and durations that result when land is developed (e.g., made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion, loss of habitat, increased sediment transport and deposition, and increased flooding.
Illicit Discharge	Any discharge to a municipal separate storm sewer (storm drain) system (MS4) that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term *illicit discharge* includes all non-stormwater discharges not composed entirely of stormwater and discharges that are identified under Section A. (Discharge Prohibitions) of this Permit. The term illicit discharge does not include discharges that are regulated by an NPDES permit (other than the NPDES permit for discharges from the MS4) or authorized by the Regional Water Board Executive Officer.
Impervious Surface	A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/stormwater. Impervious surfaces include, but are not limited to, roof tops; walkways; patios; driveways; parking lots; storage areas; impervious concrete and asphalt; and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious soil or pervious storage material, such as a gravel layer sufficient to hold at least the C.3.d volume of rainfall runoff are not impervious surfaces. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether a project is a Regulated Project under

	Provisions C.3.b. and C.3.g. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling and meeting the Hydromodification Standard.
Industrial Development	Development or redevelopment of property to be used for industrial purposes, such as factories; manufacturing buildings; and research and development parks.
Infill Site	A site in an urbanized area where the immediately adjacent parcels are developed with one or more qualified urban uses or at least 75% of the perimeter of the site adjoins parcels that are developed with qualified urban uses and the remaining 25% of the site adjoins parcels that have previously been developed for qualified urban uses and no parcel within the site has been created within the past 10 years.
Infiltration Device	Any structure that is deeper than wide and designed to infiltrate stormwater into the subsurface, and, as designed, bypass the natural groundwater protection afforded by surface soil. These devices include dry wells, injection wells, and infiltration trenches (includes French drains).
Joint Stormwater Treatment Facility	A stormwater treatment facility built to treat the combined runoff from two or more Regulated Projects located adjacent to each other,
Local Roads	Roads that provide limited mobility and are the primary access to residential areas, businesses, farms, and other local areas. Local roads offer the lowest level of mobility and usually contain no bus routes. Service to through traffic movement usually is deliberately discouraged in local roads.
Maximum Extent Practicable (MEP)	A standard for implementation of stormwater management actions to reduce pollutants in stormwater. Clean Water Act (CWA) 402(p)(3)(B)(iii) requires that municipal stormwater permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." Also see State Board Order WQ 2000-11.
Mixed-use Development or Redevelopment	Development or redevelopment of property to be used for two or more different uses, all intended to be harmonious and complementary. An example is a high-rise building with retail shops on the first 2 floors, office space on floors 3 through 10, apartments on the next 10 floors, and a restaurant on the top floor.
Municipal Separate Storm Sewer System (MS4)	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), as defined in 40 CFR 122.26(b)(8): (1) Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under section 208 of the CWA) that discharges into waters of the United States; (2) Designed or used for collecting or conveying stormwater; (3) Which is not a combined sewer; and (4) Which is not part of a Publicly Owned Treatment Works (POTW), as defined in

	40 CFR 122.2.
Municipal Corporation Yards, Vehicle Maintenance/Material Storage Facilities/	Any Permittee-owned or -operated facility, or portion thereof, that: (1) Conducts industrial activity, operates or stores equipment, and materials; (2) Performs fleet vehicle service/maintenance including repair, maintenance, washing, or fueling; (3) Performs maintenance and/or repair of machinery/equipment;
National Pollutant Discharge Elimination System (NPDES)	A national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the CWA.
Notice of Intent (NOI)	The application form by which dischargers seek coverage under General Permits, unless the General Permit requires otherwise.
Parking Lot	Land area or facility for the parking or storage of motor vehicles used for business, commerce, industry, or personal use.
Permittee/Permittees	Municipal agency/agencies that are named in and subject to the requirements of this Permit.
Permit Effective Date	The date at least 45 days after Permit adoption, provided the Regional Administrator of U.S. EPA Region 9 has no objection, whichever is later.
Pervious Pavement	Pavement that stores and infiltrates rainfall at a rate equal to immediately surrounding unpaved, landscaped areas, or that stores and infiltrates the rainfall runoff volume described in C.3.d.
Point Source	Any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.
Pollutants of Concern	Pollutants that impair waterbodies listed under CWA section 303(d), pollutants associated with the land use type of a development, including pollutants commonly associated with urban runoff. Pollutants commonly associated with stormwater runoff include, but are not limited to, total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (e.g., decaying vegetation and animal waste) litter and trash.
Potable Water	Water that is safe for domestic use, drinking, and cooking.
Pre-Project Runoff Conditions	Stormwater runoff conditions that exist onsite immediately before development activities occur. This definition is not intended to be interpreted as that period before any human-induced land activities occurred. This definition pertains to redevelopment as well as initial development.
Public Development	Any construction, rehabilitation, redevelopment or reconstruction of any public agency project, including but not limited to, libraries, office buildings, roads, and

	highways.
Redevelopment	Land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a site on which some past development has occurred.
Regional Monitoring Program (RMP)	A monitoring program aimed at determining San Francisco Bay Region receiving water conditions. The program was established in 1993 through an agreement among the Water Board, wastewater discharger agencies, dredgers, Municipal Stormwater Permittees and the San Francisco Estuary Institute to provide regular sampling of Bay sediments, water, and organisms for pollutants. The program is funded by the dischargers and managed by San Francisco Estuary Institute.
Regional Project	A regional or municipal stormwater treatment facility that discharges into the same watershed that the Regulated Project does.
Regulated Projects	Development projects as defined in Provision C.3.b.ii.
Residential Housing Subdivision	Any property development of multiple single-family homes or of dwelling units intended for multiple families/households (e.g., apartments, condominiums, and town homes).
Retrofitting	Installing improved pollution control devices at existing facilities to attain water quality objectives.
Sediments	Soil, sand, and minerals washed from land into water, usually after rain.
Solid Waste	All putrescible and nonputrescible solid, semisolid, and liquid wastes as defined by California Government Code Section 68055.1 (h).
Source Control BMP	Land use or site planning practices, or structural or nonstructural measures, that aim to prevent runoff pollution by reducing the potential for contact with rainfall runoff at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.
Standard Industrial Classification (SIC)	A federal system for classifying establishments by the type of activity in which they are engaged using a four-digit code.
Stormwater Pumping Station	Mechanical device (or pump) that is installed in MS4s or pipelines to discharge stormwater runoff and prevent flooding.
Stormwater Treatment System	Any engineered system designed to remove pollutants from stormwater runoff by settling, filtration, biological degradation, plant uptake, media absorption/adsorption or other physical, biological, or chemical process. This includes landscape-based systems such as grassy swales and bioretention units as well as proprietary systems.
Surface Water Ambient Monitoring Program (SWAMP)	The State Water Board's program to monitor surface water quality; coordinate consistent scientific methods; and design strategies for improving water quality monitoring, assessment, and reporting.
Total Maximum Daily Loads (TMDLs)	The maximum amount of a pollutant that can be discharged into a waterbody from all sources (point and nonpoint) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all waterbodies that do not meet water quality standards even after application of technology-based controls,

	more stringent effluent limitations required by a state or local authority, and other pollution control requirements such as BMPs.
Toxicity Identification Evaluation (TIE)	TIE is a series of laboratory procedures used to identify the chemical(s) responsible for toxicity to aquatic life. These procedures are designed to decrease, increase, or transform the bioavailable fractions of contaminants to assess their contributions to sample toxicity. TIEs are conducted separately on water column and sediment samples.
Trash and Litter	Trash consists of litter and particles of litter. California Government Code Section 68055.1 (g) defines litter as all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling, or manufacturing.
Treatment	Any method, technique, or process designed to remove pollutants and/or solids from polluted stormwater runoff, wastewater, or effluent.
Waste Load Allocations (WLAs)	A portion of a receiving water's TMDL that is allocated to one of its existing or future point sources of pollution.
Water Quality Control Plan (Basin Plan)	The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State within the Region, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives and discharge prohibitions. The Basin Plan was duly adopted and approved by the State Water Resources Control Board, U.S. EPA, and the Office of Administrative Law where required. The latest version is effective as of December 22, 2006.
Water Quality Objectives	The limits or levels of water quality elements or biological characteristics established to reasonably protect the beneficial uses of water or to prevent pollution problems within a specific area. Water quality objectives may be numeric or narrative.
Water Quality Standards	State-adopted and USEPA-approved water quality standards for waterbodies. The standards prescribe the use of the waterbody and establish the water quality criteria that must be met to protect designated uses. Water quality standards also include the federal and state anti-degradation policy.
Wet Season	October 1 through April 30 of each year

Municipal Regional Stormwater *(Urban Runoff)* Permit Hearing

October 14, 2009

Tom Mumley
Assistant Executive Officer
SF Bay Regional
Water Quality Control Board

Permittees

Fairfield-Suisun City

Vallejo

Contra Costa

Alameda

San Mateo

Santa Clara

Timeline

- Regional permit discussions began – 2004
- Draft permit public noticed – Dec 2007
- Water Board hearing – March 2008
- Revised draft permit – Feb 2009
- Water Board hearing – May 2009

Steps Since May Hearing

- Consideration of all comments
- Meetings with stakeholders
- Final draft permit – September 24
- Responses to comments – October 7
- Supplemental revisions – October 13

General Revisions

- Errata
- Clarifications / simplifications
- Tasks / reports date revisions

Key Revisions

- Low impact development (LID) requirements
- Trash load reductions
- Potable water discharges

LID Requirements Revisions

- 100% LID treatment
  - with limited exceptions
- Define LID treatment measures
  - Includes biotreatment when reuse, infiltration, and evapotranspiration are infeasible
- Report to the Board on infeasibility criteria and procedures

LID Requirements Revisions

- Allow off-site treatment
- LID treatment reduction for beneficial "special projects"
  - Transit-oriented development, high density urban infill, etc.
  - Requires future Board approval

Trash Reduction Revisions

Reduce trash loading 40% by 2014, 70% by 2017, and 100% by 2022

- Baseline Load and Reduction Tracking Method
  - Submit by February 2012
  - May exclude “clean” areas
- Short-Term Load Reduction
- Long-Term Load Reduction
  - Submit plan by February 2014

100% reduction = no adverse impacts

Trash Reduction Revisions

Short-Term Trash Load Reduction

- Minimum full trash capture
- Minimum # of Trash Hot Spot cleanups
- Other self determined measures

$5 million stimulus funds grant

Conditionally Exempted (Non-Stormwater) Discharges Revisions

- Removed extensive requirements for Permittees to oversee third-party potable water discharges

- Reduced monitoring and reporting requirements for Permittees that discharge potable water

Permit Requirements Lead To Funding Opportunities

- San Francisco Estuary Partnership stimulus funds (State Revolving Fund) grant
  - ✓ $5 million for trash capture
- San Francisco Bay Area Water Quality Improvement Fund – $5 million now available
- SB 310 – Watershed Improvement Plans

Summary – Final Draft Permit

- Recognizes challenge of increased costs
  - Eliminated or minimized requirements with limited water quality benefit
  - Time schedules for new requirements
  - Requirements lead to funding opportunities
- May be amended in the future
  - Resolve details and unintended consequences and to adapt requirements if necessary

Summary – Final Draft Permit

- Meets goal of a regional permit with consistency, accountability, and flexibility
- Results in meaningful and timely urban runoff pollutant load reductions loads

Questions?

Financial Challenges

- Currently $50 million to $100 million/yr spent on "stormwater management"
- New urban runoff management costs

Component	Permit Term
Trash	>$30 million
PCBs, Mercury et al	~$10 million
Monitoring	~$8 million

- Currently $500 million to $one billion/yr spent on wastewater management

Regional Permit Goals

- Specifics in one permit rather than individual management plans
- Consistency, accountability, flexibility
- Opportunity for collaboration

Permit's Regulatory Drivers

- Implement controls to reduce pollutants to the maximum extent practicable
- Effectively prohibit non-stormwater discharges
- Manage contribution to violations of water quality standards

Urban Runoff Pollutants

- Trash
- Metals
- PCBs
- Pesticides (past and present)
- Petroleum hydrocarbons
- Pathogens
- Nutrients
- Flame retardants

Municipal Operations (C.2)

- Removed detailed street sweeping and storm drain inlet cleanup requirements
  - Generally high cost vs benefit
  - Pollutant specific implementation
- Revised pump station requirements
  - Results-based = No low dissolved oxygen

Low Impact Development

- Maintain or restore the natural hydrologic functions of a site
- Natural and built features that
  - reduce the rate of runoff
  - filter pollutants out of runoff
  - facilitate the infiltration of water into the ground

New and Redevelopment Revisions (C.3)

- Made green-streets pilot projects less restrictive
- Low impact development (LID)
- Revised grandfathering language for new 5000 ft^2 and LID requirements
  - Approved projects
  - "Application deemed complete" projects that are diligently pursued

Industrial/Commercial Site Controls (C.4)

- Requirements revised
  - Now based on outcomes of inspections and resolution of problems
- Modified Enforcement Response Plan requirements
- Simplified and reduced reporting
  - Results-based summary of outcomes

Illicit Discharge Detection and Elimination (C.5)

- Requirements revised
  - Now based on outcomes of inspections and resolution of problems
- Modified Enforcement Response Plan requirements
- Simplified and reduced reporting
  - Results-based summary of outcomes

Construction Site Controls

- Erosion Control
- Runon and Runoff Control
- Sediment Control
- Active Treatment Systems (as necessary)
- Good Site Management
- Non Stormwater Management

Consistent with State General Permit

Construction Site Controls (C.6)

- Requirements revised
  - Now based on outcomes of inspections and resolution of problems
- Modified Enforcement Response Plan requirements
- Simplified and reduced reporting
  - Results-based summary of outcomes

Monitoring Revisions (C.8)

- Integration of program elements
  - Long-term stations ↔ pollutant-load stations
  - Wet-weather status monitoring → long-term
- Clarify flexibility afforded by a regional monitoring collaborative
- Revise reporting schedule
  - Monitoring year vs fiscal year
  - Better association with results availability

Monitoring (C.8)

- Bay – Regional Monitoring Program
- Creek status monitoring - rotating
- Long-term trends - fixed stations
- Monitoring projects
- Pollutant loads - fixed stations

Regional collaboration encouraged/rewarded

Monitoring

- Reduced from initial draft permit to minimum level that can be justified
- Consistent with our Surface Water Ambient Monitoring Program
- Costs are reasonable and warranted

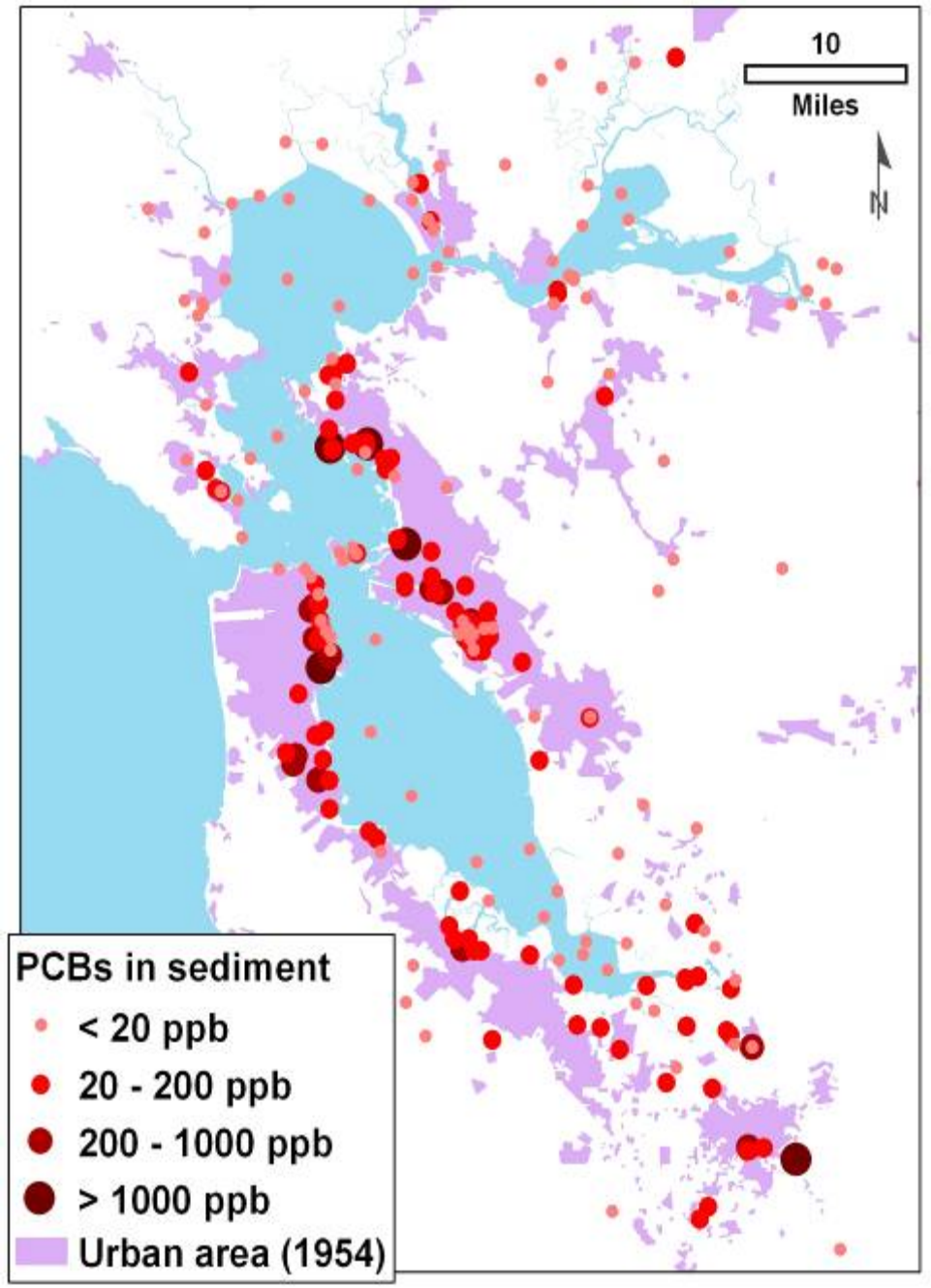
Mercury and PCBs (C.11 & 12)

- Implement TMDLs = attain wasteload allocations within 20 years
- Permit-term requirements based on phased implementation of controls
  - pilot studies phase →
  - focused implementation phase →
  - full implementation

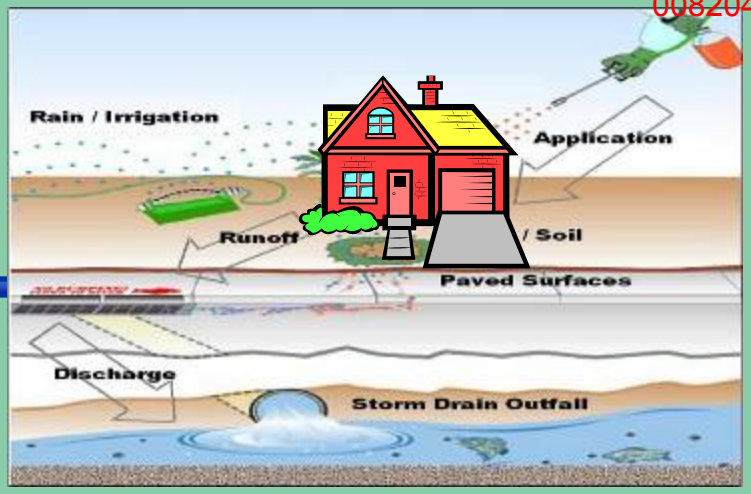
Mercury and PCBs

Pilot Studies

- Identify and cleanup sources (5)
- Improve system O&M (5)
- Strategic treatment retrofit (10)
- Route runoff to wastewater system (5)



Pesticides Toxicity Control (C.9)



TMDL Implementation

- Control municipal uses
  - Integrated Pest Management
- Use "certified" contractors
- Affect use by businesses and pubic
  - Work w/ USEPA and CA Dept of Pesticide Regulation
  - Outreach (point of sale)

Regional collaboration encouraged/rewarded

- Urban Pesticide Pollution Prevention Partnership

Annual Reports (C.16)

- Deleted Annual Report Form from permit
- Report form to be developed in collaboration with Permittees
  - Should be win-win-win

LID Standards for San Francisco Bay Area Watersheds

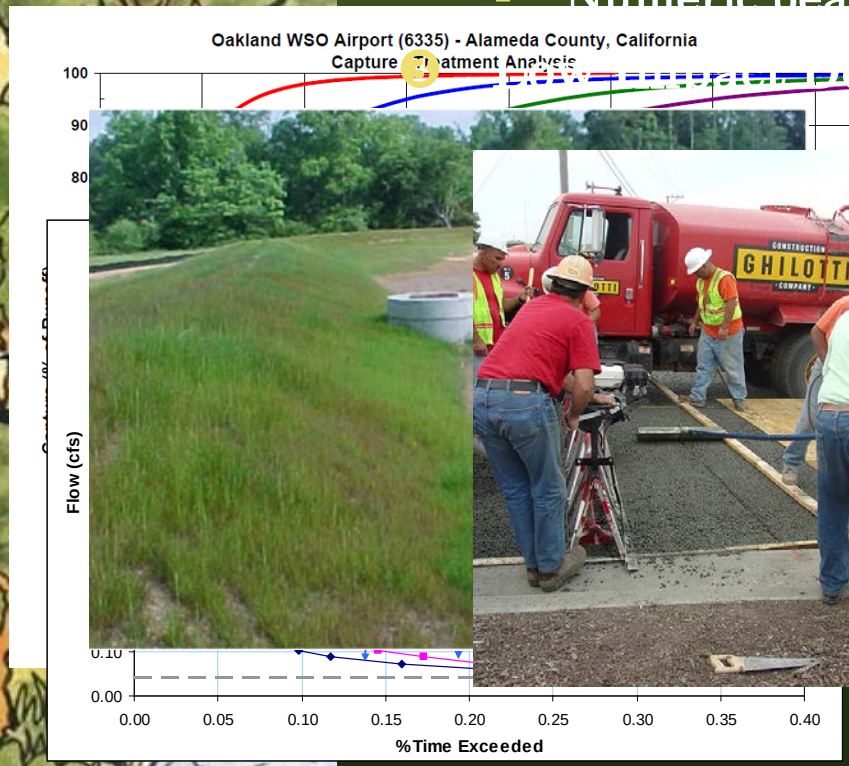
Dan Cloak, P.E.

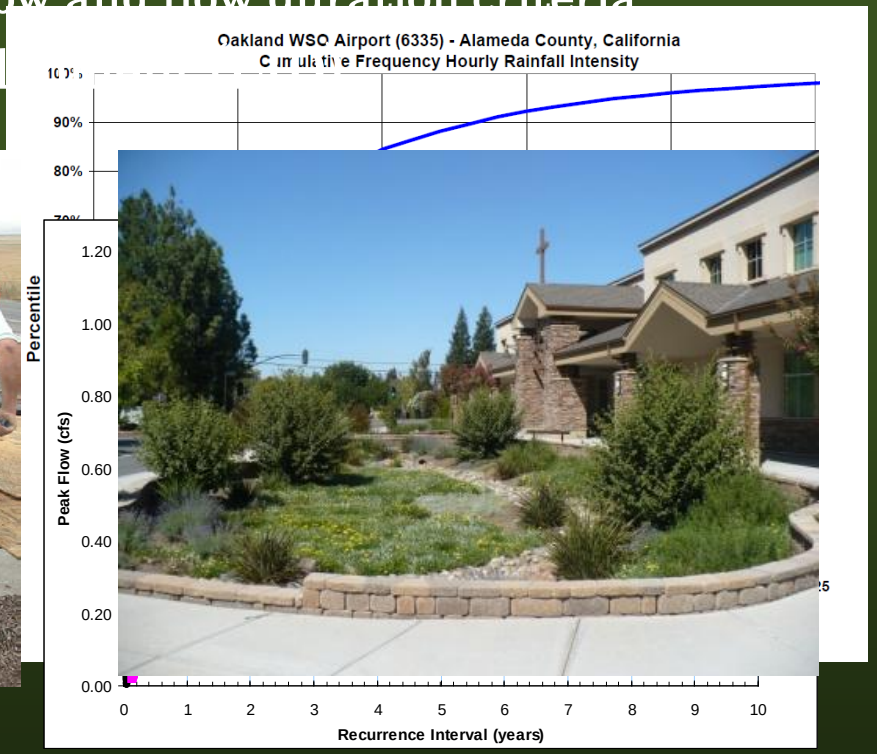
Presentation to the San Francisco Bay Regional Board

October 14, 2009

3 Separate Requirements

1. Stormwater treatment
   - Numeric volume or flow criteria
2. Hydromodification Management
   - Numeric peak flow and flow duration criteria

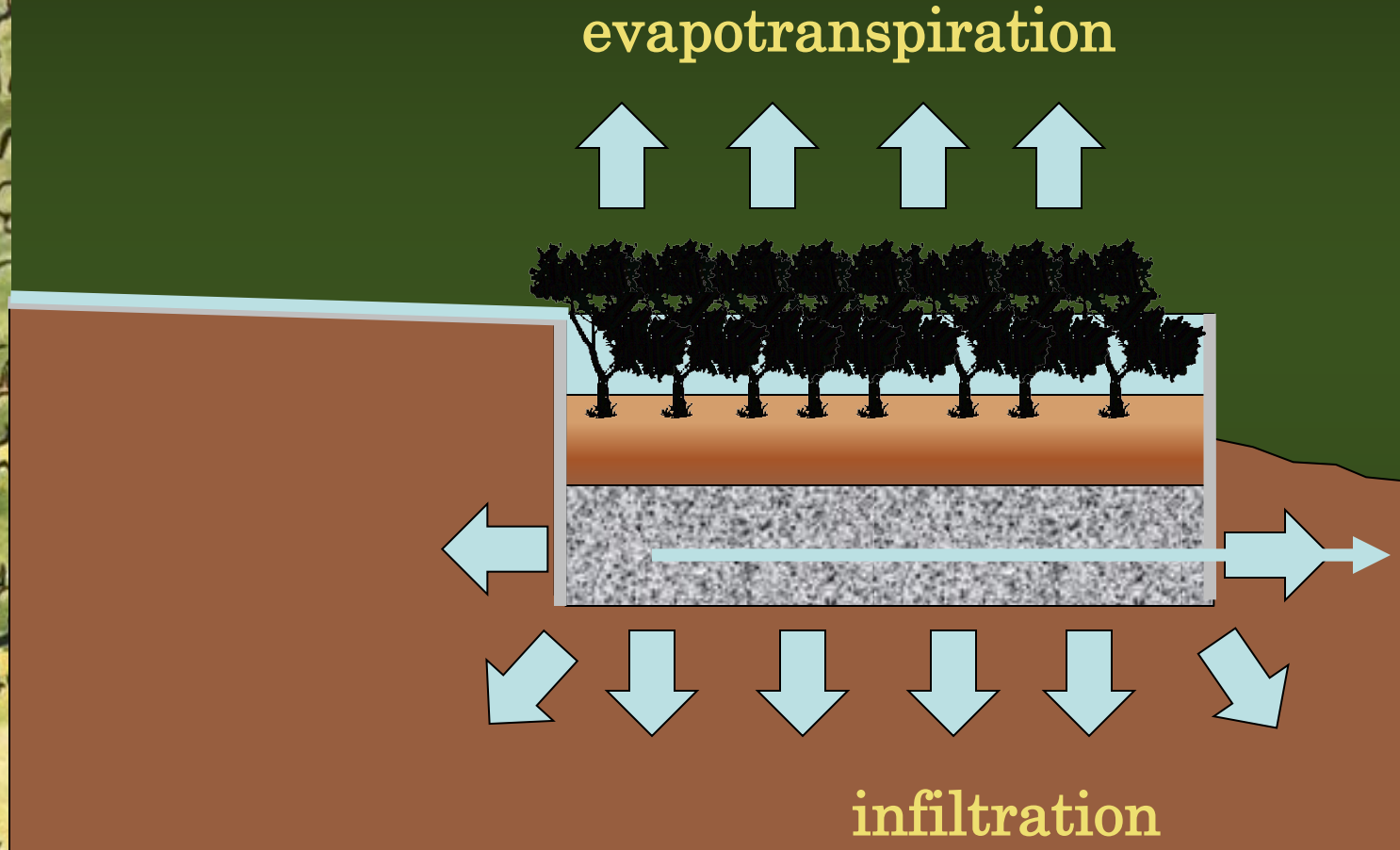




~~3~~ 4 Separate Requirements

1. Stormwater treatment
   - Numeric volume or flow criteria
2. Hydromodification Management
   - Numeric peak flow and flow duration criteria
3. Low Impact Development (LID)
4. Harvesting and Reuse

Bioretention



Mimics Natural Hydrology

Keeps Watershed Functions

Maintains the rate and seasonal timing of stream flows throughout the watershed

New Water Board Policy

- ~~Bioretention~~ treatment not allowed
  - Unless harvesting and re-use, infiltration, or evapotranspiration are infeasible
- Submit a report by May 1, 2011
  - Criteria and procedures used to determine when harvesting, re-use infiltration or evapotranspiration is feasible or infeasible at a project site.

San Francisco Bay MS4 Permit Hearing

October 14, 2009

NRDC
THE EARTH'S BEST DEFENSE

OVERVIEW

Permit Must Require Minumum Onsite Treatment of Stormwater Regardless of Alternative Compliance

- Feasible under MEP standard
- Required under SWRCB Order No. 2000-11

Permit Must Require Infeasibility Finding to Allow Alternative Compliance With LID Provisions

- Currently does not guarantee equivalent compliance

Permit Must Require Alternative Compliance Where Biofiltration is Used

- Biofiltration is not as effective as onsite retention

NRDC
THE EARTH'S BEST DEFENSE

Minimum Onsite Treatment Required

Alternative Compliance Measures

"Minimum onsite requirement. The project must reduce the percentage of Effective Impervious Area to no more than 30 percent of the total project area *and treat all remaining runoff pursuant to . . . design and sizing requirements.*"

Ventura Permit, at p. 67

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

Minimum Onsite Treatment Required

Alternative Compliance Measures

"If it is shown to be technically infeasible to treat the remaining volume up to and including the design capture volume using LID BMPs . . . *the project may implement conventional treatment control BMPs . . . and must participate in the LID waiver program . . .*"

South Orange County Draft Permit, at p. 36

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

Minimum Onsite Treatment Required

Alternative Compliance Measures: C.3.e.

(3) For each Regulated Project providing alternative compliance in accord with Provisions C.3.e.i (1) and (2) above, any volume of runoff up to the amount of runoff identified in Provision C.3.d not treated with LID treatment measures onsite or at a joint stormwater treatment facility must be treated using conventional or structural treatment control BMPs onsite. Onsite treatment at all Regulated Projects must nevertheless, at a minimum, comply with the statewide SUSMP requirements, as defined in *In re Bellflower*, State Water Resources Control Board Order No. 2000-11.

San Francisco MRP, at C.3.e.i.

i. The Permittees may allow a Regulated Project to provide alternative compliance with Provision C.3.c. in accordance with one of the two options listed below:

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

Infeasibility Must Be Required Finding

Infeasibility Required for Alternative Compliance

"*When a permittee finds that a project applicant has demonstrated technical infeasibility*, the permittee shall identify alternative compliance measures that the project will need to comply with" as a substitute for onsite retention.

Ventura Permit, at p. 67

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

Infeasibility Must Be Required Finding

Infeasibility Required for Alternative Compliance

"*Only those projects that have completed a vigorous feasibility analysis* [for onsite LID] . . . should be considered for alternatives and in-lieu programs."

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North Orange County Permit, at p. 58

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

SAN FRANCISCO MRP CONCERNS

Infeasibility Required for Alternative Compliance

- Regardless of Permit language, high degree of variability for results of offsite mitigation
- Permit allows for delay in construction of offsite projects, allowing “rolling” compliance

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

SAN FRANCISCO PERMIT

Alternative Compliance Measures: C.3.e.

i. The Permittees may allow a Regulated Project to provide alternative compliance with Provision C.3.c. in accordance with one of the options listed below.

where the Regulated Project includes a technical feasibility analysis demonstrating that it is technically infeasible to implement onsite harvesting and re-use, infiltration, or evapotranspiration LID Treatment Measures that comply with the requirements of Provision C.3.c.i.(2)(b). Alternative compliance may be provided in accordance with one of the two options listed below :

San Francisco MRP, at C.3.e.i.

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

SAN FRANCISCO PERMIT CONCERNS

Biofiltration

- Infiltration, harvest and reuse, and evapotranspiration are better than biofiltration from a water quality perspective (MRP at C.3.c.i.(2)(b)(ii))
- Infeasibility Criteria should be subject to Board review, MRP currently requires only reporting based on overly broad, illustrative guidance (C.3.c.iii.(1))

NRDC
THE EARTH'S BEST DEFENSE

(Photo: Sasaki Associates)

NRDC

THE EARTH'S BEST DEFENSE

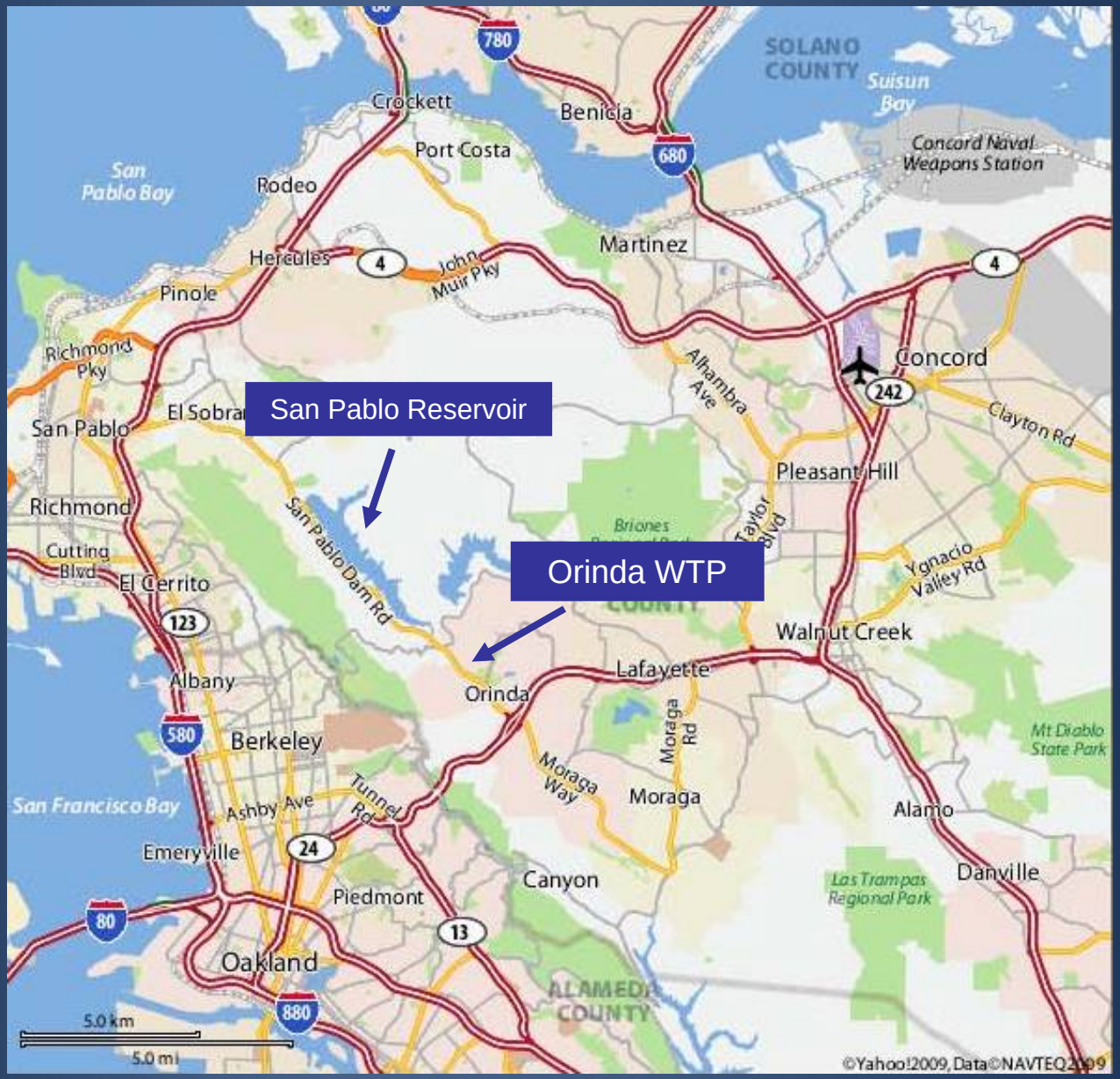
(Photo: Sasaki Associates)

East Bay Municipal Utility District
Orinda Water Treatment Plant

Issuance of NPDES Permit and Adoption of Cease and Desist Order

October 14, 2009
Presented by Heather Ottaway

Treatment Plant Location



San Pablo Creek
Settling Basins
Media Filters
© 2009 Tele Atlas
Google
Pointer 37°53'34.66" N 122°12'08.62" W elev 379 ft
Streaming 100%
Eye alt 1594 ft

Chlorine Residual Reporting Level Change

- Consistent with SFPUC permit
- Field kits can meet proposed 0.05 mg/L Reporting Level

Questions?

REGIONAL WATER QUALITY CONTROL BOARD - SAN FRANCISCO BAY
BOARD MEETING MINUTES

October 14, 2009

Note: Copies of orders and resolutions and information on obtaining tapes or transcripts may be obtained from the Executive Assistant, Regional Water Quality Control Board, 1515 Clay Street, Suite 1400, Oakland, California 94612 or by calling (510) 622-2399. Copies of orders, resolutions, and minutes also are posted on the Board's web site (www.waterboards.ca.gov/sanfranciscobay)

Item 1 – Roll Call and Introductions

The meeting was called to order on October 14, 2009 at 9:10 a.m. in the State Office Building Auditorium, First Floor, 1515 Clay Street, Oakland.

Board members present: Terry Young, Vice-Chair; Shalom Eliahu; James McGrath; Steven Moore; William Peacock; Rameshwar Singh.

Board members absent: John Muller, Chair.

Dr. Young served as Chair of the meeting.

Item 2 – Public Forum

There were no public comments.

Item 3 – Minutes of the May 13, 2009 Board Meeting

Motion: It was moved by Mr. Peacock, seconded by Mr. McGrath, and it was voted unanimously to adopt the Minutes of the May 13, 2009 Board Meeting.

Item 4 - Chairman's, Board Members', and Executive Officer's Reports

Bruce H. Wolfe addressed the Board.

Item 5 – Consideration of Uncontested Non-Enforcement Items

Mr. Wolfe said Michael Ambrose, Manager of Regulatory Compliance, East Bay Municipal Utility District, would like to speak on Items 5A and 6A. He recommended the Board consider the items after the uncontested items. He recommended adoption of Items 5B and 5C.

Mr. Peacock made a motion to adopt Items 5B and 5C as recommended by the Executive Officer.

Mr. Eliahu seconded the motion.

Mr. Moore recused himself from consideration of Item 5B.

Mr. McGrath commented.

The Board voted unanimously to adopt Mr. Peacock's motion. (On Item 5B, Mr. Moore recused himself.)

Item 6 – Consideration of Uncontested Enforcement Items

Mr. Wolfe recommended adoption of Items 6B and 6C.

Mr. Moore recused himself from consideration of Item 6B.

Motion: It was moved by Dr. Singh, seconded by Mr. Peacock, and it was voted unanimously to adopt Items 6B and 6C as recommended by the Executive Officer. (On Item 6B, Mr. Moore recused himself.)

Item 5A – East Bay Municipal Utility District, Orinda Water Treatment Plant, Orinda, Contra Costa County – Issuance of NPDES Permit

Item 6A – East Bay Municipal Utility District, Orinda Water Treatment Plant, Orinda, Contra Costa County – Issuance of Cease and Desist Order

Heather Ottaway said the Revised Tentative Order would regulate water released by East Bay Municipal Utility District to San Pablo Creek.

Ms. Ottaway said raw water is conveyed from Pardee Reservoir via aqueducts to the Orinda Water Treatment Plant. She said water entering aqueducts at Pardee Reservoir is treated with liquid lime for corrosion protection and sodium hypochlorite for disinfection. She said water is dechlorinated with a sodium bisulfite dechlorination solution upon approach to the Treatment Plant. She said the District releases raw water to San Pablo Creek that is in excess of the capacity of the Treatment Plant or the needs of consumers.

Ms. Ottaway said raw water at the Treatment Plant passes through dual media filters for removal of soil and other small particles. She said the District stores filter backwash water in settling basins before the water is released to San Pablo Creek.

Ms. Ottaway said the Revised Tentative Order includes a 0.05 mg/L total chlorine residual reporting level. She said a field test kit is commercially available that the District can use to measure total chlorine residual at the reporting level. She said use of a kit is necessary because raw water releases often occur at times when analysis in a laboratory is not feasible.

In reply to questions from Mr. McGrath, Thomas Mumley said chlorine residual requirements will help protect aquatic life in the upper reaches of San Pablo Creek.

Michael Ambrose, Manager of Regulatory Compliance, East Bay Municipal Utility District, thanked Ms. Ottaway and Bill Johnson for their work. He expressed concern that it is not feasible to measure accurately total chlorine residual at the specified reporting level with a field test kit.

Mr. McGrath said he was not clear if the District was requesting a change in proposed requirements.

Mr. Ambrose said the District's real concern was the total chlorine residual reporting level. He said the District would like the record to reflect it will need to receive an exception to provisions in the State Implementation Policy in order to meet requirements in the Revised Tentative Cease and Desist Order.

Mr. McGrath asked whether Board action would be prejudicial to the District's efforts.

Mr. Wolfe said Board action would not prejudice the District's efforts.

Mr. Wolfe said the Revised Tentative Order included a total chlorine residual effluent limit of 0.0 mg/L. He said the 0.05 mg/L total chlorine residual reporting level was included because of concern over field testing.

Mr. Moore discussed non-conservative pollutants and permitting requirements. He spoke in favor of staff's recommendation for the total chlorine residual reporting level.

In reply to a question from Dr. Young, Mr. Wolfe said staff will include a 0.05 mg/L total chlorine residual reporting level in future permits that are similar to the Revised Tentative Order.

Mr. Moore discussed future technology for measuring total chlorine residual in creek systems.

Mr. McGrath spoke in favor of including a 0.05 mg/L reporting level for total chlorine residual in the Revised Tentative Order.

Mr. Wolfe recommended adoption of the Revised Tentative Order for Item 5A.

Motion: It was moved by Mr. McGrath, seconded by Mr. Moore, and it was voted unanimously to adopt the Revised Tentative Order for Item 5A as recommended by the Executive Officer.

Roll Call:
Aye: Mr. Eliahu; Mr. McGrath; Mr. Moore; Mr. Peacock; Dr. Singh; Dr. Young
No: None

Motion passed 6 – 0.

Mr. Wolfe recommended adoption of the Revised Tentative Cease and Desist Order for Item 6A.

Motion: It was moved by Mr. McGrath, seconded by Mr. Peacock, and it was voted unanimously to adopt the Revised Tentative Cease and Desist Order for Item 6A as recommended by the Executive Officer.

Roll Call:
Aye: Mr. Eliahu; Mr. McGrath; Mr. Moore; Mr. Peacock; Dr. Singh; Dr. Young
No: None

Motion passed 6 – 0.

Item 7 – Municipal Regional Stormwater NPDES Permit – Municipalities and Flood Management Agencies in Alameda County, Contra Costa County, San Mateo County, Santa Clara County, and the Cities of Fairfield, Suisun City, and Vallejo in Solano County – Hearing to Consider Adoption of the Proposed Permit

Mr. Wolfe made introductory comments.

Dr. Mumley discussed the Final Tentative Order as supplemented.

Dr. Mumley and Mr. Wolfe replied to Board members questions and comments.

At 10:40 a.m., the Board took a break and resumed the meeting at 11:02 a.m.

In reply to a request from Dr. Young, Board members discussed concerns they had with the Final Tentative Order as supplemented that they would like the public to testify upon.

Staff replied to some concerns that Board members discussed.

The following people testified about the Final Tentative Order as supplemented: Geoff Brosseau, Executive Director, Bay Area Stormwater Management Agencies Association; Richard Napier, Executive Director, City/County Association of Governments of San Mateo County, and also speaking on behalf of the San Mateo Countywide Water Pollution Prevention Program; Curtis Kruger, Regional Project Consultant, CONTECH Construction Products Inc.; Alexis Strauss, Director, Water Division, United States Environmental Protection Agency, Region IX; Dan Cloak, Consultant, Contra Costa Clean Water Program; Michael Ambrose, Manager of Regulatory Compliance, East Bay Municipal Utility District; and David Lewis, Executive Director, Save The Bay.

At 12:23 p.m., the Board took a lunch break and resumed the meeting at 1:02 p.m.

The following people testified about the Final Tentative Order as supplemented: James Paluck, Senior Civil Engineer, City of Fairfield; Mark Lander, City Engineer, City of Dublin; Tim Potter, Environmental Compliance Superintendent, Central Contra Costa Sanitary District; Noah Garrison, Legal Counsel, Natural Resources Defense Council; Melody Tovar,

Deputy Director, Environmental Services, City of San José; Laurel Prevetti, Assistant Director, Planning Division, Department of Planning, Building and Code Enforcement, City of San José; Laura M. Hoffmeister, speaking as Mayor, City of Concord, and after which, speaking as Stormwater Manager, City of Clayton; Jennifer Kovecses, Staff Scientist, San Francisco Baykeeper; Frank Kennedy, Consultant Stormwater Program Manager, Town of Moraga and City of Oakley, and also speaking on behalf of the Contra Costa County City-County Engineering Advisory Committee; Eric Anderson, Urban Runoff Coordinator, City of Mountain View; Jill Bicknell, Assistant Program Manager, Santa Clara Valley Urban Runoff Pollution Prevention Program; Paul Campos, Senior Vice President and General Counsel, Home Builders Association of Northern California; James Scanlin, Program Manager, Alameda Countywide Clean Water Program; Gary J. Grimm, Legal Counsel, Alameda Countywide Clean Water Program; and Tom Dalziel, Assistant Program Manager, Contra Costa Clean Water Program.

At 2:21 p.m., the Board took a break and resumed the meeting at 2:38 p.m.

Mr. Wolfe and Dr. Mumley addressed concerns expressed by Board members and people who testified concerning the Final Tentative Order as supplemented. They discussed Provisions in the Final Tentative Order as supplemented, including Provision C.2 Municipal Operations, Provision C.3 New Development and Redevelopment, Provision C.11 Mercury Controls, Provision C.12 Polychlorinated Biphenols (PCBs) Controls, and Provision C.15 Exempted and Conditionally Exempted Discharges.

Mr. Wolfe recommended amending the second sentence in C.2.d.ii.(2) by adding the phrase “remains in the stormwater collection system.” He recommended C.2.d.ii.(2) read “Inspect and collect DO data from all pump stations twice a year during the dry season after July 1, starting in 2010. DO monitoring is exempted where all discharge from a pump station remains in the stormwater collection system or infiltrates into a dry creek immediately downstream.”

Dr. Mumley and Mr. Wolfe replied to questions from a Board member.

Mr. Eliahu said he would like to make a motion to adopt the Final Tentative Order as supplemented, with a provision that implementation be delayed for one year.

Mr. Wolfe said he would not recommend a delay in implementation.

Mr. Eliahu said his suggestion reflected economic situations municipalities are encountering.

Mr. McGrath made a motion to adopt the Final Tentative Order as supplemented and with the amendment to the second sentence to C.2.d.ii.(2) as recommended by Mr. Wolfe.

Mr. Peacock seconded the motion.

Mr. Eliahu made a motion to amend Mr. McGrath's motion to require implementation be delayed by one year.

Dr. Singh seconded Mr. Eliahu's motion.

Dr. Singh made a motion to amend the pending amendment to order that staff should take into account economic difficulties of cities and jurisdictions during the first year of implementation.

Mr. Eliahu seconded Dr. Singh's motion.

Mr. McGrath, Mr. Peacock, Mr. Moore, and Dr. Young spoke against adoption of the amendment to the pending amendment.

Dr. Young requested a roll call vote on Dr. Singh's motion to amend.

Roll Call:
Aye: Mr. Eliahu; Dr. Singh
No: Mr. McGrath; Mr. Moore; Mr. Peacock; Dr. Young

Motion failed 2 – 4.

Dr. Young requested a roll call vote on Mr. Eliahu's motion to amend.

Roll Call:
Aye: Mr. Eliahu
No: Mr. McGrath; Mr. Moore; Mr. Peacock; Dr. Young
Abstain: Dr. Singh

Motion failed: 1 – 4 with 1 abstention.

Mr. Moore and Mr. McGrath commented.

Dr. Young thanked stakeholders, staff, and Board members for their contributions in developing the proposed permit on which the Board was about to vote.

Dr. Young requested a roll call vote on Mr. McGrath's motion.

Roll Call:
Aye: Mr. McGrath; Mr. Moore; Mr. Peacock; Dr. Singh; Dr. Young
No: Mr. Eliahu

Motion passed 5 – 1.

Item 13 – Adjournment

The meeting was adjourned at 3:46 p.m.

California Regional Water Quality Control Board
San Francisco Bay Region

October 14, 2009, 9:00 a.m.

Elihu M. Harris Building
First Floor Auditorium
1515 Clay Street
Oakland, CA 94612

Item 7 - NPDES Permit

Reported by Kent Odell

Item 7. NPDES Permit. Municipal Regional Stormwater NPDES Permit – Municipalities and Flood Management Agencies in Alameda County, Contra Costa County, San Mateo County, Santa Clara County, and the Cities of Fairfield, Suisun City, and Vallejo in Solano County – Hearing to Consider Adoption of the Proposed Permit.

Mr. Wolfe - With that, we move to the so-called main event. Item 7A. Dr. Mumley will make the presentation and he will cue this up as we hand out copies. I see that you are continuing to get some cards, so I encourage the audience, if you have not submitted a card and plan to testify, please bring that up.

I will preface that we will note that this process to develop a region-wide Municipal Stormwater Permit, this specific permit has been ongoing since 2004, but it really goes back to 2000 at a time when my older daughter was in high school and my younger daughter was in middle college, now they are both out of college and I have two granddaughters from the older one. So time has moved on, but it started when we were reissuing the Santa Clara program permit and put out a Tentative Order in 2000 to become more rigorous on our new and redevelopment provisions. That generated a lot of back and forth, and in early 2001, the Board adopted an updated reissued permit for the Santa Clara program, for all provisions except the new

and redevelopment provision. And staff went back and worked with stakeholders to bring back to the Board later in 2001 an updated provision for new and redevelopment. That then turned to the process for reissuing the Alameda permit, which we initiated in 2002, at the same time, to attempt to be consistent, we said we would amend the San Mateo and Contra Costa permits. That process continued throughout 2002 into 2003, when, in early 2003, we did adopt a re-issued Alameda Program-wide Permit and Amended Permits for Contra Costa and San Mateo. The issue was that, already, those permits were different from what we had adopted for Santa Clara just a few months before, and later, in 2003, we reissued a Permit for Fairfield-Suisun, which was very close, but, again, not quite the same. So we really said that, at that point, we need to bring everything to a level playing field because, as we moved forward, recognizing we needed to reissue the Contra Costa and San Mateo permits in 2004, we said again we are going to be in this position of potentially having the permits say different things as we moved forward, and everybody recognized that is not the best way. In waste water permits, we have that challenge, but in many cases we are able to work through; here, where we are doing permits on a county-wide basis, that sometimes really sets the calendars for things, programs we are doing, at different stages, and it is a challenge for everybody. So

we started this process in 2004, and we hope, in terms of development of a region-wide permit, we knew it was not going to be easy, but we think we are to the point today where we are able to bring something to you that stakeholders can buy into and we can move on to the implementation stage. So, with that, I would like Tom to update us on where we are, where we have come in the process, and what the changes are since you last heard this in May.

Dr. Mumley - Thank you, Bruce, and that lead-in helps set the stage why a regional permit. And I just want to start by saying I am very pleased to be here to present what we are calling the final draft of this municipal regional permit, and I can tell you, I have been involved on a number of big big issues in my time here at the Board, and this is way up there, if not at the top. And so, again, I am pleased to be able to deliver the final recommendations for you. So I just want to emphasize again, as I did at the May hearing, that this is really about urban stormwater runoff, illustrated by the significant amount of silver gray landscape that you see throughout the Bay, and that is why we are here, is that urban runoff is a significant source of pollutants in the Bay, as well as its tributary streams.

Just to illustrate what Bruce called out, this permit covers a substantial number of the municipalities and

local agencies, specifically flood management agencies, associated with those municipalities throughout the Bay Area, and rather than a number of separate permits, which I am going to just illustrate with sort of a rough outline, there is a separate permit for Fairfield-Suisun City, there is a separate one for Vallejo, albeit that one was issued by USEPA, and then we have county-wide permits that address all the municipalities, as well as flood management agencies in Contra Costa County, Alameda County, San Mateo County, and Santa Clara County. So you put these all together, you see the regional nature of this effort. And just to remind you of our goals, our goal for this regional effort is to have one permit that provides consistency, but at the same time accountability, well, flexibility, recognizing it is not one-size-fits-all, and that it can be adapted to reflect community and watershed characteristics, and it also has an overriding goal to require controls to reduce pollutants to the maximum extent practicable, to effectively prohibit non-Stormwater discharges, it should only have clean Stormwater and clean non-Stormwater in storm drain systems, and that ultimately effectively manage the cause or contribution to violations of water quality standards associated with urban runoff discharges. So just to remind you, it has been an arduous trek going back to 2004, and what I want to emphasize here, we use the term "draft permit" and

"tentative order" interchangeably, so just to make sure our jargon refers to "tentative orders" because, ultimately, you adopt an order which issues the permits. So if I say "draft permit," or I say "tentative order," they mean one and the same. So we crafted the original draft permit, or tentative order, December 2007, we had a testimony hearing in March 2008, then subsequently we revised the draft permit and public notice of revised draft permit in February 2009, soliciting further written comments and oral testimony at the May 2009 hearing. So hopefully we are just one more time bullet on this, and that is today.

So what have we done since the May hearing? First and foremost, we took on what I would call the formidable task of reviewing and considering all comments, and we are talking all comments, both on the original tentative order, the revised tentative order, testimony at both the hearings, and as you know, given the shear magnitude, numbers of comments, that was a lot of work. At the same time, we met with stakeholders to vet -- to make sure we understood their concerns, and to vet any changes that we are considering as an outgrowth of our consideration of their comments. And that led to what we are calling the "final draft permit," which we posted roughly three weeks ago. That was our goal, a day or so late from that three-week point. And that posting on the 24th included the revisions that we had come

up with, and while we continue to complete our response to comments and continue to complete the associated fact sheets with the final draft permit and include other parts of the final draft permit that we did not change, but I wanted to emphasize that that was a lot of work, and what we wanted to do by meeting with the stakeholders was to ensure that any changes that we are proposing were indeed associated with comments and our understanding of concerns by all parties. There was a balancing act, but we wanted to ensure that we were not coming up with something new, that was outside the bounds of what had been put on the table before.

And at this time, I really want to call attention to the lot of work that our staff did. This was a team effort. Shin-Roei Lee, Dale Bowyer, Sue Ma, Selina Louie, Jan O'Hara, and Richard Looker, who is actually not here, put a tremendous amount of time in the review and development of the responses to comments. And then there were some predecessors that are not here, as well, that I will not go into. So ultimately, last Wednesday when we posted the package for today's meeting, we included complete responses to all comments received, two large documents, one referencing the comments on the 1st draft permit, and one on the revised draft permit, and all the other aspects of the package before you. I will, I guess, apologize to the public in that we had hoped to get them an early look, as

much as possible, but it was just an impossibility, a logistical challenge, so we did the best we could, and that is why we went for the early release of the draft permit reflecting changes we made, knowing that we might still find a few other non-substantive changes, and that gave us cause to have to do a supplemental, which we posted yesterday, and it is before you, so the complete package that we are putting before you is the Final Tentative Order, or Draft Permit, that was the September 24th version, augmented by the other components like the complimentary fact sheet, attachments, and parts of the previous Draft Permit that were changed on October 7th, and then, additionally, the Supplemental Revisions that are before you today. So that is a mouthful, but I wanted to make it clear for the record what basically is the supplemented, final tentative order, or final draft permit that is before you.

So I want to just briefly call attention to the revisions that we made. First, I just call attention that we made a number of the revisions that I would call "general," and they are literally errata, correcting mistakes, grammatical, etc., but we made a number of them that provide a clarification and simplification of some of the requirements, and often we found out that is the way they were being read, they were not necessarily one and the same with their intent, so we really tried to make it clear

and concise on many of these. And we also reviewed all the tasks and report deadlines, and adjusted them where we felt appropriate, both because the action on this permit was delayed from what was envisioned in the previous draft, and we had to provide accountability there, we also further looked at supportable changes and ramp-up for new requirements, and then we also made some revisions at the end in terms of when this permit expires relative to information needs associated with tasks, California's permit that would lead to development of the subsequent permit. So we adjusted some of the end report deadlines to reflect that this permit is being issued during the middle of a fiscal year, rather coincident with the fiscal year, and we had previously depended a lot on the last annual report, the Fourth Year Annual Report in this permit to be the vehicle to start the dialogue for the next permit reissuance. We found we have opportunity to segment some of those reports to allow more time, and to have more information available to feed in to that process.

So that is the general stuff. The key revisions that I believe we will still hear some comments on today are reflected in these three bullets, the low impact development requirements, although we may not see here a whole lot on trash because I think we have nailed it, we will see, but I want to be clear what we have done on trash load reductions,

then there is some concerns associated with the potable water discharges, not unlike what you just heard in the permit for the Orinda treatment facility you just heard about. So let's focus on the low impact development revisions and that first bullet has a lot associated with it, and let me just step back and say this addresses treatment requirements associated with new and redevelopment. It is opportunistic-based treatment requirements, it is premised on if we are developing and redeveloping lands, the opportunity is there to assure that runoff from that new development or redevelopment is as clean as it can be. Now, low impact development has become the preferred suite of BMPs to control pollutants, if you will, to the maximum extent practicable associated with new development. So it is not the end, it is the means to the end, but it has become, if you will, the preferred approach nationally, as well as parts of California. And so we are not the first to address this -- well, in one sense, we were the first to address low impact development concepts because all our previous permits required action by municipalities that embraced many of the low impact development concepts. Our Bay Area communities have been very proactive in this arena, and my sense, then, other permits across the country and the East Coast, particularly, as well as in California, Orange County, Ventura County, and recently in the North

Coast, the Santa Rosa permit that was just issued earlier this month, include explicit low impact developments premised on starting with the new and redevelopment requirements should strive for 100 percent LID treatment with some limited exceptions, and I will explain that more in a couple of moments.

So the bottom line, this is not necessarily a new concept, it is already happening in the Bay Area, we are building upon what is already happening, and we are being consistent with the permits in the other parts of the state, as well as the nation.

One of the key aspects of low impact treatment measures is what are they, and the primary ones are re-use including use where harvesting is included, infiltration of that transpiration. And clearly, if you think about that, that means that there is essentially reuse, harvesting infiltration of transpiration of the design storm, it is not all runoff, but it is the amount of runoff that is expected to be treated. But if you implement those measures, there is essentially no runoff except above and beyond that, so that is the quintessential pollution prevention action, you cannot argue against that, it is just a matter of the feasibility of it, and we think that -- so perhaps we have a preference to add bio-treatment on top of that where you can demonstrate that those actions are not feasible. And it is

pretty clear, where infiltration is not feasible, because we have problems with steep slopes, we have clay underlined soils, evapotranspiration is just a matter of how much air and sun exposure one gets, and also emphasize an infiltration of evapotranspiration are common components of bio-treatment systems, so you are going to get that, as well. It is the re-use that is probably -- the feasibility is the challenge because there is, as time goes on, harvesting and reuse is going to become more and more a common practice, the value of water, and so what is feasible today may change over time. But currently, we know there are a number of institutional barriers to full reuse and harvesting, where we have confidence that some of those barriers can be overcome. But I guess the issue at hand is that we are addressing this by saying in this draft permit that you can use bio-treatment if you demonstrate that reuse, infiltration, evapotranspiration are not feasible, and we ask in this revision two reports, first, the report to document what feasibility criteria and procedures are being used, and that is followed up by reports that demonstrate how they are used, so what criteria procedures will be used, and then how they are used and on an ongoing basis. So we have taken the premise -- submit that report to the Board, it does not require approval, we are taking the approach, if you will, of a presumed innocence effort

because we may find that report, that for some municipalities, is insufficient, and that would give us cause to attend to them, and it could result in Board action. I would also emphasize that the public will have opportunity to comment on these reports because, in Finding 17, which states that any report required by this permit, annual reporter specific, will be made available to the public, and that the Board is allowing them an opportunity to comment on it and, if necessary, even call for a Board hearing to consider what is required by the reports. So there is a default opportunity. If we made it a requirement up front for Board approval, it would require a significant burden upon us to bring the whole thing to you. So, again, that would be, I would call it, the "presumed guilty" approach that we would have to scrutinize each and every municipality submittal, and force us to drill down in detail to their planning procedures, which is frankly not in our interest. We prefer to have them do the job and we review the performance of appropriately implementing this. But this is an issue of interest that you will hear comments about, that is why we are spending a few moments explaining that. We asked for a report to the Board, but do not explicitly say that there will be Board approval; it is implicit that Board approval may happen, if necessary.

There are two other aspects of the low impact

development requirements. One is that, as proposed, we would allow off-site treatment of 100 percent of the design storm, so if you do not do it on-site, you can do it off-site. And there are various reasons for why we say 100 percent is the way to go, this is an area where there is also some concern, but our point -- I think I can quickly state four reasons why it is the way to go, because one thing is that we put as the condition of going off-site that you have to demonstrate an equivalent level of a flow and pollutant removal reduction, so it is equivalency; but then we also add that you have to demonstrate that there is a net environmental benefit, so it is almost like equal to and greater than, although the net environmental benefit is not limited to -- could be more flow reduction, more pollutant reduction, but it allows us to consider other environmental factors that it would be a good thing to do it off-site, so I guess it is we are purposely not being specific about the net environmental benefit because we want to look for good opportunities, and so watershed approach, and there is no penalty on-site, and if you go off-site, you do not have to have any further treatment on-site, and that is an issue that has been raised, but we look at it as we have had this requirement, this opportunity in all of our existing permits that Bruce referred to -- the new development requirements, that you can go 100 off-site, so it has never been contested

in the past. But it also has been used next to never, there might be a couple rare exceptions to it because municipalities find it is just not easy to implement, the private sector finds it is not easy to implement because you have to have dedicated land elsewhere, there are also time constraints to assure that the off-site happens in order to get the credit to not do it on-site. So our interest is to not put additional barriers on it, to make it be a good thing in the way we propose that we believe it only happens if there is a net environmental benefit. We will leave it at that. And the last issue, and you have heard some discussion of this in the past, it is what we are calling "special projects," is that recognizing that there are areas that will be difficult to implement, low impact development, because of land area constraints, really high density infill, and we also look at other things like transit oriented development, where there are other benefits. So we had proposed special projects and credits in the past permit, in the revised draft tentative order, as you heard last hearing, there was a lot of concerns on all sides about what projects should be given credit, or exemptions to treatment, how many of them, what is the footprint, you even saw the transit-oriented development circles that looked pretty broad around BART stations, and it gave us cause to say let's not railroad this right now. We know that there

is concern by municipalities, that you have some certainty as to what they have to do, but we have set up an exercise here where we allow the municipalities collectively or individually to come forward and proposed special projects, the types of projects, the size of them, and what criteria, and why there is justification for doing something other than low impact development treatment, and so we will have all the treatment available to make an informed recommendation, for you to make an informed decision. So in that case, it is set up that the municipalities shall submit a -- to get this, they have to submit a report for Board approval, so there are no special projects until you act. But that is -- realize that we have to take that approach because, rather than accepting a default approach, because there are too many unresolved issues to date, it would require Board action. So I will leave it at that.

So it becomes I guess the headline associated with this permit, and for those of you who saw, we made the front page of the Chronicle today for the potential action, focusing on trash, and you know that the proposed trash requirements from the past received a lot of written comment, as well as oral testimony, and so we did not go back to the drawing board, we thoroughly considered all those comments and basically this is a case where I think we clarified and simplified and made a better provision within

the same realm of what we had before, because, as you might recall, before we had the long-term plan, long term load reduction plan was reduce trash by 2023, and now we are establishing it as 2022, and then established two interim milestones to get there -- 40 percent reduction of current trash loads by 2014, 70 percent by 2017, and 100 percent equal no adverse impacts, so maybe it is an overstatement to say no trash load, but no trash load that causes an adverse impact by 2022. So we provide that broad over umbrella and then, within that, we rearranged or adjusted the specific requirements that we had proposed before, so rather than what some deemed as overly proscriptive interim requirements, we have provided some flexibility there in exchange for you have sort of these milestones. And in that, too, we have to figure out what is the baseline in which to measure the 40 percent, 70 percent, and so we allow for a two-year timeframe for the municipalities to get some experience and propose their baseline load, and at the same time propose how they will track it, if you will, self-determined monitoring and reporting, although all this has to be submitted to us and, again, it would be the case where these reports would be publicly available, allowed for public review, and if we found any problems, or third parties found problems with them, they could be brought before you for your approval, if problematic. We are hoping

that will not be the case, that we are going to get good proposals to easily endorse. And one aspect, part of the flexibility is that the revised provision allows exclusion of the clean areas, and you heard a number of municipalities claiming we should not have to do this, we should not have to do something that does not have value, and that is clearly the premise here. So, with that, we have a two-step framework, the short-term load reduction, which is the focus of this permit term, and the long-term load reduction, which is beyond the permit's term, we are calling for a report, a plan, by the end of the permit term to feed the requirements for the next permit term, designed to meet the 70 percent and 100 percent reduction.

And so let me just focus on a little bit of overview in the short-term trash reduction expectations. Basically, it is this -- implement actions to meet the 40 percent requirement in 2014, which is like really the fourth plus year of this permit term, and then that trash load reduction has in the premise that we will need full trash capture, so we have maintained the minimum, basically the mandatory minimum for full trash capture within that guise. We also sustain a minimum number of trash hotspot clean-ups, but we significantly reduced the proscriptive nature of the hotspot component of this. We are saying cleanups typically happen, we are saying cleanup X number of hotspots in your

community every year, and as part of that, account for what types of trash you are getting and quantity, and that is going to feed in to understanding where it is coming from and what we can do to reduce it. It is all intended to be informative and done in hopefully a much more user-friendly or central fashion than we had proscribed before. And then, of course, on top of that, as we say, that is not all, there may need to be more trash capture than the mandatory minimum, where we also encourage and really look for more actions to do pollution prevention, whether it be fast food, trash material ordinances, or ordinances associated with plastic bags, things like that that are happening, and hopefully will not get into a habit. And I cannot help but make a pitch for this down below as a good start, in May we said the San Francisco Estuary partnership/ABAG had put in a proposal to the State Board to get stimulus fund grants, well, I am happy to say we actually reported it in the Executive Officer's Report, they received it. So we have got a $5 million jumpstart to this effort.

So the last issue that there are some remaining concerns has to do with potable water discharges to storm drains, and I just wanted to remind you again why potable water. Potable water is chlorinated, chlorinated water kills fish, there also could be other -- potable water could have other reasons -- would have a pH that could be

problematic, and high velocity potable water discharges are erosive and the like, so we have reasons to be concerned about potable water discharges to the storm drain system. But what we have done to address concerns raised by a number of the municipalities, because we are burdening them to regulate third-party discharges, whether they be third-party would be like East Bay MUD, which is a separate district, and it discharges to city -- their discharge would go to city storm drains. Where there are other communities that actually own and operate the drinking water systems, the potable water systems, so they are in the mode of self-regulating, so they are not in this case second bullet, about maintaining requirements for municipalities to regulate themselves because they can, but we are -- the top bullet means we are taking away the extensive requirements for the municipalities to oversee third parties. Permittees oversee them. We are not walking away from this issue, we have intentions to repair an NPDES Permit to address these discharges region-wide, and that is in the hopper. If we looked at the requirements, though, that do apply for permittees who are potable water purveyors, and we made reductions in the monitoring reporting aspects of them. One of the issues that has been raised is related to what you heard during the Orinda hearing before, is that it has -- this permit proposes benchmarks, which are really like

action levels, they are not limits, but they have a benchmark of 0.05 milligrams per liter chlorine, and has a benchmark of pH not to be outside the range of 6.5 and 8.5 and it has a turbidity benchmark. Those are benchmarks which mean, if they are found to be exceeded, it means you have to look at how you can improve your BMPs to mitigate that. They are not enforceable limits, they are action levels, so it is a softer level of regulatory requirement, so keep that in mind because it is not the end of the world if you find that you are outside that range, you have to look at where the discharge is going and what you can do better to manage the pH level, or the chlorine level, because especially in the field under emergency situations, we appreciate public safety and the like is the highest priority.

So with that, I just want to end with some positive perspectives, one is that, I said in May, permit requirements lead to funding opportunities, I already told you about the first one that we actually have a $5 million jumpstart. The second one, I told you about in May and it is still a work in progress, that there are federal funds through CPA Region 9, specifically for the San Francisco Bay Area, there is $5 million up for grabs, proposals that have been submitted, including I know of at least two from the Bay Area Stormwater Agencies, one for trash, one for Mercury

and PCBs, but there is also a comprehensive one submitted by the San Francisco Estuary Partnership, that also includes actions that directly relate to benefitting the Bay relative to urban runoff discharges in its permit. So it is kind of like we are in a "cannot lose" situation, I think, with that. And we are actually optimistic that there will be more monies in future years coming in this direction via this concept, that we will look to feed into this.

The last point here is that some of you may or may not know about SB 310, but this was a bill signed by the Governor on Sunday, and what it does say, it is not mandatory, but allows municipalities to prepare watershed improvement plans, to implement requirements of their permits, to implement TMDL-related requirements associated with their permits, made to order for trash, PCBs, Mercury, and if Water Boards -- you -- approve those plans, then the municipalities are given the opportunity, may charge fees to implement them. Now, that is -- I think there is still a question whether that ability to charge fees supersedes Prop. 218 constraints, but it is certainly a step in the right direction. Whether it does or not, I still would advocate, if you have a plan that says this is what we are going to do with your fees, the public is going to be more willing to approve fees that they know where the money is going. So I look at that as a win-win.

So in summary, this is just emphasizing what we talked about the last time and today, that we recognize that this permit has cost challenges for municipalities, especially during these economic times, and we have done everything we can to eliminate or minimize proposed requirements that would have limited water quality benefits, so applying what is left there does have water quality benefits, and we have obligations to impose, you know, challenge municipalities to take action that improve water quality and correct water quality problems. Where all the new actions that will require new things and new resources, there are time schedules that are provided here, and we look closely at making those time schedules as user friendly as possible. And then I would just re-emphasize the point that requirements should help, not hinder, future funding opportunities. And then this last bullet is just I want to state that complimenting this finding that I referred to Finding 17, that says any new report called for by this permit can be made available to the public, well, Provision 17 is a re-opener that says, if there is new information, or there are significant changes that are recognized that were not available when this permit was enacted, we can re-open this permit to make appropriate changes. So that is the way I look at it is, if we somehow missed an unintended consequence, it can be fixed.

So with that, I want to say that we have met the goal in the final Draft Permit as supplemented, proposing a regional permit with consistency, accountability, and flexibility, and that it will result in meaningful and timely load reductions. So, with that, I urge you to consider the Final Tentative Order, the Final Draft Permit, as supplemented in today's packet, to issue the Municipal Regional Permit. And with that, we clearly expect you might have some questions to improve your comfort level with what we have done and consideration of other ongoing comments. Thank you.

Vice Chair Young - Thank you, Mr. Mumley. We will take some questions from the Board. Dr. Singh, would you like to go first?

Dr. Singh - Thank you. I have a question. This lead development still applies, the one acre and above? Is it true? The size of the lot, the development site, the minimum size should be one-acre for the lead development requirement?

Dr. Mumley - Well, the simple answer is, it is 10,000 square foot threshold, if that 10,000 square foot of new impervious area, and there are nuances in terms of on top of existing -- 10,000 square foot is the threshold, although it is reduced to 5,000 feet for certain limited set of commercial developments like retail gas, auto repair,

restaurant types, so there is a limited platform footprint down to 5,000 square feet of new impervious area, but the standard is 10,000 square feet, so it is not an acre.

Dr. Singh - Well, I will tell you this, that we need a lot more money than $5 and $10 million in stimulus package, but of course, the right direction and I am glad about the trash control and reduction because there are about 100 hotspots in the City of San Jose, one of the Councilmen told me, and one of the hotspots is close to my home and that always bothers me, at the end of a road, near the hill, Almaden Hill, there is always trash over there in the night time people are dumping, I called many times the City over there, and also a love lane over there because it kind of dead ends and all these cars are parked, and I am glad we are taking steps in that direction, I am really glad about that. I have complained about it, the reduction of the trash. So, thank you.

Vice Chair Young - All right, do we have other questions for staff? Mr. Moore? I have some questions for staff, many of which I think were answered in your presentation. But I do want to highlight them. There are, as you mentioned, several sections where we ask the Permittees to propose various definitions, allocation schemes, incentive credits, and I generally support this approach as being very reasonable for this permit, but I do

want to re-emphasize that it is important for us to assure that there is a process whereby other interested parties can influence the outcome. And you mentioned specifically in a couple of sections how we would be going about doing this, and I appreciate you highlighting those, but just to make it abundantly clear for everyone in the room, I want to give you one more opportunity to explain how members of the public and other interested parties will be able to make sure that what the Board accepts in terms of these programs that the Permittees are proposing actually have been vetted and that we have everyone's ideas. I can list sections for you, but I think you know what they are. A lot of them are in (c)(3)(c).

Dr. Mumley - Thank you. I will say, it is implicitly in the interest of the Permittees to allow public participation in the development of anything because, if they do not, there is a default that, if they do not and they put something forward that other parties do not like, it may result in adversarial science arguments or contentious dialogue in front of this Board, but ultimately the buck stops at this table. So the Finding 17 that I referred to explicitly says that any report required by this permit will be made available to all interested parties, and all interested parties will be provided an opportunity to provide comment, and if staff via the Executive Officer

cannot satisfy their concerns, it says that they can -- you are saying by adopting that finding that they can come to you and ask for a hearing on that issue. And depending on the issue and the information, it may result in a permit action, or there could be -- frankly, it could end up being the basis of an enforcement action. As default, no, you are not going to get an out, we are not going to give you the permission to do something that you have to do, but it is intended to be done in a smart fashion, that we will make changes through that exercise in a way that everybody should be balance and in a win-win situation, but the bottom line is that you get the final call.

Vice Chair Young - Well, thank you for going over that again. I just wanted to make sure that everyone, not only on the Board, but in the audience, was clear on the fact that there will be a procedure by which we made sure that these proposals are vetted, and are the best that they can be. So, thank you.

Mr. Wolfe - I think it is appropriate to reiterate that two areas that Tom hit, that are of concern to a number of folks, are the development of infeasibility criteria or where LID, especially bio-treatment, etc., will be applied and that is in the Provision C3, CIII on page 30, where we are asking for a number of reports back, as we develop and work with the Permittees on their criteria, and that is a

significant area where we want to get the stakeholder input. Likewise, as Tom mentioned, the issue that is in C(3)(E)(ii), the Special Projects, what constitutes Special Projects, what type of credit would be provide, what would be appropriate for non-LID, so that is where we want to get stakeholder input and we fully expect that we are going to be reporting back to you and keeping this very public throughout this process.

Vice Chair Young - Good. Now we are all clear on that. And I appreciate it very much. The same will of course apply to the trash issue, to progress reports, and the proposals for setting of baselines, we intend to have a robust process. We are not trying to make things happen without public input. Then, I have one other question about implementation. In Section C(11) and (12), the Mercury and PCB sections, there are several requirements where we have essentially asked the Permittees to work together as a group to accomplish something, which, again, I think is a very reasonable approach. But I want to make sure that we are focused and the Permittees are focused on the fact that this should be an equitable apportionment of responsibilities. We do not want to have a system where some Permittees are carrying all the loads, and other Permittees are just getting a free ride. Yeah, I hear mumbling over here, which I will assume is supportive mumbling. So I wanted to give

you, Tom, an opportunity to just comment on that issue and direct our attention to whatever procedures we will be able to employ to make sure that the distribution of responsibility is equitable -- and that we provide incentives and benefits to those who are in leadership positions.

Dr. Mumley - Okay. I guess a two-part answer. Part 1 is that, in some, but I do not think in all, of the associated provisions, we say that what is associated with doing pilots in five, you know, there are five pilots in some provisions areas, 10 in others, that those pilots be distributed, you know, with at least one each in each of the main county-wide program areas, as well as I believe it made reference to doing one in Solano County, and so that is one vehicle to, say, at the start, be looking for distribution; the other aspect is, in order to meet -- it is sort of all for one and one for all, and this is where this will be a challenge, possibly, if it is not done properly, is that to do these pilot projects in a manner that are all for one and one for all, they have to illustrate how these pilots are representative of the whole permit area, so accounting for the various watershed community characteristics, and so that is a burden that whoever steps up to plate has to take on. Now, I guess the latter part is, what if it boils down to that a few step up to the plate and do that, and others say,

"Great, they're doing it, I don't have to do anything?" Well, basically they are getting into -- if they do not pay now, they are going to pay a lot more later because they are going to have to live with the results of what the good actors come up with, in terms of demonstrating what works and what does not. I believe it is also going to be that we have to rely on the ability of the Bay Area municipalities to collaborate, and I would expect that, if the good players found that they were not getting appropriate support from the not so good players, they could come to the table and say, "We want you to compel others to take action," and we do have regulatory tools to compel such action, whether it be 13267 reports, or a threat of enforcement, if needed.

Mr. McGrath - Tom, on this point, is there not remaining as a back-up, or perhaps sort of Damocles -- a waste allocation coming from the Mercury TMDL that allocates the reductions?

Dr. Mumley - Well, that is why I said, if you do not pay now, you may pay later because ultimately we have to implement the Mercury TMDL waste load allocations, and then, assuming it gets approved, there are the PCB allocations, which do have explicit -- there is an aggregate, but really underneath that aggregate is a program area allocation. So those are going to be implemented sooner or later with all the players, or without them. So it is in everybody's

interest to step up to the plate now.

Mr. McGrath - And we asked for a general simplification, but this remains there as a background document for the allocation of costs in an equitable manner among the players based upon the over-arching TMDL requirement.

Dr. Mumley - Correct.

Mr. McGrath - So I think that provides, in my mind, a mechanism, as Tom said very eloquently, "If you do not pay us now, then you have to pay us later."

Mr. Wolfe - And I think it is worth reiterating that many of the actions called for in C(11) C(12) are pilots that are going to inform actions that could or should be required in the future permit terms, so that it is to all Permittees' benefit to be involved now because that could be specifically required on many more permittees in future permit terms.

Vice Chair Young - All right, based on that discussion, I think it is very clear that it would be the intention of the Board and the staff to make sure that everyone is treated equitably and that the folks who are leading the pack get credit for doing so.

Mr. Wolfe - Right.

Vice Chair Young - All right, thank you. Are there any other questions from the Board?

Mr. Moore - Yeah, if I may, Dr. Young. Thank you for actually posing those specific questions, I think they really cut to the chase. And then, Dr. Mumley, in your presentation, as you all know, I have done my own sort of critical review of the Order itself, and I have some ideas and suggestions, but I am going to wait and hear public testimony before we get into those details. But one thing I would like to highlight is this issue of -- and let me just make the point that I think that staff did an excellent job of responding to the Board's direction in many areas, particularly in integrating sections, you know, the different provisions, (C)(3) versus (C)(11), C-12, C-2, all that. I think there might be a little more opportunity for that, but I want to recognize Dr. Mumley's point at the end about adapting the requirements based on information. Maybe we will see today if we can do a little of that in terms of unintended consequences, and the need perhaps to integrate a little more between what I see, particularly between the pilot project work you just discussed, and the low impact development requirements. Because I think they both progressed very -- on a pretty significant pace since May. And so I just want us to be thinking of that as we go through the hearing today.

Dr. Mumley - Let me just give you -- because I know what you are getting at, I think the statement I would

make is, like for trash particularly, and then for PCB's and Mercury, and for other pollutants of concern, low impact development measures are just one of the tools in the toolbox, and may not be the appropriate tool for those other things, and I think that is where I emphasize as being for the low impact development requirements are opportunistic for where we could be developing clean runoff areas; but where we have dirty areas, we are talking about retrofitting, the need to go in and do something about that, that that is a different issue that overlaps with low impact development, but we are not precluded from looking at the full suite of measures -- bio-treatment and the so-called vault measures which clearly need to be considered there, and I believe you are probably going to need a little dialogue on that issue after the testimony, but I just want to observe your point before people talk so they understand where you will be coming from. Thanks.

Mr. Moore - Thank you.

Vice Chair Young - All right, with that, thank you very much. That was a wonderful presentation. And what I would like to do is to take a quick break now. We will reconvene in 10 minutes and begin with the testimony.

(Off the record at 10:40 a.m.)

(Back on the record at 11:02 a.m.)

Vice Chair Young - All right. Thank you, all. It

is always a pleasure to see so many happy people in the audience. What I would like to do right now is similar to what we did in our last hearing, and that is to give you folks who are making comments the benefit of hearing from some of the Board members what their particular concerns might be, so that you would be able to address your comments to those concerns. And I would like us to be fairly surgical and comply with our own time limits in doing this, but I would like to go along with Board members and give you each an opportunity to lay out issues on which you would particularly like to hear comments. And since Mr. Moore already volunteered with his last comment, we will let him go first. Thank you.

Mr. Moore - Thank you, Dr. Young. And again, I re-echo Dr. Young's comments in the beginning in terms of just the issues with the Order, the importance of equity, and flexibility, and accountability, as we share responsibilities moving forward to improve water quality with urban runoff. After the May hearing, I put together a list of issues that I believe the Board gave direction on, and it was in consideration of all the comments received, as well, and I am happy to report that I believe those issues were addressed. And I would just say that the landmark decisions that we made related to low impact development as the first thing that will be considered in new development,

but the real landmark decision was in redevelopment. You know, we hear the term "Smart Growth," and transit oriented development and things like that, but it never made sense to me as a Board member, or a practitioner in the field, that Smart Growth would have stupid water. You know, we have to integrate our current understanding in terms of low impact development principals as we move forward, not only on the fringes of urban development, but in the core of urban development. And I think the order, by taking away that ill-thought out exemption, has given us a chance to chart the course in a cost-effective and reasonable way. And I think there might be one little thing which I will wrap up my comments with, that I want you to listen to carefully and comment on and reflect on as we move forward today. You know, the LID requirements need to be quantitative. We have set forth flow-based and technical manual based requirements. Trash measurement -- we took away what was kind of a good straw proposal for discussion, we took away this kind of an arbitrary endpoint, and now we are focused on load reductions and giving flexibility to municipalities to demonstrate that would re-emphasize Dr. Young's point that that will be a transparent exercise and it will need to be fact and quantitative science-based. They qualitative information on trash reductions that I have seen in my professional experience, there has been a lot of misleading

presentations on this matter that were not science-based. This needs to be based in scientific principles. I really appreciate the emphasis on trash management plans. There was a comment made at the March '08 hearing, reiterated in March '09, I think that municipalities do care about the issue more than ever now, and are focusing their efforts on where they can make the biggest difference in this issue -- thermal source control and treatment, ends of the spectrum. And so I have supported the trash management plan, that cities can individually undertake, or undertake on a watershed basis, together, or on a countywide basis. And I think the Tentative Order enables that.

On Stormwater pump stations, this is an area that, under the Basin Plan, meets the definition of a controllable water quality factor. This is a point of control where we can look at ways to better engineer and operate and maintain our infrastructure. And I think staff did a good job of cross integrating all the different matters that can seem intimidating if you list them all out, but if you actually look at it holistically, you can address many water quality issues at these choke points in operations.

Reporting -- like I said in May, I really want to defer to the Permittees in a lot of ways here in terms of what is most efficient, so that we can get your legs on the ground doing work, working with contractors, working with

businesses, residents, and not sitting behind a computer typing out endless reports. So I am trusting that there are enough templates out there to do all the reporting in this Order, it is intimidating to me when I look at it, but it can be made efficient, and so I am trusting that we have come to some meeting of the minds.

And then, finally, let me deliver my punch line, I think the only thing that I am concerned about is an unintended consequence that actually would limit the Permittees' flexibility in terms of implementing engineering solutions to do Stormwater treatment, and I would just say that, you know, again, prioritization of LID practices and natural treatment systems for Stormwater treatment is evident in this Tentative Order, and it represents the direction of the Board, as I understand. It is really a more sustainable vision. But the menu of treatment systems for the abatement of particularly persistent bio-cumulative and toxic pollutants in urban runoff needs to include things below the ground, you know, engineered systems may be appropriate. And my reading of the order really makes it a two-step process for a newer redevelopment project to be able to implement below-ground, vault-based treatment methods. You know, I think the same kind of option that is afforded for bio-treatment in the Tentative Order should be expanded, just a very surgical change that I would propose

to the Order, to expand to "comparably effective treatment systems." And so bio-treatment systems or "comparably effective treatment systems." I am a Civil Engineer, I studied biological treatment, physical and chemical treatment, and there are instances -- and I am also a practicing Civil, and I open up streets, try to figure out how to have water flow according to gravity and not have to use pumps and burn electricity and fossil fuels, and sometimes gravity is working against you in a redevelopment zone where you are down in the flats and you are trying to avoid using energy to move water. There may be instances where we can do engineering that might not meet the strict definition of LID, and I do not see a clear path to that implementation in the Tentative Order --

Vice Chair Young - All right, Mr. Moore, I just want to make sure everyone is clear on this, we did have a lot of discussion in the last two hearings and in the written comments about what sorts of alternatives would be available for LID systems, both within the LID system and as alternative compliance mechanisms, and I understand that you have a concern that, in the latest revision, we may have unintentionally eliminated what might be a good option for compliance. So if you could direct us all to the extent section and line where you want to make an insertion, and then read the insertion, we will all follow. I guess we

cannot put it up -- it will take us a long time to put it up on the Board, so let's just pretend that we do not have that technology for a moment. So what section are we talking about here?

Mr. Moore - We are in Section (C)(3)(c). And that is page -- okay, page 29 -- no --

Vice Chair Young - Section (C)(3)(c) on Low Impact Development, which in redline strike-out version starts on page 10 of (C)(3), and in the Tentative Order, it starts on page 25.

Mr. Wolfe - It starts on page 25. And then which subsection?

Mr. Moore - C3CI2 -- Bii, on page 26.

Ms. Dickey - Through the Chair, if Mr. Moore could clarify how that subsection would read with his change, it would be, I think, helpful for everyone.

Mr. Moore - It currently reads -- this is basically down the flowchart when you cannot do LID measures, this is how you can justify a bio-treatment measure: "A properly engineering and maintained bio-treatment system may be considered only if it is infeasible to implement harvesting and re-use infiltration or evapotranspiration at a project site." I would propose to expand this with five words, to insert after bio-treatment system "or comparably effective treatment system." At issue

here is just that we do not know what technologies will be shown to be effective through standardized procedures, protocols that multiple states have weighed in on in terms of defining the technical performance of Stormwater best management practices.

Vice Chair Young - All right, so I am going to read the new section to everyone, it is in C3cI2Bii. Did I get that right?

Mr. Moore - You got it.

Vice Chair Young - And it would now read, "A properly engineered and maintained bio-treatment system, or comparably effective treatment system may be considered only if it is infeasible to implement harvesting and reuse, infiltration, or evapotranspiration at a project site." And to reiterate, the purpose of this is to allow promising alternatives, and Board member Moore feels that we unintentionally took that option away. So this change might be considered just as we are considering some of the clarifications in the supplemental, but I wanted to make sure that everyone in the audience was clear on the proposed change and would have time to digest it and think about it, and also to comment on it. All right, and that concludes your comments, Mr. Moore?

Mr. Moore - Yes, thank you.

Vice Chair Young - Mr. McGrath, do you have areas

in which you would particularly like folks to focus?

Mr. McGrath - Not in any particular -- what I would appreciate, and I think we just modeled it, is if someone has a concern, I would like them to be very specific about what section it is, and very specific about the concern you have and the change that you would like to see, so those three things, focus exactly on where you have a concern in the proposed order, what the policy concern is, and what you would like to see changed.

Vice Chair Young - Dr. Singh, do you have comments at this time?

Dr. Singh - I would like to make some comment here because -- you cannot hear me? Okay, I will speak up. This is a very comprehensive document and it touches everything and everybody. If you really fully implement it, although it is probably easier to implement on new development, or redevelopment, on late projects, but ultimately it is going to touch every household. Any drainage from your roof, any drainage from your sidewalks, or cleaning of your cars, or doing anything on patios, parking areas, if you really implement this on a very comprehensive basis, the whole system. And many -- you have touched every chemical site conceived, every water Stormwater origin, any source, very comprehensive, if it is really implemented on a very wide scale, I do not know how the city can monitor, and

especially the older one. The lead -- and I think it is easy to implement, they can design the sidewalk and the roofs so the water will be drained to the landscaping area, the water will go. Any kind of residue from the car or petroleum products or anything that is not allowed to go in the gutters, storm drains, but I think if you really enforced on cities, I do not know how the city will implement it on such a comprehensive level, it will be very costly to implement this effort. I think that maybe we should also propose some kind of a -- I was telling Bruce Wolfe, our Chief over here, Chief Officer, that they should have a tax incentive for the homeowners so they can modify their sidewalks and old buildings, so that we can in all our drainage ways give some kind of tax incentives so we can spend some money and modify. Why only for lead when I am thinking about everybody, to really implement it, so that there is a cost to it, not only cost to the city because, in these economic times, this is very comprehensive, and I think the staff has done a fantastic job, and if you can really implement it, I think you really will have clean water, there is no doubt in my mind the water will be clean, the quality will certainly improve to what degree, but I think there is an implementation problem, how we are going to implement this whole thing, and what is the cost of it. Now, the Stimulus Package is not going to do the job. So I

was wondering, maybe I would like staff to make some comment on my concern, where we are going to stop and how far is it going to be carried forth, and how much every individual is responsible and how much the city is responsible, what are the different duties, what the county and different agency and how they are going to implement these different agencies, the municipalities, and how we are going to enforce this. Also, there are certain provisions, for example, and there are exceptions, and that you want Board approval for lead exceptions, something like happens, in that case you want every plot, every development, to come in front of the Board if there is an exception, and the Board has to make a ruling on that, that is a time consuming process. And it can hold up the development of a plan, and there is a cost to it any time you delay a project. So I would like to make it practical, enforcement, this is a very nice goal, it is a very comprehensive document, it will achieve, oh, high class water quality end result, if it is really truly implemented, it covers everything and anything I can think of. You have really not left -- maybe something left because I would have to re-read the whole document and it will take me one week to read this whole document and I have only got two days before, and one document we got yesterday. So I did the best I could, and I -- well, I am sorry, this is my comment, okay, because you might have read

it before, went to the website, I did not go to the website, I was busy, I was out of town, I came back, and then all of a sudden this document and all of these things, see, lying down here, and I tried to digest it yesterday, and I got some help from my friend, Bruce Wolfe, over here. Yesterday I asked him some questions on the form. But it is a very comprehensive document and I was worried about implementation aspect of it, on the cost of it, and cost to individual homeowners, cost to the cities, cost to the -- ultimately, we have to pay for it. So I think, although he has given a timeframe which goes to 2022, final implementation, time is -- a very liberal amount of time is given here, but in bad economic times, the implementation starts right now, and we are in bad economic times. So I am raising these questions not because I am opposing this document, I am raising these questions so that many city representatives, county representatives that are here with the same concerns, and I am asking staff to clarify that point, it is a very important point to me.

Vice Chair Young - Do you want to comment now, or would you like to comment later in the wrap-ups?

Mr. Wolfe - Just a couple comments, but we will comment a bit more after some of the other commenters. But two points, one, as Tom, during his presentation highlighted, we are trying to identify funding opportunities

and work with all the permittees on optimizing those funding opportunities, one of those included the recently signed State Bill 310, which would set up, or could set up, a mechanism where there would be a fee-based system back down to all parties in a jurisdiction that was implementing a watershed improvement plan, which would include implementing the Stormwater permit, so there already has been some legislative thinking on this recognition that it is a challenge, and that all parties need to be putting in, that we cannot rely only on certain government agencies, or certain companies, it would have to be the public, too. The other aspect I will mention now is something we really have not touched on in the presentation, is that there is a component of this permit for public outreach, and it is something that the programs have engaged earlier during the Executive Officer's Report. I highlighted what the Contra Costa Program was initiating on its Littered Travels Program, and that is just one of many elements, and it is an ongoing effort that we need to be pushing to raise the understanding of the public that, at each place of business, where they live, etc., there are things they can and should be doing to protect and improve water quality. So that is an ongoing process that is in the permit, that is something we expect reports back, and we do want to highlight those successes and make them more readily available throughout

the region. So that, I think, is going to be the challenge as we implement this because we are optimistic we can get this adopted today so that we can really move to that implementation phase and work on the implementation challenges, rather than on the wording challenges.

Vice Chair Young - All right, and I am sure we will hear more comments from the speakers on these issues. Mr. Peacock, would you like to raise any concerns?

Mr. Peacock - I just have two very short comments, 1) I mean, we are really talking about a huge number of unfunded mandates here. And we talk about $5 million worth of Stimulus, well, this Stimulus Bill is going to run out if it ever gets spent, it is not getting spent as much as it should be, probably, in the State of California, where this Board and this particular Regional Board is leading the way. That said, any time you have a tax credit or a tax exemption, and my good friend, and I support him in his comment, Dr. Singh, that is a tax expenditure. That is still money that has to come from somewhere, it is not something that comes out of thin air, and all of a sudden it is there and you do not pay taxes on the cost of re-doing your driveway. So all of this has to be brought to bear. And I would like also to echo and support and even enhance if we can the comments that Bruce just made about public support. Without the public supporting this, nothing is

going to happen because the cities are going to be able to say, and just as I heard from my good friend, Mr. Eliahu, who talked about one of the City Managers talked to him and said, "Well, if I have to do all this, I have to shut down my hospital, and I am going to shut down my hospital after I stop doing this." So we have just got to be aware that the need for public support -- and I would like to see some of our little Treasury that we have from some of the fines we have levied go to some of these municipalities to help gain their public support, or public awareness of what we are really trying to accomplish here, because it sounds pretty technical if you read all this, which none of us has, maybe except for Mr. McGrath, it is really very technical, and we need to get the public behind this in order to accomplish the mission, which I totally support. So that is all I have to say.

Ms. Dickey - Through the chair?

Vice Chair Young - Yes, sorry.

Ms. Dickey - I would like to just jump in on one thing.

Vice Chair Young - Please.

Ms. Dickey - Mr. Peacock, in his comments, used a term that is -- has a legal meaning, I do not know whether he intended it to have that legal meaning or not, the phrase that he used is "unfunded mandate," and "unfunded mandate"

is something that has a specific meaning in terms of the State's Constitution, it is very complex whether or not something is an "unfunded mandate." It relates to whether or not the requirement that is being imposed on a local agency is in fact required under federal law, if it is, it is not an unfunded mandate because it is the Feds that are requiring it. Whether or not the local agency has the ability to raise revenues to pay for it through service charges, taxes, fees, that sort of thing, then it is not an unfunded mandate. Having said all that, I am simplifying this tremendously. There is another State agency that, in fact, determines administratively whether things are "unfunded mandates," that a state agency has been considering two Stormwater permits adopted by other regional boards, it has reached a determination with respect to one, and it is pending with respect to the other regional boards, and I think it would be -- I am not sure whether Mr. Peacock meant to reach the legal conclusion that this permit would impose a Constitutionally prohibited unfunded mandates, or whether he was speaking to the issue that this permit would require mandatory actions, for which funding has not yet been identified. But I felt that I needed to jump in on that.

Vice Chair Young - All right, well, thank you. That is why we have cracker jack lawyers on our team here.

Mr. Peacock, would you like to take the opportunity to clarify that what you, I assume, were talking about was potential new costs for which it is not clear that the budgets have already, you know, provided --

Mr. Peacock - Madam Vice Chair, your assumption is correct. I did not intend to inject a Constitutional issue into the Board determination here. However, I am aware of that and these other cases that you just referred to, or I guess they are administrative determinations, do have an impact on what we are doing here, and I think it is something that we need to all be aware of.

Vice Chair Young - All right.

Ms. Dickey - If I could just comment. Various parties did raise the unfunded mandate issue in the first round of public comments. We have taken a look at the requirements here. We believe they are all required under federal law, but, as I said, those issues are things that that other entity will be deciding.

Vice Chair Young - All right, thank you. Mr. Eliahu?

Mr. Eliahu - Yes, this is a very comprehensive document in here. There is tremendous work put in here, tremendous effort by the staff. I do not know how we pay them, maybe you pay them by furlough, that would be something. And, you know, it is time to start doing

something about this trash. I think this is a start, of course, we can learn as we go, and I would support that Order, unless I am very really concerned about how it is going to be funded. The cities and the counties, they do not have the money, they do not have the funds. And that is a big problem and big concern to me.

Vice Chair Young - All right, for my part, I will admit that I did read the whole package, and not only that, I carried it to Boston and back on the airplane, had lots of times to focus because we had very strong headwinds on the way back, it took seven hours, and I got through the notebooks. What I read was, I thought, a very good response from staff to the concerns of not only the Board, but all of the folks who have put in so much time to make comments. This version is far less proscriptive with respect to particular procedures that we are requiring. We are going much more towards a performance-based system, with quantitative measurements and that, to me, is a way to maximize the cost-effectiveness of the efforts to reduce pollution. We are allowing a lot of flexibility to the Permittees as to what mechanisms they choose to reduce the pollutants that we are going after here, yet we, I think, have set up a scheme whereby we are making people accountable for results. In my experience, that is always the most cost-effective way to do what you have to do, and

in my mind, we are doing what we have to do in terms of protecting water quality here. My one remaining concern is that I want to make sure that, in the implementation of this, that we are fair to all parties because we do, as we discussed earlier, have a number of provisions where we are asking Permittees as a group to accomplish something. And if there is something in this Order that would preclude us from treating all of the Permittees equitably, then I would like to hear comments about that.

All right, we have a few minutes before lunch. What we would like to do today is to take comments specifically on the changes that have been proposed in this Order, changes from the February version and from the version that we looked into at the May hearing, so we would ask you to be very targeted about your comments and go directly to those changes. In addition, the staff directed your attention to the changes that are proposed in the supplemental, and we want to make sure that everyone has had a chance to see that, to look at it. We had one additional change just now, suggested by one of the Board members. So I want to make very very sure that everyone has time to digest that. If I call you up to come up and to provide your comments, and you do not feel like you are quite ready yet, and you have not had a chance to get through the full supplemental, just let us know, we will put you a little bit

further back and try to provide all the time that you need to do that. We do not want to rush anybody here. We have taken a very long time and everyone has worked on this very hard, so we want to make sure that you have the opportunity to comment today. In that vein, we have set the time clock for five minutes this time. I will admit that I did that before about half of the cards kind of streamed in at the last moment, so we would really appreciate if you would just go three, just our norm, but again we are trying to sort of bend over backwards to give everybody the opportunity to say what they need to say. I will say that I have, in some cases, two cards from one entity. I am going to lump the cards together and ask that the two of you do your comments within five minutes; similarly, there are a couple of examples where we have one person coming up wearing two hats, if you are wearing two hats, each hat gets two and a half minutes, and I think you will be able to figure that out. So with that, I would like to start asking the folks to come up and we will see how this new clock works. It is over there. In theory, I am supposed to be able to see it, but I cannot, but the staff will be motioning to us -- there we go, now I can see it, thank you. So the speakers can see it, the staff can see it, all the Board members can see it, we encourage you to make us happy by only going three minutes, instead of five. Let's start with Geoff Brosseau

from BASMAA.

Mr. Brosseau - Vice Chair Young, I am not sure I am going to make you happy, I will try and shoot for the five minutes, so I timed it at six, but I will do my best. Good morning, Vice Chair Young and Board members. My name is Geoff Brosseau. I am the Executive Director for the Bay Area Stormwater Management Agencies Association, otherwise affectionately known as BASMAA. Thank you for the opportunity to speak to you this morning about the final Tentative Order before you. I think you know that BASMAA is focused on regional challenges and opportunities to improving the quality of Stormwater that flows to our local creeks, the San Francisco Bay, and Delta, and the ocean. We are a consortium of the eight Stormwater programs in the San Francisco Bay Area representing 96 agencies now, including the 76 agencies that will be regulated under this new permit. I think it is important to recognize at this honest occasion what kind of permit we are talking about. It really is groundbreaking in a number of ways, which is, from our perspective, a good thing. It collapses six permits into one, as Tom has talked about this morning, which we believe will significantly reduce the transactional costs of Stormwater permitting in the San Francisco Bay Area, saving local governments money, as well as your agency money, and that is a good thing. It also will align compliance

schedules that are currently up to four years out of phase because of the multiple permits we have had to date, and that will allow us to promote regionalism, which is the core purpose of BASMAA. BASMAA was actually started 20 years ago this year, in 1989, with the sole purpose of really getting the cities and counties to work together collectively on issues. And to your concern earlier, Vice Chair Young, about will the agencies work together or not, I think I can say with some confidence that we will because we actually worked together for 20 years without being told to work together, and we actually worked together when our schedules were out of whack with each other, and we still managed to work together. It is sometimes hurting cats, but at the same time we do herd them and we go off in the same directions, we all are coming from the same point of view. So I am confident that we will be able to do our job on that end of things. Just two general comments I would like to make, and also maybe just to provide you with some context for the comments you may hear from other -- from the Permittees themselves. I want to talk constructively about resources. The permit does push the envelope in a number of areas, as has been recognized, particularly trash monitoring, TMDL implementation, and pollutants of concern. This does create, as has been recognized by you and your staff, a significant funding challenge for local government

agencies when there really is no new money, in fact, there is actually less money because property taxes are dropping, not increasing. We know that you understand this and we appreciate the fact that you understand this. We just ask you to remain sensitive to this reality that we are facing currently. We want to thank the San Francisco Estuary Partnership for applying for and winning the $5 million worth of ERRA, or Economic Stimulus funding, that will install trash capture devices and municipal storm drains around the Bay Area. That is a small, relatively speak, small but important down payment on the tens of millions of dollars that we believe are going to be necessary for that effort, so we very much appreciate that. Also, in response to -- you should know that Tom alluded to that this morning in response to the open competition for another $5 million in federal funding through the San Francisco Bay Area Water Quality Improvement Fund, we have submitted two proposals. We are actually competing with ourselves for money of our own, one for trash capture that would build on the work from the ARRA funding for SFEP, and also another one on reducing pollutants like PCBs and Mercury in the Bay, and we will know the results of that decision fairly soon, by the end of the month. As we implement this new permit, therefore, we ask that you not only remain sensitive to our significant funding challenges, but also that you continue to help us

locate and secure federal and state funding. And my last general comment is in the area of new development, the C3 provisions, LID. We have some specific concerns there, which I think you will hear, but the key, I think, doubting principal for us is that the Bay Area has been a leader in this. You recognized that last time in our hearing. We have been the statewide and national leader in terms of the low impact development, in fact, we started doing Start at the Source, which was what we used to call that kind of work before it became called LID in the current decade, we started that in 1995, we have put out numerous guidance documents, won awards for our efforts, and people have borrowed our information and our technologies and our resources across the country. We also have included, of course, how to do modification management in our permits here in the Bay Area since starting in 2001, so we are all over hydro-modification, "LID" as it is now called, and generally focusing on low impact development. You recognize these facts, as I said, in your meeting in May, and stated that any new requirements should not penalize our proactiveness -- for gosh sakes, let's not do that -- or send our programs "sideways." Please recognize that when we raise concerns about our LID requirements, we are coming from a point of view of experienced practitioners. That is intimidating --

Vice Chair Young - I guess we have a new timer.

Mr. Brosseau - I did not get shocked, thank you.

Vice Chair Young - We will give you a sentence to wrap up here.

Mr. Brosseau - As I say, when you hear our comments, please take them as comments coming from experienced practitioners in the field, people who are actually implementing LID in the Bay Area. These are not primary requirements that we have somehow negotiated without any real sense of what makes sense, what does not make sense, they are not theoretical from our point of view. We are different in the Bay Area because we have been leading on this issue, and we really should be basing our decision based on experience, not on some theoretical idea of what might work, based on Southern California. So thank you for that. Thank you for the opportunity to comment.

Vice Chair Young - Thank you, Mr. Brosseau. Do any of the Board members have questions? All right, thank you very much. Next, we will have Richard Napier and then, on deck, Curtis Kruger. And I would remind you of the request that Mr. McGrath made, that if you have specific concerns, you can maybe direct us to the particular section. Thank you. Mr. Napier.

Mr. Napier - Good morning. My name is Richard Napier and I am Executive Director of the City and County

Association of Governments of San Mateo County, and I represent the Countywide Permittee and the 21 Co-Permittees. Our address is 555 County Center, 5th Floor, Redwood City, California. I just wanted to make a couple quick comments relative to San Mateo County Water Pollution Program, it is really committed to impact development, and I just wanted to give you just a couple of examples since the meeting last May, some of the things that we have been able to do. As I mentioned in May, we were able to get a motor vehicle fee, half of which goes to dealing with our Stormwater issues. We used that local fee to create a San Mateo County Sustainable Green Streets and Parking Lots Design Guidebook, which we completed earlier this year, and I might say our Board was extremely excited about that program. They were even more excited at the last Board meeting when I was able to present to them that they won the Innovation and Green Community Planning Award from the Northern Section of the American Planning Association in California Chapter. And we also won an award for that same guidebook from the State of California. I also wanted to mention that we completed one project and there is one project underway. The City of San Bruno completed their green streets project, and I imagine it was getting used very well yesterday and probably today, also. And Daly City is nearing completion of their green parking lot demonstration program. As Mr. Brosseau

mentioned, you know, the Bay Area has been a leader, and I think this certainly shows an example of where we have been trying to lead in low impact development, not waiting for any requirements or regulations, because it is the right thing to do. And I think in a lot of cases, some cases, less regulation is better than more, and certainly I would ask that you do not add to the LID permit language your staff has proposed, with the exception of Mr. Moore's change; I think that adds some flexibility with the intent, so I want to compliment him on that suggestion. Just one last point I want to mention, and you have heard this from me every time I have come up here, and it is about the money. And I guess what I am asking is for this Board, to the extent you can, look for opportunities to help us go after money. We have, for several years, sponsored legislation for exemptions to Prop. 218 for Stormwater programs, and we could not get anywhere. We finally succeeded in getting our motor vehicle fee adopted. Two thirds is almost impossible to achieve in good times, in bad times you just are not going to get there. So it is going to be very expensive to implement these programs, certainly the counties and the cities will work with you, but we really will need your help as we try to find ways to fund these programs. So with that, I appreciate your consideration of those two requests, and I would be glad to

respond to any questions that you might have.

Vice Chair Young - All right. The benefit of not running out your five minutes is that you do not get dinged. Were there any questions for Mr. Napier? No. Thank you so much. All right, now we have Curtis Kruger, and then we will have Alexis Strauss on deck.

Mr. Kruger - Good morning. My name is Curtis Kruger, I am with Contech, a manufacturer of construction equipment. And I live in Novato, California. I would like to first say I am thrilled to be speaking here before lunch. The last time it was 6:00 and I was the last speaker, so I am a little bit more energetic now.

Vice Chair Young - I kind of remember that.

Mr. Kruger - I would like to acknowledge Dr. Young and the rest of the Board for all the hard work they have put in on this, and also the Water Board staff, some of you I have met with over the past three years, it has been a long arduous path to get where you are today, and I think by and large the document that has been proposed is an excellent one. I think it will go a long way toward meeting the goals you are looking at. Responding to Mr. McGrath's request to focus, I would like to go to the Section C3 on Stormwater Treatment. There are three approaches that are identified; clearly, the first and what everyone is expected to do is infiltration, I fully agree with that, that is the

best approach -- everything I have read, everything I have experienced points in that direction. Where that does not work is an alternative, you are next directed to LID, incorporating bio-treatment. Again, that is an excellent choice; the problem I have, and Mr. Moore's suggested revision may deal with it, is that you then jump, as it is written now, to off-site mitigation. And I want to suggest to you that that is too restrictive. And let me give you a couple of expected results if it stays the way it is written. The first is that, as written, it excludes whatever science and technology may produce over the next five years, 10 years, however long this permit is going to be in effect. Right now, the industry is focusing on heavy metals, bacteria, pesticides. Whatever developments come about that may attack these pollutants would be forbidden under the current permit language, or the proposed permit language. I ask you to consider where the industry was 10 years ago. Ten years ago, 1999, if the type of proscriptive language you are looking at today was enforced 10 years ago, none of the hundreds of LID installations we currently have would be in existence, there would be no bound, and the Bay Area would be known as a lagging area, rather than one of the nation's leaders in Stormwater treatment. So do not tie the hands of science and technology. The second has to do with the highly urbanized or redevelopment, but using words

that more people can associate with. We are talking about city centers. The practically speaking, because the infiltration and so forth probably will not work in the city centers, you are talking about no treatment. It would simply go to off-site mitigation. So we are talking about not just Oakland, San Jose, but the smaller cities, every city that has a downtown, every highly developed area that is looking at redevelopment, or Smart Growth, or transit communities, would be affected by this. Those areas would effectively have no treatment. Mr. Peacock mentioned garnering public support. How will the citizens of Walnut Creek feel, knowing that their mitigation fees for a new shopping area, or some other development in downtown do not do anything about the pollution in the creek that runs through the heart of their city, but rather goes to treat -- create some off-site mitigation somewhere outside their area? They are not going to like it at all. So the hearts of our cities are where most of the urbanized pollution, most of the man-made pollution comes from, and there are effective ways to treat that, but this language, again, prior to Mr. Moore's suggestion, would simply eliminate all treatment in those areas. So please do not do that. Again, one of the components of LID, if you look at the various tenets of LID, one of the major components says "treat at the source." So if you are going to follow LID, which is a

development design practice, do not ignore the "treat at the source" by simply saying it is too difficult to put in a vegetative solution, so we will go somewhere else. Look at whether there are technologically equivalent systems that work just as well, and allow the use of those as an alternative. Thank you.

Vice Chair Young - All right, do we have questions. Yes.

Mr. McGrath - Mr. Kruger, your testimony was really excellent. You focused and I would like to ask you a little bit on the redevelopment project. From my perspective, if in the urban center where I have already suffered the hydrological modification, and there are social benefits like a more compact urban form, more amenable to walking, I am kind of conceptually ready to make the decision that retrofitting in that area is, as a general rule, not feasible, and that there are other social benefits of compacting growth, so that is the kind of weighing that I think we have been making. What specifically do you think we should add perhaps -- you know, I would like to see more streams out of channels if feasible, but I recognize that feasibility restriction. What specifically do you have in mind that we should consider here?

Mr. Kruger - In the highly urbanized areas, the downtowns --

Mr. McGrath - The city centers.

Mr. Kruger - -- the largest impervious areas are typically roofs, and second might be sidewalks, and so forth. For roofs, there are manufactured systems that will remove pollutants to the maximum extent practicable from the roof leaders before it gets down to where it may be injected directly into the creeks or in Lake Merritt, or in the rivers in San Jose. As far as the sidewalks and things of that sort, infiltration is the first choice. You have got porous pavers out in front of this building, excellent, but the soils do not always allow that, so where that is not possible, then you can use the same sort of in-ground systems to remove the pollutants before it leaves the site. Do not wait until it goes five miles away.

Mr. McGrath - Okay, thank you. That was very helpful.

Vice Chair Young - Are there other questions for Mr. Kruger? No. Thank you very much. All right, Alexis Strauss is up and then, after that, we will have Dan Cloak.

Ms. Strauss - Good morning, Board members. I am Alexis Strauss. I am with the U.S. Environmental Protection Agency, 75 Hawthorne Street in San Francisco. We have been working closely with the Boards across California as they embark on renewing their MS4 Stormwater permits this year, so we have an excellent body of reference, and our comments

are so informed. We definitely appreciate what a magnificent job the Board staff and managers, and the co-permittees have made in this effort here today being considered. We had provided input to this permit, not only based on our experience with permit writers and stakeholders across the state working on MS4's, but also our consultations with your staff on Bay Area specific issues, and the lessons that we have learned in auditing MS4 performance across the Western States. Clearly, many positive changes have been made since the February draft. We had provided comments in April that included requests from many substantive changes. We feel that your staff worked very hard to make these improvements and, in large part, we agree with the revisions that had been made. There are just three points I wish to raise for your consideration. C11, the revised language for Mercury controls is of concern to me in its lack of enforceability and in how I feel it is inconsistent with how TMDL waste load allocations are being implemented into permits on a statewide basis. Specifically, on page 88 of the October 14th draft, which has Mercury Controls at the top, the language in blue, we had understood yesterday, was to say the allocation is to be achieved. In looking at it this morning, it says the allocation should be achieved. It does so twice. I think it is very important, as we get better at

implementing TMDLs through permitting, it is important that this language be clear and enforceable about whether or not that waste load allocation is or is not being implemented through permits. So "should be," in our recommendation to you as Board members, should be "is to be achieved." It says so twice. I leave that to your own deliberations. Secondly, as others may also do, there are a couple of provisions for new and redevelopment that we think are inconsistent with and less vigorous than what is being done elsewhere in California, and I wanted to ensure you are aware of our perspectives, we have simply professional differences with how the current version is done, but nonetheless, support the overall effort being put forward. First, under the proposed permit, it is not presently necessary to demonstrate that LID is infeasible at the project site prior to using the off-site alternative compliance provision. One of the fundamental advantages of LID is to serve as a preventative measure to address storm or runoff at its source, as a number of speakers have already commented, or as near to that source as is feasible. When this is achieved, the Stormwater does not entrain the pollutants, which are presently impairing our waters. We recognize some individual project sites could pose constraints which make the implementation of LID physically infeasible, as Tom had cited. Where these constraints

exist, we support the concept of alternative compliance at an off-site location, however, this proposed permit does not require this initial step of determining the on-site infeasibility of LID prior to allowing alternative compliance off-site. While the Board staff have crafted, I think, a very thoughtful approach for setting expectations for off-site projects, we believe it would be preferable to require that off-site runoff be addressed on-site where feasible, as has been done in the other regional boards across the state, and we provided suggested revisions to address this. I think the problem is compounded by the fact that the permit does not require the use of traditional control BMPs for the storm volume that is not addressed by LID; this is a notable departure from what has been done in the other regional boards, as these MS4's have been re-issued this year in Boards 1, 4, 8 and 9. Secondly, the other point on new development/redevelopment, these provisions that require the use of techniques for on-site retention, infiltration, harvesting, evapotranspiration, are given preference over the use of filtration systems, which direct flows into the storm sewer via under-drains. Under-drains is an issue for us, as you can appreciate, I think we must be careful as we focus together on sanitary sewer overflows and the like, that we not inadvertently simply shift the burden from sites into the sewage collection

systems as the next meeting we undertake to deal with sewage collection systems. I do not think the permit spells out a clear process for how determination should be made on the feasibility of on-site retention. The permit presently requires the permittees to submit criteria, evaluating the feasibility of on-site retention. We suggested language that would clarify that permittees must base their conclusions on the necessity for an under-drain system on approved criteria, things that you could set out in advance that they could simply self-certify. But, to take a step back, apart from those three points that I raised to you -- oh, close your ears, close your ears -- we believe this permit takes many meaningful steps forward in reducing the impacts of urban Stormwater flow in the Bay Area, and although we believe the permit could be improved by these three modifications, we very much support your adoption of the permit today. Thank you.

Vice Chair Young - Thank you. Are there questions?

Mr. Moore - Ms. Strauss, thank you for the comments and the support, and the constructive criticism, and the specific suggestions that we should take into consideration. And, you know, forgive me, I have gone through it a few times and sometimes we read -- two people read it a little differently. I see a hierarchy established

in C3C. And is it -- are we at a point where we have to say something like, "Subsequent to a determination of infeasibility of this preceding section, a required project would go such and such?" I feel that the spirit of your comment is met in the letter of the permit, but we are getting to a very fine point, you know, in terms of, "if not this, then that," and justify it.

Ms. Strauss - Given the volume of commenters that remain, I do not want to take time on this point, I just think that, if a given jurisdiction implementing the permit, one of the co-permittees, determines that on-site is not feasible, I do not want to create by our comments a workload for staff to bring matters back to you, that is not what we intend at all; we just believe that there should be a very clear progression that is these criteria exist for on-site, that if they cannot be met, that the co-permittees, who are co-regulators with us, are they not, have a very clear process for saying why these cannot be met, even if it is in a self-certification. We are not interested in creating more workload for staff, managers, or you, in bringing these individual instances back to you. We are just interested in understanding what those criteria are, what is the process for a co-permittee, a land use entity, deciding that this cannot be done, and therefore we default to off-site. I think it happens, but it could just happen without anybody

scrutinizing it, or understanding what that is, and I do not mean to get to the minutia. On the other hand, I think Tom and Bruce have some very clear counterpoints to this that you may want to hear from.

Mr. Moore - Thank you.

Vice Chair Young - All right, thank you very much. We have now Dan Cloak, and on deck we will have Michael Ambrose.

Mr. Cloak - My name is Dan Cloak. I am a consultant to the Contra Costa Clean Water Program, as well as to other Bay Area municipalities. I also do work in Regions 3 and 9, mostly on hydro-modification issues and LID, and I assisted the Ocean Protection Council to develop their resolution on LID. If I can just find the -- there we go. So last May, I identified that there were three separate requirements in the permit related to new development, one for Stormwater treatment which requires us to size facilities, to treat Stormwater, we are also dealing with hydrograph modification management, and now we are adding specifications for low impact development. We have no added in this latest version a fourth one for harvesting and reuse, these are still relatively uncoordinated, and what I want to ask for is some flexibility in approach. With regard to the previous two speakers, though, I really want to clarify some points about bio-retention and the way

that it is being implemented in the Bay Area. In our last annual report, the Contra Costa Clean Water Program submitted a list of over 200 LID projects currently active in Contra Costa County, alone. Almost all of them use bio-retention as a means of achieving LID, Stormwater treatment, hydrograph modification management, and, in effect, harvesting and reuse. Practically none of them required going off-site. It is possible to implement this on nearly all development sites, I really do not think that is much of an issue. Practically none of them required consideration of any vault-based systems. And it is certainly possible to use bio-retention; we are implementing it and, as I will illustrate to you now, in this method, and I would ask actually that you not impose on us the requirement to consider a less effective vault-based system because, by doing so, you would burden municipal staff with having to define whether you have equivalent -- what was the phrase -- it was Steve, Mr. Moore proposed -- was "equivalent treatment," requiring municipal staff to do that would be really burdensome and, as it turns out, unnecessary. Bio-retention, the effectiveness of these facilities, I think, is pretty much unquestioned. They do detain and retain Stormwater on-site they filter it through a layer of compost and sand, it drips into a gravel layer and infiltrates to the extent that is possible in the clay soils which are

typical of our region. The plant roots and leaves process pollutants and also evapotranspire some of the runoff into the air, again, to the extent that it is possible given our climate. Now, we do have under-drains in these systems, they operate only during large storms when it is really necessary to drain the facility, so a follow-up storm, for instance, if we got another one tonight, would then also process -- have its pollutants processed, rather than simply overflowing an already full facility. Member McGrath, I think you were in El Cerrito on Friday, you saw the El Cerrito City Hall LID systems, they were built to this standard, except because there was nothing to connect the under-drain to, and these connect only to storm drains, never to sewer, they were not able to include the under-drains in that system. However, I have looked at them and they are not overflowing. If they were included, they would really have had no effect, all of that runoff that was collected from yesterday's storm, in fact, went into the ground and will seep its way over to our creeks. So this system of using bio-retention as a way of implementing LID mimics our natural hydrology. Rain from small storms soaks into the ground, larger storms actually produce some runoff, and this preserves our watershed functions. This is the natural way that various Bay Area streams operate, it is that when you get a larger storm, the clay soils do runoff

and this is the particular ecological condition that the species in our region have evolved to live in, and so we want to keep that. So the new Water Board policy, as it is in the permit now, basically says bio-treatment is not allowed unless harvesting, reuse, infiltration, and evapotranspiration are infeasible; we are a little confused by that because we think what we are doing is harvesting, reuse, infiltration, and evapotranspiration. We have been asked to submit a report in 18 months. I would encourage you, rather than make any changes to the permit at this point, to wait for the results of that report and say, "Hey, we are going to solve some of these problems, deal with some of these questions, report back to you, and continue to develop this policy as we go along." So I ask for that and I ask for your encouragement in continuing to do what we are doing. Thank you.

Vice Chair Young - All right, thank you very much. Do we have questions?

Mr. Moore - So you are asking for no change? I mean, it was not clear what you are asking us to do other than support what you are already doing.

Mr. Cloak - Yeah, we are going to have this report out in 18 months. I would like to commend Dr. Mumley's wisdom in sort of kicking this down the road and doing some more work on it, rather than trying to push something on all

parties now. And I definitely think that is the way to go, rather than making a change either on the matter of allowing vaults, or on further restricting the use of bio-retention.

Mr. Moore - So, actually, I totally respect it from a technical standpoint that there are times when a vault is completely unnecessary. Are you suggesting that we keep the current language that restricts their consideration?

Mr. Cloak - At this point, you know, in Contra Costa County, we did an extensive study of this, to which I refer you, we found that there were a very very narrow set of conditions under which it might make sense to use an underground system. As it stands now, we would continue to implement our current policy and we continue to work out with Board staff as we were unable in all of our attempts to quite get to in time for this hearing, language which would provide a suitably restricted set of conditions where it might be necessary to use those types of facilities.

Ms. Dickey - Through the chair? I think it might be helpful for the speaker to identify exactly what wording that Board member Moore proposed causes him a concern. I understood the speaker to say that Board member Moore's proposal would mandate consideration of certain things, and I did not understand Board member Moore to offer language that mandated anything. So I think it would be good to make

sure that everybody is on the same page about this.

Vice Chair Young - All right, we are looking at C3CIBIii. Correct?

Mr. Cloak - I think that is it.

Vice Chair Young - And you are suggesting, as I understood it, that bio-treatment systems be able to be considered as an option even if the other approaches such as harvesting, reuse, infiltration, are available, that bio-treatment be one of the first tier options. If that what you were saying?

Mr. Cloak - Yeah. And I think the way to work this out is in the report, which is due in 18 months, and to make no changes at present. With regard to the comparably effective language that was -- the problem is that it would require municipalities for each project to get into an argument with the developer about whether what they were proposing is comparably effective. That is where we were before and the Contra Costa Clean Water Program did considerable work basically to get us out of that, so our municipal staff were not wasting time getting into arguments about whether vault-based treatment systems are comparably effective to bio-retention.

Mr. Moore - I am not persuaded.

Mr. Wolfe - In other words, I think he is making the tie between Steve's proposal in Bii would add language

and he is saying, under BI5, on the same page, where there is the requirement that the permittees submit the report on criterion procedures by May 1, 2011, that as part of our effort, then, to reach appropriate feasibility, infeasibility, criteria, that this be addressed at that point.

Mr. McGrath - Madam Chair?

Vice Chair Young - As a legal matter, is there any reason why a permittee cannot be more restrictive than what we have suggested here?

Ms. Dickey - Excuse me, I am not understanding the question. Are you asking whether or not the permit can be the floor and that the permittees can be expected to do something more than what we are requiring?

Vice Chair Young - No. What I am asking is, if Contra Costa County decides that it really does not like vault-based systems under any circumstances, can they exclude vault-based systems, even though we have mentioned them in the permit?

Mr. Moore - Yes.

Ms. Dickey - I guess it would go to its determination under the language here, what "comparably effective" is, and I would defer to one of the local government attorneys to speak to that question.

Vice Chair Young - All right, so we will just hold

that question in our thoughts, kindly. Mr. McGrath.

Mr. McGrath - Just a point of order, both to try to get through the hearing and try to understand people's perspectives, clearly we have identified the equivalence and the flexibility in LID treatment as an issue for discussion, but I would kind of like to get everybody's ideas out and make sure that we clarify them because exactly what Alexis said and perhaps what he said, and perhaps what Steve said, are all a little bit different, so I would like to get all the discussion out before we try to chew on -- and then get a staff reaction before we figure out whether or not we want to change the recommendation.

Vice Chair Young - Your point is well taken. All right, there are, I think, no other specific questions. Thank you very much. We will have Michael Ambrose and then David Lewis on deck, please.

Mr. Ambrose - Thank you again. My name is Mike Ambrose. I am with East Bay MUD in Oakland. We just had a couple of comments to make on the MRP. I think I will get to the specifics that the recent changes here made some changes that are of concern to us, one is that East Bay MUD, as a water utility, is no longer part of the permit. I think Dr. Mumley mentioned that earlier. And the other item is the change from .08 milligrams per liter to .05 milligrams per liter on the chlorine residual, we have

already addressed that, so I will not belabor that issue. But I will talk about East Bay Mud no longer being covered in the MRP. Non-permittee water purveyors such as East Bay MUD are no longer covered in the MRP and permittees are no longer required to oversee our planned/unplanned and emergency discharges from potable water storage and distribution systems. These types of discharges are necessary in order to provide safe drinking water for East Bay MUD's 1.3 million customers. Based on discussions with staff that we have had, East Bay MUD's understanding is that the Regional Board expects water utilities to manage our potable water discharges in accordance with the MRP requirement, still, even though we are not subject to the MRP, and that the Regional Board considers this to be an acceptable approach towards surface water protection. East Bay MUD and Regional Board staff have been discussing an individual permit for East Bay MUD's potable water discharges for some time and we are interesting in accelerating that process in developing an individual permit for our potable water discharges, and we are willing to commit resources to do that. Last week, we received confirmation that staff is interested in pursuing either individual or general permits for water utilities to govern potable water discharges that are not covered by any permits. Based on these considerations, East Bay MUD

requests the Regional Board's support in proceeding with an individual permit for East Bay MUD's potable water discharges. In addition, East Bay MUD requests that the Regional Board confirm that management of potable water discharges in accordance with the MRP requirements is an acceptable approach to surface water protection in the interim. And that is it.

Vice Chair Young - All right, do we have questions? That was very clear and concise. Thank you very much.

Mr. Ambrose - Okay.

Vice Chair Young - We appreciate it. All right, now we are going to hear from David Lewis.

Mr. Lewis - Good afternoon members of the Board, I am David Lewis, the Executive Director of Save The Bay, and on behalf of Save The Bay and our 25,000 members and supporters throughout the Bay Area, I am here to urge you to adopt the groundbreaking trash provisions in the Municipal Regional Permit for Stormwater, these are in Section C10, and as you know, we fought for a long time to get to this point. This is a big improvement from May. And we call these historic changes; that is a technical term for long overdue, that is how you become part of history, is by waiting for a long time. But I do want to say that the revised Order that is in front of you reflects the direction

that you Board members provided to the staff after extensive public input over the last several years, and especially at that May hearing, now requiring permittees to make, really, the first ever significant measurable reductions in trash flowing to the Bay through Stormwater. So you deserve recognition for that, you should pat yourselves on the back. I have watched a lot of Regional Board hearings and I have rarely seen as much direct involvement and direction from Board members to the staff, and I think that the staff will agree that their good work is because of your specific direction to them. We would not have these provisions without that. It is kind of astonishing that more has not been done to prevent trash pollution over the years, compared to the extensive efforts on other pollutants. Trash has not been taken seriously enough by the public, or by the permittees, or, frankly, by your predecessors on this Board. But intense public interest and involvement and years of sustained advocacy have finally produced this permit approach that can begin to reduce Bay trash in the way that the staff described. As you adopt this permit today, which I hope you will, it is appropriate to look ahead and I want to underscore that you will also need to focus on compliance and enforcement, as will the staff. The Board really has to work to underscore to permittees through their reporting and other accountability in enforcement

measures that they have to, in fact, reach the mandated goals that are in the permit. Despite the years of delay and prior resistance to mandating deep reductions in trash, we know that this permit goal can be reached. And, in fact, that can happen if it is taken seriously and if implementation begins quickly. LA's experience with compliance on the trash TMDL that they have, a very restrictive TMDL, and implementation on that, as reported at the State of the Estuary Conference, it is actually encouraging how that is going -- it is going faster, and it is happening less expensively than was anticipated. And, of course, the jury is still out, but I think that should encourage all permittees to make their best efforts, and we certainly stand ready to help them in any way that we can. And we have some specific things that we are trying to do. And then the funding, that is small, but important, and Dr. Mumley mentioned it is also attributed to what happens when requirements -- clear requirements -- are put in place. It does not automatically create money, it does not print money, but it does help all of us, including localities to get more funding to do this work that is required under law. I also, to your point, Dr. Young, it is essential, important to make these reports that are going to be coming for implementation of this permit public, but -- and allow the public to raise concerns and be part of that process, but it

does not take the burden off of the Board, and the Board staff to enforce these permits. That is still very important work and, for too long, the cost of trash pollution has been borne by the Bay, by the waters of the State of California, and it requires more resources for the Board to do that work, too. So that is one of the things that you and your State Board counterparts and the Legislature and future Governors will have to work on -- give this Board the resources to help the permittees implement these permit requirements. So the Board should approve of these requirements to reduce trash discharge in the Bay, begin working to ensure full compliance, and thank you very much for your work over the last several years on this issue. Thanks.

Vice Chair Young - All right, thank you. Do we have questions for Mr. Lewis? No. Thank you. On deck, we have lunch. Mr. Wolfe, do you have a recommendation as to how long we should break?

Mr. Wolfe - Since your lunches are here, I think -- is it too much to ask to be back by 12:50? I know that limits the audience, but there are not many quick places around.

Vice Chair Young - Let's try reconvening in a half hour and I will just say that, if I call you and you have not been able to get back yet, I will just put you in the

back of the pile and you will have another chance. Thank you.

(Off the record at 12:23 p.m.)

(Back on the record at 1:02 p.m.)

Vice Chair Young - The first two people, the first person I would like is -- I am not sure I can read this -- Kiley Hinnon, or Kiley Kinnon. In the room? Yes? All right, thank you very much -- everyone thanks you. James Paluck? Is he here? All right, we will start with you, Mr. Paluck, and then we will have Mark Lander on deck. Is Mark Lander here? All right then, how about Tim Potter? Oh, okay. Very good, thank you very much. Mr. Paluck.

Mr. Paluck - First one after lunch.

Vice Chair Young - Yes.

Mr. Paluck - Well, good afternoon. My name is James Paluck and I am the Senior Civil Engineer for the City of Fairfield, Public Works Department Engineering Division. And on October 6th, the City of Fairfield prepared written comments on the final tentative order and we submitted these comments to Mr. Bruce Wolfe. And since my time is limited, I will only speak on a very small portion of the written comments, however, I do have copies available of the entire letter if I may pass them out.

Vice Chair Young - I think we are not able to accept those as Board members during this --

Mr. Paluck - Well, like I said, I will keep my comments very short here.

Vice Chair Young - Thank you.

Mr. Paluck - Since the adoption of our last Stormwater permit in 2003, the city has diligently enforced the rules and regulations associated with the treatment of Stormwater for new development, however, the city does have serious concerns with respect to the modifications made in the final Tentative Order concerning the mandatory implementation of Low Impact Development measures, and in particular, I just want to discuss with you Sections C3CI2B. And, again, I will limit my comments to just two. Requiring that each regulated project treat 100 percent on the amount of runoff would be extremely difficult, if not infeasible, especially if the previously accepted methods of treatment such as mechanical filters are no longer accepted. The city's recommendation is to add the language "maximum extent practicable" after the "100 percent" or in lieu of having the 100 percent. And my second comment is, it states that bio-treatment may be considered only if it is infeasible to implement harvesting, reuse, infiltration, or evapotranspiration at a project site. The city requested that bio-treatment should be weighted equally to the other three methods, especially within the City of Fairfield, where these three other methods are virtually infeasible for

various reasons. At a minimum, we request that economic infeasibility should be added to the list under Section 3C3I2Biii. And with that said, I am happy to answer any questions you may have. If not, thank you for your time.

Mr. Moore - I have a question for you. Yes, Mr. Paluck, thank you. Now, I would immediately agree with you about the 100 percent in isolation of the next phrase, which says "of the amount of runoff identified in Provision C3B." And in C3D, we have some specific numeric requirements that can be flexibly applied based on a volume hydraulic design basis, or a flow basis, and they do involve percentiles and design storms. So are you stating for the record that these are not practicable?

Mr. Paluck - I do not know the exact language in Section D or Part D. I would just hope to see a little bit more flexibility in that language there.

Mr. Moore - Okay, because I think technically there is a built-in flexibility.

Mr. Paluck - Okay.

Mr. Moore - That is my sense. But I would welcome any other input on the matter. Thanks.

Vice Chair Young - All right, thank you very much. I think I asked for Mark Lander next, or did I get my cards mixed up? Good, and then we will have Tim Potter if he is in the room.

Mr. Lander - Thank you very much, Dr. Moore. My name is Mark Lander. I am City Engineer with the City of Dublin. I am going to weigh in on C3. What we found in the latest version of the permit is that C3 has been substantially changed with regards to LID, and that treatment measures for new development now require 100 percent LID measures, no exception, and in addition to that, the revised permit language now treats biofiltration as sort of an inferior treatment measure to other LID measures. And I think we can address those issues with three minor changes to the permit, and if we can go to Section C3CI2Bii, I think first we would support Board member Moore's suggested revision; secondly, I would take the words "bio-treatment system" and move those -- this is on page 27 of the strike-out version -- move the words "biotechnical system" from the first line of that paragraph to the third line, immediately following the word "infiltration," and then I believe the following section, section C3CI2Biii, could probably be deleted. And I believe what this does, it puts biofiltration back on the same level playing field as the other LID measures, and it provides non-LID measures as an out in cases where LID measures are not feasible. That is all I have.

Vice Chair Young - All right, thank you very much. Now we have Tim Potter, and then Noah Garrison, please.

Mr. Potter - Thank you very much. My name is Tim Potter. I work as an Environmental Compliance Superintendent for Central Contra Costa Sanitary District, located in Martinez. As I have said to you before on this subject, we are not involved with the permit directly, but we are affected by the permit as a waste water agency. And it is in that capacity that I come to you today. First, I would like to thank you for the opportunity to speak to you, and I also want to start by saying that the Regional Board staff have been very responsive to waste water issues in the MRP document as it has been developed through the process. Every time a comment has been made, they have been very responsive to the recommendations and I wanted to acknowledge them. A couple examples of that in the current permit is that some of the C15 section exemptions, there were some references to directing clean water to the waste water agencies, and that reference was stricken in the current version; that is great. And also, the Water Board's ongoing support of the BACWAA White Paper on first flush and dry season diversions is also much appreciated and we are looking forward to the outcome of that process. There is one item in the current Tentative Order that could create problems, it is in Section C5 of the MRP, and it could cause problems for Central San, as well as any other waste water collection agency. The issue is that the MRP directs

Permittees to develop legal authority to control sewage as a pollutant source, without any qualifying language, that the existing programs for public agencies, responding to Sanitary Sewer Overflows, SSOs, is already in place, and is an effective program. Central San -- and I believe I can speak for most of the other waste water agencies in the region -- considers sewage to be a significant potential pollutant source of Stormwater systems, and it needs to be ideally prevented, and then obviously properly mitigated when a release does occur. The existing SSMPs, Sanitary Sewer Management Program, as well as the notification and reporting programs for SSOs from public agencies, provides for appropriate response -- preparation as well as response -- activities to such events. The current language of the MRP, as drafted in Section C5, which establishes the legal authority, as well as an enforcement response plan, and that is the biggest issue for us, would be a created duplicative and overlapping regulatory structure that could result in sanitary sewer agencies being cited for SSOs that occur within a city's storm drain system, and this additional effort would create a burden both for the cities, as well as for the waste water agencies, without really adding to any protection of water quality. After speaking with Regional Board staff about this concern, the goal was not to create this overlapping regulatory structure, which is good. When

Central San and BACWAA first provided comments on this particular issue, we had recommended that the language be inserted on this area to defer to the existing SSO programs that are in place, statewide. That language was not adopted, so looking to the next best alternative, we were informed that there might be an option to clarify to the Permittees that, in the Enforcement Response Plan Development for this particular issue, that they would be allowed to put in there that they would defer to the existing statewide programs and not pursue enforcement response on their own. That obviously would be satisfactory since what we are really looking for is not having to duplicate the effort of having to respond to this sort of thing. Thank you for your consideration of this issue and hopefully we can work on implementation to avoid this problem.

Vice Chair Young - All right, thank you. Do we have questions? Dr. Singh.

Dr. Singh - Thank you. Thank you for your comments. I was wondering, you said the power to enforce or prohibit and control illicit discharges, and the enforcement should be left at the existing system you have. What existing system do you have? Who controls it?

Mr. Potter - Currently, we are a collection agency, we are a sanitary collection agency, and we are

subject to both Sanitary Sewer Management Plan, the SSMP requirements that are now in place statewide, and that is a prevention, as well as response measures for sanitary sewer collection systems, and making sure they are being properly operated and, should an overflow occur, that there is appropriate resources in place to respond. And then there is also a statewide standard for notification of reporting, of which, within that, it is proper response, so it is containment and capture of the released sanitary waste that is also in place, that is the two-hour notification you have heard referred to possibly in other board meetings, and we have to report it to the State Office of Emergency Services, local health officials, as well as Regional Board, within two hours, and then follow-up reporting within five days. So all of those programs in place have in there the ability to not only hold the waste water agencies to the appropriate standards, and then also take enforcement should those standards not be met.

Vice Chair Young - All right, Mr. McGrath.

Mr. McGrath - I have a question of staff on this. Is there anything here to preclude -- I see the provision there in C5A -- is there anything here that would preclude a Memorandum of Understanding between a Stormwater agency and the sanitation agency, that would comply with this requirement?

Dr. Mumley - No, and it is not in our interest to intervene at all how local government addresses this, and I want to be really frank with you, it is not in our interest, nor the municipality's interest to say that they should not take enforcement action against the sanitary sewer discharge because, if there is a sanitary sewer discharge to a storm drain system, the owner/operator of that storm drain system now has ownership of that discharge, and therefore they have legal liability, so we cannot -- and I appreciate what Tim is bringing up in terms of unnecessary duplicative effort, but there is no -- it is not intended to be duplicative, but the municipalities need to have the protection to take action if they need be; they certainly can refer to a well designed, operated, and maintained Sanitary Sewer Management Plan, but we cannot say that, if a community has a Sanitary Sewer Management Plan, there is no need for further action because there has been no vetting of that plan through a formal approval process, so you cannot just say, because you have a plan, you do not have any liability. Clearly, if you have a good plan, we do not want unnecessary use of enforcement resources at the local level, nor at the state level. So, in the spirit of it all, we appreciate the concern, but I think we have to be very careful about exceeding responsibility, or precluding responsibility in this Order.

Mr. McGrath - In other words, both institutions have liability in the event of some type of overflow that then goes to the Stormwater system, and it is in their interest to have a relationship which makes the monitoring of that clear, and not duplicative.

Dr. Mumley - Yes, and one option, by the way, and often does happen, I think, in the good system management, if the overflow goes into the storm drain, there is often opportunity to contain it there and not allow it to get to waters of the state or the United States, and that is good.

Mr. McGrath - Potentially saving both entities substantial penalties.

Dr. Mumley - So there is a win-win for that, so what we do want is a progressive relationship between the two systems, not a regressive, adversarial relationship, for sure. This becomes more problematic in his territory, which is a special district, which is separate from the municipalities in some cases. The municipality is the owner and operator of both systems.

Mr. Moore - I would like to add just very briefly, really, the intent of having these type of legal authorities, I think, is not so much this nuanced discussion of interagency, but really it cuts to the chase of a business or residence that has improperly connected their sanitary sewer lateral to the storm drain, so I just wanted

to clarify -- that is my reading of it.

Mr. Potter - In our original comment, we had asked that that be the focus of it, and we were told that was not possible. We understand that that is a potential source, and it is something that needs regulation, and we actually as a contractor to the cities have taken enforcement action against those sources.

Vice Chair Young - All right, thank you very much, Mr. Potter. We now have Noah Garrison, who is coming to us from NRDC, and Mr. Garrison had requested early on that he be allowed some extra time. I agreed to grant that time because we have about three environmental groups and a half inch of non-permittee cards, so it seems fair in my view, and he has agreed that he is only going to be pinpointing his testimony on the new items. So if the timekeeper could wait for five minutes, or however you want to do it.

Mr. Garrison - That would be fine. I think an hour, as she just had up there, might be a little more than I need, but thank you. Madam Chair, thank you again for the granting of the extended time and thank you and members of the Board for hearing my testimony today. I would like to start briefly by saying that we really do appreciate the effort of staff in putting together the permit as it is now, and we recognize the significant improvements that have been made to it, and appreciate their willingness to work with us

and talk to us over the previous months. However, there are a few remaining issues that we feel are significant enough and we have not been able to reach a consensus on, that we believe the Board should be made aware of, and potentially take action on, that in some ways threaten to undercut a lot of the good work that has been made to produce the permit we have now. In large part, my comments will echo some of the concerns made by Ms. Strauss with the EPA, and so I do not want to go into too much detail over the generics of them. These are specifically related to provision C3E in the Alternative Compliance, and also to C3C and the bio-retention requirements. But sticking to sort of the C3 and Alternative Compliance, one of the problems is this permit allows for any permittee or any development to, at their discretion, use alternative compliance instead of complying on site, and then, in sequence for that, it does not actually require any on-site compliance if the alternative compliance measures are put into place. These are separate problems, but they are closely related and what the end effect is, is that you allow the permittees and developers to select what properties will pollute, and what properties will not, and potentially to extend the life of properties that would otherwise be required to come under the permit. Starting with pointing out that this permit, or these effects would actually be out of line with other permits in

California, this is the Ventura permit, which in the italicized portion says that, when alternative compliance is put into effect, the project must treat all remaining runoff pursuant to design and sizing requirements. And that is the Ventura permit under its alternative compliance procedures. The same, or similar language, is in the South Orange County Draft Permit currently up for adoption, and that states that, when alternative compliance is used, the project may implement conventional treatment controls, BMPs, and must participate in the LID waiver program. So, again, it is requiring at least conventional controls on-site, if alternative compliance is put into place, and the same is true for the North Orange County permit. And so, what I would like to do is show what the permit currently requires under C3EI, which is to say that the permittees may allow a regulated project to provide alternative compliance with Provision C3C, which is the LID provisions, in accordance with one of the two options listed below, and it simply leaves that to the discretion of the permittees. There is no requirement that they do anything other than comply with the off-site mitigation factors. And we have submitted proposed language -- I apologize, this is a bit wordy -- we have submitted this proposed language to Board staff, and the gist of this is to state that, if you are going to invoke one of the alternative compliance procedures, you

must, at the minimum, meet the Sewage Sump requirements that have been mandated by the state under *Bellflower* in Order 2000-11, and implement convention controls on the site. And we find that there is good reason for this for two principal reasons, 1) it is important because, under the current procedure of the permit, a brand new development could at its discretion go and put in LID features, or retrofit a property that is nearing the end of its usable life, that would have been redeveloped or retrofitted within a couple of years anyway, and would have come under the guise of the permit. You are now replacing that with a development that will last 60 or more years, and have absolutely no Stormwater controls placed upon it. So you are essentially perpetuating the number of properties or developments that are allowed to continue unrestricted runoff and discharge. So, in addition to requiring this being good policy, we find that, under the Sewage Sump requirements, as mandated in the *Bellflower* decision, there is no justification for allowing a property, where it is feasible to implement conventional controls, to avoid that responsibility, that it is mandated by the State Water Board. Related to that, and sort of exacerbating that property, is the problem that there is no finding of infeasibility required in order to use the alternative compliance, that any developer or permittee at their discretion may select not to implement controls on-

site, and even though the permit language does state that you must achieve a net environmental benefit or equivalent water quality and runoff volume controls, there is virtually no way to guarantee that. It would require testing for virtually every pollutant down there at every site, it would require a tremendous effort in any way to guarantee that the benefits derived from an off-site mitigation project will actually be the same as on-site, and there are too many openings for that to result in less compliance with water quality standards. We have no problem where there is infeasibility demonstrated for allowing participation in the alternative compliance system, however, we feel that it must be done based on the demonstration of infeasibility. And, again, this is what is required in other permits in the state. The Ventura permit says that, when a permittee finds a project applicant has demonstrated technical infeasibility, then they may participate in the Alternative Compliance Program. Same with the North Orange County permit, which says that only those projects that have completed a vigorous feasibility analysis may participate in alternative compliance. So, again, the San Francisco permit, while its intentions are certainly good, is out of line with other California permits, and will be less protective of water quality as a result. Again, we have some proposed language which would be to Section C3E. We

believe it should be inserted that, in order to participate in the alternative compliance, a finding of infeasibility, which could be under the same parameters set for the biofiltration requirement, must be made first before alternative compliance may be taken into account. My final comment that I want to make -- I am trying to keep myself well under the 10 minutes here, and apologize for going a little long -- is in relation to the biofiltration requirements, that we find that biofiltration, and there is ample evidence of this in the record that we have submitted from a number of studies, that biofiltration is simply not as protective of water quality as is on-site retention through LID features, and the reason for this is simple, that when you have 100 percent on-site retention of a designed storm volume, there is simply no mobilization of pollutants. With biofiltration allowing under drains, you are allowing discharge and you are allowing pollutants in some form to leave the site. Under that consideration, you are essentially allowing for biofiltration, even though it is demonstrated infeasibility, you are allowing for a practice that is less protective of water quality to substitute in entirety for the on-site retention standards, which are more protective of water quality. And under those standards, we find that any amount of water, or any volume of water that is discharged from the site, should be

mitigated off-site, as well. It should trigger a requirement that you comply with the off-site mitigation, or the alternative compliance features. Sort of extending off of that, Board member Moore has suggested to allow equivalent compliance or equivalent practices. We would be extremely concerned with any suggestion related to that, especially without a requirement that the project then participate in alternative compliance. As Mr. Cloak pointed out earlier, there has been no demonstrated need for that provision, and to put it into the permit opens up a very broad possible exception for the LID Program. And, two, because essentially what that provision would do would be to say that, in a case of infeasibility, you do not have to participate in Alternative Compliance Programs that will achieve an equivalent benefit, you essentially now can take vault-based or other conventional controls and replace the entire LID requirement with no requirement that you do anything other than that, it essentially goes back to the 2002 Sump requirement that all you do is put on conventional controls to control Stormwater on the site, and that is based on the hard work of staff and everyone who has been involved in this permit, to bring the LID provisions into being, that would seriously undercut the requirement that cites retain 100 percent of the design storm volume. So for those particular reasons, we are particularly concerned with

the current draft of the permit and we would urge the Board to take into consideration the draft language that we and EPA have considered, and to fully consider the suggestion made by Board member Moore, which I fully grant is made in good intention and to ensure that properties or development properly deals with pollution, but to understand the implications of that, and that it will significantly undercut the LID provisions. Thank you for your time.

Vice Chair Young - All right, I think we may have some questions. Let's start down at this end with Mr. McGrath this time.

Mr. McGrath - Well, I have a question of staff and I think it is only fair to put this on the record in front of the entire audience. There have been quite a few questions about C3 and whether or not the standard should be infeasibility on site, or some alternative way of being flexible, and whether it might be more efficacious, or more overall beneficial in part of another project. So when this returns through the testimony and you return to comment to the staff, I would like you to focus on the question of should "meet the standard" be that on-site must be infeasible, or can we provide flexibility for other policy reasons such as we think there may be an off-site alternative which would be more effective, or have habitat value. I really want the clarity and the benefit of staff's

thinking on that since a lot of testimony has been on it and there have been some lines drawn that it must be infeasible to go off-site, and is that the way -- I want your judgment on that -- at the end -- not at the moment.

Vice Chair Young - But not now. Mr. Moore?

Mr. Moore - Yeah. You know, I respect the thought you put into this in terms of the accountability that you are after in the permit. I respectfully professionally disagree with that, that the requirement to do LID first, and then other things, is not plainly evident here. But I think it is a fine language point, that I think we agree in principal, this Board, with the principals. What I had difficulty with as an engineer and a water quality practitioner was a bit of a broad statement that you made, that bio-retention, you know, by releasing pollutants, is degrading water quality. I prefer to look a little more holistically, as water quality standards direct us, which includes the beneficial uses and the objectives for pollutants and that sort of thing, and I would submit that, in many instances, the bio-retention systems would be superior for water quality standards in many instances than on-site retention. On-site retention has unintended consequences in terms of creating stagnation in water in certain settings, and can cause more water quality problems for the beneficial uses. So I think I would caution the

strong statement that these type of systems would somehow be inferior from a water quality basis, which includes more than just pollutant load, it includes the movement of water across the landscape and the beneficial uses that it supports. And, you know, the timing of the water and that sort of thing can be more important in a certain system than the molecules of metals and other things that happen to go with it. And that is probably all that I would say. Feel free to respond to that.

Mr. Garrison - I think our comment would be that there may be instances where -- and this almost would go to infeasibility -- certainly, we do not want to cause stagnation and massive volumes of standing water, that is something that would be avoided in that circumstance; but where you are, at least from a pollution standpoint, which is what the permit is seeking to regulate from the greatest point, from a pollution standpoint, and a water quality standpoint, where you prevent pollutants from mobilizing in the first place, it will be more protective of the water quality than will a system that allows pollutants to be discharged.

Mr. Moore - It would be a healthy debate.

Vice Chair Young - Yes, all right. Thank you, Mr. Garrison, it is a pleasure to listen to the discussion today among so many people who are so well informed, and who care

so much about water quality.

Mr. Garrison - All right, thank you again for the extension of time.

Vice Chair Young - You bet. All right, let's have Melody Tovar and, on deck, Laurel Prevetti.

Ms. Tovar - Okay, that was a nice walk. Good afternoon. Melody Tovar with the City of San Jose, Deputy Director, 170 West San Carlos, San Jose, CA. Good afternoon, Board members. I really appreciate the opportunity to address you here today, and I want to thank first the staff and my colleagues in other cities, and stakeholders who we have worked with to get us here today. It has been a long journey and we are excited that it is still moving forward. We do look at the new draft, though, and note some new changes in the permit, and that the revised draft was not circulated for public review and comment, and we think it should have been. For us, that means that my testimony here today does not benefit from the direction and feedback from our City Council, and that is something we have thoughtfully done for every draft of this permit. So in the limited time we have had to review, we do note a few areas where our previous concerns have not been resolved and I want to draw those to your attention today in the hopes that we can resolve them successfully. Laurel Prevetti with our Planning Department is going to talk more

in depth about the LID portions of C3, I will touch on the hydromodification element and on the pump station monitoring and inspection requirements. For hydromodification, looking at the current draft, the draft incorrectly presents that the hydromod attachment for Santa Clara County has already been adopted by this Board; instead, the permit should acknowledge that, while Santa Clara County has been implementing hydromodification requirements for projects since 2005, as approved by your Board, the permit will require that we implement the requirements on many more projects in our county than are covered under the current permit. And for this reason, we have requested, and continue to request an implementation timeframe that allows us to ramp-up our policies and our communications with our developers, so that we can practically implement the requirements in a clear way with the regulator. Regarding pump stations, the permit requires that we monitor and inspect all storm pump stations. We commented previously that we have quite a few in San Jose, we have 25 total, 10 of them are very very small facilities that do not directly discharge to a water body; instead, they just move water under or over a road to get elsewhere in the system. The response that we got from the Water Board in the feedback document released earlier this week, last week, did not address that specific situation, it was not responsive to

what we raised. So today we again request that the permit language be clarified to identify that only pump stations that directly discharge to a water body are subject to that monitoring inspection requirement. And for context in San Jose, I wanted to let you know that those 10 pump stations of the 25 represent only 5 percent of the total pumping capacity if you look at all of our pump stations. So the remaining 15 that would remain in the permit are 95 percent of the pump capacity in San Jose for areas that have a pump station at all. We see this as a very small clarification, but one that we thought was important to raise, still, because in the context of a permit that is asking us to move on so many angles at once, we wanted to see where we could eliminate some excess to minimize excessive use of our resources and focus what we do have. We appreciate your thoughtful consideration of our comments. Thank you. Any questions?

Vice Chair Young - Why don't we hear from your colleague, and then we will circle back to questions for both of you? Thank you.

Ms. Prevetti - Thank you very much. Good afternoon. I am Laurel Prevetti, Assistant Director for our Department of Planning, Building, and Code Enforcement with the City of San Jose, 200 East Santa Clara Street. Thank you very much again for the opportunity to comment. San

Jose shares the goals that we are all talking about in terms of high water quality and sustainable Stormwater management for our Bay region. We have been working very hard to focus new growth in our community to transit stations and to our center city consistent with low impact development principals, as well as meeting our other state mandates towards reducing greenhouse gases, the AB 32 legislation, as well as being a leader in terms of how we are going to have a sustainable community with implementation of SB 375. I do want to offer two specific comments. First of all, I respectfully disagree with Mr. Cloak, and I do support Board member Moore's proposed revision regarding the additional language for comparably effective treatment systems. This is consistent with U.S. Green Building Council lead guidance that does acknowledge structural measures are preferred in urban and constrained sites, so making that notation would definitely be beneficial. We are also very concerned about the Special Projects Provision C3E. First of all, it does not go far enough to provide the certainty that local government needs in terms of how the Board will handle center city and transit-oriented development projects. How will the Board be considering the individual proposals that will be coming before you from all of the different cities within the Bay Area? What will be the consistent standard for that review? We are concerned that, because of this

inconsistency, this may actually create a disincentive for the very development that ABAG and other regional agencies are encouraging our communities to do. We need to make sure that, in fact, intensification around our transmit, both for economic development and housing and mixed use development is precisely what we need to become a more sustainable Bay Area. And with that, we are available to answer any questions. Thank you very much.

Vice Chair Young - All right, thank you. Do we have questions? I would like to have a clarification, and maybe while you are up there, maybe it is from staff. When I was -- I think you were talking about the section on special projects on C3EII Special Projects. When I read subsection 2, and it said "permittees shall submit…," I actually sort of assumed that the permittees as a group would submit one proposal. Is your assumption at the City of San Jose that that will not happen? And then I will ask the staff, you know, what their thinking was, as well.

Ms. Prevetti - We read this as an opportunity for individual permittees to invoke this provision if we felt it was appropriate for the local condition, we have not at all undertaken the opportunity to really work under BASMAA or other unified circumstances, that would take a lot more work and this is, again, a mandate for which funding has not been identified. It is a lot easier for us to make our unique

case to be able to stitch together a case with all the permittees, while that might be beneficial. I could certainly see from the Board's perspective, I think the way each individual city is approaching growth is unique enough that not all communities might agree with the range of intensification, for example, that San Jose is embarking upon for its future.

Vice Chair Young - All right, thank you.

Dr. Mumley - This is staff. I will answer that question. Our expectation is a hybrid, and I will give you a short answer and then back it up, but we do not expect a one-size-fits-all, however, we definitely do not invite and inspect 70 different plans. And we know by working with permittees that that will not be the case and, as you probably alluded to, this Contra Costa program already has a unified approach, their unique interest in proposing special projects. We have also heard some stuff out of the Alameda program that seems quasi-united, but not totally resolved. San Jose is unique and I would expect San Jose to have its own submittal because of the unique nature of San Jose as, of course, the largest community in the area. But I also have to tell you that this is -- the alternative which Laurel has not proposed, she has proposed no alternative, the alternative we are not able to resolve through any consensus amongst all the players at this point in time, so

that is why we feel we have no choice but to ask for a future submittal that can be appropriately vetted. And we strive to try to get the municipalities to work together, and what we ended up getting were separate submittals. So that is the reality, that we are not going to get one, but we also do not have things figured out at this point in time, so there is no response that we can give that would satisfy San Jose because we cannot say San Jose's Special Projects are these specific options, here, and now.

Vice Chair Young - Okay, well, thank you. That clarifies things quite a bit. Are there other questions?

Mr. Moore - Just generally, I am supportive of Ms. Tovar's suggestion, you know, I think that is something we could consider as far as the pump station monitoring.

Dr. Mumley - Why don't I give you a quick observation on the pump station, and really it has to do with -- you know the system, so maybe I will have you ask her, because when you are saying that 10 of your 25 are just pumping water from one part of the system to the other, but they are still ultimately pumping water to receiving waters, so the fact that it is just pumping over may or may not be an issue. I mean, I am concerned that you will say we do not have to worry about low DO in those waters because you are pumping it to another pipe, but that low DO water is going to be in another pipe that is going to go into the

water. I think it is a fair request, though, that we would not require you to do the observations and monitoring if you have demonstrated a reason that there will not be low DO water discharged as a result from that station. Can you give us some condition that we could include, instead of just saying you do not have to observe and monitor those stations? That is the compromise that I think we welcome.

Ms. Tovar - Can I respond to that? So we understood the premise of the pump station inspection monitoring to be based on the idea that you have got stagnant water potentially with organics that is unreleased directly to a water body. In the case of these small stations, again, less than five percent of the total pumping capacity, when you add the 10 together, it is 40 percent of the number of pump stations, but five percent of the flow, that flow is going to move again, it is going to move again before it ever gets to a water body because it is part of the larger system, just as any storm drain lateral is part of the larger storm drain system. So we saw it as incidental that there was a pump station there, and very much not like our other large pump stations that are stagnant and then directly discharged to a receiving water.

Vice Chair Young - Mr. McGrath?

Mr. McGrath - Tom, is there anything in this order as it is written that would preclude the City of San Jose

from submitting their pump stations with an identification of which ones ultimately discharge to a point where there may be a concern which ones do not, and the staff approving that administratively as consistent with this? Could that be done as it is currently drafted?

Mr. Wolfe - We are already requiring an inventory be submitted next spring, so --

Mr. McGrath - And if that inventory indicated you should not worry about these, and the staff agreed with that, then that could be interpreted as being in compliance with this order? I am seeing nodding, but I would like to hear a "yes."

Mr. Wolfe - Well, and the goal here, as we even said in that section is to preclude the discharge of low DO water. If during that inventory they could show that this is already within the system and that, by addressing this at those pump stations that have the potential to discharge low DO water, I think we --

Mr. McGrath - So I think the vocal Board members of the staff and Ms. Tovar are all in agreement on this one.

Vice Chair Young - Okay, we are looking for a page number.

Dr. Mumley - Page 12.

Vice Chair Young - Next, I would like to have Laura Hoffmeister and then, on deck, Jennifer Kovecses. You

will have to tell me how to pronounce the name. Ms. Hoffmeister is going to be wearing two hats with two and a half minutes for each hat, from the City of Concord, and the City of Clayton, and you can pick which one goes first.

Ms. Hoffmeister - Well, thank you very much, Vice Chair and members of the Board. I will be speaking to you as City of Concord's Mayor at this time. I do want to thank the staff and the Board members for the direction and the work that has gone into the modified or updated, I should say, MRP. There have been many many modifications that I think have been helpful to all parties, both the environmental groups, as well as the regulated community, as well as the staff in terms of getting clarification. I think there have been great improvements as we talked about the Low Impact Development and those types of things, trash, and providing flexibility to address that, which was our big mantra that you heard, embraced, and gave good direction to staff. I do hear a lot of the comments that the Board members made this morning and I am very refreshed by hearing those comments about taking into consideration or having the dilemma about how do we still accomplish all of this and understanding the fiscal constraints, not only local communities are under, but the State of California, our Federal Government, and our own local citizens in our community who, quite frankly, I went to a reunion the other

day, a high school reunion, and three or four people cannot afford to pay their garbage bill, but they are still living in the community, but you know what? They are trying to take the garbage to work and throw it out there because they cannot afford it. The kids do not have sports, and when we talk about trying to get the public invoked about trash, and get them engaged in that, this is not going to be high on their radar screen right now. This is great, we have a five year permit, we can look forward to the future, the bar has been raised; but I caution all of you, as an elected official, and you all know in your own communities, the budgetary considerations are not just ending at the end of this year, they are going to be next year, the year after. Concord alone will have $9.7 million more we will have to cut. We just lost close to 78 employees, 20 percent of our workforce. We will be cutting again more staff. So these monitoring requirements is still of concern, a very large concern, because the amount of money it is going to take to do numbers of these studies, even though they are spread over a period of time, you are still talking anywhere from $16 to $43 million in capital costs throughout the permit over that five years to address some of the issues identified in those studies, possibly, and you are talking about $12, 15, 18 million of studies, of getting data. And there is a lot of data and a lot of information that wants

to be collected, and what was not done, still, I think it was done somewhat, but not maybe to the extent that it could have been, is a prioritization. And I really think as we move forward in starting to embark on these studies, working with the Board staff, I think in reality, I want to go on record that you may hear from us in another year or two, saying, "You know what? There is not enough money to do all the studies that you ask for in the time frame that you put out in this permit. It was a nice goal, it was a great place to strive for, but we need to step back, let's identify what is the first thing you want done, what is the next thing you want done, what is the third thing?" We do not quite have that yet, we are getting closer, but I do want to let you know, that is a very high concern there between C8 to C14, all of those studies that are being asked about. And as I mentioned, we still have concerns about this being an unfunded mandate, and I know legal counsel has a different opinion on it, but we look at it as, although you are achieving federal law, a lot of the details in how you are going about it is not in federal law and is requiring costs that are not identified for how those funds will come about to pay for them. Therefore, we do believe we are on good grounds, that there are some unfunded mandates that you are developing because of the specific details in how you want us to achieve the requirements under

the Federal Clean Water Act. And so that is a concern to us, still. As I mentioned, the monitoring studies is the biggest bulk of the cost and the concerns still to the local communities and the permittees. We do feel that we are being held hostage to some of those permit requirements, not that the studies and the information would not be good, but there are just no funds, really, to pay for the ransom of getting that information. And that is the concern we have. If I may switch over and change hats real quick, representing the smallest city, the City of Clayton in Contra Costa, I do want to comment a little bit to Mr. Moore's question about adding in, I think, the structural devices as an alternative in that second tier, and I appreciate hearing his thought process because that is the way I read the permit, too. You start doing what you can on-site with landscape filtration, is there a site maybe adjacent that you could do landscaping filtration on, okay, well then maybe that makes sense, but also, there may be appropriate places, and I heard from some of the other communities, where other technology devices or things that have not been invented yet in the next five years could come into being, and could be incorporated into these things -- I just do want to make a note that some of the concerns about the vaults, of course, is that they often have filtration media in it that have to be changed, or removed and

replaced, which then creates a hazardous materials or disposal issue, which is not as green as we would like something to be. There are, I think, appropriate places for them, or in a treatment terrain where you might have landscaping, as well as a vault, and I think right now we have done a great job in getting this permit moving forward and getting to this point, you should all be commended for trying to create so many region and so many municipalities under one permit, that now we have an opportunity to go forward. I do not think you are going to get every single word in this permit for everybody to agree to at this point in time, but we have come a long way, we should be proud of those accomplishments, and we will be able to move forward. Thank you.

Vice Chair Young - Thank you. Are there questions? All right, on deck I would like to have Frank Kennedy and, Jennifer, you can tell us how to pronounce your last name.

Ms. Kovecses - My name is Jennifer Kovecses, I am here representing San Francisco Bay Keeper. We are at 875 Market Street. Thank you, Board members, for this opportunity this afternoon to provide our final thoughts on this permit. Over the many years that this discussion has been going on, Bay Keeper and our colleagues at NRDC have provided extensive and specific comments on how to improve

the weaknesses we identified in each version of this permit. Many positive changes have been made to the permit as a result of these comments and others, and we do sincerely appreciate that, but today Bay Keeper would like to express some outstanding concerns that we have with this current version of the permit. For the purposes of today, I will focus on two major areas of concern, weaknesses that we see in the TMDL implementation sections, and the omission of consideration of Municipal Action Levels as a feasible measure for program accountability and effectiveness. With respect to implementation of Municipal Action Levels, we have provided considerable detail in our written comments as to why we believe MALs are an appropriate addition to the suite of monitoring requirements in this permit. We would like to reiterate that MALs have been identified as an appropriate and feasible interim mechanism for assessing effectiveness by the State Board's Panel on the Feasibility of Numeric Effluent Limits. We would also like to clarify that we are not, as staff implied in their Response to Comments, asking that MALs replace the other monitoring provisions in C8, which we believe are necessary and very important, nor are we asking permittees to monitor effluent at every single storm drain in the Bay Area. Instead, we are asking that staff consider a program along the lines of what was proposed for the Ventura permit, or is currently

being proposed for the Orange County permit. We believe that this would have helped ensure a strong and effective permit, and we hope that, in the future, staff will give more consideration to the implementation of Municipal Action Levels. With respect to TMDL implementation, we believe that the current form of the permit still places too much emphasis on pilot studies, and thus places too little emphasis on the implementation of actions to achieve significant and meaningful reductions, specifically of pollutants of concern like PCBs, in an appropriate timeframe. I would therefore like to reiterate Bay Keeper's position that this permit should include interim waste load allocations as the primary framework for achieving specific measurable criteria for determining whether we are moving forward towards reducing the loads of pollutants of concern like PCBs. In Section C10, our trash section, Section C10 appropriately outlines specific timetable for the reduction and the loading of trash to our waterways, and incorporates interim numeric load reductions, as well as a final goal. Likewise, we believe that this approach, this umbrella, as Dr. Mumley referred to earlier, should be applied to the other pollutants in these sections. We believe that it is very important that Board staff make clear their intent for future permits by articulating interim goals in this permit for all of the pollutants of concern. It is not clear why

it is possible for staff to create a framework with the schedule for numeric reduction levels for C10, but it is not possible to do that for the remaining pollutants of concern, like PCBs. This weakness was also addressed by EPA in their comments. EPA clearly indicated that, to ensure enforceability of a TMDL compliance schedule, a permit must include the full schedule, even if it extends beyond the term of the permit. This will ensure that the requirements of the schedule can be enforced, even in the event that the permit is not reissued in a timely manner. Board staff state in their Response to Comments that requiring pilot studies is a sufficient hook to ensure that permittees move towards reducing loadings of pollutants of concern. We respectfully disagree with this. Pilot studies, while an important step, produce reports and lots of useful information, but we do not believe they will result in the large scale bay-wide reductions of pollutant loadings in the timeframe that we need them to happen, to achieve waste load allocations as articulated in the TMDL documents. The pollutants identified, like trash, PCBs, and Mercury, have been widely regarded as high priority pollutants for the Bay Area. We recognize that there are challenges in addressing these pollutants, but delaying full scale implementation will only put off addressing the impacts and root causes of the problem. To emphasize the urgency of addressing these

loadings aggressively, I urge the Board to look at the recent RMP data that shows that concentrations of some of these pollutants, like PCBs, are in fact increasing in wildlife and not decreasing in the Bay. We cannot afford to keep putting off implementation of concrete actions if we have any hope of having a Bay that is free of PCBs in the timeframe allocated by the TMDL. Finally, I would like to add that Bay Keeper believes that Low Impact Development is the key to achieving effective reductions in stormwater volumes and pollutant loadings, and thus an effective and fully enforceable C3 section is an extremely important component of this permit. I do not wish to reiterate the extensive and thoughtful comments that were presented in our joint letter with NRDC, but would simply state that we support the comments that were expressed by Noah Garrison here today. Thank you for your time.

Vice Chair Young - Five seconds, great. Do we have questions? Thank you very much. All right, we have Frank Kennedy, and then Eric Anderson, please.

Mr. Kennedy - I am Frank Kennedy, the Consultant Stormwater Program Manager for the Town of Moraga and the City of Oakley. My offices are in Walnut Creek. I have also been asked to make this comment on behalf of the Contra Costa City County Engineering Advisory Committee. Substantial funding for roadway work comes from gas tax.

Another substantial source of money comes from the Surface Transportation Program, that is 23 USC 133 104(B)(4). Gas tax money can be allocated on a priority basis that we choose. The Federal money, however, is allocated by MTC. MTC monitors a program application that says that the priorities must be based on pavement management condition. The permit says that we must prioritize based on -- at C2E22B, that prioritization of rural road maintenance on the basis of soil erosion potential. We request a modification to this paragraph, that we insert "except for surface transportation program funded projects identification and prioritization of rural road, etc." That is our one comment. Thank you.

Vice Chair Young - All right, is there a clarification? Questions?

Mr. Moore - Yeah, this has followed our request for a very specific suggestion, which I really appreciate because I am trying to catch up with it, maybe the rest of the Board can catch up, too, while I am stalling right now. And so I guess the main question I have is, does the permit requirements here to be in compliance with this permit, as written, jeopardize your ability to get funding, to fund Low Impact Development road construction?

Mr. Kennedy - Yes, it would. And thank you for asking that question. I meant to mention that. Twenty-five

percent of the score in ranking projects by MTC is based on the pavement management index for the pavement condition. So what would happen is that MRP counties would be at a disadvantage, competing in the MTC area against counties that are not under the MRP, so clearly we stand an opportunity for -- or risk an opportunity -- of money. This program, under the 2009 budget for the Federal Highway Administration, was $6.5 billion. I could not find a current number on the MTC site, but they did site that, in prior years, it was as much as $100 million for the Bay Area, substantial money. Any other questions?

Vice Chair Young - Thank you for that clarification.

Mr. Kennedy - Thank you.

Vice Chair Young - All right, Eric Anderson and then we will have Jill Bicknell on deck.

Mr. Anderson - Good afternoon, Board members. My name is Eric Anderson. I manage the Stormwater Pollution Prevention Program for the City of Mountain View, which is a co-permittee in the Santa Clara Valley Urban Runoff Pollution Prevention Program. My address is 500 Castro Street in Mountain View. I am here today to comment on MRP provision C3C, which includes a recently added requirement that C3 projects must incorporate low impact development BMPs, such as rainwater reuse and infiltration for 100

percent of the site. While the City supports the use of LID Stormwater treatment controls, we have strong concerns that fully implementing this requirement on certain types of projects will be very difficult. In fact, complying with the LID requirement as it is written may not be possible for some projects and may deter responsible redevelopment. An example of a project type that would be difficult to implement the 100 percent LID requirement is podium-type redevelopment projects where parking is provided in an underground garage, with residential, commercial, office, or mixed use, on top of a podium deck. Mountain View has seen a trend of proposals of these types of construction projects. These projects are typically proposed for property edge to property edge redevelopment of relatively small, around an acre, and mostly previously impervious sites. The benefits of this type of redevelopment are higher density occupancies, first, and secondly, impervious surfaces such as roofs, plazas, and walkways, would generate less polluted runoff than the parking areas that are no longer exposed to the surface. Additionally, in Mountain View, some of these types of projects that are proposed are within one-quarter mile of the city's downtown shopping and restaurant district, and the city's downtown transportation hub where CalTran Station, light rail station, and a VTA bus terminal all come to one location. This type of

redevelopment is designed to promote utilization of mass transit and limiting the use of cars and encouraging a pedestrian lifestyle. While the type of project I described has many environmental benefits, it complicates selection of Stormwater treatment BMPs due to the lack of at grade space. BMP selection would be even more complicated with a rigid requirement for a very narrow list of acceptable LID BMPs. The city strongly encourages the Board to allow flexibility regarding the selection of Stormwater treatment BMPs for projects such as podium style redevelopment projects. And I would also like to say we support the language that was proposed by Board member Moore on C3CI2B. Do you have any questions?

Vice Chair Young - Questions? No. Thank you very much.

Mr. Anderson - Thank you for your time.

Vice Chair Young - All right, we have Jill Bicknell followed by Paul Campos.

Ms. Bicknell - Good afternoon, Board members and staff. My name is Jill Bicknell. I am the Assistant Program Manager for the Santa Clara Valley Urban Runoff Pollution Prevention Program. We are located at 111 West Evelyn in Sunnyvale. I hope you can appreciate that I have revised my talk about five times over the course of the day, so far, to adjust to what the previous speakers have said,

and I have tried to condense it to really the key points that we have to make in relation to those other speakers. We believe that the Bay Area cities and countywide programs have been leaders in the use of LID, and we have an approach that protects water quality and stream health. We are disappointed with the LID language in the Final Tentative Order because we feel that it restricts our ability to implement our existing exemplary programs. But along those lines, I have some statements I would like to make relative to the current conditions. First, I would like to say that we also support the language change suggested by Mr. Moore to allow comparably effective treatment systems. I think it provides some additional flexibility that would be helpful in meeting this requirement. Secondly, I want to say that we do not understand why bio-treatment such as bio-retention areas and bio-infiltrating swales is not a preferred LID measure when it achieves infiltration, evapotranspiration and flow reduction, as well as a high level of treatment. Mr. Cloak previously spoke about how bio-treatment achieves these goals and we support his comments on that point. We believe we should not have to make development project applicants demonstrate the infeasibility of other measures when we feel bio-treatment is a perfectly acceptable option. So we would like to request that you change the LID language in the Final Tentative Order to allow bio-treatment to be

one of the preferred methods of LID treatment that is on par with the other three methods, without requiring demonstration of their infeasibility. Secondly, we also note that, even with bio-treatment as a preferred option, certain types of projects with inherent environmental benefits, such as pedestrian friendly urban infill and high density residential and commercial projects, may have difficulty meeting the 100 percent LID treatment requirement. In addition, the LID requirements pose a significant challenge for roadway projects that typically do not have sufficient right of way to construct even bio-treatment facilities. So we are concerned that the permit requires us to complete four reports on infeasibility, design specifications, and special projects within a 12-18 month period, and then begin to apply the 100 percent LID standard within a 24-month period. This will require significant resources and the public process that you discussed earlier, while important, will be difficult to complete within these allowed timeframes, and leave us with a lot of uncertainty as to which projects will be covered when the LID requirements kick in. We hope that you will consider giving us additional time to implement the requirements if this process goes on for some time because of extensive public input. Thank you for your consideration.

Vice Chair Young - Questions?

Mr. Moore - Well, just a real quick comment that I am open-minded to that suggestion. But I also support Dr. Mumley's vision of getting some resolution outside of this permit. We have resolved a lot of issues today. But I, like you, share a puzzlement, a sincere perplexed state, that bio-retention is somehow below all those other LID measures. I am flummoxed.

Vice Chair Young - I think we are going to be able to have a discussion on that when the staff responds.

Mr. Moore - I just thought I would give you a supportive statement.

Ms. Bicknell - Thank you.

Vice Chair Young - Thank you very much. Okay, we have Paul Campos and then James Scanlin.

Mr. Campos - Vice Chair Young and members of the Board, my name is Paul Campos. I am the Senior Vice President and General Counsel for the Home Builder's Association. We have offices in San Jose, San Ramon, and San Francisco, and I appreciate the opportunity to appear before you today. At the very outset, Bruce Wolfe described sort of the long history of this process and I have the gray hairs to prove that I have been here not only since 2004, but 2001. Since 2004, unfortunately, I cannot --

Vice Chair Young - Excuse me, all the people with

more gray hair than you are squirming.

Mr. Campos - But I am only 20. But I do not have the good family news that Bruce had, I can share that since 2004, unfortunately, the Home Builder's Association had about 1,200 companies as members, and now we have about 450. That gives you a sense about how the economy is for our industry. But setting that aside and turning to the permit and specific provisions, I first want to thank the staff for all the outreach that they have done and the listening and the communication. Back in 2004, we got off to a bit of a rocky start in terms of communication with the regulated community, and I am happy that that was quickly and effectively remedied. And Sue Ma and Shin-Roei and Tom and Bruce and Dale have all done a very good job of reaching out and soliciting our views. With regards to the specifics, we also strongly support Board member Moore's comments and specific suggested amendments regarding engineering solutions in certain circumstances. We think it is appropriate. I would also echo the previous comments about biofiltration, and I do not know if there is a word "equally flummoxed, equiflummoxed," but I share the flummoxness of why that would be considered a less than ideal LID measure, and we would support elevating it, as well. I was pleased to hear at the outset Bruce and others in the staff refer to SB 310 as an exciting and potential new way of funding some

of these very important measures, and I would like to at least proclaim -- because it might be a surprise to many -- that that was our bill. The Home Builders actually sponsored that legislation. You might also be surprised to know that we actually had some pretty tense discussions with the State Board about whether or not they were going to oppose it. Fortunately, at the end of the day, they got on board and the bill has been signed. And we very much look forward to working with Water Board and the co-permittees to try to develop these watershed improvement plans, and get them the fee authority. We hope we wrote it to withstand the inevitable challenge from the Howard Jarvis Taxpayers Association over Prop. 218, we think we have, but that remains to be seen. So in closing, I would just say that I had planned to make a remark about the several references to the Ventura and LA permits as reasons for why San Francisco should be doing something. As a lifelong Northern Californian, my ears perked up at that a little bit, but I decided to bite my tongue and not comment on that. Thank you very much.

Vice Chair Young - All right, thank you. All right, we have James Scanlin and Gary Grimm, both from the same organization, so if you could try to -- sorry I did not call you together. I would appreciate it if you could share your time to the extent feasible. This is almost the end,

and then we will have Robert Falk, please.

Mr. Scanlin - Thank you, Madam Chair. Paul stole my line about gray hair and I really do have gray hair. I think I have been involved in every MRP for the last four and a half years, I think. I do not think I have missed one. No one will be happier than me to have this process finished and I also would like to thank staff, particularly Tom Mumley has really gotten involved since the May hearing and tried to push all this through, and we appreciate that. And I would like to make three brief and hopefully final comments on the MRP adoption. There have been significant additions to the Revised Tentative Order. Many of my member agencies were disappointed they did not have a chance to provide written comments, we realize people want to get this done, but that was something I have heard from our members. We appreciate that many of the changes reduced unnecessary costs, but this is still going to be very expensive and difficult permit to implement, even with those changes since the last Tentative Order. And on LID, like many others, I fully support Board member Moore's proposed edits and also his comment that biofiltration is superior to capturing rainwater. It is a holistic approach. We spent several years and a couple hundred thousand dollars developing a technically sound approach to manage increases in flow, so as not to cause downstream impacts. Your Board adopted

those provisions in 2007 and we are beginning to implement those. We have a model in place and a user interface that the developers are using now, and we think, in combination with biofiltration to remove pollutants, we have an outstanding approach to LID. And while capture may be appropriate in some areas, it should not be preferred over hydrogas management and biofiltration. And I do, in response to having a specific comment, I think we can do those things with -- I missed Dublin's comments, but I think he may have mentioned this, in C3C2BII, if we move biotreatment systems down to after "infiltration," and put in Board member Moore's comment, it would read "property engineered and maintained comparably effective treatment system may be considered only if it is infeasible to use these other approaches." And one of those other approaches would be biofiltration. And we are going to bring back the infeasibility criteria, already, so I think that would solve that problem. I do not know that we need 3, but I think 3 could, I guess, stay. So that is it.

Mr. Moore - And Mr. Scanlin brings up a good point, that my suggested language modified that presumption that biotreatment was a sub level in the LID hierarchy, by elevating biotreatment to the same level in the LID hierarchy, you have to then address the comparably effective treatment systems somehow.

Mr. Scanlin - Right.

Mr. Moore - He is good at this kind of thing.

Vice Chair Young - All right, we have Gary Grimm with the same organization. Thank you for sharing your time.

Mr. Grimm - Alameda County Clean Water Program. I am Gary Grimm, legal counsel for the program. Tremendous job, Tom Mumley and Water Board staff. Great effort. I have very little to say on the legal issues today, probably only to comment on last minute changes to the Order that you have before you today. Staff sent out a supplemental list of things last night. I mean, we got it ahead of time, we could see it, we could look at it, we do not have any objection to that, you know, it is typographical, it is clarification, it is simplicity, no problems. Board Member Young made a suggestion. You were very precise in identifying where it would go, what it would say, no problem there. However, with respect to the NRDC's suggestions, this is a major shift in direction, at least on the last day in this hearing, after four years of hearing process, or at least process with the staff. And to make that kind of shift would, I think, upset a delicate balance that has been achieved. If any person is concerned with what the permittees come back with as to a proposal for special projects or for infeasibility, that is going to come back to

the Board. I mean, a proposal has to come back to the Board for approval on special projects. People can state their objections at that time. And as Tom Mumley said earlier, there is always the opportunity to re-open the permit if unexpected circumstances come up. So that is it. Thank you.

Vice Chair Young - All right, thank you. There are no questions. Thank you, Mr. Grimm and Mr. Scanlin. We have Robert Falk next. Is he still here? All right. We wish him well in the friendly skies. I have a card here from Tom Dalziel with Contra Costa Clean Water Program, but the Contra Costa Clean Water Program, I think, already provided comments. Is that not correct? No. Okay, I had a card on another -- all right. You do not have to run, it is okay.

Mr. Dalziel - Tom Dalziel, Assistant Program Manager, Contra Costa Clean Water Program. I was not even planning on speaking today, but I just wanted to raise two quick points that perhaps will help you in your deliberations at the end of the day. The first one has to deal with the issue that has come up regarding the ability to go off-site to mitigate an impact on-site. We have been implementing LID in Contra Costa since 2005, over several hundred projects; I am only aware of one project where the applicant and the City, together, decided it was appropriate

to go off-site to do mitigation. The fact of the matter is, it is very difficult to do, no one wants to do it, particularly an applicant, especially two projects instead of one. So if there is concern that this is somehow some loophole, I assure you that that is not the case, and we have the ability right now in our existing permit to do off-site mitigation, and as I just explained, it has only been utilized once. I would urge you to continue to allow municipalities to ask for alternative off-site mitigation at a 1:1 because we want to have those rare circumstances, we want to have that ability to do that, but it is not something that is being done, so I encourage you just to keep the current -- as staff has proposed. The other one has to do with Steve Moore, your suggestion about providing perhaps a little more flexibility with respect to conventional controls, those that are existing and maybe yet to be discovered. I would say that you really do not have to make a decision on that today. We do have to come back with an infeasibility report on when biotreatment may not be available, we also have to come back to you with a proposal for when non-LID treatment devices might be appropriate and what types of projects, so I think staff took a legitimate approach essentially to pump that for another year, allow us to go back and work and submit a proposal to you for your consideration for the public review and consideration. That

is it. Thank you very much.

Vice Chair Young - Thank you. Additional questions? All right, well, we are done with the public testimony portion of this meeting. What we normally do now is to have -- provide the staff an opportunity to respond to specific comments, also provide an opportunity for Board questions and answers, provide an opportunity for Board memorializing, and then we take both. I am going to propose that, if this takes as much time as I think it is going to take, that we have probably a break at some point, and I would like for the staff to sort of consider it like a football game, you have got one time out, if you need to use it, let me know, I will let you call it.

Mr. Wolfe - Well, if you would like us to just start in on discussing some of the comments and points made, I think it would be appropriate to take a break now. If there are further things the Board wants to say before we present that, then that would be time to make a little break, just so we can try to order it and make sure that we are focused on pulling in all the comments.

Dr. Mumley - Some of the comments are in the record and we have already responded to them, so you want us to respond to everything that got brought up today, or are there ones that you particularly want us to be responsive to?

Vice Chair Young - We would like you to respond to the ones that you feel would be illuminating to have responses for in terms of --

Dr. Mumley - In a nutshell, there are not a lot from my perspective. There are a lot around the LID related ones which we talked about, so there is no way around specifically talking about those. There are a few non-LID stuff that we can probably bang bang bang, so I just want to be clear.

Vice Chair Young - Bruce, did you want to have some discussion and then take a break? I am just trying to clarify --

Mr. Wolfe - What I thought might provide us the opportunity is we can go down our list here quickly and sort of say we will touch on A, B, C, and D, and then come back and do that. So to be more focused, I think it would be appropriate to take a short break now and we can get our points together.

Vice Chair Young - Staff chooses to use its time out right now? We will be back in 10 minutes.

(Off the record at 2:21 p.m.)

(Back on the record at 2:38 p.m.)

Vice Chair Young - All right, thank you folks. I think staff appreciates having had time to prepare appropriate responses to all of your thoughtful comments.

So, Bruce, I will let you start off.

Mr. Wolfe - Well, we will not address every comment or concern raised because in a number of instances, we feel the Response to Comments document addresses those comments and there is really in our mind not much more to say, however, if there is something that Tom and I missed here, do bring it up. Let's go through somewhat in order in the permit. There were comments on C2, the first one being from San Jose about the Stormwater pump stations and the concern that, where there is discharge from a pump station that remains in the Stormwater collection system, it seems inappropriate to go through all the steps that we spell out there. So we agree to a point and suggest that, under C2DII2, where currently in the second sentence in 2, it says "DO monitoring is exempted where all discharge from a pump station infiltrates into a dry creek immediately downstream," that we add in the wording "remains in the Stormwater collection system," such that it would read "DO monitoring is exempted where all discharge from a pump station remains in the Stormwater collection system or infiltrates into a dry creek immediately downstream." And I think that addresses the concern because we recognize that, if that discharge from the pump station is not immediately reaching the water body, there is no need to monitor the DO in that instance.

Vice Chair Young - Did everyone follow that proposed language? Or does anyone need it repeated? No. It sounds like it was very clear. Thank you.

Mr. Wolfe - There was the comment also in C2E on rural roads about under C2EII2B, a suggestion of adding language in there relative to the funding. In our mind, that is not necessary because, right now it reads "Identification and prioritization of rural road maintenance on the basis of soil erosion, potential slope steepness, stream habitat resources." When you do your maintenance, you have funding. So when you do that maintenance, this is how you prioritize that maintenance. But obviously you would not start the maintenance if you do not have the funding. So, in my mind, there is already the opportunity here. We are trying to focus that it is not necessarily always a blanket. Maintenance that we know there are other things that go into considerations of when you do your maintenance based on the conditions, the road, but that this be considered as part of that, when agencies are developing their maintenance plans. Those are the two things in C2. I will let Tom start in to C3 where we had a number of points made.

Dr. Mumley - With the easy ones, thank you, Bruce. There are three main issues -- actually, regarding the LID stuff, and I am going to take two, and Bruce will take the

third. And the two I am going to take is what is considered LID, and then the consideration of biotreatment in that hierarchy, and two is our response to Board member Moore's suggested language on the "comparably effective treatment," and then the third has to do with the -- well, there actually are four, maybe -- the third is off-site 100 percent allowance, whatever, and then actually the fourth is the special projects issue, which we feel we pretty much resolved, expect there has been some request, like for San Jose, we want our special projects now. But I believe we are working backwards, we already addressed that we are not in a position to be specific about what special projects will be allowed, the best approach is as outlined. So that is that issue. So back to the first one, and we, staff, do have -- I guess we are aligned with the statements made about the value of biotreatment, however, we have reservations about, at this point in time, to change the language by putting it up there because there is a trickle down effect in terms of a lot of the resulting provisions, and I am not sure whether the potential aspect of that may not -- I think would outweigh the benefit, versus you would be making your statement into the record really clear that it is our intention to be supportive of biotreatment, recognizing that the other aspects of LID are part of starting at the source, doing things on-site, is the normal

course of action. So the way we have laid it out with the passive report on feasibility, we feel, is a reasonable way to maintain -- I guess to get it both ways -- that we take in consideration the other factors and we think that demonstration of feasibility will not be that onerous, and so our preference would be to leave the language as is relative to biotreatment. Now, on the issue of inserting language to allow for other types of treatment that are comparably effective, I would say, personally, I mean, I like the idea because, I mean, one, we want to promote innovation. To a big extent, I think, we are going to get that with "innovative biotreatment options continue to emerge." What we do have concerns about are alternatives that are not comparably effective, and I am just going to be frank, there is a lot of snake oil out there that we have had to deal with, and the municipalities have to deal with, and some of them are considered the least expensive alternatives, so let's do it, but there are issues about effectiveness and maintenance. And some commenters point out you have disposal issues with some of these things. So the good alternatives we like, the not so good alternatives, we do not like. And so a major concern that we have is that there is currently no independent -- you know, who makes the call -- there is no independent arbiter of what is comparably effective. So that is where it gets a little

troubling for some, and you heard some, you know, one permittee say they do not want to go there because it puts a burden on them to have to consider what is comparable instead of just saying we have figured out what we wanted to do, do not ask us to consider something different. Other municipalities welcome that independence and that flexibility, which translates to a burden somewhat on us because then we have to make sure that that discretion is exercised properly. And so that is a concern that we have -- what burden might that put on us? So that is a little bit of philosophical background. We would also say -- we also want to make it clear that, as I partially alluded to and I may restate and maybe emphasize -- is that these alternatives to biotreatment are fundamentally part of the trash and Mercury and PCBs and other pollutants of concern toolbox, as I said. So there is no exclusion there. So we are really just talking about the role -- these alternatives and the role of these alternatives in new and redevelopment, as we have crafted this provision, which, again, I kind of look at as opportunistic ways of improving runoff quality. And I am sort of getting defensive here on purpose because we are looking at the strain this decision may have on us, but if we do take this approach, we want to be really clear what is intended and what consequences are not intended. But from -- one of our other points is that the current

alternative compliance component that -- called the special projects provision, and it is important that we are very specific, staff, tell me which --

Mr. Wolfe - On CEII2, we do have bullets in place about the proposal due within one year, and the information that would be required as part of that. And that does -- the second bullet says "identification of institutional barriers and/or technical site-specific constraints to providing that LID treatment on-site that justified the allowance for non-LID treatment measures on site." And then the fourth bullet -- "identification of specific water quality and environmental benefits provided by these types of projects, that justify the allowance for non-LID treatment measures on-site." So the focus there certainly is non-LID treatment measures on-site, but it is in context of defining what are the special projects that would then each permittee would be implementing and try to provide some basis for where we are allowing non-LID; in other words, not saying that they would not be allowed, but having that basis spelled out.

Mr. Mumley - So -- thank you, Bruce. So I guess what we are saying -- our preference would be to not add the language because it opens this door that we are concerned about -- I guess it is in the presumed innocent approach is a good idea, to promote the -- create innovation. There are

these options that will work in the right situation. But we feel we can account for that in the special projects option. It says the special projects option requires Board action; we look at that as a way to -- we better address the concept of comparably equivalent because we could, through that exercise, make sure we are clear on what are the performance measures for which comparable equivalent would be judged, and at what procedures are, so there is a better safety net and it takes the burden off of us to have to take action, except from the context that, if municipalities put forward a good case for it, are we willing to promote it? Did I make that clear? So I guess then the only concern I have is how, well, I guess that -- our preference would be not to put it there, but to welcome it as part of the special project submittal that are forthcoming as a way to best fit how to implement it, and ensure that it is done properly and well and in a manageable fashion.

Mr. McGrath - I have a little bit more specific question, and it really was triggered in part by the tour of the green streets and efforts of the Estuary Project, particularly Baxter Creek. And that relates to the fact that, in some way, getting better cross connection across program areas with multi-purpose objectives may enhance both the effectiveness of what is happening and also the fundability. So in a couple of cases, Baxter Creek, which

had been a channelized creek and is a small creek, had been pulled out. Now, I was very persuaded by the comment by NRDC that it does not make sense to do something off-site in a site that will eventually be retrofitted, you have lost that opportunity. However, when you bring a municipality in a stream -- in a Stormwater to the table, all of a sudden you have more options that may be more cost-effective, as well as more effective. And in my mind, having a more cost-effective way of achieving the same benefit, I would choose that regardless of whether something on-site was feasible because I would look to ways that we can do this and have it really strongly supported by local government and have them see it as a way of saving money. I mean, ultimately the ability to do this in cost saving ways will give it legs and sustainability. So that is my interest. I have seen that in a couple of different segments specifically taking Baxter Creek out of channel there, gave them an opportunity to put in a giant trash wrack, reduce their problems of the storm drain backing up, reduce their flood damage, and, oh, by the way, have a working habitat. So it was a way of reducing costs. So I do not want to see efforts like that precluded. Can those be done in the manner that you have suggested, without any changes to this? In other words, can they qualify under C3E, or as special projects?

Mr. Wolfe - I think they can. I think, in fact,

some of the comments have been -- that were stifling this, and I do not think we are. Remember that there is no one-size-fits-all, and obviously there are not going to be opportunities to restore creeks, those certainly are special opportunities that we want to promote -- all opportunities. This ties in, to your mind, also into addressing some of the pollutants of concern issues where we are trying to look at opportunities to control trash, Mercury, PCBs, etc., inherently something like a trash control device is more of a retrofit, and so when we are looking at retrofit actions, and I would say a creek restoration is, to a certain degree, a retrofit. We are saying we have much broader options and we want to look at all of our options because we know one size does not fit all. We want to be able to apply all of those and get the most bang for the buck.

Mr. McGrath - So the staff's recommendation at this stage is that there is sufficient flexibility built into this system to incorporate both biotreatment, but not have a wholesale stampede to it, as well as innovative projects like stream restoration that could also accomplish the LID purposes?

Mr. Wolfe - Yeah, very much so.

Mr. McGrath - Thank you.

Dr. Mumley - And as you are segwaying into the next issue, which was the off-site --

Mr. Wolfe - Right.

Dr. Mumley - -- which overlaps in how you asked that question.

Mr. Wolfe - And as I say, the other issue that was brought up along this line is, should we allow opportunities for off-site projects without a expressed demonstration, and sort of starting from the back, Tom Dalziel, the last commenter, pointed out that we have had this opportunity already in the existing permits, yet they found that only one out of 500 projects chose the off-site. It goes back to what you just said about looking at the economics that, inevitably, folks are going to look at what makes most sense economically and we are finding that almost universally that is an on-site. However, we want to provide that opportunity for off-site and we do not want to add necessarily extra regulatory burden to do that demonstration. In fact, we do not see where that demonstration step really provides any water quality benefit; yet, on the flip side, it may potentially kill a project where there may be a benefit of an off-site project if we had that net environmental benefit -- almost like your other example there of, well, of Baxter Creek, of saying, if we could say there was that type of project in planning or under design, why wouldn't we want a project in the city of El Cerrito to consider putting some money into that, to hopefully put it over the line. So

there are instances where we would like to have a regional project because it does provide very significant net environmental benefits. So again, this is -- we are trying to provide some level of simplicity. We do not want to get caught up in the step of having too much demonstration on that. Oh, and one other issue on C3 that came up was concern by San Jose over their hydromodification management requirements. This harkens back to the fact that, as I said nearly six hours ago, that these permits evolved at a different step, and Santa Clara's was the first one that came in and first one to develop a hydromodification approach. We do attach the existing hydromodification control requirements to the permit. Each program is a little bit different. We knew, especially in Santa Clara County, that those programs would have to come up to the standard that is spelled out in C3G. This has been out there, in fact, for two or three years in this, that all of these were going to be essentially normalized. At this point, I do not see the need to provide extra time for something that has really been already out there for two or three years. And I think it is something that can be achieved, it is, again, trying to bring that consistency of application across the Board that we are trying to reach in this permit. So I would not be recommending a change in the timeframe of implementation on that.

Dr. Mumley - It is back to me. There is one point I would like to make regarding the special projects issue and that special projects is a component of C3E, it is C3Eii, Special Projects, and that is getting at the issue that San Jose raised about some of their unique redevelopment challenges and their other challenges that we have heard in the past other communities have, and there are about -- high density infill where feasibility, blah, blah, blah. The concern that San Jose and others have is that, yeah, we are giving them a year to come up with a proposal, and then we have a year to act on it and bring something to you for action, but delay is a fear, is a legitimate fear that they have because they have no certainty as to whether these projects where these actions will clearly not be feasible will still be held accountable for something that cannot be done. And so I think what I would suggest is that you make it clear in the record that you have no intention of putting anybody in such a compromise, and if we are engaged in constructive dialogue, when that dialogue is taking more time than it takes to get this back before you within that two-year period, that we may have a friendly amendment opportunity to allow more time. So ask for it, do not give it now, but allow for it to be asked for on the condition that we have a good faith effort to resolve the issue.

Vice Chair Young - So that we do not have to repeat that, I suspect that the Board can stipulate to that intention. Yes? I see no one objecting.

Dr. Mumley - I mean, I expect to see -- we are going to take a few moments after this action to catch our breath, but we expect to begin engaging with the municipalities, not everyone -- as I said before, not each and every one separately, but in a manner necessary to meet that optimum scheme that everybody has to have, and start working on this soon, so that we make this need a backstop, not the given. Okay? So moving on, let's see, I need to specifically respond to USEPA's request that we change the language that we inserted into the Mercury provision and it is specifically the opening paragraph -- it is in the Supplemental, so if you are going to look for it, you will find it in the Supplemental, and it is page 88 of the Supplemental, and EPA asked for this, and we put it in because it is informational, it is not intended to be a new requirement, because they have asked to be consistent -- they are asking that this be done in all permits in California, that they at least recognize the applicable TMDL and waste load allocations, and so Alexis was objecting to the use of the word "should" twice in this language, and you can see this in the underlined -- "this should be achieved by February 20, 2028," that is 20 years after it was

approved, and then there is an interim allocation to be met in 10 years, February 2018, that should. Well, this language here is verbatim from the Basin Plan Amendment, approved -- adopted by this Board and approved, so that is why -- I wrote it that way to be consistent. I understand why EPA would prefer to have it be "shall," but without getting into nuances of why it was "should" in the Basin Plan Amendment, it was a part to be addressed when necessary it would become a "shall," but I would say this is not the time or place to do that because it is adding an unnecessary bar to the dialogue here, and I am sure it would create consternation on the part of permittees to automatically see a "shall" appear the day before the permit is considered, because this would have an effect on future permit terms. So next permit term is when that first 10-year "should" will come into play and we will have to address it in that permit term, but the Basin Plan Amendment is always there, we have to implement requirements consistent with the Basin Plan Amendment and the like, so for informational purposes, I assert we have done it properly for now, recognizing EPA's interest in why they have asked for it differently, but for the record, that is our position.

Mr. McGrath - Can I ask a question of Dede? Dede, since the earliest possible compliance date on this is 2018 and this Order will have been renewed by then, does the term

"should" give us sufficient legal authority here to track reasonable progress towards those goals between now and the end of this permit period, and then adjust the term if necessary at the next permit compliance term? It is page 80, 2088 in the -- there are two "shoulds," and the first has to do with a deadline of February 2028, and the more -- the closer one is February 2018, which is nine years away.

Ms. Dickey - I think that the Board can require them to track their progress. I think that the Basin Plan may be amended between now and the next permit, and so the Board may be changing the permit then to conform to whatever the wording in the Basin Plan is at that time. But I think in the interim, I think the Board can clearly ask them to track their progress.

Mr. McGrath - And in this particular case, we continue to learn things about Mercury and particularly the in-Bay sources of Mercury, which I think are vital to what our strategies will be, so we do expect some -- so with all due respect, I think I am with the staff on this one.

Dr. Mumley - And there is one, maybe the last issue, related to that, Bay Keeper commented and we received this in writing, but I think it is an important issue to talk about right now, about the use of action levels and also, related to that, is how aggressive are these requirements related to Mercury and PCBs, which I was just

referring to. And why not take on an approach like we did with trash, that seems to be -- has this umbrella with certain times and, well, there is one big difference, it is a challenge, but we have much more certainty in our ability to solve the trash problem. The technology is clearly there. The technology for PCB and Mercury removal is still being considered, that is why we are taking the pilot approach, because we need to see how effective are these various approaches that we are calling for in this permit, before we go into mandating that there is a solution that can be implemented. So it is by design that we are using this permit term and you might recall, those of you who have heard the testimony, particularly for the PCBs TMDL, we talked about this phased approach, where we are in this phase that we have to aggressively evaluate the effectiveness of these various options, and then this information will allow us, presumably for next permit term, to move into a more focused, broader application of actions that would work, and then subsequent permit terms to fully implement to get the job done. So we are on course, in accordance with how the Mercury TMDL and PCB TMDL were crafted with this language. So I feel we are being as aggressive as we expected, and it is, as you have heard from the municipalities, there are still significant costs with implementing these pilots, let alone going beyond them. On

the issue of municipal action levels, I am a huge fan of the concept, and I definitely appreciate the effort that the State Board went through where they convened an expert panel, and the panel came up with a logical concept of action levels, which are not numerical effluent limits, but they are levels that say if you find levels in your runoff, higher or lower, depending on how the action level is, it means you should take action. There is something that you should be doing. And that makes good sense. And it is our intention to ultimately have action levels to drive programs because they are good performance measures. The difficulty is in coming up with them. And, if you will, an outgrowth of the pilot studies that are called for in the PCB and Mercury sections could be a basis for determining action levels, because we know that what works under what level, the runoff quality and the like, so I wanted to say, we embrace the concept, we are just not ready to implement them now, and we would, again, commit to working towards having them in subsequent permit terms. I believe we will start seeing them in the trash arena because of our lessons learned as a performance measure, and in other areas, whether it be managing pesticides, or managing Mercury, PCBs, etc. So they are the future, we are not resisting them, we are just saying the time -- we are not ready yet. But we continue to welcome the challenge to pursue that

path.

Mr. Wolfe - One final -- I think it is the final, unless you tell us something we did not respond to -- was East Bay MUD's comment about permitting for potable water discharges, and as we noted, this is somewhat associated with the issue initially considered today on Orinda Water Treatment Plant in C15, there is a section on planned, unplanned, and emergency discharges of the potable water system. We did make the change recognizing the comments that, where permittees are not water purveyors, it is really cumbersome to require -- for them to require, those water purveyors who are not also permittees, to implement these measures. So we essentially did narrow what is in this permit to only those permittees that are also potable water purveyors. We do recognize, then, the issue that those potable water purveyors are not covered essentially by this permit, and in some cases by no permit. And so East Bay MUD said, "Is it your intention to bring a permit before the Board to cover this?" And, yes, it is staff's intention to do so. We are actually working through that, as we have done essentially through looking initially at the water treatment facilities, but now we are looking at what are the other potential sources of potable water discharge. That could reach either storm drain system or waters in the state, and so that is our intention, and essentially it is

also our intention to follow the approach that is outlined in here. But I do not think there is any need to make any change in here, it is just something we will be doing potentially with some of the same staff who have been working on this. With that, I would be happy to hear from the Board if there are things that you heard that you want us to either respond to, or discuss further.

Vice Chair Young - Yeah, are there issues that the staff did not cover just now, that you would like to ask questions about? Dr. Singh.

Dr. Singh - Well, I thank you for answering some of the questions raised over here. I have two questions and I need clarification, maybe consider that I am very novice on this one. I went through the entire document and did not make any comment about economics anywhere. I did not see it, anyway. I do not know if it was necessary on this permit, TMDLs, to make a comment about the cost of the implementation, or economics should be considered legally or not considered, I do not know. But I did not find any section over here in the document on that. And the second question I have --

Vice Chair Young - All right, let's do question 1. Ms. Dickey, did you want to --

Dr. Mumley - Well, let me start first and then Dede can weigh in legally. But there is nothing in the

permit explicitly regarding economics because -- and pardon me, there are some legal reasons for this, but the nature of the requirements have taken into consideration to the extent we can consider economics, in terms of feasibility. And as I spoke to this in my presentation this time, as well as back in May, how we are well aware of the cost consequences of this, and why we have accounted for it in terms of allowing ramp-up time, and level of effort, and expectations of looking for funding mechanisms, we know there are competing priorities in municipalities. But we cannot say -- we talked about this -- we cannot say you do not have to do something, but we have the ability to provide as reasonable time to do that. In the Response to Comments, we definitely addressed numerous commenters' concerns about economics. In our staff report, both in May and in this one, we also write about recognizing those challenges and how we have done the best we can to balance that cost issue with the water quality drivers that we are obligated to implement, or I should say, you are obligated to consider when you issue a permit. So the best I can say, Dr. Singh, is that we have considered the economic challenges over and over and over again in trying to come up with this permit in the way we are recommending what we recommended for you.

Dr. Singh - I have one more question. This is, again, some of the people I heard saying prioritization

because they say there are so many things required under this NPDES permit system, and it is going to be difficult to implement, and for some people it will be costly, so their priority of which should be done first, or which should be done second, and I am not saying you should include that, but I would like to have your comment why you did not prioritize what actions should follow one after another, why you left it open, so an answer to some of the comments I heard.

Mr. Wolfe - Well, I would say we feel that where we are now is really -- it is not quite barebones, but it is the lowest level of what really is required to be in compliance with federal law for a Stormwater permit. And essentially all of these provisions are required. I cannot necessarily tell someone not to comply with the provision that is in here, so inherently there is difficulty saying, "Oh, yes, do that one, but not that one." We have tried to provide that prioritization in effect by providing some implementation ramp-up periods, some opportunity to work into these requirements, chances to check back in. Certainly, the provision C17 provides an opportunity should there be an intended consequences or other unknown factors to revisit, re-open, and re-work this. I would say the other component, though, is that we are hopeful, and I think this even harkens back to our very first commenter, Geoff

Brosseau, when he mentioned that he feels the region-wide permit is the appropriate approach which allows savings of resources because there will be more consistency and collaborative approaches, and I think especially in the monitoring, the C8 through C14, we have really tried to design this in a fashion that it will be done collaboratively, a lot of that monitoring will be done through the regional monitoring program, approaches that can be region-wide, so there is one consistent effort region-wide, rather than 76 different small approaches. That is an over-statement because the programs, by and large, have been with themselves coordinating and working together as BASMAA, but as Geoff even noted, when the requirements in the past have been phased differently, it has been difficult at times to get everybody within BASMAA on the same page. This, we think, is a major step on getting everybody on the same page and getting some consistency of the approaches. And also, recognize not only do we have to reopen our capability, but the permits are intended to be reissued every five years. Yes, because of our ramp-up time to get this region-wide permit, Contra Costa, and San Mateo's permits had not been reissued since 1999, so essentially 10 years, that is thank you to Alexis for keeping somewhat quiet on that, but she has sort of been tapping her foot over the years, of getting this permit reissued. And that is really one of our strong

mechanisms, that as we learn more, as we learn what works and what are the challenges, the barriers, including cost, then we adjust as we move forward in the permitting. So as we say, it is something that is very steadfast in front of us because we recognize the challenges and we are working with all of the stakeholders on a regular basis.

Vice Chair Young - Okay. Something new, Jim?

Mr. McGrath - I think it just may be appropriate to put the staff recommendation before the Board at this time.

Vice Chair Young - We are thinking similarly, unless Mr. Eliahu has a new question.

Mr. Eliahu - I would like to make a motion, you know, I like the Tentative Order, I think it is reasonable, inclusive, but I would like to adopt it now as it is, with the Supplemental, but delay employment by one year.

Vice Chair Young - Delay implementation.

Mr. Eliahu - Delay implementation by one year.

Mr. Wolfe - I guess I would not recommend that. I am sure there is some legal concerns over having a delayed effective date like that, but I think we are really expecting these measures, in fact, the parties really are wanting to move forward on implementation and in some instances have been holding off on doing their implementation until the permit is adopted -- obviously, by

having an effective date out there, that does not mean they cannot start implementation earlier, but I think it is still something that, in many cases, provides the permittees that certainty of being then able to go to their Councils or Boards and say, "This is what the permit says, this is our next step." So I would not recommend that. I think that somewhat spins our wheels, especially in areas such as the pollutants of concerns implementation there that slows us down, where we already have a TMDL that says we have to achieve things by a certain time, and that has the risk of slowing us down at the upfront, as Tom said, you know, if you are not aggressively involved on a collaborative basis now, you might have to pay us more at the end, then that might set all permittees up to pay us more at the end.

Mr. Eliahu - Well, the state of the economy, or the state of the cities is such that, really, going backward, they cannot have it, they cannot afford it. What are you going to do?

Mr. Wolfe - Well, there already is --

Vice Chair Young - What I would like to do at this point is to have the staff recommendation, then get a motion on the floor.

Mr. McGrath - I would move the staff recommendation, as is, without changes since they have not modified it, except in the ways they modified it in their

response, and I would incorporate those, but no others that have been discussed yet.

Vice Chair Young - All right, let's clarify. You would move to adopt the Order, the Supplemental, and the proposed insertion in Section C2 that --

Mr. McGrath - That Bruce made in the response, yes.

Mr. Wolfe - In C2DII2.

Vice Chair Young - All right, is that motion clear to everyone? We have a second on the motion. Now we can discuss the motion and take amendments if we wish.

Dr. Singh - I would like to say something over here. I do not know what are the requirements, you know, when to adopt it, and implement it, but with due respect to our Board member, Mr. Eliahu, I would like to say I understand his concern. He thinks that this is a bad economics time and cities and counties cannot afford to implement it, and so he requested that, and I completely understand it. But at the same time, one good thing I would like to say, my friend, is that it seems like the whole staff and the entire Board is very flexible, and they will be reasonable in implementing and even reopening and it is kind of a flexible system, adaptable, and a timeframe over here is -- and also maybe we will go slow, I would like to request the staff to implementation, in considering the

sentiment of our friend over here, you go slow initially and those jurisdictions that want to implement and start moving on it, allow them to move, but I understand his feeling. But at this moment, I will say that we just go ahead and adopt it. It has been a large effort. So I will second the motion.

Vice Chair Young - We already have a second to the motion that is on the table. I think the question -- one question is whether there are any amendments that people would like to propose to that motion.

Ms. Dickey - If I may speak to that, I think at various times during today's hearing, Board members have talked about amendments. I heard Mr. Eliahu propose one now, I heard Mr. Moore propose one earlier. I think this would be the time if Mr. Eliahu wants to propose a motion to delay the implementation dates, this would be the time to speak up with such a proposed amendment.

Vice Chair Young - Yes, that was what I was trying to get to, is if Mr. Eliahu, or Mr. Moore, you wish to re-proposed your suggestions in the form of an amendment to the motion that is on the floor, now is the time to do it. We will see if there is a second, then we would discuss it and we would -- somebody will have to help me -- vote on in some order on all of this stuff.

Ms. Dickey - It appears according to your Rules of

Procedure, you would vote on one of those amendments at a time.

Vice Chair Young - One amendment at a time, okay.

Mr. Eliahu - One amendment at a time.

Dr. Singh - Let's discuss --

Vice Chair Young - Wait. We do not have any amendments yet.

Dr. Singh - There is an amendment on the floor, is there not?

Vice Chair Young - No.

Dr. Singh - Mr. Eliahu?

Vice Chair Young - No, his was a suggestion.

Ms. Dickey - I misspoke, once an amendment is on the floor, and it has been seconded, then another amendment can be proposed to amend that amendment. But after that, no.

Vice Chair Young - Do you want to propose a formal amendment?

Mr. Eliahu - Yeah, my formal amendment is to delay to adopt the Order as it is, but to delay action by one year, to delay implementation by one year.

Vice Chair Young - Is there anyone who is interested in seconding that Amendment?

Dr. Singh - Let me request my friend to modify his amendment, and then I will support him. I will request him

that, if you say that we should adopt this motion on the floor, with the provision that staff is ordered to go slow during the first year in implementing this provision, considering the economic difficulties. Maybe something like that, that you can adopt, you change the language --

Vice Chair Young - I think we are not exactly going according to procedure now.

Mr. Eliahu - I can change the language, I do not care.

Dr. Singh - I will consider the economic difficulties of the cities and jurisdictions during the first year, and with that provision, we adopt this motion, then I will second it.

Ms. Dickey - I think the procedure here is, as I understand it, is if someone wants to second Board member Eliahu's amendment, then any member can then go ahead and offer an amendment to Mr. Eliahu's amendment and see if there is a second on that. And at that point, it would be appropriate to take a vote.

Vice Chair Young - So where we are now is that we have a motion on the floor with the staff amendment --

Mr. Eliahu - If you want to modify it, go ahead.

Vice Chair Young - Now, first you have to second it. If you wish to discuss it further, someone has to second Mr. Eliahu's motion. Would anyone like to second it?

Dr. Singh - I do not want him to go alone, okay, so I will support him. I will second the motion. Then, what I would like to do, then I will request to modify the motion. Okay, can I do that?

Vice Chair Young - Yes.

Dr. Singh - I would like to change the language. I would like to write, "We order the staff -- the Board orders the staff that, during the first year, they should take into account the economic difficulties of the cities and jurisdictions in implementing the Stormwater TMDL over here." So that will kind of -- they will have to consider that in implementing during the first year. So should I say that? Will you accept that one?

Mr. Eliahu - I second. That is your motion, I second that motion.

Dr. Singh - Okay, then I will support you, but I do not want to leave you alone, okay?

Ms. Dickey - At this point, the Board may want to consider whether or not the motion before them seems sufficiently clear that it would provide clear direction to the staff, to the regulated public, and the public at large.

Vice Chair Young - What --

Dr. Singh - Let me speak in support of this motion now.

Vice Chair Young - Just a minute, Mr. Singh,

please. Is it possible for us to discuss this motion and amendment, vote on the motion and amendment, as a singular entity? And then go back to discussing any other amendments that we want?

Ms. Dickey - Yes, I believe you vote first on the motion as amended; I believe if that fails, then you would go back to Mr. Eliahu's amendment, and then you would go back to the original motion.

Mr. Peacock - May we just clarify that? I believe you vote on Mr. Singh's amendment first, then you vote on Mr. Eliahu's amendment, and then you vote on the original motion.

Ms. Dickey - We are on the same page, Mr. Peacock.

Mr. Peacock - Wonderful.

Ms. Dickey - That you for stating it more clearly than I did.

Mr. Peacock - No Constitutional crisis.

Vice Chair Young - We are going to have the opportunity to discuss the amended amendment. Mr. McGrath.

Mr. McGrath - And my comment, I appreciate the economic difficulties, and I hear them in my city, but nevertheless, I cannot support this amendment for a number of reasons. First of all, there are provisions here that I believe need to go into enforcement immediately, particularly the LID and the hydromodification. Those have

been in the works pretty much all of my career, and it is definitely time to move those. And the fact that the building industry is not building actively right now means that incorporating those into projects, I do not think, bears much economic consequence at all. There is a provision for grandfathering projects that are truly too far down the road. So in terms of the LID, I would object to that. Second, I think it is time to begin to plan how you are going to meet the trash and Stormwater mandates. They have been debated in the public arena for over 25 years that I am aware of. And while I think our staff and our Board would recognize the feasibility issues for the rate of progress, nevertheless, to begin the progress at this time, I think, is essential. So I cannot support the amendment.

Vice Chair Young - Mr. Peacock, comment?

Mr. Peacock - As sympathetic as I am to the amendment to the amendment, I also would like to call your attention and discussion of this. The testimony, under oath, that Mr. Mumley set forth, that throughout every page of this document they considered the economic impact, he testified to that fact, the entire staff, there was no headshaking that they did not do that, and so I think that, as sympathetic as I am to the plight of communities, and we heard that in one of our earlier Board sessions, elected official after elected official after elected official came

up and discussed it, I do not know how you can do it any better than the way it has been set forth originally here. So with all due respect to my two colleagues, I cannot support the amendment to the amendment, either.

Vice Chair Young - Mr. Moore, do you have a comment?

Mr. Moore - Yeah, just echo my respectful disagreement with the amendment to the amendment. The way I look at this is we have momentum, we have built partnership, we have a lot of common ground in this and putting delays in implementation will be kind of a letdown for a lot of people. So I cannot support that.

Vice Chair Young - All right, I would --

Dr. Singh - I would like to speak a little bit in favor of it, but first you were going to say something.

Vice Chair Young - I join the ranks of my colleagues who are not supportive of the amendment and I would just point out that, in the version that we have before us, many of the timetables, many of the dates have already been set back for various reasons, but including concerns about the economics of implementation. So I feel that the staff has already, in effect, done much of what you are asking.

Dr. Singh - I would like to say a few words over here. I move this motion -- in fact, I wrote it down in

proper language out of respect for Mr. Eliahu and his concern. He talked to me during the recess that he was concerned, and he also heard some cities, you know, in reality this is what is going to happen. Cities are going to be a little slow. A major jurisdiction will be slow in implementing. First of all, they have to understand all these big provisions, they have to figure it out and move slowly, and then they have to face the economic reality. So this provision on what we are trying to do, just face the reality of life as it stands today and the language I had over the staff in order to slow the implementation of the provisions of our Regional Stormwater NPDES Permit, considering the economic difficulties of jurisdictions, that language is simply saying be practical in implementing during the first year. And that is what is going to happen, so I -- just by passing this whole motion, we are really putting in force today, and this was in a sense -- I did it, but I can see that Board is not ready to vote on this, on our sentiment, but I tell you the truth, I am happy that I tried to support my friend and I stood with him.

Vice Chair Young - All right, my sense is that there is no further discussion required, but what we should do is to --

Mr. Peacock - Madam Chair, I call the question.

Vice Chair Young - Call the question on Mr.

Singh's amendment to Mr. Eliahu's amendment -- proposed amendment. Did I get that right? And we will have a roll call vote.

Ms. Tryon - Mr. Eliahu - Aye; Mr. McGrath - No; Mr. Moore - No; Mr. Peacock - No; Dr. Singh - Yes; Dr. Young - No.

Vice Chair Young - Now, I would like to call the question on Mr. Eliahu's proposed amendment with a roll call vote.

Ms. Tryon - Mr. Eliahu - Aye; Mr. McGrath - No; Mr. Moore - No; Mr. Peacock - No; Dr. Singh - Abstain; Dr. Young - No.

Vice Chair Young - All right, that puts us back to where we were earlier with the motion on the floor to accept the staff recommendation.

Mr. Peacock - Madam Chair, I call the question.

Mr. McGrath - May I make a comment about economics before we --

Mr. Peacock - The question has been called.

Mr. McGrath - Okay.

Vice Chair Young - Since we so rarely get to utilize these rules of order, we need a little bit of a moment to consult our attorney. If other Board members want to have additional discussion prior to the vote, what is your advice to those members?

Ms. Dickey - I have to say, I have never seen a Board in this position, so I am caught a little bit off guard here. I think it is certainly within the sort of collegial nature of the way the Board does things to entertain some Board discussion. There has been quite a bit of discussion on the amendments, but I do not think there has been a whole lot of discussion on the main motion, and it is still unclear to me whether another member wanted to make a motion to amend the main motion.

Vice Chair Young - Mr. Peacock, out of the sense of collegiality and acknowledging the mass confusion behind the rostrum here, would you be willing to uncall your question for a moment, so we can have a little more discussion?

Mr. Peacock - I would certainly be willing to permit further discussion, but I think we are getting to the point of ad nauseam, so let's do it very briefly.

Vice Chair Young - All right, let's have a brief collegial discussion here. Mr. Moore, I think you have been waiting in line for quite a while.

Mr. Moore - Thank you, I appreciate it. Fellow Board members, I appreciate the opportunity to discuss the motion on the floor. Because I was the one who suggested language on a potential amendment, and you will note that I did not pursue that, I feel for the record that I am owed

the opportunity to discuss this further, and to clarify my expectations as a Board member. And my understanding with staff, and I want to make sure that we are on the same page, what I heard in terms -- because I think what this comes back to is, as I have stated, it is already in today's record, that I support the LID first approach to development, certainly. And to redevelopment, yes, where feasible. There is still a concern just on how the permit has been structured to sort of the layperson permittee will read this and say, "Well, those options are off the table," because it is buried, okay? It is buried. And I had a lot of support in this hearing for my proposed language. And so I want to acknowledge, though, that there is a path to flexibility. I do want to acknowledge Dr. Mumley's comment. And in the global sense of moving forward with this Order, I am supportive of the motion on the floor. But the key reports that are coming, I have high expectations for because, you know, not to diminish the concept, but we are kicking the can down the road on the matter of what is LID, is there a cast system within LID, is there a cast system within Stormwater treatment? You see, we are treading in dangerous territory here, from my perspective, in specifying the method and manner of compliance. This Water Board sets requirements based on performance, environmental protection, not how you get there. And I think the comments from NRDC

and EPA push us dangerously too far into being proscriptive about what things are going to work. But, I acknowledge that there is a pathway that will keep innovation open, keep flexibility open for the projects that the City of Mountain View discussed, the downtown redevelopments, which again I will reiterate, we boldly required LID for that type of work, and we will stick by that. So I will just say that the key two reports and the key dates in this proposed order are on page 27, CI2B4, due on May 1st, 2011, page 27, it is 19 months from now, we are going to find out about the infeasibility criteria for LID, as has been defined in this Tentative Order, as not including biotreatment in line with other important ways to do Low Impact Development. In that report, which I expect to be a regional effort, I expect the physical and chemical treatment processes that can protect the environment to be considered and not given short shrift as it has in this order. It is a long pathway to get those approved, and it rubs me the wrong way. And the second key report is on page 33, C.3.E.ii2. This is under Special Projects. There is a report due in 14 months, December 1st, 2010. And again, this touches on the issue that the City of San Jose brought up specifically, but it identifies the types of projects that will be proposed for LID credits, and identifies institutional technical barriers. These are key reports that we need to collaborate on to really, you know,

resolve this existing tension in the existing Tentative Order. They need to be collaborative, we need to bring all perspectives to the table, but recognize sort of there is a paper world, and a real world. There are these paper requirements that are going through, but we touched on some of the real world factors, you know, a developer is not going to take on the liability of a second development site for an off-site mitigation, there is no Super Highway off-ramp in this permit, okay -- and in the real world, as Tom Dalziel at Contra Costa pointed out. So let's be realistic about true, real world incentives that are out there, and not get into a tailspin about what if, when "what if" is really a fantastic notion and has nothing to do with reality. So these two key reports, I have high expectations for a regional collaborative and, you know, I am putting that out there because I think we are in danger of throwing the baby out with the bathwater on potential technical solutions to treat urban Stormwater. Thank you.

Vice Chair Young - All right, thank you for those comments. Mr. McGrath, you have --

Mr. McGrath - I am going to be brief, but I want to talk to the economics of this project, and I will start with an analogy. When I worked for the Port of Oakland, we agreed to put $2 million into mitigating truck commissions. And we did not have any real good idea how we were going to

do that, or how many trucks, it was not going to be the whole trucks, that program is now up to $22 million. And it will help re-do submission for most of those. Now, I am not trying to peddle loaf and fishes here and say that, you know, if you do it, the money will come, but I am trying to say that when you start down a program with very specifics, you will uncover other funding sources, and I think that is the case here. And I want people to look broadly, and I want there to be flexibility. There will need to be investment in our Stormwater systems. They were designed many years ago, many of them are very old, they were designed frequently using rational method that does not reflect the climate change we are seeing, or the sea level rise we are seeing. And flooding is going to get worse. The opportunity to use this permit and that need together and compete for funds for adaptation is what I want to encourage people to do. On our part, I think we will work to make sure that benefits to flood control systems, that help implement this as part of the next Coastal Conservancy Bond issue; so once the rules are drawn and we recognize that funding has to be sought, we will work to try to develop that funding. So that is my pledge to you, but that is also the context, I think, of the economics of the moment.

Vice Chair Young - All right. I had a few

comments I was -- would you like to speak? I had a few comments I was going to make, and you will be happy to know I am not going to make them, so we can get out of here.

Mr. Peacock - Madam Chair, I happily call the question, then.

Vice Chair Young - I did want to just say, though, that from my perspective, the permit that we are voting on right now is much improved over the original version, and I think we owe a debt of gratitude for that to all of the folks who commented and were so diligent about bringing us their views, particularly to the staff who worked very very hard on this, and also to the Board members who tried to very carefully sift through all of the ins and outs, and with that, I would like to ask for a roll call vote.

Ms. Tryon - Mr. Eliahu - No; Mr. McGrath - Aye; Mr. Moore - Aye; Mr. Peacock - Aye; Dr. Singh - Aye; Dr. Young - Aye.

Vice Chair Young - The motion passed. We have a new permit. Thank you, everyone. I think we are not quite adjourned yet, though. Do we have any --

Mr. Wolfe - We do not have anything else, to my knowledge.

Vice Chair Young - All right, then we are adjourned. Thank you very much, everyone.

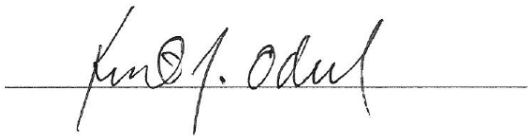
(Adjourned at 3:46 p.m.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of July, 2016.



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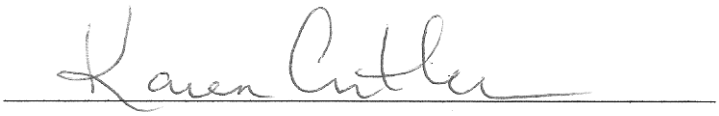
TRANSCRIBER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified transcriber and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of July, 2016.



Karen Cutler
Certified Transcriber
AAERT No. CET**D-723

California Regional Water Quality Control Board
San Francisco Bay Region
Municipal Regional Stormwater NPDES Permit

Order R2-2009-0074
NPDES Permit No. CAS612008
October 14, 2009

California Regional Water Quality Control Board
San Francisco Bay Region
Municipal Regional Stormwater NPDES Permit

ORDER R2-2009-0074
NPDES PERMIT NO. CAS612008

Issuing Waste Discharge Requirements and National Pollutant Discharge Elimination System (NPDES) Permit for the discharge of stormwater runoff from the municipal separate storm sewer systems (MS4s) of the following jurisdictions and entities, which are permitted under this San Francisco Bay Municipal Regional Stormwater Permit (MRP):

The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County, the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District, which have joined together to form the Alameda Countywide Clean Water Program (Alameda Permittees)

The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, the Contra Costa County Flood Control and Water Conservation District, which have joined together to form the Contra Costa Clean Water Program (Contra Costa Permittees)

The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District, and Santa Clara County, which have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (Santa Clara Permittees)

The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco, the towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the San Mateo County Flood Control District, and San Mateo County, which have joined together to form the San Mateo Countywide Water Pollution Prevention Program (San Mateo Permittees)

The cities of Fairfield and Suisun City, which have joined together to form the Fairfield-Suisun Urban Runoff Management Program (Fairfield-Suisun Permittees)

The City of Vallejo and the Vallejo Sanitation and Flood Control District (Vallejo Permittees)

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Attachment K: Standard NPDES Stormwater Permit Provisions

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter referred to as the Water Board) finds that:

FINDINGS

Incorporation of Fact Sheet

1. The Fact Sheet for the San Francisco Bay Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (Appendix I) includes cited regulatory and legal references and additional explanatory information in support of the requirements of this Permit. This information, including any supplements thereto, and any response to comments on the Tentative Orders, is hereby incorporated by reference.

Existing Permits

2. **Alameda County—**The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County (Unincorporated area), the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District have joined together to form the Alameda Countywide Clean Water Program (hereinafter collectively referred to as the Alameda Permittees) and have submitted a permit application (Report of Waste Discharge), dated July 26, 2007, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Alameda Permittees' jurisdictions. The Alameda Permittees are currently subject to NPDES Permit No. CAS0029831 issued by Order No. R2-2003-0021 on February 19, 2003, and amended by Order No. R2-2007-0025 on March 14, 2007, to the Alameda Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

3. **Contra Costa County—**The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, and the Contra Costa County Flood Control and Water Conservation District have joined together to form the Contra Costa Clean Water Program (hereinafter collectively referred to as the Contra Costa Permittees) and have submitted a permit application (Report of Waste Discharge), dated September 30, 2003, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Contra Costa Permittees' jurisdictions. The Contra Costa Permittees are currently subject to NPDES Permit No. CAS0029912 issued by Order No. 99-058 on July 21, 1999, amended by Order No. R2-2003-0022 on February 9, 2003, amended by Order Nos. R2-2004-059 and R2-2004-0061 on July 21, 2004, and amended by Order No. R2-2006-0050 on July 12, 2006, to the Contra Costa Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

4. **San Mateo County—**The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco, the towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the San Mateo County Flood Control District and San Mateo County have joined together to form the San Mateo Countywide Water Pollution Prevention

Program (hereinafter collectively referred to as the San Mateo Permittees) and have submitted a permit application (Report of Waste Discharge), dated January 23, 2004, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the San Mateo Permittees' jurisdictions. The San Mateo Permittees are currently subject to NPDES Permit No. CAS0029921 issued by Order No. 99-059 on July 21, 1999, amended by Order No. R2-2003-0023 on February 19, 2003, amended by Order Nos. R2-2004-0060 and R2-2004-0062 on July 21, 2004, and amended by Order R2-2007-0027 on March 14, 2007, to the San Mateo Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

5. **Santa Clara County—**The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District, and the County of Santa Clara have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (hereinafter collectively referred to as the Santa Clara Permittees) and have submitted a permit application (Report of Waste Discharge), dated February 25, 2005, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Santa Clara Permittees' jurisdictions. The Santa Clara Permittees are currently subject to NPDES Permit No. CAS029718 issued by Order No. 01-024 on April 21, 2001, amended by Order No. 01-119 on October 17, 2001, and Order No. R2-2005-0035 on July 20, 2005, to the Santa Clara Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

6. **Fairfield-Suisun—**The cities of Fairfield and Suisun City have joined together to form the Fairfield-Suisun Urban Runoff Management Program (hereinafter referred to as the Fairfield-Suisun Permittees) and have submitted a permit application (Report of Waste Discharge), dated October 17, 2007, for reissuance of their waste discharge requirements under the NPDES permit to discharge stormwater runoff from storm drains and watercourses within the Fairfield-Suisun Permittees' jurisdictions. The Fairfield-Suisun Permittees are currently subject to NPDES Permit No. CAS0612005 issued by Order No. R2-2003-0034 on April 16, 2003, and amended by Order R2-2007-0026 on March 14, 2007, to the Fairfield-Suisun Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

7. **Vallejo—**The City of Vallejo and the Vallejo Sanitary District (hereinafter referred to as the Vallejo Permittees) are currently subject to NPDES Permit No. CAS612006 issued by the United States Environmental Protection Agency (USEPA) on April 27, 1999, and that became effective on May 30, 1999, for the discharge of stormwater runoff from storm drains and watercourses within the Vallejo Permittees' jurisdictions.

8. The Alameda, Contra Costa, San Mateo, Santa Clara, Fairfield-Suisun, and Vallejo Permittees are hereinafter referred to in this Order as the Permittees.

Applicable Federal, State and Regional Regulations

9. Section 402(p) of the federal Clean Water Act (CWA), as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, USEPA published regulations (40 CFR Part 122), which prescribe permit application requirements for MS4s pursuant to CWA 402(p). On May 17, 1996, USEPA published an Interpretive Policy

Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s.

10. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board (State Board), Office of Administrative Law and the USEPA, where required.

11. The Water Board finds stormwater discharges from urban and developing areas in the San Francisco Bay Region to be significant sources of certain pollutants that cause or may be causing or threatening to cause or contribute to water quality impairment in waters of the Region. Furthermore, as delineated in the CWA section 303(d) list, the Water Board has found that there is a reasonable potential that municipal stormwater discharges cause or may cause or contribute to an excursion above water quality standards for the following pollutants: mercury, PCBs, furans, dieldrin, chlordane, DDT, and selenium in San Francisco Bay segments; pesticide associated toxicity in all urban creeks; and trash and low dissolved oxygen in Lake Merritt, in Alameda County. In accordance with CWA section 303(d), the Water Board is required to establish TMDLs for these pollutants to these waters to gradually eliminate impairment and attain water quality standards. Therefore, certain early pollutant control actions and further pollutant impact assessments by the Permittees are warranted and required pursuant to this Order.

12. The San Francisco Estuary Project, established pursuant to CWA Section 320, culminated in June 1993 with completion of its Comprehensive Conservation and Management Plan (CCMP) for the preservation, restoration, and enhancement of the San Francisco Bay-Delta Estuary. The 2007 update of the CCMP includes new and revised actions, while retaining many of the original plan's actions. The CCMP includes recommended actions in the areas of aquatic resources, wildlife, wetlands, water use, pollution prevention and reduction, dredging and waterway modification, land use, public involvement and education, and research and monitoring. Recommended actions which may, in part, be addressed through implementation of this Permit include, but are not limited to, the following:

    (1) ACTION AR-9.1 (New 2007)
    Improve understanding of sources, types, and impacts of marine debris in the Estuary.

    (5) ACTION AR-9.2 (New 2007)
    Expand existing marine debris prevention and cleanup programs and develop new initiatives to reduce discharge of debris to waterways.

    (10) ACTION PO-1.2 (Revised 2007)
    Recommend institutional and financial changes needed to place more focus on pollution prevention.

    (12) ACTION PO-1.6 (Revised 2007)
    Implement a comprehensive strategy to reduce pesticides coming into the Estuary.

    (13) ACTION PO-1.7.1 (New 2007)
    Develop product stewardship program for new commercial products to minimize future pollutant releases.

(14) ACTION PO-1.8 (New 2007)
Develop and implement programs to prevent pollution of the Estuary by other harmful pollutants like trash, bacteria, sediments, and nutrients.

(15) ACTION PO-2.1 (Revised 2007)
Pursue a mass emissions strategy to reduce pollutant discharges into the Estuary from point and nonpoint sources and to address the accumulation of pollutants in estuarine organisms and sediments.

(16) ACTION PO-2.4 (Revised 2007)
Improve the management and control of urban runoff from public and private sources.

(18) ACTION PO-3.3 (New 2007)
Accomplish large-scale improvements to Bay-Delta area infrastructure and implement pollution prevention strategies to prevent pollution threats to public health and wildlife.

(19) ACTION PO-4.1 (New 2007)
Increase regulatory incentives for municipalities, through urban runoff and other programs, to invest in projects that restore or enhance stream and wetland functions.

(20) ACTION LU-1.1 (Revised 2007)
Local land use jurisdiction's General Plans should incorporate watershed protection goals for wetlands and stream environments and to reduce pollutants in runoff.

(21) ACTION LU-1.1.1 (New 2007): Provide assistance to local agencies to ensure that applicable nonpoint source control elements are incorporated into local government and business practices.

(22) ACTION LU-1.5 (LU-3.2 in 1993 CCMP; Revised 2007)
Provide incentives and promote the use of building, planning, and maintenance guidelines for site planning and implementation of best management practices (BMPs) as related to stormwater and encourage local jurisdictions to adopt these guidelines as local ordinances.

(23) ACTION LU-1.6 (New 2007)
Continue and enhance training and certification for planners, public works departments, consultants, and builders on sustainable design and building practices with the goal of preventing or minimizing alteration of watershed functions (e.g., flood water conveyance, groundwater infiltration, stream channel and floodplain maintenance), and preventing construction-related erosion and post-construction pollution.

(24) ACTION LU-2.7 (New 2007)
Adopt and implement policies and plans that protect and restore water quality, flood water storage, and other natural functions of stream and wetland systems.

(25) ACTION LU-3.1 (New 2007)
Promote, encourage, and support collaborative partnerships with broad stakeholder representation, such as watershed councils, in order to develop diverse community-based approaches to long-term stewardship.

(26) ACTION LU-4.1 (Revised 2007)
Educate the public about how human actions impact the Estuary and its watersheds.

(28) ACTION PI-2.5 (Revised 2007)
Assist in the development of long-term educational programs designed to prevent pollution to the Estuary's ecosystem and provide assistance to other programs as needed.

13. Under section 13389 of the California Water Code, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA).

Nature of Discharges and Sources of Pollutants

14. Stormwater runoff is generated from various land uses in all the hydrologic sub basins in the Basin and discharges into watercourses, which in turn flow into Central, Lower and South San Francisco Bay.

15. The quality and quantity of runoff discharges vary considerably and are affected by hydrology, geology, land use, season, and sequence and duration of hydrologic events. Pollutants of concern in these discharges are certain heavy metals; excessive sediment production from erosion due to anthropogenic activities; petroleum hydrocarbons from sources such as used motor oil; microbial pathogens of domestic sewage origin from illicit discharges; certain pesticides associated with acute aquatic toxicity; excessive nutrient loads, which can cause or contribute to the depletion of dissolved oxygen and/or toxic concentrations of dissolved ammonia; trash, which impairs beneficial uses including, but not limited to, support for aquatic life; and other pollutants which can cause aquatic toxicity in the receiving waters.

16. Federal, State or regional entities within the Permittees' boundaries, not currently named in this Order, operate storm drain facilities and/or discharge stormwater to the storm drains and watercourses covered by this Order. The Permittees may lack jurisdiction over these entities. Consequently, the Water Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. The Water Board will consider such facilities for coverage under its NPDES permitting scheme pursuant to US EPA Phase II stormwater regulations. Under Phase II, the Water Board can permit these federal, State, and regional entities through use of the Statewide Phase II NPDES General Permit.

17. Certain pollutants present in stormwater and/or urban runoff can be derived from extraneous sources over which the Permittees have limited or no direct jurisdiction. Examples of such pollutants and their respective sources are polycyclic aromatic hydrocarbons (PAHs), which are products of internal combustion engine operation and other sources; heavy metals, such as copper from vehicle brake pad wear and zinc from vehicle tire wear; dioxins as products of combustion; polybrominated diphenyl ethers that are incorporated in many household products as flame retardants; mercury resulting from atmospheric deposition; and naturally occurring minerals from local geology. All these pollutants, and others, can be deposited on paved surfaces, rooftops, and other impervious surfaces as fine airborne particles—thus yielding stormwater runoff pollution that is unrelated to the activity associated with a given project site.

18. The Water Board will notify interested agencies and interested persons of the availability of reports, plans, and schedules, including Annual Reports, and will provide interested persons with an opportunity for a public hearing and/or an opportunity to submit their written views and recommendations. The Water Board will consider all comments and may modify the reports, plans, or schedules or may modify this Order in accordance with applicable law. All submittals required by this Order conditioned with acceptance by the Water Board will be subject to these notification, comment, and public hearing procedures.

19. This Order supersedes and rescinds Order Nos. 99-058, 99-059, 01-024, R2-2003-0021, R2-2003-0034, and supersedes NPDES Permit Nos. CAS0029831, CAS0029912, CAS0029921, CAS029718, CAS0612005, and CAS612006.

    This Order serves as a NPDES permit, pursuant to CWA section 402, or amendments thereto, and shall become effective December 1, 2009, provided the Regional Administrator, USEPA, Region 9, has no objections.

IT IS HEREBY ORDERED that the Permittees, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder and the provisions of the Clean Water Act as amended and regulations and guidelines adopted hereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

A.1. The Permittees shall, within their respective jurisdictions, effectively prohibit the discharge of non-stormwater (materials other than stormwater) into, storm drain systems and watercourses. NPDES-permitted discharges are exempt from this prohibition. Provision C.15 describes a tiered categorization of non-stormwater discharges based on potential for pollutant content that may be discharged upon adequate assurance that the discharge contains no pollutants of concern at concentrations that will impact beneficial uses or cause exceedances of water quality standards.

A.2. It shall be prohibited to discharge rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas.

B. RECEIVING WATER LIMITATIONS

B.1. The discharge shall not cause the following conditions to create a condition of nuisance or to adversely affect beneficial uses of waters of the State:

- **a.** Floating, suspended, or deposited macroscopic particulate matter, or foam;
- **b.** Bottom deposits or aquatic growths;
- **c.** Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
- **d.** Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
- **e.** Substances present in concentrations or quantities that would cause deleterious effects on aquatic biota, wildlife, or waterfowl, or that render any of these unfit for human consumption.

B.2. The discharge shall not cause or contribute to a violation of any applicable water quality standard for receiving waters. If applicable water quality objectives are adopted and approved by the State Board after the date of the adoption of this Order, the Water Board may revise and modify this Order as appropriate.

C.1. Compliance with Discharge Prohibitions and Receiving Water Limitations

The Permittees shall comply with Discharge Prohibitions A.1 and A.2 and Receiving Water Limitations B.1 and B.2 through the timely implementation of control measures and other actions as specified in Provisions C.2 through C.15.

If exceedance(s) of water quality standards or water quality objectives (collectively, WQSs) persist in receiving waters, the Permittees shall comply with the following procedure:

C.1.a. Upon a determination by either the Permittee(s) or the Water Board that discharges are causing or contributing to an exceedance of an applicable WQS, the Permittee(s) shall notify, within no more than 30 days, and thereafter, except for any exceedances of WQSs for pesticides, trash, mercury, polychlorinated biphenols, copper, polybrominated diphenyl ethers, and selenium that are addressed pursuant to Provisions C.8 through C.14 of this Order, submit a report to the Water Board that describes BMPs that are currently being implemented, and the current level of implementation, and additional BMPs that will be implemented, and/or an increased level of implementation, to prevent or reduce the discharge of pollutants that are causing or contributing to the exceedance of WQSs. The report may be submitted in conjunction with the Annual Report, unless the Water Board directs an earlier submittal, and shall constitute a request to the Water Board for amendment of this NPDES Permit. The report and application for amendment shall include an implementation schedule. The Water Board may require modifications to the report and application for amendment; and

C.1.b. Submit any modifications to the report required by the Water Board within 30 days of notification.

As long as the Permittees have complied with the procedures set forth above, they do not have to repeat the same procedure for continuing or recurring exceedances of the same WQSs unless directed by the Water Board to develop additional control measures and BMPs and reinitiate the Permit amendment process.

C.2. Municipal Operations

The purpose of this provision is to ensure development and implementation of appropriate BMPs by all Permittees to control and reduce non-stormwater discharges and polluted stormwater to storm drains and watercourses during operation, inspection, and routine repair and maintenance activities of municipal facilities and infrastructure.

C.2.a. Street and Road Repair and Maintenance

i. Task Description – Asphalt/Concrete Removal, Cutting, Installation and Repair - The Permittees shall develop and implement appropriate BMPs at street and road repair and/or maintenance sites to control debris and waste materials during road and parking lot installation, repaving or repair maintenance activities, such as those described in the California Stormwater Quality Association's Handbook for Municipal Operations.

ii. Implementation Levels

(1) The Permittees shall require proper management of concrete slurry and wastewater, asphalt, pavement cutting, and other street and road maintenance materials and wastewater to avoid discharge to storm drains from such work sites. The Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer system is available for the wastewater generated from these activities provided that appropriate approvals and pretreatment standards are met.

(2) The Permittees shall require sweeping and/or vacuuming to remove debris, concrete, or sediment residues from such work sites upon completion of work. The Permittees shall require cleanup of all construction remains, spills and leaks using dry methods (e.g., absorbent materials, rags, pads, and vacuuming), as described in the Bay Area Stormwater Management Agencies Association's (BASMAA's) Blueprint for a Clean Bay.

iii. Reporting – The Permittees shall report on implementation of and compliance with these BMPs in the Annual Report

C.2.b. Sidewalk/Plaza Maintenance and Pavement Washing

i. Task Description – The Permittees shall implement, and require to be implemented, BMPs for pavement washing, mobile cleaning, pressure wash operations in such locations as parking lots and garages, trash areas, gas station fueling areas, and sidewalk and plaza cleaning, which prohibit the discharge of polluted wash water and non-stormwater to storm drains. The Permittees shall implement the BMPs included in BASMAA's Mobile Surface Cleaner Program. The Permittees shall coordinate with sanitary sewer agencies to determine if disposal to the sanitary sewer is available for the wastewater generated from these activities provided that appropriate approvals and pretreatment standards are met.

ii. Reporting – The Permittees shall report on implementation of and compliance with these BMPs in their Annual Report.

C.2.c. Bridge and Structure Maintenance and Graffiti Removal

i. Task Description

(1) The Permittees shall implement appropriate BMPs to prevent polluted stormwater and non-stormwater discharges from bridges and structural maintenance activities directly over water or into storm drains.

(2) The Permittees shall implement BMPs for graffiti removal that prevent non-stormwater and wash water discharges into storm drains.

ii. Implementation Levels

(1) The Permittees shall prevent all debris, including structural materials and coating debris, such as paint chips, or other debris and pollutants generated in bridge and structure maintenance or graffiti removal from entering storm drains or water courses.

(2) The Permittees shall protect nearby storm drain inlets before removing graffiti from walls, signs, sidewalks or other structures. The Permittees shall prevent any discharge of debris, cleaning compound waste, paint waste or wash water due to graffiti removal from entering storm drains or watercourses.

(3) The Permittees shall determine the proper disposal method for wastes generated from these activities. The Permittees shall train their employees and/or specify in contracts about these proper capture and disposal methods for the wastes generated.

iii. Reporting – The Permittees shall report on implementation of and compliance with these BMPs in their Annual Report.

C.2.d. Stormwater Pump Stations

The objective of this sub-provision is to prevent the discharge of water with low dissolved oxygen (DO) from pump stations, and to explore the use of pump stations for trash capture and removal from waters to protect beneficial uses of receiving waters.

i. Task Description – Operation and Maintenance of Stormwater Pump Stations – The Permittees shall develop and implement measures to operate, inspect, and maintain these facilities to eliminate non-stormwater discharges containing pollutants, and to reduce pollutant loads in the stormwater discharges to comply with WQSs.

ii. Implementation Levels – The Permittees shall comply with the following implementation measures to reduce polluted water discharges from Permittee-owned or operated pump stations:

(1) Complete an inventory of pump stations within each Permittee's jurisdiction, including locations, and key characteristics[1] by March 1, 2010.

(2) Inspect and collect DO data from all pump stations twice a year during the dry season after July 1, starting in 2010. DO monitoring is exempted where all discharge from a pump station remains in the stormwater collection system or infiltrates into a dry creek immediately downstream.

(3) If DO levels are at or below 3 milligrams per liter (3 mg/L), apply corrective actions, such as continuous pumping at a low flow rate, aeration, or other appropriate methods to maintain DO concentrations of the discharge above 3 mg/L. Verify corrective actions are effective by increasing DO monitoring interval to weekly until two weekly samples are above 3 mg/L.

(4) Starting in fall 2010, inspect pump stations a minimum of two times during the wet season in the first business day after ¼-inch and larger storm events after a minimum of a two week antecedent period with no precipitation. Post-storm inspections shall collect and report presence and quantity estimates of trash, including presence of odor, color, turbidity, and floating hydrocarbons. Remove debris and trash and replace any oil absorbent booms, as needed.

iii. Reporting – The Permittees shall report information resulting from C.2.d.ii.(2)-(4), including DO monitoring data and subsequent corrective actions taken to verify compliance with the 3 mg/L implementation level, in their Annual Report, and maintain records of inspection and maintenance activities and volume or mass of waste materials removed from pump stations.

C.2.e. Rural Public Works Construction and Maintenance

i. Task Description – Rural Road and Public Works Construction and Maintenance - For the purpose of this provision, rural means any watershed or portion thereof that is developed with large lot home-sites, such as one acre or larger, or with primarily agricultural, grazing or open space uses. The Permittees shall implement and require contractors to implement BMPs for erosion and sediment control during and after construction for maintenance activities on rural roads, particularly in or adjacent to stream channels or wetlands. The Permittees shall notify the Water Board, the California Department of Fish and Game and the U.S. Army Corps of Engineers, where applicable, and obtain appropriate agency permits for rural public works activities before work in or near creeks and wetlands.

[1] Characteristics include name of pump station, latitude and longitude in WGS 84, number of pumps, drainage area in acres, dominant land use(s), first receiving water body, maximum pumping capacity of station in gallons per minute (gpm), flow measurement capability (Y or N), flow measurement method, average wet season discharge rate in gpm, dry season discharge (Y, N, or unknown), nearest municipal wastewater treatment plant, wet well storage capacity in gallons, trash control (Y or N), trash control measure, and date built or last updated.

ii. Implementation Level

(1) The Permittees shall develop, where they do not already exist, and implement BMPs for erosion and sediment control measures during construction and maintenance activities on rural roads, including developing and implementing appropriate training and technical assistance resources for rural public works activities, by April 1, 2010.

(2) The Permittees shall develop and implement appropriate BMPs for the following activities, which minimize impacts on streams and wetlands in the course of rural road and public works maintenance and construction activities:

(a) Road design, construction, maintenance, and repairs in rural areas that prevent and control road-related erosion and sediment transport;

(b) Identification and prioritization of rural road maintenance on the basis of soil erosion potential, slope steepness, and stream habitat resources;

(c) Construction of roads and culverts that do not impact creek functions. New or replaced culverts shall not create a migratory fish passage barrier, where migratory fish are present, or lead to stream instability;

(d) Development and implementation of an inspection program to maintain rural roads' structural integrity and prevent impacts on water quality;

(e) Maintenance of rural roads adjacent to streams and riparian habitat to reduce erosion, replace damaging shotgun culverts and excessive erosion;

(f) Re-grading of unpaved rural roads to slope outward where consistent with road engineering safety standards, and installation of water bars as appropriate; and

(g) Replacement of existing culverts or design of new culverts or bridge crossings shall use measures to reduce erosion, provide fish passage and maintain natural stream geomorphology in a stable manner.

(3) The Permittees shall develop or incorporate existing training and guidance on permitting requirements for rural public works activities so as to stress the importance of proper planning and construction to avoid water quality impacts.

(4) The Permittees shall provide training incorporating these BMPs to rural public works maintenance staff at least twice within this Permit term.

iii. Reporting – The Permittees shall report on the implementation of and compliance with BMPs for the rural public works construction and maintenance activities in their Annual Report, including reporting on increased maintenance in priority areas.

C.2.f. Corporation Yard BMP Implementation

i. Task Description – Corporation Yard Maintenance

(1) The Permittees shall prepare, implement, and maintain a site specific Stormwater Pollution Prevention Plan (SWPPP) for corporation yards, including municipal vehicle maintenance, heavy equipment and maintenance vehicle parking areas, and material storage facilities to comply with water quality standards. Each SWPPP shall incorporate all applicable BMPs that are described in the California Stormwater Quality Association's Handbook for Municipal Operations and the Caltrans Storm Water Quality Handbook Maintenance Staff Guide, May 2003, and its addenda, as appropriate.

(2) The requirements in this provision shall apply only to facilities that are not already covered under the State Board's Industrial Stormwater NPDES General Permit.

(3) The site specific SWPPPs for corporation yards shall be completed by July 1, 2010.

ii. Implementation Level

(1) Implement BMPs to minimize pollutant discharges in stormwater and prohibit non-stormwater discharges, such as wash waters and street sweeper, vactor, and other related equipment cleaning wash water. Pollution control actions shall include, but not be limited to, good housekeeping practices, material and waste storage control, and vehicle leak and spill control.

(2) Routinely inspect corporation yards to ensure that no non-stormwater discharges are entering the storm drain system and, during storms, pollutant discharges are prevented to the maximum extent practicable. At a minimum, an inspection shall occur before the start of the rainy season.

(3) Plumb all vehicle and equipment wash areas to the sanitary sewer after coordination with the local sanitary sewer agency and equip with a pretreatment device (if necessary) in accordance with the requirements of the local sanitary sewer agency.

(4) Use dry cleanup methods when cleaning debris and spills from corporation yards. If wet cleaning methods must be used (e.g., pressure washing), the Permittee shall ensure that wash water is collected and disposed in the sanitary sewer after coordination with the local sanitary sewer agency and in accordance with the requirements of the local sanitary sewer agency. Any private companies hired by the Permittee to perform cleaning activities on Permittee-owned property shall follow the same requirements. In areas where sanitary sewer connection is not available, the Permittees shall collect and haul the wash water to a municipal

wastewater treatment plant, or implement appropriate BMPs and dispose of the wastewater to land in a manner that does not adversely impact surface water or groundwater.

(5) Outdoor storage areas containing waste pollutants shall be covered and/or bermed to prevent discharges of polluted stormwater runoff or run-on to storm drain inlets.

iii. Reporting – The Permittees shall report on implementation of SWPPPs, the results of inspections, and any follow-up actions in their Annual Report.

C.3. New Development and Redevelopment

The goal of Provision C.3 is for the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

C.3.a. New Development and Redevelopment Performance Standard Implementation

i. Task Description – At a minimum each Permittee shall:

(1) Have adequate legal authority to implement all requirements of Provision C.3;

(2) Have adequate development review and permitting procedures to impose conditions of approval or other enforceable mechanisms to implement the requirements of Provision C.3. For projects discharging directly to CWA section 303(d)-listed waterbodies, conditions of approval must require that post-development runoff not exceed pre-development levels for such pollutants that are listed;

(3) Evaluate potential water quality effects and identify appropriate mitigation measures when conducting environmental reviews, such as under CEQA;

(4) Provide training adequate to implement the requirements of Provision C.3 for staff, including interdepartmental training;

(5) Provide outreach adequate to implement the requirements of Provision C.3, including providing education materials to municipal staff, developers, contractors, construction site operators, and owner/builders, early in the planning process and as appropriate;

(6) For all new development and redevelopment projects that are subject to the Permittee's planning, building, development, or other comparable review, but not regulated by Provision C.3, encourage the inclusion of adequate site design measures that may include minimizing land disturbance and impervious surfaces (especially parking lots); clustering of structures and pavement; directing roof runoff to vegetated areas; use of micro-detention, including distributed landscape-based detention; preservation of open space; protection and/or restoration of riparian areas and wetlands as project amenities;

(7) For all new development and redevelopment projects that are subject to the Permittee's planning, building, development, or other comparable review, but not regulated by Provision C.3, encourage the inclusion of adequate source control measures to limit pollutant generation, discharge, and runoff. These source control measures should include:

- Storm drain stenciling.

- Landscaping that minimizes irrigation and runoff, promotes surface infiltration where possible, minimizes the use of pesticides and fertilizers, and incorporates appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping.
- Appropriate covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas.
- Covered trash, food waste, and compactor enclosures.
- Plumbing of the following discharges to the sanitary sewer, subject to the local sanitary sewer agency's authority and standards:
  - Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants.
  - Dumpster drips from covered trash and food compactor enclosures.
  - Discharges from outdoor covered wash areas for vehicles, equipment, and accessories.
  - Swimming pool water, if discharge to onsite vegetated areas is not a feasible option.
  - Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option.

(8) Revise, as necessary, General Plans to integrate water quality and watershed protection with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and policies (e.g., referencing the Bay-Friendly Landscape Guidelines).

ii. Implementation Level – Most of the elements of this task should already be fully implemented because they are required in the Permittees' existing stormwater permits.

Due Dates for Full Implementation – Immediate for C.3.a.i.(1)-(5), May 1, 2010 for C.3.a.i.(6)-(7), and December 1, 2010 for C.3.a.i.(8). For Vallejo Permittees: December 1, 2010 for C.3.a.i.(1)-(8)

iii. Reporting – Provide a brief summary of the method(s) of implementation of Provisions C.3.a.i.(1)–(8) in the 2011 Annual Report.

C.3.b. Regulated Projects

i. Task Description – The Permittees shall require all projects fitting the category descriptions listed in Provision C.3.b.ii below (hereinafter called Regulated Projects) to implement LID source control, site design, and stormwater treatment onsite or at a joint stormwater treatment facility[2] in accordance with Provisions C.3.c and C.3.d, unless the Provision C.3.e alternate compliance options are evoked. For adjacent Regulated Projects that will discharge runoff to a joint stormwater treatment facility, the treatment facility must be completed by

[2] **Joint stormwater treatment facility** – Stormwater treatment facility built to treat the combined runoff from two or more Regulated Projects located adjacent to each other,

the end of construction of the first Regulated Project that will be discharging runoff to the joint stormwater treatment facility.

Regulated Projects, as they are defined in this Provision, do not include detached single-family home projects that are not part of a larger plan of development.

ii. Regulated Projects are defined in the following categories:

(1) **Special Land Use Categories**

(a) **New Development or redevelopment projects** that fall into one of the categories listed below and that create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site). This category includes development projects of the following four types on public or private land that fall under the planning and building authority of a Permittee:

(i) Auto service facilities, described by the following Standard Industrial Classification (SIC) Codes: 5013, 5014, 5541, 7532-7534, and 7536-7539;

(ii) Retail gasoline outlets;

(iii) Restaurants (SIC Code 5812); or

(iv) Uncovered parking lots that are stand-alone or part of any other development project. This category includes the top uncovered portion of parking structures unless drainage from the uncovered portion is connected to the sanitary sewer along with the covered portions of the parking structure.

(b) For redevelopment projects in the categories specified in Provision C.3.b.ii.(1)(a)(i)-(iv), specific exclusions are:

(i) Interior remodels;

(ii) Routine maintenance or repair such as:

- roof or exterior wall surface replacement,
- pavement resurfacing within the existing footprint.

(c) Where a redevelopment project in the categories specified in Provision C.3.b.ii.(1)(a)(i)-(iv) results in an alteration of **more than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire redevelopment project).

(d) Where a redevelopment project in the categories specified in Provision C.3.b.ii.(1)(a)(i)-(iv) results in an alteration of **less than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the new and/or replaced impervious surface of the project).

(e) For any private development project in the categories specified in Provisions C.3.b.ii.(1)(a)(i)-(iv) for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, the lower 5000 square feet impervious surface threshold (for classification as a Regulated Project) shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, for the 5000 square feet threshold, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the lower 5000 square feet impervious surface threshold specified in Provision C.3.b.ii.(1).

(f) For any private development project in the categories specified in Provisions C.3.b.ii.(1)(a)(i)-(iv) with an application deemed complete after the Permit effective date, the lower 5000 square feet impervious surface threshold (for classification as a Regulated Project) shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011, for the 5000 square feet threshold.

(g) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the lower 5000 square feet of impervious surface threshold (for classification as a Regulated Project) shall not apply.

Effective Date – Immediate, except December 1, 2010, for Vallejo Permittees.

Beginning December 1, 2011, all references to 10,000 square feet in Provision C.3.b.ii.(1) change to 5,000 square feet.

(2) **Other Development Projects**

New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single-family home subdivisions, multi-family attached subdivisions (town homes), condominiums, and apartments), mixed-use, and public projects. This category includes development projects on public or private land that fall under the planning and building authority of a Permittee. Detached single-family home projects that are not part of a larger plan of development are specifically excluded.

Effective Date – Immediate, except December 1, 2010, for Vallejo Permittees.

(3) **Other Redevelopment Projects**

Redevelopment projects that create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single-family home subdivisions, multi-family attached subdivisions (town homes), condominiums, and apartments), mixed-use, and public projects. Redevelopment is any land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a site on which some past development has occurred. This category includes redevelopment projects on public or private land that fall under the planning and building authority of a Permittee.

Specific exclusions to this category are:

- Interior remodels.
- Routine maintenance or repair such as:
  - roof or exterior wall surface replacement, or
  - pavement resurfacing within the existing footprint.

(a) Where a redevelopment project results in an alteration of **more than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire redevelopment project).

(b) Where a redevelopment results in an alteration **of less than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the new and/or replaced impervious surface of the project).

Effective Date – Immediate, except December 1, 2010, for Vallejo Permittees.

(4) **Road Projects**

Any of the following types of road projects that create 10,000 square feet or more of newly constructed contiguous impervious surface and that fall under the building and planning authority of a Permittee:

(a) Construction of new streets or roads, including sidewalks and bicycle lanes built as part of the new streets or roads.

(b) Widening of existing streets or roads with additional traffic lanes.

(i) Where the addition of traffic lanes results in an alteration of **more than 50 percent** of the impervious surface of an existing street or road that was not subject to Provision C.3, **the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design** (i.e.,

stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire street or road that had additional traffic lanes added).

(ii) Where the addition of traffic lanes results in an alteration **of less than 50 percent** of the impervious surface of an existing street or road that was not subject to Provision C.3, **only the new and/or replaced impervious surface of the project must be included in the treatment system design** (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from only the new traffic lanes). However, if the stormwater runoff from the existing traffic lanes and the added traffic lanes cannot be separated, any onsite treatment system must be designed and sized to treat stormwater runoff from the entire street or road. If an offsite treatment system is installed or in-lieu fees paid in accordance with Provision C.3.e, the offsite treatment system or in-lieu fees must address only the stormwater runoff from the added traffic lanes.

(c) Construction of impervious trails that are greater than 10 feet wide or are creek-side (within 50 feet of the top of bank).

(d) Specific exclusions to Provisions C.3.b.ii.(4)(a)-(c) are:

- Sidewalks built as part of new streets or roads and built to direct stormwater runoff to adjacent vegetated areas.
- Bicycle lanes that are built as part of new streets or roads but are not hydraulically connected to the new streets or roads and that direct stormwater runoff to adjacent vegetated areas.
- Impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or towards the outboard side of levees.
- Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.[3]
- Caltrans highway projects and associated facilities.

(e) For any private road or trail project described by Provisions C.3.b.ii.(4)(b) or (c) for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, the requirements of Provisions C.3.b.ii.(4)(b) or (c) to classify the project as a Regulated Project shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, for Provisions C.3.b.ii.(4)(b) and (c), the project applicant has not taken

[3] **Permeable surfaces** include pervious concrete, porous asphalt, unit pavers, and granular materials.

any action to obtain the necessary approvals from the Permittee, the project will then be classified as a Regulated Project under Provisions C.3.b.ii.(4)(b) or (c).

(f) For any private road or trail project with an application deemed complete after the Permit effective date, the requirements of Provisions C.3.b.i.(4)(b) or (c) to classify the project as a Regulated Project shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011, for Provisions C.3.b.ii.(4)(b) and (c).

(g) For any public road or trail project for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provisions C.3.b.i.(4)(b) or (c) to classify the project as a Regulated Project shall not apply.

Effective Date – Immediate for C.3.b.ii.(4)(a) and (d)-(g), and December 1, 2011, for C.3.b.ii.(4)(b) and (c). For Vallejo Permittees: Immediate for C.3.b.ii.(4)(d)-(g), and December 1, 2011 for C.3.b.ii.(4)(a)-(c).

iii. Green Street Pilot Projects

The Permittees shall cumulatively complete ten pilot green street projects that incorporate LID techniques for site design and treatment in accordance with Provision C.3.c and that provide stormwater treatment sized in accordance with Provision C.3.d. It is also desirable that they meet or exceed the Bay-Friendly Landscape Scorecard minimum requirements (see www.BayFriendly.org).

(1) Parking lot projects that provide LID treatment in accordance with Provisions C.3.c and Provision C.3.d. for stormwater runoff from the parking lot and street may be considered pilot green street projects.

(2) A Regulated Project (as defined in Provision C.3.b.ii) may not be counted as one of the ten pilot green street projects.

(3) At least two pilot green street projects must be located in each of the following counties: Alameda, Contra Costa, San Mateo, and Santa Clara.

(4) The Permittees shall construct the ten pilot green street projects in such a manner that they, as a whole:

(a) Are representative of the various types of streets: arterial, collector, and local; and

(b) Contain the following key elements:

(i) Stormwater storage for landscaping reuse or stormwater treatment and/or infiltration for groundwater replenishment through the use of natural feature systems;

(ii) Creation of attractive streetscapes that enhance neighborhood livability by enhancing the pedestrian environment and introducing park-like elements into neighborhoods;

(iii) Service as an urban greenway segment that connects neighborhoods, parks, recreation facilities, schools, mainstreets, and wildlife habitats;

(iv) Parking management that includes maximum parking space requirements as opposed to minimum parking space requirements, parking requirement credits for subsidized transit or shuttle service, parking structures, shared parking, car sharing, or on-street diagonal parking;

(v) Meets broader community goals by providing pedestrian and, where appropriate, bicycle access; and

(vi) Located in a Priority Development Area as designated under the Association of Bay Area Government's and Metropolitan Transportation Commission's FOCUS[4] program.

(5) The Permittees shall conduct appropriate monitoring of these projects to document the water quality benefits achieved. Appropriate monitoring may include modeling using the design specifications and specific site conditions.

Due Date – All pilot green street projects shall be completed by December 1, 2014.

iv. Implementation Level – All elements of Provision C.3.b.i.-iii shall be fully implemented by the effective/due dates set forth in their respective sub-provision, and a database or equivalent tabular format shall be developed and maintained that contains all the information listed under Reporting (Provision C.3.b.v.).

Due Dates for Full Implementation – See specific Effective Dates listed under Provisions C.3.b.ii& iii. .The database or equivalent tabular format required by Provision C.3.b.iv shall be developed by December 1, 2010. (For Vallejo Permittees: December 1, 2011)

v. Reporting

(1) **Annual Reporting – C.3.b.ii. Regulated Projects**

For each Regulated Project approved during the fiscal year reporting period, the following information shall be reported electronically in the fiscal year Annual Report, in tabular form (as set forth in the attached Provision C.3.b. Sample Reporting Table):

(a) Project Name, Number, Location (cross streets), and Street Address;

(b) Name of Developer, Phase No. (if project is being constructed in phases, each phase should have a separate entry), Project Type (e.g., commercial, industrial, multiunit residential, mixed-use, public), and description;

(c) Project watershed;

(d) Total project site area and total area of land disturbed;

[4] FOCUS is a regional incentive-based development and conservation strategy for the Bay Area.

(e) Total new impervious surface area and/or total replaced impervious surface area;

(f) If redevelopment or road widening project, total pre-project impervious surface area and total post-project impervious surface area;

(g) Status of project (e.g., application date, application deemed complete date, project approval date);

(h) Source control measures;

(i) Site design measures;

(j) All post-construction stormwater treatment systems installed onsite, at a joint stormwater treatment facility, and/or at an offsite location;

(k) Operation and maintenance responsibility mechanism for the life of the project.

(l) Hydraulic Sizing Criteria used;

(m) Alternative compliance measures for Regulated Project (if applicable)

(i) If alternative compliance will be provided at an offsite location in accordance with Provision C.3.e.i.(1), include information required in Provision C.3.b.v.(a) – (l) for the offsite project; and

(ii) If alternative compliance will be provided by paying in-lieu fees in accordance with Provision C.3.e.i.(2), provide information required in Provision C.3.b.v.(a) – (l) for the Regional Project. Additionally, provide a summary of the Regional Project's goals, duration, estimated completion date, total estimated cost of the Regional Project, and estimated monetary contribution from the Regulated Project to the Regional Project; and

(n) Hydromodification (HM) Controls (see Provision C.3.g.) – If not required, state why not. If required, state control method used.

(2) **Pilot Green Streets Project Reporting - Provision C.3.b.iii.**

(a) On an annual basis, the Permittees shall report on the status of the pilot green street projects.

(b) For each completed project, the Permittees shall report the capital costs, operation and maintenance costs, legal and procedural arrangements in place to address operation and maintenance and its associated costs, and the sustainable landscape measures incorporated in the project including, if relevant, the score from the Bay-Friendly Landscape Scorecard.

(c) The 2013 Annual Report shall contain a summary of all green street projects completed by January 1, 2013. The summary shall include for each completed project the following information:

(i) Location of project

(ii) Size of project, including total impervious surface treated

(iii) Map(s) of project showing areas where stormwater runoff will be treated by LID measures

(iv) Specific type(s) of LID treatment measures included

(v) Total and specific costs of project

(vi) Specific funding sources for project and breakdown of percentage paid by each funding source

(vii) Lessons learned, including recommendations to facilitate funding and building of future projects

(viii) Identification of responsible party and funding source for operation and maintenance.

C.3.c. Low Impact Development (LID)

The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as rain barrels and cisterns, green roofs, permeable pavement, preserving undeveloped open space, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.

Task Description

i. The Permittees shall, at a minimum, implement the following LID requirements:

(1) **Source Control Requirements**

Require all Regulated Projects to implement source control measures onsite that at a minimum, shall include the following:

(a) Minimization of stormwater pollutants of concern in urban runoff through measures that may include plumbing of the following discharges to the sanitary sewer, subject to the local sanitary sewer agency's authority and standards:

- Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants;
- Dumpster drips from covered trash, food waste and compactor enclosures;
- Discharges from covered outdoor wash areas for vehicles, equipment, and accessories;
- Swimming pool water, if discharge to onsite vegetated areas is not a feasible option; and
- Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option;

(b) Properly designed covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas;

(c) Properly designed trash storage areas;

(d) Landscaping that minimizes irrigation and runoff, promotes surface infiltration, minimizes the use of pesticides and fertilizers, and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping;

(e) Efficient irrigation systems; and

(f) Storm drain system stenciling or signage.

(2) **Site Design and Stormwater Treatment Requirements**

(a) Require each Regulated Project to implement at least the following design strategies onsite:

(i) Limit disturbance of natural water bodies and drainage systems; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;

(ii) Conserve natural areas, including existing trees, other vegetation, and soils;

(iii) Minimize impervious surfaces;

(iv) Minimize disturbances to natural drainages; and

(v) Minimize stormwater runoff by implementing one or more of the following site design measures:

- Direct roof runoff into cisterns or rain barrels for reuse.
- Direct roof runoff onto vegetated areas.
- Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
- Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
- Construct sidewalks, walkways, and/or patios with permeable surfaces.[3]
- Construct driveways, bike lanes, and/or uncovered parking lots with permeable surfaces.[3]

(b) Require each Regulated Project to treat 100% of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility.

(i) LID treatment measures are harvesting and re-use, infiltration, evapotranspiration, or biotreatment.

(ii) A properly engineered and maintained biotreatment system may be considered only if it is infeasible to implement harvesting and re-use, infiltration, or evapotranspiration at a project site.

(iii) Infeasibility to implement harvesting and re-use, infiltration, or evapotranspiration at a project site may result from conditions including the following:

- Locations where seasonal high groundwater would be within 10 feet of the base of the LID treatment measure.
- Locations within 100 feet of a groundwater well used for drinking water.
- Development sites where pollutant mobilization in the soil or groundwater is a documented concern.
- Locations with potential geotechnical hazards.
- Smart growth and infill or redevelopment sites where the density and/or nature of the project would create significant difficulty for compliance with the onsite volume retention requirement.
- Locations with tight clay soils that significantly limit the infiltration of stormwater.

(iv) By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report on the criteria and procedures the Permittees shall employ to determine when harvesting and re-use, infiltration, or evapotranspiration is feasible and infeasible at a Regulated Project site. This report shall, at a minimum, contain the information required in Provision C.3.c.iii.(1).

(v) By December 1, 2013, the Permittees, collaboratively or individually, shall submit a report on their experience with determining infeasibility of harvesting and re-use, infiltration, or evapotranspiration at Regulated Project sites. This report shall, at a minimum, contain the information required in Provision C.3.iii.(2).

(vi) Biotreatment systems shall be designed to have a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate. The planting and soil media for biotreatment systems shall be designed to sustain plant growth and maximize stormwater runoff retention and pollutant removal. By December 1, 2010, the Permittees, working collaboratively or individually, shall submit for Water Board approval, a proposed set of model biotreatment soil media specifications and soil infiltration testing methods to verify a long-term infiltration rate of 5 to 10 inches/hour. This submittal to the Water Board shall, at a minimum, contain the information required in Provision C.3.c.iii.(3). Once the Water Board approves biotreatment soil media specifications and soil infiltration testing methods, the Permittees shall ensure that biotreatment systems installed to meet the requirements of Provision C.3.c and d comply with the Water Board-approved minimum specifications and soil infiltration testing methods.

(vii) Green roofs may be considered biotreatment systems that treat roof runoff only if they meet certain minimum specifications. By May 1, 2011, the Permittees shall submit for Water Board approval, proposed minimum specifications for green roofs.

This submittal to the Water Board shall, at a minimum, contain the information required in Provision C.3.c.iii.(4). Once the Water Board approves green roof minimum specifications, the Permittees shall ensure that green roofs installed to meet the requirements of Provision C.3.c and d comply with the Water Board-approved minimum specifications.

(c) Require any Regulated Project that does not comply with Provision C.3.c.i.(2)(b) above to meet the requirements established in Provision C.3.e for alternative compliance.

ii. Implementation Level – All elements of the tasks described in Provision C.3.c.i shall be fully implemented.

Due Date for Full Implementation – December 1, 2011

(1) For any private development project for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, Provision C.3.c.i shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the requirements of Provision C.3.c.i.

(2) For any private development project with an application deemed complete after the Permit effective date, the requirements of Provision C.3.c.i shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011.

(3) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provision C.3.c.i shall not apply.

iii. Reporting

(1) Feasibility/Infeasibility Criteria Report - By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:

- Literature review and discussion of documented cases/sites, particularly in the Bay Area and California, where infiltration, harvesting and reuse, or evapotranspiration have been demonstrated to be feasible and/or infeasible.
- Discussion of proposed feasibility and infeasibility criteria and procedures the Permittees shall employ to make a determination of when biotreatment will be allowed at a Regulated Project site.

(2) Status Report on Application of Feasibility/Infeasibility Criteria – By December 1, 2013, the Permittees shall submit a report to the Water Board containing the following information:

- Discussion of the most common feasibility and infeasibility criteria employed since implementation of Provision C.3.c requirements, including site-specific examples;
- Discussion of barriers, including institutional and technical site specific constraints, to implementation of harvesting and reuse, infiltration, or evapotranspiration, and proposed strategies for removing these identified barriers;
- If applicable, discussion of proposed changes to feasibility and infeasibility criteria and rationale for the changes; and
- Guidance for the Permittees to make a consistent and appropriate determination of the feasibility of harvesting and reuse, infiltration, or evapotranspiration for each Regulated Project.

(3) Model Biotreatment Soil Media Specifications - By December 1, 2010, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:

- Proposed soil media specifications for biotreatment systems;
- Proposed soil testing methods to verify a long-term infiltration rate of 5-10 inches/hour;
- Relevant literature and field data showing the feasibility of the minimum design specifications;
- Relevant literature, field, and analytical data showing adequate pollutant removal and compliance with the Provision C.3.d hydraulic sizing criteria; and
- Guidance for the Permittees to apply the minimum specifications in a consistent and appropriate manner.

(4) Green Roof Minimum Specifications - By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:

- Proposed minimum design specifications for green roofs;
- Relevant literature and field data showing the feasibility of the minimum design specifications;
- Relevant literature, field, and analytical data showing adequate pollutant removal and compliance with the Provision C.3.d hydraulic sizing criteria;
- Discussion of data and lessons learned from already installed green roofs;
- Discussion of barriers, including institutional and technical site specific constraints, to installation of green roofs and proposed strategies for removing these identified barriers; and

- Guidance for the Permittees to apply the minimum specifications in a consistent and appropriate manner.

(5) Report the method(s) of implementation of Provisions C.3.c.i above in the 2012 Annual Report. For specific tasks listed above that are reported using the reporting tables required for Provision C.3.b.v, a reference to those tables will suffice.

C.3.d. Numeric Sizing Criteria for Stormwater Treatment Systems

i. Task Description – The Permittees shall require that stormwater treatment systems constructed for Regulated Projects meet at least one of the following hydraulic sizing design criteria:

(1) **Volume Hydraulic Design Basis** – Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to:

(a) The maximized stormwater capture volume for the area, on the basis of historical rainfall records, determined using the formula and volume capture coefficients set forth in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175–178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or

(b) The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Section 5 of the California Stormwater Quality Association's Stormwater Best Management Practice Handbook, New Development and Redevelopment (2003), using local rainfall data.

(2) **Flow Hydraulic Design Basis** – Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat:

(a) 10 percent of the 50-year peak flowrate;

(b) The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or

(c) The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

(3) **Combination Flow and Volume Design Basis** – Treatment systems that use a combination of flow and volume capacity shall be sized to treat at least 80 percent of the total runoff over the life of the project, using local rainfall data.

ii. Implementation Level – The Permittees shall immediately require the controls in this task.

Due Date for Full Implementation – Immediate, except December 1, 2010, for Vallejo Permittees.

iii. Reporting – Permittees shall use the reporting tables required in Provision C.3.b.v.

iv. Limitations on Use of Infiltration Devices in Stormwater Treatment Systems

(1) For Regulated Projects, each Permittee shall review planned land use and proposed treatment design to verify that installed stormwater treatment systems with no under-drain, and that function primarily as infiltration devices, should not cause or contribute to the degradation of groundwater quality at project sites. An infiltration device is any structure that is deeper than wide and designed to infiltrate stormwater into the subsurface and, as designed, bypass the natural groundwater protection afforded by surface soil. Infiltration devices include dry wells, injection wells, and infiltration trenches (includes french drains).

(2) For any Regulated Project that includes plans to install stormwater treatment systems which function primarily as infiltration devices, the Permittee shall require that:

(a) Appropriate pollution prevention and source control measures are implemented to protect groundwater at the project site, including the inclusion of a minimum of two feet of suitable soil to achieve a maximum 5 inches/hour infiltration rate for the infiltration system;

(b) Adequate maintenance is provided to maximize pollutant removal capabilities;

(c) The vertical distance from the base of any infiltration device to the seasonal high groundwater mark is at least 10 feet. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, a greater vertical distance from the base of the infiltration device to the seasonal high groundwater mark may be appropriate, and treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors in the overall analysis of groundwater safety);

(d) Unless stormwater is first treated by a method other than infiltration, infiltration devices are not approved as treatment measures for runoff from areas of industrial or light industrial activity; areas subject to high vehicular traffic (i.e., 25,000 or greater average daily traffic on a main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (e.g., bus, truck); nurseries; and other land uses that pose a high threat to water quality;

(e) Infiltration devices are not placed in the vicinity of known contamination sites unless it has been demonstrated that increased infiltration will not increase leaching of contaminants from soil, alter groundwater flow conditions affecting contaminant migration in groundwater, or adversely affect remedial activities; and

(f) Infiltration devices are located a minimum of 100 feet horizontally away from any known water supply wells, septic systems, and

underground storage tanks with hazardous materials. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, a greater horizontal distance from the infiltration device to known water supply wells, septic systems, or underground storage tanks with hazardous materials may be appropriate, and treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors in the overall analysis of groundwater safety).

C.3.e. Alternative or In-Lieu Compliance with Provision C.3.c.

i. The Permittees may allow a Regulated Project to provide alternative compliance with Provision C.3.c in accordance with one of the two options listed below:

(1) **Option 1: LID Treatment at an Offsite Location**

Treat a portion of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility **and** treat the remaining portion of the Provision C.3.d runoff with LID treatment measures at an offsite project in the same watershed. The offsite LID treatment measures must provide hydraulically-sized treatment (in accordance with Provision C.3.d) of an equivalent quantity of both stormwater runoff and pollutant loading and achieve a net environmental benefit.

(2) **Option 2: Payment of In-Lieu Fees**

Treat a portion of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility **and** pay equivalent in-lieu fees[5] to treat the remaining portion of the Provision C.3.d runoff with LID treatment measures at a Regional Project.[6] The Regional Project must achieve a net environmental benefit.

(3) For the alternative compliance options described in Provision C.3.e.i.(1) and (2) above, offsite projects must be constructed by the end of construction of the Regulated Project. If more time is needed to construct the offsite project, for each additional year, up to three years, after the construction of the Regulated Project, the offsite project must provide an additional 10% of the calculated equivalent quantity of both stormwater runoff and pollutant loading. Regional Projects must be completed within three years after the end of construction of the Regulated Project. However, the timeline for completion of the Regional Project may be

[5] **In-lieu fees** – Monetary amount necessary to provide both hydraulically-sized treatment (in accordance with Provision C.3.d) with LID treatment measures of an equivalent quantity of stormwater runoff and pollutant loading, and a proportional share of the operation and maintenance costs of the Regional Project.

[6] **Regional Project –** A regional or municipal stormwater treatment facility that discharges into the same watershed that the Regulated Project does.

extended, up to five years after the completion of the Regulated Project, with prior Executive Officer approval. Executive Officer approval will be granted contingent upon a demonstration of good faith efforts to implement the Regional Project, such as having funds encumbered and applying for the appropriate regulatory permits.

ii. Special Projects

(1) When considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and automobile-related pollutant impacts. Incentive LID treatment reduction credits approved by the Water Board may be applied to these types of Special Projects.

(2) By December 1, 2010, the Permittees shall submit a proposal to the Water Board containing the following information:

- Identification of the types of projects proposed for consideration of LID treatment reduction credits and an estimate of the number and cumulative area of potential projects during the remaining term of this Permit for each type of project;
- Identification of institutional barriers and/or technical site-specific constraints to providing 100% LID treatment onsite that justify the allowance for non-LID treatment measures onsite;
- Specific criteria for each type of Special Project proposed, including size, location, minimum densities, minimum floor area ratios, or other appropriate limitations;
- Identification of specific water quality and environmental benefits provided by these types of projects that justify the allowance for non-LID treatment measures onsite;
- Proposed LID treatment reduction credit for each type of Special Project and justification for the proposed credits. The justification shall include identification and an estimate of the specific water quality benefit provided by each type of Special Project proposed for LID treatment reduction credit; and
- Proposed total treatment reduction credit for Special Projects that may be characterized by more than one category and justification for the proposed total credit.

iii. Effective Date – December 1, 2011.

iv. Implementation Level

(1) For any private development project for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, Provisions C.3.e.i-ii shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary

approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the requirements of Provision C.3.e.i-ii.

(2) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provisions C.3.e.i-ii shall not apply.

(3) Provisions C.3.e.i-ii supersede any Alternative Compliance Policies previously approved by the Executive Officer

(4) For all offsite projects and Regional Projects installed in accordance with Provision C.3.e.i-ii, the Permittees shall meet the Operation & Maintenance (O&M) requirements of Provision C.3.h.

v. Reporting –The Permittees shall submit the ordinance/legal authority and procedural changes made, if any, to implement Provision C.3.e with their 2012 Annual Report. Annual reporting thereafter shall be done in conjunction with reporting requirements under Provision C.3.b.v.

Any Permittee choosing to require 100% LID treatment onsite for all Regulated Projects and not allow alternative compliance under Provision C.3.e, shall include a statement to that effect in the 2012 Annual Report and all subsequent Annual Reports.

C.3.f. Alternative Certification of Stormwater Treatment Systems

i. Task Description – In lieu of reviewing a Regulated Project's adherence to Provision C.3.d, a Permittee may elect to have a third party conduct detailed review and certify the Regulated Project's adherence to Provision C.3.d. The third party reviewer must be a Civil Engineer or a Licensed Architect or Landscape Architect registered in the State of California, or staff of another Permittee subject to the requirements of this Permit.

ii. Implementation Level – Any Permittee accepting third-party reviews must make a reasonable effort to ensure that the third party has no conflict of interest with regard to the Regulated Project in question. That is, any consultant or contractor (or his/her employees) hired to design and/or construct a stormwater treatment system for a Regulated Project shall not also be the certifying third party. The Permittee must verify that the third party certifying any Regulated Project has current training on stormwater treatment system design (within three years of the certification signature date) for water quality and understands the groundwater protection principles applicable to Regulated Project sites.

Training conducted by an organization with stormwater treatment system design expertise (such as a college or university, the American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, California Water Environment Association (CWEA), BASMAA, National Association of Flood & Stormwater Management Agencies, California

Stormwater Quality Association (CASQA), or the equivalent, may be considered qualifying training.

iii. Reporting – Projects reviewed by third parties shall be noted in reporting tables for Provision C.3.b.

C.3.g. Hydromodification Management

i. Hydromodification Management (HM) Projects are Regulated Projects that create and/or replace one acre or more of impervious surface and are not specifically excluded within the requirements of Attachments B–F. A project that does not increase impervious surface area over the pre-project condition is not an HM Project. All HM Projects shall meet the Hydromodification Management Standard of Provision C.3.g.ii.

ii. HM Standard

Stormwater discharges from HM Projects shall not cause an increase in the erosion potential of the receiving stream over the pre-project (existing) condition. Increases in runoff flow and volume shall be managed so that post-project runoff shall not exceed estimated pre-project rates and durations, where such increased flow and/or volume is likely to cause increased potential for erosion of creek beds and banks, silt pollutant generation, or other adverse impacts on beneficial uses due to increased erosive force. The demonstration that post-project stormwater runoff does not exceed estimated pre-project runoff rates and durations shall include the following:

(1) **Range of Flows to Control:** For Alameda, Contra Costa, San Mateo, and Santa Clara Permittees, HM controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10 % of the pre-project 2-year peak flow[7] up to the pre-project 10-year peak flow. For Fairfield-Suisun Permittees, HM controls shall be designed such that post-project stormwater discharge rates and durations shall match from 20 percent of the 2-year peak flow up to the pre-project 10-year peak flow. Contra Costa Permittees, when using pre-sized and pre-designed Integrated Management Practices (IMPs) per Attachment C of this Order, are not required to meet the low-flow criterion of 10% of the 2-year peak flow. These IMPs are designed to control 20% of the 2-year peak flow. After the Contra Costa Permittees conduct the required monitoring specified in Attachment C, the design of these IMPs will be reviewed.

(2) **Goodness of Fit Criteria:** The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10 percent

[7] Where referred to in this Order, the 2-year peak flow is determined using a flood frequency analysis based on USGS Bulletin 17 B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35-50 years of data) is run through a continuous simulation hydrologic model, the annual peak flows are identified, rank ordered, and the 2-year peak flow is estimated. Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers' Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

over more than 10 percent of the length of the curve corresponding to the range of flows to control.

(3) **Precipitation Data:** Precipitation data used in the modeling of HM controls shall, at a minimum, be 30 years of hourly rainfall data representative of the area being modeled. Where a longer rainfall record is available, the longer record shall be used.

(4) **Calculating Post-Project Runoff:** Retention and detention basins shall be considered impervious surfaces for purposes of calculating post-project runoff. Pre- and post-project runoff shall be calculated and compared for the entire site, without separating or excluding areas that may be considered self-retaining.

(5) **Existing HM Control Requirements:** The Water Board has adopted HM control requirements for all Permittees (except for the Vallejo Permittees), and these adopted requirements are attached to this Order as listed below. The Permittees shall comply with all requirements in their own Permittee-specific Attachment, unless otherwise specified by this Order. In all cases, the HM Standard shall be achieved.

- Attachment B for Alameda Permittees
- Attachment C for Contra Costa Permittees
- Attachment D for Fairfield-Suisun Permittees
- Attachment E for San Mateo Permittees
- Attachment F for Santa Clara Permittees

iii. Types of HM Controls

Projects shall meet the HM Standard using any of the following HM controls or a combination thereof.

(1) **Onsite HM controls** are flow duration control structures and hydrologic source controls that collectively result in the HM Standard being met at the point(s) where stormwater runoff discharges from the project site.

(2) **Regional HM controls** are flow duration control structures that collect stormwater runoff discharge from multiple projects (each of which shall incorporate hydrologic source control measures as well) and are designed such that the HM Standard is met for all the projects at the point where the regional HM control discharges.

(3) **In-stream measures** shall be an option only where the stream, which receives runoff from the project, is already impacted by erosive flows and shows evidence of excessive sediment, erosion, deposition, or is a hardened channel.

In-stream measures involve modifying the receiving stream channel slope and geometry so that the stream can convey the new flow regime without increasing the potential for erosion and aggradation. In-stream measures are intended to improve long-term channel stability and prevent erosion by reducing the erosive forces imposed on the channel boundary.

In-stream measures, or a combination of in-stream and onsite controls, shall be designed to achieve the HM Standard from the point where the project(s) discharge(s) to the stream to the mouth of the stream or to achieve an equivalent degree of flow control mitigation (based on amount of impervious surface mitigated) as part of an in-stream project located in the same watershed. Designing in-stream controls requires a hydrologic and geomorphic evaluation (including a longitudinal profile) of the stream system downstream and upstream of the project. As with all in-stream activities, other regulatory permits must be obtained by the project proponent.[8]

iv. Reporting

For each HM Project approved during the reporting period, the following information shall be reported electronically in tabular form. This information shall be added to the required reporting information specified in Provision C.3.b.v.

(1) Device(s) or method(s) used to meet the HM Standard, such as detention basin(s), biodetention unit(s), regional detention basin, or in-stream control;

(2) Method used by the project proponent to design and size the device or method used to meet the HM Standard; and

(3) Other information as required in the Permittee's existing HM requirements, as shown in Attachments B–F.

v. Vallejo Permittees shall complete the following tasks in lieu of complying with Provisions C.3.g.i-iv.

(1) Develop a Hydrograph Modification Management Plan (HMP) for meeting the requirements of Provisions C.3.g.i–iv. The Vallejo Permittees' HMP shall be subject to approval by the Water Board.

(2) Vallejo Permittees shall include the following in their HMP:

(a) A map of the City of Vallejo, delineating areas where the HM Standard applies. The HM Standard shall apply in all areas except where a project:

- discharges stormwater runoff into creeks or storm drains that are concrete-lined or significantly hardened (e.g., with rip-rap, sackrete) downstream to their outfall in San Francisco Bay;
- discharges to an underground storm drain discharging to the Bay; or
- is located in a highly developed watershed.[9]

[8] In-stream control projects require a Stream Alteration Agreement from the California Department of Fish & Game, a CWA section 404 permit from the U.S. Army Corps of Engineers, and a section 401 certification from the Water Board. Early discussions with these agencies on the acceptability of an in-stream modification are necessary to avoid project delays or redesign.

[9] Within the context of Provision C.3.g., "highly developed watersheds" refers to catchments or subcatchments that are 65% impervious or more.

However, plans to restore a creek reach may reintroduce the applicability of HM controls, and would need to be addressed in the HMP;

(b) A thorough technical description of the methods project proponents may use to meet the HM Standard. Vallejo Permittees shall use the same methodologies, or similar methodologies, to those already in use in the Bay Area to meet the HM Standard. Contra Costa sizing charts may be used on projects up to ten acres after any necessary modifications are made to the sizes to control runoff rates and durations from ten percent of the pre-project 2-year peak flow to the pre-project 10-year peak flow, and adjustments are made for local rainfall and soil types;

(c) A description of any land use planning measures the City of Vallejo will take (e.g., stream buffers and stream restoration activities, including restoration-in-advance of floodplains, revegetation, and use of less-impacting facilities at points of discharge) to allow expected changes in stream channel cross sections, stream vegetation, and discharge rates, velocities, and/or durations without adverse impacts on stream beneficial uses;

(d) A description of how the Vallejo Permittees will incorporate these requirements into their local approval processes, and a schedule for doing so; and

(e) Guidance for City of Vallejo project proponents explaining how to meet the HM Standard.

(3) Vallejo Permittees shall complete the HMP according to the schedule below. All required documents shall be submitted acceptable to the Executive Officer, except the HMP, which shall be submitted to the Water Board for approval. Vallejo Permittees shall report on the status of HMP development and implementation in each Annual Report and shall also provide a summary of projects incorporating measures to address Provision C.3.g and the measures used.

- By April 1, 2011, submit a detailed workplan and schedule for completion of the information required in Provision C.3.g.v.(2).
- By December 1, 2011, submit the map required in Provision C.3.g.v.(2)(a).
- By April 1, 2012, submit a draft HMP.
- By December 1, 2012, provide responses to Water Board comments on the draft HMP so that the final HMP is submitted for Water Board approval by July 1, 2013.
- Upon adoption by the Water Board, implement the HMP, which shall include the requirements of this measure. Before approval of the HMP by the Water Board, Vallejo Permittees shall encourage early implementation of measures likely to be included in the HMP.

C.3.h. Operation and Maintenance of Stormwater Treatment Systems

i. Task Description – Each Permittee shall implement an Operation and Maintenance (O&M) Verification Program.

ii. Implementation Level – At a minimum, the O&M Verification Program shall include the following elements:

(1) Conditions of approval or other legally enforceable agreements or mechanisms for all Regulated Projects that, at a minimum, require at least one of the following from all project proponents and their successors in control of the Project or successors in fee title:

(a) The project proponent's signed statement accepting responsibility for the O&M of the installed onsite, joint, and/or offsite stormwater treatment system(s) and HM control(s) (if any) until such responsibility is legally transferred to another entity;

(b) Written conditions in the sales or lease agreements or deed for the project that requires the buyer or lessee to assume responsibility for the O&M of the onsite, joint, and/or offsite installed stormwater treatment system(s) and HM control(s) (if any) until such responsibility is legally transferred to another entity;

(c) Written text in project deeds, or conditions, covenants and restrictions (CCRs) for multi-unit residential projects that require the homeowners association or, if there is no association, each individual owner to assume responsibility for the O&M of the installed onsite, joint, and/or offsite stormwater treatment system(s) and HM control(s) (if any) until such responsibility is legally transferred to another entity; or

(d) Any other legally enforceable agreement or mechanism, such as recordation in the property deed, that assigns the O&M responsibility for the installed onsite, joint, and/or offsite treatment system(s) and HM control(s) (if any) to the project owner(s) or the Permittee.

(2) Coordination with the appropriate mosquito and vector control agency with jurisdiction to establish a protocol for notification of installed stormwater treatment systems and HM controls.

(3) Conditions of approval or other legally enforceable agreements or mechanisms for all Regulated Projects that require the granting of site access to all representatives of the Permittee, local mosquito and vector control agency staff, and Water Board staff, for the sole purpose of performing O&M inspections of the installed stormwater treatment system(s) and HM control(s) (if any).

(4) A written plan and implementation of the plan that describes O&M (including inspection) of all Regional Projects and regional HM controls that are Permittee-owned and/or operated.

(5) A database or equivalent tabular format of all Regulated Projects (public and private) that have installed onsite, joint, and/or offsite stormwater

treatment systems. This database or equivalent tabular format shall include the following information for each Regulated Project:

(a) Name and address of the Regulated Project;

(b) Specific description of the location (or a map showing the location) of the installed stormwater treatment system(s) and HM control(s) (if any);

(c) Date(s) that the treatment system(s) and HM controls (if any) is/are installed;

(d) Description of the type and size of the treatment system(s) and HM control(s) (if any) installed;

(e) Responsible operator(s) of each treatment system and HM control (if any);

(f) Dates and findings of inspections (routine and follow-up) of the treatment system(s) and HM control(s) (if any) by the Permittee; and

(g) Any problems and corrective or enforcement actions taken.

(6) A prioritized plan for inspecting all installed stormwater treatment systems and HM controls. At a minimum, this prioritized plan must specify the following for each fiscal year:

(a) Inspection by the Permittee of all newly installed stormwater treatment systems and HM controls within 45 days of installation to ensure approved plans have been followed;

(b) Inspection by the Permittee of at least 20 percent of the total number (at the end of the preceding fiscal year) of installed stormwater treatment systems and HM controls;

(c) Inspection by the Permittee of at least 20 percent of the total number (at the end of the preceding fiscal year) of installed vault-based systems; and

(d) Inspection by the Permittee of all installed stormwater treatment systems subject to Provision C.3, at least once every five years.

iii. Maintenance Approvals: The Permittees shall ensure that onsite, joint, and offsite stormwater treatment systems and HM controls installed by Regulated Projects are properly operated and maintained for the life of the projects. In cases where the responsible party for a stormwater treatment system or HM control has worked diligently and in good faith with the appropriate State and federal agencies to obtain approvals necessary to complete maintenance activities for the treatment system or HM control, but these approvals are not granted, the Permittees shall be deemed to be in compliance with this Provision. Permittees shall ensure that constructed wetlands installed by Regulated Projects and used for urban runoff treatment shall abide by the Water Board's Resolution No. 94-102: Policy on the Use of Constructed Wetlands for Urban Runoff Pollution Control and the O&M requirements contained therein.

Due Date for Full Implementation: Immediate for Provisions C.3.h.i, C.3.h.ii.(1), and C.3.h.iii, and December 1, 2010, for Provisions C.3.h.ii.(2)-(6). For Vallejo Permittees: December 1, 2010, for Provisions C.3.h.i-iii.

iv. Reporting: Beginning with the 2010 Annual Report

(1) For each Regulated Project inspected during the reporting period (fiscal year) the following information shall be reported to the Water Board electronically in tabular form as part of the Annual Report (as set forth in the Provision C.3.h. Sample Reporting Table attached):

- Name of facility/site inspected.
- Location (street address) of facility/site inspected.
- Name of responsible operator for installed stormwater treatment systems and HM controls.
- For each inspection:
  - Date of inspection.
  - Type of inspection (e.g., initial, annual, follow-up, spot).
  - Type(s) of stormwater treatment systems inspected (e.g., swale, bioretention unit, tree well, etc.) and an indication of whether the treatment system is an onsite, joint, or offsite system.
  - Type of HM controls inspected.
  - Inspection findings or results (e.g., proper installation, proper operation and maintenance, system not operating properly because of plugging, bypass of stormwater because of improper installation, maintenance required immediately, etc.).
  - Enforcement action(s) taken, if any (e.g., verbal warning, notice of violation, administrative citation, administrative order).

(2) On an annual basis, before the wet season, provide a list of newly installed (installed within the reporting period) stormwater treatment systems and HM controls to the local mosquito and vector control agency and the Water Board. This list shall include the facility locations and a description of the stormwater treatment measures and HM controls installed.

(3) Each Permittee shall report the following information in the Annual Report each year:

(a) A discussion of the inspection findings for the year and any common problems encountered with various types of treatment systems and/or HM controls. This discussion should include a general comparison to the inspection findings from the previous year.

(b) A discussion of the effectiveness of the Permittee's O&M Program and any proposed changes to improve the O&M Program (e.g., changes in prioritization plan or frequency of O&M inspections, other changes to improve effectiveness of program).

C.3.i. Required Site Design Measures for Small Projects and Detached Single-Family Home Projects

i. Task Description – The Permittees shall require all development projects, which create and/or replace $\geq$ 2500 ft^2 to < 10,000 ft^2 of impervious surface, and

detached single-family home projects,[10] which create and/or replace 2,500 square feet or more of impervious surface, to install one or more of the following site design measures:

- Direct roof runoff into cisterns or rain barrels for reuse.
- Direct roof runoff onto vegetated areas.
- Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
- Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
- Construct sidewalks, walkways, and/or patios with permeable surfaces.[3]
- Construct bike lanes, driveways, and/or uncovered parking lots with permeable surfaces.[3]

This provision applies to all development projects that require approvals and/or permits issued under the Permittee's' planning, building, or other comparable authority.

ii. **Implementation Level** – All elements of this task shall be fully implemented by December 1, 2012.

iii. **Reporting** – On an annual basis, discuss the implementation of the requirements of Provision C.3.i, including ordinance revisions, permit conditions, development of standard specifications and/or guidance materials, and staff training.

iv. **Task Description** – The Permittees shall develop standard specifications for lot-scale site design and treatment measures (e.g., for roof runoff and paved areas) as a resource for single-family homes and small development projects.

v. **Implementation Level** – This task may be fulfilled by the Permittees cooperating on a countywide or regional basis.

Due Date for Full Implementation – December 1, 2012.

vi. **Reporting** – A report containing the standard specifications for lot-scale treatment BMPs shall be submitted by December 1, 2012.

[10] **Detached single-family home project** – The building of one single new house or the addition and/or replacement of impervious surface to one single existing house, which is not part of a larger plan of development.

C.4. Industrial and Commercial Site Controls

Each Permittee shall implement an industrial and commercial site control program at all sites which could reasonably be considered to cause or contribute to pollution of stormwater runoff, with inspections and effective follow-up and enforcement to abate actual or potential pollution sources consistent with each Permittee's respective Enforcement Response Plan (ERP), to prevent discharge of pollutants and impacts on beneficial uses of receiving waters. Inspections shall confirm implementation of appropriate and effective BMPs and other pollutant controls by industrial and commercial site operators.

C.4.a. Legal Authority for Effective Site Management

i. Task Description – Permittees shall have sufficient legal enforcement authority to obtain effective stormwater pollutant control on industrial sites. Permittees shall have the ability to inspect and require effective stormwater pollutant control and to escalate progressively stricter enforcement to achieve expedient compliance and pollutant abatement at commercial and industrial sites within their jurisdiction.

ii. Implementation Level

(1) Permittees shall have the legal authority to oversee, inspect, and require expedient compliance and pollution abatement at all industrial and commercial sites which may be reasonably considered to cause or contribute to pollution of stormwater runoff. Permittees shall have the legal authority to require implementation of appropriate BMPs at industrial and commercial to address pollutant sources associated with outdoor process and manufacturing areas, outdoor material storage areas, outdoor waste storage and disposal areas, outdoor vehicle and equipment storage and maintenance areas, outdoor parking areas and access roads, outdoor wash areas, outdoor drainage from indoor areas, rooftop equipment, and contaminated and erodible surface areas, and other sources determined by the Permittees or Water Board Executive Officer to have a reasonable potential to contribute to pollution of stormwater runoff.

(2) Permittees shall notify the discharger of any actual or potential pollutant sources and violations and require problem correction within a reasonably short and expedient time frame commensurate with the threat to water quality. Permittees shall require timely correction of problems involving rapid temporary repair, and may allow longer time periods for implementation of more permanent solutions, if these require significant capital expenditure or construction. Violations shall be corrected prior to the next rain event or within 10 business days after the violations are noted. If more than 10 business days are required for correction, a rationale shall be given in the tabulated sheets.

C.4.b. Industrial and Commercial Business Inspection Plan (Inspection Plan)

i. Task Description – Permittees shall develop and implement an inspection plan that will serve as a prioritized inspection workplan. This inspection plan will allow inspection staff to categorize the commercial and industrial sites within the Permittee's jurisdiction by pollutant threat and inspection frequency, change inspection frequency based on site performance, and add and remove sites as businesses open and close.

The Inspection Plan shall contain the following information:

(1) Total number and a list of industrial and commercial facilities requiring inspection, within each Permittee's jurisdiction, to be determined on the basis of a prioritization criteria designed to assign a more frequent inspection schedule to the highest priority facilities per Section C.4.b.ii. below.

(2) A description of the process for prioritizing inspections and frequency of inspections. If any geographical areas are to be targeted for inspections due to high potential for stormwater pollution, these areas should be indicated in the Inspection Plan. A mechanism to include newly opened businesses that warrant inspection shall be included.

ii. Implementation Level – Each Permittee shall annually update and maintain a list of industrial and commercial facilities in the Inspection Plan to inspect that could reasonably be considered to cause or contribute to pollution of stormwater runoff. The following are some of the functional aspects of businesses and types of businesses that shall be included in the Inspection Plans:

(1) Sites that include the following types of functions that may produce pollutants when exposed to stormwater include, but are not limited to:

(a) Outdoor process and manufacturing areas

(b) Outdoor material storage areas

(c) Outdoor waste storage and disposal areas

(d) Outdoor vehicle and equipment storage and maintenance areas

(e) Outdoor wash areas

(f) Outdoor drainage from indoor areas

(g) Rooftop equipment

(h) Other sources determined by the Permittee or Water Board to have a reasonable potential to contribute to pollution of stormwater runoff

(2) The following types of Industrial and Commercial businesses that have a reasonable likelihood to be sources of pollutants to stormwater and non-stormwater discharges:

(a) Industrial facilities, as defined at 40 CFR 122.26(b)(14), including those subject to the State General NPDES Permit for Stormwater Discharges Associated with Industrial Activity (hereinafter the Industrial General Permit);

(b) Vehicle Salvage yards;

(c) Metal and other recycled materials collection facilities, waste transfer facilities;

(d) Vehicle mechanical repair, maintenance, fueling, or cleaning;

(e) Building trades central facilities or yards, corporation yards;

(f) Nurseries and greenhouses;

(g) Building material retailers and storage;

(h) Plastic manufacturers; and

(i) Other facilities designated by the Permittee or Water Board to have a reasonable potential to contribute to pollution of stormwater runoff.

(3) **Prioritization of Facilities**

Facilities of the types described in Provision 4.b.ii.(2) above and identified by the Permittees as having the reasonable potential to contribute to pollution of stormwater runoff shall be prioritized on the basis of the potential for water quality impact using criteria such as pollutant sources on site, pollutants of concern, proximity to a waterbody, violation history of the facility, and other relevant factors.

(4) **Types/Contents of Inspections**

Each Permittee shall conduct inspections to determine compliance with its ordinances and this Permit. Inspections shall include but not be limited to the following:

(a) Prevention of stormwater runoff pollution or illicit discharge by implementing appropriate BMPs;

(b) Visual observations for evidence of unauthorized discharges, illicit connections, and potential discharge of pollutants to stormwater;

(c) Noncompliance with Permittee ordinances and other local requirements; and

(d) Verification of coverage under the Industrial General Permit, if applicable.

(5) **Inspection Frequency** – Permittees shall establish appropriate inspection frequencies for facilities based on Provision 4.b.ii (3) priority, potential for contributing pollution to stormwater runoff, and commensurate with the threat to water quality.

(6) **Record Keeping** – For each facility identified in Provision 4.b.ii, the Permittee shall maintain a database or equivalent of the following information at a minimum:

(a) Name and address of the business and local business operator;

(b) A brief description of business activity including SIC code;

(c) Inspection priority and inspection frequency; and

(d) If coverage under the Industrial General Permit is required.

iii. Reporting – The Permittees shall include the following in the Annual Report:

(1) The list of facilities identified in Provision 4.b.ii in the 2010 Annual Report and revisions or updates in subsequent annual reports; and

(2) The list of facilities scheduled for inspection during the current fiscal year.

C.4.c. Enforcement Response Plan (ERP)

i. Task Description – Permittees shall develop and implement an ERP that will serve as a reference document for inspection staff to take consistent actions to achieve timely and effective compliance from all commercial and industrial site operators.

ii. Implementation Level – The ERP shall contain the following:

(1) **Required enforcement actions** – including timeframes for corrections of problems – for various field violation scenarios. The ERP will provide guidance on appropriate use of the various enforcement tools, such as verbal and written notices of violation, citations, cleanup requirements, administrative and criminal penalties.

(2) **Timely Correction of Violations** – All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded in the electronic database or equivalent tabular system.

A description of the Permittee's procedures for follow-up inspections and enforcement actions or referral to another agency, including appropriate time periods for each level of corrective action.

(3) **Referral and Coordination with Water Board** – Each Permittee shall enforce its stormwater ordinances as necessary to achieve compliance at sites with observed violations. For cases in which Permittee enforcement tools are inadequate to remedy the noncompliance, the Permittee shall refer the case to the Water Board, district attorney or other relevant agencies for additional enforcement.

(4) **Recordkeeping** – Permittees shall maintain adequate records to demonstrate compliance and appropriate follow-up enforcement responses for facilities inspected.

Permittees shall maintain an electronic database or equivalent tabular system that contains the following information regarding industrial commercial site inspections:

(a) Name of Facility/Site Inspected
(b) Inspection Date
(c) Industrial General Permit coverage required (Yes or No)
(d) Compliance Status
(e) Type of Enforcement (if applicable)
(f) Type of Activity or Pollutant Source

Examples: Outdoor process/manufacturing areas, Outdoor material storage areas, Outdoor waste storage/disposal areas, outdoor vehicle and equipment storage/maintenance areas, Outdoor parking areas and access roads, Outdoor wash areas, Rooftop equipment, Outdoor drainage from indoor areas

(g) Specific Problems

(h) Problem Resolution

(i) Additional Comments

The electronic database or equivalent tabular system shall be made readily available to the Executive Officer and during inspections and audits by the Water Board staff or its representatives.

(5) The ERP shall be developed and implemented by April 1, 2010.

iii. Reporting – Permittees shall include the following information in each Annual Report:

(1) Number of inspections conducted, Number of violations issued (excluding verbal warnings), Percentage of sites inspected in violation, and number and percent of violations resolved within 10 working days or otherwise deemed resolved in a longer but still timely manner;

(2) Frequency and Types/categories of violations observed, Frequency and type of enforcement conducted;

(3) Summary of types of violations noted by business category; and

(4) Facilities that are required to have coverage under the Industrial General Permit, but have not filed for coverage.

C.4.d. Staff Training

i. Task Description

Permittees shall provide focused training for inspectors annually. Trainings may be Program-wide, Region-wide, or Permittee-specific.

ii. Implementation Level

At a minimum, train inspectors, within the 5-year term of this Permit, in the following topics:

(1) Urban runoff pollution prevention;

(2) Inspection procedures;

(3) Illicit Discharge Detection, Elimination and follow-up; and

(4) Implementation of typical BMPs at Industrial and Commercial Facilities.

Permittees, either countywide or regionally, if they have not already done so, are encouraged to create or adopt guidance for inspectors or reference existing inspector guidance including the California Association of Stormwater Quality Agencies (CASQA) Industrial BMP Handbook.

iii. Reporting

The Permittees shall include the following information in the Annual Report:

(1) Dates of trainings;

(2) Training topics that have been covered; and

(3) Percentage of Permittee inspectors attending training.

C.5. Illicit Discharge Detection and Elimination

The purpose of this provision is to implement the illicit discharge prohibition and to ensure illicit discharges are detected and controlled that are not otherwise controlled under provision C4, Industrial and Commercial Site Controls and C6, Construction Site Controls. Permittees shall develop and implement an illicit discharge program that includes an active surveillance component and a centralized complaint collection and follow-up component to target illicit discharge and non-stormwater sources. Permittees shall maintain a complaint tracking and follow-up data system as their primary accountability reporting for this provision.

C.5.a. Legal Authority

i. Task Description – Permittees shall have the legal authority to prohibit and control illicit discharges and escalate stricter enforcement to achieve expedient compliance.

ii. Implementation Level

(1) Permittees shall have adequate legal authority to address stormwater and non-stormwater pollution associated with, but not limited to the following:

(a) Sewage;

(b) Discharges of wash water resulting from the cleaning of exterior surfaces and pavement, or the equipment and other facilities of any commercial business, or any other public or private facility;

(c) Discharges of runoff from material storage areas, including containing chemicals, fuels, or other potentially polluting or hazardous materials;

(d) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;

(e) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and

(f) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

(2) Permittees shall have adequate legal authority to prohibit, discover through inspection and surveillance, and eliminate illicit connections and discharges to storm drains.

(3) Permittees shall have adequate legal authority to control the discharge of spills, dumping, or disposal of materials other than storm water to storm drains.

C.5.b. Enforcement Response Plan (ERP)

i. Task Description – Permittees shall develop and implement an ERP that will serve as guidance for inspection staff to take consistent actions to achieve timely and effective abatement of illicit discharges.

ii. Implementation Level – The ERP shall contain the following:

(1) Recommended responses and enforcement actions – including timeframes for corrections of problems – for various types and degree of violations. The ERP shall provide guidelines on when to employ the range of regulatory responses from warnings, citations and cleanup and cost recovery, to administrative or criminal penalties.

(2) Timely Correction of Violations: All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded in the electronic database or equivalent tabular system. Immediate correction can be temporary and short-term if a long-term, permanent correction will involve significant resources and construction time. An example would be replumbing of a wash area to the sanitary sewer, which would involve an immediate short-term, temporary fix followed by permanent replumbing.

(3) If corrective actions are not implemented promptly or if there are repeat violations, Permittees shall escalate responses as needed to achieve compliance, including referral to other agencies were necessary.

(4) The ERP shall be developed and implemented by April 1, 2010.

C.5.c. Spill and Dumping Response, Complaint Response, and Frequency of Inspections

i. Task Description – Permittees shall have a central contact point, including a phone number for complaints and spill reporting, and publicize this number to both internal Permittee staff and the public. If 911 is selected, also maintain and publicize a staffed, non-emergency phone number with voicemail, which is checked during normal business hours.

Permittees shall develop a spill/dumping response flow chart and phone tree or contact list for internal use that shows the various responsible agencies and their contacts, who would be involved in illicit discharge incident response that goes beyond the Permittees immediate capabilities. The list shall be maintained and updated as changes occur.

Permittees shall conduct reactive inspections in response to complaints and follow-up inspections as needed to ensure that corrective measures have been implemented to achieve and maintain compliance.

ii. Implementation Level – Permittees will have the phone number and contact information available and integrated into training and outreach both to Permittee staff and the public by July 1, 2010.

iii. Reporting – Submit the complaint and spill response phone number and spill contact list with the 2010 Annual Report and update annually if changes occur.

C.5.d. Control of Mobile Sources

i. Task Description – The purpose of this section is to establish oversight and control of pollutants associated with mobile business sources.

ii. Implementation Level – Each Permittee shall develop and implement a program to reduce the discharge of pollutants from mobile businesses.

(1) The program shall include the following:

(a) Development and implementation of minimum standards and BMPs to be required for each of the various types of mobile businesses such as automobile washing, power washing, steam cleaning, and carpet cleaning. This guidance can be developed via county-wide or regional collaboration.

(b) Development and implementation of an enforcement strategy which specifically addresses the unique characteristics of mobile businesses.

(c) Outreach to mobile businesses operating within the Permittee's jurisdiction with minimum standards and BMP requirements and local ordinances through an outreach and education strategy.

(d) Inspection of mobile businesses as needed.

(2) Permittees should cooperate regionally in developing and implementing their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action information, and education.

iii. Reporting – Permittees shall report on implementation of minimum standards and BMPs for mobile business and their enforcement strategy in each Annual Report.

C.5.e. Collection System Screening - Municipal Separate Storm Sewer System (MS4) Map Availability

i. Task Description – Permittees shall perform routine surveys for illicit discharges and illegal dumping in above ground check points in the collection system including elements that are typically inspected for other maintenance purposes, such as end of pipes, creeks, flood conveyances, storm drain inlets and catch basins, in coordination with public works/flood control maintenance surveys, video inspections of storm drains, and during other routine Permittee maintenance and inspection activities when Permittee staff are working in or near the MS4 system.

ii. Implementation Level – Permittees shall develop and implement a screening program utilizing the USEPA/Center for Watershed Protection publication, "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessment." Permittees shall implement the screening program by conducting a survey of strategic collection system check points (one screening point per square mile of Permittee urban and suburban jurisdiction area, less open space) including some key major outfalls draining industrial areas as defined in 40 CFR 122.26 (b)(5) once each year in dry weather conditions meaning no significant rainfall within the past 3 weeks. Routine surveys that occur on an ongoing basis during regular conveyance system inspections may be credited toward this requirement. Make maps of the MS4 publicly available, either electronically or in hard copy by July 1, 2010. The public availability shall be through a publicized single point of contact that

is convenient for the public, such as a staffed counter or web accessible maps. The MS4 map availability shall be publicized through Permittee directories and web pages.

iii. Reporting – Permittees shall provide a summary of their collection screening program, a summary of problems found during collection system screening, and any changes to the screening program in each Annual Report.

C.5.f. Tracking and Case Follow-up

i. Task Description – All incidents or discharges reported to the complaint/spill system that might pose a threat to water quality shall be logged to track follow-up and response through problem resolution. The data collected shall be sufficient to demonstrate escalating responses for repeated problems, and inter/intra-agency coordination, where appropriate.

ii. Implementation Level – Create and maintain a water quality spill and discharge complaint tracking and follow-up in an electronic database or equivalent tabular system by April 1, 2010.

The spill and discharge complaint tracking system shall contain the following information:

(1) Complaint information:
- (a) Date and time of complaint
- (b) Type of pollutant
- (c) Problem Status (potential or actual discharge.)

(2) Investigation information:
- (a) Date and time started
- (b) Type of pollutant
- (c) Entered storm drain and/or receiving water
- (d) Date abated
- (e) Type of enforcement (if applicable)

(3) Response time (days)
- (a) Call to investigation
- (b) Investigation to abatement
- (c) Call to abatement

The electronic database or equivalent tabular system shall be made available to Water Board staff as needed for review of enforcement response through problem resolution.

iii. Reporting – Permittees shall provide the following information in the Annual Report:

(1) Number of discharges reported;

(2) Number of discharges reaching storm drains and/or receiving waters;

(3) Number and percentage of discharges resolved in a timely manner; and

(4) Summary of major types of discharges and complaints.

C.6. Construction Site Control

Each Permittee shall implement a construction site inspection and control program at all construction sites, with follow-up and enforcement consistent with each Permittee's respective Enforcement Response Plan (ERP), to prevent construction site discharges of pollutants and impacts on beneficial uses of receiving waters. Inspections shall confirm implementation of appropriate and effective erosion and other construction pollutant controls by construction site operators/developers; and reporting shall demonstrate the effectiveness of this inspection and problem solution activity by the Permittees.

C.6.a. Legal Authority for Effective Site Management

i. Task Description – Permittees shall have the ability to require effective stormwater pollutant controls, and escalate progressively stricter enforcement to achieve expedient compliance and clean up at all public and private construction sites.

ii. Implementation Level

(1) Permittees shall have the legal authority to require at all construction sites year round effective erosion control, run-on and runoff control, sediment control, active treatment systems (as appropriate), good site management, and non storm water management through all phases of construction (including but not limited to site grading, building, and finishing of lots) until the site is fully stabilized by landscaping or the installation of permanent erosion control measures.

(2) Permittees shall have the legal authority to oversee, inspect, and require expedient compliance and clean up at all construction sites year round.

iii. Reporting – Permittees shall certify adequacy of their respective legal authority in the 2010 Annual Report.

C.6.b. Enforcement Response Plan (ERP)

i. Task Description – Permittees shall develop and implement an ERP that will serve as a reference document for inspection staff to take consistent actions to achieve timely and effective compliance from all public and private construction site owners/operators.

ii. Implementation Level

(1) The ERP shall include required enforcement actions – including timeframes for corrections of problems – for various field violation scenarios. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded in the electronic database or equivalent tabular system.

(2) If site owners/operators do not implement appropriate corrective actions in a timely manner, or if violations repeat, Permittees shall take progressively stricter responses to achieve compliance. The ERP shall include the structure for progressively stricter responses and various violation scenarios that evoke progressively stricter responses.

(3) The ERP shall be developed and implemented by April 1, 2010.

C.6.c. Best Management Practices Categories

i. Task Description – Permittees shall require all construction sites to have site specific, and seasonally- and phase-appropriate, effective Best Management Practices (BMPs) in the following six categories:

- Erosion Control
- Run-on and Run-off Control
- Sediment Control
- Active Treatment Systems (as necessary)
- Good Site Management
- Non Stormwater Management.

Theses BMP categories are listed in State General NPDES Permit for Stormwater Discharges Associated with Construction Activities (hereinafter the Construction General Permit).

ii. Implementation Level

The BMPs targeting specific pollutants within the six categories listed in C.6.c.i. shall be site specific. Site specific BMPs targeting specific pollutants from the six categories listed in C.6.c.i. can be a combination of BMPs from:

- California BMP Handbook, Construction, January 2003.
- Caltrans Stormwater Quality Handbooks, Construction Site Best Management Practices Manual, March 2003, and addenda.
- California Regional Water Quality Control Board, San Francisco Bay Region, Erosion and Sediment Control Field Manual, 2002.
- New BMPs available since the release of these Handbooks.

C.6.d. Plan Approval Process

i. Task Description – Permittees shall review erosion control plans for consistency with local requirements, appropriateness and adequacy of proposed BMPs for each site before issuance of grading permits for projects. Permittees shall also verify that sites disturbing one acre or more of land have filed a Notice of Intent for coverage under the Construction General Permit.

ii. Implementation Level – Before approval and issuance of local grading permits, each Permittee shall perform the following:

(1) Review the site operator's/developer's erosion/pollution control plan or Stormwater Pollution Prevention Plan (SWPPP) to verify compliance with the Permittee's grading ordinance and other local requirements. Also review the site operator's/developer's erosion/pollution control plan or SWPPP to verify that seasonally appropriate and effective BMPs for the six categories listed in C.6.c.i. are planned;

(2) For sites disturbing one acre or more of soil, verify that the site operators/developers have filed a Notice of Intent for permit coverage under the Construction General Permit; and

(3) Provide construction stormwater management educational materials to site operators/developers, as appropriate.

C.6.e. Inspections

i. Task Description – Permittees shall conduct inspections to determine compliance with local ordinances (grading and stormwater) and determine the effectiveness of the BMPs in the six categories listed in C.6.c.i.; and Permittees shall require timely corrections of all actual and threatened violations of local ordinances observed.

ii. Implementation Level

(1) **Wet Season Notification**

By September 1st of each year, each Permittee shall remind all site developers and/or owners disturbing one acre or more of soil to prepare for the upcoming wet season.

(2) **Frequency of Inspections**

Inspections shall be conducted monthly during the wet season[11] at the following sites:

(a) All construction sites disturbing one or more acre of land; and

(b) **High Priority Sites** – Other sites determined by the Permittee or the Water Board as significant threats to water quality. In evaluating threat to water quality, the following factors shall be considered:

(i) Soil erosion potential or soil type;

(ii) Site slope;

(iii) Project size and type;

(iv) Sensitivity or receiving waterbodies;

(v) Proximity to receiving waterbodies;

(vi) Non-stormwater discharges; and

(vii) Any other relevant factors as determined by the local agency or the Water Board.

[11] For the purpose of inspections, the wet season is defined as October through April, but sites need to implement seasonally appropriate BMPs in the six categories listed in C.6.c.i throughout the year.

(3) **Contents of Inspections**

Inspections shall focus on the adequacy and effectiveness of the site specific BMPs implemented for the six categories listed in C.6.c.i. Permittees shall require timely corrections of all actual and potential problems observed. Inspections of construction sites shall include, but are not limited to, the following:

(a) Assessment of compliance with Permittee's ordinances and permits related to urban runoff, including the implementation and maintenance of the verified erosion/pollution control plan or SWPPP (from C.6.d.ii.(1));

(b) Assessment of the adequacy and effectiveness of the site specific BMPs implemented for the six categories listed in C.6.c.i.;

(c) Visual observations for:

- actual discharges of sediment and/or construction related materials into stormdrains and/or waterbodies.
- evidence of sediment and/or construction related materials discharges into stormdrains and/or waterbodies.
- illicit connections.
- potential illicit connections.

(d) Education on stormwater pollution prevention, as needed.

(4) **Tracking**

All inspections must be recorded on a written or electronic inspection form. Inspectors shall follow the ERP if a violation is noted and shall require timely corrections of all actual and threatened violations of local ordinances observed. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale shall be recorded on the inspection form.

Permittees shall track in an electronic database or tabular format all inspections. This electronic database or tabular format shall be made readily available to the Executive Officer and during inspections and audits by the Water Board staff or its representatives. This electronic database or tabular format shall record the following information for each site inspection:

(a) Site name;

(b) Inspection date;

(c) Weather during inspection;

(d) Has there been rainfall with runoff since the last inspection?;

(e) Enforcement Response Level (Use ERP);

(f) Problem(s) observed using Illicit Discharge and the six BMP categories listed in C.6.c.i.;

(g) Specific Problem(s) (List the specific problem(s) within the BMP categories);

(h) Resolution of Problems noted using the following three standardized categories: Problems Fixed, Need More Time, and Escalate Enforcement; and

(i) Comments, which shall include all Rationales for Longer Compliance Time, all escalation in enforcement discussions, and any other information that may be relevant to that site inspection.

iii. Reporting

(1) In each Annual Report, each Permittee shall summarize the following information:

(a) Total number of active sites disturbing less than one acre of soil requiring inspection;

(b) Total number of active sites disturbing 1 acre or more of soil;

(c) Total number of inspections conducted;

(d) Number and percentage[12] of violations in each of the six categories listed in C.6.c.i.;

(e) Number and percentage[13] of each type of enforcement action taken as listed in each Permittee's ERP;

(f) Number of discharges, actual and those inferred through evidence, of sediment or other construction related materials;

(g) Number of sites with discharges, actual and those inferred through evidence, of sediment or other construction related materials;

(h) Number and percentage[14] of violations fully corrected prior to the next rain event but no longer than 10 business days after the violations are discovered or otherwise considered corrected in a timely, though longer period; and

(i) Number and percentage[15] of violations not fully corrected 30 days after the violations are discovered.

(2) In each Annual Report, each Permittee shall evaluate its respective electronic database or tabular format and the summaries produced in C.6.e.ii.(4) above. This evaluation shall include findings on the program's strength, comparison to previous years' results, as well as areas that need

[12] Percentage shall be calculated as number of violations in each category divided by total number of violations in all six categories.

[13] Percentage shall be calculated as number of each type of enforcement action divided by the total number of enforcement actions.

[14] Percentage shall be calculated as follows: number of violations fully corrected prior to the goal of the next rain event but no later than10 business days after the violations are discovered divided by the total number of violations for the reporting year.

[15] Percentage shall be calculated as follows: number of violations not fully corrected 30 days after the violations are discovered divided by the total number of violations for the reporting year.

more focused education for site owners, operators, and developers the following year.

(3) The Executive Officer may require that the information recorded and tracked by C.6.e.ii.(4) be submitted electronically or in a tabular format. Permittees shall submit the information within 10-working days of the Executive Officer's requirement. Submittal of the information in tabular form for the reporting year is not required in each Annual Report but encouraged.

C.6.f. Staff Training

i. Task Description – Permittees shall provide training or access to training for staff conducting construction stormwater inspections.

ii. Implementation Level – Permittees shall provide training at least every other year to municipal staff responsible for conducting construction site stormwater inspections. Training topics will include information on correct uses of specific BMPs, proper installation and maintenance of BMPs, Permit requirements, local requirements, and ERP.

iii. Reporting – Permittees shall include in each Annual Report the following information: training topics covered, dates of training, and the percentage of Permittees' inspectors attending each training. If no training in that year, so state.

C.7. Public Information and Outreach

Each Permittee shall increase the knowledge of the target audiences regarding the impacts of stormwater pollution on receiving water and potential solutions to mitigate the problems caused; change the waste disposal and runoff pollution generation behavior of target audiences by encouraging implementation of appropriate solutions; and involve various citizens in mitigating the impacts of stormwater pollution.

C.7.a. Storm Drain Inlet Marking

i. Task Description – Permittees shall mark and maintain at least 80 percent of municipally-maintained storm drain inlets with an appropriate stormwater pollution prevention message, such as "No dumping, drains to Bay" or equivalent. At least 80% of municipally-maintained storm drain inlet markings shall be inspected and maintained at least once per 5-year permit term. For newly approved, privately maintained streets, Permittees shall require inlet marking by the project developer upon construction and maintenance of markings through the development maintenance entity. Markings shall be verified prior to acceptance of the project.

ii. Implementation Level

(1) Inspect and maintain markings of at least 80 percent of municipality maintained inlets to ensure they are legibly labeled with a no dumping message or equivalent once per permit term.

(2) Verify that newly developed streets are marked prior to acceptance of the project.

iii. Reporting

(1) In the 2013 Annual Report, each Permittee shall report prior years' annual percentages of municipality maintained inlet markings inspected and maintained as legible with a no dumping message or equivalent.

(2) In the 2013 Annual Report, each Permittee shall report prior years' annual number of projects accepted after inlet markings were verified.

C.7.b. Advertising Campaigns

i. Task Description – Permittees shall participate in or contribute to advertising campaigns on trash/litter in waterways and pesticides with the goal of significantly increasing overall awareness of stormwater runoff pollution prevention messages and behavior changes in target audience.

ii. Implementation Level

(1) Target a broad audience with two separate advertising campaigns, one focused on reducing trash/litter in waterways and one focused on reducing the impact of urban pesticides. The advertising campaigns may be coordinated regionally or county-wide.

(2) Permittees shall conduct a pre-campaign survey and a post-campaign survey to identify and quantify the audiences' knowledge, trends, and

attitudes and/or practices; and to measure the overall population's awareness of the messages and behavior changes achieved by the two advertising campaigns. These surveys may be done regionally or county-wide.

iii. Reporting

(1) In the Annual Report following the pre-campaign survey, each Permittee (or the Countywide Program, if the survey was done county-wide or regionally) shall provide a report of the survey completed, which at a minimum, shall include the following:

- A summary of how the survey was implemented.
- A copy of the survey.
- A copy of the survey results.
- An analysis of the survey results.
- A discussion of the outreach strategies based on the survey results.
- A discussion of the planned or future advertising campaigns to influence awareness and behavior changes regarding trash/litter and pesticides.

(2) In the Annual Report following the post campaign survey, each Permittee (or the Countywide Program, if survey was done county-wide or regionally) shall provide a report of the survey completed, which at minimum shall include the information required in the pre-campaign report (C.7.b.iii.(1)) and the following:

- A discussion of the campaigns.
- A discussion of the measurable changes in awareness and behavior achieved.
- An update of outreach strategies based on the survey results.

C.7.c. Media Relations – Use of Free Media

i. Task Description – Permittees shall participate in or contribute to a media relations campaign. Maximize use of free media/media coverage with the objective of significantly increasing the overall awareness of stormwater pollution prevention messages and associated behavior change in target audiences, and to achieve public goals.

ii. Implementation Level – Conduct a minimum of six pitches (e.g., press releases, public service announcements, and/or other means) per year at the county-wide program, regional, and/or local levels.

iii. Reporting – In each Annual Report, each Permittee (or the Countywide Program, if the media relations campaign was done county-wide or regionally) shall include the details of each media pitch, such as the medium, date, and content of the pitch.

C.7.d. Stormwater Point of Contact

i. Task Description – Permittees shall individually or collectively create and maintain a point of contact, e.g., phone number or website, to provide the public with information on watershed characteristics and stormwater pollution prevention alternatives.

ii. Implementation Level – Maintain and publicize one point of contact for information on stormwater issues. Permittees may combine this function with the complaint/spill contact required in C.5.

iii. Reporting – In the 2010 Annual Report, each Permittee shall discuss how this point of contact is publicized and maintained. If any change occurs in this contact, report in subsequent annual report.

C.7.e. Public Outreach Events

i. Task Description – Participate in and/or host events such as fairs, shows, workshops, (e.g., community events, street fairs, and farmers' markets), to reach a broad spectrum of the community with both general and specific stormwater runoff pollution prevention messages. Pollution prevention messages shall include encouraging residents to (1) wash cars at commercial car washing facilities, (2) use minimal detergent when washing cars, and (3) divert the car washing runoff to landscaped area.

ii. Implementation Level – Each Permittee shall annually participate and/or host the number of events according to its population, as shown in the table below:

Table 7.1 Public Outreach Events[16]

Permittee Population	Number of Outreach Events
< 10,000	2
10,001– 40,000	3
40,001 – 100,000	4
100,001 – 175,000	5
175,001 – 250,000	6
> 250,000	8
Non-population-based Permittees[17]	6

Should a public outreach event contain significant citizen involvement elements, the Permittee may claim credit for both Public Outreach Events (C.7.e.) and Citizen Involvement Events (C.7.g.).

iii. Reporting – In each Annual Report, each Permittee shall list the events (name of event, event location, and event date) participated in and assess the effectiveness

[16] Permittees may claim individual credits for all events in which their Countywide Program or BASMAA participates, supports, and/or hosts, which are publicized to reach the Permittees jurisdiction.

[17] Alameda County Flood Control and Water Conservation District, Contra Costa Flood Control and Water Conservation District, Santa Clara Valley Water District, Vallejo Sanitation and Flood Control District, and Zone 7 of the Alameda County Flood Control and Water Conservation District

of efforts with appropriate measures (e.g., success at reaching a broad spectrum of the community, number of participants compared to previous years, post-event survey results, quantity/volume materials cleaned up and comparisons to previous efforts).

C.7.f. Watershed Stewardship Collaborative Efforts

i. Task Description – Permittees shall individually or collectively encourage and support watershed stewardship collaborative efforts of community groups such as the Contra Costa Watershed Forum, the Santa Clara Basin Watershed Management Initiative, "friends of creek" groups, and other organizations that benefit the health of the watershed such as the Bay-Friendly Landscaping and Gardening Coalition. If no such organizations exist, encourage and support development of grassroots watershed groups or engagement of an existing group, such as a neighborhood association, in watershed stewardship activities. Coordinate with existing groups to further stewardship efforts.

ii. Implementation Level – Annually demonstrate effort.

iii. Reporting – In each Annual Report, each Permittee shall state the level of effort, describe the support given, state what efforts were undertaken and the results of these efforts, and provide an evaluation of the effectiveness of these efforts.

C.7.g. Citizen Involvement Events

i. Task Description – Permittees shall individually or collectively, support citizen involvement events, which provide the opportunity for citizens to directly participate in water quality and aquatic habitat improvement, such as creek/shore clean-ups, adopt-an-inlet/creek/beach programs, volunteer monitoring, service learning activities such as storm drain inlet marking, community riparian restoration activities, community grants, other participation and/or host volunteer activities.

ii. Implementation Level – Each Permittee shall annually sponsor and/or host the number of citizen involvement events according to its population, as shown in the table below:

Table 7.2 Community Involvement Events[18]

Permittee Population	Number of Involvement Events
< 10,000	1
10,001 – 40,000	1
40,001 – 100,000	2
100,001 – 175,000	3
175,001 – 250,000	4
> 250,000	5
Non-population-based Permittees	2

[18] Permittees can claim individual credit for all events sponsored or hosted by their Countywide Program or BASMAA, which are publicized to reach the Permittee's jurisdiction.

Should a citizen involvement event contain significant public outreach elements, the Permittee may claim credit for both Citizen Involvement Events (C.7.g.) and Public Outreach Events (C.7.e.).

iii. Reporting – In each Annual Report, each Permittee shall list the events (name of event, event location, and event date) participated in and assess the effectiveness of efforts with appropriate measures (e.g., success at reaching a broad spectrum of the community, number of participants compared to previous years, post-event survey results, number of inlets/creeks/shores/parks/and such adopted, quantity/volume materials cleaned up, data trends, and comparisons to previous efforts).

C.7.h. School-Age Children Outreach

i. Task Description – Permittees shall individually or collectively implement outreach activities designed to increase awareness of stormwater and/or watershed message(s) in school-age children (K through 12).

ii. Implementation Level – Implement annually and demonstrate effectiveness of efforts through assessment.

iii. Reporting – In each Annual Report, each Permittee shall state the level of effort, spectrum of children reached, and methods used, and provide an evaluation of the effectiveness of these efforts.

C.7.i. Outreach to Municipal Officials

i. Task Description – Permittees shall conduct outreach to municipal officials. One alternative means of accomplishing this is through the use of the Nonpoint Education for Municipal Officials program (NEMO) to significantly increase overall awareness of stormwater and/or watershed message(s) among regional municipal officials.

ii. Implementation Level – At least once per permit cycle, or more often.

iii. Reporting – Permittees shall summarize efforts in the 2013 Annual Report.

C.8. Water Quality Monitoring

C.8.a. Compliance Options

i. Regional Collaboration – All Permittees shall comply with the monitoring requirements in C.8, however, Permittees may choose to comply with any requirement of this Provision through a collaborative effort to conduct or cause to be conducted the required monitoring in their jurisdictions. Where all or a majority of the Permittees collaborate to conduct water quality monitoring, this shall be considered a regional monitoring collaborative.

Where an existing collaborative body has initiated plans, before the adoption of this Permit, to conduct monitoring that would fulfill a requirement(s) of this Provision, but the monitoring would not meet this Provision's due date(s) by a year or less, the Permittees may request the Executive Officer adjust the due date(s) to synchronize with such efforts.

The types, quantities, and quality of data required within Provision C.8 establish the minimum level-of-effort that a regional monitoring collaborative must achieve. Provided these data types, quantities, and quality are obtained, a regional monitoring collaborative may develop its own sampling design. For Pollutants of Concern and Long-Term monitoring required under C.8.e, an alternative approach may be pursued by Permittees provided that: either similar data types, data quality, data quantity are collected with an equivalent level of effort described under C.8.e; or an equivalent level of monitoring effort is employed to answer the management information needs stated under C.8.e.

ii. Implementation Schedule – Monitoring conducted through a regional monitoring collaborative shall commence data collection by October 2011. All other Permittee monitoring efforts shall commence data collection by October 2010. By July 1, 2010, each Permittee shall provide documentation to the Water Board, such as a written agreement, letter, or similar document that confirms whether the Permittee will conduct monitoring individually or through a regional monitoring collaborative.[19]

iii. Permittee Responsibilities – A Permittee may comply with the requirements in Provision C.8 by performing the following:

(1) Contributing to its stormwater countywide program, as determined appropriate by the Permittee members, so that the stormwater countywide Program conducts monitoring on behalf of its members;

(2) Contributing to a regional collaborative effort;

[19] This documentation will allow the Water Board to know when monitoring will commence for each Permittee. Permittees who commit to monitoring individually may join the regional monitoring collaborative at any time. Any Permittee who discontinues monitoring through the regional collaborative must commence complying with all requirements of Provision C.8 immediately.

(3) Fulfilling monitoring requirements within its own jurisdictional boundaries; or

(4) A combination of the previous options, so that all requirements are fulfilled.

iv. Third-party Monitoring – Permittees may choose to fulfill requirements of Provision C.8 using data collected by citizen monitors or other third-party organizations, provided the data are demonstrated to meet the data quality objectives described in Provision C.8.h. Where an existing third-party organization has initiated plans to conduct monitoring that would fulfill a requirement(s) of this Provision, but the monitoring would not meet this Provision's due date(s) by a year or less, the Permittees may request that the Executive Officer adjust the due date(s) to synchronize with such efforts.

C.8.b. San Francisco Estuary Receiving Water Monitoring

With limited exceptions, urban runoff from the Permittees' jurisdictions ultimately discharges to the San Francisco Estuary. Monitoring of the Estuary is intended to answer questions[20] such as:

- Are chemical concentrations in the Estuary potentially at levels of concern and are associated impacts likely?
- What are the concentrations and masses of contaminants in the Estuary and its segments?
- What are the sources, pathways, loadings, and processes leading to contaminant related impacts in the Estuary?
- Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased?
- What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?

Permittees shall participate in implementing an Estuary receiving water monitoring program, at a minimum equivalent to the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP), by contributing their fair-share financially on an annual basis.

C.8.c. Status Monitoring/Rotating Watersheds

i. Status Monitoring is intended to answer these questions: Are water quality objectives, both numeric and narrative, being met in local receiving waters,

[20] These are the management questions approved by the Regional Monitoring Program's Steering Committee on May 9, 2008, and stated at http://www.sfei/rmp/rmp_steering_meetings/rmp_steering_meeting_5_09_08/Item%2010a%20Attachment%201%20%20Draft%20RMP%20Management%20Questions%2005-02-08%20Annotated.pdf. While the stated objectives may change over time, the intent of this provision is for Permittees to continue contributing financially and as stakeholders in such a program as the RMP, which monitors the quality of San Francisco Bay.

including creeks, rivers and tributaries? Are conditions in local receiving waters supportive of or likely to be supportive of beneficial uses?

ii. Parameters and Methods – Permittees shall conduct Status Monitoring using the parameters, methods, occurrences, durations, and minimum number of sampling sites as described in Table 8.1. Spring sampling shall be conducted during the April - June timeframe; dry weather sampling shall be conducted during the July - September timeframe. Minor variations of the parameters and methods may be allowed with Executive Officer concurrence.

iii. Frequency – Permittees shall complete the Status Monitoring in Table 8.1 at the following frequencies:

- Alameda Permittees – annually
- Contra Costa Permittees – annually
- Fairfield-Suisun Permittees – twice during the Permit term
- San Mateo Permittees – annually
- Santa Clara Permittees – annually
- Vallejo Permittees – once during the Permit term

Table 8.1 Status Monitoring Elements

Status Monitoring Parameter	Sampling and/or Analytical Method[21]	Minimum Sampling Occurrence[22]	Duration of Sampling	Minimum # Sample Sites to Monitor/Yr[23] Santa Clara & Alameda Permittees/ Contra Costa & San Mateo Permittees/ Fairfield-Suisun & Vallejo Permittees	Result(s) that Trigger a Monitoring Project in Provision C.8.d.i.
Biological Assessment[24] (Includes Physical Habitat Assessment and General Water Quality Parameters[25]) Nutrients (total phosphorus, dissolved orthophosphate, total nitrogen, nitrate, ammonia, silica, chloride,	SWAMP Std Operating Procedure[26,27,28] for Biological Assessments & PHab; SWAMP	1/yr (Spring Sampling)	Grab sample	Spring 20 / 10 / 4	BMI metrics that indicate substantially degraded community as per Attachment H, Table H-1 For Nutrients: 20% of results in one waterbody exceed one or more water quality standard

21 Refers to field protocol, instrumentation and/or laboratory protocol.

22 Refers to the number of sampling events at a specific site in a given year.

23 The number of sampling sites shown is based on the relative population in each Regional Stormwater Countywide Program and is listed in this order: Santa Clara & Alameda Countywide / Contra Costa & San Mateo Countywide / Vallejo & Fairfield-Suisun Programs.

24 The same general location must be used to collect benthic community, sediment chemistry, and sediment toxicity samples. General Water Quality Parameters need not be collected twice, where it is collected by a multi-parameter probe at a subset of these sample sites (see next row of Table 8.1).

25 Includes dissolved oxygen, temperature, conductivity, and pH.

26 Ode, P.R. 2007. Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California, California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP), as subsequently revised (http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/phab_sopr6.pdf). Permittees may coordinate with Water Board staff to modify their sampling procedures if these referenced procedures change during the Permit term.

27 Biological assessments shall include benthic macroinvertebrates and algae. Bioassessment sampling method shall be multihabitat reach-wide. Macroinvertebrates shall be identified according to the Standard Taxonomic Effort Level I of the Southwestern Association of Freshwater Invertebrate Taxonomists, using the most current SWAMP approved method. Current methods are documented in (1) SWAMP Standard Operating Procedure (SOP) and Interim Guidance on Quality Assurance for SWAMP Bioassessments, Memorandum to SWAMP Roundtable from Beverly H. van Buuren and Peter R. Ode, 5-21-07, and (2) Amendment to SWAMP Interim Guidance on Quality Assurance for SWAMP Bioassessments, Memorandum to SWAMP Roundtable from Beverly H. van Buuren and Peter R. Ode, 9-17-08. For algae, include mass (ash-free dry weight), chlorophyll a, diatom and soft algae taxonomy, and reachwide algal percent cover. Physical Habitat (PHab) Assessment shall include the SWAMP basic method plus 1) depth and pebble count + CPOM, 2) cobble embeddedness, 3) discharge measurements, and 4) in-stream habitat. Permittees may coordinate with Water Board staff to modify these sampling procedures if SWAMP procedures change during the Permit term.

28 Algae shall be collected in a consistent timeframe as Regional SWAMP. For guidance on algae sampling and evaluation: Fetscher, A. and K. McLaughlin, May 16, 2008. Incorporating Bioassessment Using Freshwater Algae into California's Surface Water Ambient Monitoring Program (SWAMP). Technical Report 563 and current SWAMP-approved updates to Standard Operating Procedures therein. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/563_periphyton_bioassessment.pdf.

Status Monitoring Parameter	**Sampling and/or Analytical Method**[21]	**Minimum Sampling Occurrence**[22]	**Duration of Sampling**	**Minimum # Sample Sites to Monitor/Yr**[23] Santa Clara & Alameda Permittees/ Contra Costa & San Mateo Permittees/ Fairfield-Suisun & Vallejo Permittees	**Result(s) that Trigger a Monitoring Project in Provision C.8.d.i.**
dissolved organic carbon, suspended sediment concentration)	comparable methods for Nutrients				or established threshold
General Water Quality[29]	Multi-Parameter Probe	2/yr (Concurrent with bioassessment & during the Aug. - Sept. timeframe)	15-minute intervals for 1-2 weeks	3 / 2 / 1	20% of results in one waterbody exceed one or more water quality standard or established threshold
Chlorine (Free and Total)	USEPA Std. Method 4500 Cl F[30]	2/yr Spring & Dry Seasons	Grab sample	Spring 20 / 10 / 2 Dry 3 / 2 / 1	After immediate resampling, concentrations remain > 0.08 mg/L
Temperature	Digital Temperature Logger	60-minute intervals	60-minute intervals April through Sept.	8 / 4 / 1	20% of results in one waterbody exceed applicable temperature threshold[31]
Toxicity – Water Column[32]	Applicable SWAMP Comparable Method	2/yr (1/Dry Season & 1 Storm Event)	Grab or composite sample	3 / 2 / 1	If toxicity results < 50% of control results, repeat sample. If 2nd sample yields < 50% of control results, proceed to C.8.d.i.

[29] Includes dissolved oxygen, temperature, conductivity, and pH.

[30] The method of analysis shall achieve a method detection limit at least as low as that achieved by the Amperometric Titration Method (4500-Cl from *Standard Methods for Examination of Water and Wastewater*, Edition 20).

[31] If temperatures exceed applicable threshold (e.g., Maximum Weekly Average Temperature, Sullivan K., Martin, D.J., Cardwell, R.D., Toll, J.E., Duke, S. 2000. *An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implications for Selecting Temperature Criteria, Sustainable Ecosystem Institute*) or spike with no obvious natural explanation observed.

[32] *US EPA three species toxicity tests: Selenastrum* growth and *Ceriodaphnia* and *Pimephales* with lethal and sublethal endpoints. Also H*yalella azteca with lethal endpoint.*

Status Monitoring Parameter	**Sampling and/or Analytical Method**[21]	**Minimum Sampling Occurrence**[22]	**Duration of Sampling**	**Minimum # Sample Sites to Monitor/Yr**[23] Santa Clara & Alameda Permittees/ Contra Costa & San Mateo Permittees/ Fairfield-Suisun & Vallejo Permittees	**Result(s) that Trigger a Monitoring Project in Provision C.8.d.i.**
Toxicity– Bedded Sediment, Fine-grained[33]	Applicable SWAMP Comparable Method	1/yr	Grab sample	3 / 2 / 1 At fine-grained depositional area at bottom of watershed	See Attachment H, Table H-1
Pollutants – Bedded Sediment,[34] fine-grained	Applicable SWAMP Comparable Method inc. grain size	1/yr	Grab sample	3 / 2 / 1 At fine-grained depositional area at bottom of watershed	See Attachment H, Table H-1
Pathogen Indicators[35]	U.S. EPA protocol[36]	1/yr (During Summer)	Follow U.S. EPA protocol	5 / 5 / * *Fairfield-Suisun & Vallejo Permittees: 3 sites twice in permit term	Exceedance of USEPA criteria
Stream Survey (stream walk & mapping)[37]	USA[38] or equivalent	1 waterbody/yr	N/A	9 / 6 / 3 stream miles/year	N/A

[33] Bedded sediments should be fine-grain from depositional areas. Grain size and TOC must be reported. Coordinate with TMDL Provision requirements as applicable.

[34] Bedded sediments should be fine-grain from depositional areas. Grain size and TOC must be reported. Analytes shall include all of those reported in MacDonald et al. 2000 (including copper, nickel, mercury, PCBs, DDT, chlordane, dieldrin) as well as pyrethroids (see Table 8.4 for list of pyrethroids). Coordinate with TMDL Provision requirements as applicable. MacDonald, D.D., G.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environ. Contamination and Toxicology* 39(1):20–31.

[35] Includes fecal coliform and *E. Coli.*

[36] Rather than collecting samples over five separate days, Permittees may use Example #2, pg. 54, of USEPA's *Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, March 2004 Final.

[37] The Stream Surveys need not be repeated on a watershed if a Stream Survey was completed on that waterbody within the previous five years. The number of stream miles to be surveyed in any given year may be less than that shown in Table 8-1 in order to avoid repeating surveys at areas surveyed during the previous five years.

[38] Center for Watershed Protection, Manual 10: *Unified Stream Assessment: A User's Manual*, February 2005.

iv. Locations – For each sampling year (per C.8.c.iii.), Permittees shall select at least one waterbody to sample from the applicable list below. Locations shall be selected so that sampling is sufficient to characterize segments of the waterbody(s). For example, Permittees required to collect a larger number of samples should sample two or more waterbodies, so that each sampling effort represents a reasonable segment length and/or type. Samples shall be collected in reaches that receive urban stormwater discharges, except in possible infrequent instances where non-urban-impacted stream samples are needed for comparison[39]. Waterbody selection shall be based on factors such as watershed area, land use, likelihood of urban runoff impacts, and existing monitoring data.

Table 8.2 Status Monitoring Locations – Waterbodies

SCVURPPP	ACCWP	CCCWP	SMCWPPP	FSUMRP	VALLEJO
Coyote Creek and tributaries	Arroyo Valle (below Livermore or lower)	Kirker Creek	San Pedro Creek and tributaries	Laurel Creek	Chabot Creek
Guadalupe River and tributaries	Arroyo Mocho	Mt. Diablo Creek	Pilarcitos Creek	Ledgewood Creek	Austin Creek & tributaries
San Tomas Creek and tributaries	Tassajara Creek	Walnut Creek and tributaries	Colma Creek		
Calabazas Creek	Alamo Creek	Rodeo Creek	San Bruno Creek and tributaries		
Permanente Creek and tributaries	Arroyo de la Laguna	Pinole Creek	Millbrae Creek and tributaries		
Stevens Creek and tributaries	Alameda Creek (at Fremont or below)	San Pablo Creek	Mills Creek and tributaries		
Matadero Creek and tributaries	San Lorenzo Creek & tribs	Alhambra Creek	Easton Creek and tributaries		
Adobe Creek	San Leandro Creek & tribs	Wildcat Creek	Sanchez Creek and tributaries		
Lower Penitencia Creek and tributaries	Oakland, Berkeley, or Albany Creeks		Burlingame Creek and tributaries		
Barron Creek			San Mateo Creek (below dam only)		
San Francisquito Creek & tributaries			Borel Creek & tributaries		
			Laurel Creek & tribs		
			Belmont Creek & tribs		
			Pulgas Creek & tribs		
			Cordilleras & tributaries		
			Redwood Creek & tribs		
			Atherton Creek & tribs		
			San Francisquito Creek and tributaries		

[39] Sampling efforts shall focus on stream reaches with urban stormwater system discharges. Sampling upstream of urban outfalls is not precluded where needed to meet sampling plan objectives.

v. Status Monitoring Results – When Status Monitoring produces results such as those described in the final column of Table 8.1, Permittees shall conduct Monitoring Project(s) as described in C.8.d.i.

C.8.d. Monitoring Projects – Permittees shall conduct the Monitoring Projects listed below.

i. Stressor/Source Identification – When Status results trigger a follow-up action as indicated in Table 8.1, Permittees shall take the following actions, as also required by Provision C.1. If the trigger stressor or source is already known, proceed directly to step 2. The first follow-up action shall be initiated as soon as possible, and no later than the second fiscal year after the sampling event that triggered the Monitoring Project.

(1) Conduct a site specific study (or non-site specific if the problem is wide-spread) in a stepwise process to identify and isolate the cause(s) of the trigger stressor/source. This study should follow guidance for Toxicity Reduction Evaluations (TRE)[40] or Toxicity Identification Evaluations (TIE).[41] A TRE, as adapted for urban stormwater data, allows Permittees to use other sources of information (such as industrial facility stormwater monitoring reports) in attempting to determine the trigger cause, potentially eliminating the need for a TIE. If a TRE does not result in identification of the stressor/source, Permittees shall conduct a TIE.

(2) Identify and evaluate the effectiveness of options for controlling the cause(s) of the trigger stressor/source.

(3) Implement one or more controls.

(4) Confirm the reduction of the cause(s) of trigger stressor/source.

(5) Stressor/Source Identification Project Cap: Permittees who conduct this monitoring through a regional collaborative shall be required to initiate no more than ten Stressor/Source Identification projects during the Permit term in total, and at least two must be toxicity follow-ups, unless monitoring results do not indicate the presence of toxicity. If conducted through a stormwater countywide program, the Santa Clara and Alameda

[40] USEPA. August 1999. *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*. EPA/833B-99/002. Office of Wastewater Management, Washington, D.C.

[41] Select TIE methods from the following references after conferring with SWAMP personnel: For sediment: (1) Ho KT, Burgess R., Mount D, Norberg-King T, Hockett, RS. 2007. *Sediment toxicity identification evaluation: interstitial and whole methods for freshwater and marine sediments*. USEPA, Atlantic Ecology Division/Mid-Continental Ecology Division, Office of Research and Development, Narragansett, RI, or (2) Anderson, BS, Hunt, JW, Phillips, BM, Tjeerdema, RS. 2007. *Navigating the TMDL Process: Sediment Toxicity*. Final Report- 02-WSM-2. Water Environment Research Federation. 181 pp. For water column: (1) USEPA. 1991. *Methods for aquatic toxicity identification evaluations. Phase I Toxicity Characterization Procedures.* EPA 600/6-91/003. Office of Research and Development, Washington, DC., (2) USEPA. 1993. *Methods for aquatic toxicity identification evaluations. Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*. EPA 600/R-92/080. Office of Research and Development, Washington, DC., or (3) USEPA. 1996. *Marine Toxicity Identification Evaluation (TIE), Phase I Guidance Document*. EPA/600/R-95/054. Office of Research and Development, Washington, DC.

Permittees each shall be required to initiate no more than five (two for toxicity); the Contra Costa and San Mateo Permittees each shall be required to initiate no more than three (one for toxicity); and the Fairfield-Suisun and Vallejo Permittees each shall be required to initiate no more than one Stressor/Source Identification project(s) during the Permit term.

(6) As long as Permittees have complied with the procedures set forth above, they do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed to do so by the Water Board.

ii. BMP Effectiveness Investigation – Investigate the effectiveness of one BMP for stormwater treatment or hydrograph modification control. Permittees who do this project through a regional collaborative are required to initiate no more than one BMP Effectiveness Investigation during the Permit term. If conducted through a stormwater countywide program, the Santa Clara, Alameda, Contra Costa, and San Mateo Permittees shall be required to initiate one BMP Effectiveness Investigation each, and the Fairfield-Suisun and Vallejo Permittees shall be exempt from this requirement. The BMP(s) used to fulfill requirements of C.3.b.iii., C.11.e. and C.12.e. may be used to fulfill this requirement, provided the BMP Effectiveness Investigation includes the range of pollutants generally found in urban runoff. The BMP Effectiveness Investigation will not trigger a Stressor/Source Identification Project. Data from this Monitoring Project need not be SWAMP-comparable.

iii. Geomorphic Project – This monitoring is intended to answer the questions: How and where can our creeks be restored or protected to cost-effectively reduce the impacts of pollutants, increased flow rates, and increased flow durations of urban runoff?

Permittees shall select a waterbody/reach, preferably one that contains significant fish and wildlife resources, and conduct one of the following projects within each county, except that only one such project must be completed within the collective Fairfield-Suisun and Vallejo Permittees' jurisdictions:

(1) Gather geomorphic data to support the efforts of a local watershed partnership[42] to improve creek conditions; or

(2) Inventory locations for potential retrofit projects in which decentralized, landscape-based stormwater retention units can be installed; or

(3) Conduct a geomorphic study which will help in development of regional curves which help estimate equilibrium channel conditions for different-sized drainages. Select a waterbody/reach that is not undergoing changing land use. Collect and report the following data:

- Formally surveyed channel dimensions (profile), planform, and cross-sections. Cross-sections shall include the topmost floodplain terrace and

[42] A list of local watershed partnerships may be obtained from Water Board staff.

be marked by a permanent, protruding (not flush with ground) monument.

- Contributing drainage area.
- Best available information on bankfull discharges and width and depth of channel formed by bankfull discharges.
- Best available information on average annual rainfall in the study area.

Permittees shall complete the selected geomorphic project so that project results are reported in the Integrated Monitoring Report (see Provision C.8.g.v).

C.8.e. Pollutants of Concern and Long-Term Trends Monitoring

Pollutants of Concern (POC) monitoring is intended to assess inputs of Pollutants of Concern to the Bay from local tributaries and urban runoff, assess progress toward achieving wasteload allocations (WLAs) for TMDLs and help resolve uncertainties associated with loading estimates for these pollutants. In particular, there are four priority management information needs toward which POC monitoring must be directed: 1) identifying which Bay tributaries (including stormwater conveyances) contribute most to Bay impairment from pollutants of concern; 2) quantifying annual loads or concentrations of pollutants of concern from tributaries to the Bay; 3) quantifying the decadal-scale loading or concentration trends of pollutants of concern from small tributaries to the Bay; and 4) quantifying the projected impacts of management actions (including control measures) on tributaries and identifying where these management actions should be implemented to have the greatest beneficial impact.

Permittees shall implement the following POC monitoring components or pursue an alternative approach that addresses each of the aforementioned management information needs. An alternative approach may be pursued by Permittees provided that: either similar data types, data quality, data quantity are collected with an equivalent level of effort described; or an equivalent level of monitoring effort is employed to answer the management information needs.

Long-Term monitoring is intended to assess long-term trends in pollutant concentrations and toxicity in receiving waters and sediment, in order to evaluate if stormwater discharges are causing or contributing to toxic impacts on aquatic life. Permittees shall implement the following Long-Term monitoring components or, following approval by the Executive Officer, an equivalent monitoring program.

i. Pollutants of Concern Loads Monitoring Locations – Permittees shall conduct Pollutants of Concern monitoring at stations listed below. Permittees may install these stations in two phases providing at least half of the stations are monitored in the water year beginning October 2010, and all the stations are monitored in the water year beginning October 2012. Upon approval by the Executive Officer, Permittees may use alternate POC monitoring locations.

(1) Castro Valley Creek S3 at USGS gauging station in Castro Valley

(2) Guadalupe River

(3) Zone 4 Line A at Chabot Road in Hayward

(4) Rheem Creek at Giant Road in Richmond

(5) Walnut Creek at a downstream location

(6) Calabazas Creek at Lakeside Drive in Sunnyvale, at border with Santa Clara

(7) San Mateo Creek at downstream location

(8) Laurel Creek at Laurie Meadows park, off Casanova Drive in City of San Mateo.

ii. Long-Term Monitoring Locations – Permittees shall conduct Long-Term monitoring at stations listed below. After conferring with the Regional SWAMP program, and upon approval by the Executive Officer, Permittees may use alternate Long-Term monitoring locations.

Table 8.3. Long-Term Monitoring Locations

Stormwater Countywide Program	Waterbody	Suggested Location
Alameda Permittees	Alameda Creek OR	East of Alvarado Blvd*
	Lower San Leandro Creek	Empire Road*
Contra Costa Permittees	Kirker Creek OR	Floodway*
	Walnut Creek	Concord Avenue*
Santa Clara Permittees	Guadalupe River OR	USGS Gaging Station 11169025*
	Coyote Creek	Montague*
San Mateo Permittees	San Mateo Creek	Gateway Park*

* SWAMP is scheduled to collect sediment toxicity and sediment chemistry samples annually at these stations during the month of June.

iii. Parameters and Frequencies – Permittees shall conduct Pollutants of Concern sampling pursuant to Table 8.4, Categories 1 and 2. In Table 8.4, Category 1 pollutants are those for which the Water Board has active water quality attainment strategies (WQAS), such as TMDL or site-specific objective projects. Category 2 pollutants are those for which WQAS are in development. The lower monitoring frequency for Category 2 pollutants is sufficient to develop preliminary loading estimates for these pollutants.

Permittees shall conduct Long-Term monitoring pursuant to Table 8.4, Category 3. SWAMP has scheduled collection of Category 3 data at the Long-Term monitoring locations stated in C.8.e.ii. As stated in Provision C.8.a.iv., Permittees may use SWAMP data to fulfill Category 3 sampling requirements.

iv. Protocols – At a minimum, sampling and analysis protocols shall be consistent with 40 CFR 122.21(g)(7)(ii).

v. **Methods** – Methyl mercury samples shall be grab samples collected during storm events that produce rainfall of at least 0.10 inch, shall be frozen immediately upon collection, and shall be kept frozen during transport to the laboratory. All other Category 1 and 2 samples shall be wet weather flow-weighted composite samples, collected during storm events that produce rainfall of at least 0.10 inch. Sampled storms should be separated by 21 days of dry weather, but, at a minimum, sampled storms must have 72 hours of antecedent dry weather. Samples must include the first rise in the hydrograph. Category 3 monitoring data shall be SWAMP-comparable.

Table 8.4 Pollutants of Concern Loads & Long-Term Monitoring Elements

Category/Parameter	Sampling Years	Minimum Sampling Occurrence	Sampling Interval
Category 1 • Total and Dissolved Copper • Total Mercury[43] • Methyl Mercury • Total PCBs[44] • Suspended Sediments (SSC) • Total Organic Carbon • Toxicity – Water Column • Nitrate as N • Hardness	Annually	Average of 4 wet weather events per year For methyl mercury only: average of 2 wet & 2 dry weather events per year	Flow-weighted composite For methyl mercury only: grab samples collected during the first rise in the hydrograph of a storm event.
Category 2 • Total and Dissolved Selenium • Total PBDEs (Polybrominated Diphenyl Ethers) • Total PAHs (Poly-Aromatic Hydrocarbons) • Chlordane • DDTs (Dichloro-Diphenyl-Trichloroethane) • Dieldrin • Nitrate as N • Pyrethroids - bifenthrin, cyfluthrin, beta-cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda-cyhalothrin, permethrin, and tralomethrin • Carboryl and fipronil • Total and Dissolved Phosphorus	Oct. 2010 - 2011 water year and Oct. 2012 - 2013 water year	2 times per year	Flow-weighted composite
Category 3 Toxicity – Bedded Sediment, fine-grained[45]	Biennially, Coordinate	Once per year, during April-June,	Grab sample

[43] The monitoring type and frequency shown for mercury is not sufficient to determine progress toward achieving TMDL load allocations. Progress toward achieving load allocations will be accomplished by assessing loads avoided resulting from treatment, source control, and pollution prevention actions.

[44] The monitoring type and frequency shown for PCBs is not sufficient to determine progress toward achieving TMDL load allocations. Progress toward achieving load allocations will be accomplished by assessing loads avoided resulting from treatment, source control, and pollution prevention actions.

Category/Parameter	Sampling Years	Minimum Sampling Occurrence	Sampling Interval
Pollutants – Bedded Sediment, fine-grained	with SWAMP	coordinate with SWAMP	

vi. Sediment Delivery Estimate/Budget – The objective of this monitoring is to develop a strong estimate of the amount of sediment entering the Bay from local tributaries and urban drainages. By July 1, 2011, Permittees shall develop a design for a robust sediment delivery estimate/sediment budget in local tributaries and urban drainages. Permittees shall implement the study by July 1, 2012.

vii. Emerging Pollutants – Permittees shall develop a work plan and schedule for initial loading estimates and source analyses for emerging pollutants: endocrine-disrupting compounds, PFOS/PFAS (Perfluorooctane Sulfonates (PFOS), Perfluoroalkyl sulfonates (PFAS); these perfluorocompounds are related to Teflon products), and NP/NPEs (nonylphenols/nonylphenol esters —estrogen-like compounds). This work plan, which is to be implemented in the next Permit term, shall be submitted with the Integrated Monitoring Report (see Provision C.8.g.).

C.8.f. Citizen Monitoring and Participation

i. Permittees shall encourage Citizen Monitoring.

ii. In developing Monitoring Projects and evaluating Status & Trends data, Permittees shall make reasonable efforts to seek out citizen and stakeholder information and comment regarding waterbody function and quality.

iii. Permittees shall demonstrate annually that they have encouraged citizen and stakeholder observations and reporting of waterbody conditions. Permittees shall report on these outreach efforts in the annual Urban Creeks Monitoring Report.

C.8.g. Reporting

i. Water Quality Standard Exceedence – When data collected pursuant to C.8.a.-C.8.f. indicate that stormwater runoff or dry weather discharges are or may be causing or contributing to exceedance(s) of applicable water quality standards, including narrative standards, a discussion of possible pollutant sources shall be included in the Urban Creeks Monitoring Report. When data collected pursuant to C.8.a.-C.8.f. indicate that discharges are causing or contributing to an exceedance of an applicable water quality standard, Permittees shall notify the Water Board within no more than 30 days of such a determination and submit a follow-up report in accordance with Provision C.1 requirements. The preceding reporting requirements shall not apply to

[45] If Ceriodaphnia, H*yalella azteca*, or Pimephales survival or Selenastrum growth is < 50% of control results, repeat wet weather sample. If 2nd sample yields < 50% of control results, proceed to C.8.d.i.

continuing or recurring exceedances of water quality standards previously reported to the Water Board or to exceedances of pollutants that are to be addressed pursuant to Provisions C.8 through C.14 of this Order in accordance with Provision C.1.

ii. Status Monitoring Electronic Reporting – Permittees shall submit an Electronic Status Monitoring Data Report no later than January 15 of each year, reporting on all data collected during the foregoing October 1–September 30 period. Electronic Status Monitoring Data Reports shall be in a format compatible with the SWAMP database.[46] Water Quality Objective exceedances shall be highlighted in the Report.

iii. Urban Creeks Monitoring Report – Permittees shall submit a comprehensive Urban Creeks Monitoring Report no later than March 15 of each year, reporting on all data collected during the foregoing October 1–September 30 period, with the initial report due March 15, 2012, unless the Permittees choose to monitor through a regional collaborative, in which case the due date is March 15, 2013. Each Urban Creeks Monitoring Report shall contain summaries of Status, Long-Term, Monitoring Projects, and Pollutants of Concern Monitoring including, as appropriate, the following:

(1) Maps and descriptions of all monitoring locations;

(2) Data tables and graphical data summaries; Constituents that exceed applicable water quality standards shall be highlighted;

(3) For all data, a statement of the data quality;

(4) An analysis of the data, which shall include the following:

- Calculations of biological metrics and physical habitat endpoints.
- Comparison of biological metrics to:
  - Each other
  - Any applicable, available reference site(s)
  - Any applicable, available index of biotic integrity
  - Physical habitat endpoints.
- Identification and analysis of any long-term trends in stormwater or receiving water quality.

(5) A discussion of the data for each monitoring program component, which shall:

- Discuss monitoring data relative to prior conditions, beneficial uses and applicable water quality standards as described in the Basin Plan, the Ocean Plan, or the California Toxics Rule or other applicable water quality control plans.

[46] See http://mpsl.mlml.calstate.edu/swdataformats.htm. Permittees shall maintain an information management system that will support electronic transfer of data to the Regional Data Center of the ***California Environmental Data Exchange Network*** **(*CEDEN*)**, located within the San Francisco Estuary Institute.

- Where appropriate, develop hypotheses to investigate regarding pollutant sources, trends, and BMP effectiveness.
- Identify and prioritize water quality problems.
- Identify potential sources of water quality problems.
- Describe follow-up actions.
- Evaluate the effectiveness of existing control measures.
- Identify management actions needed to address water quality problems.

iv. Monitoring Project Reports – Permittees shall report on the status of each ongoing Monitoring Project in each annual Urban Creeks Monitoring Report. In addition, Permittees shall submit stand-alone summary reports within six months of completing BMP Effectiveness and Geomorphic Projects; these reports shall include: a description of the project; map(s) of project locations; data tables and summaries; and discussion of results.

v. Integrated Monitoring Report – No later than March 15, 2014, Permittees shall prepare and submit an Integrated Monitoring Report through the regional collaborative monitoring effort on behalf of all participating Permittees, or on a countywide basis on behalf of participating Permittees, so that all monitoring conducted during the Permit term is reported.[47] This report shall be in lieu of the Annual Urban Creeks Monitoring Report due on March 15, 2014.

The report shall include, but not be limited to, a comprehensive analysis of all data collected pursuant to Provision C.8., and may include other pertinent studies. For Pollutants of Concern, the report shall include methods, data, calculations, load estimates, and source estimates for each Pollutant of Concern Monitoring parameter. The report shall include a budget summary for each monitoring requirement and recommendations for future monitoring. This report will be part of the next Report of Waste Discharge for the reissuance of this Permit.

vi. Standard Report Content –All monitoring reports shall include the following:

- The purpose of the monitoring and briefly describe the study design rationale.
- Quality Assurance/Quality Control summaries for sample collection and analytical methods, including a discussion of any limitations of the data.
- Brief descriptions of sampling protocols and analytical methods.
- Sample location description, including waterbody name and segment and latitude and longitude coordinates.
- Sample ID, collection date (and time if relevant), media (e.g., water, filtered water, bed sediment, tissue).
- Concentrations detected, measurement units, and detection limits.

[47] Permittees who do not participate in the Regional Monitoring Group or in a stormwater countywide program must submit an individual Integrated Receiving Water Impacts Report.

- Assessment, analysis, and interpretation of the data for each monitoring program component.
- Pollutant load and concentration at each mass emissions station.
- A listing of volunteer and other non-Permittee entities whose data are included in the report.
- Assessment of compliance with applicable water quality standards.
- A signed certification statement.

vii. Data Accessibility – Permittees shall make electronic reports available through a regional data center, and optionally through their web sites. Permittees shall notify stakeholders and members of the general public about the availability of electronic and paper monitoring reports through notices distributed through appropriate means, such as an electronic mailing list.

C.8.h. Monitoring Protocols and Data Quality

Where applicable, monitoring data must be SWAMP comparable. Minimum data quality shall be consistent with the latest version of the SWAMP Quality Assurance Project Plan (QAPP)[48] for applicable parameters, including data quality objectives, field and laboratory blanks, field duplicates, laboratory spikes, and clean techniques, using the most recent Standard Operating Procedures. A Regional Monitoring Collaborative may adapt the SWAMP QAPP for use in conducting monitoring in the San Francisco Bay Region, and may use such QAPP if acceptable to the Executive Officer.

[48] The current SWAMP QAPP at the time of Permit issuance is dated September 1, 2008, and is available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf.

C.9. Pesticides Toxicity Control

To prevent the impairment of urban streams by pesticide-related toxicity, the Permittees shall implement a pesticide toxicity control program that addresses their own and others' use of pesticides within their jurisdictions that pose a threat to water quality and that have the potential to enter the municipal conveyance system. This provision implements requirements of the TMDL for Diazinon and Pesticide related Toxicity for Urban Creeks in the region. The TMDL includes urban runoff allocations for Diazinon of 100 ng/l and for pesticide related toxicity of 1.0 Acute Toxicity Units (TUa) and 1.0 Chronic Toxicity Units (TUc) to be met in urban creek waters. However, urban runoff management agencies (i.e., the Permittees) are not solely responsible for attaining the allocations because their authority to regulate pesticide use is constrained by federal and State law. Accordingly, the Permittees' requirements for addressing the allocations are set forth in the TMDL implementation plan and are included in this provision.

Pesticides of concern include: organophosphorous pesticides (chlorpyrifos, diazinon, and malathion); pyrethroids (bifenthrin, cyfluthrin, beta-cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda-cyhalothrin, permethrin, and tralomethrin); carbamates (e.g., carbaryl); and fipronil. The Permittees may coordinate with BASMAA, the Urban Pesticide Pollution Prevention Project, the Urban Pesticide Committee, the Bay-Friendly Landscaping and Gardening Coalition, and other agencies and organizations in carrying out these activities.

C.9.a. Adopt an Integrated Pest Management (IPM) Policy or Ordinance

i. Task Description – In their IPM policies or ordinances, the Permittees shall include provisions to minimize reliance on pesticides that threaten water quality and to require the use of IPM in municipal operations and on municipal property.

ii. Implementation Level – If not already in place, the Permittees shall adopt IPM policies or ordinances no later than July 1, 2010.

iii. Reporting – The Permittees shall submit a copy of their IPM ordinance(s) or policy(s) in their 2010 Annual Report.

C.9.b. Implement IPM Policy or Ordinance

i. Task Description – The Permittees shall establish written standard operating procedures for pesticide use that ensure implementation of the IPM policy or ordinance and require municipal employees and contractors to adhere to the IPM standard operating procedures.

ii. Reporting

(1) In their Annual Reports, the Permittees shall report on IPM implementation by showing trends in quantities and types of pesticide used, and suggest reasons for increases in use of pesticides that threaten water quality, specifically organophosphorous pesticides, pyrethroids, carbaryl, and fipronil.

(2) The Permittees shall maintain pesticide application standard operating procedures and submit them upon request.

C.9.c. Train Municipal Employees

i. Task Description – The Permittees shall ensure that all municipal employees who, within the scope of their duties, apply or use pesticides that threaten water quality are trained in IPM practices and the Permittee's IPM policy. This training may also include other training opportunities such as Bay-Friendly Landscape Maintenance Training & Qualification Program and EcoWise Certified.

ii. Reporting

(1) In their Annual Reports, the Permittees shall report the percentage of municipal employees who apply pesticides who have received training in IPM policy and IPM standard operating procedures within the last three years.

(2) The Permittees shall submit training materials (e.g., course outline, date, attendees) upon request.

C.9.d. Require Contractors to Implement IPM

i. Task Description – The Permittees shall hire IPM-certified contractors or include contract specifications requiring contractors to implement IPM no later than July 1, 2010.

ii. Reporting – In their Annual Reports, the Permittees shall submit documentation to confirm compliance, such as the Permittee's standard contract specification or copy of contractors' certification(s).

C.9.e. Track and Participate in Relevant Regulatory Processes (may be done jointly with other Permittees, such as through CASQA or BASMAA and/or the Urban Pesticide Pollution Prevention Project)

i. Task Description

(1) The Permittees shall track USEPA pesticide evaluation and registration activities as they relate to surface water quality, and when necessary, encourage USEPA to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the CWA and to accommodate water quality concerns within its pesticide registration process;

(2) The Permittees shall track California Department of Pesticide Regulation (DPR) pesticide evaluation activities as they relate to surface water quality, and when necessary, encourage DPR to coordinate implementation of the California Food and Agriculture Code with the California Water Code and to accommodate water quality concerns within its pesticide evaluation process;

(3) The Permittees shall assemble and submit information (such as monitoring data) as needed to assist DPR and County Agricultural Commissioners in

ensuring that pesticide applications comply with water quality standards; and

(4) As appropriate, the Permittees shall submit comment letters on USEPA and DPR re-registration, re-evaluation, and other actions relating to pesticides of concern for water quality.

ii. Reporting – In their Annual Reports, the Permittees who participate in a regional effort to comply with C.9.e. may reference a regional report that summarizes regional participation efforts, information submitted, and how regulatory actions were affected. All other Permittees shall list their specific participation efforts, information submitted, and how regulatory actions were affected.

C.9.f. Interface with County Agricultural Commissioners

i. Task Description – The Permittees shall maintain regular communications with county agricultural commissioners (or other appropriate State and/or local agencies) to (1) get input and assistance on urban pest management practices and use of pesticides, (2) inform them of water quality issues related to pesticides, and (3) report violations of pesticide regulations (e.g., illegal handling) associated with stormwater management.

ii. Reporting – In their Annual Reports, the Permittees shall summarize improper pesticide usage reported to county agricultural commissioners and report follow-up actions to correct violations.

C.9.g. Evaluate Implementation of Source Control Actions Relating to Pesticides

i. Task Description – The Permittees shall evaluate the effectiveness of the control measures implemented, evaluate attainment of pesticide concentration and toxicity targets for water and sediment from monitoring data (Provision C.8.), and identify improvements to existing control measures and/or additional control measures, if needed, to attain targets with an implementation time schedule.

ii. Reporting – In their 2013 Annual Reports, the Permittees shall report the evaluation results, and if needed, submit a plan to implement improved and/or new control measures.

C.9.h. Public Outreach (may be done jointly with other Permittees, such as through CASQA or BASMAA and/or the Urban Pesticide Pollution Prevention Project or the Bay-Friendly Landscaping and Gardening Coalition).

i. Point of Purchase Outreach: The Permittees shall:

(1) Conduct outreach to consumers at the point of purchase;

(2) Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control; and

(3) Participate in and provide resources for the "Our Water, Our World" program or a functionally equivalent pesticide use reduction outreach program.

ii. Reporting – In their Annual Reports, the Permittees who participate in a regional effort to comply with C.9.h.i. may reference a report that summarizes these actions. All other Permittees shall summarize activities completed and document any measurable awareness and behavior changes resulting from outreach.

iii. Pest Control Contracting Outreach: The Permittees shall conduct outreach to residents who use or contract for structural or landscape pest control and shall:

(1) Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control, including IPM;

(2) Incorporate IPM messages into general outreach;

(3) Provide information to residents about "Our Water, Our World" or functionally equivalent program;

(4) Provide information to residents about EcoWise Certified IPM certification in Structural Pest Management, or functionally equivalent certification program; and

(5) Coordinate with household hazardous-waste programs to facilitate appropriate pesticide waste disposal, conduct education and outreach, and promote appropriate disposal.

iv. Reporting – In their 2013 Annual Reports, the Permittees who participate in a regional effort to comply with C.9.h.iii. may reference a report that summarizes these actions. All other Permittees shall document the effectiveness of their actions in their 2013 Annual Reports. This documentation may include percentages of residents hiring certified IPM providers and the change in this percentage.

v. Outreach to Pest Control Operators: The Permittees shall conduct outreach to pest control operators (PCOs) and landscapers; Permittees are encouraged to work with DPR, county agricultural commissioners, UC-IPM, BASMAA, the Urban Pesticide Committee, the EcoWise Certified Program (or functionally equivalent certification program), the Bio-integral Resource Center and others to promote IPM to PCOs and landscapers.

vi. Reporting – In each Annual Report, the Permittees who participate in a regional effort to comply with C.9.h.v. may reference a report that summarizes these actions. All other Permittees shall summarize how they reached PCOs and landscapers and reduced pesticide use.

C.10. Trash Load Reduction

The Permittees shall demonstrate compliance with Discharge Prohibition A.2 and trash-related Receiving Water Limitations through the timely implementation of control measures and other actions to reduce trash loads from municipal separate storm sewer systems (MS4s) by 40% by 2014, 70% by 2017, and 100% by 2022 as further specified below.

During this permit term, the Permittees shall develop and implement a Short-Term Trash Load Reduction Plan. This includes implementation of a mandatory minimum level of trash capture; cleanup and abatement progress on a mandatory minimum number of Trash Hot Spots; and implementation of other control measures and best management practices, such as trash reduction ordinances, to prevent or remove trash loads from MS4s to attain a 40% reduction in trash loads by July 1, 2014. The Permittees shall also develop and begin implementation of a Long-Term Trash Load Reduction Plan to attain a 70% reduction in trash loads from their MS4s by 2017 and 100% by 2022. Flood management agencies, which are non-population-based Permittees that do not have jurisdiction over urban watershed land, are not subject to these trash reduction requirements except for minimum full trash capture and Trash Hot Spot requirements, as specified in subsections C.10.a.iii and C.10.b below.

C.10.a. Short-Term Trash Load Reduction

i. Short-Term Trash Loading Reduction Plan – Each Permittee shall submit a Short-Term Trash Load Reduction Plan, including an implementation schedule, to the Water Board by February 1, 2012. The Plan shall describe control measures and best management practices, including any trash reduction ordinances, that are currently being implemented and the current level of implementation and additional control measures and best management practices that will be implemented, and/or an increased level of implementation designed to attain a 40% trash load reduction from its MS4 by July 1, 2014.

The Short-Term Trash Load Reduction Plan shall account for required mandatory minimum Full Trash Capture devices called for in Provision C.10.a.iii and Trash Hot Spot Cleanup called for in Provision C.10.b.

ii. Baseline Trash Load and Trash Load Reduction Tracking Method – Each Permittee, working collaboratively or individually, shall determine the baseline trash load from its MS4 to establish the basis for trash load reductions and submit the determined load level to the Water Board by February 1, 2012, along with documentation of methodology used to determine the load level. The submittal shall also include a description of the trash load reduction tracking method that will be used to account for trash load reduction actions and to demonstrate progress and attainment of trash load reduction levels. The submittal shall account for the drainage areas of a Permittee's jurisdiction that are associated with the baseline trash load from its MS4, and the baseline trash load level per unit area by land use type and drainage area characteristics used to derive the total baseline trash load level for each Permittee.

In the determination of applicable areas that generate trash loads for inclusion in the Baseline Trash Load, the Permittees may propose areas for exclusion, with supporting documentation, which meet Discharge Prohibition A.2 and trash-

related Receiving Water Limitations. Documentation demonstrating no material trash presence or adverse impact may include data from the maintenance of existing trash capture devices, data from trash flux measurements in the MS4 and the water column of streams during wet weather, Trash Hot Spot assessments, and litter audits of street curb and gutter areas in high pedestrian traffic and high commercial activity areas.

If proposed areas for exclusion are commercial, industrial, or high density residential areas, or adjacent to schools or event venues, the Permittee shall collect and submit by February 1, 2013, an additional year of documentation to further support the basis for the exclusion. If the data continue to support the exclusion determination, further trash reduction actions are not required in these areas, unless the Water Board notifies the Permittee otherwise.

Each Permittee shall submit a progress report by February 1, 2011, that indicates whether it is determining its baseline trash load and trash load reduction method individually or collaboratively with other Permittees and a summary of the approach being used. The report shall also include the types and examples of documentation that will be used to propose exclusion areas, and the land use characteristics and estimated area of potentially excluded areas.

iii. **Minimum Full Trash Capture** – Except as excluded below, population-based Permittees shall install and maintain a mandatory minimum number of full trash capture devices by July 1, 2014, to treat runoff from an area equivalent to 30% of Retail/Wholesale Land[49] that drains to MS4s within their jurisdictions (see Table 10.1 in Attachment J). If the sum of the areas that generate trash loads determined pursuant to C.10.a.ii above is a smaller acreage than the required trash capture acreage, a population-based Permittee may reduce its minimum full trash capture requirement to the smaller acreage. A population-based Permittee with a population less than 12,000 and retail/wholesale land less than 40 acres, or a population less than 2000, is exempt from this trash capture requirement. The minimum number of trash capture devices required to be installed and maintained by non-population-based Permittees is included in Attachment J.

All installed devices that meet the following full trash capture definition may be counted toward this requirement regardless of date of installation. A full capture system or device is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate Q resulting from a one-year, one-hour, storm in the sub-drainage area.

C.10.b. Trash Hot Spot Selection and Cleanup

Trash Hot Spots in receiving waters shall be cleaned annually to achieve the multiple benefits of beginning abatement of these impacts as mitigation and to learn more about the sources and patterns of trash loading.

[49] [http://quake.abag.ca.gov/mitigation/pickdbh2.html] and Association of Bay Area Governments, 2005 ABAG Land Use Existing Land Use in 2005: Report and Data for Bay Area Counties

i. **Hot Spot Cleanup and Definition** – The Permittees shall cleanup selected Trash Hot Spots to a level of "no visual impact" at least one time per year for the term of the permit. Trash Hot Spots shall be at least 100 yards of creek length or 200 yards of shoreline length.

ii. **Hot Spot Selection** – Population-based Permittees shall identify high trash-impacted locations on State waters totaling at least one Trash Hot Spot per 30,000 population, or one per 100 acres of Retail/Wholesale Commercial Land Area, within their jurisdictions based on Association of Bay Area Governments (ABAG) 2005 data1, whichever is greater. If the hot spot number by one of the two determination methods is more than twice that determined by the other method, double the smaller hot spot number shall be used. Otherwise, the larger hot spot number determined by the two methods shall be the Trash Hot Spot assignment for a population-based Permittee. Each population-based Permittee shall select at least one Trash Hot Spot. The Permittees shall each submit selected Trash Hot Spots to the Water Board by July 1, 2010. The list should include photo documentation (one photo per 50 feet) and initial assessment results for the proposed hot spots. The minimum number of Trash Hot Spots per Permittee is included in Attachment J for population and non-population-based Permittees. The Permittees shall proceed with cleanup of selected Trash Hot Spots unless informed otherwise by the Water Board.

iii. **Hot Spot Assessments** – The Permittees shall quantify the volume of material removed from each Trash Hot Spot cleanup, and identify the dominant types of trash (e.g., glass, plastics, paper) removed and their sources to the extent possible. Documentation shall include the trash condition before and after clean up of the entire hot spot using photo documentation with a minimum of one photo per 50 feet of hot spot length. Trash Hot Spots may also be assessed using either the Rapid Trash Assessment (RTA v.8) or the SCVURPPP Urban RTA variation of that method.

C.10.c. Long-Term Trash Load Reduction

Each Permittee shall submit a Long-Term Trash Load Reduction Plan, including an implementation schedule, to the Water Board by February 1, 2014. The Plan shall describe control measures and best management practices, including any trash reduction ordinances, that are being implemented and the level of implementation and additional control measures and best management practices that will be implemented, and/or an increased level of implementation designed to attain a 70% trash load reduction from its MS4 by July 1, 2017, and 100% by July 1, 2022.

C.10.d. Reporting

i. In each Annual Report, each Permittee shall provide a summary of its trash load reduction actions (control measures and best management practices) including the types of actions and levels of implementation, the total trash loads and dominant types of trash removed by its actions, and the total trash loads and dominant types of trash for each type of action. The latter shall include each Trash Hot Spot selected pursuant to C.10.b. Beginning with the 2012 Annual

Report, each Permittee shall also report its percent annual trash load reduction relative to its Baseline Trash Load.

ii. The Permittees shall retain records for review providing supporting documentation of trash load reduction actions and the volume and dominant type of trash removed from full trash capture devices, from each Trash Hot Spot cleanup, and from additional control measures or best management practices implemented. Data may be combined for specific types of full trash capture devices deployed in the same drainage area. These records shall have the specificity required for the trash load reduction tracking method established pursuant to subsection C.10.a.iii.

C.11. Mercury Controls

The Permittees shall implement the following control programs for mercury. The Permittees shall perform the control measures and provide reporting on those control measures according to the provisions below. The purpose of this provision is to implement the urban runoff requirements of the San Francisco Bay mercury TMDL and reduce mercury loads to make substantial progress toward achieving the urban runoff mercury load allocation established for the TMDL. The aggregate, regionwide, urban runoff wasteload load allocation is 82 kg/yr. This allocation should be achieved by February 2028 and, as a way to measure progress, an interim loading milestone of 120 kg/yr, halfway between the current load and the allocation, should be achieved by February 2018. If the interim loading milestone is not achieved, the Permittees shall demonstrate reasonable and measurable progress toward achieving the milestone. The Permittees may comply with any requirement of this provision through a collaborative effort.

C.11.a. Mercury Collection and Recycling Implemented throughout the Region

i. **Task Description** – The Permittees shall promote, facilitate, and/or participate in collection and recycling of mercury containing devices and equipment at the consumer level (e.g., thermometers, thermostats, switches, bulbs).

ii. **Reporting** – The Permittees shall report on these efforts in their Annual Report, including an estimate of the mass of mercury collected.

C.11.b. Monitor Methylmercury

i. **Task Description** – The Permittees shall monitor methymercury in runoff discharges. The objective of the monitoring is to investigate a representative set of drainages and obtain seasonal information and to assess the magnitude and spatial/temporal patterns of methylmercury concentrations.

ii. **Implementation Level** – The Permittees shall analyze aqueous grab samples already being collected for total mercury analysis for methylmercury as specified in Provision C.8.f.

iii. **Reporting** – The Permittees shall report monitoring results annually beginning with their 2010 Annual Report.

C.11.c. Pilot Projects To Investigate and Abate Mercury Sources in Drainages, Including Public Rights-Of-Way, and Stormwater Conveyances with Accumulated Sediment that Contains Elevated Mercury Concentrations.

i. **Task Description** – The Permittees shall investigate and abate mercury sources in or to their storm drain systems in conjunction with the Water Board and other appropriate regulatory agencies with investigation and cleanup authorities. The purpose of this task is to implement and evaluate the benefit of a suite of abatement measures at five pilot project locations. The Permittees shall document the knowledge and experience gained through pilot implementation,

and this documentation will provide a basis for determining the scope of abatement implementation in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads abated resulting from implementation of these measures.

ii. **Implementation Level** – Reducing loads of PCBs is the main pilot location selection factor for this Provision, and reducing loads of mercury is a secondary criterion. Accordingly, for PCB pilot project locations selected as part of Provision C.12.c, the Permittees shall conduct reconnaissance in the pilot project drainage areas. The Permittees shall test sediments in storm drains and conveyances to characterize the extent and magnitude of mercury concentrations. They shall evaluate monitoring data and determine if a mercury sediment abatement program would reduce mercury loading significantly. If so determined, the Permittees shall cause abatement activities to be conducted at those sites under Permittee jurisdiction with identified remedial activities. When contamination is located on private property, a Permittee must either exercise direct authority to require cleanup or notify and request other appropriate authorities to exercise their cleanup authority.

iii. **Reporting** – Report on mercury-related aspects of work and loads abated as part of reporting requirements for Provision C.12.c.

C.11.d. Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices

i. **Task Description** – The Permittees shall jointly evaluate ways to enhance mercury load reduction benefits of operation and maintenance actives that remove or manage sediment. The purpose of this task is to implement these management practices at the pilot scale in five drainages during this permit term. The knowledge and experience gained through pilot implementation will be used to determine the implementation scope of enhanced sediment removal and management practices in subsequent permit terms. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of enhanced sediment removal management practices in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads removed or avoided resulting from implementation of these measures.

ii. **Implementation Level** – In all pilot program drainages selected as part of Provision C.12.c, the Permittees shall jointly evaluate ways to enhance existing sediment removal and management practices such as municipal street sweeping, curb clearing parking restrictions, inlet cleaning, catch basin cleaning, stream and stormwater conveyance system maintenance, and pump station cleaning via increased effort and/or retrofits for the control of mercury. This evaluation shall also include consideration of street flushing and capture, collection, or routing to the sanitary sewer (in coordination and consultation with local sanitary sewer agencies) as a potential enhanced management practice in coordination and consultation with local sanitary sewer agencies.

Beginning July 1, 2011, the Permittees shall implement pilot studies for the most potentially effective measures(s) based on the evaluation of Provision C.11.d.ii in all drainages for which PCB pilot projects are being conducted.

iii. Reporting

(1) The Permittees shall present a progress report on the results of the evaluation in their 2010 Annual Report and the final evaluation results in their 2011 Annual Report.

(2) In their March 15, 2014 Integrated Monitoring Report, the Permittees shall report the effectiveness of enhanced practices pilot implementation, report estimates of loads reduced, and present a plan and schedule for possible expanded implementation for subsequent permit terms.

C.11.e. Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit

i. Task Description – The Permittees shall evaluate and quantify the removal of mercury by on-site treatment systems via retrofit of such systems into existing storm drain systems. The purpose of this task is to implement on-site treatment projects at the pilot scale in ten locations during this permit term. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of on-site treatment retrofits in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads removed or avoided resulting from implementation of these measures.

ii. Implementation Level – The Permittees, working collaboratively, shall identify at least ten locations throughout the Permittees' jurisdictions that present opportunities to install and evaluate[50] on-site treatment systems (e.g., detention basins, bioretention units, sand filters, infiltration basins, treatment wetlands) and shall assess best treatment options for those locations. Every county (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano) should have at least one location. This effort shall identify potential locations draining a variety of land uses; evaluate technical feasibility; and discuss economical feasibility. The pilot locations may be the same as those chosen for Provision C.12.e, but consideration should be given to areas of elevated mercury concentrations.

On the basis of the Provision C.11.e.ii report, the Permittees shall select sites to perform pilot studies and shall conduct pilot studies in ten selected locations. Pilot studies shall span treatment types and drainage characteristics.

iii. Reporting –

(1) In their 2011 Annual Report, the Permittees shall report on candidate locations and types of treatment retrofit for each location. The report shall include assessment of at least ten locations.

[50] Permittees may evaluate a maximum of two pre-existing treatment systems of the ten total required systems to be evaluated provided that these existing treatment systems are applicable to the intent of this provision..

(2) In their March 15, 2014 Integrated Monitoring Report, the Permittees shall report status, results, mercury removal effectiveness, and lessons learned from the ten pilot studies and their plan for implementing this type of treatment on an expanded basis throughout their jurisdictions during the next permit term.

C.11.f. Diversion of Dry Weather and First Flush Flows to Publicly Owned Treatment Works (POTWs)

i. Task Description – The Permittees shall evaluate the reduced loads of mercury from diversion of dry weather and first flush stormwater flows to sanitary sewers. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of urban runoff diversion projects in subsequent permit terms. The Permittees shall also quantify and report the amount of mercury loads removed or avoided resulting from implementation of these measures.

ii. Implementation Level – The Permittees shall implement pilot projects to divert dry weather and first flush flows to POTWs to address these flows as a source of PCBs and mercury to receiving waters. The Permittees are strongly encouraged to make use of stormwater pump stations in this effort because pump station characterization work performed pursuant to Provisions C.2 and C.10, addressing dissolved oxygen depletion and trash impacts, may be efficiently leveraged for the initial phase of these diversion pilot projects. The objectives of this Provision are to: implement five pilot projects for urban runoff diversion from stormwater pump stations to POTWs; evaluate the reduced loads of mercury and PCBs resulting from each diversion; and gather information to guide the selection of additional diversion projects in future permits. Collectively, the Permittees shall select five stormwater pump stations and five alternates by evaluating drainage characteristics and the feasibility of diverting flows to the sanitary sewer.

(1) The Permittees should work with local POTWs on a watershed, county, or regional level to evaluate feasibility and to establish cost sharing agreements. The feasibility evaluation shall include, but not be limited to, costs, benefits, and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather and first flush flows.

(2) From this feasibility evaluation, the Permittees shall select five pump stations and five alternates for pilot diversion studies. At least one urban runoff diversion pilot project shall be implemented in each of the five counties (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano). The pilot and alternate locations should be located in industrially-dominated catchments where elevated PCB concentrations are documented.

(3) The Permittees shall implement flow diversion to the sanitary sewer at five pilot pump stations. As part of the pilot studies, the Permittees shall monitor, measure, and report mercury load reduction.

iii. Reporting

(1) The Permittees shall summarize the results of the feasibility evaluation in their 2010 Annual Report, including:

- Selection criteria leading to the identification of the five candidate and five alternate pump stations for pilot studies.
- Time schedules for conducting the pilot studies.
- A proposed method for distributing mercury load reductions to participating wastewater and stormwater agencies.

(2) The Permittees shall report annually on the status of the pilot studies in each subsequent Annual Report.

(3) The Permittees shall include in their March 15, 2014 Integrated Monitoring Report:

- Evaluation of pilot program effectiveness.
- Mercury loads reduced.
- Updated feasibility evaluation procedures to guide future diversion project selection.

C.11.g. Monitor Stormwater Mercury Pollutant Loads and Loads Reduced

i. Task Description – The Permittees shall develop and implement a monitoring program to quantify mercury loads and loads reduced through source control, treatment and other management measures as required in Provision C.8.f.

ii. Implementation Level – The Permittees shall demonstrate progress toward (a) the interim loading milestones, or (b) attainment of the program area allocations, by using the following methods:

(1) Quantify through estimates the annual average mercury load reduced by implementing pollution prevention, source control and treatment control efforts required by the provisions of this permit or other relevant efforts; or

(2) Quantify the mercury load as a rolling five-year annual average using data on flow and water column mercury concentrations; or

(3) Quantitatively demonstrate that the mercury concentration of suspended sediment that best represents sediment discharged with urban runoff is below the target of 0.2 mg mercury/kg dry weight.

iii. Reporting

(1) The Permittees shall report in their 2010 Annual Report methods used to assess progress toward meeting WLA goals and a full description of the

measurement and estimation methodology and rationale for the approaches.

(2) The Permittees shall report in their March 15, 2014 Integrated Monitoring Report results of chosen monitoring/measurement approach concerning loads assessment and estimation of loads reduced.

C.11.h. Fate and Transport Study of Mercury in Urban Runoff

i. Task Description – The Permittees shall conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of mercury discharged in urban runoff to San Francisco Bay and tidal areas.

ii. Implementation Level – The specific information needs include understanding the in-Bay transport of mercury discharged in urban runoff, the influence of urban runoff on the patterns of food web mercury accumulation, and the identification of drainages where urban runoff mercury is particularly important in food web accumulation.

iii. Reporting – The Permittees shall submit in their 2010 Annual Report a work plan describing the specific manner in which these information needs will be accomplished and describing the studies to be performed with a schedule. The Permittees shall report on status of these studies in their 2010, 2011, and 2012 Annual Reports. In the March 15, 2014 Integrated Monitoring Report, the Permittees shall report the findings and results of the studies completed, planned, or in progress as well as implications of studies on potential control measures to be investigated, piloted or implemented in future permit cycles.

C.11.i. Development of a Risk Reduction Program Implemented Throughout the Region.

i. Task Description – The Permittees shall develop and implement or participate in effective programs to reduce mercury-related risks to humans and quantify the resulting risk reductions from these activities.

ii. Implementation Level – The risk reduction activities shall include investigating ways to address public health impacts of mercury in San Francisco Bay/Delta fish, including activities that reduce actual and potential exposure of health impacts to those people and communities most likely to be affected by mercury in San Francisco Bay-caught fish, such as subsistence fishers and their families. Such strategies should include public participation in developing effective programs in order to ensure their effectiveness. The Permittees may include studies needed to establish effective exposure reduction activities and risk communication messages as part of their planning. The risk reduction activities may be performed by a third party if the Permittees wish to provide funding for this purpose. This requirement may be satisfied by a combination of related efforts through the Regional Monitoring Program or other similar collaborative efforts.

iii. Reporting – The Permittees shall submit in their 2010 Annual Report the specific manner in which these risk reduction activities will be accomplished and describe the studies to be performed with a schedule. The Permittees shall report on the status of the risk reduction efforts in their 2011 and 2012 Annual Reports. The Permittees shall report the findings and results of the studies completed, planned, or in progress as well as the status of other risk reduction actions in their March 15, 2014 Integrated Monitoring Report.

C.11.j. Develop Allocation Sharing Scheme with Caltrans.

i. Task Description – The wasteload allocations for urban stormwater developed through the San Francisco Bay mercury TMDL implicitly include California Department of Transportation (Caltrans) roadway and non-roadway facilities within the geographic boundaries of urban runoff management agencies. Consistent with the TMDL, the Permittees are required to develop an equitable mercury allocation-sharing scheme in consultation with Caltrans to address the Caltrans facilities in the program area, and report the details to the Water Board. Alternatively, Caltrans may choose to implement mercury load reduction actions on a watershed or regionwide basis in lieu of sharing a portion of an urban runoff management agencies' mercury allocation. In such a case, the Water Board will consider a separate allocation for Caltrans for which it may demonstrate progress toward attaining an allocation or load reduction in the same manner as municipal programs.

ii. Reporting – The Permittees shall report on the status of the efforts to develop this allocation sharing scheme in their 2010, 2011, and 2012 Annual Reports. The Permittees shall submit in their March 15, 2014 Integrated Monitoring Report the manner in which the urban runoff mercury TMDL allocation will be shared between the Permittees and Caltrans.

C.12. Polychlorinated Biphenyls (PCBs) Controls

The Permittees shall implement the following control programs for PCBs. The Permittees shall perform the control measures and provide reporting on those control measures according to the provisions below. The purpose of these provisions is to implement the urban runoff requirements of the PCBs TMDL and reduce PCBs loads to make substantial progress toward achieving the urban runoff PCBs load allocation. The Permittees may comply with any requirement of this Provision through a collaborative effort.

C.12.a. Implement Project throughout Region to Incorporate PCBs and PCB-Containing Equipment Identification into Existing Industrial Inspections

i. Task Description – The Permittees shall develop training materials and train municipal industrial building inspectors to identify, in the course of their existing inspections, PCBs or PCB-containing equipment. The Permittees shall incorporate such PCB identification into industrial inspection programs.

ii. Implementation Level – Where inspectors identify during inspections PCBs or PCB-containing equipment, the Permittees shall document incidents in inspection reports and refer to appropriate regulatory agencies (e.g. county health departments, Department of Toxic Substances Control, California Department of Public Health, and the Water Board) as necessary.

iii. Reporting – The Permittees shall report the results of training in their 2010 Annual Report and report on both ongoing training development and inspections for PCB identification in their 2011, and following, Annual Reports.

C.12.b. Conduct Pilot Projects to Evaluate Managing PCB-Containing Materials and Wastes during Building Demolition and Renovation (e.g., Window Replacement) Activities

i. Task Description – The Permittees shall evaluate potential presence of PCBs at construction sites, current material handling and disposal regulations/programs (e.g., municipal ordinances, RCRA, TSCA) and current level of implementation.

ii. Implementation Level –

(1) The Permittees shall develop a sampling and analysis plan to evaluate PCBs at construction sites that involve demolition activities (including research on when, where, and which materials potentially contained PCBs).

(2) The Permittees shall implement a sampling and analysis plan at a minimum of 10 sites distributed throughout the combined Permittees' jurisdiction areas.

(3) The Permittees shall develop/select BMPs to reduce or prevent discharges of PCBs during demolition/remodeling. The BMPs will focus on methods

to identify, handle, contain, transport and dispose of PCB-containing building materials.

(4) The Permittees shall develop model ordinances or policies, train and deploy inspectors, and pilot test BMPs at 5 sites.

iii. Reporting –

(1) In their 2010 Annual Report, the Permittees shall submit the sampling and analysis plan (of Provision C.12.b.ii.).

(2) In their 2010 Annual Report, the Permittees shall submit a status report on sampling and analysis along with whatever sampling results are available.

(3) In their 2011 Annual Report, the Permittees shall submit the results of the evaluation (Provision C.12.b.i.) of current regulations, level of implementation, and regulatory gaps as well as the final sampling and analysis report, a list of appropriate BMPs, BMP training program, and model ordinances and policies to prevent PCB discharges from building demolition and improvement activities.

(4) In the March 15, 2014 Integrated Monitoring Report, the Permittees shall submit the results of pilot program effectiveness evaluation.

C.12.c. Pilot Projects to Investigate and Abate On-land Locations with Elevated PCB Concentrations, Including Public Rights-of-way, and Stormwater Conveyances with Accumulated Sediments with Elevated PCBs Concentrations.

i. Task Description – The Permittees shall investigate and abate PCBs sources in or to their storm drain systems in conjunction with the Water Board and other appropriate regulatory agencies with investigation and cleanup authorities. The purpose of this task is to implement and evaluate the benefit of a suite of abatement measures at five pilot project locations. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of abatement projects in subsequent permit terms. The Permittees shall also quantify and report the amount of PCBs loads abated resulting from implementation of these measures.

ii. Implementation Level –

(1) The Permittees, working collaboratively, shall identify 5 drainage areas that contain high levels of PCBs and conduct pilot projects to investigate and abate these high PCB concentrations. To accomplish this, the Permittees shall interview municipal staff and review municipal databases, data collected or compiled through grant-funded efforts, other agency files, and other available information to identify potential PCB source areas and areas where PCB-contaminated sediment accumulates, including within stormwater conveyances. The Permittees shall qualitatively rank and map potential PCB source areas within each drainage. Investigation of mercury (Provision C.11.c.) shall be included in these efforts unless not

appropriate. When contamination is located on private property, the Permittees must either exercise direct authority to require cleanup or notify and request other appropriate authorities to exercise their cleanup authority.

(2) The Permittees shall conduct reconnaissance surveys of the identified drainages and gather information concerning past or current use of PCBs to further identify potential source areas and determine whether runoff from such locations is likely to convey soils/sediments with PCBs to municipal stormwater conveyances.

(3) The Permittees shall validate existence of elevated PCB concentrations through surface soil/sediment sampling and analysis where visual inspections and/or other information suggest potential source areas within each drainage.

Where data confirm significantly elevated PCB concentrations in surface soils/sediments within the subject pilot drainage, the Permittees shall provide available information on current site conditions and owner/operators and other potentially responsible parties to Water Board and other appropriate regulatory agencies to facilitate their issuance of orders for further investigation and remediation of subject sites. The Permittees shall assist the Water Board and other appropriate agencies to identify/evaluate funding to perform abatement and/or responsible parties and abatement options.

(4) The Permittees shall identify areas for expedited abatement on the basis of loading potential including factors such as PCB concentration, mass of sediment, and mobilization potential and/or human health protection thresholds, such as California Human Health Screening Levels.

(5) The Permittees shall conduct an abatement program in portions of drainages under their jurisdiction in conjunction with the Water Board and other appropriate agencies.

iii. Reporting

(1) The Permittees shall report on the identified suspect drainage areas [Provision C.12.c.ii (1)] in their 2010 Annual Report and results of the surveys [Provision C.12.c.ii.(2)] in their 2011 Annual Report.

(2) The Permittees shall report sampling and chemical analysis results at pilot locations [Provision C.12.c.ii.(3)] in their 2011 Annual Reports.

(3) The Permittees shall report on proposed abatement opportunities and activities [Provision C.12.c.ii.(4) and (5)], responsible parties, funding, agency oversight, and schedules in their 2012 Annual Report.

(4) The Permittees shall report results of abatement program effectiveness and estimates of loads reduced (see C.11.g) in the March 15, 2014 Integrated Monitoring Report.

C.12.d. Conduct Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices

i. **Task Description** – The Permittees shall jointly evaluate ways to enhance PCBs load reduction benefits of operation and maintenance activities that remove or manage sediment. The purpose of this task is to implement these management practices at the pilot scale in five drainages during this permit term. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of enhanced sediment removal and management practices in subsequent permit terms. The Permittees shall also quantify and report the amount of PCBs loads removed or avoided resulting from implementation of these measures.

ii. **Implementation Level** – In all pilot program drainages selected as part of Provision C.12.c, the Permittees shall jointly evaluate ways to enhance existing sediment removal and management practices such as municipal street sweeping, curb clearing parking restrictions, inlet cleaning, catch basin cleaning, stream and stormwater conveyance system maintenance, and pump station cleaning via increased effort and/or retrofits. This evaluation shall also include consideration of street flushing and capture, collection, or routing to the sanitary sewer (in coordination and consultation with local sanitary sewer agency) as a potential enhanced management practice. The Permittees shall also jointly evaluate existing information on high-efficiency street sweepers. The goal is to evaluate the cost-effectiveness of high-efficiency street sweeping relative to reducing pollutant loads. The Permittees shall develop recommendations for follow-up studies to be conducted.

iii. **Reporting** – The Permittees shall submit a progress report on the results of these two evaluations in their 2010 Annual Report and the final evaluation results in their 2011 Annual Report.

iv. Beginning July 1, 2011, the Permittees shall implement pilot studies for the most potentially effective measure(s) based on the evaluation of Provision C.12.d. ii. throughout the region.

v. **Reporting** – The Permittees shall report effectiveness of enhanced practices pilot implementation in the March 15, 2014 Integrated Monitoring Report, and their plan for implementing enhanced practices in the next permit term.

C.12.e. Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit

i. **Task Description** – The Permittees shall evaluate and quantify the removal of PCBs by on-site treatment systems via retrofit of such systems into existing storm drain systems. The purpose of this task is to implement on-site treatment projects at the pilot scale in ten locations during this permit term. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of on-site treatment retrofits in subsequent permit terms.

ii. Implementation Level – The Permittees, working collaboratively, shall identify at least 10 locations throughout the Permittees' jurisdictions that present opportunities to install and evaluate[51] on-site treatment systems (e.g., detention basins, bioretention units, sand filters, infiltration basins, treatment wetlands) and shall assess the best treatment options for those locations. Every county (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano) should have at least one location. This assessment shall identify potential locations draining a variety of land uses, discuss technical feasibility, and discuss economical feasibility. The Permittees shall choose pilot study locations primarily on the basis of elevated PCBs concentrations with additional consideration to mercury concentrations.

iii. On the basis of the Provision C.12.e.ii. report, the Permittees shall select sites to perform pilot studies and shall conduct pilot studies in selected locations. Taken as a group, these 10 pilot study locations should span treatment types and drainage characteristics.

iv. Reporting –

(1) In their 2011 Annual Report, the Permittees shall report on candidate locations with types of treatment retrofit for each location. The report shall include assessment of at least 10 locations.

(2) In the March 15, 2014 Integrated Monitoring Report, the Permittees shall report status, results, PCBs-removal effectiveness, and lessons learned from the pilot studies and their plan for implementing this type of treatment on an expanded basis throughout the region during the next permit term.

C.12.f. Diversion of Dry Weather and First Flush Flows to POTWs

i. Task Description – The Permittees shall evaluate the reduced loads of PCBs from diversion of dry weather and first flush stormwater flows to sanitary sewers. The knowledge and experience gained through pilot implementation will be used to determine the implementation scope of urban runoff diversion in subsequent permit terms. The Permittees shall document the knowledge and experience gained through pilot implementation, and this documentation will provide a basis for determining the implementation scope of urban runoff diversion projects in subsequent permit terms.

ii. Implementation Level – The Permittees shall implement pilot projects to address the role of pump stations as a source of pollutants of concern (primarily PCBs and secondarily mercury). This work is in addition to Provisions C.2 and C.10 that address dissolved oxygen depletion and trash impacts in receiving waters. The objectives of this provision are: to implement five pilot projects for urban runoff diversion from stormwater pump stations to POTWs; evaluate the reduced loads of mercury and PCBs resulting from the diversion; and gather

[51] The Permittees may evaluate a maximum of two pre-existing treatment systems of the ten total required systems to be evaluated provided that these existing treatment systems are applicable to the intent of this provision.

information to guide the selection of additional diversion projects required in future permits. Collectively, the Permittees shall select 5 stormwater pump stations and 5 alternates by evaluating drainage characteristics and the feasibility of diverting flows to the sanitary sewer.

(1) The Permittees should work with the local POTW on a watershed, program, or regional level to evaluate feasibility and to establish cost sharing agreements. The feasibility evaluation shall include, but not be limited to, costs, benefits, and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather and first flush flows.

(2) From this feasibility evaluation, the Permittees shall select 5 pump stations and 5 alternates for pilot diversion studies. At least one urban runoff diversion pilot project shall be implemented in each of the five counties (San Mateo, Contra Costa, Alameda, Santa Clara, and Solano). The pilot and alternate locations should be located in industrially dominated catchments where elevated PCB concentrations are documented.

(3) The Permittees shall implement flow diversion to the sanitary sewer at the 5 pilot pump stations. As part of the pilot studies, they shall monitor and measure PCBs load reduction.

iii. Reporting –

(1) The Permittees shall summarize the results of the feasibility evaluation in their 2010 Annual Report, including:

- Selection criteria leading to the identification of the 5 candidate and 5 alternate pump station for pilot studies.
- Time schedules for conducting the pilot studies.
- A proposed method for distributing PCBs load reductions to participating wastewater and stormwater agencies.

(2) The Permittees shall report annually on the status of the pilot studies in each subsequent annual report.

(3) The March 15, 2014 Integrated Monitoring Report shall include:

- Evaluation of pilot program effectiveness.
- PCBs loads reduced.
- Updated feasibility evaluation procedures to guide future diversion project selection.

C.12.g. Monitor Stormwater PCB Pollutant Loads and Loads Reduced

The Permittees shall develop and implement a monitoring program as required in Provision C.8.f to quantify PCBs loads and loads reduced (see C.11.g for details) through the source control, treatment and other management measures implemented as part of the pilot studies of C.12.a through C.12.f.

C.12.h. Fate and Transport Study of PCBs in Urban Runoff

i. **Task Description** – The Permittees shall conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of PCBs discharged in urban runoff.

ii. **Implementation Level** – The specific information needs include understanding the in-Bay transport of PCBs discharged in urban runoff, the influence of urban runoff on the patterns of food web PCBs accumulation, and the identification of drainages where urban runoff PCBs are particularly important in food web accumulation.

iii. **Reporting** – The Permittees shall submit in their 2010 Annual Report a workplan describing the specific manner in which these information needs will be accomplished and describing the studies to be performed with a schedule. The Permittees shall report on status of the studies in their 2011 and 2012 Annual Reports. The Permittees shall report in the March 15, 2014 Integrated Monitoring Report the findings and results of the studies completed, planned, or in progress as well as implications of studies on potential control measures to be investigated, piloted or implemented in future permit cycles.

C.12.i. Development of a Risk Reduction Program Implemented throughout the Region

i. **Task Description** – The Permittees shall develop and implement or participate in effective programs to reduce PCBs-related risks to humans and quantify the resulting risk reductions from these activities.

ii. **Implementation Level** – The risk reduction activities shall include investigating ways to address public health impacts of PCBs in San Francisco Bay/Delta fish, including activities that reduce actual and potential exposure of health impacts to those people and communities most likely to be affected by PCBs in San Francisco Bay-caught fish, such as subsistence fishers and their families. Such strategies should include public participation in developing effective programs in order to ensure their effectiveness. The Permittees may include studies needed to establish effective exposure reduction activities and risk communication messages as part of their planning. The risk reduction activities may be performed by a third party if the Permittees wish to provide funding for this purpose. This requirement may be satisfied by a combination of related efforts through the Regional Monitoring Program or other similar collaborative efforts.

iii. **Reporting** – The Permittees shall submit in their 2010 Annual Report the specific manner in which these risk reduction activities will be accomplished and describe the studies to be performed with a schedule. The Permittees shall report on status of the studies in their 2011 and 2012 Annual Reports. The Permittees shall report the findings and results of the studies completed, planned, or in progress as well as the status of other risk reduction actions in the March 15, 2014 Integrated Monitoring Report.

C.13. Copper Controls

The control program for copper is detailed below. The Permittees shall implement the control measures and accomplish the reporting on those control measures according to the provisions below. The purpose of these provisions is to implement the control measures identified in the Basin Plan amendment necessary to support the copper site-specific objectives in San Francisco Bay. The Permittees may comply with any requirement of C.13 Provisions through a collaborative effort.

C.13.a. Manage Waste Generated from Cleaning and Treating of Copper Architectural Features, Including Copper Roofs, during Construction and Post-Construction.

i. Task Description – The Permittees shall ensure that local ordinance authority is established to prohibit the discharge of wastewater to storm drains generated from the installation, cleaning, treating, and washing of the surface of copper architectural features, including copper roofs to storm drains.

ii. Implementation Level

(1) The Permittees shall develop BMPs on how to manage the waste during and post-construction.

(2) The Permittees shall require use of appropriate BMPs when issuing building permits.

(3) The Permittees shall educate installers and operators on appropriate BMPs.

(4) The Permittees shall enforce against noncompliance.

iii. Reporting

(1) The Permittees shall certify adequate legal authority in their 2011 Annual Report or otherwise provide justification for schedule not to exceed one year to comply.

(2) The Permittees shall report annually, starting with their 2012 Annual Report, on training, permitting and enforcement activities.

(3) In their 2013 Annual Report, the Permittees shall evaluate the effectiveness of these measures, including BMP implementation and propose any additional measures to address this source.

C.13.b. Manage Discharges from Pools, Spas, and Fountains that Contain Copper-Based Chemicals

i. Task Description – By adopting local ordinances, the Permittees shall prohibit discharges to storm drains from pools, spas, and fountains that contain copper-based chemicals.

ii. Implementation Level – The Permittees shall either: 1) require installation of a sanitary sewer discharge connection for pools, spas, and fountains, including

connection for filter backwash, with a proper permit from the POTWs; or 2) require diversion of discharge for use in landscaping or irrigation.

iii. Reporting – The Permittees shall certify adequate legal authority in their 2011 Annual Report or otherwise provide justification for schedule not to exceed one year to comply.

C.13.c. Vehicle Brake Pads

i. Task Description – The Permittees shall engage in efforts to reduce the copper discharged from automobile brake pads to surface waters via urban runoff.

ii. Implementation Level – The Permittees shall participate in the Brake Pad Partnership (BPP) process to develop California legislation phasing out copper from certain automobile brake pads sold in California.

iii. Reporting – The Permittees shall report on legislation development and implementation status in Annual Reports during the permit term. In their 2013 Annual Report, the Permittees shall assess status of copper water quality issues associated with automobile brake pads and recommend brake pad-related actions for inclusion in subsequent permits if needed.

C.13.d. Industrial Sources

i. Task Description – The Permittees shall ensure industrial facilities do not discharge elevated levels of copper to storm drains by ensuring, through industrial facility inspections, that proper BMPs are in place.

ii. Implementation Level –

(1) As part of industrial site controls required by Provision C.4, the Permittees shall identify facilities likely to use copper or have sources of copper (e.g., plating facilities, metal finishers, auto dismantlers) and include them in their inspection program plans.

(2) The Permittees shall educate industrial inspectors on industrial facilities likely to use copper or have sources of copper and proper BMPs for them.

(3) As part of the industrial inspection, inspectors shall ensure that proper BMPs are in place at such facilities to minimize discharge of copper to storm drains, including consideration of roof runoff that might accumulate copper deposits from ventilation systems on-site.

iii. Reporting

The Permittees shall highlight copper reduction results in the industrial inspection component in the C.13 portion of each Annual Report beginning September 2010.

C.13.e. Studies to Reduce Copper Pollutant Impact Uncertainties

i. Task Description – The Permittees shall conduct or cause to be conducted technical studies to investigate possible copper sediment toxicity and technical studies to investigate sub-lethal effects on salmonids.

ii. Implementation Level – Technical uncertainties regarding copper effects in the Bay are described in the Basin Plan's implementation program for copper site-specific objectives. These uncertainties include toxicity to Bay benthic organisms possibly caused by high copper concentrations as well as possible impacts to the olfactory system of salmonids. The Permittees shall ensure that these studies are supported and conducted. Similar requirements are included in NPDES permits for wastewater discharges. The Permittees shall submit in their 2010 Annual Report the specific manner in which these information needs will be accomplished and describe the studies to be performed with a schedule. The Permittees shall report the findings and results of the studies completed, planned, or in progress in their 2012 Annual Report.

C.14. Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides and Selenium

The control program for PBDEs, legacy pesticides, and selenium is detailed below. The Permittees shall perform the control measures and accomplish the reporting on those control measures according to the provisions below. The purpose of these provisions is to gather concentration and loading information on a number of pollutants of concern (e.g., PBDEs, DDT, dieldrin, chlordane, selenium) for which TMDLs are planned or are in the early stages of development. The Permittees may comply with any requirement of C.14 Provisions through a collaborative effort.

C.14.a. Control Program for PBDEs, Legacy Pesticides, and Selenium.

i. **Task Description** – To determine if urban runoff is a conveyance mechanism associated with the possible impairment of San Francisco Bay for PBDEs, legacy pesticides (such as DDT, dieldrin, and chlordane), and selenium, the Permittees shall work with the other municipal stormwater management agencies in the Bay Region to implement a plan (PBDEs/Legacy Pesticides/Selenium Plans) to identify, assess, and manage controllable sources of PBDEs, legacy pesticides, and selenium found in urban runoff, if any. The Water Board recognizes that these three pollutants are distinct in terms of origin and transport, but they have been grouped into a single permit provision because the requirements are identical. The Water Board anticipates that some of the control measures that are developed for PCBs consistent with aforementioned efforts warrant consideration for the control of PBDEs and possibly legacy pesticides.

ii. **Implementation Level** – The PBDEs/Legacy Pesticides/Selenium Plan shall include actions to do the following:

Characterize the representative distribution of PBDEs, legacy pesticides, and selenium in the urban areas of the Bay Region covered by this permit to determine:

(1) If PBDEs, legacy pesticides, and selenium are present in urban runoff;

(2) If PBDEs, legacy pesticides, or selenium are distributed relatively uniformly in urban areas; and

(3) Whether storm drains or other surface drainage pathways are sources of PBDEs, legacy pesticides, or selenium in themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PBDEs, legacy pesticides, or selenium to San Francisco Bay via urban runoff conveyance systems.

iii. Report on progress in 2010 and 2011 Annual Reports. Submit in the 2012 Annual Report a report with the results of the characterization of PBDEs, legacy pesticides, and selenium in urban areas throughout the Bay Region.

iv. Provide information to allow calculation of PBDEs, legacy pesticides, and selenium loads to San Francisco Bay from urban runoff conveyance systems.

v. Submit in the 2013 Annual Report a report with the information required to compute such loads to San Francisco Bay of PBDEs, legacy pesticides, and selenium from urban runoff conveyance systems throughout the Bay.

vi. Identify control measures and/or management practices to eliminate or reduce discharges of PBDEs, legacy pesticides, or selenium conveyed by urban runoff conveyance systems.

vii. Submit in the 2013 Annual Report a report identifying such control measures/management practices.

C.15. Exempted and Conditionally Exempted Discharges

The objective of this provision is to exempt unpolluted non-stormwater discharges from Discharge Prohibition A.1 and to conditionally exempt non-stormwater discharges that are potential sources of pollutants. In order for non-stormwater discharges to be conditionally exempted from Discharge Prohibition A.1, the Permittees must identify appropriate BMPs, monitor the non-stormwater discharges where necessary, and ensure implementation of effective control measures – as listed below – to eliminate adverse impacts to waters of the State consistent with the discharge prohibitions of the Order.

C.15.a. Exempted Non-Stormwater Discharges (Exempted Discharges):

i. Discharge Type – In carrying out Discharge Prohibition A.1, the following unpolluted discharges are exempted from prohibition of non-stormwater discharges:

(1) Flows from riparian habitats or wetlands;

(2) Diverted stream flows;

(3) Flows from natural springs;

(4) Rising ground waters;

(5) Uncontaminated and unpolluted groundwater infiltration;

(6) Single family homes' pumped groundwater, foundation drains, and water from crawl space pumps and footing drains;

(7) Pumped groundwater from drinking water aquifers; and

(8) NPDES permitted discharges (individual or general permits).

ii. Implementation Level – The non-stormwater discharges listed in Provision C.15.a.i above are exempted unless they are identified by the Permittees or the Executive Officer as sources of pollutants to receiving waters. If any of the above categories of discharges, or sources of such discharges, are identified as sources of pollutants to receiving waters, such categories or sources shall be addressed as conditionally exempted discharges in accordance with Provision C.15.b below.

C.15.b. Conditionally Exempted Non-Stormwater Discharges:

The following non-stormwater discharges are also exempt from Discharge Prohibition A.1 if they are either identified by the Permittees or the Executive Officer as not being sources of pollutants to receiving waters, or if appropriate control measures to eliminate adverse impacts of such sources are developed and implemented in accordance with the tasks and implementation levels of each category of Provision C.15.b.i-viii below.

i. Discharge Type – Pumped Groundwater, Foundation Drains, and Water from Crawl Space Pumps and Footing Drains

(1) **Pumped Groundwater from Non Drinking Water Aquifers** –
Groundwater pumped from monitoring wells, used for groundwater basin management, which are owned and/or operated by the Permittees who pump groundwater as drinking water. These aquifers tend to be shallower, when compared to drinking water aquifers.

(a) **Implementation Level** – Twice a year (once during the wet season and once during the dry season), representative samples shall be taken from each aquifer that potentially will discharge or has discharged into a storm drain. Samples collected and analyzed for compliance in accordance with self-monitoring requirements of other NPDES permits or sample data collected for drinking water regulatory compliance may be submitted to comply with this requirement as long as they meet the following criteria:

(i) The water samples shall meet water quality standards consistent with the existing effluent limitations in the Water Board's NPDES General Permits, such as NPDES Nos. CAG912002 and CAG912003 for Discharge or Reuse of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by fuel and VOCs, respectively, and NPDES No. CAG912004 for discharges of low-level, incidental, and potentially contaminated groundwater.

(ii) The water samples shall be analyzed using approved USEPA Methods (e.g., (a) USEPA Method 160.2 for total suspended solids; (b) USEPA Method 8015 Modified for total petroleum hydrocarbons; (c) USEPA Method 8260B and 8270C or equivalent for volatile and semi-volatile organic compounds; and (d) USEPA Method 3005 for metals.

(iii) The water samples shall be analyzed for pH and turbidity.

(iv) If a Permittee is unable to comply with the above criteria, the Permittee shall notify the Water Board upon becoming aware of the compliance issue.

(b) **Required BMPs** – When uncontaminated (meeting the criteria in C.15.b.i.(1)(a)(i)) groundwater is discharged from these monitoring wells, the following shall be implemented:

(i) Discharges shall be properly controlled and maintained to prevent erosion at the discharge point and at a rate that avoids scouring of banks and excess sedimentation in the receiving waterbody.

(ii) Appropriate BMPs shall be implemented to remove total suspended solids and silt to allowable discharge levels. Appropriate BMPs may include filtration, settling, coagulant application with no residual coagulant discharge, minor odor or color removal with activated carbon, small scale peroxide addition, or other minor treatment.

(iii) Turbidity of the discharged groundwater shall be maintained below 50 NTUs for discharges to dry creeks, 110 percent of the

ambient stream turbidity for a flowing stream with turbidities greater than 50 NTU, or 5 NTU above ambient turbidity for flowing streams with turbidities less than or equal to 50 NTU.

(iv) pH of the discharged groundwater shall be maintained within the range of 6.5 to 8.5.

(c) **Reporting** – The Permittees shall maintain records of these discharges, BMPs implemented, and any monitoring data collected.

(2) **Pumped[52] Groundwater, Foundation Drains, and Water from Crawl Space Pumps and Footing Drains**

(a) Proposed new discharges of uncontaminated groundwater at flows of 10,000 gallons/day or more and all new discharges of potentially contaminated groundwater shall be reported to the Water Board so that they can be subject to NPDES permitting requirements.

(b) Proposed new discharges of uncontaminated groundwater at flows of less than 10,000 gallons/day shall be encouraged to discharge to a landscaped area or bioretention unit that is large enough to accommodate the volume.

(c) If the discharge options in C.15.b.i.(2)(b) above are not feasible and these discharges must enter a storm drain, sampling shall be done to verify that the discharge is uncontaminated.

(i) The discharge shall meet water quality standards consistent with the existing effluent limitations in the Water Board's NPDES General Permits, such as NPDES Nos. CAG912002 and CAG912003 for Discharge or Reuse of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by fuel and VOCs, respectively, and NPDES No. CAG912004 for discharges of low-level, incidental, and potentially contaminated groundwater.

(ii) The Permittees shall require that water samples from these discharge types be analyzed using approved USEPA Methods (e.g., (a) USEPA Method 160.2 for total suspended solids; (b) USEPA Method 8015 Modified for total petroleum hydrocarbons; (c) USEPA Method 8260B and 8270C or equivalent for volatile and semi-volatile organic compounds; and (d) USEPA Method 3005 for metals.

(d) **Required BMPs** – When the discharge has been verified as uncontaminated per sampling completed in C.15.b.i.(2)(c) above, the Permittees shall require the following during discharge:

(i) Proper control and maintain to prevent erosion at the discharge point and at a rate that avoids scouring of banks and excess sedimentation in the receiving waterbody.

(ii) Appropriate BMPs to render pumped groundwater free of pollutants and therefore exempted from prohibition may include

[52] Pumped groundwater not exempted in C.15.a or conditionally exempted in C.15.b.i.(1).

the following: filtration, settling, coagulant application with no residual coagulant discharge, minor odor or color removal with activated carbon, small scale peroxide addition, or other minor treatment.

(iii) Testing of water samples for turbidity and pH on the first two consecutive days of dewatering.

(iv) Turbidity of discharged groundwater shall be maintained below 50 NTU for discharges to dry creeks, 110 percent of the ambient stream turbidity for a flowing stream with turbidities greater than 50 NTU, or 5 NTU above ambient turbidity for a flowing stream with turbidities less than or equal to 50 NTU.

(v) pH of discharged water shall be maintained within the range of 6.5 to 8.5.

(e) If a Permittee determines that a discharger or a project proponent is unable to comply with the above criteria, the discharger shall be directed to obtain approval or permits directly from the Water Board.

(f) **Reporting** – The Permittees shall maintain records of these discharges, BMPs implemented, and any monitoring data collected.

ii. Discharge Type – Air Conditioning Condensate

Required BMPs – Condensate from air conditioning units shall be directed to landscaped areas or the ground. Discharge to a storm drain system may be allowed if discharge to landscaped areas or the ground is not feasible.

iii. Discharge Types – Planned,[53] Unplanned,[54] and Emergency Discharges of the Potable Water System

(1) **Planned Discharges** – Planned discharges are routine operation and maintenance activities in the potable water distribution system that can be scheduled in advance, such as disinfecting water mains, testing fire hydrants, storage tank maintenance, cleaning and lining pipe sections, routine distribution system flushing, reservoir dewatering, and water main dewatering activities. The following requirements only apply to those Permittees that are water purveyors and pertain to their planned discharges of potable water to their storm drain systems.

(a) **Required BMPs**[55] – The Permittees shall implement appropriate BMPs for dechlorination, and erosion and sediment controls for all planned potable water discharges.

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[53] Planned discharges typically result from required routine operation and maintenance activities that can be scheduled in advance. Planned discharges are easier to control than unplanned discharges, and the BMPs are significantly easier to plan and implement.

[54] Unplanned discharges are non-routine, the result of accidents or incidents that cannot be scheduled or planned for in advance.

[55] Reference for BMPs, monitoring methods: *Guidelines for the Development of Your BMP Manual for Drinking Water System Releases.* Developed by the California-Nevada Sections of the American Water Works Association (CA-NV AWWA), Environmental Compliance Committee (ECC) 2005.

(b) **Notification Requirements**

(i) The Permittees shall notify the Water Board staff at least one week in advance for planned discharges with a flow rate of 250,000 gallons per day or more, or a total volume of 500,000 gallons or more. The Permittees shall also notify other interested parties who may be impacted by planned discharges, such as flood control agencies, downstream jurisdictions, and non-governmental organizations such as creek groups, before discharge. The notification shall include the following information, but is not limited to: (1) project name; (2) type of discharges; (3) receiving waterbody(ies); (4) date of discharge; (5) time of discharge (in military time); (6) estimated volume (gallons); and (7) estimated flow rate (gallons per day); and (8) monitoring plan of the discharges and receiving water. If receiving water monitoring is infeasible or is not practicable, justification shall be provided.

(c) **Monitoring and Reporting Requirements**

(i) The Permittees shall monitor planned discharges for pH, chlorine residual, and turbidity.

(ii) The following discharge benchmarks shall be used to evaluate the effectiveness of BMPs for all planned discharges:

- Chlorine residual 0.05 mg/L using the field test (Standard Methods 4500-Cl F and F) or equivalent
- pH ranges between 6.5 and 8.5
- Turbidity of 50 NTU post-BMPs or limit increase in turbidity above background level as follows:

Receiving Water Background	Incremental Increase
Dry Creek	50 NTU
< 50 NTU	5 NTU
50–100 NTU	10 NTU
> 100 NTU	10% of background

(iii) The Permittees shall submit the following information with the Annual Report in tabular form for all planned discharges. Reporting content shall include, but is not limited to the following parameters: (1) project name; (2) type of discharge; (3) receiving waterbody(ies); (4) date of discharge; (5) duration of discharge (in military time); (6) estimated volume (gallons); (7) estimated flow rate (gallons per day); (8) chlorine residual (mg/L); (9) pH; (10) turbidity (NTU) for receiving water where feasible and point of discharge, and (11) description of implemented BMPs or corrective actions.

(2) **Unplanned Discharges** – Unplanned discharges are non-routine activities such as water line breaks, leaks, overflows, fire hydrant shearing, and emergency flushing. The following requirements only apply to those Permittees that are water purveyors and pertain to their unplanned discharges of potable water to their storm drain systems.

(a) **Required BMPs** – The Permittees shall implement appropriate BMPs for dechlorination and erosion and sediment control for all unplanned discharges upon containing the discharge and attaining safety of the discharge site.

(b) **Administrative BMPs** – In some instances, the Permittees shall implement Administrative BMPs, such as source control measures, managerial practices, operations and maintenance procedures, or other measures to reduce or prevent potential pollutants from being discharged during unplanned discharges upon containing the discharge and attaining safety of the discharge site.

(c) **Notification Requirements**

(i) The Permittees shall report to the State Office of Emergency Services as soon as possible, but no later than two hours after becoming aware of (1) any aquatic impacts (e.g., fish kill) as a result of the unplanned discharges, or (2) when the discharge might endanger or compromise public health and safety.

(ii) The Permittees shall report to Water Board staff, by telephone or email as soon as possible, but no later than 24 hours after becoming aware of any unplanned discharges, where the total chlorine residual is greater than 0.05 mg/L and the total volume is approximately 50,000 gallons or more.

- Within five working days after the 24-hour telephone or email report, the Permittees shall submit a report documenting the discharge and corrective actions taken to Water Board staff and other interested parties.

(d) Monitoring and Reporting Requirements

(i) The Permittees shall monitor at least 10% of their unplanned discharges for pH and chlorine residual, and visually assess each discharge for turbidity immediately downstream of implemented BMPs to demonstrate their effectiveness. After the implementation of appropriate BMPs, the discharge pH levels outside the discharge ranges (below 6.5 and above 8.5), chlorine residual above 0.05 mg/l, or moderate and high turbidity shall trigger BMP improvement. If the Permittees monitor more than 10% of the unplanned discharges, all monitoring results shall be included in the Annual Report.

(ii) The Permittees shall submit the following information with the Annual Report in tabular form for all unplanned discharges. The reporting format and content shall be as described in Provision C.15.b.ii.(1)(c)(iii) of the Planned Discharges above. In addition, these reports shall also state the time of discharge discovery, notification time, inspector arrival time, and responding crew arrival time.

(iii) After 18 months of consecutive data gathering, a Permittee may propose, to the Executive Officer, a reduced monitoring plan targeting specific “high-risk” or “environmentally sensitive”

areas (i.e., areas that are prone to erosion and excess sedimentation at high flows, support rare or endangered species, or provide aquatic habitat with proven effective BMPs). Until the Executive Officer approves the reduced monitoring plan, the Permittee shall continue the monitoring plan prescribed in C.15.b.iii.(2)(d)(i).

(3) **Emergency Discharges** – Emergency discharges are the result of firefighting, unauthorized hydrant openings, natural or man-made disasters (e.g., earthquakes, floods, wildfires, accidents, terrorist actions).

Required BMPs

(a) The Permittees shall implement or require fire fighting personnel to implement BMPs for emergency discharges. However, the BMPs should not interfere with immediate emergency response operations or impact public health and safety. BMPs may include, but are not limited to, the plugging of the storm drain collection system for temporary storage, the proper disposal of water according to jurisdictional requirements, and the use of foam where there may be toxic substances on the property the fire is located.

(b) During emergency situations, priority of efforts shall be directed toward life, property, and the environment (in descending order). The Permittees or fire fighting personnel shall control the pollution threat from their activities to the extent that time and resources allow.

(c) **Reporting Requirements** – Reporting requirements will be determined by Water Board staff on a case-by-case basis, such as for fire incidents at chemical plants.

iv. Discharge Type – Individual Residential Car Washing

Required BMPs

(1) The Permittees shall discourage through outreach efforts individual residential car washing within their jurisdictional areas that discharge directly into their MS4s.

(2) The Permittees shall encourage individuals to direct car wash waters to landscaped areas, use as little detergent as necessary, wash cars at commercial car wash facilities, etc.

v. Discharge Type – Swimming Pool, Hot Tub, Spa, and Fountain Water Discharges

(1) **Required BMPs**

(a) The Permittees shall prohibit discharge of water that contains chlorine residual, copper algaecide, filter backwash or other pollutants to storm drains or to waterbodies. Such polluted discharges from pools, hot tubs, spas, and fountains shall be directed to the sanitary sewer (with the local sanitary sewer agency's approval) or to landscaped areas that can accommodate the volume.

(b) Discharges from swimming pools, hot tubs, spas and fountains shall be allowed into storm drain collection systems only if there are no

other feasible disposal alternatives (e.g., disposal to sanitary sewer or landscaped areas) and if the discharge is properly dechlorinated to non-detectable levels of chlorine consistent with water quality standards.

(c) The Permittees shall require that new or rebuilt swimming pools, hot tubs, spas and fountains within their jurisdictions have a connection[56] to the sanitary sewer to facilitate draining events. The Permittees shall coordinate with local sanitary sewer agencies to determine the standards and requirements necessary for the installation of a sanitary sewer discharge location to allow draining events for pools, hot tubs, spas, and fountains to occur with the proper permits from the local sanitary sewer agency.

(d) The Permittees shall improve their public outreach and educational efforts and ensure implementation of the required BMPs and compliance in commercial, municipal, and residential facilities.

(e) The Permittees shall implement the Illicit Discharge Enforcement Response Plan from C.5.b for polluted (contains chlorine, copper algaecide, filter backwash, or other pollutants) swimming pool, hot tub, spa, or fountain waters that get discharged into the storm drain.

(2) **Reporting** – The Permittees shall keep records of the authorized major discharges of dechlorinated pool, hot tubs, spa and fountain water to the storm drain, including BMPs employed; such records shall be available for inspection by the Water Board.

vi. Discharge Type – Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering

(1) **Required BMPs** – The Permittees shall promote measures that minimize runoff and pollutant loading from excess irrigation via the following:

(a) Promoting and/or working with potable water purveyors to promote conservation programs that minimize discharges from lawn watering and landscape irrigation practices;

(b) Promoting outreach messages regarding the use of less toxic options for pest control and landscape management;

(c) Promoting and/or working with potable water purveyors to promote the use of drought tolerant, native vegetation to minimize landscape irrigation demands;

(d) Promoting and/or working with potable water purveyors to promote outreach messages that encourage appropriate applications of water needed for irrigation and other watering practices; and,

(e) Implementing the Illicit Discharge Enforcement Response Plan from C.5.b, as necessary, for ongoing, large-volume landscape irrigation runoff to their MS4s.

[56] This connection could be a drain in the pool to the sanitary sewer or a sanitary sewer clean out located close enough to the pool so that a hose can readily direct the pool discharge into the sanitary sewer clean out.

(2) **Reporting** – The Permittees shall provide implementation summaries in their Annual Report.

vii. Additional Discharge Types –The Permittees shall identify and describe additional types and categories of discharges not yet listed in Provision C.15.b that they propose to conditionally exempt from Prohibition A.1 in periodic submissions to the Executive Officer. For each such category, the Permittees shall identify and describe, as necessary and appropriate to the category, either documentation that the discharges are not sources of pollutants to receiving waters or circumstances in which they are not found to be sources of pollutants to receiving waters. Otherwise, the Permittees shall describe control measures to eliminate adverse impacts of such sources, procedures and performance standards for their implementation, procedures for notifying the Water Board of these discharges, and procedures for monitoring and record management.

viii. Permit Authorization for Exempted Non-Stormwater Discharges

(1) Discharges of non-stormwater from sources owned or operated by the Permittees are authorized and permitted by this Permit, if they are in accordance with the conditions of this provision.

(2) The Water Board may require dischargers of non-stormwater, other than the Permittees, to apply for and obtain coverage under an NPDES permit and to comply with the control measures pursuant to Provision C.15.b. Non-stormwater discharges that are in compliance with such control measures may be accepted by a Permittee and are not subject to Prohibition A.1.

(3) The Permittees may propose, as part of their annual updates consistent with the requirements of Provision C.15.b of this Permit, additional categories of non-stormwater discharges with BMPs, to be included in the exemption to Prohibition A.1. Such proposals may be subject to approval by the Executive Officer as a minor modification of the Permit.

C.16. Annual Reports

C.16.a. The Permittees shall submit Annual Reports electronically and in paper copy upon request by September 15 of each year. Each Annual Report shall report on the previous fiscal year beginning July 1 and ending June 30. The annual reporting requirements are set forth in Provisions C.1 – C.15. The Permittees shall retain documentation as necessary to support their Annual Report. The Permittees shall make this supporting information available upon request within a timely manner, generally no more that ten business days unless otherwise agreed to by the Executive Officer.

C.16.b. The Permittees shall collaboratively develop a common annual reporting format for acceptance by the Executive Officer by April 1, 2010. The resulting Annual Report Form, once approved, shall be used by all Permittees. The Annual Report Form may be changed by April 1 of each year for the following annual report, to more accurately reflect the reporting requirements of Provisions C.1 – C.15, with the agreement of the Permittees and by the approval of the Executive Officer.

C.16.c. The Permittees shall certify in each Annual Report that they are in compliance with all requirements of the Order. If a Permittee is unable to certify compliance with a requirement, it must submit in the Annual Report the reason for failure to comply, a description and schedule of tasks necessary to achieve compliance, and an estimated date for achieving full compliance.

C.17. Modifications to this Order

This Order may be modified, or alternatively, revoked or reissued, before the expiration date as follows:

C.17.a. To address significant changed conditions identified in the technical or Annual Reports required by the Water Board, or through other means or communication, that were unknown at the time of the issuance of this Order;

C.17.b. To incorporate applicable requirements of statewide water quality control plans adopted by the State Board or amendments to the Basin Plan approved by the State Board; or

C.17.c. To comply with any applicable requirements, guidelines, or regulations issued or approved under section 402(p) of the CWA, if the requirement, guideline, or regulation so issued or approved contains different conditions or additional requirements not provided for in this Order. The Order as modified or reissued under this paragraph shall also contain any other requirements of the CWA then applicable.

C.18. Standard Provisions

Each Permittee shall comply with all parts of the Standard Provisions contained in Attachment K of this Order.

C.19. Expiration Date

This Order expires on November 30, 2014, five years from the effective date of this Order. The Permittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, not later than 180 days in advance of such date as application for reissuance of waste discharge requirements.

C.20. Rescission of Old Orders

Order Nos. 99-058, 99-059, 01-024, R2-2003-0021, and R2-2003-0034 are hereby rescinded on the effective date of this Order, which shall be December 1, 2009, provided that the Regional Administrator of USEPA, Region IX, does not object.

C.21. Effective Date

The Effective Date of this Order and Permit shall be December 1, 2009, provided that the Regional Administrator of USEPA, Region IX, does not object.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on October 14, 2009.

_____

Bruce H. Wolfe
Executive Officer

Appendix I: Municipal Regional Stormwater Permit Fact Sheet
Attachment A: Provision C.3.b. Sample Reporting Table
Attachment B: Provision C.3.g. Alameda Permittees Hydromodification Requirements
Attachment C: Provision C.3.g. Contra Costa Permittees Hydromodification Requirements
Attachment D: Provision C.3.g. Fairfield-Suisun Permittees Hydromodification Requirements
Attachment E: Provision C.3.g. San Mateo Permittees Hydromodification Requirements
Attachment F: Provision C.3.g. Santa Clara Permittees Hydromodification Requirements
Attachment G: Provision C.3.h. Sample Reporting Table
Attachment H: Provision C.8. Status & Long-Term Monitoring Follow-up Analysis and Actions
Attachment I: Provision C.8. Standard Monitoring Provisions
Attachment J: Provision C.10. Minimum Trash Capture Areas and Minimum Number of Trash Hot Spots
Attachment K: Standard NPDES Stormwater Permit Provisions

ACRONYMS & ABBREVIATIONS

ACCWP	Alameda Countywide Clean Water Program
BAHM	Bay Area Hydrology Model
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
BASMAA	Bay Area Stormwater Management Agencies Association
BMPs	Best Management Practices
CASQA	California Stormwater Quality Association
CCC	California Coastal Commission
CCCWP	Contra Costa Clean Water Program
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CSBP	California Stream Bioassessment Procedures
CWA	Federal Clean Water Act
CWC	California Water Code
DCIA	Directly Connected Impervious Area
ERP	Enforcement Response Plan
FR	Federal Register
GIS	Geographic information System
HBANC	Homebuilders Association of Northern California
HM	Hydromodification Management
HMP	Hydromodification Management Plan
IC/ID	Illicit Connections and Illicit Discharges
IPM	Integrated Pest Management
LID	Low Impact Development
MEP	Maximum Extent Practicable
MRP	Municipal Stormwater Regional Permit
MS4	Municipal Separate Storm Sewer System
MTC	Metropolitan Transportation Commission

NAFSMA	National Association of Flood & Stormwater Management Agencies
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
O&M	Operation and Maintenance
PBDE	Polybrominated Diphenyl Ether
POTW	Publicly Owned Treatment Works
RCRA	Resource Conservation and Recovery Act
RMP	Regional Monitoring Program
ROWD	Report of Waste Discharge
RTA	Rapid Trash Assessment
SARA	Superfund Amendments and Reauthorization Act
SCURTA	Santa Clara Urban Rapid Trash Assessment
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SIC	Standard Industrial Classification
SMWPPP	San Mateo Countywide Water Pollution Prevention Program
SOP	Standard Operating Procedure
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TIE	Toxicity Identification Evaluation
TMDLs	Total Maximum Daily Loads
TSCA	Toxic Substances Control Act
USEPA	Unites States Environmental Protection Agency
Water Board	San Francisco Bay Regional Water Quality Control Board
WLAs	Wasteload Allocations

GLOSSARY

Arterial Roads	Freeways, multilane highways, and other important roadways that supplement the Interstate System. Arterial roads connect, as directly as practicable, principal urbanized areas, cities, and industrial centers.
Beneficial Uses	The uses of water of the state protected against degradation, such as domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation and preservation of fish and wildlife, and other aquatic resources or preserves.
Collector Roads	Major and minor roads that connect local roads with arterial roads. Collector roads provide less mobility than arterial roads at lower speeds and for shorter distances.
Commercial Development	Development or redevelopment to be used for commercial purposes, such as office buildings, retail or wholesale facilities, restaurants, shopping centers, hotels, and warehouses.
Construction Site	Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, paving, disturbances to ground such as stockpiling, and excavation. Construction sites are all sites with disturbed or graded land area not protected by vegetation, or pavement, that are subject to a building or grading permit.
Conditionally Exempted Non-Stormwater Discharge	Non-stormwater discharges that are prohibited by A.1. of this permit, unless such discharges are authorized by a separate NPDES permit or are not in violation of water quality standards because appropriate BMPs have been implemented to reduce pollutants to the maximum extent practicable, consistent with Provision C.15.
Discharger	Any responsible party or site owner or operator within the Permittees' jurisdiction whose site discharges stormwater runoff, or a non-stormwater discharge
Detached Single-family Home Project	The building of one single new house or the addition and/or replacement of impervious surface associated with one single existing house, which is not part of a larger plan of development.
Development	Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project (whether single-family, multi-unit, or planned unit development); or industrial, commercial, retail or other nonresidential project, including public agency projects.
Estate Residential Development	Development zoned for a minimum 1 acre lot size
Emerging Pollutants	Pollutants in water that either: (1) May not have been thoroughly studied to date but are suspected by the scientific community to be a source of impairment of beneficial uses and/or present a health risk; or (2) Are not yet part of a monitoring program.
Erosion	The diminishing or wearing away of land due to wind, or water. Often the eroded debris (silt or sediment) becomes a pollutant via stormwater runoff. Erosion occurs

	naturally, but can be intensified by land disturbing and grading activities such as farming, development, road building, and timber harvesting.
Full Trash Capture Device	Full trash capture systems are defined as "any device or series of devices that traps all particles retained by a 5mm mesh screen and has a design treatment capacity of not less than the peak flow rate resulting from a one-year, one-hour, storm in the tributary drainage catchment area." Trash collection booms and sea curtains do not meet this definition, but are effective for removal of floating trash if properly maintained. Because these devices do not meet the Full Trash Capture Device definition, only ¼ of the catchment area treated by these measures is credited toward meeting the trash management area requirement of C.10.a.
General Permits	Waste Discharge Requirements or NPDES Permits containing requirements that are applicable to a class or category of dischargers. The State of California has general stormwater permits for construction sites that disturb soil of 1 acre or more; industrial facilities; `Phase II smaller municipalities (including nontraditional Small MS4s, which are governmental facilities, such as military bases, public campuses, and prison and hospital complexes); and small linear underground/overhead projects disturbing at least 1 acre, but less than 5 acres (including trenching and staging areas).
Grading	The cutting and/or filling of the land surface to a slope or elevation.
Hydrologic source control measures	Site design techniques that minimize and/or slow the rate of stormwater runoff from the site.
Hydromodification	The modification of a stream's hydrograph, caused in general by increases in flows and durations that result when land is developed (e.g., made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion, loss of habitat, increased sediment transport and deposition, and increased flooding.
Illicit Discharge	Any discharge to a municipal separate storm sewer (storm drain) system (MS4) that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term *illicit discharge* includes all non-stormwater discharges not composed entirely of stormwater and discharges that are identified under Section A. (Discharge Prohibitions) of this Permit. The term illicit discharge does not include discharges that are regulated by an NPDES permit (other than the NPDES permit for discharges from the MS4) or authorized by the Regional Water Board Executive Officer.
Impervious Surface	A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/stormwater. Impervious surfaces include, but are not limited to, roof tops; walkways; patios; driveways; parking lots; storage areas; impervious concrete and asphalt; and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious soil or pervious storage material, such as a gravel layer sufficient to hold at least the C.3.d volume of rainfall runoff are not impervious surfaces. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether a project is a Regulated Project under

	Provisions C.3.b. and C.3.g. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling and meeting the Hydromodification Standard.
Industrial Development	Development or redevelopment of property to be used for industrial purposes, such as factories; manufacturing buildings; and research and development parks.
Infill Site	A site in an urbanized area where the immediately adjacent parcels are developed with one or more qualified urban uses or at least 75% of the perimeter of the site adjoins parcels that are developed with qualified urban uses and the remaining 25% of the site adjoins parcels that have previously been developed for qualified urban uses and no parcel within the site has been created within the past 10 years.
Infiltration Device	Any structure that is deeper than wide and designed to infiltrate stormwater into the subsurface, and, as designed, bypass the natural groundwater protection afforded by surface soil. These devices include dry wells, injection wells, and infiltration trenches (includes French drains).
Joint Stormwater Treatment Facility	A stormwater treatment facility built to treat the combined runoff from two or more Regulated Projects located adjacent to each other,
Local Roads	Roads that provide limited mobility and are the primary access to residential areas, businesses, farms, and other local areas. Local roads offer the lowest level of mobility and usually contain no bus routes. Service to through traffic movement usually is deliberately discouraged in local roads.
Maximum Extent Practicable (MEP)	A standard for implementation of stormwater management actions to reduce pollutants in stormwater. Clean Water Act (CWA) 402(p)(3)(B)(iii) requires that municipal stormwater permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." Also see State Board Order WQ 2000-11.
Mixed-use Development or Redevelopment	Development or redevelopment of property to be used for two or more different uses, all intended to be harmonious and complementary. An example is a high-rise building with retail shops on the first 2 floors, office space on floors 3 through 10, apartments on the next 10 floors, and a restaurant on the top floor.
Municipal Separate Storm Sewer System (MS4)	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), as defined in 40 CFR 122.26(b)(8): (1) Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under section 208 of the CWA) that discharges into waters of the United States; (2) Designed or used for collecting or conveying stormwater; (3) Which is not a combined sewer; and (4) Which is not part of a Publicly Owned Treatment Works (POTW), as defined in

	40 CFR 122.2.
Municipal Corporation Yards, Vehicle Maintenance/Material Storage Facilities/	Any Permittee-owned or -operated facility, or portion thereof, that: (1) Conducts industrial activity, operates or stores equipment, and materials; (2) Performs fleet vehicle service/maintenance including repair, maintenance, washing, or fueling; (3) Performs maintenance and/or repair of machinery/equipment;
National Pollutant Discharge Elimination System (NPDES)	A national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the CWA.
Notice of Intent (NOI)	The application form by which dischargers seek coverage under General Permits, unless the General Permit requires otherwise.
Parking Lot	Land area or facility for the parking or storage of motor vehicles used for business, commerce, industry, or personal use.
Permittee/Permittees	Municipal agency/agencies that are named in and subject to the requirements of this Permit.
Permit Effective Date	The date at least 45 days after Permit adoption, provided the Regional Administrator of U.S. EPA Region 9 has no objection, whichever is later.
Pervious Pavement	Pavement that stores and infiltrates rainfall at a rate equal to immediately surrounding unpaved, landscaped areas, or that stores and infiltrates the rainfall runoff volume described in C.3.d.
Point Source	Any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.
Pollutants of Concern	Pollutants that impair waterbodies listed under CWA section 303(d), pollutants associated with the land use type of a development, including pollutants commonly associated with urban runoff. Pollutants commonly associated with stormwater runoff include, but are not limited to, total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (e.g., decaying vegetation and animal waste) litter and trash.
Potable Water	Water that is safe for domestic use, drinking, and cooking.
Pre-Project Runoff Conditions	Stormwater runoff conditions that exist onsite immediately before development activities occur. This definition is not intended to be interpreted as that period before any human-induced land activities occurred. This definition pertains to redevelopment as well as initial development.
Public Development	Any construction, rehabilitation, redevelopment or reconstruction of any public agency project, including but not limited to, libraries, office buildings, roads, and

	highways.
Redevelopment	Land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a site on which some past development has occurred.
Regional Monitoring Program (RMP)	A monitoring program aimed at determining San Francisco Bay Region receiving water conditions. The program was established in 1993 through an agreement among the Water Board, wastewater discharger agencies, dredgers, Municipal Stormwater Permittees and the San Francisco Estuary Institute to provide regular sampling of Bay sediments, water, and organisms for pollutants. The program is funded by the dischargers and managed by San Francisco Estuary Institute.
Regional Project	A regional or municipal stormwater treatment facility that discharges into the same watershed that the Regulated Project does.
Regulated Projects	Development projects as defined in Provision C.3.b.ii.
Residential Housing Subdivision	Any property development of multiple single-family homes or of dwelling units intended for multiple families/households (e.g., apartments, condominiums, and town homes).
Retrofitting	Installing improved pollution control devices at existing facilities to attain water quality objectives.
Sediments	Soil, sand, and minerals washed from land into water, usually after rain.
Solid Waste	All putrescible and nonputrescible solid, semisolid, and liquid wastes as defined by California Government Code Section 68055.1 (h).
Source Control BMP	Land use or site planning practices, or structural or nonstructural measures, that aim to prevent runoff pollution by reducing the potential for contact with rainfall runoff at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.
Standard Industrial Classification (SIC)	A federal system for classifying establishments by the type of activity in which they are engaged using a four-digit code.
Stormwater Pumping Station	Mechanical device (or pump) that is installed in MS4s or pipelines to discharge stormwater runoff and prevent flooding.
Stormwater Treatment System	Any engineered system designed to remove pollutants from stormwater runoff by settling, filtration, biological degradation, plant uptake, media absorption/adsorption or other physical, biological, or chemical process. This includes landscape-based systems such as grassy swales and bioretention units as well as proprietary systems.
Surface Water Ambient Monitoring Program (SWAMP)	The State Water Board's program to monitor surface water quality; coordinate consistent scientific methods; and design strategies for improving water quality monitoring, assessment, and reporting.
Total Maximum Daily Loads (TMDLs)	The maximum amount of a pollutant that can be discharged into a waterbody from all sources (point and nonpoint) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all waterbodies that do not meet water quality standards even after application of technology-based controls,

	more stringent effluent limitations required by a state or local authority, and other pollution control requirements such as BMPs.
Toxicity Identification Evaluation (TIE)	TIE is a series of laboratory procedures used to identify the chemical(s) responsible for toxicity to aquatic life. These procedures are designed to decrease, increase, or transform the bioavailable fractions of contaminants to assess their contributions to sample toxicity. TIEs are conducted separately on water column and sediment samples.
Trash and Litter	Trash consists of litter and particles of litter. California Government Code Section 68055.1 (g) defines litter as all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling, or manufacturing.
Treatment	Any method, technique, or process designed to remove pollutants and/or solids from polluted stormwater runoff, wastewater, or effluent.
Waste Load Allocations (WLAs)	A portion of a receiving water's TMDL that is allocated to one of its existing or future point sources of pollution.
Water Quality Control Plan (Basin Plan)	The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State within the Region, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives and discharge prohibitions. The Basin Plan was duly adopted and approved by the State Water Resources Control Board, U.S. EPA, and the Office of Administrative Law where required. The latest version is effective as of December 22, 2006.
Water Quality Objectives	The limits or levels of water quality elements or biological characteristics established to reasonably protect the beneficial uses of water or to prevent pollution problems within a specific area. Water quality objectives may be numeric or narrative.
Water Quality Standards	State-adopted and USEPA-approved water quality standards for waterbodies. The standards prescribe the use of the waterbody and establish the water quality criteria that must be met to protect designated uses. Water quality standards also include the federal and state anti-degradation policy.
Wet Season	October 1 through April 30 of each year

APPENDIX I

MUNICIPAL REGIONAL STORMWATER PERMIT

FACT SHEET

FACT SHEET/RATIONALE
TECHNICAL REPORT

for

ORDER NO. R2-2009-0074

NPDES Permit No. CAS612008

Municipal Regional Stormwater NPDES Permit
and
Waste Discharge Requirements

for

The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County, the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District, which have joined together to form the Alameda Countywide Clean Water Program

The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, and the Contra Costa County Flood Control and Water Conservation District, which have joined together to form the Contra Costa Clean Water Program

The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District, and Santa Clara County, which have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program

The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco, the towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the San Mateo County Flood Control District, and San Mateo County, which have joined together to form the San Mateo Countywide Water Pollution Prevention Program

The cities of Fairfield and Suisun City, which have joined together to form the Fairfield-Suisun Urban Runoff Management Program

The City of Vallejo and the Vallejo Sanitation and Flood Control District

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I. CONTACT INFORMATION

Water Board Staff Contact: Dale Bowyer, 1515 Clay Street, Suite 1400, Oakland, CA 94612, 510-622-2323, 510-622-2501 (fax), email: dbowyer@waterboards.ca.gov

The Permit and other related documents can be downloaded from the Water Board website at: http://www.waterboards.ca.gov/sanfranciscobay/mrp.htm

Comments can be electronically submitted to mrp@waterboards.ca.gov.

All documents referenced in this Fact Sheet and in the Order are available for public review at the Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 9:00 am to 4:00 pm, Monday through Friday, 12 - 1 pm excluded. Per the Governor's order calling for furloughs, the Water Board office will be closed the first three Fridays of each month through June 2010. To schedule an appointment to inspect public records, contact Melinda Wong at 510-622-2430.

II. PERMIT GOALS AND PUBLIC PROCESS

Goals

The Goals for the Municipal Regional Stormwater Permit (hereinafter, the Permit) Development Process include:

1. Consolidate six Phase I municipal stormwater NPDES permits into one consistent permit which is regional in scope.
2. Include more specificity in NPDES permit order language and requirements. Create (A) required stormwater management actions, (B) a specific level of implementation for each action or set of actions, and (C) reporting and effectiveness evaluation requirements for each action sufficient to determine compliance.
3. Incorporate the Stormwater Management Plan level of detail and specificity into the Permit. Stormwater Management Plans have always been considered integral to the municipal stormwater NPDES permits, but have not received the level of public review in the adoption process necessary relative to their importance in adequate stormwater pollutant management implementation.
4. Implement and enhance actions to control 303(d) listed pollutants, pollutants of concern, and achieve Waste Load Allocations adopted under Total Maximum Daily Loads.
5. Implement more specific and comprehensive stormwater monitoring, including monitoring for 303(d) listed pollutants.

Public Process

Water Board staff conducted a series of stakeholder meetings and workshops with the Permittees and other interested parties to develop this Permit over the past 3 years. These meetings included Water Board staff, representatives of the Permittees, representatives of

environmental groups, homebuilders, private citizens, and other interested parties. The following is a summary of the lengthy stakeholder process.

(2004–2005) Water Board staff and the Bay Area Stormwater Management Agencies Association (BASMAA) agreed to develop a municipal regional stormwater permit. Board staff and BASMAA held monthly meetings to agree on the regional permit approach and developed concepts and ground rules for a Steering Committee. The Steering Committee for the Permit began regular monthly meetings, and there was agreement to form work groups to develop options for permit program components in table format.

(2006) Water Board staff, BASMAA, and nongovernmental groups met and discussed the Performance Standard (i.e., actions, implementation levels, and reporting requirements) tables from six workgroups. In addition to the Steering Committee, Work Group Stakeholder meetings focused on the six program elements to complete the Performance Standard Tables and discuss other issues in preparation for creating the first Draft Permit Provisions. Two large public workshops were held in November with all interested stakeholders to discuss Work Group products.

(2007) The Water Board held a public workshop in March to receive public input. Board staff distributed an Administrative Draft Permit dated May 1, 2007, held multiple meetings and received comment.

(2007- 2008) On December 14, 2007, Board staff distributed the Tentative Order for a 77-day written public comment period ending February 29, 2008. A public hearing for oral testimony was held on March 11, 2008. During the remainder of 2008 there were additional meetings with stakeholders, and Board staff worked on revisions to the Tentative Order and produced responses to both written comments received by February 29, 2008, and oral comments received at the March 11, 2008, hearing. The Revised Tentative Order for the MRP was released on February 11, 2009, and a May 13, 2009, hearing before the Water Board was scheduled. Written comments on the revisions to the Tentative Order were received until April 3, 2009.

(2009) After the May 2009 MRP Public Hearing, Water Board staff held numerous meetings with the Permittees (via the Bay Area Stormwater Management Agencies Association) and other key stakeholders including Save the Bay, NRDC, the Northern California Homebuilders, S.F. BayKeeper and the U.S. EPA. These meetings have been focused on discussion of revisions to the MRP Tentative Order in response to comments received, in an effort to resolve issues primarily related to Provisions C.3 New Development, C.8 Monitoring, C.10 Trash Load Reduction, C.11 Mercury Controls, C.12 PCBs Controls, and C.15 Exempt Non-Stormwater Discharges.

Implementation

It is the Water Board's intent that this Permit shall ensure attainment of applicable water quality objectives and protection of the beneficial uses of receiving waters and associated habitat. This Permit requires that discharges shall not cause exceedances of water quality objectives nor shall they cause certain conditions to occur that create a condition of nuisance or water quality impairment in receiving waters. Accordingly, the Water Board is

requiring that these standard requirements be addressed through the implementation of technically and economically feasible control measures to reduce pollutants in stormwater discharges to the maximum extent practicable as provided in Provisions C.1 through C.15 of this Permit and section 402(p) of the CWA. Compliance with the Discharge Prohibitions, Receiving Water Limitations, and Provisions of this Permit is deemed compliance with the requirements of this Permit. If these measures, in combination with controls on other point and nonpoint sources of pollutants, do not result in attainment of applicable water quality objectives, the Water Board may invoke Provision C.1. and may reopen this Permit pursuant to Provisions C.1 and C.15 of this Permit to impose additional conditions that require implementation of additional control measures.

Each of the Permittees is individually responsible for adoption and enforcement of ordinances and policies, for implementation of assigned control measures or best management practices (BMPs) needed to prevent or reduce pollutants in stormwater, and for providing funds for the capital, operation, and maintenance expenditures necessary to implement such control measures/BMPs within its jurisdiction. Each Permittee is also responsible for its share of the costs of the area-wide component of the countywide program to which the Permittee belongs. Enforcement actions concerning non-compliance with the Permit will be pursued against individual Permittee(s) responsible for specific violations of the Permit.

III. BACKGROUND

Early Permitting Approach

The federal Clean Water Act (CWA) was amended in 1987 to address urban stormwater runoff pollution of the nation's waters. One requirement of the amendment was that many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of urban runoff from their Municipal Separate Storm Sewer Systems (MS4s). In response to the CWA amendment (and the pending federal NPDES regulations which would implement the amendment), the Water Board issued a municipal storm water Phase I permits in the early 1990s. These permits were issued to the entire county-wide urban areas of Santa Clara, Alameda, San Mateo and Contra Costa Counties, rather than to individual cities over 100,000 population threshold. The cities chose to collaborate in countywide groups, to pool resources and expertise, and share information, public outreach and monitoring costs, among other tasks.

During the early permitting cycles, the county-wide programs developed many of the implementation specifics which were set forth in their Stormwater Pollution Prevention Management Plans (Plans). The permit orders were relatively simple documents that referred to the stormwater Plans for implementation details. Often specific aspects of permit and Plan implementation evolved during the five year permit cycle, with relatively significant changes approved at the Water Board staff level without significant public review and comment.

Merging Permit Requirements and Specific Requirements Previously Contained in Stormwater Management Plans

US EPA stormwater rules for Phase I stormwater permits envisioned a process in which municipal stormwater management programs contained the detailed BMP and specific level of implementation information, and are reviewed and approved by the permitting agency before the municipal NPDES stormwater permits are adopted. The current and previous permits established a definition of a stormwater management program and required each Permittee to submit an urban runoff management plan and annual work plans for implementing its stormwater management program. An advantage to this approach was that it provided flexibility for Permittees to tailor their stormwater management programs to reflect local priorities and needs. However, Water Board staff found it difficult to determine Permittees' compliance with the current permits, due to the lack of specific requirements and measurable outcomes of some required actions. Furthermore, federal stormwater regulations require that modifications to stormwater management programs, such as annual revisions to urban runoff management plans, be approved through a public process.

Recent court decisions have reiterated that federal regulations and State law require that the implementation specifics of Municipal Stormwater NPDES permits be adopted after adequate public review and comment, and that no significant change in the permit requirements except minor modifications can occur during the permit term without a similar level of public review and comment.

This Permit introduces a modification to these previous approaches by establishing the stormwater management program requirements and defining up front, as part of the Permit Development Process, the minimum acceptable elements of the municipal stormwater management program. The advantages of this approach are that it satisfies the public involvement requirements of both the federal Clean Water Act and the State Water Code. An advantage for Permittees and the public of this approach is that the permit requirements are known at the time of permit issuance and not left to be determined later through iterative review and approval of work plans. While it may still be necessary to amend the Permit prior to expiration, any need to this should be minimized.

This Permit does not include approval of all Permittees' stormwater management programs or annual reports as part of the administration of the Permit. To do so would require significantly increased staff resources. Instead, minimum measures have been established to simplify assessment of compliance and allow the public to more easily assess each Permittee's compliance. Each Permit provision and its reporting requirements are written with this in mind. That is, each provision establishes the required actions, minimum implementation levels (i.e., minimum percentage of facilities inspected annually, escalating enforcement, reporting requirements for tracking projects, number of monitoring sites, etc.), and specific reporting elements to substantiate that these implementation levels have been met. Water Board staff will evaluate each individual Permittee's compliance through annual report review and the audit process.

The challenge in drafting the Permit is to provide the flexibility described above considering the different sizes and resources while ensuring that the Permit is still enforceable. To achieve this, the Permit frequently prescribes minimum measurable

outcomes, while providing Permittees with flexibility in the approaches they use to meet those outcomes. Enforceability has been found to be a critical aspect of the Permit. To avoid these types of situations, a balance between flexibility and enforceability has been crafted into the Permit.

Current Permit Approach

In the previous permit issuances, the detailed actions to be implemented by the Permittees were contained in Stormwater Management Plans, which were separate from the NPDES permits, and incorporated by reference. Because those plans were legally an integral part of the permits and were subject to complete public notice, review and comment, this permit reissuance incorporates those plan level details in the permit, thus merging the Permittees' stormwater management plans into the permit in one document. This Permit specifies the actions necessary to reduce the discharge of pollutants in stormwater to the maximum extent practicable, in a manner designed to achieve compliance with water quality standards and objectives, and effectively prohibit non-stormwater discharges into municipal storm drain systems and watercourses within the Permittees' jurisdictions. This set of specific actions is equivalent to the requirements that in past permit cycles were included in a separate stormwater management plan for each Permittee or countywide group of Permittees. With this permit reissuance, that level of specific compliance detail is integrated into permit language and is not a separate document.

The Permit includes requirements for the following components:

- Municipal Operations
- New Development and Redevelopment
- Industrial and Commercial Site Controls
- Illicit Discharge and Elimination
- Construction Site Controls
- Public Information and Outreach
- Water Quality Monitoring
- Pesticides Toxicity Controls
- Trash Reduction
- Mercury Controls
- PCBs Controls
- Copper Controls
- Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides, and Selenium
- Exempt and Conditionally Exempt Discharges

IV. ECONOMIC ISSUES

Economic discussions of urban runoff management programs tend to focus on costs incurred by municipalities in developing and implementing the programs. This is appropriate, and these costs are significant and a major issue for the Permittees. However, when considering the cost of implementing the urban runoff programs, it is also important

to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation.

It is very difficult to ascertain the true cost of implementation of the Permittees' urban runoff management programs because of inconsistencies in reporting by the Permittees. Reported costs of compliance for the same program element can vary widely from Permittee to Permittee, often by a very wide margin that is not easily explained.[57] Despite these problems, efforts have been made to identify urban runoff management program costs, which can be helpful in understanding the costs of program implementation.

In 1999, United States Environmental Protection Agency (USEPA) reported on multiple studies it conducted to determine the cost of urban runoff management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. USEPA also studied 35 Phase I municipalities, finding costs to be similar to those anticipated for Phase II municipalities, at $9.08 per household annually.[58]

A study on program cost was also conducted by the Los Angeles Regional Water Quality Control Board (LARWQCB), where program costs reported in the municipalities' annual reports were assessed. The LARWQCB estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50.

The State Water Resources Control Board (State Water Board) also commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study is current and includes an assessment of costs incurred by the City of Encinitas in implementing its program. Annual cost per household in the study ranged from $18-46, with the City of Encinitas representing the upper end of the range.[59] The cost of the City of Encinitas' program is understandable, given the City's coastal location, reliance on tourism, and consent decree with environmental groups regarding its program. For these reasons, as well as the general recognition the City of Encinitas receives for implementing a superior program, the City's program cost can be considered as the high end of the spectrum for Permittee urban runoff management program costs.

It is important to note that reported program costs are not all attributable to compliance with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been implemented by municipalities. Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38% of program costs are new costs fully attributable to MS4 permits. The remainder of program costs were either pre-existing or resulted from enhancement of pre-exiting programs.[60] The County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement its Drainage Area Management Plan, its municipal

[57] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003.p.2
[58] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[59] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii
[60] Ibid. P. 58.

stormwater permit requirements, is less than 20% of the total budget. The remaining 80% is attributable to pre-existing programs.[61]

It is also important to acknowledge that the vast majority of costs that will be incurred as a result of implementing the Order are not new. Urban runoff management programs have been in place in this region for over 15 years. Any increase in cost to the Permittees will be incremental in nature.

Urban runoff management programs cannot be considered in terms of their costs only. The programs must also be viewed in terms of their value to the public. For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by USEPA to be $158-210.[62] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study corroborates USEPA's estimates, reporting annual household willingness to pay for statewide clean water to be $180.[63] When viewed in comparison to household costs of existing urban runoff management programs, these household willingness to pay estimates exhibit that per household costs incurred by Permittees to implement their urban runoff management programs remain reasonable.

Another important way to consider urban runoff management program costs is to consider the implementation cost in terms of costs incurred by not improving the programs. Urban runoff in southern California has been found to cause illness in people bathing near storm drains.[64] A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8% among bathers at those beaches resulted in about $3 million annually in health-related expenses.[65] Extrapolation of such numbers to the beaches and other water contact recreation in San Francisco Bay and the tributary creeks of the region could result in huge expenses to the public.

Urban runoff and its impact on receiving waters also places a cost on tourism. the California Division of Tourism has estimated that each out-of-state visitor spends $101.00 a day. The experience of Huntington Beach provides an example of the potential economic impact of poor water quality. Approximately 8 miles of Huntington Beach were closed for two months in the middle of summer of 1999, impacting beach visitation and the local economy.

Finally, it is important to consider the benefits of urban runoff management programs in conjunction with their costs. A recent study conducted by USC/UCLA assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles Region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could

[61] County of Orange, 2000. A NPDES Annual Progress Report. P. 60. More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

[62] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.

[63] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.

[64] Haile, R.W., et al, 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.

[65] Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.

reach $18 billion.[66] Costs are anticipated to be borne over many years – probably ten years at least. As can be seen, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[67]

V. LEGAL AUTHORITY

The following statutes, regulations, and Water Quality Control Plans provide the basis for the requirements of Order No. R2-2009-0074: CWA, California Water Code (CWC), 40 CFR Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule), Part II of 40 CFR Parts 9, 122, 123, and 124 (National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule), Water Quality Control Plan – Ocean Waters of California (California Ocean Plan), Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), 40 CFR 131Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule (California Toxics Rule), and the California Toxics Rule Implementation Plan.

The legal authority citations below generally apply to directives in Order No. R2-2009-0074, and provide the Water Board with ample underlying authority to require each of the directives of Order No. R2-2009-0074.. Legal authority citations are also provided with each permit provision in this Fact Sheet.

CWA 402(p)(3)(B)(ii) – The CWA requires in section 402(p)(3)(B)(ii) that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."

CWA 402(p)(3)(B)(iii) – The CWA requires in section 402(p)(3)(B)(iii) that permits for discharges from municipal storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,D,E, and F) require that each Permittee's permit application "shall consist of: (i) Adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; (D) Control through interagency agreements among co-applicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system; (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all

[66] LARWQCB, 2004. Alternative Approaches to Stormwater Control.
[67] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires "a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. […] Proposed programs may impose controls on a system wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. […] Proposed management programs shall describe priorities for implementing controls."

40 CFR 122.26(d)(2)(iv)(A -D) – Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A -D) require municipalities to implement controls to reduce pollutants in urban runoff from new development and significant redevelopment, construction, and commercial, residential, industrial, and municipal land uses or activities. Control of illicit discharges is also required.

CWC 13377 – CWC section 13377 requires that "Notwithstanding any other provision of this division, the state board or the regional boards shall, as required or authorized by the CWA, as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with anymore stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

Order No. R2-2009-0074 is an essential mechanism for achieving the water quality objectives that have been established for protecting the beneficial uses of the water resources in the San Francisco Bay Region. Federal NPDES regulation 40 CFR 122.44(d)(1) requires MS4 permits to include any requirements necessary to "achieve water quality standards established under CWA section 303, including State narrative criteria for water quality." The term "water quality standards" in this context refers to a water body's beneficial uses and the water quality objectives necessary to protect those beneficial uses, as established in the Basin Plan.

State Mandates

This Permit does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Permit implements federally mandated requirements under CWA section 402, subdivision (p)(3)(B). (33 U.S.C. § 1342(p)(3)(B).) This includes federal requirements to effectively prohibit non-stormwater discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held that these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (Natural Resources Defense Council, Inc. v. USEPA

(9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.) The authority exercised under this Permit is not reserved state authority under the CWA's savings clause (cf. Burbank v. State Water Resources Control Bd. (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements that are not less stringent than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for MS4. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389; Building Industry Association of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.)

Likewise, the provisions of this Permit to implement total maximum daily loads (TMDLs) are federal mandates. The CWA requires TMDLs to be developed for waterbodies that do not meet federal water quality standards. (33 U.S.C. § 1313(d).) Once USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable WLA. (40 CFR 122.44(d)(1)(vii)(B).)

Second, the local agencies' (Permittees') obligations under this Permit are similar to, and in many respects less stringent than, the obligations of nongovernmental dischargers who are issued NPDES permits for stormwater discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne regulates the discharge of waste (Water Code, section 13263), both without regard to the source of the pollutant or waste. As a result, the costs incurred by local agencies to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental dischargers. (See County of Los Angeles v. State of California (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Water Quality Control Act largely regulate stormwater with an even hand, but to the extent that there is any relaxation of this evenhanded regulation, it is in favor of the local agencies. Except for MS4s, the CWA requires point source dischargers, including discharges of stormwater associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), Defenders of Wildlife v. Browner (1999) 191 F.3d 1159, 1164-1165 [noting that industrial stormwater discharges must strictly comply with water quality standards].) As discussed in prior State Water Board decisions, this Permit does not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) The Permit, therefore, regulates the discharge of waste in municipal stormwater more leniently than the discharge of waste from nongovernmental sources.

Third, the Permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Permit. The fact sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Permittees can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., Apartment Association of Los Angeles County, Inc. v. City of Los Angeles (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The ability of a local agency to defray the cost of a program without raising

taxes indicates that a program does not entail a cost subject to subvention. (County of Fresno v. State of California (1991) 53 Cal.3d 482, 487-488.)

Fourth, the Permittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their discharges. To the extent Permittees have voluntarily availed themselves of the Permit, the program is not a state mandate. (Accord County of San Diego v. State of California (1997) 15 Cal.4th 68, 107-108.) Likewise, the Permittees have voluntarily sought a program-based municipal stormwater permit in lieu of a numeric limits approach. (See City of Abilene v. USEPA (5th Cir. 2003) 325 F.3d 657, 662-663 [noting that municipalities can choose between a management permit or a permit with numeric limits].) The Permittees' voluntary decision to file a report of waste discharge proposing a program-based permit is a voluntary decision not subject to subvention. (See Environmental Defense Center v. USEPA (9th Cir. 2003) 344 F.3d 832, 845-848.)

Fifth, the Permittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

This Permit is based on the federal CWA, the Porter-Cologne Water Quality Control Act (Division 7 of the CWC, commencing with Section 13000), applicable State and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Board, the Basin Plan, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

Discussion: In 1987, Congress established CWA Amendments to create requirements for storm water discharges under the NPDES program, which provides for permit systems to regulate the discharge of pollutants. Under the Porter-Cologne Water Quality Control Act, the State Water Board and Regional Water Quality Control Boards (Water Boards) have primary responsibility for the coordination and control of water quality, including the authority to implement the CWA. Porter-Cologne (section 13240) directs the Water Boards to set water quality objectives via adoption of Basin Plans that conform to all state policies for water quality control. As a means for achieving those water quality objectives, Porter-Cologne (section 13243) further authorizes the Water Boards to establish waste discharge requirements (WDRs) to prohibit waste discharges in certain conditions or areas. Since 1990, the Water Board has issued area-wide MS4 NPDES permits. The Permit will re-issue Order Nos. 99-058, 99-059, 01-024, R2-2003-0021, R2-2003-0034 to comply with the CWA and attain water quality objectives in the Basin Plan by limiting the contributions of pollutants conveyed by urban runoff. Further discussions of the legal authority associated with the prohibitions and directives of the Permit are provided in section V. of this document.

This Permit supersedes NPDES Permit Nos. CAS029718, CAS029831, CAS029912, CAS029921, CAS612005, and CAS612006.

Basin Plan

The Urban Runoff Management, Comprehensive Control Program section of the Basin Plan requires the Permittees to address existing water quality problems and prevent new problems associated with urban runoff through the development and implementation of a comprehensive control program focused on reducing current levels of pollutant loading to storm drains to the maximum extent practicable. The Basin Plan comprehensive program requirements are designed to be consistent with federal regulations (40 CFR Parts 122-124) and are implemented through issuance of NPDES permits to owners and operators of MS4s. A summary of the regulatory provisions is contained in Title 23 of the California Code of Regulations at section 3912. The Basin Plan identifies beneficial uses and establishes water quality objectives for surface waters in the Region, as well as effluent limitations and discharge prohibitions intended to protect those uses. This Permit implements the plans, policies, and provisions of the Water Board's Basin Plan.

Statewide General Permits

The State Water Board has issued NPDES general permits for the regulation of stormwater discharges associated with industrial activities and construction activities. To effectively implement the New Development (and significant redevelopment) and Construction Controls, Illicit Discharge Controls, and Industrial and Commercial Discharge Controls components in this Permit, the Permittees will conduct investigations and local regulatory activities at industrial and construction sites covered by these general permits. However, under the CWA, the Water Board cannot delegate its own authority to enforce these general permits to the Permittees. Therefore, Water Board staff intends to work cooperatively with the Permittees to ensure that industries and construction sites within the Permittees' jurisdictions are in compliance with applicable general permit requirements and are not subject to uncoordinated stormwater regulatory activities.

Regulated Parties

Each of the Permittees listed in this Permit owns or operates a MS4, through which it discharges urban runoff into waters of the United States within the San Francisco Bay Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Permit Coverage

The Permittees each have jurisdiction over and maintenance responsibility for their respective MS4s in the Region. Federal, State or regional entities within the Permittees' boundaries, not currently named in this Permit, operate storm drain facilities and/or discharge stormwater to the storm drains and watercourses covered by this Permit. The Permittees may lack jurisdiction over these entities. Consequently, the Water Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. The Water Board will consider such facilities for coverage under NPDES permitting pursuant to USEPA Phase II stormwater regulations. Under Phase II, the Water

Board intends to permit these federal, State, and regional entities through use of a Statewide Phase II NPDES General Permit.

Discussion: Section 402 of the CWA prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a NPDES permit. Though urban runoff comes from a diffuse source, it is discharged through MS4s, which are point sources under the CWA. Federal NPDES regulation 40 CFR 122.26(a) (iii) and (iv) provide that discharges from MS4s, which service medium or large populations greater than 100,000 or 250,000 respectively, shall be required to obtain a NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [storm water] discharge which the Director, or in States with approved NPDES programs, either the Director or the USEPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." Such sources are then designated into the program.

VI. PERMIT PROVISIONS

A. Discharge Prohibitions

Prohibition A.1. Legal Authority – CWA 402(p)(3)(B)(ii) – The CWA requires in section 402(p)(3)(B)(ii) that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."

Prohibition A.2. Legal Authority – San Francisco Bay Basin Plan, 2006 Revision, Chapter 4 Implementation, Table 4-1, Prohibition 7.

B. Receiving Water Limitations

Receiving Water Limitation B.1. Legal Authority – Receiving Water Limitations are retained from previous Municipal Stormwater Runoff NPDES permits. They reflect applicable water quality standards from the Basin Plan.

Receiving Water Limitation B.2. Legal Authority – Receiving Water Limitations are retained from previous Municipal Stormwater Runoff NPDES permits. They reflect applicable water quality standards from the Basin Plan.

C. Provisions

C.1. Compliance with Discharge Prohibitions and Receiving Water Limitations

Legal Authority

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: The Water Board's Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) contains the following waste discharge prohibition: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in California Water Code Section 13050, is prohibited."

California Water Code section 13050(l) states "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination."

California Water Code section 13050(k) states "'Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

California Water Code section 13050(m) states "'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

California Water Code section 13241 requires each water board to "establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance […]."

California Water Code Section 13243 provides that a water board, "in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the water board implement the Basin Plan.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A -D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A -D) require municipalities to have legal authority to control various discharges to their MS4.

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]chieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

State Water Resources Control Board ("State Water Board") Order WQ 1999-05, is a precedential order requiring that municipal stormwater permits achieve water quality standards and water quality standard based discharge prohibitions through the implementation of control measures, by which Permittees' compliance with the permit can be determined. The State Water Board Order specifically requires that Provision C.1 include language that Permittees shall comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in the discharges. State Water Board Order WQ 2001-15 refines Order 1999-05 by requiring an iterative approach to compliance with water quality standards that involves ongoing assessments and revisions.

C.2. Municipal Operations

Legal Authority

The following legal authority applies to Provision C.2:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), California Water Code (CWC) section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) requires, "A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) requires, "A description for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of deicing activities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) requires, "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving waterbodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(5) requires, "A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) requires, "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Fact Sheet Findings in Support of Provision C.2

C.2-1 Municipal maintenance activities are potential sources of pollutants unless appropriate inspection, pollutant source control, and cleanup measures are implemented during routine maintenance works to minimize pollutant discharges to storm drainage facilities.

Sediment accumulated on paved surfaces, such as roads, parking lots, parks, sidewalks, landscaping, and corporation yards, is the major source of point source pollutants found in urban runoff. Thus, Provision C.2 requires the Permittees to designate minimum BMPs for all municipal facilities and activities as part of their ongoing pollution prevention efforts as set forth in this Permit. Such prevention measures include, but are not limited to, activities as described below. The work of municipal maintenance personnel is vital to minimize stormwater pollution, because personnel work directly on municipal storm drains and other municipal facilities. Through work such as inspecting and cleaning storm drain drop inlets and pipes and conducting municipal construction and maintenance activities upstream of the storm drain, municipal maintenance personnel are directly responsible for preventing and removing pollutants from the storm drain. Maintenance personnel also play an important role in educating the public and in reporting and cleaning up illicit discharges.

C.2-2 Road construction and other activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. In particular, poorly designed roads can act as man-made drainages that carry runoff and sediment into natural streams, impacting water quality.

Provision C.2 also requires the Permittees to implement effective BMPs for the following rural works maintenance and support activities: (a) Road design, construction, maintenance, and repairs in rural areas that prevent and control road-related erosion and sediment transport; (b)Identification and prioritization of rural roads maintenance on the basis of soil erosion potential, slope steepness, and stream habitat resources; (c) Road and culvert construction designs that do not impact creek functions. New or replaced culverts shall not create a migratory fish passage barrier, where migratory fish are present, or lead to stream instability; (d) Development and implement an inspection program to maintain roads structural integrity and prevent impacts on water quality; (e) Provide adequate maintenance of rural roads adjacent to streams and riparian habitat to reduce erosion, replace damaging shotgun culverts, re-grade roads to slope outward where consistent with road engineering safety standards, and install water bars; and (f) When replacing existing culverts or redesigning new culverts or bridge crossings use measures to reduce erosion, provide fish passage and maintain natural stream geomorphology in a stable manner.

Road construction, culvert installation, and other rural maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly

designed roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other rural public works activities, including those the BMP approach would address, have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways. This Provision would help ensure that these impacts are appropriately controlled.

Specific Provision C.2 Requirements

Provision C.2.a-f. (Operation and Maintenance of Municipal Separate Storm Sewer Systems (MS4) facilities) requires that the Permittees implement appropriate pollution control measures during maintenance activities and to inspect and, if necessary, clean municipal facilities such as conveyance systems, pump stations, and corporation yards, before the rainy season. The requirements will assist the Permittees to prioritize tasks, implement appropriate BMPs, evaluate the effectiveness of the implemented BMPs, and compile and submit annual reports.

Provision C.2.d. (Stormwater Pump Stations) In late 2005, Board staff investigated the occurrence of low salinity and dissolved oxygen conditions in Old Alameda Creek (Alameda County) and Alviso Slough (Santa Clara County) in September and October of 2005. Board staff became aware of this problem in their review of receiving water and discharge sampling conducted by the U.S. Geological Survey as part of its routine monitoring on discharges associated with the former salt ponds managed by the U.S. Fish and Wildlife Service in Santa Clara County and the California Department of Fish and Game in Alameda County.

In the case of Old Alameda Creek, discharge of black-colored water from the Alvarado pump station to the slough was observed at the time of the data collection on September 7, 2005, confirming dry weather urban runoff as the source of the documented violations of the 5 mg/L dissolved oxygen water quality objective. Such conditions were measured again on September 21, 2005.

On October 17, 2005, waters in Alviso Slough were much less saline than the salt ponds and had the lowest documented dissolved oxygen of the summer, suggesting a dry weather urban runoff source. The dissolved oxygen sag was detected surface to bottom at 2.3 mg/L at a salinity of less than 1 part per thousand (ppt), mid-day, when oxygen levels should be high at the surface. The sloughs have a typical depth of 6 feet.

Board staff's investigations of these incidents, documented in a memorandum,[68] found that "storm water pump stations, universally operated by automatic float triggers, have been confirmed as the cause in at least one instance, and may represent an overlooked source of controllable pollution to the San Francisco Bay Estuary and its tidal sloughs. . . . the discharges of dry weather urban runoff from these pump stations are not being

[68] Internal Water Board Memo dated December 2, 2005: "Dry Weather Urban Weather Urban Runoff Causing or Contributing to Water Quality Violations: Low Dissolved Oxygen (DO) in Old Alameda Creek and Alviso Slough"

managed to protect water quality, and [that] surveillance monitoring has detected measurable negative water quality consequences of this current state of pump station management."

Pump station discharges of dry weather urban runoff can cause violations of water quality objectives. These discharges are controllable point sources of pollution that are virtually unregulated. The Water Board needs a complete inventory of dry weather urban runoff pump stations and to require BMP development and implementation for these discharges now. In the long term, Water Board staff should prioritize the sites from the regional inventory for dry weather diversion to sanitary sewers and encourage engineering feasibility studies to accomplish the diversions in a cost-effective manner. Structural treatment alternatives should be explored for specific pump stations.

To address the short term goals identified in the previous paragraph, Provision C.2.g. requires the Permittees to implement the following measures to reduce pollutant discharges to stormwater runoff from Permittee-owned or operated pump stations:

1. Establish an inventory of pump stations within each Permittee's jurisdiction, including pump station locations and key characteristics, and inspection frequencies.
2. Inspect these pump stations regularly, but at least two times a year, to address water quality problems, including trash control and sediment and debris removal.
3. Inspect trash racks and oil absorbent booms at pump stations in the first business day after ¼-inch within 24 hours and larger storm events. Remove debris in trash racks and replace oil absorbent booms, as needed.

C.3. New Development and Redevelopment

Legal Authority

Broad Legal Authority: CWA Sections 402(p)(3)(B)(ii-iii), CWA Section 402(a), CWC Section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

Fact Sheet Findings in Support of Provision C.3

C.3-1 Urban development begins at the land use planning phase; therefore, this phase provides the greatest cost-effective opportunities to protect water quality in new development and redevelopment. When a Permittee incorporates policies and principles designed to safeguard water resources into its General Plan and development project approval processes, it has taken a critical step toward the preservation and most of local water resources for current and future generations.

C.3-2 Provision C.3. is based on the assumption that Permittees are responsible for considering potential stormwater impacts when making planning and land use decisions. The goal of Provision C.3. is for Permittees to use their planning authority to include appropriate source control, site design, and stormwater treatment measures to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flow from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques. Neither Provision C.3. nor any of its requirements are intended to restrict or control local land use decision-making authority.

C.3-3 Certain control measures implemented or required by Permittees for urban runoff management might create a habitat for vectors (e.g., mosquitoes and rodents) if not properly designed or maintained. Close collaboration and cooperative efforts among Permittees, local vector control agencies, Water Board staff, and the State Department of Public Health are necessary to minimize potential nuisances and public health impacts resulting from vector breeding.

C.3-4 The Water Board recognized in its Policy on the Use of Constructed Wetlands for Urban Runoff Pollution Control (Resolution No. 94-102) that urban runoff treatment wetlands that are constructed and operated pursuant to that Resolution and are constructed outside a creek or other receiving water are stormwater treatment systems and, as such, are not waters of the United States subject to regulation pursuant to Sections 401 or 404 of the federal Clean Water Act. Water Board staff is working with the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS) to identify how maintenance for stormwater treatment controls required under permits such as this Permit can be appropriately streamlined, given CDFG and USFWS requirements, and particularly those that address special status species. This Permit requires Permittees to ensure that constructed wetlands installed by

Regulated Projects are consistent with Resolution No. 94-102 and the operation and maintenance requirements contained therein.

C.3-5 The Permit requires Permittees to ensure that onsite, joint, and offsite stormwater treatment systems and HM controls installed by Regulated Projects are properly operated and maintained for the life of the projects. In cases where the responsible parties for the treatment systems or HM controls have worked diligently and in good faith with the appropriate state and federal agencies to obtain approvals necessary to complete maintenance activities for the treatment systems or HM controls, but these approvals are not granted, the Permittees shall be considered by the Water Board to be in compliance with Provision C.3.h.iii. of the Permit.

Specific Provision C.3 Requirements

Provision C.3.a. (New Development and Redevelopment Performance Standard Implementation) sets forth essentially the same legal authority, development review and permitting, environmental review, training, and outreach requirements that are contained in the existing permits. This Provision also requires the Permittees to encourage all projects not regulated by Provision C.3., but that are subject to the Permittees' planning, building, development , or other comparable review, to include adequate source control and site design measures, which include discharge of appropriate wastestreams to the sanitary sewer, subject to the local sanitary agency's authority and standards. Lastly, this Provision requires Permittees to revise, as necessary, their respective General Plans to integrate water quality and watershed protection with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and policies. Adequate implementation time has been allocated to Provisions C.3.a.i.(6)-(8), which may be considered new requirements.

Provision C.3.b. (Regulated Projects) establishes the different categories of new development and redevelopment projects that Permittees must regulate under Provision C.3. These categories are defined on the basis of the land use and the amount of impervious surface created and/or replaced by the project because all impervious surfaces contribute pollutants to stormwater runoff and certain land uses contribute more pollutants. Impervious surfaces can neither absorb water nor remove pollutants as the natural, vegetated soil they replaced can. Also, urban development creates new pollution by bringing higher levels of car emissions that are aerially deposited, car maintenance wastes, pesticides, household hazardous wastes, pet wastes, and trash, which can all be washed into the storm sewer.

Provision C.3.b.ii.(1) lists Special Land Use Categories that are already regulated under the current stormwater permits. Therefore, extra time is not necessary for the Permittees to comply with this Provision, so the Permit Effective Date is set as the required implementation date. For these categories, the impervious surface threshold (for classification as a Regulated Project subject to Provision C.3.) will be decreased from the current 10,000 ft^2 to 5,000 ft^2 beginning two years from the Permit Effective Date. These special land use categories represent land use types

that may contribute more polluted stormwater runoff. Regulation of these special land use categories at the lower impervious threshold of 5,000 square feet is considered the maximum extent practicable and is consistent with State Board guidance, court decisions, and other Water Boards' requirements. In the precedential decision contained in its WQ Order No. 2000-11, the State Board upheld the SUSMP (Standard Urban Stormwater Mitigation Plan) requirements issued by the Los Angeles Water Board's Executive Officer on March 8, 2000, and found that they constitute MEP for addressing pollutant discharges resulting from Priority Development Projects. The State Board re-affirmed that SUSMP requirements constitute MEP in their Order WQ 2001-15. Provision C.3.b.ii.(1)'s requirement that development projects in the identified Special Land Use Categories adding and/or replacing > 5000 ft^2 of impervious surface shall install hydraulically sized stormwater treatment systems is consistent with the SUSMP provisions upheld by the State Board. Provision C.3.b.ii.(1) is also consistent with Order No. R9-2007-0001 issued by the San Diego Water Board, Order Nos. R4-2009-0057 and R4-2001-182 issued by the Los Angeles Water Board, Order No. 2009-0030 issued by the Santa Ana Water Board, and State Board's Order WQ 2003-0005 issued to Phase II MS4s. Under Order WQ 2003-0005, Phase II MS4s with populations of 50,000 and greater must apply the lower 5000 ft^2 threshold for requiring stormwater treatment systems by April 2008. The MRP allows two years from the MRP effective date for the Permittees to implement the lower 5000 ft^2 threshold for the special land use categories, three and half years later than the Phase II MS4s. However, the additional time is necessary for the Permittees to revise ordinances and permitting procedures and conduct training and outreach.

This Provision contains a "grandfathering" clause, which allows any private development project in a special land use category for which a planning application has been deemed complete by a Permittee on or before the Permit effective date to be exempted from the lower 5,000 square feet impervious surface threshold (for classification as a Regulated Project) as long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, for the 5000 square feet threshold, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the lower 5000 square feet impervious surface threshold specified in Provision C.3.b.ii.(1).

For any private development project in a special land use category with an application deemed complete after the Permit effective date, the lower 5000 square feet impervious surface threshold (for classification as a Regulated Project) shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011 for the 5000 square feet threshold.

Previous stormwater permits also used the "application deemed complete" date as the date for determining Provision C.3. applicability, but it was tied to the implementation date for new requirements and not the Permit effective date. The Permit Streamlining Act requires that a public agency must determine whether a permit application is complete within 30 days after receipt; if the public agency does not make this determination, the application is automatically deemed complete after 30 days. Data we have collected from audits and file reviews as well as reported to us by Permittees confirm that in many cases, the development permit applications have indeed not been reviewed for compliance with Provision C.3. requirements and yet have automatically been deemed complete 30 days after the application submittal date. As soon as the Permit is adopted, there is certainty about any new requirements that must be implemented during the Permit term. Therefore, the "application deemed complete" date should only be used to exempt projects that have reached this milestone by the Permit effective date and not years later at a new requirement's implementation date. However, this change requires consideration of those applications that are deemed complete after the Permit effective date. Because there is certainty with regard to new requirements as soon as the Permit becomes effective, we have tied the "final discretionary approval" date to a new requirement's implementation date for determining whether to exempt the projects with applications deemed complete after the Permit effective date. After a project receives "final discretionary approval" it would be too late in the permitting process to implement new requirements, particularly since this type of approval requires actions by city councils or boards of supervisors. Therefore, the "grandfathering" language is a hybrid that makes use of both the "application deemed complete" date and the "final discretionary approval" date, two known and recognized milestones in development planning.

As for private projects, public projects should be far enough along in the design and approval process to warrant being grandfathered and essentially exempted from complying with the lower 5000 ft^2 threshold when it becomes effective. Previous stormwater permits grandfathered projects that only had funds committed by the new threshold's effective date, which was too early because projects can be held for years before design can begin, well after funding commitments have been made. Conversely, application of the grandfathering exemption to projects that have construction scheduled to begin by the threshold effective date (or 2 years after the MRP effective date) may be too late in the permitting process to implement new threshold requirements, particularly since this type of approval requires actions by city councils or boards of supervisors. Therefore, the Permit provides the grandfathering exemption for projects that have construction set to begin within 1 year of the threshold effective date (or 3 years after the MRP effective date).

Provisions C.3.b.ii.(2)-(3) describe land use categories that are already regulated under the current stormwater permits; therefore, extra time is not necessary for the Permittees to comply with these Provisions and the implementation date is the Permit effective date. Because the Vallejo Permittees do not have post-

construction requirements in their current stormwater permit, the Permit allows an extra year for them to comply with these Provisions.

Provision C.3.b.ii.(4) applies to road projects adding and/or replacing 10,000 ft^2 of impervious surface, which include the construction of new roads and sidewalks and bicycle lanes built as part of the new roads; widening of existing roads with additional traffic lanes; and construction of impervious trails that are greater than 10 feet wide or are creekside (within 50 feet of the top of bank). Although widening existing roads with bike lanes and sidewalks increases impervious surface and therefore increases stormwater pollutants because of aerial deposition, they have been excluded from this Provision because we recognize the greater benefit that bike lanes and sidewalks provide by encouraging less use of automobiles. Likewise, this Provision also contains specific exclusions for: sidewalks built as part of a new road and built to direct stormwater runoff to adjacent vegetated areas; bike lanes built as part of a new road but not hydraulically connected to the new road and built to direct stormwater runoff to adjacent vegetated areas; impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or towards the outboard side of levees; and sidewalks, bike lanes, or trails constructed with permeable surfaces.

In the case of road widening projects where additional lanes of traffic are added, the 50% rule also applies. That is, the addition of traffic lanes resulting in an alteration of more than 50 percent of the impervious surface of an existing street or road that was not subject to Provision C.3, the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire street or road that had additional traffic lanes added).

Where the addition of traffic lanes results in an alteration of less than 50 percent of the impervious surface of an existing street or road that was not subject to Provision C.3, only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from only the new traffic lanes). However, if the stormwater runoff from the existing traffic lanes and the added traffic lanes cannot be separated, any onsite treatment system must be designed and sized to treat stormwater runoff from the entire street or road. If an offsite treatment system is installed or in-lieu fees paid in accordance with Provision C.3.e., the offsite treatment system or in-lieu fees must address only the stormwater runoff from the added traffic lanes.

Because road widening and trail projects belong to a newly added category of Regulated Projects, adequate implementation time has been included as well as "grandfathering" language. (See discussion under Provision C.3.b.ii.(1).)

Provision C.3.b.iii. requires that the Permittees cumulatively complete 10 pilot "green street" projects within the Permit term. This Provision was originally intended to require stormwater treatment for road rehabilitation projects on

arterial roads that added and/or replaced > 10,000 ft^2 of impervious surface. We acknowledge the logistical difficulties in retrofitting roads with stormwater treatment systems as well as the funding challenges facing municipalities in the Bay Area. However, we are aware that some cities have or will have funding for "green street" retrofit projects that will provide water quality benefits as well as meet broader community goals such as fostering unique and attractive streetscapes that protect and enhance neighborhood livability, serving to enhance pedestrian and bike access, and encouraging the planting of landscapes and vegetation that contribute to reductions in global warming. Therefore, instead of requiring post-construction treatment for all road rehabilitation of arterial streets, this Provision requires the completion of 10 pilot "green street" projects by the Permittees within the Permit term. These projects must incorporate LID techniques for site design and treatment in accordance with Provision C.3.c. and provide stormwater treatment pursuant to Provision C.3.d. and must be representative of the three different types of streets: arterial, collector, and local. To ensure equity and an even distribution of projects, at least two pilot projects must be located in each of the following counties: Alameda, Contra Costa, San Mateo, and Santa Clara. Parking lot projects are acceptable as pilot projects as long as both parking lot and street runoff is addressed. Because these are pilot projects, we have not specified a minimum or maximum size requirement and the details of which cities will have these projects are to be determined by the Permittees.

Provision C.3.c (Low Impact Development (LID)) recognizes LID as a cost-effective, beneficial, holistic, integrated stormwater management strategy[69]. The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treat stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as preserving undeveloped open space, rain barrels and cisterns, green roofs, permeable pavement, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.

This Provision sets forth a three-pronged approach to LID with source control, site design, and stormwater treatment requirements. The concepts and techniques for incorporating LID into development projects, particularly for site design, have been extensively discussed in BASMAA's Start at the Source manual (1999) and its companion document, Using Site Design Techniques to Meet Development Standards for Stormwater Quality (May 2003), as well as in various other LID reference documents.

Provision C.3.c.i.(1) lists source control measures that must be included in all Regulated Projects as well as some that are applicable only to certain types of

[69] USEPA, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices* **(**Publication Number EPA 841-F-07-006, December 2007) http://www.epa.gov/o**wow/nps/lid/costs07)**

businesses and facilities. These measures are recognized nationwide as basic, effective techniques to minimize the introduction of pollutants into stormwater runoff. The current stormwater permits also list these methods; however, they are encouraged rather than required. By requiring these source control measures, this Provision sets a consistent, achievable standard for all Regulated Projects and allows the Board to more systematically and fairly measure permit compliance. This Provision retains enough flexibility such that Regulated Projects are not forced to include measures inappropriate, or impracticable, to their projects. This Provision does not preclude Permittees from requiring additional measures that may be applicable and appropriate.

Provision C.3.c.i.(2)(a) lists site design elements that must be implemented at all Regulated Projects. These design elements are basic, effective techniques to minimize pollutant concentrations in stormwater runoff as well as the volume and frequency of discharge of the runoff. On the basis of the Board staff's review of the Permittees' Annual Reports and CWA section 401 certification projects, these measures are already being done at many projects. One design element requires all Regulated Projects to include at least one site design measure from a list of six which includes recycling of roof runoff, directing runoff into vegetated areas, and installation of permeable surfaces instead of traditional paving. All these measures serve to reduce the amount of runoff and its associated pollutants being discharged from the Regulated Project.

Provision C.3.c.i.(2)(b) requires each Regulated Project to treat 100% of the Provision C.3.d. runoff with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility. LID treatment measures are harvesting and re-use, infiltration, evapotranspiration, or biotreatment. A properly engineered and maintained biotreatment system may be considered only if it is infeasible to implement harvesting and re-use, infiltration, or evapotranspiration at a project site. Infeasibility may result from conditions including the following:

- Locations where seasonal high groundwater would be within 10 feet of the base of the LID treatment measure.
- Locations within 100 feet of a groundwater well used for drinking water.
- Development sites where pollutant mobilization in the soil or groundwater is a documented concern.
- Locations with potential geotechnical hazards.
- Smart growth and infill or redevelopment sites where the density and/or nature of the project would create significant difficulty for compliance with the onsite volume retention requirement.
- Locations with tight clay soils that significantly limit the infiltration of stormwater.

This Provision recognizes the benefits of harvesting and reuse, infiltration and evapotranspiration and establishes these methods at the top of the LID treatment hierarchy. This Provision also acknowledges the challenges, both institutional and technical, to providing these LID methods at all Regulated Projects. There

are certainly situations where biotreatment is a valid LID treatment measure and this Provision allows Permittees the flexibility to make this determination so that Regulated Projects are not forced to include measures inappropriate or impracticable to the project sites. However, Permittees are required to submit a report within 18 months of the Permit effective date and prior to the required implementation date on the criteria and procedures that Permittees will employ to determine when harvesting and re-use, infiltration, or evapotranspiration is feasible and infeasible at a Regulated Project site. The Permittees are also required to submit a second report two years after implementing the new LID requirements that documents their experience with determining the feasibility and infeasibility of harvesting and reuse, infiltration, and evapotranspiration at Regulated Project sites. This report shall also discuss barriers, including institutional and technical site specific constraints, to implementation of infiltration, harvesting and reuse, or evapotranspiration and proposed strategies for removing these identified barriers.

This Provision specifies minimum specifications for biotreatment systems to be considered as LID treatment and requires Permittees to develop soil media specifications. Because this Provision recognizes green roofs as biotreatment systems for roof runoff, it also requires Permittees to develop minimum specifications for green roofs.

Provision C.3.c.ii. establishes the implementation date for the new LID requirements of Provision C.3.c.i. to be two years after the Permit effective date. Grandfathering language consistent with Provision C.3.b.ii.(1) has been included in this Provision to exempt private development projects (that are far along in their permitting and approval process) and public projects (that are far along in their funding and design) from the requirements of Provision C.3.c.i.

Provision C.3.d (Numeric Sizing Criteria for Stormwater Treatment Systems) lists the hydraulic sizing design criteria that the stormwater treatment systems installed for Regulated Projects must meet. The volume and flow hydraulic design criteria are the same as those required in the current stormwater permits. These criteria ensure that stormwater treatment systems will be designed to treat the optimum amount of relatively smaller-sized runoff-generating storms each year. That is, the treatment systems will be sized to treat the majority of rainfall events generating polluted runoff but will not have to be sized to treat the few very large annual storms as well. For many projects, such large treatment systems become infeasible to incorporate into the projects. Provision C.3.d. also adds a new combined flow and volume hydraulic design criteria to accommodate those situations where a combination approach is deemed most efficient.

Provision C.3.d.iv. defines infiltration devices and establishes limits on the use of stormwater treatment systems that function primarily as infiltration devices The intent of the Provision is to ensure that the use of infiltration devices, where feasible and safe from the standpoint of structural integrity, must also not cause or contribute to the degradation of groundwater quality at the project sites. This Provision requires infiltration devices to be located a minimum of 10 feet

(measured from the base) above the seasonal high groundwater mark and a minimum of 100 feet horizontally away from any known water supply wells, septic systems, and underground storage tanks with hazardous materials, and other measures to ensure that any potential threat to the beneficial uses of ground water is appropriately evaluated and avoided.

Provision C.3.e (Alternative or In-Lieu Compliance with Provision C.3.c.) recognizes that not all Regulated Projects may be able to install LID treatment systems onsite because of site conditions, such as existing underground utilities, right-of-way constraints, and limited space.

Provision C.3.e.i. In keeping with LID concepts and strategies, we expect new development projects to provide LID treatment onsite and to allocate the appropriate space for these systems because they do not have the site limitations of redevelopment and infill site development in the urban core. However, this Provision does not restrict alternative compliance to redevelopment and infill projects because the Permittees have requested flexibility to make the determination of when alternative compliance is appropriate. Based on the lack of offsite alternative compliance projects installed during the current stormwater permit terms, it seems that having to find offsite projects is already a great disincentive. Therefore, this Provision allows any Regulated Project to provide LID treatment for up to 100% of the required Provision C.3.d. stormwater runoff at an offsite location or pay equivalent in-lieu fees to provide LID treatment at a Regional Project, as long as the offsite and Regional Projects are in the same watershed as the Regulated Project.

For the LID Treatment at an Offsite Location alternative compliance option, offsite projects must be constructed by the end of construction of the Regulated Project. We acknowledge that a longer timeframe may be required to complete construction of offsite projects because of administrative, legal, and/or construction delays. Therefore, up to 3 years additional time is allowed for construction of the offsite project; however, to offset the untreated stormwater runoff from the Regulated Project that occurs while construction of the offsite project is taking place, the offsite project must be sized to treat an additional 10% of the calculated equivalent quantity of both stormwater runoff and pollutant loading for each year that it is delayed. Permittees have commented that for projects that are delayed, requiring treatment of an additional (10-30)% of stormwater runoff may result in costly re-design of treatment systems. In those cases, payment of in-lieu fees to provide the additional treatment at a Regional Project is a viable alternative.

For the Payment of In-Lieu Fees to a Regional Project alternative compliance option, the Regional Project must be completed within 3 years after the end of construction of the Regulated Project. We acknowledge that a longer timeframe may be required to complete construction of Regional Projects because they may involve a variety of public agencies and stakeholder groups and a longer planning and construction phase. Therefore, the timeline for completion of a Regional Project may be extended, up to 5 years after the completion of the Regulated

Project, with prior Water Board Executive Officer approval. Executive Officer approval will be granted contingent upon a demonstration of good faith efforts to implement the Regional Project, such as having funds encumbered and applying for the appropriate regulatory permits.

Provision C.3.e.ii. (Special Projects) When considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto-related pollutant impacts. Incentive LID treatment reduction credits approved by the Water Board may be applied to these types of Special Projects.

This Provision requires that by December 1, 2010, Permittees shall submit a proposal to the Water Board containing the following information:

- Identification of the types of projects proposed for consideration of LID treatment reduction credits and an estimate of the number and cumulative area of potential projects during the remaining term of this permit for each type of project..
- Identification of institutional barriers and/or technical site specific constraints to providing 100% LID treatment onsite that justify the allowance for non-LID treatment measures onsite.
- Specific criteria for each type of Special Project proposed, including size, location, minimum densities, minimum floor area ratios, or other appropriate limitations.
- Identification of specific water quality and environmental benefits provided by these types of projects that justify the allowance for non-LID treatment measures onsite.
- Proposed LID treatment reduction credit for each type of Special Project and justification for the proposed credits. The justification shall include identification and an estimate of the specific water quality benefit provided by each type of Special Project proposed for LID treatment reduction credit.
- Proposed total treatment reduction credit for Special Projects that may be characterized by more than one category and justification for the proposed total credit.

Provision C.3.f (Alternative Certification of Adherence to Numeric Sizing Criteria for Stormwater Treatment Systems) allows Permittees to have a third-party review and certify a Regulated Project's compliance with the hydraulic design criteria in Provision C.3.d. Some municipalities do not have the staffing resources to perform these technical reviews. The third-party review option addresses this staffing issue. This Provision requires Permittees to make a reasonable effort to ensure that the third-party reviewer has no conflict of interest with regard to the Regulated Project being reviewed. That is, any consultant, contractor or their employees hired to design and/or construct a stormwater treatment system for a Regulated Project can not also be the certifying third party.

Provision C.3.g. (Hydromodification Management, HM) requires that certain new development projects manage increases in stormwater runoff flow and volume so that post-project runoff shall not exceed estimated pre-project runoff rates and durations, where such increased flow and/or volume is likely to cause increased potential for erosion of creek beds and banks, silt pollutant generation, or other adverse impacts on beneficial uses due to increased erosive force.

Background for Provision C.3.g. Based on Hydrograph Modification Management Plans prepared by the Permittees, the Water Board adopted hydromodification management (HM) requirements for Alameda Permittees (March 2007), Contra Costa Permittees (July 2006), Fairfield-Suisun Permittees (March 2007), Santa Clara Permittees (July 2005), and San Mateo Permittees (March 2007). Within Provision C.3.g, the major common elements of these HM requirements are restated. Attachments B–F contain the HM requirements as adopted by the Water Board, with some changes to correct minor errors and to provide consistency across the Region. Attachment F contains updated HM requirements for the Santa Clara Permittees. Permittees will continue to implement their adopted HM requirements; where Provision C.3.g. contradicts the Attachments, Provision C.3.g. shall be implemented. Additional requirements and/or options contained in the Attachments, above and beyond what is specified in Provision C.3.g., remain unaltered by Provision C.3.g. In all cases, the HM Standard must be achieved.

The Alameda, Santa Clara and San Mateo Permittees have adapted the Western Washington Hydrology Model[70] for modeling runoff from development project sites, sizing flow duration control structures, and determining overall compliance of such structures and other HM control structures (HM controls) in controlling runoff from the project sites to manage hydromodification impacts as described in the Permit. The adapted model is called the Bay Area Hydrology Model (BAHM).[71] All Permittees may use the BAHM if its inputs reflect actual conditions at the project site and surrounding area, including receiving water conditions. As Permittees gain experience in designing and operating HM controls, the Programs may make adjustments in the BAHM to improve its function in controlling excess runoff and managing hydromodification impacts. Notification of all such changes shall be given to the Water Board and the public through such mechanism as an electronic email list.

The Contra Costa Permittees have developed sizing charts for the design of flow duration control devices. Attachment C requires the Contra Costa Permittees to conduct a monitoring program to verify the performance of these devices. Following the satisfactory conclusion of this monitoring program, or conclusion of other study(s) that demonstrate devices built according to Attachment C specifications satisfactorily protect streams from excess erosive flows, the Water Board intends to allow the use of the Contra Costa sizing charts, when tailored to local conditions, by other stormwater programs and Permittees. Similarly, any other control strategies or criteria approved by the Board would be made available across the Region. This would be accomplished

[70] http://www.ecy.wa.gov/programs/wq/stormwater/wwhm_training/wwhm/wwhm_v2/instructions_v2.html
[71] See www.bayareahydrologymodel.org , Resources.

through Permit amendment or in another appropriate manner following appropriate public notification and process.

The Fairfield-Suisun Permittees have developed design procedures, criteria, and sizing factors for infiltration basins and bioretention units. These procedures, criteria, and sizing factors have been through the public review process already, and are not subject to public review at this time. Water Board staff's technical review found that the procedures, criteria, and sizing factors are acceptable in all ways except one: they are based on an allowable low flow rate that exceeds the criteria established in this Permit. Fairfield-Suisun Permittees may choose to change the design criteria and sizing factors to the allowable criterion of 20 percent of the 2-year peak flow, and seek Executive Officer approval of the modified sizing factors. This criterion, which is greater than the criterion allowed for other Bay Area Stormwater Countywide Programs, is based on data collected from Laurel and Ledgewood Creeks and technical analyses of these site-specific data. Following approval by the Executive Officer and notification of the public through such mechanism as an email list-serve, project proponents in the Fairfield-Suisun area may meet the HM Standard by using the Fairfield-Suisun Permittees' design procedures, criteria, and sizing factors for infiltration basins and/or bioretention units.

Attachments B and F allow the Alameda and Santa Clara Permittees to prepare a user guide to be used for evaluating individual receiving waterbodies using detailed methods to assess channel stability and watercourse critical flow. This user guide would reiterate and collate established stream stability assessment methods that have been presented in these Programs' HMPs, which have undergone Water Board staff review and been made available for public review. After the Programs have collated their methods into user guide format, received approval of the user guide from the Executive Officer, and informed the public through such process as an email list-serve, the user guide may be used to guide preparation of technical reports for: implementing the HM standard using in-stream or regional measures; determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in this Permit); and/or determining if a watercourse has a higher critical flow and project(s) discharging to it are eligible for an alternative Qcp[72] for the purpose of designing on-site or regional measures to control flows draining to these channels (i.e., the actual threshold of erosion-causing critical flow is higher than 10 percent of the 2-year pre-project flow).

The Water Board recognizes that the collective knowledge of management of erosive flows and durations from new and redevelopment is evolving, and that the topics listed below are appropriate topics for further study. Such a study may be initiated by Water Board staff, or the Executive Officer may request that all Bay Region municipal stormwater Permittees jointly conduct investigations as appropriate. Any future

[72] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

proposed changes to the Permittees' HM provisions may reflect improved understanding of these issues:

- Potential incremental costs, and benefits to waterways, from controlling a range of flows up to the 35- or 50-year peak flow, versus controlling up to the 10-year peak flow, as required by this Permit;
- The allowable low-flow (also called Qcp and currently specified as 10–20 percent of the pre-project 2-year runoff from the site) from HM controls;
- The effectiveness of self-retaining areas for management of post-project flows and durations; and/or
- The appropriate basis for determining cost-based impracticability of treating stormwater runoff and controlling excess runoff flows and durations.

Within Attachments B-F, this Permit allows for alternative HM compliance when on-site and regional HM controls and in-stream measures are not practicable. Alternative HM compliance includes contributing to or providing mitigation at other new or existing development projects that are not otherwise required by this Permit or other regulatory requirements to have HM controls. The Permit provides flexibility in the type, location, and timing of the mitigation measure. The Board recognizes that handling mitigation funds may be difficult for some municipalities because of administrative and legal constraints. The Board intends to allow flexibility for project proponents and/or Permittees to develop new or retrofit stormwater treatment or HM control projects within a broad area and reasonable time frame. Toward the end of the Permit term, the Board will review alternative projects and determine whether the impracticability criteria and options should be broadened or made narrower.

Provision C.3.g.i. defines the subset of Regulated Projects that must install hydromodification controls (HM controls). This subset, called HM Projects, are Regulated Projects that create and/or replace one acre or more of impervious surface and are not specifically excluded within Attachments B–F of the Permit. Within these Attachments, the Permittees have identified areas where the potential for single-project and/or cumulative development impacts to creeks is minimal, and thus HM controls are not required. Such areas include creeks that are concrete-lined or significantly hardened (e.g., with concrete) from point of discharge and continuously downstream to their outfall into San Francisco Bay; underground storm drains discharging to the Bay; and construction of infill projects in highly developed watersheds.[73]

Provision C.3.g.ii. establishes the standard hydromodification controls must meet. The HM Standard is based largely on the standards proposed by Permittees in their Hydrograph Modification Management Plans. The method for calculating post-project runoff in regards to HM controls is standard practice in Washington State and is equally applicable in California.

[73] Within the context of Provision C.3.g., "highly developed watersheds; refer to catchments or sub-catchments that are 65 percent impervious or more.

Provision C.3.g.iii. identifies and defines three methods of hydromodification management.

Provision C.3.g.iv. sets forth the information on hydromodification management to be submitted in the Permittees' Annual Reports.

Provision C.3.g.v. requires the Vallejo Permittees to develop a Hydromodification Management Plan (HMP), because the Vallejo Permittees have not been required to address HM impacts to date. Vallejo's current permit was issued by USEPA and does not require the Vallejo Permittees' to develop an HMP. The Vallejo Permittees may choose to adopt and implement one or a combination of the approaches in Attachments B–F.

Provision C.3.h (Operation and Maintenance of Stormwater Treatment Systems) establishes permitting requirements to ensure that proper maintenance for the life of the project is provided for all onsite, joint, and offsite stormwater treatment systems installed. The Provision requires Permittees to inspect at least 20% of these systems annually, at least 20% of all vault-based systems annually, and every treatment system at least once every 5 years. Requiring inspection of at least 20% of the total number of treatment and HM controls serves to prevent failed or improperly maintained systems from going undetected until the 5th year. We have the additional requirement to inspect at least 20% of all installed vault-based systems because they require more frequent maintenance and problems arise when the appropriate maintenance schedules are not followed. Also, problems with vault systems may not be as readily identified by the projects' regular maintenance crews. Neither of these inspection frequency requirements interferes with the Permittees' current ability to prioritize their inspections based on factors such as types of maintenance agreements, owner or contractor maintained systems, maintenance history, etc. This Provision also requires the development of a database or equivalent tabular format to track the operation and maintenance inspections and any necessary enforcement actions against Regulated Projects and submittal of Reporting Table C.3.h., which requires standard information that should be collected on each operation and maintenance inspection. We require this type of information to evaluate a Permittee's inspection and enforcement program and to determine compliance with the Permit. Summary data alone without facility-specific inspection findings does not allow us to determine whether Permittees are doing timely follow-up inspections at problematic facilities and taking appropriate enforcement actions.

Stormwater treatment system maintenance has been identified as a critical aspect of addressing urban runoff from Regulated Projects by many prominent urban runoff authorities, including CASQA, which states that "long-term performance of BMPs [stormwater treatment systems] hinges on ongoing and proper maintenance."[74] USEPA also stresses the importance of BMP [stormwater treatment system] maintenance,

[74] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment, p. 6-1.

stating that "Lack of maintenance often limits the effectiveness of stormwater structure controls such as detention/retention basins and infiltration devices."[75]

Provision C.3.i. (Required Site Design Measures for Small Project and Detached Single-Family Homes Projects) introduces new requirements on single-family home projects that create and/or replace 2500 square feet or more of impervious surface and small development projects that create and/or replace > 2500 ft^2 to <10,000 ft^2 impervious surface (collectively over the entire project). A detached single-family home project is defined as the building of one single new house or the addition and/or replacement of impervious surface to one single existing house, which is not part of a larger plan of development.

This Provision requires these projects to select and implement one or more stormwater site design measures from a list of six. These site design measures are basic methods to reduce the amount and flowrate of stormwater runoff from projects and provide some pollutant removal treatment of the runoff that does leave the projects. Under this Provision, only projects that already require approvals and/or permits under the Permittees' current planning, building, or other comparable authority are regulated. Hence this Provision does not require Permittees to regulate small development and single-family home projects that would not otherwise be regulated under the Permittees' current ordinances or authorities. Water Board staff recognizes that the stormwater runoff pollutant and volume contribution from each one of these projects may be small; however, the cumulative impacts could be significant. This Provision serves to address some of these cumulative impacts in a simple way that will not be too administratively burdensome on the Permittees. To assist these small development and single-family home projects, this Provision also requires the Permittees to develop standard specifications for lot-scale site design and treatment measures.

[75] USEPA. 1992. *Guidance Manual for the Preparation of Part II of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems.* EPA 833-B-92-002.

C.4. Industrial and Commercial Site Controls

Legal Authority

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) requires, "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system."

Specific Provision C.4. Requirements

Provision C.4.a (Legal Authority for Effective Site Management)

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Permittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity." This section also describes requirements for effective follow-up and resolution of actual or threatened discharges of either polluted non-stormwater or polluted stormwater runoff from industrial/commercial sites.

Provision C.4.b (Inspection Plan)

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that Permittees must "identify priorities and procedures for inspections and establishing and implementing control measures for such discharges." The Permit requires Permittees to implement an industrial and commercial site controls program to reduce pollutants in runoff from all industrial and commercial sites/sources.

Provision C.4.b.ii.(1) (Commercial and Industrial Source Identification)

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that Permittees "Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

USEPA requires "measures to reduce pollutants in storm water discharges to municipal separate storm sewers from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of

1986 (SARA)."[76] USEPA "also requires the municipal storm sewer Permittees to describe a program to address industrial dischargers that are covered under the municipal storm sewer permit."[77] To more closely follow USEPA's guidance, this Permit also includes operating and closed landfills, and hazardous waste treatment, disposal, storage and recovery facilities.

The Permit requires Permittees to identify various industrial sites and sources subject to the General Industrial Permit or other individual NPDES permit. USEPA supports the municipalities regulating industrial sites and sources that are already covered by an NPDES permit:

> Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system. It is anticipated that general or individual permits covering industrial storm water discharges to these municipal separate storm sewer systems will require industries to comply with the terms of the permit issued to the municipality, as well as other terms specific to the Permittee.[78]

And:

> Although today's rule will require industrial discharges through municipal storm sewers to be covered by separate permit, USEPA still believes that municipal operators of large and medium municipal systems have an important role in source identification and the development of pollutant controls for industries that discharge storm water through municipal separate storm sewer systems is appropriate. Under the CWA, large and medium municipalities are responsible for reducing pollutants in discharges from municipal separate storm sewers to the maximum extent practicable. Because storm water from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for storm water discharges associated with industrial activity through their system in their storm water management program.[79]

Provision C.4.b.ii.(5) (Inspection Frequency)
USEPA guidance[80] says, "management programs should address minimum frequency for routine inspections." The USEPA Fact Sheet—Visual Inspection[81] says, "To be effective, inspections must be carried out routinely."

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[76] *Federal Register*. Vol. 55, No. 222, Friday, November 16, 1990. Rules and Regulations. P. 48056.
[77] Ibid.
[78] *Federal Register*. Vol. 55, No. 222, Friday, November 16, 1990, Rules and Regulations. P. 48006.
[79] Ibid. P. 48000
[80] USEPA. 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[81] USEPA. 1999. 832-F-99-046, "Storm Water Management Fact Sheet – Visual Inspection".

Provision C.4.c (Enforcement Response Plan) requires the Permittees to establish an Enforcement Response Plan (ERP) that ensures timely response to actual or potential stormwater pollution problems discovered in the course of industrial/commercial stormwater inspections. The ERP also provides for progressive enforcement of violations of ordinances and/or other legal authorities. The ERP will provide guidance on the appropriate use of the various enforcement tools, such as verbal and written notices of violation, when to issue a citations, and require cleanup requirements, cost recovery, and pursue administrative or and criminal penalties. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered.

Provision C.4.d (Staff Training) section of the Permit requires the Permittees to conduct annual staff trainings for inspectors. Trainings are necessary to keep inspectors current on enforcement policies and current MEP BMPs for industrial and commercial stormwater runoff discharges.

C.5. Illicit Discharge Detection and Elimination

Legal Authority

The following legal authority applies to section C.5:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(1)(iii)(B)(1) provides that the Permittee shall include in their application, "the location of known municipal storm sewer system outfalls discharging to waters of the United States."

Federal NPDES regulations 40 CFR 122.26(d)(1)(iii)(B)(5) provides that the Permittee shall include in their application, "The location of major structural controls for storm water discharge (retention basins, detention basins, major infiltration devices, etc."

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B) provides that the Permittee shall have, "adequate legal authority to prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer."

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B) provides that the Permittee shall, "Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) requires, "shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) requires, "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) requires, "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) requires, "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) requires, "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(5) requires, "a description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(7) requires, "a description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary."

Fact Sheet Findings in Support of Provision C.5

C.5-1 Illicit and inadvertent connections to MS4 systems result in the discharge of waste and chemical pollutants to receiving waters. Every Permittee must have the ability to discover, track, and clean up stormwater pollution discharges by illicit connections and other illegal discharges to the MS4 system.

C.5-2 Illicit discharges to the storm drain system can be detected in several ways. Permittee staff can detect discharges during their course of other tasks, and business owners and other aware citizens can observe and report suspect discharges. The Permittee must have a direct means for these reports of suspected polluted discharges to receive adequate documentation, tracking, and response through problem resolution.

Specific Provision C.5 Requirements

Provision C.5.a (Legal Authority) requires each Permittee have adequate legal authority to effectuate cessation, abatement, and/or clean up of non-exempt non-stormwater discharges per Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B). Illicit and inadvertent connections to MS4 systems result in the discharge of waste and chemical pollutants to receiving waters. Every Permittee must have the ability to discover, track, and clean up stormwater pollution discharges by illicit connections and other illegal discharges to the MS4 system.

Provision C.5.b (ERP) requires Permittees to establish an ERP that ensures timely response to illicit discharges and connections to the MS4 and provides progressive enforcement of violations of ordinances and/or other legal authorities. This section also requires Permittees to establish criteria for triggering follow-up investigations. Additional language has been added to this section to clarify the minimum level of effort and time frames for follow-up investigations when violations are discovered. Timely investigation and follow up when action levels are exceeded is necessary to identify sources of illicit discharges, especially since many of the discharges are transitory. The requirements for all violations to be corrected before the next rain event but no longer than 10 business days when there is evidence of illegal non-stormwater discharge, dumping, or illicit connections having reached municipal storm drains is necessary to ensure timely response by Permittees.

Provision C.5.c (Spill and Dumping Response, Complaint Response, and Frequency of Inspections) Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) requires, "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer." This Provision of the Permit requires the Permittees to establish and maintain a central point of contact including phone numbers for spill and complaint reporting. Reports from the public are an essential tool in discovering and investigating illicit discharge activities. Maintaining contact points will help ensure that there is effective reporting to assist with the discovery of prohibited discharges. Each Permittee must have a direct means for these reports of suspected polluted discharges to receive adequate documentation, tracking, and response through problem resolution.

Provision C.5.d (Control of Mobile Sources) requires each Permittee to develop and implement a program to reduce the discharge of pollutants from mobile businesses. The purpose of this section is to establish oversight and control of pollutants associated with mobile business sources to the MEP.

Provision C.5.e (Collection System Screening and MS4 Map Availability) Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) requires, "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water." This Provision of the Permit requires the Permittees to conduct follow up investigations and inspect portions of the MS4 for illicit discharges and connections. Permittees shall implement a program to actively seek and eliminate illicit connections and discharges during their routine collection system screening and during screening surveys at strategic check points. Additional wording has been added to this section to clarify and ensure that all appropriate municipal personnel are used in the program to observe and report these illicit discharges and connections when they are working the system.

This section also requires the Permittees to develop or obtain a map of their entire MS4 system and drainages within their jurisdictions and provide the map to the public for review. As part of the permit application process federal NPDES regulations 40 CFR 122.26(d)(1)(iii)(B)(1) and 40 CFR 122.26(d)(1)(iii)(B)(5) specify that dischargers must identify the location of any major outfall that discharges to waters of the United States, as well as the location of major structural controls for stormwater discharges. A major outfall is any outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres) or; for areas zoned for industrial activities, any pipe with a diameter of 12 inches or more or its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more). The permitting agency may not process a permit until the applicant has fully complied with the application requirements.[82] If, at the time of application, the information is unavailable, the Permit must require implementation of a program to meet the application requirements.[83] The requirement in this Provision of the Permit for

[82] 40 CFR 124.3 (applicable to state programs, see section 123.25).
[83] 40 CFR. 122.26(d)(1)(iv)(E).

Permittees to prepare maps of the MS4 system will help ensure that Permittees comply with federal NPDES permit application requirements that are more than 10 years old.

Provision C.5.f (Tracking and Case Follow-up) section of the Permit requires Permittees to track and monitor follow-up for all incidents and discharges reported to the complaint/spill response system that could pose a threat to water quality. This requirement is included so Permittees can demonstrate compliance with the ERP requirements of Section C.5.b and to ensure that illicit discharge reports receive adequate follow up through to resolution.

C.6. Construction Site Control

Legal Authority

The following legal authority applies to section C.6:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) requires, "A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) requires, "A description of procedures for site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) requires, "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) requires, "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) requires, "A description of appropriate educational and training measures for construction site operators."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Permittee must demonstrate that it can control, "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that, "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: […] (x) Construction activity including cleaning, grading and excavation activities […]."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to, "control all pollutants or pollutant parameters (either conventional, non-conventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute

to an excursion above any State water quality standard, including State narrative criteria for water quality."

Fact Sheet Findings in Support of Provision C.6.

C.6-1 Vegetation clearing, mass grading, lot leveling, and excavation expose soil to erosion processes and increase the potential for sediment mobilization, runoff and deposition in receiving waters. Construction sites without adequate BMP implementation result in sediment runoff rates that greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters.

C.6-2 Excess sediment can cloud the water, reducing the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and grease. Permittees are on-site at local construction sites for grading and building permit inspections, and also have in many cases dedicated construction stormwater inspectors with training in verifying that effective BMPs are in place and maintained. Permittees also have effective tools available to achieve compliance with adequate erosion control, such as *stop work* orders and citations.

C.6-3 Mobilized sediment from construction sites can flow into receiving waters. According to the 2004 National Water Quality Inventory[84], States and Tribes report that sediment is one of the top 10 causes of impairment of assessed rivers and streams, next to pathogens, habitat alteration, organic enrichment or oxygen depletion, nutrients, metals, etc.. Sediment impairs 35,177 river and stream miles (14% of the impaired river and stream miles). Sources of sedimentation include agriculture, urban runoff, construction, and forestry. Sediment runoff rates from construction sites, however, are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades.[85]

Specific Provision C.6 Requirements

Provision C.6.a. Legal Authority for Effective Site Management. Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) requires that each Permittee demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity." This section of the Permit requires each Permittee to have the

[84] http://www.epa.gov/owow/305b/2004report/2004_305Breport.pdf

[85] USEPA. December 2005. *Stormwater Phase II Final Rule Fact Sheet Series – Construction Site Runoff Control Minimum Control Measure*. EPA 833-F-00-008. Fact Sheet 2.6.

authority to require year-round, seasonally and phase appropriate effective erosion control, run-on and runoff control, sediment control, active treatment systems, good site management, and non stormwater management through all phases of site grading, building, and finishing of lots. All Permittees should already have this authority. Permittees shall certify adequacy of their respective legal authority in the 2010 Annual Report.

Inspectors should have the authority to take immediate enforcement actions when appropriate. Immediate enforcement will get the construction site's owner/operator to quickly implement corrections to violations, thereby minimizing and preventing threats to water quality. When inspectors are unable to take immediate enforcement actions, the threat to water quality continues until an enforcement incentive is issued to correct the violation. In its Phase II Compliance Assistance Guidance, USEPA says that, "Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties."[86] To issue warnings and assess penalties during inspections, inspectors must have the legal authority to conduct enforcement.

Provision C.6.b. Enforcement Response Plan (ERP). This section requires each Permittee to develop and implement an escalating enforcement process that serves as reference for inspection staff to take consistent actions to achieve timely and effective corrective compliance from all public and private construction site owners/operators. Under this section, each Permittee develops its own unique ERP tailored for the specific jurisdiction; but all ERPs must make it a goal to correct all violations before the next rain event but no longer than 10 business days after the violations are discovered. In a few cases, such as slope inaccessibility, it may require longer than 10 days before crews can safely access the eroded area. The Permittees' tracking data need to provide a rationale for the longer compliance timeframe.

Water Board staff has noted deficiencies in the Permittees' enforcement procedures and implementation during inspections. The most common issues found were that enforcement was not firm and appropriate to correct the violation, and that repeat violations did not result in escalated enforcement procedures. USEPA supports enforcement of ordinances and permits at construction sites stating, "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[87] In addition, USEPA expects permits issued to municipalities to address "weak inspection and enforcement."[88] For these reasons, the enforcement requirements in this section have been established, while providing sufficient flexibility for each Permittee's unique stormwater program.

Provision C.6.c. Best Management Practices Categories. This section requires all Permittees to require all construction sites to have year-round seasonally appropriate effective Best Management Practices (BMPs) in the following six categories: (1)

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[86] USEPA. 2000. 833-R-00-002, Storm Water Phase II Compliance Assistance Guide, P.4-31
[87] USEPA. 1992. Guidance 833-8-92-002. Section 6.3.2.3.
[88] *Federal Register*. Vol. 55, No. 222, Friday, November 16, 1990. Rules and Regulations. p. 48058.

erosion control, (2) run-on and runoff control, (3) sediment control, (4) active treatment systems, (5) good site management, and (6) non stormwater management. These BMP categories are listed in the State General NPDES Permit for Stormwater Discharges Associated with Construction Activities (General Construction Permit). The Water Board staff decided it was too prescriptive and inappropriate to require a specific set of BMPs that are to be applicable to all sites. Every site is different with regards to terrain, soil type, soil disturbance, and proximity to a waterbody. The General Construction Permit recognizes these different factors and requires site specific BMPs through the Storm Water Pollution Prevention Plan that addresses the six specified BMP categories. This Permit allows Permittees the flexibility to determine if the BMPs for each construction site are effective and appropriate. This Permit also allows the Permittees and the project proponents the necessary flexibility to make immediate decisions on appropriate, cutting-edge technology to prevent the discharge of construction pollutants into stormdrains, waterways, and right-of-ways. Appropriate BMPs for the different site conditions can be found in different handbooks and manuals. Therefore, this Permit is consistent with the General Construction Permit in its requirements for BMPs in the six specified categories.

Vegetation clearing, mass grading, lot leveling, and excavation expose soil to erosion processes and increase the potential for sediment mobilization, runoff and deposition in receiving waters. Construction sites without adequate BMP implementation result in sediment runoff rates that greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. This can even occur in conjunction with unexpected rain events during the so-called *dry-season*. Although rare, significant rains can occur in the San Francisco Bay Region during the dry season. Therefore, Permittees should ensure that construction sites have materials on hand for rapid rain response during the dry season.

Normally, stormwater restrictions on grading should be implemented during the wet season from October 1st through April 30th. Section C.6.c.ii.(1).d of the Permit requires, "project proponents to minimize grading during the wet season and scheduling of grading with seasonal dry weather periods to the extent feasible." If grading does occur during the wet season, Permittees shall require project proponents to (1) implement additional BMPs as necessary, (2) keep supplies available for rapid response to storm events, and (3) minimize wet-season, exposed, and graded areas to the absolute minimum necessary.

Slope stabilization is necessary on all active and inactive slopes during rain events regardless of the season, except in areas implementing advanced treatment. Slope stabilization is also required on inactive slopes throughout the rainy season. These requirements are needed because unstabilized slopes at construction sites are significant sources of erosion and sediment discharges during rainstorms. "Steep slopes are the most highly erodible surface of a construction site, and require special attention."[89] USEPA emphasizes the importance of slope stabilization when it states, "slope length

[89] Schueler, T., and H. Holland. 2000. *Muddy Water In—Muddy Water Out*? The Practice of Watershed Protection. p. 6.

and steepness are key influences on both the volume and velocity of surface runoff. Long slopes deliver more runoff to the base of slopes and steep slopes increase runoff velocity; both conditions enhance the potential for erosion to occur."[90] In lieu of vegetation preservation or replanting, soil stabilization is the most effective measure in preventing erosion on slopes. Research has shown that effective soil stabilization can reduce sediment discharge concentrations up to six times, as compared to soils without stabilization.[91] Slope stabilization at construction sites for erosion control is already the consensus among the regulatory community and is found throughout construction BMP manuals and permits. For these reasons, Permittees must ensure that slope stabilization is implemented on sites, as appropriate.

It is also necessary that Permittees ensure that construction sites are revegetated as early as feasible. Implementation of revegetation reduces the threat of polluted stormwater discharges from construction sites. Construction sites should permanently stabilize disturbed soils with vegetation at the conclusion of each phase of construction.[92] A survey of grading and clearing programs found one-third of the programs without a time limit for permanent revegetation, "thereby increasing the chances for soil erosion to occur."[93] USEPA states "the establishment and maintenance of vegetation are the most important factors to minimizing erosion during development."[94]

To ensure the MEP standard and water quality standards are met, advanced treatment systems may be necessary at some construction sites. In requiring the implementation of advanced treatment for sediment at construction sites, Permittees should consider the site's threat to water quality. In evaluating the threat to water quality, the following factors shall be considered: (1) soil erosion potential; (2) the site's slopes; (3) project size and type; (4) sensitivity of receiving waterbodies; (5) proximity to receiving waterbodies; (6) non-stormwater discharges; and (7) any other relevant factors. Advanced treatment is a treatment system that employs chemical coagulation, chemical flocculation, or electro coagulation in order to reduce turbidity caused by fine suspended sediment.[95] Advanced treatment consists of a three part treatment train of coagulation, sedimentation, and polishing filtration. Advanced treatment has been effectively implemented extensively in the other states and in the Central Valley Region of California.[96] In addition, Water Board's inspectors have observed advanced treatment being effectively implemented at both large sites greater than 100 acres, and at small, 5-acre sites. Advanced treatment is often necessary for Permittees to ensure that discharges from construction sites are not causing or contributing to a violation of water quality standards.

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90 USEPA. 1990. *Sediment and Erosion Control: An Inventory of Current Practices*. p. II-1.
91 Schueler, T., and H. Holland. 2000. "Muddy Water In—Muddy Water Out?" *The Practice of Watershed Protection*. p. 5.
92 Ibid.
93 Ibid. p. 11.
94 USEPA. 1990. *Sediment and Erosion Control: An Inventory of Current Practices.* p. II-1.
95 SWCRB. September 2, 2009. *NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities – Order No. 2009-0009-DWQ.*
96 SWRCB. 2004. Conference on Advanced Treatment at Construction Sites.

Provision C.6.d. Plan Approval Process. This section of the Permit requires the Permittees to review project proponents' stormwater management plans for compliance with local regulations, policies, and procedures. USEPA states that it is often easier and more effective to incorporate stormwater quality controls during the site plan review process or earlier.[97] In the Phase I stormwater regulations, USEPA states that a primary control technique is good site planning.[98] USEPA goes on to say that the most efficient controls result when a comprehensive stormwater management system is in place.[99] To determine if a construction site is in compliance with construction and grading ordinances and permits, USEPA states that the "MS4 operator should review the site plans submitted by the construction site operator before ground is broken."[100] Site plan review aids in compliance and enforcement efforts since it alerts the "MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities."[101]

Provision C.6.e. (Inspections) The Water Board allows flexibility on the exact legal authority language, ERP, and BMPs required on a site. This section of the Permit pulls together the accountability of the whole Provision through regular inspections, consistent enforcement, and meaningful tracking. These three elements will help ensure that effective construction pollutant controls are in place in order to minimize construction polluted runoff to the stormdrain and waterbodies.

Currently, Annual Reports show that some Permittees provide no information on its construction inspection and enforcement programs; some Permittees only provide information on pre rainy season inspections; another group of Permittees conduct inspections through December and provide just the date each site was inspected; yet another group of Permittees provides a very brief summary of their respective overall inspection program; and there is a small group of Permittees who report meaningful inspection and enforcement information. Inspections of construction sites by Water Board staff have noted deficiencies in stormwater inspections and enforcement. Therefore, this section clearly identifies the level of effort necessary by all Permittees to minimize construction pollutant runoff into stormdrains and ultimately, waterbodies.

This section requires monthly inspections during the wet season of all construction sites disturbing one or more acre of land and at all high priority sites as determined by the Permittee or the Water Board as significant threats to water quality. Inspections shall focus on the adequacy and effectiveness of the site specific BMPs implemented for the six BMP categories. Permittees shall implement its ERP and require timely corrections of all actual and potential problems observed. All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer

[97] USEPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Section 6.3.2.1.
[98] *Federal Register*. Vol. 55, No. 222, Friday, November 16, 1990. Rules and Regulations. p. 48034.
[99] Ibid.
[100] USEPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Section 4.6.2.4, pp. 4–30.
[101] Ibid. pp. 4–31.

than 10 business days after the violations are discovered. All inspections shall be recorded on a written or electronic inspection form, and also tracked in an electronic database or tabular format. The tracked information provides meaningful data for evaluating compliance. An example tabular format is included as Table 6 – Construction Inspection Data. Submittal of this Table is not required in each Annual Report but encouraged. Each Permittee will need to use the information in the electronic database or tabular format to compile its Annual Reports. The Executive Officer may require that the tracked information be submitted electronically or in a tabular format. When required, Permittees shall submit that data within 10-working days of the requirement. The recommended submittal format is in Table 6 – Construction Inspection Data.

Provision C.6.f. Staff Training. This section of the Permit requires Permittees to conduct annual staff trainings for municipal staff. These trainings have been found to be extremely effective means to educate inspectors and to inform them of any changes to local ordinances and state laws. Trainings provide valuable opportunity for Permittees to network and share strategies used for effective enforcement and management of erosion control practices.

Table 6 – Construction Inspection Data

Facility/Site Inspected	Inspection Date	Weather During Inspection	Inches of Rain Since Last Inspection	Enforcement Response Level	Problem(s) Observed							Specific Problem(s)	Resolution			Comments/ Rationale for Longer Compliance Time
					Erosion Control	Run-on and Runoff Control	Sediment Control	Active Treatment System	Good Site Management	Non Stormwater Management	Illicit Discharge		Problems Fixed	Need More Time	Escalate Enforcement	
Panoramic Views	9/30/08	Dry	0	Written Notice			x					Driveway not stabilized				
Panoramic Views	10/15/08	Dry	0.5										x			50' of driveway rocked.
Panoramic Views	11/15/08	Rain	3	Stop Work	x		x				x	Uncovered graded lots eroding; Sediment entering a stormdrain that didn't have adequate protection.				
Panoramic Views	11/15/08	Drizzling	0.25										x			Lots blanketed. Storm drains pumped. Street cleaned.
Panoramic Views	12/1/08	Dry	4	Verbal Warning					x			Porta potty next to stormdrain.	x			Porta potty moved away from stormdrain.
Panoramic Views	1/15/08	Rain	3.25	Written Warning	x					x		Fiber rolls need maintenance; Tire wash water flowing into street				
Panoramic Views	1/25/09	Dry	0										x			Fiber rolls replaced.

Facility/Site Inspected	Inspection Date	Weather During Inspection	Inches of Rain Since Last Inspection	Enforcement Response Level	Problem(s) Observed							Specific Problem(s)	Resolution			Comments/ Rationale for Longer Compliance Time
					Erosion Control	Run-on and Runoff Control	Sediment Control	Active Treatment System	Good Site Management	Non Stormwater Management	Illicit Discharge		Problems Fixed	Need More Time	Escalate Enforcement	
Panoramic Views	2/28/09	Rain	2.4	Stop Work	x		x				x	Slope erosion control failed. Fiber rolls at the bottom of the hill flattened. Sediment laden discharge skipping protected stormdrains and entering unprotected stormdrains.				
Panoramic Views	2/28/09	Rain	0.1											x		Fiber rolls replaced. Silt fences added. More stormdrains protected. Streets cleaned. Slope too soggy to access.
Panoramic Views	3/15/09	Dry	1	Citation with Fine					x		x	Paint brush washing not designated	x			Street and storm drains cleaned. Slopes blanketed.
Panoramic Views	4/1/09	Dry	0.5	Citation with Fine							x	Concrete washout overflowed; Evidence of illicit discharge				
Panoramic Views	4/15/09	Dry	0										x			Concrete washout replaced; Storm drain and line cleaned.

C.7. Public Information and Outreach

Legal Authority

The following legal authority applies to section C.7:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) requires, "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(5) requires , "a description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(6) requires, "A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Fact Sheet Finding in Support of Provision C.7.

C.7-1 An informed and knowledgeable community is critical to the success of a stormwater program since it helps ensure greater support for the program as the public gains a greater understanding of stormwater pollution issues.

C.7-2 An informed community also ensures greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

C.7-3 The public education programs should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children.[102]

[102] USEPA. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

C.7-4 Target audiences should include (1) government agencies and official to achieve better communication, consistency, collaboration, and coordination at the federal, state, and local levels and (2) K-12/Youth Groups.103

C.7-5 Citizen involvement events should make every effort to reach out and engage all economic and ethnic groups.[104]

Specific Provision C.7 Requirements

Provision C.7.a. Storm Drain Inlet Marking. Storm drain inlet marking is a long-established program of outreach to the public on the nature of the storm drain system, providing the information that the storm drain system connects directly to creeks and the Bay and does not receive treatment. Past public awareness surveys have demonstrated that this BMP has achieved significant impact in raising awareness in the general public and meets the MEP standard as a required action. Therefore, it is important to set a goal of ensuring that all municipally-maintained inlets are legible labeled with a no dumping message. If storm drain marking can be conducted as a volunteer activity, it has additional public involvement value.

Provision C.7.b. Advertising Campaigns. Use of various electronic and/or print media on trash/litter in waterways and pesticides. Advertising campaigns are long-established outreach management practices. Specifically, the Bay Area Management Agencies Association (BASMAA) already implements an advertising campaign on behalf of the Permittees. While the Permittees have been successful at reaching certain goals for its Public Information/Participation programs, it must continue to increase public awareness of specific stormwater issues. This Permit also requires a pre-campaign survey and a post-campaign survey. These two surveys will help identify and quantify the audiences' knowledge, trends, and attitudes and/or practices; and to measure the overall population awareness of the messages and behavioral changes.

Provision C.7.c. Media Relations. Public service media time is available and allows the Permittees to leverage expensive media purchases to achieve broader outreach goals.

Provision C.7.d. Stormwater Point of Contact. As the public has become more aware, citizens are more frequently calling their local jurisdictions to report spills and other polluting behavior impacting stormwater runoff and causing non-stormwater prohibited discharges. Permittees are required to have a centralized, easily accessible point of contact both for citizen reports and to coordinate reports of problems identified by Permittee staff, permitting follow-up and pollution cleanup or prevention. Often the follow-up, cleanup, and/or prevention provide the opportunity to educate the immediate neighborhood through established public outreach mechanisms such as distributing door hangers in the neighborhood describing the remedy for the problem discovered. Permittees already have existing published stormwater point of contacts.

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103 State Water Board. 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

104 USEPA. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

Provision C.7.e. Public Outreach Events. Staffing tables or booths at fairs, street fairs or other community events are a long-established outreach mechanism employed by Permittees to reach large numbers of citizens with stormwater pollution prevention information in an efficient and convenient manner. These have been ongoing in the Region for several municipal stormwater permit cycles and are MEP outreach actions. Permittees shall continue with such outreach events utilizing appropriate outreach materials, such as printed materials, newsletter/journal articles, and videos. Permittees shall also utilize existing community outreach events such as the Bringing Back the Natives Garden Tour.

Provision C.7.f. Watershed Stewardship Collaborative Efforts. Watershed and Creek groups are comprised of active citizens, but they often need support from the local jurisdiction and certainly need to coordinate actions with Permittees such as flood districts and cities.

Provision C.7.g. Citizen Involvement Events. Citizen involvement and volunteer efforts both accomplish needed creek cleanups and restorations, and serve to raise awareness and provide outreach opportunities. These have been ongoing in the Region for several municipal stormwater permit cycles and are MEP outreach actions.

In previous municipal stormwater permits, Public Information/Participation encompassed both Citizen Involvement Events and Public Outreach Events. Citizen Involvement Events are important because they provide the community opportunities to actively practice being good stewards of our environment. Therefore, this Permit separates out the Public Outreach Events from the Citizen Involvement Events to ensure that citizens in all Bay Area communities are given the opportunity to be involved. In addition, the Permit allows Permittees to claim both Public Outreach and Citizen Involvement credits if the event contains significant elements of both. The combined specified number of events for Public Outreach and Citizen Involvement are very close to current performance standards and/or level of effort for respective Public Information/Participation Programs.

Provision C.7.h. School-Age Children Outreach. Outreach to school children has proven to be a particularly successful program with an enthusiastic audience who are efficient to reach. School children also take the message home to their parents, neighbors, and friends. In addition, they are the next generation of decision makers and consumers.

Provision C.7.i. Outreach to Municipal Officials. It is important for Permittee staff to periodically inform Municipal Officials of the permit requirements and also future planning and resource needs driven by the permit and stormwater regulations.

C.8. Water Quality Monitoring

Legal Authority

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii); CWC section 13377; Federal
NPDES regulations 40 CFR 122.26(d)(2)(iv)

Specific Legal Authority: Permittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.48, 40 CFR 122.44(i), 40 CFR 122.26.(d)(1)(iv)(D), and 40 CFR 122.26(d)(2)(ii)-(iv).

Fact Sheet Findings in Support of Provision C.8

C.8-1 In response to questions regarding the type of water quality-based effluent limitations that are most appropriate for NPDES stormwater permits, and because of the nature of stormwater discharges, USEPA established the following approach to stormwater monitoring:

> Each storm water permit should include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations for subsequent permits. Such a monitoring program may include ambient monitoring, receiving water assessment, discharge monitoring (as needed), or a combination of monitoring procedures designed to gather necessary information.[105]

According to USEPA, the benefits of stormwater runoff monitoring include, but are not limited to, the following:

- Providing a means for evaluating the environmental risk of stormwater discharges by identifying types and amounts of pollutants present;
- Determining the relative potential for stormwater discharges to contribute to water quality impacts or water quality standard violations;
- Identifying potential sources of pollutants; and
- Eliminating or controlling identified sources more specifically through permit conditions.[106]

C.8-2 Provision C.8 requires Permittees to conduct water quality monitoring, including monitoring of receiving waters, in accordance with 40 CFR 122.44(i) and 122.48. One purpose of water quality monitoring is to demonstrate the effectiveness of the Permittees' stormwater management

[105] USEPA. 1996. Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits. Sept. 1, 1996. http://www.epa.gov/npdes/pubs/swpol.pdf
[106] USEPA. 1992. NPDES Storm Water Sampling Guidance Document. EPA/833-B-92-001.

actions pursuant to this Permit and, accordingly, demonstrate compliance with the conditions of the Permit. Other water quality monitoring objectives under this Permit include:

- Assess the chemical, physical, and biological impacts of urban runoff on receiving waters;
- Characterize stormwater discharges;
- Assess compliance with Total Maximum Daily Loads (TMDLs) and Wasteload Allocations (WLAs) in impaired waterbodies;
- Assess progress toward reducing receiving water concentrations of impairing pollutants;
- Assess compliance with numeric and narrative water quality objectives and standards;
- Identify sources of pollutants;
- Assess stream channel function and condition, as related to urban stormwater discharges;
- Assess the overall health and evaluate long-term trends in receiving water quality; and
- Measure and improve the effectiveness of the Permittees' urban runoff control programs and the Permittees' implemented BMPs.

C.8-3 Monitoring programs are an essential element in the improvement of urban runoff management efforts. Data collected from monitoring programs can be assessed to determine the effectiveness of management programs and practices, which is vital for the success of the iterative approach, also called the "continuous improvement" approach, used to meet the MEP standard. When water quality data indicate that water quality standards or objectives are not being met, particular pollutants, sources, and drainage areas can be identified and targeted for urban runoff management efforts. The iterative process in Provision C.1, Water Quality Standards Exceedances, could potentially be triggered by monitoring results. Ultimately, the results of the monitoring program must be used to focus actions to reduce pollutant loadings to comply with applicable WLAs, and protect and enhance the beneficial uses of the receiving waters in the Permittees' jurisdictions and the San Francisco Bay.

C.8-4 Water quality monitoring requirements in previous permits were less detailed than the requirements in this Permit. Under previous permits, each program could design its own monitoring program, with few permit guidelines. A decision by the California Superior Court[107] regarding two of the programs' permits stated:

Federal law requires that all NPDES permits specify "[r]equired monitoring including type, intervals, and frequency sufficient to yield

[107] San Francisco Baykeeper vs. Regional Water Quality Control Board, San Francisco Bay Region, Consolidated Case No. 500527, filed Nov. 14, 2003.

data which are representative of the monitored activity." 40 C.F.R. § 122.48(b). Here, there is no monitoring program set forth in the Permit. Instead, an annual Monitoring Program Plan is to be prepared by the dischargers to set forth the monitoring program that will be used to demonstrate the effectiveness of the Stormwater Management Plan. This does not meet the regulatory requirements that a monitoring program be set forth including the types, intervals, and frequencies of the monitoring.

The water quality monitoring requirements in Provision C.8 comply with 40 CFR 122.44(i) and 122.48(b), and the Superior Court decision.

C.8-5 The Water Quality Monitoring Provision is intended to provide answers to five fundamental management questions, outlined below. Monitoring is intended to progress as iterative steps toward ensuring that the Permittees' can fully answer, through progressive monitoring actions, each of the five management questions:

- Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
- What is the extent and magnitude of the current or potential receiving water problems?
- What is the relative urban runoff contribution to the receiving water problem(s)?
- What are the sources of urban runoff that contribute to receiving water problem(s)?
- Are conditions in receiving waters getting better or worse?

C.8-6 On April 15, 1992, the Water Board adopted Resolution No. 92-043 directing the Executive Officer to implement the Regional Monitoring Program for San Francisco Bay. Subsequent to a public hearing and various meetings, Board staff requested major permit holders in the Region, under authority of CWC section 13267, to report on the water quality of the Estuary. These permit holders, including the Permittees, responded to this request by participating in a collaborative effort through the San Francisco Estuary Institute. This effort has come to be known as the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP). The RMP involves collection and analysis of data on pollutants and toxicity in water, sediment and biota of the Estuary. The Permittees are required to continue to report on the water quality of the Estuary, as presently required. Compliance with the requirement through participation in the RMP is considered to be adequate compliance.

C.8-7 The Surface Water Ambient Monitoring Program (SWAMP) is a statewide monitoring effort, administered by the State Water Board, designed to assess the conditions of surface waters throughout California. One purpose of SWAMP is to integrate existing water quality monitoring activities of the State Water Board and the Regional Water Quality Control Boards, and to coordinate with other monitoring programs. Provision C.8 contains a

framework, referred to as a regional monitoring collaborative, within which Permittees can elect to work cooperatively with SWAMP to maximize the value and utility of both the Permittees' and SWAMP's monitoring resources.

C.8-8 In 1998 BASMAA published *Support Document for Development of the Regional Stormwater Monitoring Strategy*,[108] a document describing a possible strategy for coordinating the monitoring activities of BASMAA member agencies. The document states:

> BASMAA's member agencies are connected not only by geography but also by an overlapping set of environmental issues and processes and a common regulatory structure. It is only natural that the evolution of their individual stormwater management programs has led toward increasing amounts of information sharing, cooperation, and coordination.
>
> This same concept is found in the optional provision for Permittees to form a regional monitoring collaborative. Such a group is meant to provide efficiencies and economies of scale by performing certain tasks (e.g., planning, contracting, data quality assurance, data management and analysis, and reporting) at the regional level. Further benefits are expected from closer cooperation between this group, the Regional Monitoring Program, and SWAMP.

C.8-9 This Permit includes monitoring requirements to verify compliance with adopted TMDL WLAs and to provide data needed for TMDL development and/or implementation. This Permit incorporates the TMDLs' WLAs adopted by the Water Board as required under CWA section 303(d).

C.8-10 SB1070 (California Legislative year 2005/2006) found that there is no single place where the public can go to get a look at the health of local waterbodies. SB1070 also states that all information available to agencies shall be made readily available to the public via the Internet. This Permit requires water quality data to be submitted in a specified format and uploaded to a centralized Internet site so that the public has ready access to the data.

Specific Provision C.8 Requirements

Each of the components of the monitoring provision is necessary to meet the objectives and answer the questions listed in the findings above. Justifications for each monitoring component are discussed below.

Provision C.8.a. Compliance Options. Provision C.8.a. provides Permittees options for obtaining monitoring data through various organizational structures, including use of data obtained by other parties. This is intended to

[108] EcoAnalysis, Inc. & Michael Drennan Assoc., Inc., *Support Document for Development of the Regional Stormwater Monitoring Strategy*, prepared for Bay Area Stormwater Management Agencies Association, March 2, 1998.

- Promote cost savings through economies of scale and elimination of redundant monitoring by various entities;
- Promote consistency in monitoring methods and data quality;
- Simplify reporting; and
- Make data and reports readily publicly available.

In the past, each Stormwater Countywide Program has conducted water quality monitoring on behalf of its member Permittees, and some data were collected by wider collaboratives, such as the Regional Monitoring Program. In this Permit, all the Stormwater Countywide Programs are encouraged to work collaboratively to conduct all or most of the required monitoring and reporting on a region-wide basis. For each monitoring component that is conducted collaboratively, one report would be prepared on behalf of all contributing Permittees; separate reports would not be required from each Program. Cost savings could result also from reduced contract and oversight hours, fewer quality assurance/quality control samples, shared sampling labor costs, and laboratory efficiencies.

Provision C.8.b. San Francisco Estuary Receiving Water Monitoring. The San Francisco Estuary is the ultimate receiving water for most of the urban runoff in this region. For this reason and because of the high value of its beneficial uses, Provision C.8.b requires focused monitoring on the Estuary to continue. Since the mid-1990s, Permittees have caused this monitoring to be conducted by contributing financially and with technical expertise, to the San Francisco Estuary Regional Monitoring Program for Trace Substances. Provision C.8.b requires such monitoring to continue.

Provisions C.8.c. & C.8.e.ii. Status Monitoring and Long-Term Monitoring. Status Monitoring and Long-Term Monitoring serve as surrogates to monitoring the discharge from all major outfalls, of which the Permittees have many. By sampling the sediment and water column in urban creeks, the Permittees can determine where water quality problems are occurring in the creeks, then work to identify which outfalls and land uses are causing or contributing to the problem. In short, Status and Long-Term Monitoring are needed to identify water quality problems and assess the health of streams; they are the first step in identifying sources of pollutants and an important component in evaluating the effectiveness of an urban runoff management program.

Provisions C.8.c.i. and C.8.e.iii. Parameters and Methods
Status & Long-Term parameters and methods reflect current accepted practices, based on the knowledge and experience of personnel responsible for water quality monitoring, including state and Regional SWAMP managers, Permittee representatives, and citizen monitors. Many Status and Long-Term Monitoring parameters are consistent with parameters the Permittees have been monitoring to date. The following parameters are new for some of the Permittees:

- Biological Assessment—to provide site-specific information about the health and diversity of freshwater benthic communities within a specific reach of a creek, using standard procedures developed and/or used by the State Water

Resources Control Board Surface Water Ambient Monitoring Program.[109] It consists of collecting samples of benthic communities and conducting a taxonomic identification to measure community abundance and diversity, which is then compared to a reference creek to assess benthic community health. This monitoring can also provide information on cumulative pollutant exposure/impacts because pollutant impacts to the benthic community accumulate and occur over time.

- Chlorine—to detect a release of potable water or other chlorinated water sources, which are toxic to aquatic life.
- Nutrients—recent monitoring data indicate nutrients, which can increase algal growth and decrease dissolved oxygen concentrations, are present in significant concentrations in Bay area creeks.
- Toxicity and Pollutants in Bedded Sediment—to determine the presence of, and identify, chemicals and compounds that bind to sediment in a creek bed and are toxic to aquatic life.
- Pathogen Indicators—to detect pathogens in waterbodies that could be sources of impairment to recreational uses at or downstream of the sampling location.
- Stream Survey (stream walk and mapping)—to assess the overall physical health of the stream and to gain information potentially useful in interpreting monitoring results.

In consideration of economic impacts to Permittees, the minimum number of Status & Long-Term samples ("Minimum # Sample Sites" columns in Tables 8.1 and 8.3) reflects the Programs' populations, not waterbody size. Permittees must select exact sample locations that will yield adequate information on the status of their waterbodies; in some cases, additional sampling above the minimum might be necessary.

Provisions C.8.c.ii. and C.8.e.iii. Frequency

Status Monitoring continues to be an annual requirement for the Permittees, except for two much smaller Permittees, Fairfield-Suisun and Vallejo. In considering costs, the frequency of Status Monitoring is established at twice per Permit term for Fairfield-Suisun, and once per Permit term for Vallejo. It is common for Permit terms to be extended through a lengthy Permit reissuance process. Thus, these frequencies are considered the minimum; costs are minimized while data necessary for successful stormwater management are obtained.

Long-Term Monitoring is required every second year (biennially), rather than annually, in order to balance data needs and Permittee costs. To further reduce costs, the Fairfield-Suisun and Vallejo Permittees have no Long-Term Monitoring requirements.

Provisions C.8.c.iii. and C.8.e.ii. Locations

Status Monitoring is to be conducted on a rotating-watershed basis, in similar fashion to the Statewide SWAMP. Provision C.8.c.iii. identifies the major waterbodies, and Permittees are to select which of these waterbodies will be sampled during the Permit

[109] Ode, P.R. 2007. Standard Operating Procedures for Collecting Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California, California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP), as subsequently revised.

term. The exact sample locations within each waterbody are critical in terms of determining the monitoring program's effectiveness. If correctly sited, the stations are expected to be very useful in answering the monitoring program's management questions and meeting its goals. For this reason, Provision C.8.c.iii. requires sample locations to be based on surrounding land use, likelihood of urban runoff impacts, existing data gaps, and similar considerations. This will help maximize the utility of the sample locations, while also providing the Permittees with adequate flexibility to ultimately choose practical Status Monitoring locations.

Long-Term Monitoring is to be conducted at fixed stations, which are intended to be lower reaches of urban creeks. This monitoring is intended to help assess progress toward reducing receiving water concentrations of impairing pollutants, among other purposes. Provision C.8.e.ii. establishes the waterbodies on which to locate fixed stations, and suggests that fixed stations be co-located with SWAMP fixed stations so that Permittees can use SWAMP data to fulfill some of their monitoring requirements. However, Permittees may select alternate locations based on their knowledge of such factors as site access and stream characteristics and provided that similar data types, data quality, and data quantity are collected.

Provision C.8.d. Monitoring Projects. Monitoring Projects are necessary to meet several water quality monitoring objectives under this Permit, including characterize stormwater discharges; identify sources of pollutants; identify new or emerging pollutants; assess stream channel function and condition; and measure and improve the effectiveness of Stormwater Countywide Programs and implemented BMPs. In consideration of economic impacts to Permittees, the number of Monitoring Projects required reflects the Permittees' populations.

Provision C.8.d.i. Stressor/Source Identification
Minimizing sources of pollutants that could impair water quality is a central purpose of urban runoff management programs. Monitoring which enables the Permittees to identify sources of water quality problems aids the Permittees in focusing their management efforts and improving their programs. In turn, the Permittees' programs can abate identified sources, which will improve the quality of urban runoff discharges and receiving waters. This monitoring is needed to address the management question, "What are the sources to urban runoff that contribute to receiving water problems?"

When Status or Long-Term Monitoring results indicate an exceedance of a water quality objective, toxicity threshold, or other "trigger", Permittees must identify the source of the problem and take steps to reduce any pollutants discharged from or through their municipal storm sewer systems. This requirement conforms to the process, outlined in Provision C.1., of complying with the Discharge Prohibition and Receiving Water Limitations. If multiple "triggers" are identified through monitoring, Permittees must focus on the highest priority problems; a cap on the total number of source identification projects conducted within the Permit term is provided to cap Permittees' potential costs.

Provision C.8.d.ii. BMP Effectiveness Investigation
U.S. EPA's stated approach to NPDES stormwater permitting uses BMPs in first-round permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards.[110] The purpose of this monitoring project is to investigate the effectiveness of one currently in-use BMP to determine how it might be improved. Permittees may choose the particular stormwater treatment or hydromodification control BMP to investigate. As with other monitoring requirements, Permittees may work collaboratively to conduct one investigation on a region-wide basis, or each stormwater countywide program may conduct an investigation.

Provision C.8.d.iii. Geomorphic Project
The physical integrity of a stream's bed, bank and riparian area is integral to the stream's capacity to withstand the impacts of discharged pollutants, including chemical pollutants, sediment, excess discharge volumes, increased discharge velocities, and increased temperatures. At present, various efforts are underway to improve geomorphic conditions in creeks, primarily through local watershed partnerships. In addition, local groups are undertaking *green stormwater projects* with the goal of minimizing the physical and chemical impacts of stormwater runoff on the receiving stream. Such efforts ultimately seek to improve the integrity of the waterbodies that receive urban stormwater runoff.

The purpose of the Geomorphic Project is to contribute to these ongoing efforts in each Stormwater Countywide Program area. Permittees may select the geomorphic project from three categories specified in the Permit.

C.8.e. Pollutants of Concern[111] Monitoring. Federal CWA section 303(d) TMDL requirements, as implemented under the CWC, require a monitoring plan designed to measure the effectiveness of the TMDL point and nonpoint source control measures and the progress the waterbody is making toward attaining water quality objectives. Such a plan necessarily includes collection of water quality data. Provision C.8.e. establishes a monitoring program to measure of the effectiveness of TMDL control measures in progressing toward WLAs. Locations, parameters, methods, protocols, and sampling frequencies for this monitoring are specified. A sediment delivery estimate/budget is also required to improve the Permittees' estimates of their loading estimates. In addition, a workplan is required for estimating loads and analyzing sources of emerging pollutants, which are likely to be present in urban runoff, in the next Permit term.

C.8.f. Citizen Monitoring and Participation. CWA section 101(e) and 40 CFR Part 25 broadly require public participation in all programs established pursuant to the CWA, to foster public awareness of environmental issues and decision-making processes. Provision C.8.f. is intended to do the following:

[110] USEPA. 1996. *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits*. Sept. 1, 1996. http://www.epa.gov/npdes/pubs/swpol.pdf
[111] See section C.9, C.11, C.12, and C.13 of this Fact Sheet for more information on Pollutants of Concern.

- Support current and future creek stewardship efforts by providing a framework for citizens and Permittees to share their collective knowledge of creek conditions; and
- Encourage Permittees to use and report data collected by creek groups and other third-parties when the data are of acceptable quality.

C.8.g. Reporting. CWC section 13267 provides authority for the Water Board to require technical water quality reports. Provision C.8.g. requires Permittees to submit electronic and comprehensive reports on their water quality monitoring activities to (1) determine compliance with monitoring requirements; (2) provide information useful in evaluating compliance with all Permit requirements; (3) enhance public awareness of the water quality in local streams and the Bay; and (4) standardize reporting to better facilitate analyses of the data, including for the CWA section 303(d) listing process.

C.9. – C.14. Pollutants of Concern including Total Maximum Daily Loads

Provisions C.9 through C.14 pertain to pollutants of concern, including those for which TMDLs are being developed or implemented.

Legal Authority

The following legal authority applies to provisions C.9 through C.14:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal stormwater permits to include any requirements necessary to, "[a]chieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to, "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Basin Plan Requirements: Section 4.8 of the Region's Water Quality Control Plan (Basin Plan) requires that stormwater permits include requirements to prevent or reduce discharges of pollutants that cause or contribute to violations of water quality objectives. In the first phase, the Water Board requires implementation of technically and economically feasible control measures to reduce pollutants in stormwater to the MEP. If this first phase does not result in attainment of water quality objectives, the Water Board will consider permit conditions that might require implementation of additional control measures. For example, the control measures required as a result of TMDLs may go beyond the measures required in the first phase of the program.

General Strategy for Sediment-Bound Pollutants (Mercury, PCBs, legacy pesticides, PBDEs)

The control measures for mercury are intended to implement the urban runoff requirements stemming from TMDLs for this pollutant. The control measures required for PCBs are intended to implement those that are consistent with control measures in the PCBs TMDL implementation plan that has been approved by the Water Board and is pending approval by the State Board, the Office of Administrative Law, and U.S. EPA. The urban runoff management requirements in the PCBs TMDL implementation plan call for permit-term requirements based on an assessment of controls to reduce

PCBs to the MEP, and that is the intended approach of the required provisions for all pollutants of concern. Many of the control actions addressing PCBs and mercury will result in reductions of a host of sediment-bound pollutants, including legacy pesticides, mercury, PBDEs, and PCBs. The strategy for these pollutants is to use PCBs control guide decisions concerning where to focus effort, but implementation of the control efforts would taken into account the benefits for controlling other pollutants of concern. Further, because many of the control strategies addressing these pollutants of concern are relatively untested, the Water Board will implement control measures in the following modes:

1. Full-scale implementation throughout the region.
2. Focused implementation in areas where benefits are most likely to accrue.
3. Pilot-testing in a few specific locations.
4. Other: This may refer to experimental control measures, Research and Development, desktop analysis, laboratory studies, and/or literature review.

The logic of such categorization is that, as actions are tested and confidence is gained regarding level of experience and confidence in the control measure's effectiveness, the control measure may be implemented with a greater scope. For example, an untested control measure for which the effectiveness is uncertain may be implemented as a pilot project in a few locations during this permit term. If benefits result, and the action is deemed effective, it will be implemented in subsequent permit terms in a focused fashion in more locations or perhaps fully implemented throughout the Region, depending upon the nature of the measure. On the other hand there may be some control measures in which there is sufficient confidence, on the basis of prior experience, that the control action should be implemented in all applicable locations and/or situations. By conducting actions in this way and gathering information about effectiveness and cost, we will advance our understanding and be able to perform an updated assessment of the suite of actions that will constitute MEP for the following permit term. In fact, in additional to implementing control measures, gathering the necessary information about control measure effectiveness is a vital part of what needs to be accomplished by Permittees during this permit term. In the next permit term, control measures will be implemented on the basis of what we learn in this term, and we will, thus, achieve iterative refinement and improvement through time.

Background on Specific Provisions: Provisions C.9 through C.14 contain both technology-based requirements to control pollutants to the MEP and water quality based requirements to prevent or reduce discharges of pollutants that may cause or contribute to violations of water quality standards. Provisions C.9 and C.11 of the Permit incorporate requirements for the two TMDLs that have been fully approved and are effective for the Permittees. These TMDLs are for pesticide-related toxicity in urban creeks and mercury in San Francisco Bay. Additionally, Provision C.12 contains measures that address PCBs. The Regional Water Board has adopted a PCB TMDL, but it is still pending approval by State Board, the Office of Administrative Law, and U.S. EPA. This PCBs TMDL includes requirements that would be consistent with this

provision. Finally, Provision C.13 contains measures to implement the copper site-specific objective in San Francisco Bay.

Where a TMDL has been approved, NPDES permits must contain effluent limitations and conditions consistent with the requirements and assumptions in the TMDL.[112] Effluent limitations are generally expressed in numerical form. However, USEPA recommends that for NPDES-regulated municipal and small construction stormwater discharges, effluent limitations should be expressed as BMPs or other similar requirements rather than as numeric effluent limitations.[113] Consistent with USEPA's recommendation, this section implements WQBELs expressed as an iterative BMP approach capable of meeting the WLAs in accordance with the associated compliance schedule. The Permit's WQBELs include the numeric WLA as a performance standard and not as an effluent limitation. The WLA can be used to assess if additional BMPs are needed to achieve the TMDL Numeric Target in the waterbody.

[112] 40 CFR 122.44(d)(1)(vii)(B)

[113] USEPA, 2002. Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs. P. 4.

C.9. Pesticides Toxicity Control

Fact Sheet Findings in Support of Provision C.9.

C.9-1 This Permit fulfills the Basin Plan amendments the Water Board adopted that establish a Water Quality Containment Strategy and TMDL for diazinon and pesticide-related toxicity for Bay Area urban creeks on November 16, 2005, and approved by the State Water Board on November 15, 2006. The Water Quality Containment Strategy requires urban runoff management agencies to minimize their own pesticide use, conduct outreach to others, and lead monitoring efforts. Control measures implemented by urban runoff management agencies and other entities (except construction and industrial sites) shall reduce pesticides in urban runoff to the MEP.

C.9-2 **(Allocations):** The TMDL is allocated to all urban runoff, including urban runoff associated with MS4s, Caltrans facilities, and industrial, construction, and institutional sites. The allocations are expressed in terms of toxic units and diazinon concentrations.

Specific Provision C.9 Requirements

C.9 provisions fully implement the TMDL for Urban Creeks Pesticide Toxicity. All C.9 provisions are stated explicitly in the implementation plan for this TMDL. Permittees are encouraged to coordinate activities with the Urban Pesticide Pollution Prevention Project, the Urban Pesticide Committee, and other agencies and organizations. The Urban Pesticide Pollution Prevention (UP3) Project has been funded by a grant from the State Water Board and its goal is to prevent water pollution from urban pesticide use. The Urban Pesticides Committee serves as an information clearinghouse and as a forum for coordinating pesticide TMDL implementation.

The UP3 Project provides resources and information on integrated pest management (IPM) and tools to municipalities to support their efforts to reduce municipal pesticide use and to conduct outreach to their communities on less-toxic methods of pest control. In addition, it provides technical assistance to municipalities to encourage the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation to prevent water quality problems from pesticides. It also maintains and manages the Urban Pesticides Committee, a statewide network of agencies, nonprofits, industry, and other stakeholders that are working to solve water quality problems from pesticides.

Specific tools provided by the UP3 Project that relate to permit requirements include:

- Guidance and resources to help agencies create contracts and bid documents for structural pest management services that help them meet their integrated pest management goals
- IPM policies and ordinances
- IPM training workshops and materials

- Outreach program design resources
- Resources for evaluating effectiveness

Provisions C.9.a through C.9.d are designed to insure that integrated pest management (IPM) is adopted and implemented as policy by all municipalities. IPM is a pest control strategy that uses an array of complementary methods: natural predators and parasites, pest-resistant varieties, cultural practices, biological controls, various physical techniques, and pesticides as a last resort. If implemented properly, it is an approach that can significantly reduce or eliminate the use of pesticides. The implementation of IPM will be assured through training of municipal employees and the requirement that municipalities only hire IPM-certified contractors.

Provision C.9.e requires that municipalities (through cooperation or participation with BASMAA) track and participate in pesticide regulatory processes like the USEPA pesticide evaluation and registration activities related to surface water quality, and the California Department of Pesticide Regulation (DPR) pesticide evaluation activities. The goal of these efforts is to encourage both the state and federal pesticide regulatory agencies to accommodate water quality concerns within the pesticide regulation or registration process. Through these efforts, it could be possible to prevent pesticide-related water quality problems from happening by affecting which products are brought to market.

Provision C.9.g is critical to the success of municipal efforts to control pesticide-related toxicity. Future permits must be based on an updated assessment of what is working and what is not. With every provision comes the responsibility to assess its effectiveness and report on these findings through the permit. The particulars of assessment will depend on the nature of the control measure.

Provision C.9.h directs the municipalities to conduct outreach to consumers at point of purchase and provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control. One way in which this can be accomplished is for the Permittees to participate in and provide resources for the “Our Water, Our World” program (www.ourwaterourworld.org) or a functionally equivalent pesticide use reduction outreach program. The “Our Water, Our World” program has developed a Web site with many resources, “to assist consumers in managing home and garden pests in a way that helps protect” the environment.

C.10. Trash Load Reduction

Legal Authority

The following legal authority applies to section C.10:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) requires, "shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) requires, "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) requires, "a description of procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) requires, "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

San Francisco Bay Basin Plan, Chapter 4 – Implementation, Table 4-1 Prohibitions, Prohibition 7, which is consistent with the State Water Board's Enclosed Bays and Estuaries Policy, Resolution 95-84, prohibits the discharge of rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas. This prohibition was adopted by the Water Board in the 1975 Basin Plan, primarily to protect recreational uses such as boating.

Fact Sheet Findings in Support of Provision C.10

C.10-1 Trash and litter are a pervasive problem near and in creeks and in San Francisco Bay. Controlling trash is one of the priorities for this Permit reissuance not only because of the trash discharge prohibition, but also because trash and litter cause particularly major impacts on our enjoyment of creeks and the Bay. There are also significant impacts on aquatic life and habitat in those waters and eventually to the global ocean ecosystem, where plastic often floats, persists in the environment for hundreds of years, if not

forever, concentrates organic toxins, and is ingested by aquatic life. There are also physical impacts, as aquatic species can become entangled and ensnared and can ingest plastic that looks like prey, losing the ability to feed properly.

For the purposes of this provision, trash is defined to consist of litter and particles of litter. Man made litter is defined in California Government Code section 68055.1 (g): *Litter* means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling, or manufacturing.

C.10-2 Data collected by Water Board staff using the SWAMP Rapid Trash Assessment (RTA) Protocol,[114] over the 2003–2005 period,[115] suggest that the current approach to managing trash in waterbodies is not reducing the adverse impact on beneficial uses. The levels of trash in the waters of the San Francisco Bay Region are alarmingly high, considering the Basin Plan prohibits discharge of trash and that littering is illegal with potentially large fines. Even during dry weather conditions, a significant quantity of trash, particularly plastic, is making its way into waters and being transported downstream to San Francisco Bay and the Pacific Ocean. On the basis of 85 surveys conducted at 26 sites throughout the Bay Area, staff have found an average of 2.93 pieces of trash for every foot of stream, and all the trash was removed when it was surveyed, indicating high return rates of trash over the 2003–2005 study period. There did not appear to be one county within the Region with higher trash in waters—the highest wet weather deposition rates were found in western Contra Costa County, and the highest dry weather deposition was found in Sonoma County. Results of the trash in waterbodies assessment work by staff show that rather than adjacent neighborhoods polluting the sites at the bottom of the watershed, these areas, which tend to have lower property values, are subject to trash washing off with urban stormwater runoff cumulatively from the entire watershed.

C.10-3 A number of key conclusions can be made on the basis of the trash measurement in streams:

- Lower watershed sites have higher densities of trash.
- All watersheds studied in the San Francisco Bay Region have high levels of trash.
- There are trash source hotspots, usually associated with parks, schools, or poorly kept commercial facilities, near creek channels, that appear to contribute a significant portion of the trash deposition at lower watershed sites.

[114] SWAMP Rapid Trash Assessment Protocol, Version 8
[115] SWAMP S.F. Bay Region Trash Report, January 23, 2007

- Dry season deposition of trash, associated with wind and dry season runoff, contributes measurable levels of trash to downstream locations.
- The majority of trash is plastic at lower watershed sites where trash accumulates in the wet season. This suggests that urban runoff is a major source of floatable plastic found in the ocean and on beaches as marine debris.
- Parks that have more evident management of trash by city staff and local volunteers, including cleanup within the creek channel, have measurably less trash pieces and higher RTA scores.

C.10-4 The ubiquitous, unacceptable levels of trash in waters of the San Francisco Bay Region warrant a comprehensive and progressive program of education, warning, and enforcement, and certain areas warrant consideration of structural controls and treatment.

C.10-5 Trash in urban waterways of coastal areas can become *marine debris*, known to harm fish and wildlife and cause adverse economic impacts.[116] Trash is a regulated water pollutant that has many characteristics of concern to water quality. It accumulates in streams, rivers, bays, and ocean beaches throughout the San Francisco Bay Region, particularly in urban areas.

C.10-6 Trash adversely affects numerous beneficial uses of waters, particularly recreation and aquatic habitat. Not all litter and debris delivered to streams are of equal concern with regards to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to wildlife in the form of entanglement or ingestion.[117,118] Some elements of trash exhibit significant threats to human health, such as discarded medical waste, human or pet waste, and broken glass.[119] Also, some household and industrial wastes can contain toxic batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Large trash items such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistent accumulation of trash in a waterbody is of particular concern, and signifies a priority for prevention of trash discharges. Also of concern are trash *hotspots* where illegal dumping, littering, and/or accumulation of trash occur.

C.10-7 The narrative water quality objectives applicable to trash are Floating Material (Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely

[116] Moore, S.L., and M.J. Allen. 2000. Distribution of anthropogenic and natural debris on the mainland shelf of the Southern California Bight. *Mar. Poll. Bull*. 40:83-88.
[117] Laist, D. W. and M. Liffmann. 2000. *Impacts of marine debris: research and management needs*. Issue papers of the International Marine Debris Conference, Aug. 6-11, 2000. Honolulu, HI, pp. 16–29.
[118] McCauley, S.J. and K.A. Bjorndahl. 1998. Conservation implications of dietary dilution from debris ingestion: sublethal effects in post-hatchling loggerhead sea turtles. *Conserv. Biol*. 13(4):925-929.
[119] Sheavly, S.B. 2004. *Marine Debris: an Overview of a Critical Issue for our Oceans.* 2004 International Coastal Cleanup Conference, San Juan, Puerto Rico. The Ocean Conservancy.

affect beneficial uses), Settleable Material (Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses), and Suspended Material (Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses).

C.10-8 The Water Board, at its February 11, 2009 hearing, adopted a resolution proposing that 26 waterbodies in the region be added to the 303(d) list for the pollutant trash. The adopted Resolution and supporting documents are contained in Attachment 10.1 – 303(d) Trash Resolution and Staff Report Feb 2009.

Specific Provision C.10 Requirements

Provision C.10. Permittees shall demonstrate compliance with Discharge Prohibition A.2 and trash-related Receiving Water Limitations through the timely implementation of control measures and other actions to reduce trash loads from municipal separate storm sewer systems (MS4s) by 40% by 2014, 70% by 2017, and 100% by 2022 as further specified below.

C.10.a.i. Short-Term Trash Load Reduction Plan
The Short-Term Trash Load Reduction Plan is intended to describe actions to incrementally reduce trash loads toward the 2014 requirement of a 40% reduction and eventual abatement of trash loads to receiving waters.

C.10.a.ii. Baseline Trash Load and **Trash Load Reduction Tracking Method**
In order to achieve the incremental trash load reductions in an accountable manner, the Permittees will propose Baseline Trash Loads and a Trash Load Reduction Tracking Method. The Tracking will account for additional trash load reducing actions and BMPs the Permittees implement. Permittees are also able to propose, with documentation, areas for exclusion from the Tracking Method accounting, by demonstrating that these areas already meet the Discharge Prohibition A.2 and have no trash loads.

C.10.a.iii. Minimum Full Trash Capture
Installation of full trash capture systems to prevent trash loads through the MS4 is MEP as demonstrated by the significant implementation of these systems occurring in the Los Angeles region. The minimum full trash capture installation requirements in this permit represent a moderate initial step toward employing this tool for trash load reduction.

C.10.b.i, ii. Trash Hot Spot Selection and Clean Up
Trash Hot Spots must be cleaned up as an interim measure until complete abatement of trash loads occurs. Eventually, with adequate source controls and trash loading abatement, trash hot spots will not occur in the receiving waters. In addition, Permittees will be credited for trash volume removed from hot spots in the trash load reduction tracking.

C.10.b.iii. Hot Spot Assessments
Trash Hot Spot assessments have been simplified and streamlined. Rather than counting individual trash items, which can vary in size from small plastic of glass particles to shopping carts, volume of material removed is measured, along with dominant types of trash removed. Photographs are recorded both before and after cleanup, to add to the record and verify cleanup.

C.10.c. Long Term Trash Load Reduction
Each Permittee will submit a Plan to achieve the incremental progress of 70% trash load reduction by 2017 during the following permit term, and the 100% reduction of trash loading by 2022.

C.10.d. Reporting
This sub-provision sets forth the reporting required in this provision, including the specific submittals and reports, and the annual reporting requirements.

Costs of Trash Control

Costs for either enhanced trash management measure implementation or installation and maintenance of trash capture devices are significant, but when spread over several years, and when viewed on a per-capita basis, are reasonable. Also, Trash capture devices have been installed by cities in California and in the Bay Region.

Trash and litter are costly to remove from our aquatic resource environments. Staff from the California Coastal Commission report that the Coastal Cleanup Day budget statewide: $200,000-250,000 for staff Coastal Commission staff, and much more from participating local agencies. The main component of this event is the 18,000 volunteer-hours which translates to $3,247,200 in labor, and so is equivalent to $3,250,000-3,500,000 per year to clean up 903,566 pounds of trash and recyclables at $3.60 to $3.90 per pound. This is one of the most cost-effective events because of volunteer labor and donations. The County of Los Angeles spends $20 million per year to sweep beaches for trash, according to Coastal Commission staff.

In Oakland, the Lake Merritt Institute is currently budgeted at $160,000 per year, with trash and litter removal from the Lake as a major task. The budget has increased from about $45,000 in 1996 to current levels. In the period of 1996-2005 the Lake Merritt Institute staff, utilizing significant volunteer resources, and accomplishing other education tasks, removed 410,859 pounds of trash from the Lake at cost of $951,725 at $2.3 per pound.

The City of Oakland reports that installation of two vortex and screen separators, titled by their brand name of CDS units, which cost, according to the table below, $821,000 for installations that treat tributary catchments of 192 acres before discharge to Lake Merritt at $4,276 per acre.

City of Oakland—CDS Unit Overview 9-07

Existing CDS unit location	Outfall number	Treatment area (acres)	Cost of implementation	Sizing	Maintenance requirements	Comments
Intersection of 27th and Valdez Streets	56*	71	$203,000 to contactor; plus ~$100,000 City costs	73 cfs peak flow; 36" stormdrain; Unit sizing: 18'6'6' box with 10'11"diam x 9'6" long cylinder	Visually inspect CDS Unit; remove trash and debris with Hydro Flusher bi-monthly	Installed in 2006. Required relocation of electrical conduit. Water main and gas line were also in the way; the box was adjusted to accommodate these conflicts.
Intersection of 22nd and Valley Streets	56*	121	$368,000 to contactor; plus ~$150,000 City costs	115 cfs peak flow; 54" stormdrain; Unit sizing: 18'8.5'6' box with 12'diam x 9'6" long cylinder	Visually inspect CDS Unit; remove trash and debris with Hydro Flusher bi-monthly	Installed in 2006. Installation costs were higher than anticipated. Sewer lines and PGE facilities were exposed that were not known before. Unit had to be modified and poured-in-place.

* The city is treating 192 acres or 72 percent of the 252 acres draining to outfall 56.

Mr. Morad Sedrak, the TMDL Implementation Program Manager, Bureau of Sanitation, Department of Public Works, City of Los Angeles, reports that the City plans to invest $72 million dollars for storm drain catch basin based capture device installation primarily, for a City of 4 million population, for a per-capita cost of $18 dollars. This effort is occurring over a span of over five years, for an annual per-capita cost of under $4.

Mr. Sedrak reports that O&M costs are not anticipated to increase, as the City of L.A. is already budgeted for 3 catch basin cleanings per year. He also states that catch basin inserts installed inside the catch basin in front of the lateral pipe, which have been certified by the Los Angeles Regional Water Board as total capture trash control devices, cost approximately $800 to $3,000 depending on the depth of the catch basin. The price quoted includes installation and the insert is made of Stainless Steel 316.

Furthermore, the price for catch basin opening screen covers, which are designed to retain trash at the street level for removal by sweepers, and also to open if there is a potential flooding blockage, ranges roughly from $800 to $4,500, depending on the opening size of the catch basin.

The City of Los Angeles has currently spent 27 million dollars on a retrofit program to install catch basin devices in approximately 30% of its area, with either inserts or screens

or both. Mr. Sedrak states that Los Angeles plans to spend $45 million over the next 3 years to retrofit the remaining catch basins within the City. The total number of catch basins within the City is approximately 52,000.

Here are some links to information about the Los Angeles trash control approach:

http://www.lastormwater.org/Siteorg/program/TMDLs/trashtmdl.htm

http://www.lastormwater.org/Siteorg/download/pdfs/general_info/Request-Certification-10-06.pdf)

http://www.lastorhttp://www.lastormwater.org/Siteorg/download/pdfs/general_info/Request-Certification-10-06.pdfmwater.org/Siteorg/program/poll_abate/cbscreens.htm)

http://www.lastormwater.org/Siteorg/program/poll_abate/cbinserts.htm

http://www.lastormwater.org/Siteorg/program/poll_abate/cbscreens.htm

Additional cost information on various trash capture devices are included in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) BMP Trash Toolbox (July 2007). The Toolbox contains cost information for both trash capture devices and enhanced trash management measure implementation, covers a broad range of options and also discusses operation and maintenance costs. Catch basin screens are included with an earlier estimate by the City of Los Angeles of $44 million over 10 years to install devices in 34,000 inlets.

Litter booms are also discussed with an example from the City of Oakland. The Damon Slough litter boom or sea curtain cost $36,000 for purchase and installation, including slough side access improvements for maintenance and trash removal. Annual maintenance costs have been $77,000 for weekly maintenance, which includes use of a crane for floating trash removal.

The costs of the full trash capture device installation required in the Order is significantly less than the previous tentative orders requirements for trash capture, as set forth in the table below.

Trash Capture Cost Estimates – Final TO versus previous TOs

Trash Capture Device Requirement	Acres of Capture	Cost for Trash Capture Installation	Percent of Retail/Wholesale Commercial (ABAG 2005)	Per capita $, Population = 4,533,634
Final TO: Implemented in Year 4 – 30% of Retail/Wholesale Commercial	5527	**$ 27,635,000**	30%	$6.06
Previous TOs: Implement in Year 4, 5% of Urban/suburban land	0.05 X 529,712 = 26,485 (BASMAA) or ABAG 0.05 X 655,015 = 32,750	$132,425,000 or $163,750,000	5% of Urban/suburban land	$29 or $36

30**%** X 18,426 acres = 5527 acres X $5000/acre = **$27,635,000** for four counties for installation; maintenance will add an additional cost. The Permittees may work cooperatively to achieve this capture installation requirement, and there is the potential for Regional revenue development. The previous requirement was 5% of (.05 X 655,015) (529,712 by BASMAA's count) acres of urban land (from ABAG 2005 table) = 32,750 acres, ((26,486 according to BASMAA) X $5000 = $132,000,000).

C.11. Mercury Controls

Fact Sheet Findings in Support of Provision C.11

C.11-1 On August 9, 2006, the Water Board adopted a Basin Plan amendment including a revised TMDL for mercury in San Francisco Bay, two new water quality objectives, and an implementation plan to achieve the TMDL. The State Water Board has approved this Basin Plan amendment, and USEPA approval is pending. C.11-2 through C.11-6 are components of the Mercury TMDL implementation plan relevant to implementation through the municipal stormwater permit.

C.11-2 The 2003 load of mercury from urban runoff is 160 kg/yr, and the aggregate WLAs for urban runoff is 80 kg/yr and shall be implemented through the NPDES stormwater permits issued to urban runoff management agencies and Caltrans. The urban stormwater runoff allocations implicitly include all current and future permitted discharges, not otherwise addressed by another allocation, and unpermitted discharges within the geographic boundaries of urban runoff management agencies (collectively, *source category*) including, but not limited to, Caltrans roadway and non-roadway facilities and rights-of-way, atmospheric deposition, public facilities, properties proximate to stream banks, industrial facilities, and construction sites.

C.11-3 The allocations for this source category shall be achieved within 20 years, and, as a way to measure progress, an interim loading milestone of 120 kg/yr, halfway between the current load and the allocation, should be achieved within 10 years. If the interim loading milestone is not achieved, NPDES-permitted entities shall demonstrate reasonable and measurable progress toward achieving the 10-year loading milestone.

C.11-4 The NPDES permits for urban runoff management agencies shall require the implementation of BMPs and control measures designed to achieve the allocations or accomplish the load reductions derived from the allocations. In addition to controlling mercury loads, BMPs or control measures shall include actions to reduce mercury-related risks to humans and wildlife. Requirements in the permit issued or reissued and applicable for the term of the permit shall be based on an updated assessment of control measures intended to reduce pollutants in stormwater runoff to the MEP and remain consistent with the section of this chapter titled, *Surface Water Protection and Management—Point Source Control—Stormwater Discharges*.

C.11-5 The following additional requirements are or shall be incorporated into NPDES permits issued or reissued by the Water Board for urban runoff management agencies.

a. Evaluate and report on the spatial extent, magnitude, and cause of contamination for locations where elevated mercury concentrations exist;

b. Develop and implement a mercury source control program;

c. Develop and implement a monitoring system to quantify either mercury loads or loads reduced through treatment, source control, and other management efforts;

d. Monitor levels of methylmercury in discharges;

e. Conduct or cause to be conducted studies aimed at better understanding mercury fate, transport, and biological uptake in San Francisco Bay and tidal areas;

f. Develop an equitable allocation-sharing scheme in consultation with Caltrans (see below) to address Caltrans roadway and non-roadway facilities in the program area, and report the details to the Water Board;

g. Prepare an Annual Report that documents compliance with the above requirements and documents either mercury loads discharged, or loads reduced through ongoing pollution prevention and control activities; and

h. Demonstrate progress toward (a) the interim loading milestone, or (b) attainment of the allocations shown in Individual WLAs (see Table 4-w of the Basin Plan amendment), by using one of the following methods:

(1) Quantify the annual average mercury load reduced by implementing

i. Pollution prevention activities, and
ii. Source and treatment controls. The benefit of efforts to reduce mercury-related risk to wildlife and humans should also be quantified. The Water Board will recognize such efforts as progress toward achieving the interim milestone and the mercury-related water quality standards upon which the allocations and corresponding load reductions are based. Loads reduced as a result of actions implemented after 2001 (or earlier if actions taken are not reflected in the 2001 load estimate) may be used to estimate load reductions.

(2) Quantify the mercury load as a rolling 5-year annual average using data on flow and water column mercury concentrations.

(3) Quantitatively demonstrate that the mercury concentration of suspended sediment that best represents sediment discharged with urban runoff is below the suspended sediment target.

C.11-6 Urban runoff management agencies have a responsibility to oversee various discharges within the agencies' geographic boundaries. However, if it is determined that a source is substantially contributing to mercury loads to the Bay or is outside the jurisdiction or authority of an agency, the Water Board will consider a request from an urban runoff management agency that may include an allocation, load reduction, and/or other regulatory requirements for the source in question.

Specific Provision C.11 Requirements

The C.11 provisions implement the mercury TMDL and follow the general approach for sediment-bound pollutants discussed above where we seek to build our understanding and level of certainty concerning control actions by implementing actions in a phased approach. We then expand implementation of those actions that prove effective, and perhaps scale back or discontinue those that are not effective. Accordingly, there are some provisions that will be implemented throughout the Region, some that will be tested on a limited basis first before making the decision to expand region-wide in the next permit term. Some of the measures are companion measures for efforts targeting PCBs.

Provision C.11.a. Mercury is found in a wide variety of consumer products (e.g., fluorescent bulbs) that are subject to recycling requirements. These recycling efforts are already happening throughout the Region, and Provision C.11.a requires promotion, facilitation and/or participation in these region-wide recycling efforts to increase effectiveness and public participation.

Provision C.11.b. The remand resolution of the SF Bay Mercury TMDL made it clear that methyl mercury monitoring must be required of all NPDES Permittees. Methyl mercury is the most toxic form of mercury, and there is very little information, if any, regarding the concentrations of methyl mercury found in urban runoff. The purpose of the monitoring required through this provision is to obtain seasonal information and to assess the magnitude and spatial/temporal patterns of methylmercury concentrations in urban runoff.

Provisions C.11.c through Provision C.11.f relate to identical C.12 Provisions for PCBs. For each of these, sites for pilot studies will primarily be chosen on the basis of the potential for reducing PCB loads, but consideration will be given to mercury removal in the final design and implementation of the studies. For more information, see the fact sheet discussions for
Provisions C.12.c, d, e, and f and Provision C.2.g.

Provision C.11.g implements the TMDL requirement that Permittees measure mercury loads and loads reduced from program activities. There are three options for accomplishing this requirement: quantifying mercury loads reduced through implemented control measures, quantify mercury loading into the Bay from urban runoff, or demonstrating that the concentration of mercury on suspended sediment particles is below the sediment target of 0.2 ppm. It is likely that the first option will be chosen, and this will require development of an accounting system to establish what load reductions result from program activities. This will not be difficult for those measures that involve capture and measurement of mercury-containing sediment, but it will be more challenging for efforts that do not involve direct measurement.

Provision C.11.h is equivalent to Provision C.12.h for PCBs and is motivated by the same remaining technical uncertainties.

Provision C.11.i requires actions that manage human health risk due to mercury and PCBs. These may include efforts to communicate the health risks of eating Bay fish and other efforts aimed at high risk-communities.

Provision C.11.j requires an allocation sharing scheme to be developed in cooperation with Caltrans. The urban runoff TMDL allocation implicitly includes loads from Caltrans facilities.

C.12. PCBs Controls

The C.12 provisions are consistent with the regulatory approach and implementation plan of the San Francisco Bay PCBs TMDL adopted by the Water Board. They follow the general approach for sediment-bound pollutants discussed above where we seek to build our understanding and level of certainty concerning control actions by implementing actions in a phased approach. We then expand implementation of those actions that prove effective, and perhaps scale back or discontinue those that are not effective. Accordingly, there are some provisions that will be implemented throughout the region, some that will be tested on a limited basis first before making the decision to expand region-wide in the next permit term.

Fact Sheet Findings in Support of Provision C.12

C.12-2 On February 13, 2008, the Water Board adopted a Basin Plan amendment establishing a TMDL for PCBs in San Francisco Bay and an implementation plan to achieve the TMDL. Approval by the State Water Board and USEPA is pending. The following excerpts from the TMDL implementation plan are relevant to implementation of the municipal stormwater permit.

"Stormwater runoff wasteload allocations shall be achieved within 20 years and shall be implemented through the NPDES stormwater permits issued to stormwater runoff management agencies and the California Department of Transportation (Caltrans). The urban stormwater runoff wasteload allocations implicitly include all current and future permitted discharges, not otherwise addressed by another allocation, and unpermitted discharges within the geographic boundaries of stormwater runoff management agencies including, but not limited to, Caltrans roadway and non-roadway facilities and rights-of-way, atmospheric deposition, public facilities, properties proximate to stream banks, industrial facilities, and construction sites.

Requirements in each NPDES permit issued or reissued shall be based on an updated assessment of best management practices and control measures intended to reduce PCBs in urban stormwater runoff. Control measures implemented by stormwater runoff management agencies and other entities (except construction and industrial sites) shall reduce PCBs in stormwater runoff to the maximum extent practicable. Control measures for construction and industrial sites shall reduce discharges based on best available technology economically achievable. All permits shall remain consistent with Section 4.8 - Stormwater Discharges.

In the first five-year permit term, stormwater Permittees will be required to implement control measures on a pilot scale to determine their effectiveness and technical feasibility. In the second permit term, stormwater Permittees will be required to implement effective control measures, that will not cause significant adverse environmental impacts, in strategic locations, and to develop a plan to fully implement control measures that will result in

attainment of allocations, including an analysis of costs, efficiency of control measures and an identification of any significant environmental impacts. Subsequent permits will include requirements and a schedule to implement technically feasible, effective and cost efficient control measures to attain allocations. If, as a consequence, allocations cannot be attained, the Water Board will take action to review and revise the allocations and these implementation requirements as part of adaptive implementation.

In addition, stormwater Permittees will be required to develop and implement a monitoring system to quantify PCBs urban stormwater runoff loads and the load reductions achieved through treatment, source control and other actions; support actions to reduce the health risks of people who consume PCBs-contaminated San Francisco Bay fish; and conduct or cause to be conducted monitoring, and studies to fill critical data needs identified in the adaptive implementation section.

Stormwater runoff management agencies have a responsibility to oversee various discharges within the agencies' geographic boundaries. However, if it is determined that a source is substantially contributing to PCBs loads to the Bay or is outside the jurisdiction or authority of an agency the Water Board will consider a request from an stormwater runoff management agency which may include an allocation, load reduction, and/or other regulatory requirements for the source in question."

C.12-3 **Some PCB congeners have dioxin-like properties.** Dioxins are persistent, bioaccumulative, toxic compounds that are produced from the combustion of organic materials in the presence of chlorine. Dioxins enter the air through fuel and waste emissions, including diesel and other motor vehicle exhaust fumes and trash incineration, and are carried in rain and contaminate soil. Dioxins bioaccumulate in fat, and most human exposure occurs through the consumption of animal fats, including those from fish. Therefore, the actions targeting PCBs will likely have the simultaneous benefit of addressing a portion of the dioxin impairment resulting from dioxin-like PCBs.

Specific Provision C.12 Requirements

Provision C.12.a. PCBs were used in a variety of electrical devices and equipment, some of which still can be found during industrial inspections. Provision C.12.a requires the stormwater management agencies to ensure that industrial inspectors can identify PCBs or PCB-containing equipment during their inspections and make sure appropriate agencies are notified if they are found. There is enough experience and/or background knowledge about the presence of such PCB-containing equipment that this measure should be implemented region-wide during this permit term.

Provision C.12.b. PCBs are used in a variety of building materials like caulks and adhesives. PCBs contained in such materials can be liberated and transported in runoff during and after demolition and renovation activities. At this point, it is not known how extensive this type of PCB contamination is in the region. Therefore, the expectation for

this permit term is that Permittees conduct pilot studies (Provision C.12.b) that includes evaluation of the presence of PCBs in such materials, sampling and analysis, and BMP development to prevent PCBs in these materials from being released into the environment during demolition and renovation. Conducting these pilot tests and reporting results will help determine if control measures for PCBs from these sources should be implemented in a more widespread fashion in the next permit term.

Provisions C.12.c and C.12.d form the core of PCB-related efforts for this permit term, and these efforts are crucial for the iterative development of effective control measures for PCBs and other sediment-bound pollutants in future permit terms. The overarching purpose of these two provisions is to conduct five comprehensive pilot studies in locations known to contain high levels of PCBs. The pilot studies will involve a combination of efforts including abatement of the on-land PCB contamination (Provision C.12.c) as well as exploration of sediment management practices (C.12.d) that can be implemented by municipalities to control migration of the PCBs away from the source of contamination. We expect that a suite of control measures will be applied in these five pilot regions to determine the optimum suite of measures for controlling PCB contamination and preventing its transport through the storm drain system. The lessons learned through these pilot efforts will inform the direction of future efforts targeting contaminated zones throughout the Region in subsequent permit terms.

Provision C.12.e. One promising management practice for addressing a wide range of sediment-bound contaminants, including PCBs is on-site treatment. Provision C.12.e requires selection of 10 locations for pilot studies spanning treatment types as described in the Provision. This effort can be conducted in conjunction with Provision C.12.d such that on-site treatment efforts conducted as part of C.12.d can be counted toward accomplishing C.12.e requirements.

Provision C.12.f. Another promising management practice is the diversion of certain flows to the sanitary sewers to be treated by the local POTWs. Provision C.12.f requires an evaluation of locations for diversion pilot studies and implementation of pilot studies at five pump stations. This effort can be conducted in conjunction with Provision C.12.d such that POTW diversion efforts conducted as part of C.12.d can be counted toward accomplishing C.12.f requirements. Also see discussion under Provision C.2.g.

Provision C.12.g requires, consistent with the approach taken in the PCBs TMDL, development of a monitoring system to quantify PCBs loads and loads reduced through source control, treatment and other management measures. This monitoring system will be used to determine progress toward meeting TMDL load allocations. This system should establish the baseline loading or loads reduced against which to compare future loading and load reductions.

Provision C.12.h. There are still uncertainties surrounding the magnitude and nature of PCBs reaching the Bay in urban runoff and the ultimate fate of such PCBs, including biological uptake. Provision C.12.h requires that Permittees ensure that fate and transport studies of PCBs in urban runoff are completed.

Provision C.12.i. requires actions that manage human health risk due to mercury and PCBs. These may include efforts to communicate the health risks of eating Bay fish and other efforts aimed at high risk-communities.

C.13. Copper Controls

Chronic and acute site-specific objectives (SSOs) for dissolved copper have been established in all segments of San Francisco Bay. The plan to implement the SSOs and ensure the achievement and ongoing maintenance of the SSOs in the entire Bay includes two types of actions for urban runoff management agencies. These actions from the SSO implementation are implemented through this permit as provisions to control urban runoff sources of copper as well as measures to resolve remaining technical uncertainties for copper fate and effects in the Bay.

The control measures for urban runoff target significant sources of copper identified in a report produced in 2004 for the Clean Estuary Partnership.[120] This report updated information on sources of copper in urban runoff, loading estimates and associated level of uncertainty, and summarized feasible control measures and priorities for further investigation. Accordingly, the permit provisions target major sources of copper including vehicle brake pads, architectural copper, copper pesticides, and industrial copper use.

Fact Sheet Findings in Support of Provision C.13.

C.13-1 Urban runoff is a conveyance mechanism by which copper reaches San Francisco Bay.

C.13-2 Copper has the reasonable potential to cause or contribute to exceedances of copper water quality standards in San Francisco Bay.

C.13-3 Site specific water quality objectives for dissolved copper have already been adopted for South San Francisco Bay will soon be adopted for the rest of the Bay.

C.13-4 The Permit requirements to control copper to the MEP are necessary to implement and support ongoing achievement of the site-specific water quality objectives.

Specific Provision C.13. Requirements

Provision C.13.a. Copper is used as an architectural feature in roofs, gutters and downspouts. When these roofs are cleaned with aggressive cleaning solutions, substantial amounts of copper can be liberated. The provision C.13.a for architectural copper involves a variety of strategies ranging from BMPs to prohibition against discharge of these cleaning wastes to the storm drain.

[120] TDC (TDC Environmental). 2004. *Copper Sources in Urban Runoff and Shoreline Activities*. Prepared for the Clean Estuary Partnership.

Provision C.13.b. Copper is commonly used as an algaecide in pools, spas, and fountains. The provision C.13.b prohibits discharge to the storm drain of copper-containing wastewater from such amenities.

Provision C.13.c. Vehicle brake pads are a large source of copper to the urban environment. There are cooperative efforts (e.g., the Brake Pad Partnership) evaluating the potential effects of brake wear debris on water quality. This cooperative effort could result in voluntary actions to reduce the amount of copper in automobile brake pads. However, this voluntary reduction is uncertain, and some aftermarket brake pads are possibly unaffected by the voluntary action. Moreover, the benefits of copper content reduction might be slowly realized because there is a great deal of wear debris already deposited on watersheds, and this wear debris will continue to be deposited as long as copper-containing brake pads are in use. Therefore, there might need to be additional measures addressing copper-containing wear debris on the part of urban stormwater management agencies. Provision C.13.c requires ongoing participation in the cooperative efforts of the Partnership.

Provision C.13.d Some industrial facilities likely use copper or have sources of copper (e.g., plating facilities, metal finishers, auto dismantlers). This control measure requires municipalities to include these facilities in their inspection program plans.

The most recent Staff Report[121] for the SSOs north of the Dumbarton Bridge also describes several areas of remaining technical uncertainty, and **Provision C.13.e** requires studies to address these uncertainties. Two of these areas are of particular concern, and urban runoff management agencies are required to conduct or cause to be conducted studies to help resolve these two uncertainties.

The first uncertainty concerns copper's tendency, even at low concentrations, to cause a variety of sublethal (not resulting in death, but in impaired function) effects. The studies documenting such effects have, so far, been conducted in the laboratory in experiments modeling freshwater systems, and many of them have not yet been published. A number of uncertainties need to be resolved before interpretation and extension to marine or estuarine systems can be attempted.[122]

The second uncertainty is that surface sediment samples have exhibited toxicity to test organisms at a number of sites throughout the Bay. Research has shown that sediment toxicity to bivalve embryos is caused by "elevated concentrations of divalent cations….with copper as the most probable cause of toxicity." Additional studies are needed to further examine whether water and sediment toxicity tests used in the RMP are accurate predictors of impacts on the Bay's aquatic and benthic communities.

[121] SFBRWQCB (San Francisco Bay Regional Water Quality Control Board). 2007. *Copper Site-Specific Objectives in San Francisco Bay: Proposed Basin Plan Amendment and Draft Staff Report.* June.
[122] Ibid.

C.14. Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides and Selenium

This section is predicated on the fact that legacy pesticides, PBDEs, and selenium are either known to impair or potentially impair Bay and tributary beneficial uses. Further, urban stormwater is a likely or potential cause or contributor to such impairment. The requirements for this permit term are primarily information gathering consistent with Provision C.1. Namely, this provision requires that Permittees gather information on a number of pollutants of concern (e.g., PBDEs, DDT, dieldrin, chlordane, selenium) for which TMDLs are planned or are in the early stages of development.

The goals of the provisions in this section are the following: One goal is to determine the concentrations and distribution of these pollutants and if urban runoff is a conveyance mechanism associated with their possible impairment of San Francisco Bay.

A second goal is to gather and provide information to allow calculation of PBDEs, legacy pesticides, and selenium loads to San Francisco Bay from urban runoff conveyance systems. A third goal is to identify control measures and/or management practices to eliminate or reduce discharges of PBDEs, legacy pesticides, or selenium conveyed by urban runoff conveyance systems. The Permittees are encouraged to work with the other municipal stormwater management agencies in the Bay Region to implement a plan to identify, assess, and manage controllable sources of these pollutants in urban runoff. The control actions initiated for PCBs will form the core of initial actions targeting sediment bound pollutants like these. It is very likely that some of these PCB control measures (see Provision C.12) warrant consideration for the control of sediment bound pollutants like PBDEs, legacy pesticides, and possibly others as well.

C.15. Exempted and Conditionally Exempted Discharges

Legal Authority

Broad Legal Authority: CWA section 402(p)(3)(B)(ii-iii), CWC section 1337, and Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators, "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Permittees shall prevent all types of illicit discharges into the MS4 except for certain non-stormwater discharges.

Fact Sheet Findings in Support of Provision C.15.

Prohibition A.1. effectively prohibits the discharge of non-stormwater discharges into the storm sewer system. However, we recognize that certain types of non-stormwater discharges may be exempted from this prohibition if they are unpolluted and do not violate water quality standards. Other types of non-stormwater discharges may be conditionally exempted from Prohibition A.1. if the discharger employs appropriate control measures and BMPs prior to discharge, and monitors and reports on the discharge.

Specific Provision C.15. Requirements

Provision C.15.a. Exempted Non-Stormwater Discharges. This section of the Permit identifies the types of non-stormwater discharges that are exempted from Discharge Prohibition A.1. if such discharges are unpolluted and do not violate water quality standards. If any exempted non-stormwater discharge is identified as a source of pollutants to receiving waters, the discharge shall be addressed as a conditionally exempted discharge and must meet the requirements of Provision C.15.b.

Provision C.15.b. Conditionally Exempted Non-Stormwater Discharges. This section of the Permit identifies the types of non-stormwater discharges that are conditionally exempted from Discharge Prohibition A.1. if they are identified by Permittees or the Executive Officer as not being sources of pollutants to receiving waters. To eliminate adverse impacts from such discharges, project proponents shall develop and implement appropriate pollutant control measures and BMPs, and where applicable, shall monitor and report on the discharges in accordance with the requirements specified in Provision C.15.b. The intent of Provision C.15.b.'s requirements is to facilitate Permittees in regulating these non-stormwater discharges to the storm drains since the Permittees have ultimate responsibility for what flows in those storm drains to receiving waters. For all planned discharges, the nature and characteristic of the discharge must be verified prior to the discharge so that effective

pollution control measures are implemented, if deemed necessary. Such preventative measures are cheaper by far than post-discharge cleanup efforts.

Provision C.15.b.i.(1). Pumped Groundwater from Non Drinking Water Aquifers. These aquifers tend to be shallower than drinking water aquifers and more subject to contamination. The wells must be purged prior to sample collection. Since wells are purged regularly, this section of the Permit requires twice a year monitoring of these aquifers. Pumped groundwater from non drinking water aquifers, which are owned and/or operated by Permittees who pump groundwater as drinking water, are conditionally exempted as long as the discharges meet the requirements in this section of the Permit.

Provision C.15.b.i.(2). Pumped Groundwater, Foundation Drains, and Water from Crawl Space Pumps and Footing Drains. This section of the Permit encourages these types of discharges to be directed to landscaped areas or bioretention units, when feasible. If the discharges cannot be directed to vegetated areas, it requires testing to determine if the discharge is uncontaminated. Uncontaminated discharges shall be treated, if necessary, to meet specified discharge limits for turbidity and pH.

Provision C.15.b.ii. Air Conditioning Condensate. Small air conditioning units are usually operated during the warm weather months. The condensate from these units are uncontaminated and unlikely to reach a storm drain or waters of the State because they tend to be low in volume and tend to evaporate or percolate readily. Therefore, condensate from small air conditioning units should be discharged to landscaped areas or the ground. Commercial and industrial air conditioning units tend to produce year-round continuous flows of condensate. It may be difficult to direct a continuous flow to a landscaped area large enough to accommodate the volume. While the condensate tends to be uncontaminated, it picks up contaminates on its way to the storm drain and/or waters of the State and can contribute to unnecessary dry weather flows. Therefore, discharges from new commercial and industrial air conditioning units should be discharged to landscaped areas, if they can accommodate the continuous volume, or to the sanitary sewer, with the local sanitary sewer agency's approval. If none of these options are feasible, air conditioning condensate can be directly discharged into the storm drain. If descaling or anti-algal agents are used to treat the air conditioning units, residues from these agents must be properly disposed of.

Provision C.15.b.iii. Planned, Unplanned, and Emergency Discharges of the Potable Water System.. Potable water discharges contribute pollution to water quality in receiving waters because they contain chlorine or chloramines, two very toxic chemicals to aquatic life. Potable water discharges can cause erosion and scouring of stream and creek banks, and sedimentation can result if effective BMPs are not implemented. Therefore, appropriate dechlorination and monitoring of chlorine residual, pH and turbidity, particularly for planned discharges of potable water, are crucial to prevent adverse impacts in the receiving waters.

This section of the Permit requires Permittees to notify Water Board staff at least one week in advance for planned discharges of potable water with a flowrate of 250,000 gpd or more or a total 500,000 gallons or more. These planned discharges must meet specified discharge benchmarks for chlorine residual, pH, and turbidity.

To address unplanned discharges of potable water such as non-routine water line breaks, leaks, overflows, fire hydrant shearing, and emergency flushing, this section of the Permit requires Permittees to implement administrative BMPs such as source control measures, managerial practices, operations and maintenance procedures or other measures to reduce or prevent potential pollutants from being discharged during these events. This Provision also contains specific notification and monitoring requirements to assess immediate and continued impacts to water quality when these events happen.

This section of the Permit acknowledges that in cases of emergency discharge, such as from firefighting and disasters, priority of efforts shall be directed toward life, property, and the environment, in that order. Therefore, Permittees are required to implement BMPs that do not interfere with immediate emergency response operations or impact public health and safety. Reporting requirements for such events shall be determined by Water Board staff on a case-by-case basis.

Provision C.15.b.iv. Individual Residential Car Washing. Soaps and automotive pollutants such as oil and metals can be discharged into storm drains and waterbodies from individual residential car washing activities. However, it is not feasible to prohibit individual residential car washing because it would require too much resources for the Permittees to regulate the prohibition. This section of the Permit requires Permittees to encourage residents to implement BMPs such as directing car washwaters to landscaped areas, using as little detergent as possible, and washing cars at commercial car washing facilities.

Provision C.15.b.v. Swimming Pool, Hot tub, Spa, and Fountain Water Discharges. These types of discharges can potentially contain high levels of chlorine and copper. Permittees shall prohibit the discharge of such waters that contain chlorine residual, copper algaecide, filter backwash, or other pollutants to the storm drains or to waterbodies. High flow rates into the storm drain or waterbody could cause erosion and scouring of the stream or creek banks. These types of discharges should be directed to landscaped areas large enough to accommodate the volume or to the sanitary sewer, with the local sanitary sewer's approval. If these discharge options are not feasible and the swimming pool, hot tub, spa, or fountain water discharges must enter the storm drain, they must be dechlorinated to non-detectable levels of chlorine and they must not contain copper algaecide. Flow rate should be regulated to minimize downstream erosion and scouring. We strongly encourage local sanitary sewer agencies to accept these types of non-stormwater discharges, especially for new and rebuilt ones where a connection could be achieved with marginal effort. This Provision also requires Permittees to coordinate with local sanitary agencies in these efforts.

Provision C.15.b.v.i. Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering. Fertilizers and pesticides can be washed off of landscaping and discharged into storm drains and waterbodies. However, it is not feasible to prohibit excessive irrigation because it would require too much resource for the Permittees to regulate such a prohibition. It is also not feasible for individual Permittees to ban the use fertilizers and pesticides. This section of the Permit requires Permittees to promote and/or work with potable water purveyors to promote measures that minimize runoff and pollutant loading from excess irrigation, such as conservation programs, outreach regarding overwatering and less toxic options for pest control and landscape management, the use of drought tolerant and native vegetation, and to implement appropriate illicit discharge response and enforcement for ongoing, large-volume landscape irrigation runoff to the storm drains.

Provision C.15.b.vii. requires Permittees to identify and describe additional types and categories of discharges not listed in Provision C.15.b., that they propose to conditionally exempt from Prohibition A.1., in periodic submittals to the Executive Officer.

Provision C.15.b.viii. establishes a mechanism to authorize under the Permit non-stormwater discharges owned or operated by the Permittees.

Attachment J: Standard NPDES Stormwater Permit Provisions

The following legal authority applies to Attachment J:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in federal NPDES regulation 40 CFR 122.41.

Attachment J includes Standard Provisions. These Standard Provisions ensure that NPDES stormwater permits are consistent and compatible with USEPA's federal regulations. Some Standard Provision sections specific to publicly owned sewage treatment works are not included in Attachment J.

Fact Sheet Attachment 6.1

Construction Inspection Data

Construction Inspection Data

Facility/Site Inspected	Inspection Date	Weather During Inspection	Inches of Rain Since Last Inspection	Enforcement Response Level	Problem(s) Observed							Specific Problem(s)	Resolution			Comments/ Rationale for Longer Compliance Time
					Erosion Control	Runon and Runoff Control	Sediment Control	Active Treatment System	Good Site Management	Non Stormwater Management	Illicit Discharge		Problems Fixed	Need More Time	Escalate Enforcement	
Panoramic Views	9/30/08	Dry	0	Written Notice			x					Driveway not stabilized				
Panoramic Views	10/15/08	Dry	0.5										x			50' of driveway rocked.
Panoramic Views	11/15/08	Rain	3	Stop Work	x		x				x	Uncovered graded lots eroding; Sediment entering a stormdrain that didn't have adequate protection.				
Panoramic Views	11/15/08	Drizzling	0.25										x			Lots blanketed. Storm drains pumped. Street cleaned.
Panoramic Views	12/1/08	Dry	4	Verbal Warning					x			Porta potty next to stormdrain.	x			Porta potty moved away from stormdrain.
Panoramic Views	1/15/08	Rain	3.25	Written Warning	x					x		Fiber rolls need maintenance; Tire wash water flowing into street				
Panoramic Views	1/25/09	Dry	0										x			Fiber rolls replaced.

Facility/Site Inspected	Inspection Date	Weather During Inspection	Inches of Rain Since Last Inspection	Enforcement Response Level	Problem(s) Observed							Specific Problem(s)	Resolution			Comments/ Rationale for Longer Compliance Time
					Erosion Control	Runon and Runoff Control	Sediment Control	Active Treatment System	Good Site Management	Non Stormwater Management	Illicit Discharge		Problems Fixed	Need More Time	Escalate Enforcement	
Panoramic Views	2/28/09	Rain	2.4	Stop Work	x		x				x	Slope erosion control failed. Fiber rolls at the bottom of the hill flattened. Sediment laden discharge skipping protected stormdrains and entering unprotected stormdrains.				
Panoramic Views	2/28/09	Rain	0.1											x		Fiber rolls replaced. Silt fences added. More stormdrains protected. Streets cleaned. Slope too soggy to access.
Panoramic Views	3/15/09	Dry	1	Citation with Fine					x		x	Paint brush washing not designated	x			Street and storm drains cleaned. Slopes blanketed.
Panoramic Views	4/1/09	Dry	0.5	Citation with Fine							x	Concrete washout overflowed; Evidence of illicit discharge				
Panoramic Views	4/15/09	Dry	0										x			Concrete washout replaced; Storm drain and line cleaned.

Fact Sheet Attachment 10.1

303(d) Trash Resolution and Staff Report February 2009

Available at
http://www.waterboards.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0008.pdf

ATTACHMENT A

Provision C.3.b.
Sample Reporting Table

Provision C.3.b. Sample Reporting Table
Regulated Projects Approved During the Reporting Period 07/08 to 06/09
City of Eden Annual Report FY 2008-09

Project Name, Project Number, Location, Street Address,	Name of Developer, Project Phase No.,[1] Project Type & Description	Project Watershed[2]	Total Site Area, Total Area of Land Disturbed	Total New and/or Replaced Impervious Surface Area[3]	Total Pre- and Post-Project Impervious Surface Area[4]	Status of Project[5]	Source Control Measures	Site Design Measures	Treatment Systems Installed[6]	Operation & Maintenance Responsibility Mechanism	Hydraulic Sizing Criteria	Alternative Compliance Measures[7,8]	HM Controls[9,10]
Private Projects													
Nirvana Estates; Project #05-122; Property bounded by Paradise Lane, Serenity Drive, and Eternity Circle; Eden, CA	Heavenly Homes; Phase 1; Construction of 156 single-family homes and 45 townhomes with commercial shops and underground parking.	Runoff from site drains to Babbling Brook	25 acres site area, 21 acres disturbed	20 acres new	20 acres post-project	Application submitted 12/29/07, Application deemed complete 1/30/08, Project approved 7/16/08	Stenciled inlets, street sweeping, covered parking, car wash pad drains to sanitary sewer	Pervious pavement for all driveways, sidewalks, and commercial plaza	vegetated swales, detention basins,	Conditions of Approval require Homeowners Association to perform regular maintenance. Written record will be made available to City inspectors.	WEF Method	n/a	Contra Costa sizing charts used to design detention basin at Peace Park. Also contributed to in-stream projects in Babbling Brook
Barter Heaven; Project #05-345; Shoppers Lane & Bargain Avenue; 14578 Shoppers Lane, Eden, CA	Deals Galore Development Co.; Demolition of strip mall and parking lot and construction of 500-unit 5-story shopping mall with underground parking and limited outdoor parking.	Runoff from site drains to Bargain River	5 acres site area, 3 acres disturbed	1 acre new, 2 acres replaced	3.5 acres pre-project, 4.5 acres post-project	Application submitted 7/9/08, Application deemed complete 8/2/08, Project approved 12/12/08	Stenciled inlets, trash enclosures, underground parking, street sweeping	One-way aisles to minimize outdoor parking footprint; roof drains to planter boxes	tree wells with bioretention; planter boxes with bioretention	Conditions of Approval require property owner (landlord) to perform regular maintenance. Written record will be made available to City inspectors.	BMP Handbook Method	$ 250,000 paid to Renew Regional Project sponsored by Riverworks Foundation, 243 Water Way, Eden, CA 408-345-6789	Renew Project includes treatment and HM Controls

Provision C.3.b. Sample Reporting Table
Regulated Projects Approved During the Reporting Period 07/08 to 06/09
City of Eden Annual Report FY 2008-09

Project Name, Project Number, Location, Street Address,	Name of Developer, Project Phase No.,[1] Project Type & Description	Project Watershed[2]	Total Site Area, Total Area of Land Disturbed	Total New and/or Replaced Impervious Surface Area[3]	Total Pre- and Post-Project Impervious Surface Area[4]	Status of Project[5]	Source Control Measures	Site Design Measures	Treatment Systems Installed[6]	Operation & Maintenance Responsibility Mechanism	Hydraulic Sizing Criteria	Alternative Compliance Measures[7,8]	HM Controls[9,10]
New Beginnings; Project No. #05-456; Hope Street & Chance Road; 567 Hope Boulevard, Eden, CA	Fresh Start Corporation; Demolition of abandoned warehouse and construction of a 5-story building with 250 low-income rental housing units.	Runoff from site drains to Poor Man Creek	5 acres site area, 100,000 ft^2 disturbed	1 acre replaced	2 acres pre-project, 1 acre post-project	Application submitted 2/9/09, Application deemed complete 4/10/09; Project approved 6/30/09	Trash enclosures, underground parking, street sweeping, car wash pad drains to sanitary sewer	roof drains to landscaping	parking runoff flows to six bioretention units/gardens	Conditions of Approval require property owner (landlord) to perform regular maintenance. Written record will be made available to City inspectors.	BMP Handbook Method	n/a	n/a
Public Projects													
Gridlock Relief, Project No. #05-99, ABC Blvd between Main and Huett Streets, Eden, CA	City of Eden. Widening of ABC Blvd from 4 to 6 lanes	Runoff from site drains to Congestion River	6 acres site area, 3 acres disturbed	2 acres new, 1 acre replaced	4 acres pre-project, 6 acres post-project	Application submitted 7/9/06, Application deemed complete 10/6/08, Project approved 12/9/08, Construction scheduled to begin 7/10/09	none	ABC Blvd sloped to drain runoff into landscaped areas in median	Runoff leaving underdrain system of landscaped median is pumped to bioretention gardens along either side of ABC Blvd	Signed statement from City of Eden assuming post-construction responsibility for treatment BMP maintenance.	WEF Method	n/a	BAHM used to design and size stormwater treatment units so that increased runoff is detained.

Sample Reporting Table C.3.b. Footnotes

1. If a project is being constructed in Phases, use a separate row entry for each Phase.
2. State the watershed(s) that the Regulated Project drains to. Optional but recommended: Also state the downstream watershed(s).
3. State both the total new impervious surface area and the total replaced impervious surface area, as applicable.
4. For redevelopment projects state both the pre-project impervious surface area and the post-project impervious surface area.
5. State project application date; application deemed complete date; and final, major, staff-level discretionary review and approval date.
6. List stormwater treatment system(s) installed onsite or at a joint stormwater treatment system facility.
7. For Alternative Compliance at an offsite location in accordance with Provision C.3.e.i.(1), on a separate page, give a discussion of the alternative compliance site including the information specified in Provision C.3.b.v.(1)(m)(i) for the offsite project.
8. For Alternative Compliance by paying in-lieu fees in accordance with Provision C.3.e.i.(2), on a separate page, provide the information specified in Provision C.3.b.v.(1)(m)(ii) for the Regional Project.
9. If HM control is not required, state why not.
10. If HM control is required, state control method used (e.g., method to design and size device(s) or method(s) used to meet the HM Standard, and description of device(s) or method(s) used, such as detention basin(s), biodetention unit(s), regional detention basin, or in-stream control).

Instructions for Provision C.3.b. Sample Reporting Table

1. **Project Name, Number, Location, and Street Address** – Include the following information:
   - Name of the project
   - Number of the project (if applicable)
   - Location of the project with cross streets
   - Street address of the project (if available)

2. **Name of Developer, Project Phase Number, Project Type, and Project Description** – Include the following information:
   - Name of the developer
   - Project phase name and/or number (only if the project is being developed in phases) – each phase should have a separate row entry
   - Type of development (i.e., new and/or redevelopment)
   - Description of development (e.g., 5-story office building, residential with 160 single-family homes with five 4-story buildings to contain 200 condominiums, 100 unit 2-story shopping mall, mixed use retail and residential development (apartments), industrial warehouse)

3. **Project Watershed**
   - State the watershed(s) that the Project drains into
   - Optional but recommended: Also state the downstream watershed(s)

4. **Total Site Area and Total Area of Land Disturbed** – State the total site area and the total area of land disturbed.

5. **Total New and/or Replaced Impervious Surface Area**
   - State the total new impervious surface area
   - State the total replaced impervious surface area, as applicable

6. **Total Pre- and Post-Project Impervious Surface Area** – For redevelopment projects, state both the pre-project impervious surface area and the post-project impervious surface area.

7. **Status of Project –** Include the following information:
   - Project application submittal date
   - Project application deemed complete date
   - Final, major, staff-level discretionary review and approval date

8. **Source Control Measures** – List all source control measures that have been or will be included in the project.

9. Site Design Measures – List all site design measures that have been or will be included in the project.

10. Treatment Systems Installed – List all post-construction stormwater treatment system(s) installed onsite and/or at a joint stormwater treatment system facility.

11. Operation and Maintenance Responsibility Mechanism – List the legal mechanism(s) that have been or will be used to assign responsibility for the maintenance of the post-construction stormwater treatment systems.

12. Hydraulic Sizing Criteria Used – List the hydraulic sizing criteria used for the Project.

13. Alternative Compliance Measures

- **Option 1: LID Treatment at an Offsite Location (Provision C.3.e.i.(1))** – On a separate page, give a discussion of the alternative compliance project including the information specified in Provision C.3.b.v.(1)(m)(i) for the offsite project.
- **Option 2: Payment of In-Lieu Fees (Provision C.3.e.i.(2))** – On a separate page, provide the information specified in Provision C.3.b.v.(1)(m)(ii).

14. HM Controls

- If HM control is not required, state why not
- If HM control is required, state control method used (e.g., method to design and size device(s), method(s) used to meet the HM Standard, and description of device(s) or method(s) used, such as detention basin(s), biodetention unit(s), regional detention basins, or in-stream control)

ATTACHMENT B

Provision C.3.g.
Alameda Permittees
Hydromodification Management Requirements

Alameda Permittees Hydromodification Management Requirements

1. On-site and Regional Hydromodification Management (HM) Control Design Criteria

a. *Range of flows to control*: Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10 percent of the pre-project 2-year peak flow[123] up to the pre-project 10-year peak flow, except where the lower endpoint of this range is modified as described in Section 6 of this Attachment.

b. *Goodness of fit criteria*: The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10 percent over more than 10 percent of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate*: Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving waterbody. This flow rate (also called *Qcp*[124]) shall be no greater than 10 percent of the pre-project 2-year peak flow unless a modified value is substantiated by analysis of actual channel resistance in accordance with an approved User Guide as described in Section 6 of this Attachment.

d. *Standard HM modeling*: On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM[125]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the most current BAHM User's Manual.[126] Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made are consistent with the requirements of this Attachment and Provision C.3.f.

e. *Alternate HM modeling and design*: The project proponent may use a continuous simulation hydrologic computer model[127] to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the

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[123] Where referred to in this Order, the 2-year peak flow is determined using a flood frequency analysis procedure based on USGS Bulletin 17 B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35–50 years of data) is run through a continuous simulation hydrologic model, the annual peak flows are identified, rank ordered, and the 2-year peak flow is estimated. Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers' Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

[124] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[125] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, and A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[126] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, and A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[127] Such models include US EPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Surface Water Management Model (SWMM).

pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a-e above are met.

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, *and* where the project's runoff cannot be directed to a regional HM control within a reasonable time frame, *and* where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, *and* (2) stormwater treatment measures that collectively minimize, slow, and detain[128] runoff to the maximum extent practicable. In addition, the project proponent shall provide for or contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM Standard and the Provision C.3.d treatment requirement exceeds 2 percent of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM controls:* A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional HM control is in place by the time of project construction.

c. *In-stream measures practicability:* In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

d. *Financial contribution to an alternative HM project:* The difference between 2 percent of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a of this Attachment) shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure that is not otherwise required by the Water Board or other regulatory agency. Preference shall be given to projects discharging, in this order, to the same tributary, mainstem, watershed, then in the same municipality or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

[128] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media and include bioretention units, bioswales, basins, planter boxes, tree wells, media filters, and green roofs.

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM Project (name, location, date of start up, entity responsible for maintenance); and

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale. Permittees shall submit this list and explanation annually with the Annual Report. This may be prepared at the Countywide Program level and submitted on behalf of participating Permittees.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects are in areas of HM applicability shown in the Alameda Permittees' HM Map.[129] (available at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf). Plans to restore a creek reach may reintroduce the applicability of HM requirements; in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

To assist in location and evaluation of project applicability, the Alameda Permittees' HM Map depicts a number of features including the following:

- Hardened channels and culverts at least 24 inches in diameter (green solid or dashed lines);
- Natural channels (red lines);
- Boundaries of major watersheds (light blue lines); and
- Surface streets and highways (gray or black lines).

These data are of varying age, precision and accuracy and are not intended for legal description or engineering design. Watersheds extending beyond the County boundaries are shown for illustration purposes only. Project proponents are responsible for verifying and describing actual conditions of site location and drainage.

5. Alameda Permittees' HM Map is color-coded as follows:

a. Solid pink areas – Solid pink designates hilly areas, where high slopes (greater than 25 percent) occur. The HM Standard and all associated requirements apply in areas shown in solid pink on the map. In this area, the HM Standard does *not* apply if a project proponent demonstrates that all project runoff will flow through enclosed storm drains, existing concrete culverts, or fully hardened (with bed and banks continuously concrete-lined) channels to the tidal area shown in light gray.

b. Purple/red hatched areas – These are upstream of areas where hydromodification impacts are of concern because of factors such as bank instability, sensitive habitat, or restoration projects. The HM Standard and all associated requirements apply in areas

[129] The watercourses potentially susceptible to hydromodification impacts are identified based on an assessment approach developed by Balance Hydrologics (2003).

shown in purple/red (printer-dependant) hatch marking on the map. Projects in these areas may be subject to additional agency reviews related to hydrologic, habitat or other watershed-specific concerns.

c. **Solid white areas** – Solid white designates the land area between the hills and the tidal zone. This area may be susceptible to hydromodification unless the site is connected to storm drains that discharge to the tidal area. The HM Standard and all associated requirements apply to projects in solid white areas *unless* a project proponent demonstrates that all project runoff will flow through fully hardened channels.[130] Short segments of engineered earthen channels (length less than 10 times the maximum width of trapezoidal cross-section) can be considered resistant to erosion if located downstream of a concrete channel of similar or greater length and comparable cross-sectional dimensions. Plans to restore a hardened channel may affect the HM Standard applicability in this area.

d. **Solid gray areas** – Solid gray designates areas where streams or channels are tidally influenced or primarily depositional near their outfall in San Francisco Bay. The HM Standard does not apply to projects in this area. Plans to restore a hardened channel may affect the HM Standard applicability in this area.

e. **Dark gray, *Eastern County* area** – Dark gray designates the portion of eastern Alameda County that lies outside the discharge area of this NPDES permit. This area is in the Central Valley Regional Water Quality Control Board's jurisdiction.

6. Potential Exceptions to Alameda Permittees' HM Map Designations

The Program may choose to prepare a User Guide[131] to be used for evaluating individual receiving waterbodies using detailed methods to assess channel stability and watercourse critical flow. This User Guide would reiterate and collate established stream stability assessment methods that have been presented in the Program's HMP.[132] After the Program has collated its methods into a User Guide format, received approval of the User Guide from the Executive Officer,[133] and informed the public through such process as an electronic mailing list, the Permittees may use the User Guide to guide preparation of technical reports for the following: implementing the HM Standard using in-stream or regional HM controls; determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in these requirements); and/or determining if a watercourse has a higher critical flow and project(s) discharging to it are eligible for an alternative Qcp for the purpose of designing on-site or regional measures to control flows draining to these channels (i.e., the actual threshold of erosion-causing critical flow is higher than 10 percent of the 2-year pre-project flow). In no case shall the design value of Qcp exceed 50 percent of the 2-year pre-project flow.

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[130] In this paragraph, *fully hardened channels* include enclosed storm drains, existing concrete culverts, or channels whose bed and banks are continuously concrete-lined to the tidal area shown in light gray on the map.

[131] The User Guide may be offered under a different title.

[132] The Program's HMP has undergone Water Board staff review and been subject to public notice and comment.

[133] The User Guide shall not introduce a new concept, but rather reformat existing methods; therefore, Executive Officer approval is appropriate.

ATTACHMENT C

Provision C.3.g.
Contra Costa Permittees
Hydromodification Management Requirements

Contra Costa Permittees Hydromodification Management Requirements

1. Demonstrating Compliance with the Hydromodification Management (HM) Standard

Contra Costa Permittees shall ensure that project proponents shall demonstrate compliance with the HM Standard by demonstrating that any one of the following four options is met:

a. *No increase in impervious area.* The project proponent may compare the project design to the pre-project condition and show that the project will not increase impervious area and also will not facilitate the efficiency of drainage collection and conveyance.

b. *Implementation of hydrograph modification IMPs.* The project proponent may select and size IMPs to manage hydrograph modification impacts, using the design procedure, criteria, and sizing factors specified in the Contra Costa Clean Water Program's *Stormwater C.3 Guidebook*. The use of flow-through planters shall be limited to upper-story plazas, adjacent to building foundations, on slopes where infiltration could impair geotechnical stability, or in similar situations where geotechnical issues prevent use of IMPs that allow infiltration to native soils. Limited soil infiltration capacity in itself does not make use of other IMPs infeasible.

c. *Estimated post-project runoff durations and peak flows do not exceed pre-project durations and peak flows.* The project proponent may use a continuous simulation hydrologic computer model such as USEPA's Hydrograph Simulation Program—Fortran (HSPF) to simulate pre-project and post-project runoff, including the effect of proposed IMPs, detention basins, or other stormwater management facilities. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, using limitations and instructions provided in the Program's *Stormwater C.3 Guidebook*, and shall show that the following criteria are met:

i. For flow rates from 10 percent of the pre-project 2-year runoff event (0.1Q2) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10 percent over more than 10 percent of the length of the flow duration curve.

ii. For flow rates from 0.5Q2 to Q2, the post-project *peak flows* shall not exceed pre-project peak flows. For flow rates from Q2 to Q10, post-project peak flows may exceed pre-project flows by up to 10 percent for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10 percent for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10.

d. *Projected increases in runoff peaks and durations will not accelerate erosion of receiving stream reaches.* The project proponent may show that, because of the specific characteristics of the stream receiving runoff from the project site, or because of proposed stream restoration projects, or both, there is little likelihood that the cumulative impacts from new development could increase the net rate of stream erosion to the extent that beneficial uses would be significantly impacted. To use this option, the project proponent shall evaluate the receiving stream to determine the relative risk of erosion impacts and take the appropriate actions as described below and in Table A-1. Projects 20 acres or larger in total area shall not use the medium risk methodology in *(d)ii* below.

i. ***Low Risk.*** In a report or letter report, signed by an engineer or qualified environmental professional, the project proponent shall show that all downstream channels between the project site and the Bay/Delta fall into one of the following *low-risk* categories.

(1) Enclosed pipes.

(2) Channels with continuous hardened beds and banks engineered to withstand erosive forces and composed of concrete, engineered riprap, sackcrete, gabions, mats, and such. This category excludes channels where hardened beds and banks are not engineered continuous installations (i.e., have been installed in response to localized bank failure or erosion).

(3) Channels subject to tidal action.

(4) Channels shown to be aggrading (i.e., consistently subject to accumulation of sediments over decades) and to have no indications of erosion on the channel banks.

ii. ***Medium Risk.*** Medium risk channels are those where the boundary shear stress could exceed critical shear stress as a result of hydrograph modification but where either the sensitivity of the boundary shear stress to flow is low (e.g., an oversized channel with high width to depth ratios) or where the resistance of the channel materials is relatively high (e.g., cobble or boulder beds and vegetated banks). In *medium-risk* channels, accelerated erosion due to increased watershed imperviousness is not likely but is possible, and the uncertainties can be more easily and effectively addressed by mitigation than by additional study.

In a preliminary report, the project proponent's engineer or qualified environmental professional shall apply the Program's *Basic Geomorphic Assessment*[134] methods and criteria to show each downstream reach between the project site and the Bay/Delta is either at *low-risk* or *medium-risk* of accelerated erosion due to watershed development. In a following, detailed report, a qualified stream geomorphologist[135] shall use the Program's Basic Geomorphic Assessment methods and criteria, available information, and current field data to evaluate each *medium-risk* reach. For *each medium-risk* reach, the detailed report shall show one of the following:

[134] Contra Costa Clean Water Program *Hydrograph Modification Management Plan*, May 15, 2005, Attachment 4, pp. 6-13. This method must be made available in the Program's *Stormwater C.3 Guidebook.*

[135] Typically, detailed studies will be conducted by a stream geomorphologist retained by the lead agency (or, on the lead agency's request, another public agency such as the Contra Costa County Flood Control and Water Conservation District) and paid for by the project proponent.

(1) A detailed analysis, using the Program's criteria, showing the particular reach may be reclassified as *low-risk.*

(2) A detailed analysis, using the Program's criteria, confirming the *medium-risk* classification, and:

(a) A preliminary plan for a mitigation project for that reach to stabilize stream beds or banks, improve natural stream functions, and/or improve habitat values, and

(b) A commitment to implement the mitigation project timely in connection with the proposed development project (including milestones, schedule, cost estimates, and funding), and

(c) An opinion and supporting analysis by one or more qualified environmental professionals that the expected environmental benefits of the mitigation project substantially outweigh the potential impacts of an increase in runoff from the development project, and

(d) Communication, in the form of letters or meeting notes, indicating consensus among staff representatives of regulatory agencies having jurisdiction that the mitigation project is feasible and desirable. In the case of the Regional Water Board, this must be a letter, signed by the Executive Officer or designee, specifically referencing this requirement. (This is a preliminary indication of feasibility required as part of the development project's Stormwater Control Plan. All applicable permits must be obtained before the mitigation project can be implemented.)

iii. ***High Risk.*** High-risk channels are those where the sensitivity of boundary shear stress to flow is high (e.g., incised or entrenched channels, channels with low width-to-depth ratios, and narrow channels with levees) or where channel resistance is low (e.g., channels with fine-grained, erodible beds and banks, or with little bed or bank vegetation). In a *high-risk* channel, it is presumed that increases in runoff flows will accelerate bed and bank erosion.

To implement this option (i.e., to allow increased runoff peaks and durations to a high-risk channel), the project proponent must perform a comprehensive analysis to determine the design objectives for channel restoration and must propose a comprehensive program of in-stream measures to improve channel functions while accommodating increased flows. Specific requirements are developed case-by-case in consultation with regulatory agencies having jurisdiction. The analysis will typically involve watershed-scale continuous hydrologic modeling (including calibration with stream gauge data where possible) of pre-project and post-project runoff flows, sediment transport modeling, collection and/or analysis of field data to characterize channel morphology including analysis of bed and bank materials and bank vegetation, selection and design of in-stream structures, and project environmental permitting.

2. IMP Model Calibration and Validation

The Program shall monitor flow from Hydrograph Modification Integrated Management Practices (IMPs) to determine the accuracy of its model inputs and assumptions. Monitoring

shall be conducted with the aim of evaluating flow control effectiveness of the IMPs. The Program shall implement monitoring where feasible at future new development projects to gain insight into actual versus predicted rates and durations of flow from IMP overflows and underdrains.

At a minimum, Permittees shall monitor five locations for a minimum of two rainy seasons. If two rainy seasons are not sufficient to collect enough data to determine the accuracy of model inputs and assumptions, monitoring shall continue until such time as adequate data are collected.

Permittees shall conduct the IMP monitoring as described in the IMP Model Calibration and Validation Plan in Section 5 of this Attachment. Monitoring results shall be submitted to the Executive Officer by June 15 of each year following collection of monitoring data. If the first year's data indicate IMPs are not effectively controlling flows as modeled in the HMP, the Executive Officer may require the Program to make adjustments to the IMP sizing factors or design, or otherwise take appropriate corrective action. The Permittees shall submit an IMP Monitoring Report by August 30 of the second year[136] of monitoring. The IMP Monitoring Report shall contain, at a minimum, all the data, graphic output from model runs, and a listing of all model outputs to be adjusted, with full explanation for each. Board staff will review the IMP Monitoring Report and require the Program to make any appropriate changes to the model within a 3-month time frame.

3. Stormwater C.3 Guidebook and IMP Design Criteria

The Current Contra Costa Clean Water Program C.3 Guidebook, 4th Edition (September 2008) shall be implemented until the expiration of this permit (November 2014). Any significant changes in the designs of the IMPs, their sizing factors or manner of implementation shall be approved by the Water Board.

4. IMP Model Calibration and Validation Plan Objective

Monitoring shall be conducted with the aim of evaluating flow control effectiveness of the IMPs. The IMPs were redesigned in 2008 to meet a low flow criterion of 0.2Q2, not 0.1Q2, which is current HMP standard for Contra Costa County. The Program shall implement monitoring at future new development projects at a minimum of five locations and for a minimum of two rainy seasons to gain insight into actual versus predicted rates and durations of flow from IMP overflows and underdrains. If two rainy seasons are not sufficient to collect enough data to determine the accuracy of model inputs and assumptions, monitoring shall continue until such time as adequate data are collected.

a. The Dischargers Shall Identify and Establish Monitoring Sites – Program staff shall work with municipal Co-Permittees to identify potential monitoring sites on development projects that implement IMPs. Proposed sites shall be identified during review of planning and zoning applications so that monitoring stations can be designed and constructed as part of the development project. Monitoring shall begin after the development project is complete and the site is in use.

Criteria for appropriate sites include**,** but are not limited to**,** the following:

[136] If the monitoring extends beyond 2 years, an IMP Monitoring Report shall be submitted by August 30 annually until model calibration and validation is complete.

- To ensure applicability of results, the development project and IMPs should be typical of development sites and types of IMPs foreseen throughout the County. In particular, at least one each of the infiltration planter, flow-through planter, and *dry* swale shall be selected for monitoring.
- The area tributary to the IMP should be clearly defined, should contain and direct runoff at all rainfall intensities to the IMP. Two monitoring locations shall contain tributary areas that are a mix of pervious and impervious areas to test the pervious area simplifying assumptions used in the HMP, Table 14, Attachment 2, page 49. If no such locations are constructed by the monitoring period, modeling of mixed (pervious and impervious) tributary areas can substitute for direct monitoring of this type of location.
- The site shall be easily accessible at all times of day and night to allow inspection and maintenance of measurement equipment.
- Hourly rain gauge data representative of the site's location shall be available.

b. Documentation of Monitoring Sites – The Dischargers shall record and report (i.e., document) pertinent information for each monitoring site. Documentation of each monitoring site shall include the following:

- Amount of tributary area;
- Condition of roof or paving;
- Grading and drainage to the IMP, including calculated time of concentration.
- Locations and elevations of inlets and outlets;
- As-built measurements of the IMP including depth of soil and gravel layers, height of underdrain pipe above the IMP floor or native soil;
- Detailed specifications of soil and gravel layers and of filter fabric and other appurtenances; and
- Condition of IMP surface soils and vegetation.

c. Design, Construction, and Operation of Monitoring Sites – The Dischargers shall ensure that IMPs selected for monitoring are equipped with a manhole, vault, or other means to install and access equipment for monitoring flows from IMP overflows and underdrains.

Development of suitable methods for monitoring the entire range of flows may require experiment. The Program and Water Board are interested in the timing and duration of very low flows from underdrains, as well as higher flows from IMP overflows. The Dischargers shall ensure that equipment is configured to measure the entire range of flows and to avoid potential clogging of orifices used to measure low flows.

The Dischargers shall ensure that construction of IMPs is inspected carefully to ensure that IMPs are installed as designed and to avoid potential operational problems. For example, gravel used for underdrain layers should be washed free of fines, and filter fabric should be installed without breaks.

The Dischargers shall ensure that, following construction, artificial flows are applied to the IMP to verify the IMP and monitoring equipment are operating correctly and to resolve any operational problems prior to measuring flows from actual rain storms.

The Dischargers shall ensure that monitoring equipment is properly maintained. Maintenance of monitoring equipment will require, initially, inspections during and after storms that produce runoff. The inspection and maintenance schedule may be adjusted as additional experience is gained.

d. Data to be Obtained – The Dischargers shall collect the following data for each IMP, during the monitoring period:

- Hourly rainfall and more frequent rainfall data where available;
- Hourly IMP outflow and 15-minute outflow for all time periods in which sub-hourly rainfall data are available;
- Hourly IMP inflow (if possible) and more frequent inflow (if possible) when sub-hourly rainfall data are available; and
- Notes and observations.

e. Evaluation of Data – The principal use of the monitoring data shall be a comparison of predicted to actual flows. The Dischargers shall ensure that the HSPF model is set up as it was to prepare the curves in Attachment 2 of the HMP, with appropriate adjustments for the drainage area of the IMP to be monitored and for the actual sizing and configuration of the IMP. Hourly rainfall data from observed storms shall be input to the model, and the resulting hourly predicted output recorded. Where sub-hourly rainfall data are available, the model shall be run with, and output recorded for, 15-minute time steps.

The Dischargers shall compare predicted hourly outflows to the actual hourly outflows. As more data are gathered, the Dischargers may examine aggregated data to characterize deviations from predicted performance at various storm intensities and durations.

Because high-intensity storms are rare, it will take many years to obtain a suitable number of events to evaluate IMP performance under overflow conditions. Underdrain flows will occur more frequently, but possibly only a few times a year, depending on rainfall and IMP characteristics (e.g., extent to which the IMP is oversized, and actual, rather than predicted, permeability of native soils). However, evaluating a range of rainfall events that do *not* produce underflow will help demonstrate the effectiveness of the IMP.

5. Record Keeping and Reporting

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance); and

f. A list and thorough technical explanation of any changes in design criteria for HM Controls, including IMPs. Permittees shall submit this list and explanation annually with the Annual Report.

6. The current Contra Costa Clean Water Program C.3 Guidebook, 4th Edition (C.3 Guidebook) (September 2008) design approach and IMPs shall be used to comply with Provision C.3.g flow requirements until this permit expires and is reissued, pending model verification studies as described below. The IMPs shall be an implementation option as the flow control implementation for development projects up to a footprint of 30 acres

By April 1, 2014, the Contra Costa Clean Water Program shall submit a proposal containing one or a combination of the following three options (a.-c.) for implementation after the expiration and reissuance of this permit:

a. Present model verification monitoring results demonstrating that the IMPs are sufficiently overdesigned and perform to meet the 0.1Q2 low flow design criteria; or

b. Present study results of Contra Costa County streams geology and other factors that support the low flow design criteria of 0.2Q2 as the limiting HMP design low flow; or

c. Propose redesigns of the IMPs to meet the low flow design criteria of 0.1Q2 to be implemented during the next permit term.

ATTACHMENT D

Provision C.3.g.
Fairfield-Suisun Permittees
Hydromodification Management Requirements

Fairfield-Suisun Permittees Hydromodification Management Requirements

1. On-site and Regional Hydromodification Management (HM) Control Design Criteria

a. *Range of flows to control*: Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 20 percent of the pre-project 2-year peak flow[137] up to the pre-project 10-year peak flow.

b. *Goodness of fit criteria*: The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10 percent over more than 10 percent of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate:* Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving waterbody. This flow rate (also called Qcp[138]) shall be no greater than 20 percent of the pre-project 2-year peak flow.

d. *Standard HM modeling:* On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM[139]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the most current BAHM User Manual.[140] Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made are consistent with this Attachment and Provision C.3.g.

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[137] Where referred to in this Order, the 2-year peak flow is determined using a flood flow frequency analysis procedure based on USGS Bulletin 17 B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35–50 years of data) is run through a continuous simulation hydrologic model, the annual peak flows are identified, rank ordered, and the 2-year peak flow is estimated. Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers' Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

[138] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[139] See www.bayareahydrologymodel.org , Resources

[140] *The Bay Area Hydrology Model User Manual* is available at http://www.bayareahydrologymodel.org/downloads.html.

e. *Alternate HM modeling and design:* The project proponent may use a continuous simulation hydrologic computer model[141] to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a–c above are met.

f. *Sizing Charts:* The Program developed design procedures, criteria, and sizing factors for infiltration basins and bioretention units, based on a low flow rate that exceeds the allowable low flow rate. After the Program has modified its sizing factors[142] to the allowable criteria, received approval of the modified sizing factors from the Executive Officer,[143] and informed the public through such mechanism as an electronic mailing list, project proponents may meet the HM Standard by using the Program's design procedures, criteria, and sizing factors for infiltration basins and/or bioretention units.

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, *and* where the project's runoff cannot be directed to a regional HM control within a reasonable time frame, *and* where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, *and* (2) stormwater treatment measures that collectively minimize, slow, and detain[144] runoff to the maximum extent practicable. In addition, if the cost of providing site design for hydrologic source control and treatment measures to the maximum extent practicable does not exceed 2% of the project cost (as defined in "2.a." below), the project proponent shall provide for or contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM Standard and the Provision C.3.d. treatment requirement exceeds 2 percent of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM controls*: A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional HM control is in place by the time of project construction.

c. *In-stream measures practicability*: In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

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[141] Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

[142] Current sizing factors and design criteria are shown in Appendix D of the FSURMP HMP.

[143] The modified sizing factors will not introduce a new concept but rather make an existing compliance mechanism more stringent; therefore, Executive Officer approval is appropriate.

[144] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, tree wells, media, filters, and green roofs.

d. *Financial contribution to an alternative HM project*: The difference between 2 percent of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a of this Attachment) shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure. Preference shall be given to projects discharging, in this order, to the same tributary, mainstem, watershed, then in the same municipality or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance); and

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale. Permittees shall submit this list and explanation annually with the Annual Report.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects discharge into the upstream reaches of Laurel or Ledgewood Creeks, as delineated in the Fairfield-Suisun Permittees' HM Maps (available at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf.). Plans to restore a creek reach may reintroduce the applicability of HM requirements; in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

ATTACHMENT E

Provision C.3.g.
San Mateo Permittees
Hydromodification Management Requirements

San Mateo Permittees Hydromodification Management Requirements

1. On-site and Regional Hydromodification Management (HM) Control Design Criteria

a. *Range of flows to control:* Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10 percent of the pre-project 2-year peak flow[145] up to the pre-project 10-year peak flow.

b. *Goodness of fit criteria*: The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10 percent over more than 10 percent of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate:* Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving waterbody. This flow rate (also called Qcp[146]) shall be no greater than 10 percent of the pre-project 2-year peak flow.

d. *Standard HM modeling*: On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM[147]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the

[145] Where referred to in this Order, the 2-year peak flow is determined using a flood flow frequency analysis procedure based on USGS Bulletin 17 B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35–50 years of data) is run through a continuous simulation hydrologic model, the annual peak flows are identified, rank ordered, and the 2-year peak flow is estimated. Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers' Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

[146] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[147] See www.bayareahydrologymodel.org , Resources

most current BAHM User Manual.[148] Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made are consistent with the requirements of Provision C.3.g.

e. *Alternate HM modeling and design*: The project proponent may use a continuous simulation hydrologic computer model[149] to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a.–c. above are met.

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, *and* where the project's runoff cannot be directed to a regional HM control within a reasonable time frame, *and* where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, *and* (2) stormwater treatment measures that collectively minimize, slow, and detain[150] runoff to the maximum extent practicable. In addition, , if the cost of providing site design for hydrologic source control and treatment measures to the maximum extent practicable does not exceed 2% of the project cost (as defined in "2.a." below), the project proponent shall provide for or contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM Standard and the Provision C.3.d treatment requirement exceeds 2 percent of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM controls:* A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional HM control is in place by the time of project construction.

c. *In-stream measures practicability:* In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

d. *Financial contribution to an alternative HM project*: The difference between 2 percent of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a of this Attachment shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or

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[148] The Bay Area Hydrology Model User Manualis available at http://www.bayareahydrologymodel.org/downloads.html

[149] Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

[150] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, tree wells, media filters, and green roofs.

in-stream measure. Preference shall be given to projects discharging, in this order, to the same tributary, mainstem, watershed, then in the same municipality, or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of startup, entity responsible for maintenance); and

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale. Permittees shall submit this list and explanation annually with the Annual Report. This may be prepared at the Countywide Program level and submitted on behalf of participating Permittees.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects are in the HM control areas shown in the San Mateo Permittees' HM Map (available at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf). Plans to restore a creek reach may reintroduce the applicability of HM requirements; in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

The HM Standard and all associated requirements apply in areas that are shown in green on the map and noted in the map's key as *areas subject to HMP*. The other areas are exempt from the HM Standard because they drain to hardened channels or low gradient channels (a characteristic applicable to San Mateo County's particular shoreline properties), or are in highly developed areas. Plans to restore a hardened channel may affect areas of applicability.

Areas shown in the San Mateo Permittees' HM Map may be modified as follows:

b. **Street Boundary Interpretation** – Streets are used to mark the boundary between areas where the HM Standard must be met and exempt areas. Parcels on the boundary street are considered within the area exempted from the hydromodification requirements. Nonetheless, there might be cases where the drainage from a particular parcel(s) on the boundary street drains westward into the hydromodification required area and, as such, any applicable project on such a parcel(s) would be subject to the hydromodification requirements.

c. **Hardened Channel/Drainage to Exempt Area** – If drainage leaving a proposed project subject to the HM Standard is determined to flow only through a hardened channel and/or enclosed pipe along its entire length before directly discharging into a waterway in the exempt area or into tidal waters, the project would be exempted from the HM Standard and its associated requirements. The project proponent must demonstrate, in a statement signed by an engineer or qualified environmental professional, that this condition is met.

d. **Boundary Re-Opener** – If the municipal regional permit or future permit reissuances or amendments modify the types of projects subject to the hydromodification requirements, the appropriate location for an HMP boundary or boundaries will be reevaluated at the same time.

ATTACHMENT F

Provision C.3.g.
Santa Clara Permittees
Hydromodification Management Requirements

Santa Clara Permittees Hydromodification Management Requirements

1. On-site and Regional Hydromodification Management (HM) Control Design Criteria

a. *Range of flows to control:* Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10 percent of the pre-project 2-year peak flow[151] up to the pre-project 10-year peak flow, except where the lower endpoint of this range is modified as described in Section 5 of this Attachment.

b. *Goodness of fit criteria*: The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10 percent over more than 10 percent of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate*: Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving waterbody. This flow rate (also called *Qcp*[152]) shall be no greater than 10 percent of the pre-project 2-year peak flow unless a modified value is substantiated by analysis of actual channel resistance in accordance with an approved User Guide as described in Section 5 of this Attachment.

d. *Standard HM modeling*: On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM[153]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the

[151] Where referred to in this Order, the 2-year peak flow is determined using a flood flow frequency analysis procedure based on USGS Bulletin 17B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35–50 years of data) is run through a continuous simulation hydrologic model, the annual peak flows are identified, rank ordered, and the 2-year peak flow is estimated. Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers' Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

[152] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[153] See www.bayareahydrologymodel.org , Resources.

most current BAHM User Manual.[154] Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made are consistent with this attachment and Provision C.3.g.

e. *Alternate HM modeling and design*: The project proponent may use a continuous simulation hydrologic computer model[155] to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a. – c. above are met.

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, *and* where the project's runoff cannot be directed to a Regional HM control[156] within a reasonable time frame, *and* where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, *and* (2) stormwater treatment measures that collectively minimize, slow, and detain[157] runoff to the maximum extent practicable. In addition, if the cost of providing site design for hydrologic source control and treatment measures to the maximum extent practicable does not exceed 2% of the project cost (as defined in "2.a." below), the project shall contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM Standard and the Provision C.3.d treatment requirement exceeds 2 percent of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM control:* A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional control is in place by the time of project construction.

c. *In-stream measures practicability:* In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

d. *Financial contribution to an alternative HM project:* The difference between 2 percent of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a of this Attachment) shall be contributed to an alternative

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[154] *The Bay Area Hydrology Model User Manual* is available at http://www.bayareahydrologymodel.org/downloads.html.

[155] Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

[156] *Regional HM controls* are flow duration control structures that collect stormwater runoff discharge from multiple projects (each of which should incorporate hydrologic source control measures as well) and are designed such that the HM Standard is met for all the projects at the point where the regional control measure discharges.

[157] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, sand filters, and green roofs.

HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure. Preference shall be given to projects discharging, in this order, to the same tributary, mainstem, watershed, then in the same municipality or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance); and

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale. Permittees shall submit this list and explanation annually with the Annual Report. This may be prepared at the Countywide Program level and submitted on behalf of participating Permittees.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects are located in areas of HM applicability as described below and shown in the Santa Clara Permittees' HM Map (available at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf).

a. **Purple areas**: These areas represent catchments that drain to hardened channels that extend continuously to the Bay or to tidally influenced sections of creeks. The HM Standard and associated requirements do not apply to projects in the areas designated in purple on the map.

Plans to restore a creek reach may reintroduce the applicability of HM requirements, unless the creek restoration project is designed to accommodate the potential hydromodification impacts of future development; if this is not the case, in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

b. **Red areas**: These areas represent catchments and subwatersheds that are greater than or equal to 65% impervious, based on existing imperviousness data sources. The HM Standard and associated requirements do not apply to projects in the areas designated in red on the map.

c. **Pink areas**: These are areas that are under review by the Permittees for accuracy of the imperviousness data. The HM Standard and associated requirements apply to projects in areas designated as pink on the map until such time as a Permittee presents new data that indicate that the actual level of imperviousness of a particular area is greater than or equal

to 65% impervious. Any new data will be submitted to the Water Board in one coordinated submittal within one year of permit adoption.

d. Green area: These areas represent catchments and subwatersheds that are less than 65% impervious and are not under review by the Permittees. The HM Standard and associated requirements apply to projects in areas designated as green on the map.

5. Potential Exceptions to Map Designations

The Program may choose to prepare a User Guide[158] to be used for evaluating individual receiving waterbodies using detailed methods to assess channel stability and watercourse critical flow. This User Guide would reiterate and collate established stream stability assessment methods that have been presented in the Program's HMP.[159] After the Program has collated its methods into User Guide format, received approval of the User Guide from the Executive Officer,[160] and informed the public through such process as an electronic mailing list, the Permittees may use the User Guide to guide preparation of technical reports for the following: implementing the HM Standard using in-stream or regional controls; determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in these requirements); and/or determining if a watercourse has a higher critical flow and project(s) discharging to it are eligible for an alternative Qcp for the purpose of designing on-site or regional measures to control flows draining to these channels (i.e., the actual threshold of erosion-causing critical flow is higher than 10 percent of the 2-year pre-project flow). In no case shall the design value of Qcp exceed 50 percent of the 2-year pre-project flow.

[158] The User Guide may be offered under a different title.
[159] The Program's HMP has undergone Water Board staff review and been subject to public notice and comment.
[160] The User Guide will not introduce a new concept, but rather reformat existing methods; therefore, Executive Officer approval is appropriate.

ATTACHMENT G

Provision C.3.h.
Sample Reporting Table

Table C.3.h. – Operation and Maintenance of Stormwater Treatment Systems
City of Eden Annual Report FY 2008-09

Facility/Site Inspected and Responsible Party for Maintenance	Date of Inspection	Type of Inspection (annual, follow-up, etc.)	Type of Treatment System or HM Control Inspected	Inspection Findings or Results	Enforcement Action Taken (Warning, NOV, administrative citation, etc.)	Comments
ABC Company 123 Alphabet Road San Jose	12/06/08	annual	offsite bioretention unit	proper operation	none	Unit is operating properly and is well maintained.
DEF site 234 Blossom Drive Santa Clara	12/17/08	annual	onsite media filter	ineffective filter media	verbal warning	Media filter is clogged and needs to be replaced.
	12/19/08	follow-up	onsite media filter	proper operation	none	New media filter in place and unit is operating properly.
	1/19/09	follow-up	onsite media filter	proper operation	none	Unit is operating properly.
GHI Hotel 1001 Grand Blvd 227 Touring Parkway	12/21/08	annual	onsite swales	proper operation	notice of violation	Bioretention unit #2 is badly eroded because of flow channelization. Stormwater is flowing over the eroded areas, bypassing treatment and running off into parking area.
			onsite bioretention unit #1	proper operation		
			onsite bioretention unit #2	eroded areas due to flow channelization		
	12/27/08	follow-up	onsite bioretention unit #2	proper operation	none	Entire bioretention unit #2 has been replanted and re-graded. Raining heavily but no overflow observed.
Rolling Hills Estates Homeowners' Association 543 Rolling Hill Drive Pleasanton	01/17/09	annual	onsite pond	sediment and debris accumulation	notice of violation	Pond needs sediment removal and check dam needs debris removal.
	01/24/09	follow-up	onsite pond	sediment and debris accumulation	administrative citation $1000	Pond still a mess. Administrative citation requires maintenance within a week.
	01/31/09	follow-up	onsite pond	proper maintenance	none	Pond maintenance completed.
	02/18/09	spot inspection	onsite pond	proper operation and maintenance	none	Proper operation and maintenance.

ATTACHMENT H

Provision C.8.
Status and Long-Term Monitoring
Follow-up Analysis and Actions

Status and Long-Term Monitoring Follow-up Analysis and Actions for Biological Assessment, Bedded Sediment Toxicity, and Bedded Sediment Pollutants

When results from Biological Assessment, Bedded Sediment Toxicity, and/or Bedded Sediment Pollutants monitoring indicate impacts at a monitoring location, Permittees shall evaluate the extent and cause(s) of impacts to determine the potential role of urban runoff as indicated in Table H-1.

Table H-1. Sediment Triad Approach to Determining Follow-Up Actions

Chemistry Results[161]	Toxicity Results[162]	Bioassessment Results[163]	Action
No chemicals exceed Threshold Effect Concentrations (TEC), mean Probable Effects Concentrations (PEC) quotient < 0.5 and pyrethroids < 1.0 Toxicity Unit (TU)[164]	No Toxicity	No indications of alterations	No action necessary
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	Toxicity	No indications of alterations	(1) Take confirmatory sample for toxicity. (2) If toxicity repeated, attempt to identify cause and spatial extent. (3) Where impacts are under Permittee's control, take management actions to minimize upstream sources causing toxicity; initiate no later than the second fiscal year following the sampling event.

[161] TEC and PEC are found in MacDonald, D.D., G.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environ. Contamination and Toxicology* 39(1):20–31.

[162] Toxicity is exhibited when *Hyallela* survival statistically different than and < 20 percent of control.

[163] Alterations are exhibited if metrics indicate substantially degraded community.

[164] Toxicity Units (TU) are calculated as follows: TU = Actual concentration (organic carbon normalized) ÷ Reported *H. azteca* LC_{50} concentration (organic concentration normalized). Weston, D.P., R.W. Holmes, J. You, and M.J. Lydy, 2005. Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides. *Environ. Science and Technology* 39(24):9778–9784.

Chemistry Results[161]	Toxicity Results[162]	Bioassessment Results[163]	Action
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	No Toxicity	Indications of alterations	Identify the most probable cause(s) of the alterations in biological community. Where impacts are under Permittee's control, take management actions to minimize the impacts causing physical habitat disturbance; initiate no later than the second fiscal year following the sampling event.
No chemicals exceed TECs, mean PEC quotient < 0.5 and pyrethroids< 1.0 TU	Toxicity	Indications of alterations	(1) Identify cause(s) of impacts and spatial extent. (2) Where impacts are under Permittee's control, take management actions to minimize impacts; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	No Toxicity	Indications of alterations	(1) Identify cause of impacts. (2) Where impacts are under Permittee's control, take management actions to minimize the impacts caused by urban runoff; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	Toxicity	No indications of alterations	(1) Take confirmatory sample for toxicity. (2) If toxicity repeated, attempt to identify cause and spatial extent. (3) Where impacts are under Permittee's control, take management actions to minimize upstream sources; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	No Toxicity	No Indications of alterations	If PEC exceedance is Hg or PCBs, address under TMDLs
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids > 1.0 TU	Toxicity	Indications of alterations	(1) Identify cause(s) of impacts and spatial extent. (2) Where impacts are under Permittee's control, take management actions to address impacts.

ATTACHMENT I

Provision C.8.
Standard Monitoring Provisions

All monitoring activities shall meet the following requirements:

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. [40 CFR 122.41(j)(1)]
2. Permittees shall retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, and copies of all reports required by this Order for a period of at least five (5) years from the date of the sample, measurement, report, or application. This period may be extended by request of the Water Board or USEPA at any time and shall be extended during the course of any unresolved litigation regarding this discharge. [40 CFR 122.41(j)(2), CWC section 13383(a)]
3. Records of monitoring information shall include [40 CFR 122.41(j)(3)]:
   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and,
   f. The results of such analyses.
4. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both. [40 CFR 122.41(j)(5)]
5. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the monitoring Provisions. [40 CFR 122.41(l)(4)(iii)]
6. All chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services or a laboratory approved by the Executive Officer.
7. For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Permittees shall instruct its laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Permittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Permittee must submit documentation from the laboratory to the Water Board for approval prior to raising the ML for any priority toxic pollutant.
8. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-

compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both. [40 CFR 122.41(k)(2)]

9. If the discharger monitors any pollutant more frequently than required by the Permit, unless otherwise specified in the Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the reports requested by the Water Board. [40 CFR 122.41(l)(4)(ii)]

ATTACHMENT J

Minimum Trash Capture Area
and
Minimum Number of Trash Hot Spots

Table 10.1 Minimum Trash Capture Area and Trash Hot Spots for Population Based Permittees

Data Source: http://quake.abag.ca.gov/mitigation/pickdbh2.html and Association of Bay Area Governments, 2005 ABAG Land Use Existing Land Use in 2005: Report and Data for Bay Area Counties

	Population	Retail / Wholesale Commercial Acres		**Minimum Trash Capture Catchment Area (Acres)**[165]		# of Trash Hot Spots per 30K Population	# of Trash Hot Spots per 100 Retail / Wholesale Commercial Acres	**Minimum # of Trash Hot Spots**[166]
Alameda County								
San Leandro	73,402	721		**216**		2	7	4
Oakland	420,183	759		**228**		14	8	8
Dublin	46,934	377		**113**		1	3	**3**
Emeryville	9,727	69		**21**		1	1	1
Albany	16,877	95		**28**		1	1	1
Berkeley	106,697	183		**55**		3	1	3
Alameda County Unincorporated.	140,825	375		**112**		4	3	4
Alameda	75,823	402		**121**		2	4	**4**
Fremont	213,512	698		**209**		7	6	7
Hayward	149,205	726		**218**		4	7	**7**
Livermore	83,604	423		**127**		2	4	**4**
Newark	43,872	314		**94**		1	3	**3**
Piedmont	11,100	1		**0.3**		1	1	1
Pleasanton	69,388	366		**110**		2	3	**3**
Union City	73,402	183		**55**		2	1	2

[165] 30% of Retail / Wholesale Commercial Acres

[166] If the hot spot # based on % commercial area is more than twice that based on population, the minimum hot spot # is double the population based #.

	Population	Retail / Wholesale Commercial Acres		**Minimum Trash Capture Catchment Area (Acres)**[165]		# of Trash Hot Spots per 30K Population	# of Trash Hot Spots per 100 Retail / Wholesale Commercial Acres	**Minimum # of Trash Hot Spots**[166]
San Mateo County								
San Mateo County Unincorporated.	65,844	71		**21**		2	1	2
Atherton	7,475	0		**0**		1	1	1
Belmont	26,078	58		**17**		1	1	1
Brisbane	3,861	16		**5**		1	1	1
Burlingame	28,867	123		**37**		1	1	1
Colma	1,613	106		**32**		1	1	1
Portola Valley	4,639	9		**3**		1	1	1
Daly City	106,361	242		**73**		3	2	3
East Palo Alto	32,897	59		**18**		1	1	1
Foster City	30,308	67		**20**		1	1	1
Half Moon Bay	13,046	49		**15**		1	1	1
Hillsborough	11,272	0		**0**		1	1	1
Menlo Park	31,490	83		**25**		1	1	1
Millbrae	21,387	68		**20**		1	1	1
Pacifica	39,616	100		**30**		1	1	1
Redwood City	77,269	309		**93**		2	3	**3**
San Bruno	43,444	137		**41**		1	1	1
San Carlos	28,857	129		**39**		1	1	1
San Mateo	95,776	275		**82**		3	2	3
South San Francisco	63,744	195		**58**		2	1	2
Woodside	5,625	9		**3**		1	1	1

	Population	Retail / Wholesale Commercial Acres		**Minimum Trash Capture Catchment Area (Acres)**[165]		# of Trash Hot Spots per 30K Population	# of Trash Hot Spots per 100 Retail / Wholesale Commercial Acres	**Minimum # of Trash Hot Spots**[166]
Contra Costa County								
Contra Costa County Unincorporated.	173,573	524		**157**		5	5	5
Concord	123,776	1016		**305**		4	10	8
Walnut Creek	65,306	329		**99**		2	3	**3**
Clayton	10,784	21		**6**		1	1	1
Danville	42,629	134		**40**		1	1	1
El Cerrito	23,320	105		**32**		1	1	1
Hercules	24,324	37		**11**		1	1	1
Lafayette	23,962	68		**20**		1	1	1
Martinez	36,144	142		**43**		1	1	1
Moraga	16,138	108		**32**		1	1	1
Orinda	17,542	24		**7**		1	1	1
Pinole	19,193	140		**42**		1	1	1
Pittsburg	63,652	520		**156**		2	5	4
Pleasant Hill	33,377	219		**66**		1	2	**2**
Richmond	103,577	391		**117**		3	3	3
San Pablo	31,190	131		**39**		1	1	1
San Ramon	59,002	274		**82**		1	2	**2**

	Population	Retail / Wholesale Commercial Acres		**Minimum Trash Capture Catchment Area (Acres)**[165]		# of Trash Hot Spots per 30K Population	# of Trash Hot Spots per 100 Retail / Wholesale Commercial Acres	**Minimum # of Trash Hot Spots**[166]
Santa Clara County								
Santa Clara County Unincorporated	99,122	270		**81**		3	3	3
Cupertino	55,551	213		**64**		2	2	2
Los Altos	28,291	65		**20**		1	1	1
Los Altos Hills	8,837	0		**0**		1	1	1
Los Gatos	30,296	163		**49**		1	1	1
Milpitas	69,419	457		**137**		2	4	**4**
Monte Sereno	3,579	0		**0**		1	1	1
Mountain View	73,932	375		**112**		2	3	**3**
Santa Clara	115,503	560		**168**		3	5	**5**
Saratoga	31,592	41		**12**		1	1	1
San Jose	989,496	2983		**895**		32	29	32
Sunnyvale	137,538	548		**164**		3	5	**5**
Palo Alto	63,367	282		**84**		2	2	2
Solano County								
Vallejo	120,416	559		**168**		4	5	**5**
Fairfield	106,142	486		**146**		3	4	**4**
Suisun	28,031	75		**22**		1	1	1
Totals	4,930,339	19057		**5718**		165	184	349

Table 10-2. Non-Population Based Permittee Trash Hot Spot and Trash Capture Assignments

Non population based Permittee	Number of Trash Hot Spots	Trash Capture Requirement
Santa Clara Valley Water District	12	4 trash booms or 8 outfall capture devices (minimum 2 ft. diameter outfall) or equivalent measures
Alameda County Flood Control Agency	9	3 trash booms or 6 outfall capture devices (minimum 2 ft. diameter outfall) or equivalent measures
Alameda Co. Zone 7 Flood Control Agency	3	1 trash boom or 2 outfall capture devices (minimum 2 ft. diameter outfall) or equivalent measures
Contra Costa County Flood Control Agency	6	2 trash booms or 4 outfall capture devices (minimum 2 ft. diameter outfall) or equivalent measures
San Mateo County Flood Control District	2	1 trash booms or 2 outfall capture devices (minimum 2 ft. diameter outfall) or equivalent measures
Vallejo Sanitation and Flood District	1	1 trash boom or 2 outfall capture devices or equivalent measures (minimum 2 ft. diameter outfall)

ATTACHMENT K

Standard NPDES Stormwater Permit Provisions

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION

Standard Provisions and Reporting Requirements for NPDES Stormwater Discharge Permits

February 2009

A. GENERAL PROVISIONS

1. Neither the treatment nor the discharge of pollutants shall create a pollution, contamination, or nuisance as defined by Section 13050 of the California Water Code.

2. All discharges authorized by this Order shall be consistent with the terms and conditions of this Order.

3. Duty to Comply

a. If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act, or amendments thereto, for a toxic pollutant which is present in the discharge authorized herein and such standard or prohibition is more stringent than any limitation upon such pollutant in a Board adopted Order, discharger must comply with the new standard or prohibition. The Board will revise or modify the Order in accordance with such toxic effluent standard or prohibition and so notify the discharger.

b. If more stringent applicable water quality standards are approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the discharger must comply with the new standard. The Board will revise and modify this Order in accordance with such more stringent standards.

c. The filing of a request by the discharger for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. [40 CFR 122.41(f)]

4. Duty to Mitigate

The discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this order and permit which has a reasonable likelihood of adversely affecting public health or the environment, including such accelerated or additional monitoring as requested by the Board or Executive Officer to determine the nature and impact of the violation. [40 CFR 122.41(d)]

5. Pursuant to U.S. Environmental Protection Agency regulations the discharger must notify the Water Board as soon as it knows or has reason to believe (1) that they have begun or expect to begin, use or manufacture of a pollutant not reported in the permit application,

or (2) a discharge of toxic pollutants not limited by this permit has occurred, or will occur, in concentrations that exceed the limits specified in 40 CFR 122.42(a).

6. The discharge of any radiological, chemical, or biological warfare agent waste is prohibited.

7. All facilities used for transport, treatment, or disposal of wastes shall be adequately protected against overflow or washout as the result of a 100-year frequency flood.

8. Collection, treatment, storage and disposal systems shall be operated in a manner that precludes public contact with wastewater, except where excluding the public is inappropriate, warning signs shall be posted.

9. Property Rights

This Order and Permit does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from liabilities under federal, state or local laws, nor create a vested right for the discharge to continue the waste discharge or guarantee the discharger a capacity right in the receiving water. [40 CFR 122.41(g)]

10. Inspection and Entry

The Board or its authorized representatives shall be allowed:

a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of the order and permit;

b. Access to and copy at, reasonable times, any records that must be kept under the conditions of the order and permit;

c. To inspect at reasonable times any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under the order and permit; and

d. To photograph, sample, and monitor, at reasonable times for the purpose of assuring compliance with the order and permit or as otherwise authorized by the Clean Water Act, any substances or parameters at any locations. [40 CFR 122.41(i)]

11. Permit Actions

This Order and Permit may be modified, revoked and reissued, or terminated in accordance with applicable State and/or Federal regulations. Cause for taking such action includes, but is not limited to any of the following:

a. Violation of any term or condition contained in the Order and Permit;

b. Obtaining the Order and Permit by misrepresentation, or by failure to disclose fully all relevant facts;

c. Endangerment to public health or environment that can only be regulated to acceptable levels by order and permit modification or termination; and

d. Any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

12. Duty to Provide Information

The discharger shall furnish, within a reasonable time, any information the Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit. The discharger shall also furnish to the Board, upon request, copies of records required to be kept by its permit. [40 CFR 122.41(h)]

13. Availability

A copy of this permit shall be maintained at the discharge facility and be available at all times to operating personnel.

14. Continuation of Expired Permit

This permit continues in force and effect until a new permit is issued or the Board rescinds the permit. Only those dischargers authorized to discharge under the expiring permit are covered by the continued permit.

B. GENERAL REPORTING REQUIREMENTS

1. Signatory Requirements

a. All reports required by the order and permit and other information requested by the Board or USEPA Region 9 shall be signed by a principal executive officer or ranking elected official of the discharger, or by a duly authorized representative of that person. [40 CFR 122.22(b)]

b. Certification

All reports signed by a duly authorized representative under Provision E.1.a. shall contain the following certification:
"I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. [40 CFR 122.22(d)]

2. Should the discharger discover that it failed to submit any relevant facts or that it submitted incorrect information in any report, it shall promptly submit the missing or correct information. [40 CFR 122.41(l)(8)]

3. False Reporting

Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall be subject to enforcement procedures as identified in Section F of these Provisions.

4. Transfers

a. This permit is not transferable to any person except after notice to the Board. The Board may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

b. Transfer of control or ownership of a waste discharge facility under an National Pollutant Discharge Elimination System permit must be preceded by a notice to the Board at least 30 days in advance of the proposed transfer date. The notice must include a written agreement between the existing discharger and proposed discharger containing specific dates for transfer of responsibility, coverage, and liability between them. Whether an order and permit may be transferred without modification or revocation and reissuance is at the discretion of the Board. If order and permit modification or revocation and reissuance is necessary, transfer may be delayed 180 days after the Board's receipt of a complete application for waste discharge requirements and an NPDES permit.

5. Compliance Reporting

a. Planned Changes

The discharger shall file with the Board a report of waste discharge at least 120 days before making any material change or proposed change in the character, location or volume of the discharge.

b. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final compliance dates contained in any compliance schedule shall be submitted within 10 working days following each scheduled date unless otherwise specified within this order and permit. If reporting noncompliance, the report shall include a description of the reason for failure to comply, a description and schedule of tasks necessary to achieve compliance and an estimated date for achieving full compliance. A final report shall be submitted within 10 working days of achieving full compliance, documenting full compliance

c. Non-compliance Reporting (Twenty-four hour reporting:)

i. The discharger shall report any noncompliance that may endanger health or the environment. All pertinent information shall be provided orally within 24 hours from the time the discharger becomes aware of the circumstances. A written submission shall also be provided within five working days of the time the discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

C. ENFORCEMENT

1. The provision contained in this enforcement section shall not act as a limitation on the statutory or regulatory authority of the Board.

2. Any violation of the permit constitutes violation of the California Water Code and regulations adopted hereunder and the provisions of the Clean Water Act, and is the basis for enforcement action, permit termination, permit revocation and reissuance, denial of an application for permit reissuance; or a combination thereof.

3. The Board may impose administrative civil liability, may refer a discharger to the State Attorney General to seek civil monetary penalties, may seek injunctive relief or take other appropriate enforcement action as provided in the California Water Code or federal law for violation of Board orders.

4. It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this order and permit.

5. A discharger seeking to establish the occurrence of any upset (See Definitions, G. 24) has the burden of proof. A discharger who wishes to establish the affirmative defense of any upset in an action brought for noncompliance shall demonstrate, through properly signed contemporaneous operating logs, or other relevant evidence that:

   a. an upset occurred and that the Permittee can identify the cause(s) or the upset;

   b. the permitted facility was being properly operated at the time of the upset;

   c. the discharger submitted notice of the upset as required in paragraph E.6.d.; and

   d. the discharger complied with any remedial measures required under A.4.

   No determination made before an action for noncompliance, such as during administrative review of claims that noncompliance was caused by an upset, is final administrative action subject to judicial review.
   In any enforcement proceeding, the discharger seeking to establish the occurrence of any upset has the burden of proof. [40 CFR 122.41(n)]

D. DEFINITIONS

1. DDT and Derivatives shall mean the sum of the p,p' and o,p' isomers of DDT, DDD (TDE), and DDE.

2. Duly authorized representative is one whose:

   a. Authorization is made in writing by a principal executive officer or ranking elected official;

   b. Authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as general manager in a partnership, manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

   c. Written authorization is submitted to the USEPA Region 9. If an authorization becomes no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements above must be submitted to the Board and USEPA Region 9 prior to

or together with any reports, information, or applications to be signed by an authorized representative.

3. Hazardous substance means any substance designated under 40 CFR 116 pursuant to Section 311 of the Clean Water Act.
4. HCH shall mean the sum of the alpha, beta, gama (Lindane), and delta isomers of hexachlorocyclohexane.
5. Overflow is defined as the intentional or unintentional spilling or forcing out of untreated or partially treated wastes from a transport system (e.g. through manholes, at pump stations, and at collection points) upstream from the plant headworks or from any treatment plant facilities.
6. Priority pollutants are those constituents referred to in 40 CFR S122, Appendix D and listed in the USEPA NPDES Application Form 2C, (dated 6/80) Items V-3 through V-9.
7. Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage. It excludes infiltration and runoff from agricultural land.
8. Toxic pollutant means any pollutant listed as toxic under Section 307(a)(1) of the Clean Water Act or under 40 CFR S401.15.
9. Total Identifiable Chlorinated hydrocarbons (TICH) shall be measured by summing the individual concentrations of DDT, DDD, DDE, aldrin, BHC, chlordane, endrin, heptachlor, lindane, dieldrin, PCBs and other identifiable chlorinated hydrocarbons.
10. Waste, waste discharge, discharge of waste, and discharge are used interchangeably in this order and permit. The requirements of this order and permit are applicable to the entire volume of water, and the material therein, which is disposed of to surface and ground waters of the State of California.

MEMBER AGENCIES:

Alameda

Alameda County

Alameda County Flood Control and Water Conservation District

Albany

Berkeley

Dublin

Emeryville

Fremont

Hayward

Livermore

Newark

Oakland

Piedmont

Pleasanton

San Leandro

Union City

Zone 7 of the Alameda County Flood Control District

STORMWATER QUALITY MANAGEMENT PLAN

July 2001 – June 2008

Alameda Countywide Clean Water Program

A Consortium of Local Agencies

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ACRONYMS

ACCWP	Alameda Countywide Clean Water Program
BASMAA	Bay Area Stormwater Management Agencies Association
BMPs	Best Management Practices
CDPR	California Department of Pesticide Regulation
CWA	Clean Water Act
DTSC	Department of Toxic Substances Control
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FY	Fiscal Year
GBP	Green Business Program
GIS	Geographic Information Systems
HHW	Household Hazardous Waste
I&IDC	Industrial and Illicit Discharge Control
II&ID	Illicit Discharge Controls and Industrial/Commercial Discharge Controls
IPM	Integrated Pest Management
MOA	Memorandum of Understanding
NAS	National Academy of Sciences
NPDES	National Pollutant Discharge Elimination System
P^2	Pollution Prevention
PCBs	Polychlorinated biphenyls
PCOs	Pest Control Operators
PI/P	Public Information and Participation
PRPs	Pollutant Reduction Plans
RMAS	Regional Monitoring and Assessment Strategy
RMP	Regional Monitoring Program for Trace Substances
SUSMPs	Standard Urban Stormwater Mitigation Plans
SWMM	Storm Water Management Model
TIEs	Toxicity Identification Evaluations
TMDL	Total Maximum Daily Load
U.S. EPA	United States Environmental Protection Agency
WAMS	Watershed Assessment and Monitoring Subcommittee

DEFINITIONS

Act	Porter-Cologne Water Quality Control Act
BMPs	Best Management Practices – Practices Implemented by private industry and public agencies which prevent or reduce water pollution.
District	Alameda County Flood Control and Water Conservation District
Plan	Stormwater Quality Management Plan
Program	Alameda County Clean Water Program
Regional Board	California Regional Water Quality Control Board, San Francisco Bay Region
Stakeholders	People that live and work in a watershed
State Board	State Water Resources Control Board

SECTION 1 INTRODUCTION AND BACKGROUND

INTRODUCTION

The Alameda Countywide Clean Water Program (Program) is a consortium of agencies within Alameda County that discharge stormwater to the San Francisco Bay. This Stormwater Quality Management Plan (Plan) describes the Program's approach to reducing stormwater pollution.

There are five major sections to the Plan. The Background provides a brief history of water quality regulations. The Program Description describes the structure, accomplishments, and recent developments of the Program. The Component Work Plans describe the objectives and tasks of each Program component. The Pollution Reduction Plans describe the actions the Program and the member agencies will take to address specific pollutants that are impairing water quality. Lastly, the Performance Standards list specific tasks that the member agencies are required to perform.

The Plan for FY 2001/02 through 2007/08 is the Program's third stormwater quality management plan and will serve as the basis of the Program's third stormwater discharge permit from the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board). The Plan was submitted to the Regional Board 180 days prior to the expiration of the Program's second permit on February 19, 2002. The federal Clean Water Act (1972) requires stormwater dischargers to reduce pollutants to the maximum extent practicable. The Plan, in conjunction with the permit adopted by the Regional Board, is designed to enable the consortium to meet that requirement.

BACKGROUND

HISTORY OF THE CLEAN WATER ACT

By the late 1960s, urbanization and industrialization had taken a toll on the nation's waters: many rivers and bays were visibly polluted. In response to growing public concern over water pollution, Congress passed the Clean Water Act (1972). The goals of the Clean Water Act are to restore the biological, physical, and chemical integrity of our nation's waters and to make all of our waters fishable and swimable.

Section 402 of the Clean Water Act (CWA) established the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES permit program set nationwide permitting requirements for discharging pollutants into waterways. The limits varied by category of industry and were based on a level of treatment that was achievable using the best available technology. The 1987 amendments to the CWA required that municipal stormwater discharges obtain NPDES permit coverage. These amendments required municipalities to effectively prohibit non-stormwater discharges to their storm drain systems and to implement controls to reduce pollutants in stormwater to the maximum extent practicable.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

In California, the State Water Resources Control Board (State Board) along with the nine Regional Boards has primary responsibility for regulating water quality. The State Board has overall responsibility for water quality regulation under division 7 of the Porter-Cologne Water Quality Control Act (Act). This Act also divides the state into nine hydrological basins, for local administration of the Act by the semiautonomous Regional Boards with coordination and oversight from the State Board. The Regional Boards have authority to regulate point source discharges, such as municipal stormwater discharges, through the adoption of waste discharge requirements under chapter 5.5 of the Act. In addition, the responsibility for implementing the NPDES permit program has been delegated to the State Board and its local Region Boards.

RECENT DEVELOPMENTS

The implementation of the CWA has been very effective in cleaning up our nation's waters. The reduction of pollution has been particularly dramatic for industrial and sanitary treatment plant discharges. For example, the amount of metals being discharged from these sources decreased by about 60 percent between 1986 and 1999 (T. Wu, personal communication, February 2001). However, many of our nation's waters still do not meet the goals set forth in the CWA. Two approaches to address this problem are being implemented, namely, the total maximum daily load (TMDL) program, and the watershed management approach.

TMDL Program

A TMDL is an estimate of the maximum quantity of a pollutant that could be discharged to a body of water while still ensuring the attainment of water quality standards. The TMDL program was established by Section 303 of the CWA. Congress correctly presumed that even after the implementation of technology based controls, some water bodies would not meet water quality standards. For each water body that does not meet applicable standards (referred to as "impaired"), a TMDL must be established. After the TMDL is established, additional requirements are placed on sources of the pollutant so that the total quantity of the pollutant discharged to the water body from all sources is no greater than the established TMDL.

In response to lawsuits, the U.S. Environmental Protection Agency (U. S. EPA) has recently initiated an intensive effort to develop TMDLs for all impaired waters. In the San Francisco Bay region, TMDLs are scheduled to be developed for mercury, PCBs, chlorinated pesticides, diazinon, sediment, and several other pollutants.

Watershed Management Approach

A watershed is the area of land that drains to a specific body of water. USEPA defines the watershed management approach as having the following components: problem identification, stakeholder involvement, and integrated actions. The watershed management approach is similar to the TMDL approach in that both address

water quality problems in a comprehensive manner. The difference between the two is that the TMDL approach is primarily a command and control approach, whereas the watershed management approach focuses on developing cooperative solutions. Under the watershed management approach, people that live and work in a watershed (stakeholders) develop a consensus regarding the best solutions to watershed problems. The watershed management approach can also encompass issues such as flood control, habitat restoration, and water supply, which are not specifically regulated by the CWA. This Plan describes the Program's involvement in both the TMDL program and the watershed management approach.

SUSMPs

SUSMPs (Standard Urban Stormwater Mitigation Plans) represent a new initiative by the State Board and Regional Boards to control the detrimental effects on water quality caused by new development and redevelopment. The Los Angeles Regional Water Quality Control Board initiated the use of SUSMPs, and under appeal to the State Board, its use was upheld in October 2000 as the statewide standard for what constitutes maximum extent practicable stormwater controls. In the Bay area SUSMPs will need to be tailored to fit local hydrologic and development conditions.

The Alameda Countywide Clean Water Program has long implemented the portion of the SUSMPs requiring the use of BMPs. One of the new parts is the requirement specifying that about 85 percent of the volume of runoff typical of an average wet season must be treated. Another new part will be the requirement to minimize the rate of runoff that flows from a project site in order to prevent increased erosion of creek channels.

It is expected that SUSMPs will be increasingly used to impose requirements on new development and redevelopment that will be more specific and numeric.

SECTION 2 PROGRAM DESCRIPTION

MISSION, VISION, AND STRATEGIC OBJECTIVES

Mission

The mission of the Alameda Countywide Clean Water Program is to help local residents, businesses and municipalities meet the stormwater quality goals of the Clean Water Act.

Vision

We, the member agencies, see the Alameda Countywide Clean Water Program as an innovative, nationally recognized leader in efficient and effective stormwater management, protecting and preserving our natural water resources and the San Francisco Bay.

Strategic Objectives: To accomplish its mission and vision, the Program has developed the following strategic objectives:

- Continue our self-directed, proactive approach fostering trust and respect from regulators and business and environmental groups;
- Produce tangible water quality improvements through expanded collaborations with other organizations;
- Communicate a clear vision of the Program's goals and objectives to the public, and to member agencies' staff, management, and elected officials; and,
- Improve communication links and working relationships among departments within member agencies and between the Program and Regional Board staff.

PROGRAM STRUCTURE

The following agencies are members of the Program: the cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City; the County of Alameda; the Alameda County Flood Control and Water Conservation District (District); and Zone 7 of the District. The Program was established in 1991 through a Memorandum of Agreement (MOA). The MOA established a General Program and individual programs. The General Program carries out activities in common on behalf of the member agencies. The individual programs are implemented by each member agency. A copy of the MOA is included in Appendix A.

As part of its individual program, each of the member agencies is responsible for complying with the NPDES permit requirements for discharges from its municipally owned storm drain system. The NPDES permit finds that enforcement actions will, wherever possible, be pursued only against the individual agency responsible for the violation. As an area wide activity, the General Program will inform any of the member agencies about potential significant permit compliance problems that it becomes aware of and will offer suggested solutions.

There are eight components to the Program: Planning and Regulatory

Compliance, Watershed Assessment, Monitoring and Special Studies, Public Information and Participation, Municipal Maintenance Activities, New Development and Construction Controls, Illicit Discharge Controls, and Industrial/Commercial Discharge Controls. Component objectives and tasks are described in Section 4. Individual Program activities are described in the Performance Standards (Section 5). Each component is coordinated through a subcommittee that is composed of representatives of the member agencies. All subcommittees report to the Management Committee which is the official decision making body for the Program.

General Program activities are funded by the member agencies through contributions proportional to their area and population. The General Program budget for fiscal year 2001-2002 is $2.1 million. A copy of the General Program component tasks and budgets for fiscal year 2001-2002 is included in Appendix B.

PROGRAM ACHIEVEMENTS

The Program has enjoyed significant achievements, such as, increasing public awareness, developing a model inspection program, initiating a watershed approach, and identifying diazinon as a significant stormwater toxicant. A few of the Program's achievements are described below; other achievements are described in the component work plans.

Public Awareness

A major focus of the Program's effort has been to raise the public's awareness of stormwater pollution and the public's role in preventing it. To accomplish that goal the Program initiated numerous activities; including, (1) participated in the Bay Area Stormwater Management Agencies Association's regional television advertising campaign "When Ants Invade," which promoted the use of less toxic pest control practices and won a national advertising industry award; (2) sponsored the development of innovative outreach programs such as *Bay Savers* and *Kids in Creeks,* which encourage watershed awareness and pollution prevention among elementary school students; (3) distributed over 100,000 educational brochures, fact sheets and promotional items; (4) stenciled over 10,000 drop inlets with the "No Dumping Drains to Bay" message; (5) provided over fifty community stewardship grants to local teachers and student groups, environmental groups, service clubs, homeowner associations, and other clean water partners; and (6) implemented two major point of purchase campaigns to educate consumers about less toxic alternatives to pesticides. These efforts have been very successful: in a recent survey of Alameda County residents, 45% of respondents mentioned stormwater runoff as a major cause of water pollution and 74%, believed that their behavior could affect water quality.[1]

Model Industrial/Commercial Stormwater Inspection Program

In 1993 the Program's municipalities started to conduct stormwater inspections combined with educational outreach to businesses. Since then, more than 10,000 inspections have been

conducted. Based on an evaluation of approximately 1,200 businesses inspected two or more times, the accomplishments of this inspection and educational effort include the following: 1) The number of non-stormwater discharges decreased by about one-fourth; 2) a decline of almost one-half occurred in the number of businesses judged to have a high potential to discharge pollutants to stormwater; and 3) an increase was observed in the use of Best Management Practices. In some ways the program has served as a model as judged by the use of Program's municipal inspection staff in 2000 to help train staff from the Regional Boards; the Program's receipt of a state grant in 1996 to develop a statewide inspection handbook; and the use of several of the inspection program's ideas by other municipal stormwater programs in the Bay area.

Watershed Approach

During the past five years the Program has worked closely with its member agencies and local organizations to begin building successful collaborations in local watersheds. The Program has funded the development of watershed maps, which have been very useful to community groups, and has developed a countywide geographic information system (GIS) that includes data on topography, soil type, impervious surfaces, creeks, storm drains, sanitary sewer lines, water quality, fisheries, and habitat quality. In addition, the Program's member agencies have provided funding to support the development of creek groups and have been participating in numerous ongoing watershed efforts, including, Sausal Creek, Alameda Creek, Laguna Creek, San Leandro Creek, San Lorenzo Creek, and Lake Merritt. This has resulted in improved stewardship for these creeks and thousands of volunteer hours dedicated to advocacy, clean up, educational outreach, restoration and other improvements to water quality.

Diazinon

When the Program conducted its stormwater pollutant characterization effort (1990 through 1992), it was not anticipated that current generation pesticides would cause impairment of local creeks. However, through the use of toxicity tests and toxicity identification evaluations, the Program found that diazinon, a widely used insecticide, was a significant cause of stormwater toxicity.[2] That finding led to the eventual listing of local creeks as being impaired due to diazinon. After determining that diazinon was a prevalent toxicant, the Program conducted several studies to determine the sources of diazinon in stormwater. One of these studies found that the application of diazinon in accordance with label directions may be responsible for much of the diazinon found in stormwater.[3] The results of that study were cited in U. S. EPA's recent assessment of diazinon that resulted in a national ban on the sale of diazinon for urban use after 2004.[4]

EVOLUTION OF THE PROGRAM

A great deal has been accomplished over the past ten years. However, as the Program moves into its third permit, it faces significant challenges. In particular, the listings of the bay and creeks as impaired by specific pollutants will require increased efforts to reduce the discharges of these pollutants in

stormwater prior to and as part of TMDLs. The increased focus on other stormwater impacts to local creeks will also require additional effort.

Response to Impairment

The Regional Board conducts periodic reviews of data on water bodies in the region to determine if any pollutant is causing an impairment. As a result of the Regional Board's 1998 review of existing data, the State Board and U. S. EPA listed San Francisco Bay as impaired due to several pollutants, including, mercury, polychlorinated biphenyls (PCBs), diazinon, chlorinated insecticides, and copper. Several creeks in Alameda County are also listed as impaired due to diazinon.

There are often multiple sources of these pollutants, for example, sources may include industrial and sanitary discharges, air emissions and deposition, historic deposits, or stormwater discharges. To address the contribution of these pollutants coming from Alameda County's stormwater discharge, the Program has developed Pollutant Reduction Plans (see Section 4). These Pollutant Reduction Plans provide a description of the problem the pollutants are causing, the known or suspected sources of the pollutant, and the Program's approach to minimizing its discharge of the pollutant. Also included is a list of tasks the Program will complete during the next two years (i.e., FY 2001/02 and 2002/03). These work plans are based on our current understanding of the sources and the appropriate next steps. Beginning in 2002, proposed tasks for future years will be submitted to the Board along with the Program's Annual Report.

Local Watershed Efforts

The previous stormwater management plan recognized that the Program should investigate the watershed management approach as an alternative method for solving local environmental problems. In contrast to the traditional command and control regulatory approach, the watershed approach is characterized by collaborative planning among the various stakeholders in a watershed. The solutions derived from this approach typically take longer to develop, but are more tailored to the unique problems and characteristics of individual watersheds. During the past five years the Program has worked closely with its member agencies and other local organizations to begin building successful collaborations in local watersheds. As expected, each watershed has a unique combination of environmental problems, existing organizations, and restoration opportunities, requiring a patient and flexible approach to developing solutions.

This Plan commits the Program to continuing and expanding the use of the watershed management approach. In addition to the extensive effort that will be conducted under the Watershed Assessment component, the Program will conduct the following activities: (1) provide support to watershed stewardship efforts (Public Information and Participation: Task 3); (2) incorporate results of watershed resource inventories into General Plan amendments (New Development: Performance Standard VII); and, (3) provide Program-wide coordination of watershed activities (Planning and Regulatory Compliance: Task 4). The Program and its member agencies will

also continue to work with key stakeholders in local watersheds to determine how the management of stormwater quality can contribute to local creek protection and improvement efforts. To guide the implementation of the watershed approach, the Program will develop a watershed framework The framework will lay out specific goals and a process for the Program's and its member agencies' participation in watershed management efforts.

Increased Planning and Evaluation

Work plans and performance standards are divided into components. As in the past, the implementation of each component will be guided by a subcommittee. This structure has been very effective at allowing the Program to focus on specific areas of activity. However, there remains a need for greater planning and coordination across components. The Program has taken a number of steps to address this need. First, to provide a Program-wide focus to our efforts, the Program has developed mission and vision statements as well as strategic objectives. Second, the Plan includes a task to establish and maintain a work group to provide Program-wide planning and coordination (Planning and Regulatory Compliance: Task 6). The work group will meet on a regular basis and be attended by representatives of the various subcommittees. The development and implementation of Pollutant Reduction Plans will also promote coordination across components.

Another ongoing challenge for the Program, as well as for other stormwater management programs, is evaluating the effectiveness of its stormwater management practices. Due to the tremendous variability in stormwater flow and the ubiquitous nature of stormwater pollutants, it is extremely difficult to detect reductions in pollutant concentrations. Therefore, alternative evaluation methods need to be developed and employed. To address this, the Program has begun to develop methods of assessment for each major task in the component work plans. The Program will continue to develop and implement these methods of assessment over the course of the permit. The Program will also conduct periodic Program-wide evaluations of effectiveness (Planning and Regulatory Compliance: Task 6).

Notes

[1] *Results of the 1999 Public Attitude and Awareness Survey Regarding Storm Water Pollution. 1999, Jenkinson Associates: Sacramento, CA.*

[2] Hansen, S.R., *Identity and Control of Toxicity in Storm Water Discharges to Urban Creeks*. 1995, S.R. Hansen and Associates: Concord, CA.

[3] Scanlin, J. and Feng, A, *Characterization of the Presence and Sources of Diazinon in the Castro Valley Creek Watershed*. 1997, Alameda Countywide Clean Water Program: Hayward, CA.

[4] USEPA Memorandum, *Water Resources Assessment for Diazinon*. May 10, 1999, Office of Prevention, Pesticides and Toxic Substances, U.S. Environmental Protection Agency: Washington, D.C.

SECTION 3 COMPONENT OBJECTIVE AND TASKS

PLANNING AND REGULATORY COMPLIANCE

Introduction

This component encompasses the major planning, regulatory compliance, watershed management, and administrative activities of the Program. The Policy Level Subcommittee oversees this component's activities.

Component Objectives

1. Promote the implementation of effective and reasonable stormwater regulations by participating in regulatory processes. This may include advocating legislation that benefits member agencies.
2. Promote permit compliance by assisting member agencies with reporting and related activities.
3. Improve Program effectiveness by partnering with outside organizations.
4. Protect and improve the physical, chemical and biological integrity of waters in Alameda County through the development of watershed partnerships and the coordination of watershed management efforts.
5. Develop and implement measures to effectively reduce pollutants causing or threatening to cause impairment.
6. Promote Program coordination through Program-wide planning and evaluation.
7. Provide essential management and legal services.

Major Tasks

1. **Participate in the Regulatory Process:**

   - Review and comment on draft legislation and proposed regulations affecting stormwater
   - Confer with the Regional Board and other stakeholders during reissuance or amendment of permit
   - Participate in TMDL development and implementation process
   - Coordinate with other storm water programs through the Bay Area Stormwater Management Agencies Association and the California Stormwater Quality Task Force

   Task Evaluation: The evaluation of this task may include: 1) a review of the Program's participation in the regulatory process; and 2) an evaluation of the effectiveness of that participation.

2. **Assist Members with Permit Compliance:** A fundamental objective of the Program is to ensure that the member agencies comply with the requirements of their permit. The objective of this task is to assist member agencies with the reporting requirements and ensure that reports are submitted on schedule.

- Develop deliverable report forms
- Compile and submit completed deliverable reports to the Regional Board by required dates
- Review member agencies' performance
- Provide additional assistance with permit compliance as requested by member agencies, such as by providing orientation to new staff

Task Evaluation: The evaluation of this task may include: 1) a review of the completeness, and timeliness of report submittals; 2) a review of what the Regional Board staff needs included in the reporting; and 3) an assessment of any impediments to reporting as part reviewing the effectiveness of reporting formats and processes.

3. **Develop Partnerships:** Many public and private organizations have objectives that overlap with the Program's objectives, examples include, Alameda County Household Hazardous Waste Program, Green Business Program, and the Alameda County Waste Management Authority. By working together with these groups and others, the Program will be able to improve its cost-effectiveness. The Program has already begun to build working relationships with these groups and others. The purpose of this task is to expand upon those partnerships and to pursue opportunities to create additional partnerships.

   - Identify and prioritize issues where partnerships could significantly improve effectiveness
   - Seek to develop or enhance partnerships with public and private organizations that have similar interests

   Task Evaluation: The evaluation of this task may include: 1) enumeration of new or expanded partnerships, or 2) assessment of the benefits of those partnerships.

4. **Facilitate Watershed Approach:** The Program is engaged in promoting a watershed approach through activities within several components: the Watershed Assessment component provides technical assistance such as habitat assessments and watershed mapping; the Public Information and Participation component sponsors projects that increase watershed awareness; and, the New Development and Construction Site Controls component's performance standards incorporate results of watershed resource inventories into General Plan amendments. In addition, throughout the county member agencies are participating in numerous watershed efforts. The purpose of this task is to coordinate and assist with these activities.

   - Assess roles for and develop relationships with potential watershed partners: Regional organization such as the East Bay Municipal Utility District, Alameda County Water District, East Bay Regional Park District, and the Urban Creeks Council are potential partners in several county watersheds.
   - Establish a work group to promote information exchange

and coordination among watershed efforts
- Update Watershed Framework Document and implement as appropriate

Task Evaluation: The evaluation of this task may include: 1) the number of new or expanded partnerships, and 2) a survey of agency staff regarding the usefulness of the coordination effort.

5. **Support Pollutant Reduction Plans:** The Program has developed measures to address specific pollutants that are believed to be causing impairment to local water bodies. Planning activities related to the implementation and evaluation of those Plans will be conducted under this task.

   - Implement aspects of the Pollutant Reduction Plans that fall within this component
   - Coordinate implementing and updating the Pollutant Reduction Plans

   Task Evaluation: Evaluation may include: 1) assessment of the level of implementation; and 2) qualitative assessment of effectiveness.

6. **Plan and Evaluate:** Planning and evaluation are essential if the Program is to be effective. This task provides for establishing a work group to coordinate planning and evaluation across all components.

   - Evaluate Program performance and coordinate development of Program-wide annual work plans
   - Develop and maintain newsletter and website

   Task Evaluation: The evaluation for this task may include an assessment of the Program's planning and evaluation process.

7. **Provide Management Services:** The objective of this task is to provide essential administrative services to the member agencies.

   - Provide Program management, contracting, accounting, and other administrative services, and produce reports on Program activities, expenditures, and performance
   - Facilitate the Policy and Management Committee meetings

   Task Evaluation: The evaluation for this task may include a review of the reporting processes and assessment of areas for possible improvement.

WATERSHED ASSESSMENT

Introduction

The Program's objectives for monitoring and assessment have evolved during its first ten years. Early monitoring emphasized testing stormwater, dry weather discharges and sediment to assess pollutant loads and stormwater impacts on San Francisco Bay.

However, in August 1996 the Regional Board staff requested that the Program and other municipal stormwater programs in the region redirect their monitoring resources from fixed-station, wet-weather monitoring, to increased watershed assessment and long-term monitoring plans for creeks and other waterbodies.

In November 1999 the Regional Board staff released the Regional Monitoring and Assessment Strategy (RMAS) that describes a regional framework and schedule for assessment of pilot watersheds by various agencies. A letter sent to stormwater agencies in February 2000 affirmed that their participation in the RMAS would meet the intent of NPDES permit's requirements for assessing watersheds and estimating pollutant loading. The letter supported a functional approach to watershed assessment, which would vary according to the conditions and beneficial uses found in each watershed. The Program has incorporated this approach into its Watershed Assessment component.

These assessments will vary depending on the condition of the watershed. Functional assessment of relatively undeveloped watersheds may focus on habitat and flow conditions needed to sustain fishery resources and other creek-dependent life.

In contrast, urbanized creeks are usually highly altered by land use changes in their watersheds, and assessment of such systems might focus on their ability to support existing uses, such as non-contact recreation and industrial water supply. In a report funded by the Program, Gunther et al. (2000) identified potential indicators or benchmarks for evaluating the condition of a creek's beneficial uses. These include measurements of individual pollutants, characterization of the amount and timing of creek flow, and surveys of diversity and composition of plant and animal communities living in creeks and adjacent riparian areas.

The Program's 1996-2001 Plan included activities aimed at exploring waterbody-specific approaches for improving water quality and increasing awareness and stewardship by local residents. Experiences from these pilot watershed activities have led to development of the Alameda County Watershed Framework. The Watershed Framework is a working document that describes potential roles for the Program, member agencies, and others in local watershed efforts.

The Watershed Assessment component includes activities to coordinate, manage and present watershed-specific information and spatial data. Component tasks also include refining a suite of indicators of creek health and tailoring the content and presentation of data to make it more useful to managers and other stakeholders of local watershed-based initiatives. Activities under the

Monitoring and Special Studies component continue to include monitoring pollutant trends, evaluating the effectiveness of BMPs, and conducting special studies that have regional scope or are applicable to multiple watersheds. Coordination and facilitation of watershed-based activities are incorporated into the Planning and Regulatory Compliance component.

Component Objectives

1. Develop and maintain a GIS resource for watershed information
2. Use a variety of indicators to assess the functional condition of creeks and watersheds.
3. Provide useful watershed information to the Program and other watershed stakeholders
4. Evaluate component effectiveness

Major Tasks

1. **Develop and Maintain GIS for Watershed Information:** A Geographical Information System (GIS) is the most effective way to manage and analyze complex and diverse types of watershed data. The Program initiated a GIS-based inventory of ten pilot watersheds in FY 2000/01, building on an existing system developed for the San Lorenzo Creek watershed by the District. The objective of this task is to build a coordinated resource for watershed information that can be used by the Program, its member agencies and other watershed partners.

    - Expand available countywide coverages through conversion and data sharing with other agencies
    - Develop task list and schedule for adding GIS data and tools based on priorities of Program and local watershed efforts
    - Maintain and update coverages, metadata standards and data-sharing agreements
    - Coordinate with Program members, Monitoring and other Program components to incorporate additional data types
    - Coordinate with the Monitoring and Special Studies component to integrate stormwater and sediment monitoring databases and establish protocols for linking rainfall and flow data

    Task Evaluation: The evaluation of this task may include 1) review of completeness and quality of GIS coverages; and 2) evaluation of levels of participation in data-sharing by members and other agencies

2. **Characterize Functional Attributes of Creeks and Potential for Stormwater Impacts:** Beneficial uses, such as fisheries and wildlife, depend on natural ecosystem functions of creeks which link physical and chemical processes with biological populations of animals and plants, both in the creek channel and in the watershed as a whole. Because these systems are complex, watershed managers seek quantifiable indicators that may be applied over a range of conditions to help screen and characterize problems. Regional and national proposals for various indicators must be evaluated, calibrated and

refined for use in Alameda County creeks.

- Establish expected values for selected biological indicators (e.g., macroinvertebrates and fish) in relatively natural channels
- Explore ranges of application of additional measures of creek function, e.g., habitat, riparian buffers, and alterations to flow regime
- Promote consistent, effective indicator application among the Program, its members and other partners including volunteer monitors.
- Coordinate with regional initiatives and assessment strategies

Task Evaluation: The evaluation of this task may include 1) review of where various indicators have been applied; and 2) evaluation of indicators' consistency and usefulness in guiding management in pilot watersheds.

3. **Provide Useful Information To Assist Watershed Management Efforts:** As the General Program and its member agencies increase their participation in local stakeholder meetings and watershed management groups, specialized assessment needs will arise. Effective information presentation and data reporting may require tailoring to a variety of audiences ranging from agency workers to regulators and community groups. Products might include guidance on GIS mapping approaches, supporting materials for grant applications, and "report cards" or descriptions of constraints and opportunities for watershed management.

- Continue inventory and assessment of the pilot group of creek segments or lakes, and establish a plan for assessing other creeks or lakes within the County
- Work with member agencies and other watershed stakeholders in mapping and identifying data needs for individual watersheds
- Explore ways to inventory existing patterns of BMP application and other localized spatial data
- Develop models for data presentation for different types of representative watersheds
- Present watershed and other spatial data on the Program website and provide user-friendly guidance for its use
- Coordinate data definitions and data management structures through regular meetings with the Regional Board staff, BASMAA Monitoring Committee, and other partners
- Compile assessment data requested by Regional Board staff for water quality assessment reports (Clean Water Act section 305(b))

Task Evaluation: The evaluation of this task may include 1) evaluation of overall assessment effort; and 2) review of form, content and distribution methods for assessment information products, with comments and feedback from partners and other data users.

4. **Management and Evaluation of Component Effectiveness:** The Program will prepare reports, budgets and other items to assist with management and implementation of this component. The effectiveness of implementation will be evaluated as part of the annual report. Annual activities and work plans will be guided by (a) priorities and objectives developed under task 1; and (b) annual review of Watershed Management-related tasks conducted under the Planning and Regulatory Compliance component. Implementation of this component will initially focus on establishing a GIS resource (Task 1), and emphasis will gradually shift to providing other useful data to stakeholders.

   Task Evaluation: The evaluation of this task may include 1) review of progress towards goals in the long-term strategy; and 2) comments and feedback from Program's Management Committee.

MONITORING AND SPECIAL STUDIES

Introduction

Since its inception, the Program has tried to improve its understanding of stormwater pollution and to develop effective ways to control pollutants through monitoring and related activities. It has participated in the Regional Monitoring Program for Trace Substances (RMP), which monitors water and sediment in the Bay, and it has also conducted testing of stormwater and sediment at an array of fixed storm drain and creek stations throughout the urbanized portion of the county. This monitoring helped to identify a number of pollutants of concern that could be impairing the bay and urban creeks. Current knowledge about these pollutants, and the evolving strategies for addressing them, are described in Section 4 (Pollutants of Concern) and the Pollutant Reduction Plans in Appendix C.

In 1996, the Regional Board staff directed the Program to cease fixed-station wet-weather monitoring and redirect resources to watershed assessment and development of the long-term monitoring strategy for creeks. A draft plan for Long Term Monitoring and Assessment (Gunther et al., 2000) identified the need to link Program monitoring objectives more closely to beneficial uses of waters. Because of the wide range of watershed factors that can affect a waterbody's ability to support beneficial uses, a separate Watershed Assessment component has been developed to collect and manage complex spatial data. Monitoring and Special Studies component tasks will focus on the occurrence, long-term trends and control strategies for pollutants of concern, including the development of a long-term monitoring work plan for representative urban creeks.

The Program has conducted a variety of special studies to refine information needed to implement the requirements of previous Plans. Examples include studies of the effectiveness of specific BMPs, the use of Toxicity Identification Evaluations to identify diazinon as a probable source of toxicity in urban creeks, and studies to better identify the sources of diazinon and other pollutants.

The Program will continue to identify information gaps and conduct special studies on stormwater pollution to fill these gaps. These studies can be grouped into two categories: 1) studies focused on the pollutants of concern and other widespread pollutant problems; and 2) studies of pollutants responsible for more localized problems, such as litter and construction-related discharges. The implementation of BMPs to address pollutants that are local problems may need to be tailored to physical, social or jurisdictional conditions in specific watersheds. The evaluation of the effectiveness of these BMPs may need to consider conditions as well.

Component Objectives

1. Improve characterization and tracking of pollutants of concern that are found in stormwater
2. Evaluate the effectiveness of stormwater BMPs
3. Provide technical information to member agencies about pollutants

that may cause localized stormwater problems
4. Coordinate planning and reporting with related monitoring efforts
5. Evaluate component effectiveness and develop ways to measure the Program's effectiveness over time, including information on cost effectiveness

Major Tasks

1. **Characterize Concentrations and Long-Term Trends for Pollutants of Concern:** Section 4 (Pollutants of Concern) describes several pollutants that the Regional Board or U.S. EPA have identified as causing impairment of the bay or local creeks. Because the Regional Board needs to develop TMDLs for these pollutants it will require the Program's assistance in developing information about pollutant loading and changes in pollutant concentrations that result from the implementation of Pollutant Reduction Plans (Appendix C) and TMDLs. Past monitoring experience indicates that stormwater testing is useful for characterizing some constituents, and it will be continued at a long-term site on Castro Valley Creek. The Program will also sample sediment from creek beds, which is useful for surveying the occurrence of pollutants that are associated with fine particles.

   Activities for this task are described in the Annual Monitoring Work Plans submitted to the Regional Board. In addition to participating in coordinated regional data collection, the Program will develop a strategy for creek monitoring that incorporates the following objectives:

   - Review existing stormwater and sediment data to select effective sampling methodologies
   - Evaluate long-term trends in pollutant concentrations and toxicity in urban runoff
   - Establish expected baseline concentrations of mercury, PCBs and targeted organochlorine pesticides in sediment of creeks and storm drains and estimate loadings using available total suspended solids and discharge data.

   The Program has a database with the results of the fixed-station stormwater and sediment monitoring results collected during 1988-1995. This database will be updated with pollutant data from relevant special studies conducted by the Program and other local entities. Additional database modules for yearly rainfall patterns and flow history for one or more benchmark sites will be added to assist with assessment of long-term trends in water quality. Objectives for improving data interpretation include:

   - Incorporate grab sampling, rainfall and other types of data into the existing database
   - Facilitate linkages among pollutant concentrations, rainfall and spatial GIS data

   Task Evaluation: The evaluation of this task may include review of the Program's effectiveness in identifying long-term pollutant trends.

2. **Characterize Sources and Evaluate BMP Effectiveness for Pollutants of Concern:** Sources of pollutants must be understood in order to develop effective pollutant reduction measures. The impairments caused by the Pollutants of Concern are generally widespread because of the ubiquitous nature of the pollutants and the transport of many of these pollutants through the atmosphere. Because of the regional nature of these pollutants, the Program will need to coordinate closely with the Regional Board staff and with other BASMAA agencies. This task may involve a range of activities, including:

   - Special studies of specific watersheds with high pollutant concentrations
   - Special studies of sources or pathways
   - Modeling pollutant transport in runoff
   - Participation in coordinated regional studies such as the North Bay Copper Study
   - Participation in national pollutant prevention initiatives such as the Brake Pad Partnership

   Program members have implemented a variety of BMPs, but information about their effectiveness is not always readily available. While the new permit may incorporate additional provisions for treating runoff from new development, past studies by the Program and other stormwater agencies have shown that the effectiveness of treatment devices varies according to site-specific conditions. Evaluation of overall BMP effectiveness may necessitate evaluations of:

   - Structural treatment controls
   - Pollutant control tasks listed in the Pollutant Reduction Plans, such as fluorescent bulb recycling for mercury source control

   Task Evaluation: The evaluation of this task may include 1) tracking changes in the level of understanding of pollutant sources and controls; and 2) identifying ways to improve the effectiveness and application of BMPs.

3. **Assist Local Watershed Managers in Identifying Localized Stormwater Impacts and Provide Tools for Addressing These Impacts:** In contrast to the pollutants described in Section 4, some pollutants mainly affect waters nearby the source of the pollutant's release. Some beneficial uses, such as contact and non-contact recreation, are very location specific. Assessing stormwater impacts on these beneficial uses may involve a variety of site-specific factors, and the member agencies play a large role in choosing which specific factors and management objectives they would like better understood through studies. High-priority objectives identified by the Watershed Assessment and Monitoring Subcommittee include:

   - Evaluate toxicity or other impacts on bay fisheries
   - Characterize sediment and litter problems
   - Evaluate fecal coliforms and other indicators of human

health risk for light contact recreation areas
- Provide technical assistance to local watershed managers by providing data and guidance information

Task Evaluation: The evaluation of this task may include 1) review of successes and limitations of various approaches to managing localized issues under different conditions; 2) assess feedback from the Program's member agencies and other users about the effectiveness of Program-produced data and guidance materials.

4. **Coordinate with and Support BASMAA and Other Regional Monitoring Efforts:** The Regional Monitoring Program (RMP) is a collaborative effort to monitor the condition and health of San Francisco Bay. The Program, along with other NPDES-permitted dischargers, contributes to this effort annually. In addition, the BASMAA Monitoring Committee has worked with the Regional Board staff to establish the following three priorities for regional coordination of information: watershed assessment; BMP effectiveness; and characterization of pollutant loads and potential sources. The Program's participation in these regional activities increases opportunities for collaboration and coordination with other stormwater agencies.

   - Continue participation in the RMP
   - Participate in BASMAA Monitoring Committee and other regional monitoring groups
   - Explore monitoring partnerships with other agencies and organizations

   Task Evaluation: The evaluation of this task may include a review of useful information exchanged and partnerships that are initiated or enhanced.

5. **Management and Evaluation of Component Effectiveness:** The Program will prepare reports, budgets and other items to assist with management and implementation of this component. The effectiveness of implementation will be evaluated as part of the annual report.

   - Coordinate annual work plans to reflect the priorities of the Program's Long-Term Monitoring Plan
   - Promote cost-effective monitoring by designing data collection to meet multiple monitoring objectives, where possible.
   - Facilitate and support the Watershed Assessment and Monitoring Subcommittee meetings

   Task Evaluation: The evaluation of this task may include 1) a review of work plan development process; and 2) evaluation of accomplishments against Program objectives.

PUBLIC INFORMATION AND PARTICIPATION

Introduction

Most people are unaware that the largest source of pollutants to local creeks, lakes and the bay comes from the stormwater that flows off the cityscape picking up drops of motor oil, brake pad dust, exhaust emissions, pesticides, dirt and litter and, in most cases, receiving no treatment. These sources of pollutants result from the small, incremental and collective activities of everyone in Alameda County. Public information and participation is one of the keys to preventing stormwater pollution. The better that everyone understands the importance of stormwater pollution, their own, often unintentional, contribution to the problem, and simple things that we can do about it, the cleaner our creeks and the bay will become.

This component of the program focuses on providing information to residents in order to enlist their help in preventing stormwater pollution. The Public Information and Participation Subcommittee oversees this component's activities. This subcommittee is also responsible for ensuring the consistency of terminology, format and style among all of the Program's educational outreach efforts.

A summary of the progress being made in public awareness is described in the Program Description Section under Program Achievements.

Component Objectives

1. Educate residents about stormwater pollution problems.
2. Encourage residents to adopt less polluting and more environmentally beneficial behavior.
3. Assist member agencies with watershed awareness efforts and provide stewardship opportunities.
4. Improve public information and participation effectiveness through partnering with other organizations.
5. Evaluate component effectiveness and make improvements.

Major Tasks

1. **Implement Targeted Outreach:** The Clean Water Program has been working with other municipal stormwater agencies through BASMAA to identify categories of pollutants and pollutant generating behavior to target as part of regional advertising and action campaigns. This pooling of resources has helped to generate more effective campaigns than could be achieved by working independently.

   It is anticipated that future targeted campaigns will focus on helping to implement the Pollutant Reduction Plans for specific water quality impairing pollutants. The pollutants that appear to be priorities on the Regional Board's list include mercury, PCBs and dioxin compounds, and pesticides (diazinon, chlordane, dieldrin and DDT). Another possibility would be to develop and implement a countywide anti-littering campaign. The campaigns will focus primarily on targeting

residential sources and encouraging residents to prevent pollution.

The Public Information and Participation (PIP) Subcommittee will develop and update a list of priorities for helping to select future campaigns. Criteria for the selection of priorities will include that a significant portion of the pollutant-generating behavior originates from residents. It will be important to continue to evaluate the effectiveness of each campaign and not to focus too much on the same type of pollutant or category of pollutants.

The General Program will also collaborate with groups such as the Bay Area Air Quality Management District, the Alameda County Waste Management Authority, Home Builders Association of Northern California, and other groups to expand the impact of any targeted outreach.

2. **Continue to Reinforce General Outreach Messages:** Existing PIP materials that the PIP Subcommittee determines are useful enough to continue in circulation will be updated, as needed, and reprinted or produced for each agency to distribute and for distribution by the General Program on its website and through other methods. The PIP Subcommittee may choose to have more of the existing materials translated into additional languages, if this has been identified as an effective way to reach groups whose primary language is not English. The continued reinforcement will also occur through increased collaboration with other public agencies and private organizations with common interests.

3. **Provide Educational Support and Watershed Stewardship Support:** This task will include helping to educate students about stormwater pollution prevention and related environmental issues. The General Program has actively supported a number of school focused educational endeavors, including Bay Savers (targeted to fourth graders), Kids in Creeks/Gardens/Watersheds (targeted to teachers) and Estuary Action Challenge. The PIP Subcommittee will decide at least every two years which educational activities to support based on the known or expected effectiveness of the activity and how well it addresses the objectives of the PIP component.

   This task will also involve continued support for the Community Stewardship Grant program.

   Lastly, this task will include training for member agency staff responsible for PIP. This training may also be expanded to include other targeted groups such as was done with the *East Bay Watershed Management Symposium* in 1998 and *Turning the Tide: Balancing New Development and Clean Waters* symposium in 2001.

4. **Assist Member Agencies Implement and Improve the Performance Standards:** This task will include assisting the member agencies to implement their PIP performance standards. This assistance may include undertaking any project that will

result in additional tools and means for the member agencies to better implement the performance standards. In the past this has included such things as purchasing kiosk displays and dioramas for the member agencies to use at public events.
This task will also include review and, if needed, improvement in the performance standards at least every two years. This review will occur as part of PIP Subcommittee meetings. The evaluation information collected as part of Task 5 will be used to decide how and where to make improvements.

5. **Manage Component and Evaluate and Improve Its Effectiveness:** The General Program will assist the PIP Subcommittee and its work groups to conduct its meetings and prepare any needed NPDES permit required reports and work plans. This task will also include assisting with the development of annual General Program component work plans and budgets.

   The effectiveness of this component will be evaluated as part of the following types of activities, which are offered as examples:

   - Conduct a public awareness survey similar to the one conducted in 2000.
   - Evaluate the information being submitted as part of the annual reports.
   - Survey member public agencies to obtain information about how well this component and the performance standards are working.
   - Evaluate the Regional Board staff's reviews of the Clean Water Program's performance in this area.
   - Review information collected elsewhere of tangible progress. This may include tracking changes in behavior based on pre and post- campaign surveys paid through participation in BASMAA.

   The PIP Subcommittee as part of developing its annual work plan and budget will consider improvements to the General Program at least annually.

MUNICIPAL MAINTENANCE ACTIVITIES

Introduction

Municipal maintenance staff comprises one of the largest group's of public employees whose everyday work sweeping and repairing streets, cleaning storm drains, and applying herbicides can directly help to prevent stormwater pollution. In addition, the hundreds of maintenance field personnel play an essential role in reporting on illicit discharges and pollution problems that need to be fixed. The maintenance staff also helped to spread the word about stormwater pollution prevention among its maintenance counterparts in other public agencies.

The Maintenance Subcommittee, which is one of the oldest in the Program, is responsible for helping to implement this component's activities.

Component Objectives

1. Optimize pollutant removal during routine maintenance activities such as street sweeping and maintenance of storm drainage facilities.
2. Prevent or minimize discharges to storm drains and watercourses from road maintenance, parks, corporation yards and other publicly owned facilities.
3. Provide information and education about the Alameda Countywide Clean Water Program to agency employees.
4. Evaluate component effectiveness and make improvements.
5. Facilitate reporting.

Achievements

One of the accomplishments of the Program has been to reach a consensus among the member agencies on how to implement the diverse activities involved in municipal maintenance so as to minimize the stormwater pollution. This resulted in the development of performance standards for street cleaning; storm drainage and watercourse maintenance; litter control; road repair and maintenance; and corporation yard operations.

One of the core maintenance areas has been the use of street sweeping to remove potential pollutants prior to their being flushed into local creeks and the bay. All of the municipalities report their street sweeping and storm drainage cleaning activities on a standardized monthly form. In Fiscal Year 1999/00 the collective street sweeping effort of all of the municipalities resulted in the sweeping of about one quarter of a million curb miles of street with the removal of over 78,000 cubic yards and 1,000 tons of material. These amounts are similar to what has been achieved in most recent years, except during the El Nino year in 1998 when the amount of material removed by sweeping was reduced probably because the persistent rains flushed material away before it could be swept up.

The Program has well attended annual training workshops for municipal maintenance staff. During the last three years this training has been augmented creatively by the sweeper rodeo and similar events to demonstrate Best Management

Practices usage in an engaging manner. In addition, in 2000 the Program hosted an educational outreach workshop that was attended by representatives from public agencies outside of the Program and by PG&E.

Major Tasks

1. **Implement and Assist with Performance Standards:** Each agency will implement the municipal maintenance performance standards presented in Section IV. The performance standards include the following major activities:

   - Street Sweeping
   - Storm Drain Cleaning
   - Training
   - Reporting

   The General Program will work through the Maintenance Subcommittee to resolve implementation and consistency issues.

2. **Coordinate Maintenance-Related Activities with Other Subcommittees of the ACCWP, Other Agencies and Private Industries**: The subcommittee will work with appropriate staff from other Subcommittees of the ACCWP, park and recreation departments, and other public agencies and private industries whose activities are similar to or potentially affect municipal maintenance activities to identify activities of concern. Examples of other public agencies and private industries include PG&E, water suppliers and utilities, garbage collection companies, the Port of Oakland, golf courses, private recreational facilities and animal confinement areas.

3. **Optimize Data Management and Analysis**: The General Program will optimize ongoing collection, recording and analysis of maintenance data. This will include continuing to evaluate if the types of maintenance data being collected are useful and if other types of data should be collected. Examples of potential studies and data analysis include the following:

   - Leaf collection programs
   - Litter abatement programs

4. **Outreach and Training:** The General Program will facilitate outreach and training activities aimed at preventing discharges from maintenance activities, with direction from the Maintenance Subcommittee. This includes selecting the appropriate forum (e.g., workshops, round table meetings, work groups, inter/intra-agency coordination meetings, etc.) depending on the target audiences (e.g., ACCWP agencies, other agencies, property owners, residence, etc.). The Maintenance Subcommittee will also coordinate outreach activities with other ACCWP Subcommittees when the objectives of a planned outreach and training activity conducted by the Maintenance Subcommittee overlap with the objectives of another Subcommittee.

   The Maintenance Subcommittee will identify a target audience at least once every two years; the Subcommittee will select the appropriate forum for the outreach depending on the selected audience.

The General Program will develop and update materials (such as BMP flyers, brochures, posters, etc.) that are needed to support outreach and training activities, as determined by the Maintenance Subcommittee.

5. **Manage Component and Evaluate and Improve Its Effectiveness:** The General Program will assist the Maintenance Subcommittee and its work groups to conduct meetings and prepare any needed NPDES permit reports and work plans related to this component. This includes assisting with the development of annual General Program budgets. The following activities are examples of how the effectiveness of this component may be evaluated:

   - Survey member agencies to obtain information about how well this component and the performance standards are working.
   - Evaluate the information being submitted as part of the annual reports.
   - Evaluate the Regional Board staff's reviews of the Clean Water Program's performance in this area.

NEW DEVELOPMENT AND CONSTRUCTION CONTROLS

Introduction

New development offers a unique opportunity to construct projects that prevent stormwater pollution. Historically projects were constructed by building up to or over culverted creeks, constructing drainage ways to convey runoff off of project sites quickly, and ignoring opportunities to prevent or treat stormwater runoff. These developments lead to the destruction of flood plains and alterations in the natural structure and function of creeks, as well as to increases in the amount of stormwater pollution.

Better ways to design and construct new projects have received a considerable amount of attention in recent years. In 1994 the Regional Board staff developed its *Staff Recommendations for New and Redevelopment Controls for Storm Water Programs.*

The concepts in this document were used to develop the performance standards for New Development. In 1998 the Program and other Bay area municipal stormwater programs developed through BASMAA the *Start at the Source* manual. This manual describes a comprehensive approach to planning environmentally sensitive developments that minimize increases in the amount of impervious cover and combine stormwater treatment systems into the landscaping. Additional models will be developed as part of meeting the new Standard Urban Stormwater Mitigation Plan requirements described in the Background Section under Recent Developments.

Component Objectives

1. Identify and help implement source controls, site design measures and post-construction stormwater pollutant and hydromodification controls.
2. Assist with incorporating controls on impairing pollutants prior to and following completion of load and waste load allocations as part of a Total Maximum Daily Loads process.
3. Ensure that public works construction and maintenance projects conform to the same standards as private projects.
4. During construction promote the use of controls to reduce the discharge of pollutants to the maximum extent practicable and effectively control non-stormwater discharges.
5. Evaluate component effectiveness and make improvements.

Achievements

The Clean Water Program has emphasized the development of tools to help implement this component of the Stormwater Quality Management Plan. This included developing suggested Conditions of Approval for residential, commercial and industrial developments and compiling a *Catalog of Structural Stormwater Quality Control Measures.* Training focused on Planning Commissioners and individual municipality planning and engineering staffs. Municipalities have begun to implement the *Start at the Source* types of stormwater design measures. This has included the use of

grassy swales at residential, commercial, industrial and public works developments in a number of cities and the District's construction and operation of a stormwater treatment pond draining about 500 acres of residential area in Fremont. With assistance from the Regional Board staff, other areas of emphasis have included improving controls on erosion and sedimentation and preventing the releases of construction related discharges.

Major Tasks

1. **Identify How To Implement Source, Site Design, Post-Construction Stormwater Treatment and Hydromodification Controls:** As part of the previous Stormwater Management Plan, the Clean Water Program emphasized the use of pollutant source controls and site planning measures, such as those found in the *Start at the Source* manual. The Regional Water Quality Control Board and municipal planning staff are interested in specifying more clearly how source, design, treatment and hydromodification controls need to be used as part of the maximum extent practicable control of pollutants from stormwater.

   This task will include the following activities:

   - Review the Santa Clara Valley Urban Runoff Pollution Prevention Program's work on implementing its new permit requirements that address these types of controls. This will also include identifying and reviewing useful approaches of other municipal stormwater programs in California and elsewhere.
   - Identify and work with a stakeholder group to develop a method for appropriately integrating pollutant and hydromodification controls as requirements for new development.
   - Submit the Clean Water Program's agreed upon method for implementing pollutant and hydromodification controls to the Regional Board staff and, based on feedback, make any needed changes.
   - Identify assistance that the Clean Water Program's member agencies will need in order to implement the new, agreed upon controls.
   - Every two years review and, if appropriate, improve the agreed upon controls based upon implementation experience and other new information.

   Task Evaluation: The evaluation of this task may include 1) determine whether the General Program was able to achieve consensus among the stakeholders regarding the new controls and 2) obtain feedback from the Regional Board staff on how well the agreed upon controls met its expectations.

2. **Help Implement Source, Site Design, Post Construction Stormwater Treatment and Hydromodification Controls:** This task will include assisting the member agencies to implement the agreed upon more specific pollutant and hydromodification controls. This may include the following types of activities, which are offered as examples:

- Modify and improve the performance standards to incorporate the agreed upon control methods.
- Develop and update the Conditions of Approval, development guidance and review checklists.
- Track and discuss at New Development Subcommittee meetings municipal case studies of new development/redevelopment projects that are illustrative of successes, problems and questions about the control method.
- Develop guidance on cost-effective ways to implement the controls, such as, updating the "Project Worksheet for Permanent Stormwater Quality Controls."

Task Evaluation: The evaluation of this task may include: 1) assess the information being submitted as part of the annual reports; 2) obtain feedback from the municipalities about how successful the implementation of the controls has been; and 3) survey builders on how helpful the more specific controls and implementation tools have been and ways that they can be improved.

3. **Assist with the Development of Watershed Information and Facilitate Its Use:** This task will involve identifying the watershed information needs of the member agencies so that this information may be collected for use by agency planning and engineering staff. The actual collection of most watershed information will be conducted as part of the Watershed Assessment component. This task will also include assisting the member agencies with the use of watershed information that has been collected.

   Task Evaluation: The evaluation of this task may include a survey of the agencies' planning and engineering staffs to see how well their watershed information needs were met.

4. **Promote Outreach and Training:** This task will include reinforcing and expanding educational outreach to agency planning and engineering staff, Planning Commissions, City Councils, builders, and builders' consultants and contractors. The next wave of this outreach and training will focus on helping everyone to understand and implement the more specific pollutant and hydromodification controls developed as part of Task 1. This outreach and training will include the following:
   - Conduct at least one outreach and/or training event annually that is targeted to either agency staff or to the building industry. This may be conducted in collaboration with other agencies, organizations or groups.
   - Develop and distribute outreach material that goes beyond the trifolds that have been developed in the past.
   - Compile and distribute, in binders, to agency staff copies of all of the guidance and educational material that have been developed by the subcommittee.
   - Develop and maintain a mailing list of designers,

builders, developers that may be used by member agencies to do outreach.

Task Evaluation: The evaluation of this task may include 1) the number of staff trained from each of the targeted groups; and 2) summaries of the feedback obtained from recipients of training and outreach.

5. **Manage Component and Evaluate and Improve Its Effectiveness:** The General Program will assist the New Development Subcommittee and its work groups to conduct its meetings and prepare any needed NPDES permit required reports and products. This task will also include assisting with the development of annual General Program work plans and budgets. As part of developing the annual work plan and budgets, the New Development Subcommittee will consider ways to improve the General Program.

   Task Evaluation: The evaluation of this task may include: 1) review how well the municipalities are meeting the new NPDES permit requirements that affect new development and redevelopment, this may include summarizing the Regional Board staff's reviews of member agency performance in this area; and 2) review information collected elsewhere of tangible progress, such as changes in environmental indicators developed by the Stormwater Environmental Indicators Pilot Demonstration Project in Santa Clara Valley.

ILLICIT DISCHARGE CONTROLS

Introduction

One of the most visible reasons for having a Program is to eliminate pollution caused by materials being poured, spilled, dumped, washed, or discharged into the municipal storm drain system. One of the Clean Water Act's few explicit stormwater dictates is that permits include a "requirement to effectively prohibit non-stormwater discharges into the storm" drain systems. The federal regulations allow the discharge of some minor types of non-stormwater discharges, such as under specified conditions.

The Program has been proactive in identifying and eliminating illicit discharges to the municipal storm drain system. This has included enlisting the help of each agency's municipal maintenance and other field staff who are most likely to see what is being discharged to the storm drain system or dumped where it may become waterborne. A brief summary of the progress being made is described in the Achievements section below.

Component Objectives

1. Control illicit discharges by conducting field surveys of the municipal storm drainage conveyance system and identifying and eliminating the sources of non-stormwater discharges.
2. Effectively coordinate spill response and clean-up with existing programs.
3. Optimize illicit discharge control activities through planning and prioritization.
4. Address discharges that may not be considered illicit if properly managed.
5. Partner with other Subcommittees, agencies, and groups to increase public awareness on how to effectively and efficiently prevent pollutant discharges to the storm drains.

Achievements

The Program has conducted several training workshops for illicit discharge inspectors to improve member agencies' familiarity with Best Management Practices for identifying and eliminating illicit discharges. In 1995 the Program developed a standardized form for documenting illicit discharge findings and controls. This systematic approach has helped to identify the predominant types of illicit discharges so that additional, targeted educational outreach could be undertaken.

Since 1995 the member agencies have identified and eliminated approximately 5,000 illicit discharges. During this period the number of illicit discharges being found each year has about doubled and the number of illicit discharges that led to enforcement has approximately quadrupled. The increase in the number of illicit discharges being found may reflect an improvement by illicit discharge inspectors, maintenance staff, outside agency staff and the general public in identifying and reporting illicit discharges incidents.

Major Tasks

1. **Implement and Assist with Performance Standards:** Each agency will implement the performance standards specified in Section 5 for illicit discharge control activities. The performance standards include the following major activities.
   - Developing a five-year Action Plan for conducting field surveys of the agency's watershed.
   - Conducting field surveys.
   - Investigating illicit discharge reports and conduct appropriate follow-up.
   - Effectively eliminate illicit discharges through education and enforcement.

   The Industrial & Illicit Discharge Control (I&IDC) Subcommittee will review the performance standards at least every two years and make any needed improvements. The General Program will work through the I&IDC Subcommittee to resolve implementation and consistency questions.

2. **Assist Member Agencies Comply with Requirements for Conditionally Exempt Non-Stormwater Discharges:** The General Program will continue to facilitate compliance with non-stormwater discharges identified in the NPDES permit as conditionally exempt from discharge prohibitions to the storm drains. The General Program will work through the I&IDC Subcommittee and its work groups to identify effective control measures. The General Program will also facilitate the process for adding any non-stormwater discharges identified to the list of conditionally exempt non-stormwater discharges, and developing the appropriate BMPs.

3. **Track and Analyze Non-stormwater Discharge Reports:** Each agency submits quarterly summary reports on illicit discharge control activities as described in the performance standards. The General Program will collect and analyze this information for trends and other useful information to better plan and help improve illicit discharge control program activities, with direction from the I&IDC Subcommittee. For example, information on non-stormwater discharges can be used to identify needs for additional information or to develop discharge elimination/disposal priorities for categories of discharges.

4. **Conduct Outreach and Training:** The General Program will facilitate outreach and training activities to prevent illicit discharges, with direction from the I&IDC Subcommittee. This includes selecting the appropriate forum (e.g., workshops, round table meetings, work groups, inter/intra-agency coordination meetings, etc.) depending on the target audiences (e.g., ACCWP agencies, other agencies, property owners, residences, etc.). The I&IDC Subcommittee will also coordinate outreach activities with other ACCWP Subcommittees when the objectives of a planned outreach and training activity conducted by the I&IDC Subcommittee overlap with the objectives of another

Subcommittee. For example, the I&IDC Subcommittee will coordinate with the Watershed and Monitoring Subcommittee when conducting outreach activities that address pollutants targeted in Pollutant Reduction Plans.

The I&IDC Subcommittee will better define and identify the target audience at least once every two years; the Subcommittee will select the appropriate forum for the outreach depending on the selected audience. The General Program will develop materials (such as BMP flyers, brochures, posters, etc.) that are needed to support outreach and training activities, as determined by the I&IDC Subcommittee.

5. **Manage Component and Evaluate and Improve Its Effectiveness:** The General Program will assist the I&IDC Subcommittee and its work groups to conduct meetings and prepare any needed NPDES permit reports and work plans related to this component. This includes assisting with the development of annual General Program budgets. The following activities are offered as examples of how the effectiveness of this component may be evaluated.
   - Evaluate the information being submitted by ACCWP agencies as part of the annual reports.
   - Coordinate with the PIP Subcommittee to survey the general public on illicit discharges and BMPs to prevent the discharge of pollutants.
   - Evaluate the Regional Board staff's reviews of the Program's performance in this area.

INDUSTRIAL/COMMERCIAL DISCHARGE CONTROLS

Introduction

The prevention and control of stormwater pollution from commercial and industrial businesses is one of the major activities of the Program. The Program emphasizes educating businesses about methods to prevent and control stormwater pollution. Educational outreach to businesses has occurred primarily during facility inspections and through working with trade and business organizations on identifying appropriate Best Management Practices.

Educational outreach materials for the automotive repair shops and restaurants, the two most common businesses countywide, has included the development of brochures, posters, and flyers. In addition, there are manufacturers and other more industrial types of businesses that are required to have coverage under the California Industrial Stormwater NPDES General Permit. Since the municipalities are required to control any type of stormwater that discharges to their municipal storm drain system, the municipalities do not treat one type of business differently than another.

The Industrial & Illicit Discharge Control Subcommittee is responsible for overseeing the implementation of this component and the Illicit Discharge Controls component.

Component Objectives

1. Reduce the amount of pollutants in stormwater runoff to the maximum extent practicable from industrial and commercial facilities.
2. Eliminate effectively non-stormwater discharges from industrial and commercial facilities to the municipal storm drain system.
3. Identify and eliminate potential stormwater pollution sources through facility inspections, outreach activities, and appropriate follow-up including enforcement.
4. Provide incentives, both positive and regulatory, for businesses to comply with stormwater requirements.
5. Evaluate component effectiveness and make improvements.

A summary of the progress being made in preventing and controlling businesses' contribution to stormwater pollution is described in the Program Description Section under Program Achievements.

Major Tasks

1. **Implement and Assist with Performance Standards:** Each agency will implement the performance standards specified in Section 5 for industrial/commercial discharge control activities. The performance standards include the following major activities.
   - Developing a five-year Inspection Plan and an annual Inspection Workplan for conducting business inspections.
   - Conducting business inspections.
   - Conducting outreach and enforcement to businesses to obtain compliance.

   The five-year Inspection Plan is a one-time permit requirement. Each agency will

describe its industrial and commercial base, as well as business inspection priorities and procedures. The description will include an estimate of the number of industrial and commercial sites requiring inspection for the five-year permit period and the numbers of facilities under each business type.

The Industrial & Illicit Discharge Control (I&IDC) Subcommittee will review the performance standards at least every two years and make any needed improvements. The General Program will work through the I&IDC Subcommittee to resolve implementation and consistency questions.

2. **Develop BMP Guidance:** With direction from the I&IDC Subcommittee, the General Program will develop materials to support illicit discharge control and industrial/commercial discharge control activities. This includes identifying target audiences and the format (e.g., brochures, flyers, checklist, poster, etc.) of the guidance material best suited for the target audience.

3. **Track and Analyze Facility Inspection Reports:** Each municipality submits inspection information on the standard report form as described in the performance standards. The General Program will continue to collect and analyze this information for trends and other useful information to better plan and help improve business inspection, outreach, and enforcement activities, with direction from the I&IDC Subcommittee. For example, information on the potential to discharge pollutants can be used to identify priority businesses for the following year's inspection or outreach activities.

4. **Conduct Outreach and Training:** The General Program will facilitate outreach and training activities to prevent pollutant discharges from business activities, with direction from the I&IDC Subcommittee. This includes providing incentives, both education/outreach and enforcement, for businesses to comply. The audience can include both agency and business groups or organizations. The I&IDC Subcommittee will also coordinate outreach activities with other ACCWP Subcommittees when the objectives of a planned outreach and training activity conducted by the I&IDC Subcommittee overlap with the objectives of another Subcommittee.

   The I&IDC Subcommittee will identify a target audience at least once every two years; the Subcommittee will select the appropriate forum for the outreach depending on the selected audience.

5. **Manage Component and Evaluate and Improve Its Effectiveness:** The General Program will assist the I&IDC Subcommittee and its work groups to conduct meetings and prepare any needed NPDES permit reports and work plans related to this component. This includes assisting with the development of annual General Program budgets. The following activities are offered as examples of how the effectiveness of this component may be evaluated:
   - Evaluate the information being submitted by ACCWP agencies as part of the annual reports.
   - Survey businesses on how the effectiveness of outreach and inspection activities described in this component and its performance standards.
   - Evaluate the Regional Board staff's reviews of the ACCWP's performance in this area.

SECTION 4 POLLUTANTS OF CONCERN

As a result of its 1998 assessment of water bodies in the Bay Area, the Regional Board listed San Francisco Bay as impaired due to the following pollutants: diazinon, mercury, polychlorinated biphenyls (PCBs), copper, nickel, chlordane, DDT, dieldrin, and selenium. The U.S. EPA subsequently added dioxin-like compounds as one of the bay's impairing pollutants; listed several creeks in Alameda County as impaired by diazinon; and listed Lake Merritt as impaired due to litter and low dissolved oxygen.

To address the contribution of these pollutants from stormwater, the Program is developing pollutant reduction plans (PRPs). PRPs provide a comprehensive list of actions the Program will take to further reduce the discharge of impairing pollutants that are the highest priority for the Regional Board: diazinon, mercury, copper, and PCBs (see Appendix C). This section of the Plan provides information on each of these pollutants, including, problem definition, sources, challenges, and the Program's approach to reducing the level of these pollutants in stormwater. Other pollutant reduction plans will be developed as needed.

DIAZINON

Problem Definition

Diazinon is a widely used organophosphate insecticide that has been detected in creeks throughout the Bay Area. During storm events, the concentration of diazinon in local creeks is often high enough to be toxic to some species of aquatic life. For example, 71% of stormwater samples collected from Bay Area creeks were lethal to a small crustacean, *Ceriodaphnia dubia*, and Toxicity Identification Evaluations (TIEs) have determined that diazinon was the primary cause of this toxicity (Katznelson, 1997). *C. dubia* is a standard U.S. EPA test species, and although it is not a resident species in local creeks, toxicity to *C. dubia* suggests that other aquatic insects that inhabit local creeks could also be adversely affected by the presence of diazinon. Based on the prevalence of stormwater toxicity and the results of the TIEs, the U.S. EPA listed Alameda, San Leandro, and San Lorenzo creeks as impaired by diazinon.

U.S. EPA has banned the sale of diazinon for urban use after 2004 due to concerns regarding potential environmental and human health impacts. However, the application of diazinon will be allowed to continue until the stock of diazinon sold prior to the end of 2004 has been depleted. Therefore, the level of diazinon in stormwater may continue to exceed toxic concentrations for several years after its sale is banned.

Diazinon is not the only insecticide found in Bay Area creeks. Other commonly used insecticides, such as chlorpyrifos, carbaryl, and malathion, also have been detected and may be contributing to toxicity. As diazinon and other insecticides such as chlorpyrifos are banned, other insecticides will be used in their place. The replacement

pesticides may cause equal or increased toxicity in stormwater discharges.

Sources

The primary source of diazinon in Alameda County creeks is stormwater runoff from urbanized areas. Diazinon is applied by both professional and non-professional applicators. About half of the estimated 30,000 pounds of diazinon used in Alameda County in 1995 was applied by residents who purchased the product at retail outlets. The remainder was applied by commercial pest control applicators. The most common target pests were ants, fleas, and spiders (Scanlin and Cooper, 1997).

Although improper use or disposal may account for some of the diazinon in stormwater, recent studies suggest that a major source is use in accordance with label directions (Scanlin and Feng, 1997). Only a small amount of pesticide causes toxicity in creeks, therefore, even proper use could account for the toxic concentrations observed. For example, Scanlin and Feng (1997) often observed toxic concentrations in a creek where it was estimated that only 0.3% of the diazinon used in a small, urbanized watershed ended up in the creek. This percentage of pesticide entering runoff is what would be expected for runoff from proper use. For example, Balogh and Walker (1992), in a study of agricultural runoff, estimated the maximum runoff rate for most pesticides under normal conditions at between 0.5% and 1% of the total quantity applied, and initial results of a study to assess diazinon runoff from urban sites suggests that pesticide runoff from these sites is of about the same proportion as in agricultural applications (ACCWP).

Challenges

There are major regulatory, economic, social and technical obstacles to significantly reducing the level of insecticides in stormwater runoff. Following is a brief description of some of these obstacles.

Regulatory Obstacles: Nationally, insecticides are regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). The criterion for acceptability under FIFRA is that "the insecticide *does not cause unreasonable adverse effects* to people or the environment when it is used according to the product label directions and restrictions" [emphasis added]. Under FIFRA, the economic benefit is weighed against the environmental impact when determining what is "unreasonable". Under the Clean Water Act, however, the water quality standard is much more restrictive and is stated as "no toxics in toxic amounts". The effect of this discrepancy is that one office of U.S. EPA may allow the use of an insecticide, while another office may require the development of a TMDL to address a water quality impairment due to its use.

In California, the use of insecticides is also regulated by the California Department of Pesticide Regulation (CDPR), and with the exception of some very limited authority granted to the county agricultural commissioner, local government is prohibited from regulating insecticide use (section 11501.1 of the California Code of Regulations).

Economic Obstacles: Pest control is a big business. Based on the estimated 15,000 pounds of diazinon (active

ingredient) sold annually, retail sales in Alameda County are in the neighborhood of $250,000 annually for diazinon alone. In addition to retail sales, there are approximately 50,000 licensed applications of diazinon for structural and landscape pest control in Alameda County every year (Scanlin and Cooper, 1997). Assuming an average per-application cost of $50, this use would generate over $2 million annually. Considering the financial resources available to the pesticide industry, it would be difficult for the Program to compete effectively through the use of public outreach/advertising.

Social Obstacles: Some people do not like bugs, and view one spider or ant around their house as one too many. This strongly ingrained perception is difficult to alter. Many people will still choose to use insecticides even if they are aware of the harm it causes aquatic ecosystems.

Technical Obstacles: Preventing the improper use or disposal of diazinon will not solve the problem. Previous and ongoing studies (Scanlin and Feng, 1997; and ACCWP) indicate that a significant portion of diazinon applied according to label directions moves off-site and eventually ends up in creeks. Many other insecticides migrate in a similar fashion. An effective solution must involve the development of an insecticide formulation that does not migrate from the site of application or one that is toxic only to the target pest.

Direct treatment of runoff to reduce diazinon or other insecticides is impractical for two main reasons. It is difficult to treat a large volume of water in a short period of time as occurs during storm events. Furthermore, diazinon in its dissolved form causes toxicity and it is not readily removed by the usual filtration or settling technologies.

Program's Approach

Lead by Example: Although municipal use accounts for a small fraction of the insecticides used in the county, the member agencies believe they should set an example by ensuring that they minimize risk to the environment and human health. Their first step is to conduct a review of annual insecticide use to determine the quantity used and the targeted insects. The next step is to evaluate the audit results to determine if additional actions could be taken to minimize risk. The results of the audit and evaluation will be submitted to the Regional Board. Member agencies will review existing practices, policies and ordinances to determine where improvements can be made to minimize risk to the environment and human health to the maximum extent practicable. If it is determined that they are not adequate, additional or revised policies or ordinances will be adopted. A summary of the review and recommended revisions will be submitted to the Regional Board.

Outreach to Residents: Advertising Campaigns over the past four years the Program has spent over $500,000 on outreach campaigns aimed at reducing the use of insecticides. For example, the Program participated in the Bay Area Stormwater Management Agencies Association's (BASMAA) regional television advertising campaign "When Ants Invade," which promoted less toxic pest control practices and won a national advertising industry award. The Program has also funded radio, billboard and

newspaper ads. The Program will continue to employ various media to reach residential audiences and encourage the use of a less toxic, integrated pest management (IPM) approach.

Point of Purchase Campaign The Program is participating in the innovative "Our Water, Our World" IPM campaign. Through the campaign the Program encourages stores that sell insecticides to also stock and promote the sale of less-toxic alternatives. Over 20 stores in the county are currently participating. The Program will aggressively market the IPM campaign to other stores with the goal of having at least 40 stores participating within the next two years. Through the distribution of printed material and information on its website, the Program will promote the IPM campaign to residents

Distribution of Informational Material The Program has printed and distributed over 250,000 pesticide-related brochures, fact sheets and informational guides. These materials are distributed by the Program and its member agencies. The Program has been constructing and staffing a stormwater exhibit at the County Fair for the past seven years and has maintained a booth at the Home and Garden show twice a year. Member agencies have been distributing material at their offices and at events such as watershed festivals and Earth Day fairs. The Program will continue these activities and will also distribute material through its website (www.cleanwaterprogram.com).

Outreach to Commercial Facilities: Some commercial facilities hire licensed applicators or self- apply insecticides. Through the Industrial/Commercial Discharge Control Component of the Program, the municipalities will conduct outreach to selected business sectors. The Program will develop or adapt outreach materials that are appropriate for specific business sectors. These materials will be distributed by the municipalities as part of their regular inspection programs. The Program intends to target retail food establishments in Fiscal Year 2001/02.

Partner with Licensed Pest Control Applicators: Licensed pest control applicators apply approximately half of the diazinon used in Alameda County (Scanlin and Cooper, 1997). Any successful effort to minimize the environmental impact associated with insecticide use will need to have the support of the licensed applicators. The Program is committed to working with the licensed applicators to develop an approach that will allow them to maintain their profitability and provide an effective service to their customers in a way that minimizes environmental impacts. The Program will contact licensed applicators in the county, and will work (with those who are willing) to set up a program to minimize water quality impacts from structural pest control applications. The Program will attempt to coordinate this effort with other programs such as the Bio-Integral Resource Center.

Partner with Other Agencies: County Agricultural Commission The Alameda County Agricultural Commission (Commission) has been very involved in the effort to reduce environmental impacts of insecticide use. Representatives of the Commission have attended the Urban Pesticide Committee

and other related meetings. The Program will coordinate with the Commission in the development of outreach efforts, particularly for licensed applicators.

Household Hazardous Waste There are three permanent household hazardous waste (HHW) facilities in Alameda County. The Program has coordinated with the HHW program in the past and will continue to coordinate with the HHW program to promote the proper disposal of insecticides.

Monitoring and Special Studies: The Program has taken a lead in evaluating the sources of diazinon in stormwater in the Bay Area. In fact, one of the Program's studies, Scanlin and Feng (1997), was cited extensively in U.S. EPA's diazinon reregistration (U.S. EPA, 1999). The Program will continue its effort to provide information that will assist in the development of effective control measures.

Develop an Application/Runoff Model The Program is in the process of developing a computer model of the application and runoff of insecticides from an urban area. Certain insecticides or formulations of insecticides may be more likely to be transported by stormwater. The SWMM-based model uses properties such as water solubility, vapor pressure, and environmental persistence to predict stormwater impacts of insecticide use. The Program believes that the model will be useful as a tool to evaluate the impact of alternative control strategies as well as in evaluating the potential impacts of insecticides that will replace diazinon.

Track Trends in Diazinon Concentrations and Stormwater Toxicity The Program will continue to track diazinon concentrations and toxicity in stormwater runoff to assess the effectiveness of its control activities and monitor the effect of the diazinon ban. A detailed sampling plan will be included in the Program's Long Term Monitoring Plan (draft available, August 2001).

Participate in the Regulatory Process: The Program will coordinate with BASMAA, the California Stormwater Quality Task Force, and the Urban Pesticide Committee to provide data, express concerns, and request consideration of its issues in U.S. EPA's and CDPR's insecticide registration decisions.

MERCURY

Problem Definition

Human exposure to mercury has been shown to cause damage to the liver, kidneys, brain and central nervous system; resulting in loss of physical coordination, mental retardation blindness and even death. Developing fetuses and young children are especially susceptible to poisoning.

Table 4-1: Estimated Annual Loadings of Mercury to San Francisco Bay

Source	Estimate of Annual Load (kg/yr)
Central Valley Watershed Sources	607
Within Basin Watershed Sources	168
Atmospheric Deposition	15
Sediment Remobilization	500
Wastewater Discharge	44
Total	1304

(Modified from Abu-Saba and Tang, 2000)

The National Academy of Sciences[1] (NAS) recently completed an independent study of the toxicological effects of methyl mercury to assist the U.S. EPA. Fish consumption is the major source of human exposure to methyl mercury in the U.S. The study found that chronic, low-level prenatal methyl mercury exposure from maternal consumption of fish has been associated with poor performance by offspring on neurobehavioral tests. The study found that these neurodevelopmental deficits are the most sensitive, well-documented effects of low-level, chronic exposure to methyl mercury. While the majority of the U.S. population has a low risk of adverse effects from methyl mercury exposure, individuals who regularly consume fish may have high methyl mercury exposure and demonstrate observable effects. The study also concluded "because of the beneficial effects of fish consumption, the long-term goal needs to be a reduction in the concentrations of MeHg in fish rather than a replacement of fish in the diet by other foods. In the interim, the best method of maintaining fish consumption and minimizing Hg [mercury] exposure is the consumption of fish known to have lower MeHg concentrations."

Analysis of fish tissue samples conducted on fish caught in the San Francisco Bay between 1994 and 1997 showed that concentrations of mercury exceeded established screening levels, suggesting potential health concerns for consumers of Bay fishes (Davis, 1998). Subsequent to the 1994 fish sampling, the California Office of Environmental Health and Hazard Assessment issued an interim Fish Consumption Advisory for all of San Francisco Bay, partly based on mercury concentrations.

Sources and Loadings

Mercury is used in the manufacturing of such items as thermometers, fluorescent lamps, batteries, paints, and other household products. Of particular importance to the Bay Area is the presence of several large natural deposits of mercury within the San Francisco Bay watershed. Much of this mercury was mined during and after the Gold Rush for use in mining operations.

The two largest sources of mercury to Bay waters are inflow from Central Valley watersheds and remobilization of Bay sediment, which account for 46% and 38% of the total load respectively (see Table 4-1). Much of the mercury in

these two sources is a remnant of its historic use in amalgamating gold.

The next largest category of sources of mercury to Bay Waters, is input from local watersheds, which accounts for approximately 13% of the total load. This category encompasses numerous sources, the largest being mercury from the New Almaden mining area in Santa Clara County that accounts for about 30% of the load from local watersheds (that is, 4% of total Bay load). Other sources contributing to the load from local watersheds include air deposition and soil erosion. Local sources contributing to air deposition are not well quantified but significant sources are believed to include crematoria, cement processing plants, stationary and mobile sources of fossil fuel combustion, and broken fluorescent lamps. Some portion of this mercury is deposited on urbanized surfaces in the county and flows to the Bay in stormwater runoff.

Challenges

Reducing levels of mercury in stormwater discharges poses a number of regulatory and technical challenges. Following is a brief description of some of these challenges.

Regulatory Obstacles: Many of the sources contributing mercury to stormwater runoff are beyond the control of local government, for example, some of the mercury is from global sources, and some is from local air sources, such as cement processing plants and crematoria that are regulated by the California Air Resources Board. The California Department of Toxic Substances Control (DTSC) under the Universal Waste Rule regulates the recycling and disposal of fluorescent lamps.

Technical Obstacles: Because mercury bioaccumulates in the food web, minute quantities of mercury in water and sediment can be hazardous. As with other pollutants, removing these minute quantities of mercury from a large volume of water in a short period of time poses a significant challenge. In addition, standard treatment technologies such as detention basins and wetland treatment systems may actually increase the methylation of mercury. This would exacerbate the problem because methyl mercury is the form that bioaccumulates in fish the most rapidly.

Program's Approach

Focus on Fluorescent Lamps: Fluorescent lamps contain a small amount of mercury with most current generation lamps containing from 10 to 21 mg/bulb. Abu-Saba and Tang (2000) estimate that 13 million fluorescent lamps are disposed of each year in the Bay Area and from this 10-130 kg/year of mercury is released to the environment. Recycling technology is available, and the Regional Board staff has concluded that the recycling of fluorescent lamps is "one of the most effective, readily implementable measures" to reduce the discharge of mercury to the Bay (Abu-Saba and Tang, 2000).

Lead by Example As is the case with the use of insecticides, municipalities use only a tiny fraction of the fluorescent lamps used in the Bay Area. However, the member agencies believe they should set an example for county residents and businesses by ensuring that they minimize the risk to the environment

and human health. The agencies first step will be to conduct a review of their current practices regarding the recycling or disposal of fluorescent lamps. The next step will be to evaluate the results of the survey to determine if these practices could be revised to minimize the risk of mercury release to the environment. The results of the survey and evaluation will be submitted to the Regional Board.

Outreach to Businesses The commercial sector is the largest user of fluorescent lamps. Therefore, the Program will target its initial outreach effort towards businesses. The Program will work with the business community to identify current fluorescent lamp recycling and disposal practices and potential obstacles to increasing the level of recycling. The Program plans to work with the commercial sector and relevant entities such as the Department of Toxic Substances Control (DTSC), the Household Hazardous Waste program, recycling facilities, and the Regional Board to minimize obstacles and provide incentives for recycling. The Program will also develop or adopt outreach material and distribute it to businesses, either through direct mail or in conjunction with the municipalities' Industrial/Commercial inspection program.

Support Changes to Fluorescent Lamp Regulations Current regulations allow businesses to dispose of up to 25 fluorescent lamps at a time as solid waste. The Program will attempt to work with DTSC and other agencies to support and encourage changes to regulations that would promote increased recycling of fluorescent lamps.

Coordinate with Green Business Program The Green Business Program (GBP) helps businesses comply with environmental regulations, and then go beyond compliance to conserve energy, water and other resources, and reduce pollution and waste (www.abag.ca.gov/bayarea/enviro/gbus/gb.html). The Program has been a major supporter of the GBP for several years, and will coordinate with them to promote the recycling of fluorescent lamps at GBP facilities.

Coordinate with Household Hazardous Waste There are three permanent household hazardous waste (HHW) facilities in Alameda County. The Program will coordinate with the HHW program to promote the recycling of fluorescent lamps and other mercury containing products.

Other Mercury Related Efforts:

Participate in the Regulatory Process The Program has been an active participant in the Regional Board's Mercury Council and will continue to support the Regional Board's effort to develop a reasonable approach to solving the mercury problem in the Bay. The Program will also coordinate with BASMAA and the California Stormwater Quality Task Force to develop or support legislation that will help reduce levels of mercury in the Bay.

Track Trends in Mercury Concentrations in Creek Sediment During FY 2000/01 the Program conducted an extensive survey of mercury levels in creek and storm drain sediments throughout the county (Gunther, et al., 2001). During FY 2001/01 the Program will conduct a follow up survey. The Program will

continue its effort to develop information that will assist in the development of effective control measures. The Program is in the process of developing a long-term monitoring plan that will incorporate sediment sampling for mercury. A detailed sampling plan will be included in the Program's Long Term Monitoring Plan (draft available, August 2001).

COPPER

Problem Definition

At very low concentrations, copper is beneficial to aquatic organisms, but at higher concentrations it can be extremely toxic. This toxicity to aquatic life can occur at levels that are not harmful to humans.

The Bay is currently listed as impaired due to copper. However, recent studies have suggested that the Bay should not be listed as impaired, and the Regional Board has indicated that copper may be removed from the list of impairing pollutants on the condition that activities are undertaken to prevent increases in discharges of copper.

Sources and Loadings

Copper is a naturally occurring element that is found in many everyday items, including products associated with building construction, electronic equipment, automobiles, and agriculture. There are a number of significant sources for copper loadings to Bay, but the most significant is automotive vehicle usage. Automobile emissions often contain small amounts of copper. More significantly, brake pads can contain as much as 20% copper by weight. Recent research suggests that brake pad wear may be the largest single contributor of copper to the Bay, adding as much as 40% of the copper in stormwater runoff (Regional Water Quality Control Plant, 1997).

Another potentially significant source of copper to urban runoff is from its use in building construction. The use of copper materials in ornamental applications, gutters, down-spouts, roofs, and algae-resistant treatments for shingles all have the potential for contributing copper to stormwater runoff. Additional significant sources of copper loadings to the Bay include industrial and wastewater discharges; the use of copper in agricultural operations and water treatment systems; and the erosion of native soils, which contain small quantities of copper.

Challenges

Reducing copper levels in stormwater offers challenges similar to reducing diazinon and mercury for both source control and treatment. For example, the largest source of copper to stormwater is believed to be brake-pad wear. As local government agents, Program members are not able to regulate the manufacturing or use of brake pads. Treatment is also problematic since the dissolved form of copper causes toxicity and occasionally exceeds the chronic water quality standard. As with diazinon, dissolved constituents cannot be removed by standard treatment technologies, which rely on filtration or settling of particulates.

Program's Approach

Brake Pad Partnership: The Brake Pad Partnership is a nationwide effort to reduce the level of copper in brake pads. A coalition including stormwater programs, brake pad manufacturers, and the U.S. EPA are working together to find a solution. The partnership was initiated in the Bay Area, and the Program was one of its initial sponsors. The Program continues to support the effort and believes it is the best approach to addressing the problem.

Copper in Building Materials: Barron (2000) estimated that 20% of the copper in runoff from the Palo Alto (CA) area was from the use of copper in building materials. This was partly associated with a large number of luxury homes being constructed in that area at this time. The conditions in Alameda County may be quite different. However, the Program believes that this source of copper is worth looking into, since it could be significant and is one of the few areas where local governments have the potential to initiate a source control effort. The first step the Program will take will be to review construction practices in the county to assess their potential copper contribution. Based on the results of the assessment, municipalities will review and revise their practices if appropriate.

Municipal Maintenance Activities: Street sweeping has the potential to remove some of the copper from brake pad wear and other sources. The municipalities will continue their street sweeping activities in accordance with the municipal maintenance performance standards.

Monitoring and Special Studies: The Program will continue to track the concentration of copper in stormwater runoff in accordance with its Long Term Monitoring Plan (draft available in August 2001), the Program will conduct field studies or literature reviews as necessary to assist with the development and implementation of control measures. The Program also is contributing funding to the North Bay Copper and Nickel Study to investigate the effects of copper on aquatic life.

POLYCHLORINATED BIPHENYLS

Problem Definition

U.S. EPA lists Polychlorinated Biphenyls (PCBs) as a potential carcinogen. Additionally, PCBs are suspected of having negative impacts on the human immune system, reproductive system, nervous system, endocrine system, and digestive system (additional health effects information available at http://www.epa.gov/opptintr/pcb/effects.htm). Although their manufacture is now banned in the United States, PCBs continue to pose a serious risk due to their persistence in the environment.

PCBs accumulate in fatty tissue, hence organisms with a higher fat content will tend to accumulate more PCBs than organisms with a lower fat content. This is important to human health in that several of the more common food fishes in the Bay (e.g., striped bass, white croaker) are marked by relatively high fat content. Sampling conducted on Bay food fishes between 1994 and 1997 showed that concentrations of PCBs in fish tissue exceeded screening values, suggesting potential health concerns for consumers of these fishes (Davis *et al.*, 1998). Subsequent to the 1994 fish

sampling, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory for all of San Francisco Bay, partly based on PCB concentrations found in Bay fishes.

Sources and Loading

PCBs were used in the past in a number of industrial and commercial applications; most importantly as coolants, lubricants, and insulators in electrical equipment such as transformers and capacitors. Additionally, PCBs at one time found many other uses in products such as paints, sealants, preservatives, and fire retardants.

In the mid-1960s, questions regarding the widespread presence of PCBs and their potential health impacts began to raise concern. Commercial production and import of PCBs into this country was banned by the U.S. EPA in 1979, though some manufacture of "closed system" products (having little potential for escape of PCBs from the system) was allowed to continue. By 1984, virtually all manufacture and distribution of products containing detectable levels of PCBs was banned by the U.S. EPA (Hetzel, 2000).

As with mercury, a large source of PCBs to the Bay water and biota is contaminated Bay sediment. The Regional Monitoring Program's sampling effort has detected areas of contaminated sediment adjacent to heavily industrialized land use. Of particular interest to the Program are elevated concentrations found in the Oakland Estuary, San Leandro Bay, and Emeryville Crescent.

Additional contaminated sediment may still be moving towards the Bay from contaminated sites within local watersheds. An initial survey of creek and storm drain sediment conducted in 2000 found a few sites with elevated concentrations (Gunther, et al., 2001). A follow-up study will be conducted in 2001 to determine if sources can be identified.

Challenges

The immediate obstacle to addressing PCB contamination is that the sources are dispersed and largely unidentified.

Program's Approach

Monitoring and Special Studies: The first step in addressing the discharge of PCBs in stormwater is to develop a better understanding of sources within the county. To do this the Program has initiated a multi-year study of the level of PCBs in creek and storm drain sediments throughout the county. A report on the initial round of sampling has been completed (Gunther et al., 2001). Follow-up sampling upstream of sites where elevated concentrations were found will be conducted during FY 2001-2001.

Participate in the Regulatory Process: The Program has been participating actively in the Regional Board's TMDL stakeholder process and will continue to do so.

Notes

[1] National Research Council. 2000. Toxicological Effects of Methylmercury. Prepublication copy.

SECTION 5 PERFORMANCE STANDARDS

Performance standards that are implemented by member agencies exist for the following five areas of the Plan:

- Public Information and Participation
- Municipal Maintenance Activities
- New Development and Construction Controls
- Illicit Discharge Controls, and
- Industrial and Commercial Discharge Controls

These performance standards define a large part of what each member agency must do to implement the Plan and comply with the NPDES permit. In addition, the Plan's Pollutant Reduction Plans for specific impairing pollutants also describe what the member agencies need to do to implement the Plan. It is expected that agency-led activities in the Pollutant Reduction Plans that prove worthwhile for long-term implementation will eventually be integrated into the performance standards.

CHANGES FROM PREVIOUS PERFORMANCE STANDARDS

The following performance standards are generally the same as during the previous SWMP. Some relatively minor modifications have been made to clarify and improve the performance standards. For example, the performances standards for Municipal Maintenance have been reduced and simplified by eliminating details about Best Management Practices and by retaining the more substantive sections that describe what the performance standards are intended to accomplish. A more substantive change was to move requirements for insect management from these performance standards to the Pollutant Reduction Plans. This change reflects the priority that will be placed on controlling the use of insecticides, the still developing approach for controlling insecticides and the need to involve all of the departments within the member agencies in minimizing insecticide usage.

The improvements in the performance standards reflect the collective experience of everyone who has been implementing the performance standards. Each of the proposed changes was discussed at length by the subcommittee that is directly involved in helping the member agencies to understand and implement the performance standards.

OPPORTUNITY TO PROPOSE ALTERNATIVE PERFORMANCE STANDARDS

As the Program continues to evolve, it is becoming increasingly important to recognize agency and watershed-specific differences. In order to allow appropriate tailoring and improvement of the performance standards, each agency retains the flexibility to propose alternative performance standards for its use that will accomplish equivalent or better water quality improvements than the area-wide performance standards described in the subsequent sections. Alternative agency-specific performance standards must be submitted in writing to the Regional Board's Executive Officer, and the alternative performance standards will not become effective until

approved by the Executive Officer, and that approval will be presumed unless it is rejected in writing within 90 days of submittal.

FLOOD CONTROL DISTRICT RESPONSIBILITIES

Some of the performance standards are appropriate for the Alameda County Flood Control and Water Conservation District (District) and Zone 7 of the District, and others are not. For example, the ACFC&WCD and Zone 7 do not conduct business inspection, nor do they sweep streets. Performance standards that each city, the county, ACFC&WCD and Zone 7 are responsible for implementing use the term "agency(ies)" in the performance standard. Performance standards that each city and the county are responsible for implementing, but not the District and Zone 7 of the District, use the term "municipality(ies)."

PUBLIC INFORMATION AND PARTICIPATION

I. PARTICIPATION IN PI/P SUBCOMMITTEE AND GENERAL PROGRAM ACTIVITIES

1. Each agency will designate a person responsible for implementing its Public Information/Participation (PI/P) activities and for acting as a liaison with the PI/P Subcommittee. This designated person will stay sufficiently informed by attending Subcommittee meetings or using other means to participate constructively in PI/P Subcommittee decisions and activities.

2. Each agency will chair the PI/P Subcommittee on a rotating basis so that the burden of providing leadership for the Program is shared in an equitable manner among all of the agencies.

3. Each agency will complete its PI/P quarter or semiannual deliverable reports within the schedule established by the General Program.

II. INTERNAL AGENCY COMMUNICATION AND TRAINING

City Staff and Officials

Each agency is responsible for identifying, developing, and communicating information about the Program so that its clean water staff, new employees involved with the Program, agency managers, and elected officials are well informed about their role in implementing the Program and the Program's requirements and progress. Each agency will provide information at least annually to these targeted groups.

Procedures and Training for Handling Telephone Calls from the Public about Stormwater

- Each agency will have a procedure that it follows for answering and efficiently routing stormwater related telephone calls to the appropriate municipal staff for handling.

- Agency staff assigned to answering or responding to telephone calls will be trained and familiar with the established procedures.

III. USE OF PROGRAM OUTREACH

As described in Task 5 of the PIP component work plan (Section 3), the General Program will be responsible for conducting surveys to evaluate the effectiveness of public education and outreach efforts implemented by the member agencies and by the General Program.

Distribution of Program Information Pieces

- Each agency will be responsible for identifying, in a written plan maintained at its offices, how it will distribute copies of General Program informational materials.

This plan will be available to the Regional Board upon request.

- Within two years of receiving its allotment from the General Program, each agency will have the goal of completing distribution of these materials to the target audience. Approximately one-half or more of the materials should be distributed within twelve months of receiving the allotment.

- Each agency will be responsible for tracking its inventory of General Program educational materials in order to be able to determine the need to re-order.

Storm Drain Inlet Stencils and Signs

- Each municipality will have stenciled or in some other ways signed ninety percent of its municipality-owned storm drain inlets or conducted activities that are demonstrably equivalent in terms of achieving awareness by residents that materials should not be disposed down storm drains. Demonstrably equivalent means that the municipality will provide examples of comparable alternative activities or have available a valid survey to show that its residents are as aware of where storm drains lead as are residents in comparable communities with stencils or signs. A description of the demonstrably equivalent activities must be submitted in writing and approved in advance by the Regional Board's Executive Officer, and this approval will be presumed unless disapproved in writing within 90 days of its submittal.

- As a goal all stencils and signs installed will be maintained sufficiently to be readable.

- In order to provide an educational opportunity, each municipality will optimize the use of local volunteers to assist with the stenciling or signage activities.

IV. AGENCIES' COMMUNITY OUTREACH PROGRAM

General Needs

The community outreach activity must be reasonably significant in terms of either the level of participation of the member agency and/or the number of people reached by the event.

Agencies will participate in community outreach activities from the areas listed below (under A. through F.) for the purpose of communicating the general stormwater pollution prevention message and complementing the General Program's specific message(s) for its targeted audience(s). Every other year at least one of these activities must be from Category F. The following provides the number of different activities that will be participated in annually:

Over 100,000 in population

- each municipality will participate in eight activities;

Between 50,000 and 100,000

- each municipality will participate in six activities;

Less than 50,000; Alameda County Flood Control and Water Conservation District (District); and Zone 7 of District

- each agency will participate in four activities.

A. Participate in Existing Community Events

Distribute ACCWP information by participating in existing community events (fairs, festivals, exhibits, etc.) held within its or a nearby jurisdiction. This participation may include the setting up of a booth, kiosk display, or other creative means of communicating the general stormwater pollution prevention message, using a specific message to a target group, or make a presentation to a local community service group.

B. Plan/Implement New Community Events

Play a major role in planning and staging a community or citywide event, examples include the following:

- Earth Day or other festival or fair;
- Business mixer;
- Seminar or target group; and/or
- Contests.

C. Contact Media and Conduct Advertising

Maintain local media contacts with local newspaper, radio, and television stations to be able to communicate the general stormwater pollution prevention message, complement the General Program's specific targeted audience(s) and message(s) and complement regional PI/P activities. This local media contact may include: adaptation and/or development and distribution of stormwater related press releases or use of paid advertising including advertising in local telephone directories.

D. Provide Program Information Through Other Venues

The following types of venues may be used:

- Agency newsletter;
- Other municipal newsletter;
- Local magazine;
- Utility bill inserts;
- Mailing to target group; and
- WebPages.

E. Develop and Implement Integrated Outreach Approaches

This area includes activities, such as the following:

- Point of purchase display and giveaway;
- Plan, create and distribute videos;
- Create and stage a play;
- Develop special displays or kiosks for your message especially interactive ones (such as slides in movie theaters);
- Develop/implement program for school curriculum and provide equipment;
- Support and partner with

other agencies to increase or improve pollution prevention capabilities (e.g., helping set up oil and/or antifreeze collection facilities); and
- Make and place signs on sweepers or other vehicles; and
- Place messages on workers' T-shirts.

F. Develop Watershed Awareness

This area includes one or more of the following types of activities that are listed as examples:
- Identify and support a friends of a watershed group and encourage creek cleanups (or if this is infeasible, lagoon or shoreline cleanups) or adopt-a-creek or other volunteer monitoring and resource inventorying activities.
- Conduct a creek cleanup (or if this is not feasible, lagoon or shoreline cleanups) within its jurisdiction on an annual basis; and
- Participate in a local event in its jurisdiction or neighboring jurisdiction as part of the Coastal Commission's annual Coastal Clean-Up Day and/or as part of Earth Day.

Special Needs

Each municipality will identify whether there are any special needs of some of its residents. An example of a special need would be if a significant percentage of the residents are native speakers of a language other than English or Spanish who would be able to better participate in the municipality's stormwater pollution prevention efforts by having materials available in their native language.
If a municipality has identified a special need not being addressed by the General Program, it will, on its own or in collaboration with other member agencies, develop and distribute translated materials or other special materials needed to fill the special need.

V. COORDINATION WITH SCHOOLS

1. If not being performed by others, each municipality will help to distribute to schools within its jurisdiction information provided by the General Program about its school outreach activities, such as, the Bay Savers, Kids in Creeks/Gardens/Marshes/Watersheds workshops, and community stewardship grants.

2. The General Program will continue to develop and produce materials for outreach to schools. Each municipality will make these materials available to schools in its jurisdiction, if not distributed by the General Program or other methods. This may include each municipality disseminating information on how to obtain copies of these materials if this is a more efficient way to achieve distribution.

3. Each municipality will also work with the local school district to encourage that appropriate stormwater pollution prevention and aquatic resource protection information will be taught to

school children within its jurisdiction.

MUNICIPAL MAINTENANCE – GENERAL

The following General Performance Standards apply to all municipal maintenance activities.

I. SPILL RESPONSE

1. If the spill is suspected to be toxic or hazardous materials, maintenance staff will call the public safety dispatcher, 911, and/or the local illicit discharge coordinator.

2. If non-hazardous materials are spilled, maintenance staff will contain the spill area immediately to prevent additional discharge of pollutants into the storm drain system and clean as soon as practicable.

3. Maintenance staff will report spills to, and work with, the agency's illicit discharge coordinator, or appropriate party, to determine the appropriate follow up response (e.g., track the source of the spill and identify product labels that have a bar code identifying the originating agency, contact Building and Planning Departments, send a clean-up bill to the responsible party, etc.).

II. TRAINING

Each agency will train employees and contractors in the use of the Spill Response Performance Standards as appropriate.

III. DISPOSAL OF WASTE MATERIAL AND CHEMICALS

1. Each agency will ensure proper handling and disposal of material removed from streets and storm drainage facilities to prevent discharges of pollutants to surface waters or groundwater.

2. Each agency will dispose of excess chemicals at an Alameda County Household Hazardous Waste Facility or other approved disposal location (or recycle the chemical.)

3. Each agency will properly dispose of or recycle used solvents/chemicals.

IV. CONTRACTORS

1. Each agency shall incorporate the municipal maintenance performance standards into municipal contract specifications.

2. Each agency shall provide volunteers and contractors with educational material describing the Municipal Maintenance Performance Standards as appropriate.

MUNICIPAL MAINTENANCE – STREET CLEANING

I. STREET CLEANING FREQUENCY

1. Each municipality will clean streets on at least a monthly average unless an alternative schedule is approved as described in number 2 below. In calculating this average, the number of curb miles swept in a fiscal year divided by the number of curb miles within a municipality will equal twelve or greater. The removal of cars should be encouraged by having a fixed sweeping schedule. Sweeping will be prioritized to clean the streets that have been found to be typically the dirtiest and to conduct sweeping prior to the rainy season.

2. If a municipality chooses to clean streets less than on a monthly average the rationale for the alternative standard must be describe in a written action plan. The rationale should demonstrate that the alternative schedule is equivalent in terms of protecting water quality as the annual average sweeping. The action plan must be submitted to the Regional Board as part of the Mid Fiscal Year Report or the Annual Report. The alternative standard will not be effective until approved by the Regional Board's Executive Officer, and that approval will be presumed unless it is rejected in writing within 90 days of its submittal.

II. STREET CLEANING OPERATION TO MAXIMIZE POLLUTANT REMOVAL

1. Each municipality will utilize, as appropriate, the Street Cleaning BMPs to maximize pollutant removal during sweeping activities. When purchasing new sweepers, each municipality will review alternative equipment and new technologies to maximize pollutant removal.

III. PROBLEMS ASSOCIATED WITH EFFICIENT STREET CLEANING

Getting Parked Cars Off Streets

1. Each municipality will maintain a consistent sweeping schedule.

2. Each Agency will utilize, as appropriate, the Street Cleaning BMPs to keep curbed areas clear during street cleaning.

Removing Large Accumulations of Leaves Just Prior to Sweeping

Each municipality will have a leaf removal option available to residents. The leaf removal may be conducted by an entity other than the municipality, for example, curbside leaf pick up by a waste management company. Each municipality will utilize, as appropriate, the Street Cleaning BMPs for specific leaf handling methods.

Maintaining Trees Near Streets

Each municipality will provide operators with adequate resources to conveniently report trees interfering with street cleaning.

IV. RECORD KEEPING

1. Each municipality will track miles swept using a broom odometer or by tracking mileage only when cleaning (do not include mileage to an area).

2. Each municipality will track volume or weight of material removed.

MUNICIPAL MAINTENANCE – STORM DRAIN FACILITIES AND WATERCOURSES

I. ROUTINE INSPECTION AND CLEANING

1. Each agency will inspect, and clean as necessary, storm drainage facilities (inlets, culverts, V-ditches, pump stations, open channels, and watercourses), once a year on average unless an alternative schedule is approved as described in number 2 below. The inspections and needed cleaning will preferably occur prior to the rainy season. In calculating this average, some facilities may be inspected more than once per year and others less than once per year.

2. If an agency chooses to inspect, and clean as necessary, storm drainage facilities (inlets, culverts, V-ditches, pump stations, open channels, and watercourses), less than an annual average the rationale for the alternative standard must be described in a written action plan. The rationale should demonstrate that the alternative schedule is equivalent in terms of protecting water quality as the annual average inspection. The action plan must be submitted to the Regional Board as part of the Mid Fiscal Year Report or the Annual Report. The alternative standard will not be effective until approved by the Regional Board's Executive Officer, and that approval will be presumed unless it is rejected in writing within 90 days of its submittal.

3. When cleaning storm drainage facilities, each agency will remove the maximum amount of material at the nearest access point to minimize discharges to watercourses.

4. Each agency will maintain a storm drainage facility inspection and maintenance plan. The Plan includes:

   a. Schedule for inspecting storm drainage facilities;

   b. Rational for determining when to clean inlets, etc.;

   c. Results of an evaluation to install additional screens or grates near or in inlets to inhibit discharge of litter, but where flooding is not a concern;

   d. Identification of target areas that tend to accumulate excessive pollutants for cleaning and/or public education; and

   e. Inventory of the storm drain system.

5. Unless provided for in an alternative plan approved by the Regional Board's Executive Officer, each agency will inspect twice a year storm drainage facilities that tend to accumulate excessive sediment and debris: prior to the rainy season to prevent flooding and discharge of pollutants and after the rainy season to remove sediment and debris.

6. Each agency will inspect storm drain inlets monthly during the wet season

in areas suspected of containing illegal dumping, and clean as necessary.

II. RECORD KEEPING

1. Each agency will report the amount of material removed when cleaning storm drainage facilities in monthly record keeping forms.

2. Each agency will document and track spill incidents and response to spill incidents either as described in the "Monthly Record Keeping Form" or as part of the Illicit Discharge Quarterly Summary Form.

3. Each agency will document and maintain the following records monthly for pump stations and watercourses:

   a. Areas/sites inspected,
   b. Silt and vegetation removal practices,
   c. Areas where man-made materials are removed, type and estimate of quantity or weight removed,
   d. Disposal practices and any testing results,
   e. Spill incidents and follow-up actions,
   f. Application of chemicals (type used, areas applied), and
   g. Areas for possible improvements.

III. INSPECTION AND MAINTENANCE

1. Each agency will inspect pump stations after the wet season and develop a schedule for maintenance activities prior to the next wet season.

2. Each agency will inspect trash racks and oil absorbent booms during or after significant storms. Remove debris in trash racks and replace oil absorbent booms as needed.

IV. PERMITS AND OTHER REGULATORY REQUIREMENTS

Each agency will coordinate with the California Department of Fish and Game, the U.S. Army Corps of Engineers, and other agencies as appropriate in order to comply with regulatory requirements prior to commencing work.

V. VEGETATION

See procedures in the Municipal Maintenance BMP Manual.

MUNICIPAL MAINTENANCE – CORPORATION YARDS AND AUXILIARY STORAGE AREAS

I. GENERAL BMPS

1. Each agency will ensure that necessary safety equipment and spill containment kits are readily accessible in areas where chemicals are used, in fueling areas, and in areas that have a potential for spills. Each agency will inspect safety equipment (eye flushing stations, etc.) regularly to ensure they are operational.

2. Each agency will assign one person the primary responsibility for ensuring that BMPs are implemented. This person will also be responsible for ensuring that all persons using the facility are aware of BMPs.

3. Each agency will stencil inlets to the storm drainage system with a message such as "No Dumping, Drains to Bay".

4. Each agency will conduct facility surveys annually - possibly in conjunction with hazardous materials management and/or spill prevention inspections.

5. Each agency will have a Storm Water Pollution Prevention Plan (SWPPP) for each corporation yard.

6. Each agency will inspect the yard routinely to ensure that there are no illegal discharges to the storm drain system and that during storms, pollutant discharges are controlled to the maximum extent practicable.

7. Each agency will sweep the corporation yard. The agency will dispose of material removed from streets and storm drainage facilities often to eliminate exposure to rainwater and runoff to the storm drain system.

II. WASHING VEHICLES/EQUIPMENT

1. Each agency will clean all vehicles/equipment on designated wash pad areas or off-site if needed so washwater drains to the sanitary sewer or is recycled.

2. Each agency will ensure that wash pad area and sump are large enough so that all washwater drains to the sanitary sewer or recycling system. The agency will re-grade area if necessary or install dikes to convey washwater.

III. REFUSE HOLDING AREAS

Each agency will store material removed from storm drainage facilities and streets on a concrete or asphalt pad in a contained area. The agency will drain liquids to the sanitary sewer or allow it to evaporate. If feasible, the agency will cover the storage area during the rainy season.

IV. FUEL DISPENSING AREAS

1. Each agency will store spill

containment kits nearby. If spills occur, the agency will use dry methods to clean the fueling area and follow procedures in the Hazardous Materials Business Plan (HMBP) and/or Spill Prevention Control and Countermeasure Plan.

2. Each agency will maintain signs reminding people not to "top off" tanks.

3. Appropriate spill equipment will be used when mobile fueling is implemented.

4. Each agency will cover fuel dispensing areas, when feasible. The agency will not conduct fueling over open ground (ground should be covered by concrete or asphalt protected with a sealant).

V. CHEMICAL USAGE AND STORAGE

1. Each agency will store paint and other chemicals in an approved covered containment area. If 55-gallon drums containing hazardous materials or wastes are stored outside, each agency will keep drums in an approved containment area.

2. Each agency will minimize use of chemicals. The agency will use water-based paints and non-toxic chemicals as much as possible.

VI. FLEET MAINTENANCE/VEHICLE PARKING AREAS

1. Each agency will minimize leaks from vehicles by performing routine inspections, repairing vehicles with significant leaks, and employing drips pans where appropriate.

2. Each agency will periodically dry sweep the area.

MUNICIPAL MAINTENANCE – LITTER CONTROL, ROAD REPAIR AND GRAFFITI REMOVAL

LITTER

1. Each agency will provide an adequate number of litter receptacles in commercial areas and other litter source areas. Agencies will make every effort to contain litter in receptacles.

2. Each agency will ensure litter receptacles are maintained on a frequent enough basis to minimize or prevent spillage.

3. Each agency will document and maintain the following records monthly:

   a. Areas targeted for litter removal

   b. Total amount of material removed

ROAD REPAIR

I. General

1. Each agency will schedule excavation and road maintenance activities for dry weather, if feasible.

2. Each agency will perform major equipment repairs at the corporation yard, when practical.

3. When refueling or maintaining vehicles and equipment on-site, each agency will use a location away from storm drain inlets and creeks.

4. Each agency will recycle used motor oil, diesel oil, concrete, broken asphalt, etc. whenever possible.

5. Each agency will contain diesel oil used to lubricate or clean equipment or parts.

II. ASPHALT/CONCRETE REMOVAL

Each agency will utilize, as appropriate, the Road Repair BMPs for protecting storm drain inlets prior to breaking up asphalt or concrete. The agencies will clean afterwards by sweeping up as much material as possible.

III. PATCHING AND RESURFACING

1. Each agency will utilize, as appropriate, the Road Repair BMPs for protecting storm drain inlets prior to patching and resurfacing activities.

2. Agencies will not stockpile materials in streets, gutter areas or near storm drain inlets or creeks unless these areas are protected.

3. Agencies will never wash excess material from exposed aggregate concrete or similar treatments into a street or storm drain inlet. Each agency will designate an unpaved area for clean up and proper disposal of excess materials.

IV. EQUIPMENT CLEAN UP/STORAGE

Each Agency will clean equipment at the end of the day at the corporation yard, when possible, and will cover sprayers and patching and paving equipment to prevent rainfall from contacting pollutants.

GRAFFITI REMOVAL

See graffiti removal BMPs in the Municipal Maintenance BMP Manual.

NEW DEVELOPMENT AND CONSTRUCTION SITE CONTROLS

The following performance standards apply to all Clean Water Program member agencies for all construction activity including clearing, grading and excavation activities that result in the cumulative disturbance of 10,000 or greater square feet of land that would discharge stormwater to the municipally-owned storm drain system. A member agency may consider a project exempt from these performance standards if it would disturb less than 10,000 square feet of land and it does not cause substantial or potentially substantial adverse change in the quantity and/or quality of stormwater runoff generated from the site considering all four of the following conditions:

- The size of the project is negligible;
- The amount of land disturbed is insignificant;
- The potential impact on stormwater quality and quantity is insignificant; and
- The intensity of the construction activity is minimal.

I. MEASURES AND POLICIES TO CONTROL THE QUALITY OF STORMWATER RUNOFF

1. Each agency will incorporate the New Development Subcommittee's conditions of approval into its standards for development, as appropriate.

2. Each agency will document permanent erosion and stormwater quality controls, controls during construction, and operation and maintenance of structural controls in conditions of approval for both public and private projects. Best management practices (BMPs) will be selected from appropriate guidance materials.

3. Each agency will ensure that stormwater quality requirements are included in plans and contract specifications for municipal construction projects.

4. Each agency will implement design guidelines and practices that incorporate water quality protection measures for both public and private projects.

The Following Will Be Implemented when General Plans and Ordinances are Amended:

1. Each agency will review and update General Plan policies and implementation measures that help preserve and enhance water quality.

2. Each agency will review and update legal authority provided in erosion control and stormwater management and discharge control ordinances.

II. EDUCATIONAL ACTIVITIES

1. Each agency will provide educational materials (BMP flyers, Blueprint for a Clean Bay, etc.) to municipal staff, developers, contractors, construction site operators, and owner/builders, as appropriate. (Requires coordination with the PIP Subcommittee.)
2. Each agency will educate:

- Staff responsible for development application and plan review on stormwater quality issues and controls. Agencies will provide information on municipal design guidelines, ordinances, conditions of approval, contract specifications and protected sensitive areas.

- Construction site inspectors on proper implementation and maintenance of erosion and sediment controls and materials/waste management BMPs.

- Other municipal staff involved in development and redevelopment projects (e.g., capital improvement, public works, and/or building inspectors).

3. Each agency will provide pre-application materials containing information on stormwater controls and requirements to developers.

4. Each agency will attach appropriate BMP information to building permits, as needed.

III. DEVELOPMENT APPLICATION AND PLAN REVIEW

1. Each agency will continue to evaluate the effects of development on stormwater runoff and wetlands in the CEQA process.

2. Each agency will consider water quality impacts in the context of their review and possible approval of both public and private development projects.

3. Agencies will require public and private development projects to include site planning and design techniques to prevent and minimize impacts to water quality. These may include the following:

   a. Minimize land disturbance.

   b. Minimize impervious surfaces, especially directly connected impervious areas.

   c. Use of clustering.

   d. Preservation of quality open space.

   e. Maintain (and/or restore, if possible) riparian areas and wetlands as project amenities, establishing vegetation buffer zones to reduce runoff into waterways.

4. Each agency will require public and private development projects to include permanent stormwater quality controls, as appropriate, if sufficient site planning measures are not implemented or feasible.

IV. EROSION AND SEDIMENTATION CONTROL

1. Each agency will review its erosion control program for adequacy, and identify and implement any improvements needed in the following areas:

   a. Enforcement authority (grading, erosion, and/or

stormwater control ordinances).

b. Minimum BMPs required.

c. Training and tools for inspectors.

d. Information for developers and contractors.

2. As a condition of issuance of a grading permit, each agency will require developers to prepare, submit to the agency for review and approval, and implement an effective erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

3. Each agency will require developers to provide permanent erosion and stormwater controls on plans submitted for projects.

V. STATE GENERAL PERMIT

Prior to construction of a project that disturbs ≥ 5 acres, each agency will require a copy of the Notice of Intent (NOI) sent to the State Water Resources Control Board for coverage under the Construction Activity Stormwater NPDES General Permit.

The Following Will Be Implemented upon Adoption of the New Construction General Permit:[1]

1. Prior to construction of a project that disturbs ≥ 1 acres, each agency will require a copy of the Notice of Intent (NOI) sent to the State Water Resources Control Board for coverage under a Construction Activity Stormwater NPDES General Permit.

2. Prior to the construction of a project that requires the filing of an NOI, each agency will require a copy of the project's Stormwater Pollution Prevention Plan (SWPPP).

VI. CONSTRUCTION SITE FIELD CONTROLS

1. Each agency will require that project applicants prepare and submit a Stormwater Quality Protection Plan[2] prior to the start of construction activity, to demonstrate that the owner, developer, and/or contractor has evaluated BMPs and provided those appropriate for protection of stormwater quality during construction activities.

2. Each agency will coordinate construction inspections and enforcement of corrective actions with Regional Board staff, if appropriate.

3. Each agency will inspect construction sites for adequacy of stormwater quality control measures on a regular basis, with the frequency of inspections based on considerations such as the size of the project, its potential impact on stormwater quality, and the amount of construction activity.

4. For construction sites requiring erosion sediment control plans, each agency will inspect sites prior to the beginning of the wet season

each year, to ensure that measures have been taken to prevent erosion and minimize discharges of sediment from disturbed areas.

5. For construction sites requiring erosion sediment control plans, each agency will inspect sites following each major storm event or series of events during the wet season of each year, to observe the effectiveness of erosion sediment control measures.

6. For project site inspections, inspectors will:
   a. If available, review the Stormwater Quality Protection Plan prior to conducting the inspection.

   b. Inspect for and effectively prohibit non-stormwater discharges, except those discharges which contain no pollutants.

   c. Whenever possible, visually observe the quality of stormwater runoff after a major storm event.
   d. Require proper implementation and maintenance of erosion sediment controls and material/waste management BMPs (e.g., covering stockpiled materials, designating work and storage areas) to minimize the discharge of pollutants.

   e. If appropriate, document stormwater violations and corrective actions.

VII. WATERSHED RESOURCE INVENTORY AND PLANNING

These activities will be coordinated with the Watershed Assessment and Monitoring (WAM) Subcommittee.

1. Each agency will develop and submit with the *Annual Report*[3] an approach and schedule for conducting a watershed management issues assessment based on guidance from the Regional Board and guidance being developed by the WAM Subcommittee as it becomes available.

The Following Will Be Implemented when General Plans and Ordinances are Amended:

1. Each agency will consider the criteria for sensitive areas as guidance when amending their General Plans.

2. Each agency will incorporate findings from the watershed resource inventories conducted by the WAM Subcommittee into General Plan amendments.

VIII. POLICIES FOR MAINTAINANCE AND OPERATIONS OF FLOOD CONTROL CHANNELS AND WATER COURSES) –

These performance standards apply to all agencies that maintain creeks and flood control channels.

Each agency will consider potential benefits to habitat,

education, recreation, and water quality when planning flood control channel maintenance and improvements.

IX. SUBCOMMITTEE MEETINGS AND WORKSHOPS

1. At least one representative from each agency will attend the Program's New Development workshops.

2. Each agency will chair the New Development Subcommittee on a rotating basis so that the burden of providing leadership is shared equitably.

3. Each agency will designate a person responsible for implementing the New Development, Redevelopment, and Construction Site Controls Component and for acting as a liaison with the New Development Subcommittee. This designated person will stay informed sufficiently to participate in New Development Subcommittee decisions and activities.

ILLICIT DISCHARGE CONTROLS

I. ILLICIT DISCHARGE CONTROL INSPECTION PROGRAM –

These performance standards apply to all agencies.

1. Each agency will prepare a written Five-Year Action Plan that demonstrates the agency's commitment to conducting effective investigation, tracking, and elimination of illicit discharges and describes the level of effort for conducting these activities. The Action Plan will demonstrate that the agency has:

    a. Identified, verified, and prioritized problem areas for investigation and/or repeat inspections.

    b. Defined priority for investigation of all areas within their jurisdiction.

    c. Demonstrated commitment to survey high priority areas annually.

    d. Defined frequency of survey for second and/or third priority areas, until the entire agency's drainage area has been inspected at least once during the five-year period of the Action Plan.

    e. Selected which agency or group will conduct the field surveys and estimated the number of labor hours required to implement the program. When more than one department is involved with conducting field surveys, determined how illicit discharge surveys and follow-up activities will be coordinated.

    f. Established how activities will be documented.

    g. Adopted the minimum enforcement procedures.

    h. Developed procedures for enforcement or referral to an outside agency, including appropriate time periods for action.

The Five-Year Action Plan will be submitted to the Regional Board by May 30, 2003.

2. Each agency will review annually and update as necessary its Five-Year Action Plan. The review will include an evaluation of field survey results from the previous year and an assessment of which types of non-stormwater discharges were most prevalent. Changes for the coming fiscal year will be submitted to the Regional Board by March 1.

3. Each agency will ensure that designated illicit discharge inspectors are trained. Agencies

will provide inspectors with the knowledge and skills necessary to conduct effective field investigations, with guidance from the Industrial & Illicit Discharge Control (I&IDC) Subcommittee and Regional Board staff.

4. Each agency will develop or obtain accurate maps of the agency's storm drain system including major drain segments, reaches, and outfalls within the agency's jurisdiction.

II. CONDUCTING FIELD INVESTIGATIONS

These performance standards apply to all agencies.

1. Each agency will conduct field investigations that include inspecting portions of the municipal storm drain system for potential sources of illicit discharges. Inspectors will:

    a. Survey priority areas as defined in the Five-Year Action Plan and make observations. Record observed or suspected dry weather flows.

    b. As possible, attempt to determine the type of flow and try to trace the flow to its source by following storm drain maps, inspecting manholes, and making surface observations. Record findings.

    c. If the responsible party is identified, educate the party on the impacts of his or her actions, explain the stormwater requirements, and provide BMPs. Initiate follow-up and/or enforcement procedures, if applicable. (Follow-up and enforcement activities are detailed further in Section III below.) Record activities.

2. Each agency will send at least one representative to General Program workshops to obtain additional training and share experiences with other agencies. The I&IDC Subcommittee will annually assess inspector training needs.

III. EVALUATING COMPLIANCE OF NON-STORMWATER DISCHARGER

These performance standards apply to all agencies.

Follow-up Activities

1. Each agency will continue inspection and follow-up activities until compliance is achieved. Record activities.

2. Agency staff will meet with the responsible party to discuss methods for eliminating the illicit discharge, including disposal options, recycling and possible discharge to the sanitary sewer, as appropriate. Provide ACCWP information to the responsible party. In the case of washwaters, refer to the incremental BMPs in *Recommended Discharge Elimination/Disposal Priorities for Washwaters* (September, 1994).

3. If the discharge is traced to a business, inspectors will coordinate information on the illicit discharge with the industrial/commercial discharge control program.

4. The appropriate agency will begin enforcement procedures, if necessary.

Enforcement

1. Agencies will conduct enforcement activities and report these activities as outlined in the *Protocol for Reporting Enforcement Activities* (*Protocols*). These activities are set forth by the individual municipality ordinances.

2. Agencies will provide inspectors with sufficient authority to initiate enforcement procedures.

IV. SPILL REPORTS/COMPLAINTS

These performance standards apply to all agencies.

Since a network of spill response and clean up programs already exists, establishing a new and separate stormwater response program would duplicate many of the services already being provided by these programs. The approach of the ACCWP illicit discharge control component is to supplement these services and respond to spill incidents that are not under the purview of previously existing clean-up programs. Within this context, each agency will implement the following performance standards.

1. Inspectors will investigate spill reports and/or complaints within their jurisdiction and record their activities.

2. Inspectors will become familiar with the existing spill response and clean-up programs that cover the agency's jurisdiction, and coordinate illicit discharge program activities with these existing programs.

3. Through internal communication and public education, agencies will encourage the use of "911" to report large or hazardous spills. If the use of "911" is not appropriate in a particular agency, establish and publicize an alternative telephone number for reporting spills.

4. Each agency will establish a mechanism for obtaining information about spill incidents so that source identification and follow-up actions can be conducted.

5. Each agency will identify an appropriate role for its participation in spill response drills, in cooperation with other agencies or industries.

V. DOCUMENTATION AND REPORTING

These performance standards apply to all agencies.

1. Each agency will summarize field investigations and follow-up activities using the Illicit Discharge Inspection Quarterly Summary Report form. These forms will be incorporated into the ACCWP's annual reports to the Regional Board.

2. Each agency will document the number and types of spill incidents reported and responded to within the agency's jurisdiction, based on direct calls, "911" dispatch records, referrals from the General Program, and other sources. (Agencies do not need to document automotive fluid spills for traffic accidents.) This information will be incorporated into the ACCWP's annual reports to the Regional Board.

3. Location of field investigations and incidents responded to must be tracked and recorded internally and be available for Regional Board staff review. This data does not need to be included in the ACCWP's annual reports to the Regional Board.

4. Each agency will describe training and coordination of staff involved with illicit discharges. This information will be incorporated into the ACCWP's annual reports to the Regional Board.

INDUSTRIAL AND COMMERCIAL DISCHARGE CONTROLS

I. INDUSTRIAL AND COMMERCIAL BUSINESS INSPECTION PROGRAM

These performance standards apply to all municipalities.

1. Each municipality will prepare a written five-year Inspection Plan that describes industrial and commercial sectors, as well as business inspection procedures and priorities. The five-year Inspection Plan will be submitted to the Regional Board by May 30, 2003.

2. Each municipality will prepare annually a written Inspection Workplan that outlines specific steps the municipality will take to conduct effective inspections in the following year. The Inspection Workplan will include:

    a. An evaluation of inspection results from the previous year to assess which industry types had the most impact on stormwater quality.

    b. An estimate of the number of facilities to be inspected in the coming fiscal year listed by type of business. If a business is being inspected due to geographical location, then it will be listed by geographical sector.

    c. An estimate of the number of high priority facilities that will be inspected in the coming fiscal year. The goal is to inspect the business community that has the potential to impact stormwater quality, at least once during the five-year permit period.

    d. As appropriate, a summary of efforts to coordinate inter/intra-agency issues.

    The Inspection Workplan for the coming fiscal year will be submitted to the Regional Board by March 1 of each year, except the FY 2003/4 workplan which will be submitted by May 30, 2003.

3. Each municipality will ensure facility inspectors are adequately trained. This includes the knowledge and skills necessary to conduct effective stormwater inspections, with direction from the Industrial & Illicit Discharge Control (I&IDC) Subcommittee. This may include: stormwater regulations and requirements (including the municipality's ordinance, municipal stormwater permit, and the industrial stormwater general permit); the impacts of non-stormwater discharges to the storm drains; inspection techniques and procedures; follow-up and enforcement procedures; and stormwater BMPs.

4. Each municipality will conduct outreach in addition to inspection activities, to inform facility representatives about appropriate stormwater BMP information. This may be satisfied by responding to telephone calls from business representatives, making presentations to business groups, or participating in focused outreach efforts coordinated by the I&IDC Subcommittee for targeted business groups.

5. Municipalities may coordinate outreach information with other ACCWP Subcommittees and other inspection programs.

II. INSPECTION ACTIVITIES

These performance standards apply to all agencies.

1. Each agency will respond to complaints or referrals concerning a facility. The response may include actions such as: interviewing the caller concerning the specific nature of the discharge; inspecting the site; locating any non-stormwater discharges to the storm drains; informing the facility representative of appropriate stormwater BMPs; and conducting follow-up measures to ensure compliance is achieved.

2. Each municipality will update their list of businesses from the following as appropriate: inter/intra-agency referrals; other agency and department lists; business licenses; water/utility bills; etc.

Preparing for the Site Visit

Inspectors will review existing information on the site and its regulatory history.

During the Site Visit

1. Inspectors will review the facility layout to locate the storm drain system and/or stormwater drainage path for storage areas, process areas, vehicle and heavy equipment wash and maintenance areas, and stormwater sampling locations, if applicable.

2. Inspectors will review/inspect the following areas for the potential to discharge pollutants from non-stormwater discharges or exposure to runoff. The areas that are inspected will depend on facility operations.

   a. Outdoor process/manufacturing areas;

   b. Outdoor material storage areas;

   c. Outdoor waste storage and disposal areas;

   d. Outdoor vehicle and heavy equipment storage and maintenance areas;

   e. Outdoor parking areas and

access roads;

f. Equipment on rooftops;

g. Outdoor wash areas;

h. Outdoor drainage from indoor areas; and

i. Stormwater conveyance system maintenance, and emergency response practices.

3. Inspectors will collect the information on the most recently adopted Standard Stormwater Facility Inspection Report Form.

4. Inspectors will use the facility's SWPPP, if available, as a tool in assessing the facility's stormwater pollution control activities. This will not imply review or approval of the adequacy of the SWPPP.

5. Inspectors will identify and inform the facility representative about problems and violation(s), if applicable. A schedule for correcting problems identified during the inspection and a means for verifying its implementation will be coordinated between the inspector and the facility representative. This information will also be noted on the inspection form.

6. Inspectors will provide facility representatives with appropriate BMP information, education materials, and inter/intra-agency referrals as appropriate.

7. Inspectors will obtain ongoing training to support inspection activities and to continue to improve program implementation. Inspector(s) representing each municipality will attend General Program inspector training workshops. The Industrial & Illicit Discharge Control Subcommittee will annually assess inspector training needs.

III. FACILITY COMPLIANCE EVALUATION

These performance standards apply to all agencies.

Repeat/Follow-up Inspection

1. The inspector will determine if the facility is in compliance with the municipality's stormwater ordinance (i.e., there are no unpermitted non-stormwater discharges and pollutant exposure to rain is minimized).

2. Inspectors will prioritize the facility for re-inspection. If a problem was identified during the inspection, inspectors will perform a follow-up inspection or initiate a self-certification process where the facility representative certifies in writing that the problem has been removed or corrected within the time specified by the inspector.

3. Inspectors will begin enforcement procedures as appropriate.

Enforcement

4. Agencies will conduct enforcement activities and report these activities as outlined in the *Protocol for Reporting Enforcement Activities*

adopted by the Industrial & Illicit Discharge Control Subcommittee and the Management Committee. These activities are set forth by the individual agency ordinances.

IV. DOCUMENTATION AND REPORTING

These performance standards apply to all agencies.

Each municipality will annually review inspection results and assess whether goals were met. The General Program will summarize inspection activity, follow-up activities, and enforcement action taken against businesses determined to be in non-compliance. This review will be incorporated into the Program's *Annual Report* to the Regional Board.

Notes

[1] Implement when State Board adopts a Construction Activity Stormwater NPDES General Permit for construction activities ≥ 1 acres.
[2] For projects that require a NOI, the SWPPP is equivalent to a Stormwater Quality Protection Plan.
[3] Approach and schedule to be submitted with the second *Annual Report* after permit adoption.

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SECTION 2

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SECTION 5

Approach and schedule to be submitted with the second *Annual Report* after permit adoption.

Implement when State Board adopts a Construction Activity Stormwater NPDES General Permit for construction activities ≥ 1 acres.

For projects that require a NOI, the SWPPP is equivalent to a Stormwater Quality Protection Plan.

Appendix A: Memorandum of Agreement

AGREEMENT

TO IMPLEMENT THE ALAMEDA COUNTY

URBAN RUNOFF CLEAN WATER PROGRAM

(Including First and Second Amendments)

AGREEMENT

PROVIDING FOR IMPLEMENTATION OF THE ALAMEDA COUNTY URBAN RUNOFF CLEAN WATER PROGRAM

THIS AGREEMENT is made and entered into this day of , 1991 by and between the following undersigned public agencies, all which are referred to collectively as the Parties.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, a public agency of the State of California;

Zone 7 of ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, a local public agency of the State of California;

COUNTY OF ALAMEDA, a subdivision of the State of California;

CITY OF ALAMEDA, a municipal corporation of the State of California;

CITY OF ALBANY, a municipal corporation of the State of California;

CITY OF BERKELEY, a municipal corporation of the State of California;

CITY OF DUBLIN, a municipal corporation of the State of California;

CITY OF EMERYVILLE, a municipal corporation of the State of California;

CITY OF FREMONT, a municipal corporation of the State of California;

CITY OF HAYWARD, a municipal corporation of the State of California;

CITY OF LIVERMORE, a municipal corporation of the State of California;

CITY OF NEWARK, a municipal corporation of the State of California;

CITY OF OAKLAND, a municipal corporation of the State of California;

CITY OF PIEDMONT, a municipal corporation of the State of California;

CITY OF PLEASANTON, a municipal corporation of the State of California;

CITY OF SAN LEANDRO, a municipal corporation of the State of California; and CITY OF UNION CITY, a municipal corporation of the State of California.

RECITALS

A. The 1986 Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), adopted by the Regional Water Quality Control Board in implementation of the Federal Clean Water Act, requires that the PARTIES develop a Program to control the discharge of pollutants from urban runoff.

B. In furtherance of their responsibilities pursuant to the Basin Plan, the PARTIES, have previously entered into a series of agreements to jointly fund the cost of preparing an action plan to evaluate nonpoint source pollutants, monitor identified pollutants and develop control measures to mitigate or reduce nonpoint sources of pollutants. Collectively, the measures undertaken pursuant to the previous agreements and anticipated to continue pursuant to this Agreement, are known as the Alameda County Urban Runoff Clean Water Program (hereinafter "Program"). The Program contains certain elements which provide a general benefit to the parties (such as monitoring, public education, program administration, etc.) and these elements of joint responsibility among the parties are termed the "General Program". In addition, the Program contains other elements which are an individual Party responsibility and which provide individual benefits (such as construction site controls, catch basin cleaning, and illicit and illegal connection

inspections, monitoring and enforcement), and these elements are termed the "Individual Programs". A description of the General and Individual Programs' elements, major tasks, schedules, and budgets will be developed as part of the "Work Plan for Cities in Alameda County, Alameda County, and the Alameda County Flood Control and Water Conservation District to file for a NPDES Permit" dated August 24, 1990.

C. The previous Agreements that have been executed are the following: The November 10, 1987 "Agreement Regarding Evaluation of the Non-Point Source of Water Pollution" and the October 17, 1989 "Agreement Regarding Implementation of Nonpoint Source Control Evaluation Program". In addition there is a pending agreement titled "Agreement Regarding Development of a Proposed Alameda County Nonpoint Source Control Management Plan" which will provide funding through June 1991 for implementation of the August 24, 1990 work plan.

D. The PARTIES desire to continue the Program and to enter into this Agreement for the purpose of ensuring continued participation, in terms of cost and administrative responsibilities.

E. This Agreement does not amend or supersede any prior agreement among the PARTIES regarding the Program, but is to be read as in accord with and

implementation thereof.

F. The Alameda County Flood Control and Water Conservation District (District) is a local public agency of the State of California duly organized and existing and empowered to conserve water and to provide maintenance and flood control management of the water courses and has the authority to control the discharge of surface waters to its facilities. The County of Alameda and all of the cities therein are subdivisions of the State with authority to control the discharge of surface waters from their respective jurisdictions.

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. A Management Committee is hereby created to provide overall program direction, review and recommend an annual budget for approval by the PARTIES, and budget oversight, all in accordance with the Alameda County Urban Runoff Clean Water Program. Management Committee members, and their alternates, shall be appointed by the City Manager or the equivalent of the respective Parties and a confirming letter sent to the authorized representative of the District. The Management Committee shall adopt bylaws for its governance.

(a) Each Party to this agreement is allocated the number (or fraction thereof) of votes shown in Exhibit A. This allocation of voting strength is based on the formulas stated in Exhibit B to the Agreement.

(b) A quorum for the conduct of business by the Management Committee shall be a majority of the voting Parties to the Agreement. The voting strength allocated to a Party shall not be considered in the determination of a quorum.

(c) Approval of actions by the Management Committee shall require a two-thirds affirmative vote of all allocated votes as shown in Exhibit A.

No action shall be taken by the District which requires expenditures by any party other than the District without prior Management Committee approval.

2. Pursuant to direction of the Management Committee, the District shall administer and coordinate the Program, which duties include but are not limited to:

(a) Reapplying on behalf of the PARTIES to become co-applicants for a National Pollutant Discharge Elimination System (NPDES) permit;

(b) Preparing draft annual budget and, periodic status reports on Program activities and expenditure and distributing same to PARTIES at least annually;

(c) Consolidating and submitting reports prepared by the several PARTIES required by the NPDES permit;

(d) Letting and administering approved consultant contracts according to District policies and procedures and considering other members' requirements. All consultant contracts will contain hold harmless and indemnity provisions and insurance requirements for the benefit of all PARTIES;

(e) Conducting audits of consultant contracts in accordance with District policies and procedures;

(f) Maintaining knowledge of and advising the PARTIES regarding current and proposed state and federal policies, regulations and programs that impact nonpoint source pollutant control programs; assisting the PARTIES in development and presentation of positions on these issues before local, State, and Federal agencies;

(g) Preparing an annual report on the implementation of the Program;

(h) Representing the PARTIES in participation in the Bay Area Stormwater Management Agencies Association; and

(i) Formally advising the appropriate State and Federal agencies of termination or amendment of this Agreement.

3. The PARTIES accept and agree to perform the following duties:

(a) Each will authorize a representative to reapply for an NPDES permit as co-applicants with the other Parties;

(b) Each will fully comply with the NPDES permit conditions applicable to its Individual Program and its identified portion of the General Program;

(c) Each will select a representative and an alternate to participate in Management Committee meetings and other required meetings of the PARTIES;

(d) Each will fund and implement its own Individual Program, and will fund and implement its share of the General Program. The District intends to provide funding to support new and expanded activities required by the General and Individual Programs for Cities locate in District zones with Benefit Assessment Programs. Such funding will be provided to the extent that it is available and with the concurrence of the applicable City if it results in deferring flood control projects.

(e) Each will provide agreed upon reports (certified under penalty of perjury) to the District on compliance with applicable provisions of the NPDES permit and program implementation.

4. A proper accounting of funds and reports of all receipts and disbursements shall be made, including funds disbursed to individual parties for implementation of permit programs. Upon completion of the purposes of this Agreement, any surplus money on hand shall be returned in proportion to the

contributions made. In the event a Party terminates this Agreement, any unexpended portion of its share of cost funds shall be returned to it.

5. By agreement of the PARTIES, budget allocations and voting shares for the General Program shall be made according to a formula which for the municipalities allocates proportional shares based on a 50 percent weight given to the area and a 50 percent weight given to the population within each municipalities' jurisdiction (excluding open water and wetland areas of San Francisco Bay). The attached Exhibit B provides a copy of the formulas which are used to allocate costs. Each Parties' share of the General Program's costs for fiscal year 1991/92 will be according to the percentages provided in Exhibit A. Cost shares will be recalculated based on updated information on population and area using the formulas in Exhibit B for fiscal year 1992/93 and at appropriate future intervals as specified in the bylaws. The budget allocation for the Individual Programs shall be made directly by the individual responsible parties.

6. This Agreement shall have a term of six (6) years from the first day of April 1991, subject to automatic renewal for a five (5) year period in the absence of objection thereto made in writing by any Party 90 days in advance of the renewal date. This Agreement shall have an additional term of six (6) years from the first day of April 2002, subject to an additional automatic renewal for a five (5) year period in the absence of objection thereto made in writing by any Party 180 days in advance of the renewal date. The participation of any Party to this Agreement may be terminated by a two-thirds affirmative vote of all allocated votes in any year in which the funds necessary for its continued involvement are not appropriated by its legislative body.

7. The PARTIES shall retain the ability to individually (or collectively) request permit modifications and initiate permit appeals for permit provisions to the extent that a provision affects an individual party or group of PARTIES.

8. This agreement may be amended from time to time by written agreement of the Parties' governing bodies representing two-thirds or more of all allocated votes as shown in Exhibit A.

9. Participation in this Agreement may be terminated by any Party for any reason after the Party complies with all of the conditions of termination. The conditions of termination include the following: the Party shall notify all of the other Parties to the Agreement 90 days prior to its termination in the Agreement, the Party shall obtain its own NPDES permit for urban runoff, and the Party shall have its name deleted as a co-permittee of the Parties' NPDES permit. Any expenses associated with terminating the Agreement including but not limited to filing for and obtaining the individual NPDES permit and the amendment of the Parties' NPDES permit will be solely the responsibility of the Party terminating its participation in the Agreement.

10. It is understood and agreed that, pursuant to Government Code 895.4, each Party ("indemnitor") shall, to the extent permitted by law, defend, indemnify and save harmless each other Party, and its officers and employees from all claims, suits or actions of every name, kind and description resulting from indemnitor's performance of this Agreement, excluding any injuries, death, damage or liability resulting from the negligence or willful misconduct of the other Parties or their officers or employees.

Appendix B: General Program Tasks and Budget for FY 2001/02

Program Component	FY 2001/02 Budget
Planning and Regulatory Compliance	$519,000

Alameda Countywide Clean Water Program

FY 2001/02 General Program Budget Summary

Watershed Assessment	$151,000
Monitoring and Special Studies	$448,000
Public Information/Participation	$555,000
Municipal Maintenance Activities	$88,000
New Development and Construction Site Controls	$82,000
Illicit Discharge Controls	$46,000
Industrial and Commercial Discharge Controls	$124,000
Contingency	$87,000
BUDGET TOTAL	**$2,100,000**

Alameda Countywide Clean Water Program

Planning and Regulatory Compliance General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
PRC-1. Participate in the Regulatory Process:		$99,000	
• Review and comment on legislation and regulation affecting stormwater management. Confer with Regional board on permit reissuance. (Includes all legal assistance to the Program.)	Previously funded under Task 2.3 (Respond to Regulatory Initiatives).	($59,000)	Ongoing
• Represent Program in TMDL and permit processes and on BASMAA and California Stormwater Quality Task Force.	Previously part of Task 2.2 (Lead and Represent).	($40,000)	Ongoing
PRC-2. Assist with Permit Compliance:		$87,000	Ongoing
• Develop deliverable forms. Compile and submit required reports to Regional Board.	Previously funded under Task 2.1 (Assist with Compliance).	($52,000)	
• Review member agencies' performance and provide additional assistance with permit compliance.	Previously funded under Task 2.4 (Continuous Improvement).	($35,000)	
PRC 3 & 4. Develop Partnerships and Facilitate Watershed Approach:		$40,000	Ongoing
• The purpose of this task is to expand upon existing partnerships and to pursue opportunities to create additional partnerships.	Previously part of Task 2.2 (Lead and Represent).	($15,000)	
• The purpose of this task is to coordinate the Program's involvement in watershed management activities.	Funding transferred from Watershed Assessment component.	($25,000)	
PRC 5. Control Measure Plans:		$50,000	Ongoing
• Implement the planning component tasks of the Control Measure Plans and coordinate the implementation and updating of Control Measure Plans	$22,000 from Task 2.2 (Lead and Represent); $28,000 in additional funding.		
PRC 6. Planning and Evaluation:		$57,000	Ongoing
• Program planning, coordination and evaluation.	Previously funded under Task 2.5.1.	($20,000)	
• Newsletter and website.	Previously funded under Task 2.6 (Website and Newsletter).	($37,000)	
PRC 7. Management Services		$101,000	Ongoing
• Program management, budgeting, contracting, accounting, and reporting.	Previously funded under Task 2.5.2 (Management Services	($61,000)	
• Facilitate Management and Policy Level Subcommittee meetings and project management.	Previously funded under Task 2.5.1	(40,000)	
PRC 8. Fees and Dues:		$85,000	

Alameda Countywide Clean Water Program

Planning and Regulatory Compliance General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
• Annual NPDES Permit Fee. • BASMAA and California SWQTF contributions		($10,000) ($75,000)	
Total Budget		$519,000	

Alameda Countywide Clean Water Program

Watershed Assessment General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
WA-1. Develop and maintain a GIS resource for watershed information: • Continue mapping of pilot watersheds, and fill high-priority data needs such as digital conversion of available data or maps. Priorities and map projects to be developed in consultation with the local co-permittees or other watershed partners, and in coordination with other regional efforts. • Develop framework for long-term inventory of other Alameda County watersheds. Identify needs and priorities for incorporating data.	These tasks are all based on the Draft SWQMP, and support Objective #1 of the BASMAA Regional Monitoring Strategy.	$55,000 ($45,000) ($10,000)	Ongoing Target completion January 2002
WA-2. Use a variety of indicators to assess the condition of streams and watersheds: • Coordinate development of creek indicators (macroinvertebrate community, flow or imperviousness) with the proposed Stream Protection Policy and other regional initiatives. • Provide resources and training to citizen monitoring groups that are working with local watershed partners. May use services for training and technical assistance provided by Watershed Assessment Resource Center or other regional information sources.		$30,000 ($15,000) ($15,000)	Ongoing
WA-3. Provide useful watershed information to the Program and other watershed stakeholders: • Continue testing and application of selected indicators for contact recreation and human health risk (e.g. microbiological, chemical); provide tools and guidance to co-permittees and other local managers. • Conduct local pilot projects or assist member agencies in conducting watershed inventory and planning. • Prepare watershed maps and other creek information for display on ACCWP website.		$56,000 ($16,000) ($30,000) ($10,000)	Ongoing
WA-4. Reporting and component management: • Develop budgets, manage projects, compile reports, and evaluate component activities.		$10,000	Ongoing
Total Budget		$151,000	

Alameda Countywide Clean Water Program

Monitoring and Special Studies General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
MS-1. Characterize and track pollutants of concern in urban runoff:	These tasks are based on the Draft SWQMP, and support Objective #2 of the BASMAA Regional Monitoring Strategy.	$267,000	Ongoing
• Required contribution to Regional Monitoring Program for Trace Substances.	An anticipated increase in the annual RMP fee has been estimated at 10% for calendar year 2002.	($147,000)	
• Continue sediment sampling for Mercury, PCB and organochlorine pesticides, and investigate potential sources in high priority watersheds as requested by Regional Board staff to support TMDL development.	One-time allocation for review of past data and preparation of long-term plan, to be updated after several years of sampling.	($50,000)	
• Review past Program fixed-station sampling data and develop statistically sound design for long-term monitoring plan to track metals, pesticides and toxicity.		($30,000)	
• Conduct stormwater monitoring in accordance with long-term plan.		($15,000)	
• Refine database of past sampling data; incorporate additional data types and develop queries or other user interfaces to facilitate analysis of long-term trends.		($25,000)	
MS-2. Evaluate the effectiveness of urban runoff BMPs:	These tasks are based on the Draft SWQMP, and support Objective #3 of the BASMAA Regional Monitoring Strategy.	$75,000	Ongoing
• Conduct special studies focusing on TMDL priority pollutants and their sources. These studies may include: planning of data collection for future TMDLs; local source identification; identification or refinement of specific control measures.		($35,000)	
• Conduct studies to assist establishment of local design standards for treatment and retention of runoff from new developments and redevelopment areas, similar to the SUSWMP requirements being discussed in relation to Santa Clara's NPDES permit renewal.	ACCWP's next NPDES permit is likely to include similar requirements, pursuant to recent "Bellflower" decision.	($40,000)	
MS-3. Provide technical information on management issues involving urban runoff:	These tasks support stormwater management and pollution prevention by co-permittees	$37,000	Ongoing
• Conduct special studies to address data gaps or management issues concerning pollutants of concern and urban runoff impacts.		($27,000)	
• Provide miscellaneous technical on-call support as needed.		($10,000)	

Alameda Countywide Clean Water Program

Monitoring and Special Studies General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
MS-4. Coordinate with RMP and BASMAA: • Participate in BASMAA Monitoring Committee, RMP technical review, other regional stakeholder discussions.		$24,000	Ongoing
MS-5. Reporting and component management: • Facilitate and support Watershed Assessment and Monitoring Subcommittee. • Develop component budgets, track expenditures, conduct special studies needs assessment, evaluate component activities and manage component tasks.		$45,000 ($20,000) ($25,000)	Ongoing
Total Budget		$448,000	

Alameda Countywide Clean Water Program

Public Information/Participation General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
PI/P 1. Implement targeted outreach: • Targeted campaigns will focus on helping to implement the control measure plans for specific water quality impairing pollutants. The pollutants that appear to be priorities on the Regional Board's list include mercury, PCBs and dioxin compounds, and pesticides. The campaigns will focus primarily on targeting residential usage and encouraging residents to prevent pollution.	Regional Advertising Campaign Local Placement of Advertising Collaboration with BASMAA and others	$205,000 ($100,000) ($95,000) ($10,000)	Ongoing
PI/P 2. Continue to reinforce storm water messages: • This task supports reinforcing general and specific storm water messages.	IPM partnership Media Relations Outreach Events	$41,000 ($21,000) ($10,000) ($10,000)	Ongoing
PI/P 3. Support educational and watershed-based approaches: • This task will provide support for programs that educate students about stormwater pollution (for example, Bay Savers, Kids in Creeks, or Estuary Action Challenge), the Community Stewardship Grants program, and outreach events such as the *Watershed Symposium*.	Bay Savers Aquatic Outreach Institute Estuary Action Community Stewardship Symposium BAEER Fair	$170,000 ($56,000) ($70,000) ($15,000) ($17,500) ($10,000) ($2,500)	Ongoing
PI/P 4. Support municipalities: • This task includes: developing and obtaining promotional materials for use by the municipalities; updating, reprinting, and distributing existing ACCWP materials; and, responding to requests for information from the public and member agencies.	Materials Support	$74,000 ($50,000) ($24,000)	Ongoing
PI/P 5. Component management and evaluation: • This task includes: subcommittee support, component evaluation, task management, and the development of work plans and budgets.	Subcommittee Support $20,000 Component Evaluation $7,000 Component Management $40,000	$67,000 ($20,000) ($7,000) ($40,000)	Ongoing
Total Budget		$555,000	

Alameda Countywide Clean Water Program

Municipal Maintenance Activities General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
MN-1. Implement and Assist with Performance Standards: • Each agency will implement the performance standards for municipal maintenance activities. The performance standards include the following major activities: – Street Sweeping – Storm Drain Cleaning – Conducting Training – Reporting The General Program will work through the Maintenance Subcommittee to resolve implementation and consistency issues.	Performance standards are the primary method for implementing the SWMP and complying with requirements of the NPDES permit.	$15,000	Ongoing
MN-2. Coordinating Maintenance-Related Activities with Other Subcommittees of the ACCWP, Other Agencies and Private Industries: • The subcommittee will work with appropriate staff from other Subcommittees of the ACCWP, park and recreation departments, and other public agencies and private industries whose activities are similar to or potentially affect municipal maintenance activities to identify activities of concern. Examples of other public agencies and private industries include PG&E, water suppliers and utilities, garbage collection companies, the Port of Oakland, golf courses, private recreational facilities and animal confinement areas. private recreational facilities and construction contractors.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goals.	$15,000	Ongoing
MN-3. Optimize Data Management and Analysis: • The General Program will optimize ongoing collection, recording and analysis of maintenance data. This will include continuing to evaluate if the types of maintenance data being collected are useful and if other types of data should be collected. Examples of potential studies and data analysis include the following: – Leaf collection programs – Litter abatement programs.	This task is based on the SWMP.	$15,000	Ongoing
MN-4. Outreach and Training: • The General Program will facilitate outreach and training activities aimed at preventing discharges from maintenance activities, with direction from the Maintenance Subcommittee. This includes selecting the appropriate forum (e.g., workshops, round table meetings, work groups, inter/intra-agency coordination meetings, etc.) depending on the target audiences (e.g., ACCWP agencies, other agencies, property owners, residence, etc.). • The Maintenance Subcommittee will also coordinate outreach activities with	Outreach activities will educate maintenance staff and the public about the ACCWP's goals related to municipal maintenance and provide information on how the public can help the municipalities achieve these goals.	$33,000	Ongoing

Municipal Maintenance Activities General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
other ACCWP Subcommittees when the objectives of a planned outreach and training activity conducted by the Maintenance Subcommittee overlap with the objectives of another Subcommittee.			
MN-5. Manage Component and Evaluate and Improve Its Effectiveness: • The General Program will assist the Maintenance Subcommittee and its workgroups to conduct meetings and prepare any needed NPDES permit reports and work plans related to this component. This includes assisting with the development of annual General Program budgets. The following activities are examples of how the effectiveness of this component may be evaluated: – Survey member public agencies to obtain information about how well this component and the performance standards are working. – Evaluate the information being submitted as part of the annual reports. – Evaluate the Regional Board staff's reviews of the Clean Water Program's performance in this area.	This task is based on the SWMP.	$10,000	Ongoing
Total Budget		$88,000	

Alameda Countywide Clean Water Program

New Development and Construction Site Controls General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rational/Background (if necessary)	Budget	Schedule/ Due Date
ND-1. Identify More Specific Stormwater Controls for New Development: • Identify and work with a stakeholder group to develop a method for integrating pollutant and hydromodification controls. Submit method to Regional Board staff and make changes based on their feedback. • Identify assistance needed by ACCWP agencies to implement these controls.	This task is based on the SWMP and Regional Board interest in more directly specifying how treatment, hydromodification, source and design controls, will be used.	$18,000	06-30-2002 Ongoing
ND-2. Assist with Implementation of More Specific Stormwater Controls: • Perform activities identified by New Development Subcommittee as helpful to implementation of the new, more specific controls such as: incorporate the controls into performance standards; develop revised Conditions of Approval and other planning materials; provide information on successful development/redevelopment projects employing the controls and information on cost-effective ways to implement the controls; and assist with implementation of any new development control measures related to a specific pollutant.	This task is based on the SWMP and municipal planning staff's need to implement treatment, hydromodification, source and design controls.	$18,000	Ongoing
ND-3. Assist Development and Facilitate Use of Watershed Information: • Identify watershed information needs related to New Development. Communicate these needs to the Watershed Monitoring and Management Subcommittee. • Facilitate municipal planning and engineering staff's use of this information as it becomes available.	This task is based on the SWMP and the ACCWP's emphasis on watershed management.	$3,000 ($1,000) ($2,000)	Ongoing
ND-4. Promote Outreach and Training: • Conduct one outreach and/or training event to a target group (agency staff or building industry) chosen by the New Development Subcommittee. • Develop and distribute outreach materials with direction from New Development Subcommittee. Compile and distribute guidance and educational material to agency staff.	This task is based on the SWMP. The focus of training and outreach materials will be on the specific pollutant and hydromodification controls developed in Task 7.1.	$18,000 ($10,000) ($8,000)	06-30-2002

Alameda Countywide Clean Water Program

New Development and Construction Site Controls General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rational/Background (if necessary)	Budget	Schedule/ Due Date
ND-5. Assist with NPDES Permit Requirements, Reports, and Budgets: • Provide support for monthly New Development Subcommittee meetings and any needed work group meetings. Prepare reports, budgets, and other items to assist with implementation and documentation of this component. Evaluate effectiveness of this component so that the New Development Subcommittee can make improvements to the General Program.	This task is based on the SWMP and the ACCWP desire to implement a process of continuous improvement.	$25,000	Ongoing
Total Budget		$82,000	

Alameda Countywide Clean Water Program

Illicit Discharge Controls General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rational/Background (if necessary)	Budget	Schedule/ Due Date
ID-1. Implement and Assist with Performance Standards: • Provide input and direction on the next Stormwater Management Plan and permit application based on comments from the I&IDC Subcommittee.[1] Review component performance standards and update as needed.	This task is based on the SWMP. Performance standards are reviewed annually, and updated as necessary.	$1,000	Ongoing 01-01-2002
ID-2. Assist Member Agencies Comply with Requirements for Conditionally Exempt Non-Stormwater Discharges: • Facilitate compliance with conditionally exempt non-stormwater discharges. Work with the I&IDC Subcommittee to identify effective control measures. Facilitate process for adding new conditionally exempt non-stormwater discharges and developing appropriate BMPs.	This task is based on the SWMP, the municipal stormwater NPDES permit, and "Table 5. Summary of Conditionally Exempt Discharges, Follow-up, and Schedule" of the ACCWP *1997/98 Annual Report*.	$7,000	09-15-2002
ID-3. Track and Analyze Non-Stormwater Discharge Reports: • Collect and analyze information on illicit discharge control activities reported in the ACCWP agencies' quarterly summary reports. Analyze information to detect trends and to improve planning and management of illicit discharge control program activities, with direction from the I&IDC Subcommittee.	This task is based on the SWMP and the municipal stormwater NPDES permit.	$20,000	03-15-2002 & 09-15-2002
ID-4. Conduct Outreach and Training: • Facilitate outreach and training activities to prevent illicit discharges, with direction from the I&IDC Subcommittee. Develop materials to support outreach and training activities. • Identify a target audience and select appropriate outreach activity at least once every two years.	This task is based on the SWMP.	$12,000 ($2000) ($10,000)	07-01-2002
ID-5. Manage Component and Evaluate and Improve Its Effectiveness: • Assist I&IDC Subcommittee and its workgroups to conduct meetings and prepare NPDES permit reports, work plans and associated budgets related to this component.	This task is based on the SWMP. All agencies will submit their action plan using the same form to help ensure the information reported is consistent countywide.	$6,000	12-15-2001 03-15-2002 & 09-15-2002
Total Budget		$46,000	

[1] The majority of the budget for I&IDC Subcommittee coordination of illicit discharge control consistency issues is included in Task 9.2.

Alameda Countywide Clean Water Program

Industrial and Commercial Discharge Controls General Program Work Plan and Budget - FY 2001/02

Task Number and Description	Rational/Background (if necessary)	Budget	Schedule/ Due Date
ICD-1. Assist with the Implementation of Business Inspections, Enforcement and Educational Outreach Activities: • Assist Agencies to implement business inspections and related performance standards and encourage Program-wide consistency under the auspices of the Industrial/Commercial & Illicit Discharge Control (I&IDC) Subcommittee and its work groups. • Review performance standards and make improvements on a biannual or more frequent basis.	This task is based on SWMP. *Illicit Discharge Control Program coordination is incorporated into this budget.*	$45,000	Ongoing 06-30-2003
ICD-2. Develop BMP Guidance Materials: • Identify target audiences and which format to use for materials under the direction of the Industrial/Commercial & Illicit Discharge Control Subcommittee. Produce materials.	This task is based on SWMP. Guidance materials will support both illicit discharge control and industrial/commercial discharge control activities.	18,000	Ongoing
ICD-3. Track and Analyze Facility Inspection Reports: • Collect and analyze facility inspection report forms. Discuss findings with and perform additional analysis at the request of the Industrial/Commercial & Illicit Discharge Control Subcommittee.	This task is based on SWMP.	$20,000	Ongoing
ICD-4. Conduct Outreach and Training: • Identify a target audience (agency, business groups or industrial/ commercial associations), select appropriate forum for outreach under the direction of the Industrial/Commercial & Illicit Discharge Control Subcommittee. Conduct outreach or training activity(s) on a biannual or more frequent basis. When common objectives exist, coordinate training or outreach events with other General Program subcommittees.	This task is based on the SWMP.	$15,000	06-30-2003
ICD-5. Assist with NPDES Permit Requirements, Reports, Budgets and Evaluation of Industrial Discharge Control Activities: • Support the meetings of the Industrial/Commercial & Illicit Discharge Control Subcommittee and work groups. Prepare reports, budgets and other items necessary for administering this component and ensuring NPDES Permit compliance. Evaluate effectiveness of component through business surveys, analysis of agency annual report submittals and Regional Board staff's reviews. Based on evaluation, suggest policy and procedure improvements.	This task is based on the SWMP.	26,000	Ongoing
Total Budget		$124,000	

Appendix C: Pollutant Reduction Plans

Table C1- Diazinon Pollutant Reduction Plan: FYs 2001/02 and 2002/03

These plans will be replaced by new plans when available according to the reissued NPDES permit's requirements

Area of Activity	Specific Tasks	Schedule	Conducted by:
Municipal Activities			
MA-1: Survey agency use of insecticides	1) Conduct survey of insecticide use by municipal employees or contractors. 2) Assess results of survey and develop a plan to minimize the potential for municipal use of insecticides to impact storm water quality. 3) Begin implementation of recommended activities	1) FY 01/02 2) FY 01/02 3) FY 01/02	1) Municipalities/ Program 2) Municipalities/ Program 3) Municipalities
MA-2: Train municipal employees who use insecticides about insecticide-related surface water toxicity, proper use and disposal of insecticides, and less-toxic methods of prevention and control.	1) Conduct survey of established training requirements for municipal employees who use insecticides. Report on results. 2) Assess results of survey and develop a plan to augment existing training activities. 3) Implement training activities	1) FY 01/02 2) FY 01/02 3) FY 01/02	1) Municipalities/ Program 2) Planning Comp. 3) Municipalities/ Planning Comp.
MA-3: Integrated Pest Management (IPM) practices, policies, or ordinances.	1) Review established IPM practices, policies, or ordinances. Determine if additional practices, policies or ordinances should be developed. Submit written report on findings and recommended actions to Regional Board. 2) Compile examples of IPM practices, policies, and ordinances and provide to member agencies. Assist member agencies with implementation as appropriate. 3) Implement recommendations from Task 1.	1) FY 01/02 2) FY 01/02 3) FY 01/02	1) Municipalities/ Program 2) Planning Comp. 3) Municipalities

Table C1- Diazinon Pollutant Reduction Plan: FYs 2001/02 and 2002/03

These plans will be replaced by new plans when available according to the reissued NPDES permit's requirements

Area of Activity	Specific Tasks	Schedule	Conducted by:
Outreach			
OR-1 Outreach to Residents: Continue to develop and distribute information to the general public on pesticide-related toxicity, proper use and disposal of pesticides, and less-toxic methods of pest prevention and pest control.	1) Support "Our Water, Our World" point of purchase campaign. 2) Develop distribution plan for insecticide related outreach materials. 3) Implement distribution plan	1) FY 01/02 2) FY 01/02 3) FY 01/02	1) PI/P Comp. 2) Municipalities and PI/P Comp. 3) Municipalities and PI/P Comp.
OR-2 Outreach to Commercial Facilities: Provide information to selected businesses (e.g., restaurants, and supermarkets) about insecticide-related surface water toxicity, proper use and disposal of insecticides, and less-toxic methods of prevention and control.	1) Select business sector and develop or adopt outreach material 2) Distribute Material in conjunction with Industrial/Commercial Inspection Program	1) FY 01/02 2) FY 02/03	1) II&ID Comp. / Planning Comp. 2) Municipalities
Develop Partnerships			
DP-1 PCOs: The Program will contact licensed applicators in the county, and will work with those who are willing, to set up a program to minimize water quality impacts from structural pest control applications.	1) Contact licensed applicators and coordinate development of IPM approach 2) Begin implementation of IPM approach	1) FY 01/02 2) FY 02/03	1) Planning Comp. 2) Planning Comp.
DP-2 HHW facilities: Continue to support and promote household hazardous waste collection as an important insecticide disposal option for residents.	1) HHW info on P^2 Outreach material. 2) Conduct meeting(s) with HHW staff to discuss additional opportunities for coordination. 3) Begin Implementation of activities developed in Task 2.	1) Ongoing 2) FY 01/02 3) FY 01/02	1) PI/P Comp. 2) Planning Comp. 3) Program or municipalities as appropriate
DP-3 Agricultural Commission:	1) Conduct meeting(s) with County Agriculture staff to coordinate development of outreach for PCOs.	1) FY 01/02	1) Planning Comp.

Table C1- Diazinon Pollutant Reduction Plan: FYs 2001/02 and 2002/03

These plans will be replaced by new plans when available according to the reissued NPDES permit's requirements

Area of Activity	Specific Tasks	Schedule	Conducted By
Monitoring			
M-1: Use monitoring and science to investigate local impacts and sources.	1) Develop insecticide application/runoff model. 2) Track long term trends in storm water toxicity and insecticide concentrations (will be included in long-term monitoring plan)	1) FY 01/02 2) Ongoing	1) Monitoring Comp. 2) Monitoring Comp.
Regulatory			
R-1: Participate in the pesticide regulatory processes as appropriate.	1) Provide written comments to Regional Board, U.S. EPA and California Department of Pesticide Regulation as appropriate. 2) Provide monitoring data to Regional Board, U.S. EPA and California Department of Pesticide Regulation as appropriate.	1) Ongoing 2) Ongoing	1) Planning Comp. 2) Monitoring Comp.
Coordination			
C-1: Coordinate implementation of the PRP.	1) Establish work group to coordinate implementation across components, develop reporting forms and assist municipalities. 2) Coordinate with BASMAA, the California Storm Water Quality Task Force and the Urban Pesticide Committee as appropriate.	1) Ongoing 2) Ongoing	1) Planning Comp. 2) Planning Comp.
Evaluation			
V-1: Evaluate implementation of the PRP	1) Review each of the action items and develop and conduct evaluations as appropriate. 2) Report on the results of the evaluations to the Regional Board	1. Annually 2. Annually	1. Planning Comp. 2. Planning Comp.

Table C2- Mercury Pollutant Reduction Plan: FYs 2001/2, 2002/3 and 2003/4

These plans will be replaced by new plans when available according to the reissued NPDES permit's requirements

Area of Activity	Specific Tasks	Schedule	Conducted by:
Municipal Activities			
MA1 Fluorescent Bulb Recycling	1) Conduct survey of fluorescent bulb recycling practices currently employed by municipalities. 2) Assess potential for improvement in recycling practices. 3) Implement improved practices	1) FY 02/03 2) FY 02/03 3) FY 03/04	1) Municipalities 2) Municipalities 3) Municipalities
MA2- Mercury Reduction Policies/Ordinances	1) Assess feasibility of implementing purchasing policies to reduce the use of mercury containing products. 2) Implement activities from assessment as appropriate.	1) FY 02/03 . 2) FY 03/04	1) Municipalities 2) Municipalities
Outreach			
OR1- Outreach to Businesses: Work with business community to increase level of fluorescent lamp recycling.	1) Identify obstacles to increased fluorescent lamp recycling. 2) Work with appropriate entities to try to minimize obstacles.	1) FY 02/03 2) FY 02/03	1) Planning Comp. 2) Planning Comp.
OR2- Outreach to Residents: Develop and distribute information to the general public on mercury related hazards, proper use and disposal of mercury containing products, and mercury free alternatives.	1) Develop mercury related outreach program 2) Conduct public outreach	1) FY 02/03 2) FY 03/04	1) PI/P Comp. 2) PI/P Comp. and/or Municipalities
Partner with Other Agencies			
P1- Household Hazardous Waste: Continue to support and promote household hazardous waste collection as a mercury disposal option for residents.	1) HHW info on P^2 Outreach material. 2) Conduct meeting(s) with HHW staff to discuss opportunities for coordination. 3) Begin implementation of activities developed in Task 2.	1) Ongoing 2) FY 01/02 3) FY 02/03	1) PI/P Comp. 2) Planning Comp. 3) Program or municipalities as appropriate

Table C2- Mercury Pollutant Reduction Plan: FYs 2001/2, 2002/3 and 2003/4

These plans will be replaced by new plans when available according to the reissued NPDES permit's requirements

Area of Activity	Specific Tasks	Schedule	Conducted by:
P2- Green Business Program:	1) Evaluate funding Green Business Program 2) Assess potential for improving Green Business Program's fluorescent bulb recycling component 3) Promote Program's and municipalities' use of Green Businesses 4) Promote public's use of Green Businesses	1) FY 01/02 & 02/03 2) FY 01/02 3) Starting 02/03 4) Starting 02/03	1) II&ID Comp. 2) II&ID Comp. 3) Planning Comp. and Municipalities 4) PI/P
Regulatory Involvement			
R1: Participate in the mercury TMDL process.	1) Attend mercury TMDL meetings as appropriate. 2) Provide written comments to U.S. EPA and the Regional Board as appropriate. 3) Support legislation to reduce mercury use.	1) Ongoing 2) Ongoing 3) Ongoing	1) Planning Comp. 2) Planning Comp 3) Planning Comp
R2: Fluorescent Bulb Recycling	1) Encourage the Department of Toxic Substances Control to promote recycling of fluorescent bulbs through revisions to Universal Waste Rule.	1) Ongoing	1) Planning Comp.
Monitoring			
M1: Use monitoring and science to investigate local impacts and sources.	1) Conduct survey of stream sediments to assess concentrations and loading of mercury. 2) Conduct additional surveys or special studies as appropriate.	1) FY 01/02 2) As appropriate	1) Monitoring Comp. 2) Monitoring Comp.
Coordination and Evaluation			
CE1: Coordinate implementation of the mercury PRP.	1) Coordinate implementation across components. 2) Coordinate with BASMAA, the Regional Board, and U.S. EPA as appropriate.	1) Ongoing	1) Planning Comp.
CE2: Evaluate implementation of the mercury PRP	1) Review each of the action items and develop and conduct evaluations as appropriate. 2) Report on the results of the evaluations to the Regional Board	1) Annually 2) Annually	1) Planning Comp. 2) Planning Comp.

Table C3- Copper Pollutant Reduction Plan: FYs 2001/2 and 2002/3

These plans will be replaced by new plans when available according to the reissued NPDES permit's requirements

Area of Activity	Specific Tasks	Schedule	Conducted by:
Brake Pad Partnership			
B-1: Brake Pad Partnership	1) Contribute funds to support Brake Pad Partnership effort.	1) FY 01/02 & 02/03	1) Planning Comp.
Municipal Activities			
MA1: Architectural uses of copper	1) Assess feasibility and effectiveness of reducing the use of copper in roofs or gutters. 2) Implement actions based on results of assessment.	1) FY 01/02 2) FY 02/03	1) New Development and Monitoring Comp. 2) Municipalities
MA2: Street Sweeping	1) Continue street sweeping in accordance with Municipal Maintenance Performance Standard.	1) Ongoing	1) Municipalities.
MA3- Outreach to Businesses: Conduct outreach to selected business sector (e.g., metal finishers, pool maintenance, auto repair) regarding BMPs to reduce copper discharge.	1) Select Business Sector and Develop Outreach 2) Distribute material in conjunction with Industrial/Commercial inspection program	1) FY 02/03 2) FY 03/04	1) II&ID Comp. 2) Municipalities
Monitoring			
M-1: Use monitoring and science to investigate local impacts and sources.	1) Track long term trends for copper concentrations in storm water. (Will be included in long-term monitoring plan.) 2) Conduct special studies as appropriate	1) Ongoing 2) As appropriate	1) Monitoring Comp. 2) Monitoring Comp.
Coordination			
C-1: Coordinate implementation of the CMP.	1) Coordinate implementation across components. 2) Coordinate with BASMAA, the Brake Pad Partnership, and others as appropriate.	1) Ongoing 2) Ongoing	1) Planning Comp. 2) Planning Comp.
Evaluation			
V-1: Evaluate implementation of the CMP	1) review each of the action items and develop and conduct evaluations as appropriate. 2) report on the results of the evaluations to the Regional Board	1) Annually 2) Annually	1) Planning Comp. 2) Planing Comp.

Table C4- PCBs Pollutant Reduction Plan: FYs 2001/02 and 2002/03

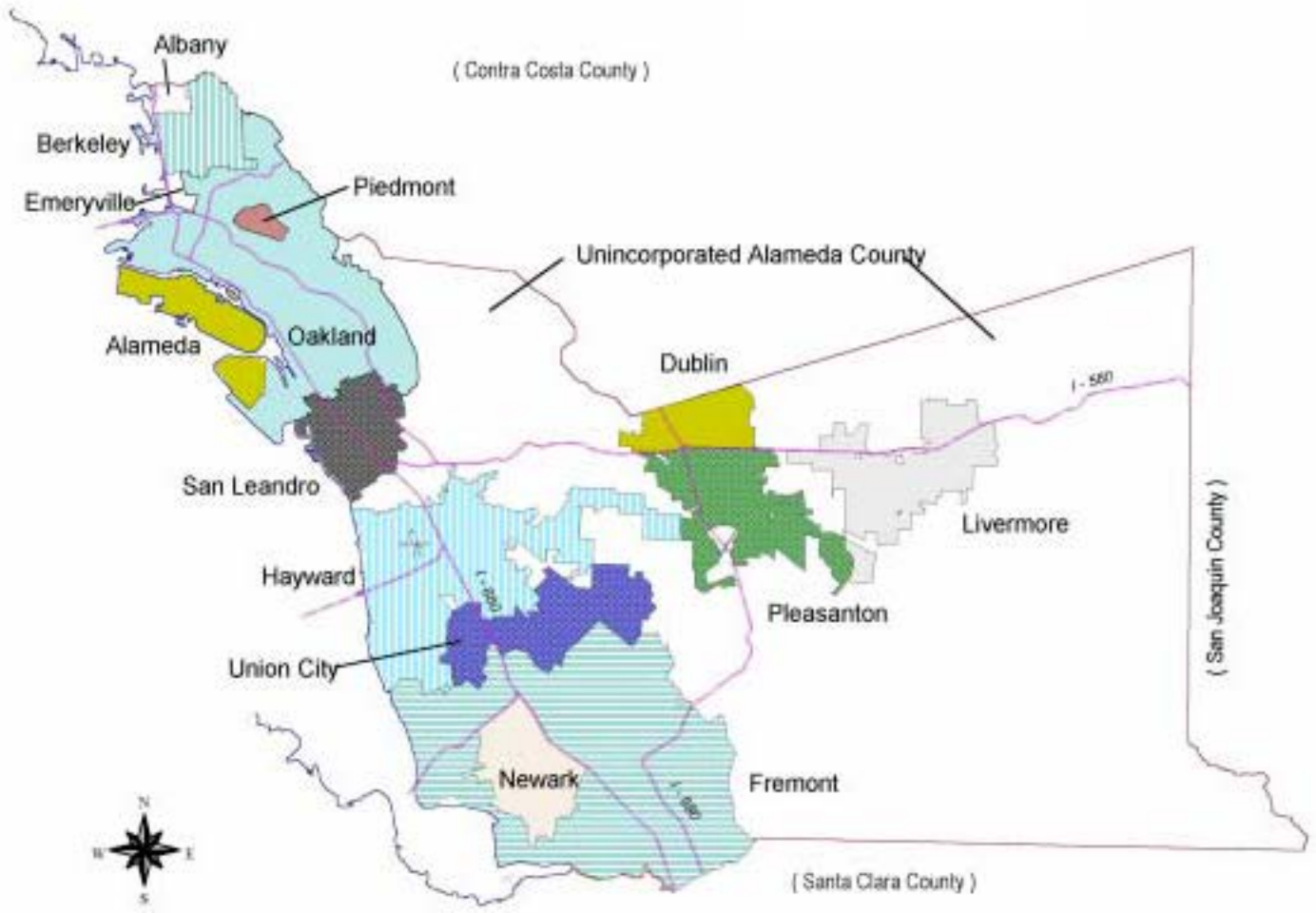
These plans will be replaced by new plans when available according to the reissued NPDES permit's requirements

Area of Activity	Specific Tasks	Schedule	Conducted by:
Monitoring			
M-1: Use monitoring and science to further investigate local impacts and sources.	1) Conduct survey of stream sediments to assess concentrations and loadings of PCBs. 2) Conduct follow-up activities to track sources of PCBs 3) Assess potential for ongoing discharges of PCBs from industrial facilities or other sources. 4) Develop a plan to reduce discharges of PCBs in runoff from the county.	1) FY 01/02 2) FY 01/02 3) FY 01/02 4) FY 02/03	1) Monitoring Comp. 2) Monitoring Comp. 3) Monitoring Comp. 4) Monitoring Comp.
Regulatory			
R-1: Participate in the PCB TMDL process as appropriate.	1) Provide written comments on draft documents the Regional Board as appropriate. 2) Provide monitoring data to the Regional Board as appropriate.	1) Ongoing 2) Ongoing	1) Planning Comp. 2) Monitoring Comp.
Evaluation			
V-1: Evaluate implementation of the PRP	1) reviewing each of the action items and develop and conduct evaluations as appropriate. 2) report on the results of the evaluations to the Regional Board	1) Annually 2) Annually	1) Planning Comp. 2) Planing Comp.

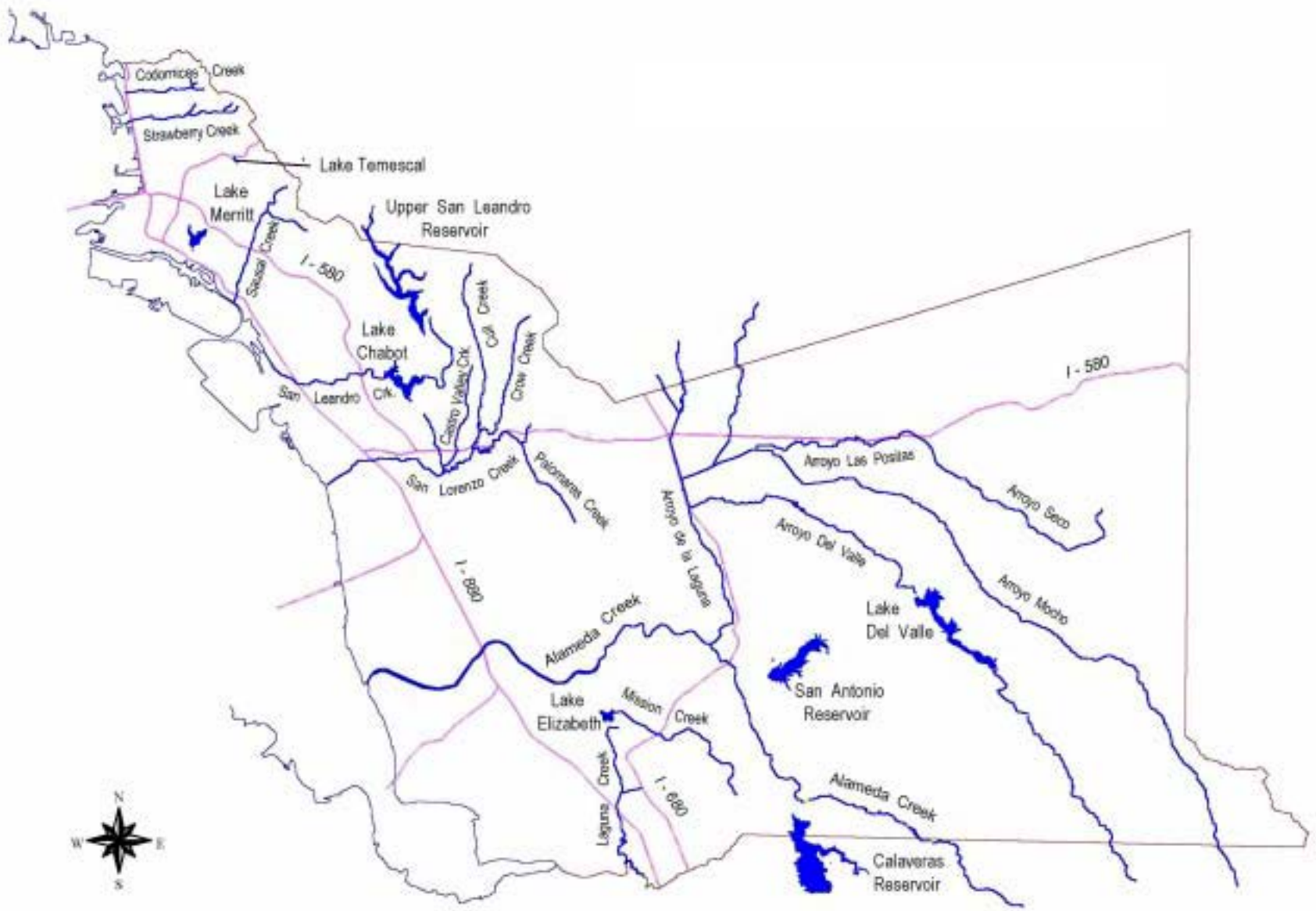
Appendix D: Figures

Figure D-1. Alameda County Municipalities
Figure D-2. Major Open Creeks and Waterbodies in Alameda County
Figure D-3. Boundaries of Alameda County watersheds

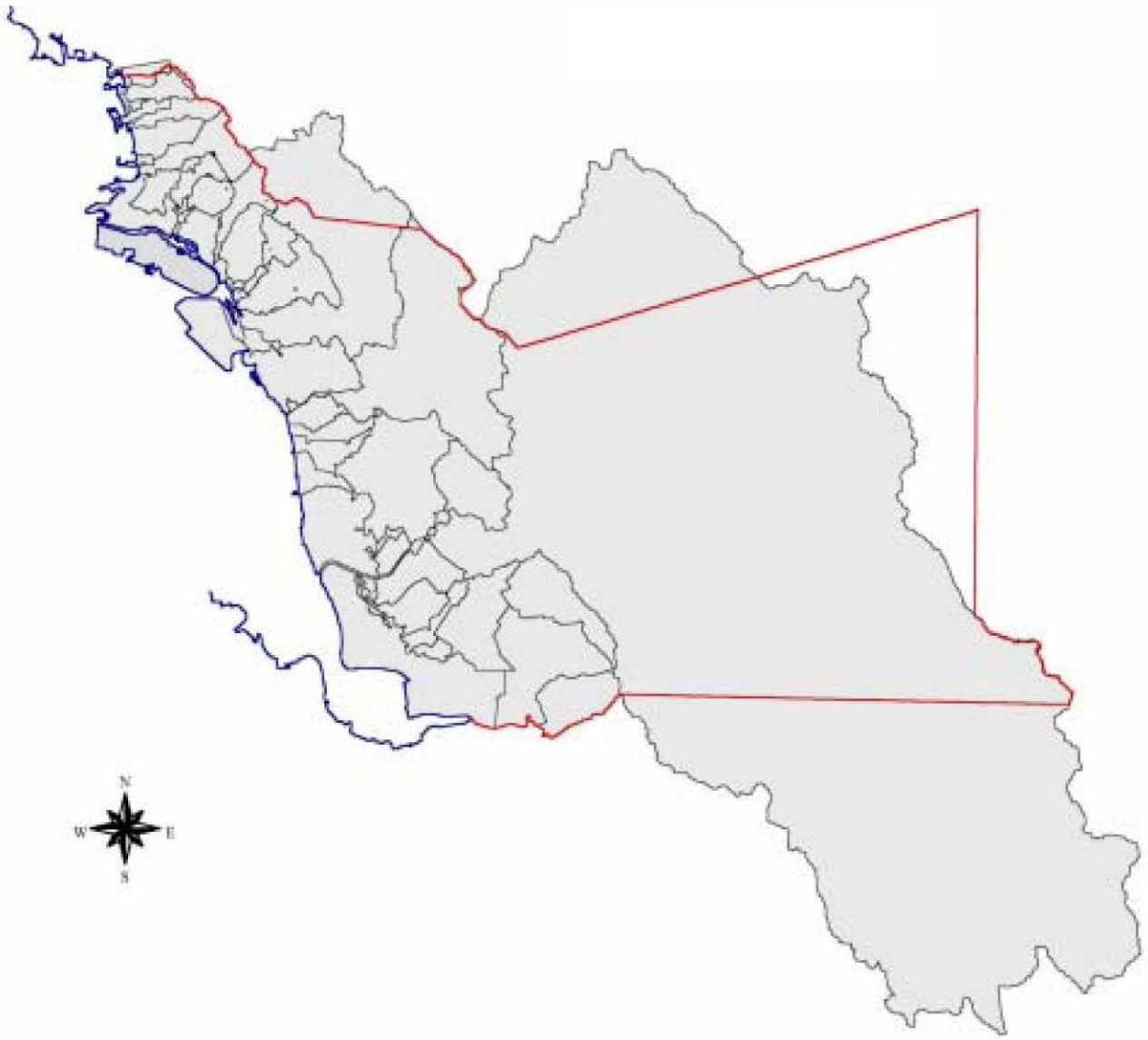
Alameda County Municipalities
Figure D-1



Major Open Creeks and Waterbodies in Alameda County
Figure D-2



Boundaries of Alameda County Watershed
Figure D-3



Member Agencies:

Alameda

Albany

Berkeley

Dublin

Emeryville

Fremont

Hayward

Livermore

Newark

Oakland

Piedmont

Pleasanton

San Leandro

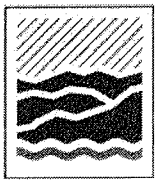
Union City

Alameda County

Alameda County Flood Control and Water Conservation District (District)

Zone 7 of the District

Multi-Year Plan for Monitoring and Assessment



Alameda Countywide Clean Water Program

A Consortium of Local Agencies

Prepared by:
The Alameda County Public Works Agency

May 28, 2003

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I. INTRODUCTION

I.A Overview and scope

The mission and vision of the Alameda Countywide Clean Water Program (ACCWP or Program) is to manage urban stormwater and protect natural aquatic resources of Alameda County and San Francisco Bay (ACCWP 2003). As a joint holder of a discharge permit under the National Pollutant Discharge Elimination System (NPDES), ACCWP's responsibilities include collecting information on stormwater pollution, the condition of receiving waters, and other data necessary to address problems caused by urban runoff. This Multi-Year Plan (MYP) provides an overview of the Program's long-term plan for monitoring and assessment activities, as required by Section C.8 of its third five-year NPDES permit for stormwater discharge (RWQCB, 2003) issued by the San Francisco Bay Regional Water Quality Control Board (Regional Board or RWQCB)

The MYP has several functions:

1) Document the status of knowledge about Alameda County watersheds and the occurrence of stormwater related pollution and other impacts to beneficial uses.
2) Outline ACCWP's proposed approach to improving this knowledge base and its usefulness for managers of stormwater discharges and watershed resources.
3) Guide further investigation and discussion, primarily by ACCWP and its member agencies, but also by other watershed stakeholders such as resource agencies, creek groups, and regulators.
4) Improve and clarify the MYP itself through regular updates incorporating lessons learned and new information in an adaptive management process.

The core of the MYP addresses functions 1 and 2 by describing the main elements, or types of information-gathering activities, to be conducted through the ACCWP Watershed Assessment and Monitoring components from Fiscal Year 2002-03 through FY 2007-08. Details and background for each element will be provided by reference to one or more subplans, stand-alone planning documents that can continue to develop during the period of the MYP. Functions 3 and 4 will be addressed by annual updates and refined workplans for successive Fiscal Years to be incorporated into Sections IV and V

The Introduction reviews basic terminology, the relation between the Program's organizational framework and the Regional Board's guidance, and provides basic information on the physical context of Alameda County and the Bay Area.
The Overview or Planning Rationale in Part II describes the elements included in the MYP, with a brief explanation of how each will contribute to the information base needed for effective management of local creeks, lakes and the Bay. Each element section will propose annual objectives for the period through June 2008, subject to availability of funds. This section also provides summary tables of the Program's current and planned activities towards assessing the conditions of individual watersheds, or of groups of similar watersheds.

Part III, Planned Activities, tabulates the objectives and scope of individual tasks or activities planned for the period through June 2008.
Part IV describes highlights of past monitoring and assessment activities, and the lessons learned. This part of the MYP is a working document that will be updated annually as new results, management issues and external sources of information become available.
Part V includes detailed workplans for the near-term period, with outlines of annual workplans for each FY in the MYP, with increased detail to be added for later years in annual updates.
Part VI lists applicable planning documents, along with other references and background material.

I.B General objectives for Watershed Assessment and Monitoring/Special Studies

ACCWP's Stormwater Quality Management Plan (ACCWP 2003) distributes data and information gathering activities among two program components:

- **Watershed Assessment** focuses on landscape-level attributes of watersheds and streams, and beneficial uses or management issues that are more specifically tied to the physical, biological or social conditions in individual watersheds
- **Monitoring and Special Studies** focus on pollutants and problems that are more uniformly distributed in urbanized areas, or for which the most relevant geographical scale for study and management is larger than individual watersheds.

These components are closely interconnected and their relative roles will continue to evolve within the framework of the Plan and this strategy. General Program activities for these components are directed by the Program's Watershed Assessment and Monitoring Subcommittee, and are implemented by technical consultants working under the supervision of Program staff provided by agreement with the Alameda County Flood Control and Water Conservation District (District, ACFCWCD). Although individual member agencies (co-permittees) of the Program perform some environmental inspection and testing as part of their management activities, the NPDES permit does not include Performance Standards for monitoring by co-permittees.

Relation to objectives in BASMAA Regional Monitoring Strategy and RWQCB guidance
The Regional Board has requested that ACCWP and other members of the Bay Area Stormwater Management Agencies Association (BASMAA) conduct "monitoring" in a broad sense that includes both of the above components. The scope and objectives of monitoring and assessment activities have been refined through a number of initiatives including the BASMAA Regional Monitoring Strategy (BMRS) and the Regional Monitoring and Assessment Strategy (RMAS; RWQCB 1999). The Regional Board's most recent conceptual strategy is based on the design of its Surface Water Ambient Monitoring Program (SWAMP; RWQCB 2001) efforts and uses several categories depending on the spatial extent, type of pollutant or stressor and level of detail and data quality required. Table I-1 outlines the objectives for the two ACCWP components and relates them to the terminology used by the Regional Board concept.

In general,

- **Watershed Assessment** includes many basic screening activities in the SWAMP Tier 1, which identify the presence or extent of potential problems. It also includes some of the more detailed Tier 2 assessments and studies involved in hypothesis testing or investigations of local problems in specific watersheds. It also encompasses GIS-based data management and interpretation
- **Monitoring/Special Studies** primarily addresses loadings to San Francisco Bay, Pollutants of Concern, and evaluation and design of BMPs. Regional priorities may be increasingly addressed through participation in the Clean Estuary Partnership (CEP). Most of the data management and adaptive development of workplans is currently in this component, although increased integration with watershed assessment data will occur over time.

I.C The Alameda County setting.

Physical setting:

- Located on the eastern shore of San Francisco Bay, Alameda County has two main physiographic areas, lying east and west of the East Bay Hills. The hills trend from north-northwest to south-southeast and reach elevations of 1600 ft in the north, increasing to 2500 ft at Mission Peak in the south. Geology is complex, including rocks and soils of sedimentary, metamorphic and igneous origin. The East Bay Hills include areas of active uplift in the northern part of the County (Figuers, 1998). Annual rainfall varies with region and topography, ranging from less than 12 inches in the extreme eastern part of the County to 34 inches in parts of the Oakland hills.
- The western slope of the hills is divided into a series of relatively small watersheds (<10 sq. miles) drained by simple stream systems (order 3 or less). The Hayward Fault system provides a fairly well-defined break in slope at the base of the hills, offsetting stream channels and also generating springs and sag ponds, particularly in the south. Below the hills, alluvial deposition has formed the East Bay plain and the adjacent tidally-influenced baylands. In the northern part of the County a steeper shoreline gradient and past alterations limit the tidally influenced baylands to a narrow coastal strip, but south of the San Mateo Bridge a band of salt ponds and sloughs extends up to 1 mile in width from the edge of filled or reclaimed shoreline.
- East of the hills, the Alameda Creek watershed drains a 700 square-mile portion of the inner Coast Ranges between Mt. Diablo in Contra Costa County to the north and Mount Hamilton in Santa Clara County to the south. Alameda County borders have been artificially drawn to enclose the central portion of this basin, including the Livermore-Amador Valley, which occupies the former site of a seasonal lake. Alameda Creek penetrates the hills through a narrow canyon at Niles; its former channel system west of the hills was replaced by a Federally funded flood control channel in the early 1960's. The extreme northeastern corner of the county drains to the San Joaquin River in the Central Valley. Most of the large tributaries flowing to Alameda Creek from the south

are impounded behind large reservoirs operated by the San Francisco Public Utilities Commission or state Department of Water Resources.

- Historically, two moderate sized stream systems drained intermediate valleys within the East Bay Hills. The 49 sq. mile San Leandro Creek watershed is now divided into upper and lower sections by two storage reservoirs (SLCWAC 1999). The 50-sq mile San Lorenzo Creek watershed includes Cull and Don Castro reservoirs on separate tributaries, and a major flood control channel replacing the original creek across the Bay plain.

Ecological conditions:

General historical patterns are known, although local details are not complete for individual sites. The baylands and San Francisco Bay itself are the result of rising sea levels during the last 10,000 years (Goals Project, 1999). Before European development, hills and moister canyons were oak-bay woodlands with areas of redwood in the fog drip zone in the north, while drier sunnier slopes were covered with chaparral. Foothills and alluvial slopes were mixtures of oak savannah & perennial grassland. Riparian corridors supported trees along larger streams or in the hills and willow groves occurred on the lower alluvial plains, where many smaller creeks may have disappeared or ended in sag ponds without reaching the Bay. Many smaller creeks were intermittent or seasonal, at least for some reaches.

Management history:

The following general characterization of land uses during different periods is derived from Goals Project (1999), Richard (1995), and Figuers (1998):

- Native American, ~8,000 BC- late 1700's: Practices included controlled burning of upland areas to manage structure of plant communities and facilitate game hunting. Use of riparian areas involved management of willows and harvesting of steelhead, salmon and shellfish. The human population was dispersed and relatively small, most intensive on the Bay slope west of the hills. Large mammal herds were extensive but did not browse intensively in individual locations.
- Spanish period, late 1700's to mid 1800's: The establishment of Mission San Jose, followed by secular land grant ranchos, introduced cattle which denuded perennial grasslands and replaced large areas of native vegetation with annual exotics. Probable major impacts on stream processes throughout the area included increased runoff and sedimentation, downcutting and widening of channels.
- Initial Euro-American development, 1850-early 1900's: During the Gold Rush era hydraulic mining caused massive deposition of sediments bearing legacy mercury in Sacramento River and Bay-Delta system. Town centers and farming were developed in the East Bay to support San Francisco and other centers of California commerce. Extensive filling of baylands for towns and infrastructure occurred in the north, and diking for farms and salt ponds in the south. Roads and bridges were constructed to transport products and goods to boat "landings" by the Bay, but were replaced by railroads in the late 1860's. Well pumping for irrigation and drinking water led to recurrent water quality problems and changes to the water table. Construction of dams and reservoirs began in canyons. Lumber mills were located throughout the northern

hills, involving construction of logging roads, clearcutting of redwoods and other impacts on streams. Draining of Tulare Lake in the Livermore-Amador Valley east of the hills was begun.

- Urban growth, 1900's: Urbanization in the Berkeley/Oakland area was accelerated after the 1906 earthquake. Consolidation of drinking water suppliers and increased reliance on aqueducts and reservoirs led to protection of some watershed lands behind the Berkeley Hills and in southern tributaries to Alameda Creek. The 1930's establishment of the East Bay Regional Parks District provided protection for many ridgeline areas from development. A post-World War II building boom developed the San Leandro/Hayward portion of the Bay Plain and increased town sizes in the southern Tri-city area. Environmental activism in the 1960's led to upgrading of wastewater plants and redirection of their discharges to the Bay, and also increased regulatory protection for water quality and wetland areas. The economic growth of the 1980's and 90's led to major growth in the southern and eastern county; countering trends included voter approval of urban growth limits through Measure D in 2000, and an increasing NPDES permit focus on stormwater treatment and hydromodification controls for new development.
- Channel alterations: Local culvert projects began around the 1870's on creeks in town areas; drainage and levees enclosing the Lake Merritt estuary also began. Creeks were initially used as sewers and later as sites for sanitary sewer pipes. Local filling and bank alterations by private owners were also common. Major flooding in 1949 stimulated the formation of the ACFCWCD with extensive channelization and culverting continuing from the late 1950's through the 1970's. Federally funded Flood Control channels were constructed in lower San Lorenzo and Alameda Creeks in early 1960's.

Table I-1a Watershed Assessment 6-year objectives and FY03 Workplan

Task Number and objectives for FY2002-FY2008	FY2002-2003 Tasks	Regional Board conceptual monitoring elements
WA-1. Develop and maintain a GIS resource for watershed information: • Provide basic delineation and mapping of all watersheds and significant waterbodies, including land cover types, impervious cover, channel condition and riparian corridor condition. • Integrate existing data for rainfall and surface/ground hydrology • Map sensitive areas for wildlife, fisheries and erosion/sediment processes • Coordinate data sharing with Regional Board, copermittees and other resource management agencies	• Continue mapping support for characterization & management planning in pilot watersheds • improve coverages on channel condition and recommend priorities for field confirmation • Identify other high-priority data needs to support long-term watershed assessment and planning for New Development requirements • Improve data sharing & coordination with Regional Board and Alameda County	**Background and support for:** Watershed Assessment for Tier 1, Tier 2 detailed assessment information for selected watersheds Sources and Loadings Data analysis and hypothesis development for further assessment and monitoring Source identification
WA-2. Use a variety of indicators to assess the condition of streams and watersheds: • Establish expected range of macroinvertebrate indices consitent with maintaining beneficial uses, and apply as screening tool • Select & test additional indicators for local use, including photodocumentation. • Provide on-call resources and training to citizen monitoring groups and local watershed partners, promoting improved and consistent approaches to watershed assessment	• Conduct 2nd year of CSBP sampling in 4 target creeks; work with regional partners on standards for protocols, data analysis and reference condition development. • Coordinate development of creek indicators with Stream Protection Policy and other regional initiatives. • Provide on-call resources and training to co-permittees, citizen monitoring groups and other watershed partners. • Review ways to expand photodocumentation beyond trash assessment (see also MS-3)	Watershed Assessment Tier 1 Rapid Biological Assessment Visual Physical Assessment Photodocumentation (Some water quality screening)
WA-3. Provide useful watershed information to the Program and other watershed stakeholders: • Provide guidance on use of contact recreation indicators • Assist/participate in local watershed pilot projects and assessments • Develop ACCWP website resources for watershed maps and creek information, and	• Develop strategy for assessment of human health risks for light contact recreation, using pathogen testing and other available tools • Support local pilot projects or member agencies' activities for monitoring, watershed assessment and planning. • Prepare watershed maps and other creek information for display on ACCWP website.	Support management actions Support further studies to test hypotheses and suggest actions Identify sources

Table I-1b Monitoring and Special Studies 6-year objectives and FY03 Workplan

Task Number and objectives for FY2002-FY2008	FY2002-2003 Tasks	Regional Board conceptual monitoring elements
MS-1. Characterize and track pollutants of concern in urban runoff: • Contribution to Regional Monitoring Program • Contribution for Water Quality Attainment Strategies Program • Sediment monitoring to characterize and track mercury, PCBs, organochlorine pesticides & other sediment pollutants at watershed sites. Continue annual sediment monitoring at 1 or 2 selected index sites per draft "Monitoring Program 2002-2006" • Develop and implement a screeningprogram for ambient water quality characterization • Stormwater sampling for metals, diazinon, toxicity at Castro Valley Creek per draft "Monitoring Program 2002-2006" • Continue additions/refinements to fixed-station database, coordinate data sharing with Reg. Board and SWAMP	• Support RMP and WQASP • Conduct sediment monitoring in watersheds • Sample storm events with antecedent dry weather • Develop a pilot semiannual screening point monitoring design for general water quality parameters, supplemented by data on selected contaminants and physical indicators. • Review past temperature logging datasets and explore appropriate sites/applications for other continuous monitoring • Add diazinon data to database; develop protocol for incorporation of incidental grab samples in to database.	Support RMP for SF Bay water quality Sources and Loadings issues Water Quality screening Data analysis and hypothesis development for further monitoring and management actions Identify sources Coordinate with Tier 2 assessments in a few representative watersheds
MS-2. Evaluate the effectiveness of urban runoff BMPs: • Conduct special studies focusing on TMDL priority pollutants or "threat" pollutants and their sources. • Support New and Redevelopment requirements	• Review local BMPS for leaf & litter, identify potential areas for pilot applications of new BMPs • Support design guidance and HMP development	Evaluate BMP effectiveness Develop hypotheses for further work
MS-3. Provide technical information on management issues involving urban runoff: • Conduct special studies to address data gaps or management issues concerning pollutants of concern and urban runoff impacts. May include: Bay toxicity, trash and sedimentation problems, human health risks • Provide miscellaneous technical on-call support as needed.	• Develop and test trash assessment strategy	Tier 2 assessments-relate management issues to detailed physical, chemical or biological evaluations Detailed source identifications for POCs
MS-4. Coordinate with RMP, BASMAA and WQASP: • Participate in BASMAA Monitoring Committee, RMP technical review, WQASP MOU committees, other regional stakeholder discussions.	Ongoing	Develop hypotheses Adapt annual monitoring plans

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II. OVERVIEW OF THE MULTI-YEAR PLAN ELEMENTS

Objective and Scope: Each of the numbered task areas within the Watershed Assessment and Monitoring/Special Studies components may include one or more elements, or systematic methods for gathering watershed or pollutant information. Section II describes each element in turn and the rationale for including it in the MYP. The type and amount of effort planned for an element will vary from year to year, and not all elements may be active in any given year. The introductory paragraphs explore the regional and conceptual context for the MYP, followed by a summary of past monitoring and assessment activities in Section IIA (see Section IV for additional background). Section IIB provides a general rationale and overview for integration of MYP activities, followed by discussion of watershed assessment elements in Section IIC and monitoring for Pollutants of Concern in Section IID. Section IIE reviews ACCWP's efforts to evaluate the effectiveness of Best Management Practices.

Context for ACCWP's monitoring and assessment:

Watershed assessment and monitoring are parts of an iterative cycle of information gathering and management action (Figure II-1). These cycles may occur simultaneously at different spatial and temporal scales, and vary in their independence from each other. Localized, acute effects are often more apparent than large-scale or long-term processes that may be causing or contributing to the problem. In the absence of local data, initial characterization efforts often rely heavily on general patterns and data from similar geographical regions. After general surveys suggest that certain specific issues are local priorities, focused studies are required to test these hypotheses. Initial study systems are selected that are relatively simple and well understood so that sources and transport of pollutants, or actions of other causes of impairment, are easier to distinguish. Results of these local studies may then provide useful recommendations for immediate management action in these systems. As similar information accumulates, another important outcome may be the development of a more refined conceptual model that can be applied to a wide range of waterbodies or to other pollutants with similar characteristics, which in turn stimulates a new generation of studies to address more complex problems and processes.

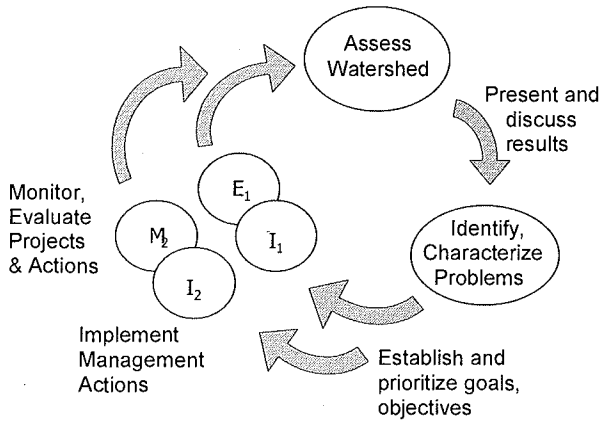

Figure II-1. Relation of Monitoring and Assessment to management activities

As knowledge about problems and potential solutions is refined, lines of investigation multiply, with some concentrating more on the regional scale and others on the details at smaller scales. Monitoring pollutants of concern in San Francisco Bay has involved extensive regional coordination, but the implementation of TMDLs may require increasing focus on case studies and monitoring in local watersheds.

Availability of more specific information lets management questions become more articulated and detailed, engaging larger numbers of stakeholders and other interested parties in the discussion. Information management and dissemination have become correspondingly more important in linking the elements and translating between scales where appropriate. An important function of the Program is connecting regional monitoring data and regulatory information with the implementation of source controls and restoration projects in local communities

Because of technical advancement and the changing context of monitoring and assessment activities, later studies often use different methods or combinations of methods. Older tools and datasets may need to be redesigned or augmented as part of the adaptive approach.

II.A Summary of past monitoring and assessment activities

The Program's monitoring component was initiated in 1988 by an Alameda County Task Force that was a precursor of the formal creation of the ACCWP. Wet and dry weather monitoring were conducted at 16 fixed stations to estimate nonpoint source loads of a wide range of pollutants from Alameda County to San Francisco Bay, in an effort to evaluate the effect of urban runoff on the receiving waters of the Bay (WCC, 1990 and 1991). Fixed station monitoring was continued after this initial characterization period, as part of efforts to improve a regional stormwater database. Initial assessment activities focused on stormwater conveyance systems as the first priority for management improvements directly affecting discharges. During its first 5-year permit in 1991-1996, the Program also conducted special studies to characterize pollutant occurrence and reduction in the Demonstration Urban Stormwater Treatment (DUST) Marsh and evaluated other BMPs . The Program also continued previous toxicity testing and conducted a Toxicity Identification Evaluation (TIE) in the San Lorenzo Creek watershed (Hanson 1995). During the second permit period (1996-2001) the Program conducted extensive studies of the insecticide diazinon (e.g. Scanlin and Feng 1997), which TIE evidence suggested as the likely cause of toxicity in urban creeks. The Program also began regular contributions the Regional Monitoring Program for Trace Substances (RMP) to support monitoring in San Francisco Bay.

In August 1996 the Regional Board staff requested that the Program redirect monitoring resources away from fixed-station, wet-weather monitoring and towards increased watershed assessment and long-term monitoring plans for creeks and other waterbodies. A focused Watershed Management component was included in the second Storm Water Management Plan, and pilot activities included training and supervision of volunteer monitors in San Leandro Creek. Based on Program experiences that stakeholder involvement and partnership are critical to the success watershed management, the Program's Stormwater Plan Coordinating committee

recommended in 1999 that promotion of partnerships be incorporated into the Planning and Regulatory Compliance component. Technical activities related to watersheds were retained in a reorganized Watershed Assessment component. In 1999 a pilot watershed assessment project was begun in the San Lorenzo Creek watershed by the District. The Program also provided technical assistance to city watershed managers for monitoring and assessment in the Lake Merritt (Oakland) and Laguna Creek (Fremont) watersheds

In 2000 the Program initiated a GIS-based Watershed Inventory to support mapping and data management needs for improved assessment data from all watersheds. Because of topographic and development patterns in Alameda County, the assessment strategy will be organized by Watershed Assessment Units (WAUs). The rationale for WAUs is to use natural boundaries to define areas that are relatively homogeneous in character and of a manageable size for study. ACCWP's WAUs are similar (though not identical) to the Planning Watersheds used for the Region 2 SWAMP, and are also able to nest within the CALWATER hydrological units commonly used for larger geographical divisions. WAUs either contain groups of similar small Bay Plain watersheds or are subdivisions of the large Alameda Creek watershed (Figure II-2). Within each WAU, individual focus watersheds represent typical conditions and/or areas of special interest (Table II-1). Past monitoring and assessment information by the Program and related agencies are summarized for WAUs in Table II-2. Past Program activities are described in more detail in Section IV.

II.B Rationale and adaptive approach for the Multi-Year Plan

This document presents ACCWP's plan for studies supporting its mission to minimize the impact of stormwater discharge on the beneficial uses of the waters of Alameda County and San Francisco Bay. A frequent pitfall for environmental monitoring is to make measurements based upon technical capability, without considering the objectives for use of the data. To prevent this, Gunther et, al (2000) worked with the Program and co-permittees to identify five key management questions to guide monitoring and assessment:

1) Is urban runoff a significant contributor of pollution to San Francisco Bay?
2) Are our creeks healthy?
3) How can we restore creeks?
4) Are program actions making a difference?
5) Is it safe to play in the creeks?

Each of these questions is associated with particular values and beneficial uses of one or more waterbodies. The physical and social features of the surrounding watersheds determine the specific objectives and challenges for the design of appropriate studies to answer the questions. To deliver meaningful information for management decisions, this Multi Year Plan is based on a general strategy involving four concepts:

a) assess Alameda County watersheds for a range of meaningful attributes and continue to track these over time,
b) link existing beneficial uses or management priorities with indicators that can be measured,

c) develop target values or ranges for these indicators that allow identification of different levels of support or impairment of these uses, and
d) Communicate and interpret this information to managers, decision-makers and the public.

With this approach, management concerns were used to generate program objectives and will therefore be reflected in each element. The elements are grouped into 3 subsections:

Section IIC Watershed Assessment aims to clarify the conditions that are relatively specific to individual watersheds, and the underlying ecological processes that determine those conditions (Management Questions 2, 3, 4 and 5)

Section IID Pollutants of Concern focuses on pollutants or impacts that can be generalized based on land use or on runoff characteristics shared by multiple watersheds (Management Questions 1 and 4)

Section IIE Effectiveness Of Best Management Practices (Management Question 4)

This organization reflects the component structure of the new Stormwater Quality Management Plan for FY02-FY08. In reality these two components are closely linked and are managed through a single Watershed Assessment and Monitoring Subcommittee (WAMS) of the ACCWP Management Committee. The Program anticipates that the following changes may evolve in WAMS workplans during the next Plan period:

An increase in the scope and emphasis on Watershed Assessment, related to:

- Increasing regulatory focus on functional assessment, reflected in Regional Board documents such as the RMAS and Stream and River Protection primer (Riley, 2003).
- Increasing need to tailor the pollution prevention activities of individual co-permittees
- ACCWP's strategic objective to increase partnership activity at multiple levels
- Increasing need by a wide range of audiences for improved watershed information

A decrease in the proportion of Monitoring and Special Studies activities that are designed or initiated solely by the Program, due to:

- Inclusion of many pollutant-focused studies in the Clean Estuary Partnership (CEP)
- Increasing involvement of the RMP's Sources, Pathways and Loadings Workgroup in monitoring or modeling local tributaries and watersheds
- Increasing emphasis on partnership formation for solving complex problems, and to obtain funding.

Ongoing dialogue between the Regional Board and the BASMAA Monitoring Committee has been crucial in shaping the evolution of ACCWP's monitoring and assessment program. This dialogue is further complicated by overlap with many other stakeholder groups and workgroups with intersecting objectives and membership, such as the CEP, Urban Pesticide Committee, RMP committees and various ad hoc workgroups. Many individuals both within the Program and outside it have contributed to the development of ACCWP's Multi-Year Plan as part of this larger community of scientists, managers, regulators and concerned residents. The MYP is designed as a "living document" that will be adapted as needed to address changes in management questions, priorities, and the status of Alameda County watersheds.

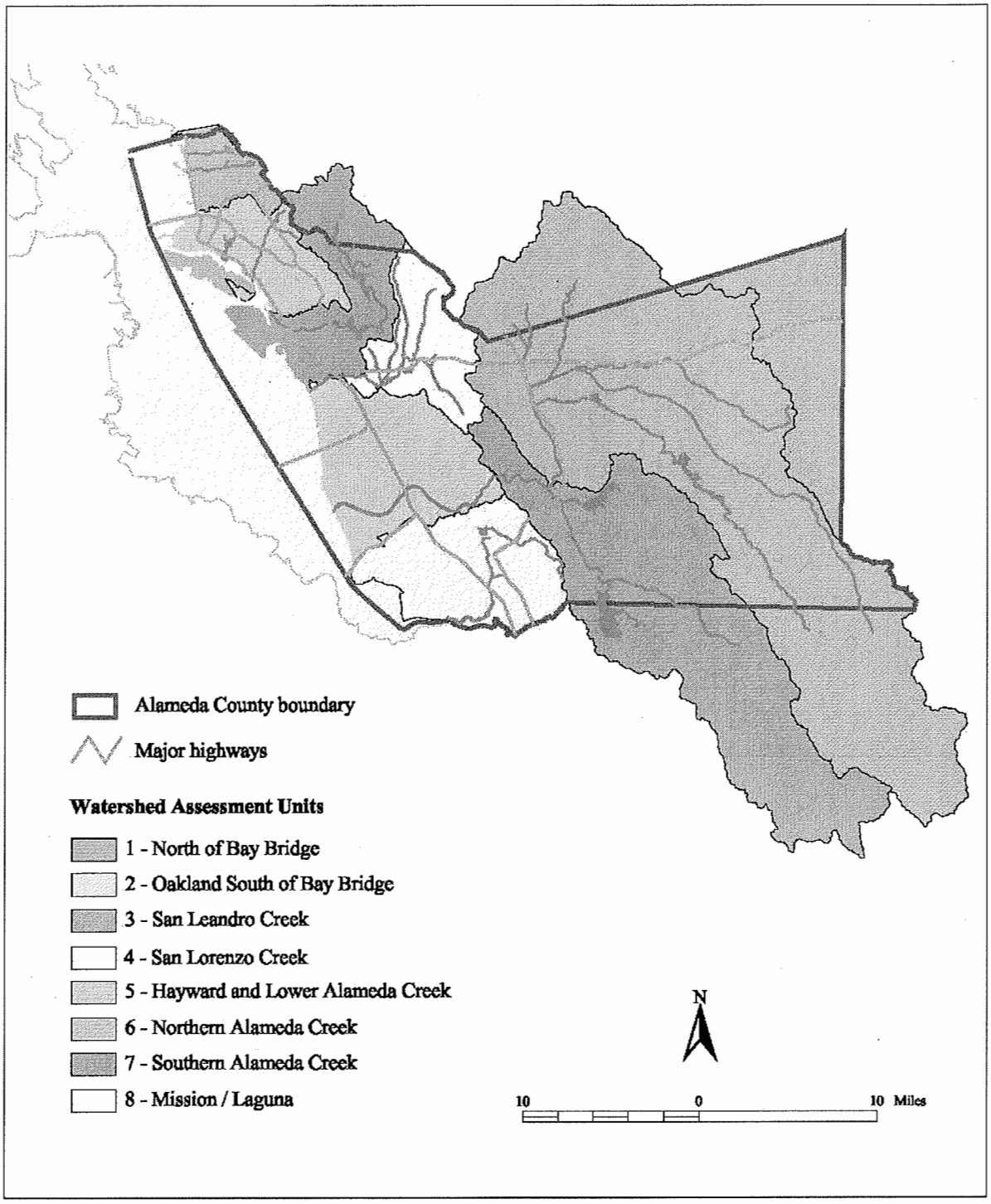

Figure II-2. Watershed Assessment Units

Table II-1a. Watershed Assessment Units in western Alameda County.

Watershed Assess. Unit	1	2	3	4	5	8	
WAU name	**north of Bay Bridge**	**Oakland, south of Bay Bridge**	**San Leandro Creek**	**San Lorenzo Creek**	**Hayward to Lower Alameda**	**Mission-Laguna**	**Notes**
focus watersheds or representative waterbodies	Codornices Strawberry (L. Temescal)	Sausal Creek Lake Merritt (Arroyo Viejo)	San Leandro Creek	Castro Valley (urban) Crow Creek (mixed) San Lorenzo Crk, Don Castro Res.	Old Alameda Creek, Crandall Creek, Lower Alameda Creek	Laguna Creek, Mission Creek Lake Elizabeth	focus creeks have mostly open channels
Characteristics							
Size (sq mi)	22	42	69*	48	81	73	*not all within County
Dominant Land Uses	urban pre-1950	urban pre-1950	urban mostly pre-1950 (lower portion)	mixed urban-rural (grazing)	mixed urban	mixed urban	Remote Sensing for impervious estimates, 2001-02
Dominant Channel Type (in Bay plain or valley floor; hill reaches typically more open/ natural, esp. to south)	culverts; small catchments direct to Bay (<10 sq. mi)	culverts; small catchments direct to Bay (<10 sq. mi)	Earth channel	concrete channel (fragmented natural in upper valleys)	earth channel	earth channel	Preliminary estimates via GIS/ photo analysis 2003
Beneficial Uses (existing or potential)	COLD, REC-1-2, SPWN, WARM, WILD (L. Temescal); *COLD, REC-2, SPWN, WARM, WILD (creeks)*	REC-1-2, SPWN, WARM, WILD (Lake Merritt); *COLD, REC-2, SPWN, WARM, WILD (creeks)*	FRSH, MIGR, REC-1-2, SPWN, WARM, WILD (includes Lake Chabot)	COLD, FRSH, GWR, MIGR, MUN, REC-1-2, SPWN, WARM, WILD (includes reservoirs)	*COLD?, GWR, MIGR, MUN, REC-2, SPWN, WARM, WILD*	COLD, REC-1-2, SPWN, WARM, WILD (Lake Elizabeth); *COLD, REC-2, SPWN, WARM, WILD (creeks)*	*Italics* = not listed in 1995 Basin Plan, hypothetical
Main issues (tentative list)	urban runoff, recreation, community involvement in restoration	urban runoff, recreation, community involvement in restoration (creeks); also nutrients, pathogens (LM)	urban runoff, dam, community involvement in restoration	urban runoff, erosion/ sedimentation, animal facilities, reservoirs/dams, steelhead habitat, other fisheries	urban runoff, new development, erosion/ sedimentation, recreation, community involvement at Lower Alameda	urban runoff, new development, erosion/ sedimentation, recreation, community involvement in restoration	
Developable open land index (tentative)	low	low	low	medium-high	Medium	medium	verify in 2002 using GIS & planning data

Table II-1b. Watershed Assessment Units in eastern Alameda County.

Watershed Assessment Unit	6	7	
WAU name	**Alameda Creek-northern**	**Alameda Creek-southern**	**Notes**
focus watersheds or representative waterbodies	Arroyo Mocho, Arroyo La Laguna (Arr. Las Positas, Lake Del Valle)	Alameda Creek (San Antonio Reservoir)	focus creeks have mostly open channels
Characteristics			
Size (sq mi)	490*	210*	*not all within County
Dominant Land Uses	rural (ranch, farming), and urban	rural	Remote Sensing for impervious estimates, 2001-02
Dominant Channel Type (in Bay plain or valley floor; hill reaches typically more open/ natural, esp. to south)	earth channel	natural	Preliminary estimates via GIS/ photo analysis 2002
Beneficial Uses (existing or potential)	AGR, COLD, GWR, MIGR, MUN, REC-1-2, SPWN, WARM, WILD	AGR?, COLD, FRSH, GWR, MIGR, MUN, REC-1-2, SPWN, WARM, WILD (includes reservoirs)	
Main issues (tentative list)	urban runoff, new development, erosion/ sedimentation, grazing, mines, groundwater recharge, drinking water, other fisheries	erosion, reservoirs/dams, grazing, steelhead habitat, other fisheries	
Developable open land index (tentative)	high	medium-high	verify in 2002 using GIS & planning data

Table II-2a. Status of Monitoring and Assessments organized by Watershed Assessment Units in western Alameda County.

Watershed Assess. Unit	1	2	3	4	5	8	
WAU name	**north of Bay Bridge**	**Oakland, south of Bay Bridge**	**San Leandro**	**San Lorenzo**	**Hayward to Lower Alameda**	**Mission-Laguna**	**Notes**
Tier 1 -Screening Level							
Chemical-Physical Parameters	Codornices-Friends of 5 Creeks continuous monitoring 2001	Lake Merritt- Monthly grabs (FCD, 1996-97); continuous monitoring (FCD 199x)	(RWQCB-lead pilot 2000-02)	Monthly WQ grabs (FCD, 1995-98); continuous temperature logging (FCD, 2000-02)		City 2001	Also fixed station monitoring in all WAU's 1989-1995
Chemical-Physical, basic screening by volunteers	(Friends of 5 Creeks*)	(Friends of Sausal Creek, 1998-2001*; LM by Oakland Tech HS 200?)	WCC and Friends of SLC1995-97, continuing			(Math-Science Nucleus, 2000-01)	*volunteer/educational protocols for grabs
Bioassessment-macroinvertebrate		1 site 2001; FOSausal, 2 sites bimonthly screening 1998-2001	(RWQCB-lead pilot, 2 sites 2000-01;)	5 sites 2001; FCD 2-3 sites 1998-2000		4 sites 2001	ACCWP and FCD use CSBP in spring; FOSausal (Friends) = modified biosurvey
Biological-Physical: Fish community and habitat	Resource assessment 2002*	Oakland creeks resource inventory, 1998	WCC 1996, Resource assessment 2002*	Population surveys and habitat mapping (FCD, 2001)		Resource assessment 2002*	Resource assessment includes review of Leidy data
Geophysical							
Stream morphology							
Vegetation							
Flow	(Friends of 5 Creeks, 2001)			(USGS, Castro Valley & San Lorenzo)	(USGS historical)		

Notes: a) Data collection by ACCWP unless otherwise noted in parentheses ( ). b) FCD = Alameda County Flood Control and Water Conservation District

Table II-2a. continued

Watershed Assess. Unit	1	2	3	4	5	8	
WAU name	**north of Bay Bridge**	**Oakland, south of Bay Bridge**	**San Leandro**	**San Lorenzo**	**Hayward to Lower Alameda**	**Mission-Laguna**	**Notes**
Tier 2-More Focused							
Contaminant Chemistry	Fixed* (2 sites)	Fixed* (5 sites)	Fixed* (2 sites)	Fixed* (2 sites)	Fixed* (3 sites), Crandall Creek1994-96	Fixed* (1 site)	*Fixed stations 1989-95
Nutrients	Fixed* (2 sites)	Fixed* (5 sites)	Fixed*(2 sites)	Fixed* (2 sites)	Fixed* (3 sites)	Fixed* (1 site)	*1989-95
Pathogens		LM 1994-97 (4 sites, 2x/month continued by city)					
Toxicity	Fixed* (1 site)	Fixed* (3 sites)	Fixed* (2 sites)	Fixed* (2 sites); Castro Valley, San Lorenzo 1995	Fixed* (2 sites)	Fixed* (1 site)	*Fixed stations 1989-90
Geomorphic and Sediment Source Analysis				(SFEI channel morphology and landslide mapping in Crow, for FCD)	(USGS Alameda Cr. sediment study for FCD)		
Tier 3-TMDL/Pollutants of Concern sampling							
Hg/PCB sediment survey	3 sites 2000; 2 sites 2001	6 sites 2000-01	1 site 2000-01	3 sites 2000-01	3 sites 2000; 2 sites 2001; Dry Creek replaced by Decoto industrial site, 2001		
Hg/PCB Source investigation	Codornices-Hg, 8 sites 2000	Ettie St drains-PCBs, 5 drains/ 9 inlet composites, 2001; Glen Echo Creek PCBs, 2 sites 2001					
PAH sediment survey	2 sites 2000; 2 sites 2001	6 sites 2000-01	1 site 2000-01	3 sites 2000-01	3 sites 2000; 2 sites 2001		
Chlorinated pesticides sediment	2 sites 2001	6 sites 2001	1 site 2001	3 sites 2001	2 sites 2000; 2 sites 2001		
Copper in stormwater	Fixed* (2 sites)	Fixed* (5 sites)	Fixed*(2 sites)	Fixed* (2 sites); Castro Valley Creek-2000-02, time interval composites	Fixed* (3 sites)	Fixed* (1 site)	*Fixed stations 1989-95
Diazinon in stormwater				Castro Valley Creek-1995-2000, 21events			

Table II-2b. Status of Monitoring and Assessments organized by Watershed Assessment Units in eastern Alameda County.

Watershed Assessment Unit	6	7	
WAU name	Alameda Creek-northern	Alameda Creek-southern	Notes
Tier 1 -Screening Level			
Chemical-Physical Parameters	(RWQCB-lead pilot 2000-02 in Arroyo Las Positas)		Also fixed station monitoring in all WAU's 1989-1995
Chemical-Physical, basic screening by volunteers	(Amador Valley HS*)		*volunteer/educational protocols for grabs
Bioassessment-macroinvertebrate			ACCWP and FCD use CSBP in spring; FOSausal (Friends) = modified biosurvey
Biological-Physical: Fish community and habitat	Resource assessment 2002*	Resource assessment 2002* (also SFPUC)	Resource assessment includes review of Leidy data
Geophysical			
Stream morphology			
Vegetation			
Flow	(USGS at Niles)	(USGS)	

Notes: a) Data collection by ACCWP unless otherwise noted in parentheses ( ). b) FCD = Alameda County Flood Control and Water Conservation District

Table II-2b. continued

Watershed Assessment Unit	6	7	
WAU name	**Alameda Creek-northern**	**Alameda Creek-southern**	**Notes**
Tier 2-More Focused			
Contaminant Chemistry		Niles*	*Fixed station 1989-95
Nutrients		Niles*	*Fixed station 1989-95
Pathogens			
Toxicity		Niles*	*Fixed station 1989-90
Geomorphic and Sediment Source Analysis	USGS Alameda Cr. sediment study for FCD)		
Tier 3-TMDL/Pollutants of Concern sampling			
Hg/PCB sediment survey	integrated in Niles site	1 site 2000-01 (Niles)	
Hg/PCB Source investigation			
PAH sediment survey	integrated in Niles site	1 site 2000-01 (Niles)	
Chlorinated pesticides sediment	integrated in Niles site	1 site 2000-01 (Niles)	
Copper in stormwater		Niles*	*Fixed station 1989-95
Diazinon in stormwater			

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II.C Watershed Assessment

Objective: Support watershed-based management efforts through characterization of existing resource values and beneficial uses, and through exploration of a variety of indicators to identify critical areas and functions to be addressed by management actions for protecting and restoring creeks and watersheds in Alameda County.

Basic concepts

A stream,lake or other waterbody is part of a system that involves the surrounding upland area or watershed that drains to it, as well as the entire drainage network of channels and pipes that carry the water from headwaters to mouth. Changes to either upland areas or channel network may involve physical, chemical or biological characteristics, and these changes interact to produce cumulative effects on the system. These effects may be most visible in a part of the stream far removed from the area where changes occurred. The response of the system may also continue to evolve for many years after the initial impact. In both urbanized and non-urban parts of Alameda County, many streams show cumulative effects of past landuse changes and alterations to the channel network.

A watershed system involves many complex processes, with inputs and outputs interacting at many scales. Indicators are individual measurable parameters that express or summarize different aspects of these processes. Ecological indicators can be physical, chemical or biological; while all three types should be integrated for a comprehensive watershed assessment, individual indicators can be useful for answering specific management questions.

Watershed assessment is conducted to help make informed decisions about future management activities and help clarify and resolve issues within a watershed (Figure II-1). The details of the watershed assessment process will vary for individual watersheds (FISRWG 1998, WPN, 1999) but are typically incorporated into a common framework (see Figure II-3). In all cases a preliminary overview includes mapping of main features, listing of assessment participants and identification of the main stakeholder interests and resource concerns. From this base, a process of goal-setting and issue identification must be used to focus the objectives of assessment so that appropriate indicator selection and data gathering techniques can follow.

ACCWP approach

ACCWP is not a primary resource management entity. Its main role in watershed assessment is to inform and facilitate watershed management by co-permittees and their local partners. A secondary objective is to assist the Regional Board in assembling improved watershed information for its Clean Water Act reporting and assessment of the condition of beneficial uses.

The Watershed Assessment component has three main objectives:

- Develop a cost-effective system for managing and presenting watershed data, using a Geographical Information System (GIS).
- Develop and refine a suite of indicators for evaluating the physical, chemical and biological functioning of watersheds, and identify effective ways to apply them in urban streams.
- provide guidance and support for application of improved watershed understanding to protection and restoration of watershed resources.

The MYP groups watershed assessment activities under five elements:

II.C.1 Watershed classification and mapping leading to refinement of physical indicators
II.C.2 Biological indicators of creek health and ability to support aquatic life.
II.C.3 Basic screening indicators of water quality and absence of human-caused toxicity
II.C.4 Indicators of human health risk from light contact with natural waters. (Heavy water contact recreation is mostly limited to a few heavily managed lakes and is not a primary management focus)
II.C.5 Integration and interpretation of watershed data for specific management and educational purposes.

The Program will develop a detailed workplan for watershed assessment as part of a report on watershed management to be submitted in accordance with permit section C.11. The workplan will incorporate Tier 1 screening approaches for the first four of these elements. These indicators and any additional ones will be refined and adapted in response to issues and needs identified through comparison with additional assessment information from selected pilot watersheds. Details of assessment implementation will depend on the participation of local managers and other stakeholders.

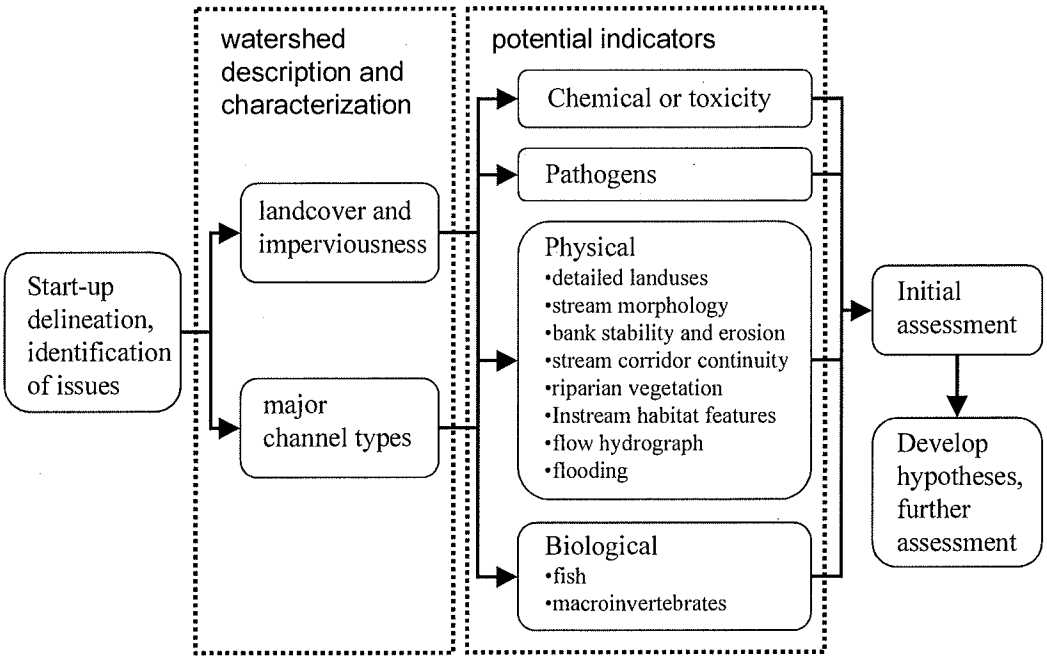

Figure II-3. Generalized framework for watershed assessment
adapted from the Oregon Watershed Assessment Manual (WPN 1999)

II.C.1 Watershed classification and physical indicators of creek health:

Objective and scope: Use analysis of landscape-level similarities and differences in watersheds or sections of watersheds, to help interpret indicator data and make useful distinctions among these watersheds. Refine selected physical parameters as indicators to complement chemical and biological indicators.

Background:

An important objective for watershed classification and physical indicator development is the identification of priority areas for management action. In the context of urban and urbanizing watersheds, examples of such areas are

a) sensitive areas or special resources valued by stakeholders and requiring protection
b) areas being degraded or at risk of degradation without active intervention
c) areas with potential for upgrading existing uses through rehabilitation or restoration activities.

The proportion of impervious surface in the watershed is one of the strongest indicators of initial urbanization impacts on stream function (Zielinski, 2002). While most of Alameda County's urban watersheds exceed the 25% imperviousness suggested by the Center for Watershed Protection as a threshold for a "non-supporting" classification, many streams still provide some support for biological or other community resources. Additional physical indicators can be used to distinguish varying levels of habitat quality. Channel alterations and fragmentation of the riparian zone may also be useful landscape-scale indicators of watershed condition (Roni et al 2002), with a varying relationship to impervious area depending on development history and geologic conditions.

Approach

ACCWP's watershed delineation is based on available topographical and drainage information, which has been refined for most urban areas in the Creek and Watershed maps produced by William Lettis and Associates (Sowers 1997, 1999, 2000, 2003). Initial classification of stream reaches will be based on two major indicators of urban alteration: percentage of impervious area and channel modification by channelization or culverting (Fig. II-3). ACCWP is using Landsat Thematic Mapper remote sensing data as a base for determining density of development, with overlays of available municipal data for roads and other surface construction to improve accuracy. ACFCWCD data and the Creek and Watershed maps provide basic channel information for the western Bay slope portion of the county. Mapping efforts by Zone 7 and William Lettis Associates will also develop channel and watershed data for portions of the Alameda Creek watershed.

The Program will map zones with different combinations of these primary indicators to produce a preliminary classification based on a hypothetical relationship of their cumulative effects to conditions in the creeks. This relationship will be initially checked against detailed habitat

studies (ACFCWCD and HES, 2002) and other information gathered in the District's pilot assessment of the San Lorenzo Creek watershed. More limited biological indicator information from other watersheds will also be used for verification.

The watershed assessment workplan will address data gaps and other work needed to refine this classification model. Subject to availability of data and priorities set by local management objectives, additional indicators of watershed function and their measurable assessment parameters could be selected, and a strategy for rating or scoring each parameter and the potential causative factors may be developed.

Activities

No.	Description	Approx dates	Task ID, Status May2003
1.	Draft detailed subplan	Draft Dec 2003	WA-1.2 Planned
2.	Develop long-term workplan	February 2004	WA-1.2 Planned
3.	Review data from initial pilot watersheds	FY2003/04 and FY04/05	WA-3.2 Proposed
4.	Review indicators used and identify additional candidates	FY04/05-FY07/08	WA-2.1 Proposed

WAUs and/or watersheds

WAU	Current status	Planned activities
1	Landcover and Channel data available, partially checked	
2	Landcover and Channel data available, partially checked	Lake Merritt and Sausal pilot watershed verification FY 2004-05
3	Landcover and Channel data available, partially checked	
4	Landcover and Channel data available, partially checked	San Lorenzo watershed pilot review FY 2003-04
5	Landcover and Channel data available, partially checked	
6	Landcover data to be checked; Channel data refinement needed	
7	Landcover data to be checked; Channel data refinement needed	
8	Landcover and Channel data available, partially checked	Laguna Creek pilot watershed verification FY 2004-05 or FY05-06

Related tasks and activities:

- Watershed delineation and basic characteristics to be included in report on integration of watershed management activities as specified in permit section C.11.
- Coordinate the refinement of biological indicators and classification approaches with Bay Area Macroinvertebrate Bioassessment Information network (BAMBI).
- Obtain other detailed assessment information from local watershed partners or stakeholders.

II.C.2 Biological Indicators of Creek Health

Objective and Scope: Use biological indicators to describe the functional condition of streams, and relate these indicator values to support for management objectives and beneficial uses related to aquatic and riparian organisms and their habitats..

Background: Useful biological indicators are those that display a range of variation that can be associated with gradients or variations in stream condition. Because of the wide range in size and anthropogenic change in Alameda County streams and watersheds, a single indicator may not effectively characterize all support conditions. Fish, particularly salmonids, are species of interest in natural systems but are sometimes difficult to sample and are excluded from many streams by flow regime or local barriers. Benthic macroinvertebrates (BMIs), the insects and other small animals that live in the bottom substrate of a stream, are an important indicator of biological and ecological health because they recycle nutrients and are a major component of the riparian food web. BMI communities are found in practically all streams and their makeup changes in response to pollution and habitat changes. Extensive guidance on development and use of BMI indicators has been supported at the national and state levels (e.g. Barbour, et al 1997), and a number of agencies and volunteer groups have begun to sample BMIs in Bay Area creeks using the California Stream Bioassessment Procedure (CSBP, 1999)

Approach: Initial screening and classification will be based on community composition of two taxonomic groups:

- fish for larger perennial streams or where there are populations of special interest
- BMI assemblages for streams with predominantly natural bottom substrate.

ACCWP has reviewed available data and professional knowledge about fishery resources in Alameda County creeks.(SFEI 1999, HES 1999, ACFCWCD and HES 2002). After 2-3 years of BMI data have been collected, a summary report and detailed workplan will be developed for further sampling. Benchmarks for data interpretation will be developed in regional collaboration through the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI), along with BASMAA members, RWQCB and other agencies or groups.

Activities

No.	Description	Approx dates	Task ID, Status May2003
1.	Inventory of fishery resources in Oakland creeks	FY97-98	complete (WCC and HES, 1998)
2.	Inventory of available fisheries data	FY00/1 – FY02/3	4.2.6 Phase 1 complete 2001 (URS);
3.	Preliminary mapping of areas where fish community data may be useful	FY01/2 – FY02/3	WA-1.1 Version 1 map completed 2002
4.	Pilot BMI community surveys in San Lorenzo watershed (ACFCWCD)	FY 97/98 – FY99/00	Sampling completed; data review to be integrated with Activity #7

5.	Conduct ACCWP BMI sampling program	FY00/01 - FY07/08	WA-2.1 Initiated April 2001 (BAS 2002); further review in Activity #7
6.	Promote regional development of biocriteria (benchmarks and application methodology) for BMI indicators	FY00/01 - FY07/08	WA-2.1 Issue papers drafted on regional needs, concept proposal submitted for funding to conduct regional data analyses.
7.	Prepare 3-year summary report and detailed workplan	FY03/04	WA-2.1 Planned
8.	Develop and test preliminary classification based on biological indicators in focus watersheds	FY04/05 – FY06/07	Proposed at regional level via BAMBI
9.	Coordinate and acquire additional Alameda County data from other agencies and sources	FY04/05- - FY05/06	WA-2.1 Planned
10	Plan refinements to use of fish/BMI indicators, and consider other groups e.g. vegetation/algae	FY 04/05 - FY07/08	WA-2.1 Proposed

WAUs and/or watersheds

WAU	Current status	Planned activities
1	Codornices Creek fish surveys by watershed group; BMI sampling 2003 by ACCWP (1 site)	Codornices BMI sampling 2004 by RWQCB
2	BMI surveys with Friends of Sausal Creek 1997-2001. BMI sampling 2001-03 ACCWP (1-3 sites)	Continue Sausal creek professional sampling as restoration project follow-up
3	BMI sampling 2001-2003 by RWQCB	
4	Multi-year, multi-site dataset by ACFCWCD	Continue sampling
5		
6	Arroyo Las Positas BMI sampling 2001 by RWQCB	Arroyo Mocho BMI sampling 2004 by RWQCB
7		
8	Laguna and Mission Creek sampling 2001-03 by ACCWP (4-5 sites)	

Related tasks and activities:

- Spatial and temporal patterns in biological indicator data will be integrated with physical indicators, developed through GIS mapping and also more detailed assessment strategy
- More qualitative interpretations of data will be explored through support for local watershed efforts, including volunteer monitoring workshops and work with city staff.

II.C.3 Water Quality Screening in Watersheds

Objective and Scope: Use basic water quality parameters and selected chemical indicators to screen conditions at representative watershed sites.

Background: Water quality objectives are established in the Basin Plan for basic parameters including temperature, pH and dissolved oxygen. These data are routinely collected along with benthic macroinvertebrate samples in creeks. However screening for selected parameters at additional sites and at other times of year can provide complementary information about urban stream conditions.

Approach: ACCWP will screen approximately 10 selected sites semiannually in spring and fall during dry weather. Sites will be selected to represent a range of urban stream conditions and different WAUs. For the initial pilot screening in FY2002/03, screening parameters will include the basic water quality parameters listed above and also turbidity, conductivity, ammonia and free and total chlorine. Grab samples will be collected for diazinon, hardness and total copper and zinc. Sites with elevated values of one or more pollutants may be flagged for follow-up or other action. The site list will be revised each fall to extend the coverage to new watersheds.

Activities

No.	Description	Approx dates	Task ID, Status May2003
1.	Develop SOPs and sampling plan	FY02/03	MS-1.4 In progress
2.	Pilot sampling	FY02/03	MS-1.4 Sep 2002 completed (13 sites); May 2003 planned
3.	Pilot test of Rapid Trash Assessment Protocol by RWQCB	FY02/03	MS-2.1 Initial field test completed August 2002; ACCWP pilots September 2002
4.	Refine and continue sampling	FY03/04-FY07/08	MS-1.4 Proposed

WAUs and/or watersheds

WAU	Current status	Planned activities
1	3 sites screened September 2002	Repeat screening May 2003
2	2 sites for trash pilot assessment, 1 site screened September 2002;	Repeat screening May 2003
3		Screen FY2003/04
4	2 sites for trash pilot assessment, 3 sites screened September 2002	Repeat screening May 2003
5	2 sites for trash pilot assessment, 2 sites screened September 2002	Repeat screening May 2003
6		
7		
8	Laguna Creek dry season sampling at 3 sites (2002); 4 sites screened 9/02	Salop (in prep); repeat screening in May 2003

Related tasks and activities:

- Screening stations may include sites used in long-term trends monitoring for pollutants of concern.
- Support for local watershed efforts, including volunteer monitoring workshops and work with city staff.
- Coordinate with Zone 7 and the Alameda County Water District for screening data in the Alameda Creek watershed.

II.C.4 Indicators of Human Health Risk

Objective and Scope: Use a variety of indicators and strategies to assist watershed managers in evaluating risks to humans from non-immersion water contact in creeks and lakes.

Background: Alameda County is home to a wide variety of creek types, ranging from fairly natural in stretches, to hardened above-ground channels, to completely culverted conveyances. It follows that all creeks are not able to support the same types of uses; some creeks allow relatively easy public access and are popular recreation sites, while others are inaccessible except to the property owner.

The ability of creeks to support a variety of water contact recreation activities is an important concern ACCWP member agencies. Elected officials, managers, and citizen groups would like to ensure that creeks are safe to work and play in. Because of small watersheds and a history of heavy urbanization, relatively few County creeks support recreational activities associated with heavy water contact (e.g., swimming, fishing); therefore these should not be compared with water quality objectives developed for intensive water contact activities. The resource objectives for the County's urbanized creeks depend on their current condition and the degree of modification/restoration that the local community in the watershed wants that can reasonably be accomplished given available resources and existing physical constraints.

Coliform bacteria have traditionally been used as the standard indicator of sewage contamination in receiving waters. However, there are well-known problems with the interpretation of coliform data. Coliforms are not themselves pathogens, and can be introduced to stormwaters from sources other than sewage (e.g., mammals other than humans). Because coliforms do not provide a reliable signal of human sewage contamination, they are not always useful in identifying and tracking sewage inputs to creeks and streams. The primary objective for many water quality managers is to identify alternative indicators that more reliably indicate human sources and provide more accurate measures of pathogen concentrations in stormwater.

Approach: Initial efforts will focus on developing information that can be used to assist in interpretation of existing indicators and monitoring data. Because there is no perfect indicator for all situations, emphasis will be on identifying useful strategies for selecting appropriate indicators and interpretations of available data. ACCWP will also explore specific water contact recreation issues in individual watersheds as interest in particular areas (e.g., Lake Merritt) and issues (e.g., homeless encampments, suspected sanitary sewer infiltration) dictate.

Activities

No.	Description	Approx dates	Task ID, Status May2003
1.	Literature review of potential contact recreation indicators	FY00/01 – FY02/03	4.2.3 Final draft (URS, in prep)
2.	Analysis of existing Alameda County data	FY00/01 – FY02/03	MS-3.1 Draft memo (URS, in prep)
3.	Develop guidance for interpretation of contact recreation indicators	FY02/03 – FY03/04	MS-3.1 Initiated Mar 2003
4.	Review of Lake Merritt coliform testing program	FY02/03 - FY03/04	WA-3.1 Initiated Apr 2003
5.	Development of summary document, GIS layer outlining existing water contact recreation activities supported within the north county	FY02/03 – FY04/05	WA-3.1 Initiated Mar 2003
6.	Identify priorities for further activities	Fy04/05 – FY07/08	WA-3.1 Proposed

WAUs and/or watersheds

WAU	Current status	Planned activities
1		
2	Lake Merritt bacteria monitoring (ongoing); City of Piedmont storm sewer monitoring (2000)	Review of Lake Merritt monitoring program.
3		
4		
5		
6		
7		
8	Laguna Creek dry season sampling at three sites (2002)	Salop (in prep)

Related tasks and activities:

- Coordinate with SCCWRP five-year study targeting development of a rapid indicator for microbial contamination.
- Coordinate with Stanford / SFEI monitoring project in Bay and tributary watersheds
- Coordinate with City of Fremont Laguna Creek Monitoring Program or other local agencies as appropriate.

II.C.5 Data Integration and Interpretation

Objective and Scope: Provide useful information and support to assist watershed approaches to stormwater management activities.

Background: Local municipalities and other watershed managers need useful data and effective presentations to support their activities and engage the involvement of various stakeholders including public officials, other agencies and community groups.

Approach: The Program will maintain a GIS inventory of information about Alameda County watersheds and data that can inform watershed management decisions. Basic characteristics of watersheds and ACCWP co-permittees will be included in a report to be submitted in compliance with Section C.11 of the permit. Watershed information will also be presented and updated regularly on the ACCWP website (www.cleanwaterprogram.com). Watershed information, GIS and other technical resources will also be used on an on-call basis to support specific watershed monitoring or outreach activities by the Program, its member agencies and partners.

Activities

No.	Description	Approx dates	Task ID, Status May2003
1.	Incorporate watershed maps and basic information on website, with regular updates	FY02/03 – FY07/08	WA-3.3 In progress
2.	Provide watershed characterization and issues information for watershed management report	FY03/04	WA-3.2 Planned
3.	Integrate watershed assessment planning with local management priorities and available data	FY03/04 – FY07/08	WA-3.2 Planned
4.	Update watershed assessment plans as needed	FY04/05 – FY07/08	WA-3.2 Proposed

WAUs and/or watersheds

WAU	Current status	Planned activities
1		
2	Lake Merritt monitoring program by City of Oakland	Review of Lake Merritt bacteriological datasets FY03/04
3		
4	San Lorenzo Pilot watershed assessment by ACFCWCD	Integrate with BMI data and WQ review by Program FY2003/04
5		
6		
7		
8	Laguna Creek Watershed Monitoring Program, 2001-02 by city of Fremont	Review of summary report FY03/04

Related tasks and activities:

- ACCWP's Policy Level Work Group will coordinate reporting of watershed management activities by Program co-permittees and facilitate further collaborations to address watershed issues.

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II.D Pollutants of Concern

Pollutants of Concern (POCs) are substances that enter the environment as a result of human activities in quantities large enough to cause harm to aquatic ecosystems or human uses of these systems. Several pollutants have been found to be widespread in the environment and are suspected of causing impairment to San Francisco Bay. In some cases these pollutants also have the potential to impair creeks and lakes in the watersheds that drain into the Bay. Several MYP elements address local and regional needs for technical information to address POCs in these different environments.

Past ACCWP Monitoring

In the late 1980s, review of progress under the Clean Water Act suggested that sources of pollutants other than traditional point sources were contributing "significant" discharges of POCs to the San Francisco Estuary. In response to this, the Program implemented studies to evaluate the effect of urban runoff on the receiving waters of the Bay. Some of the findings of this initial Loads Assessment (WCC, 1991) included:

- Intermittent exceedances of water quality objectives for a few of large suite of metals analyzed, including cadmium, copper, lead, and zinc
- Regular aquatic toxicity from stormwater samples in urbanized areas of the County
- Detectable concentrations of polycyclic aromatic hydrocarbons (PAHs) in most of the stormwater samples
- Infrequent detections of organochlorine (OC) pesticides in dry weather samples
- Elevated concentrations of sediment-associated POCs
- Initial estimates of loadings to the Bay suggest that nonpoint source loads from Alameda County form a much higher percentage of the total loads to the Bay than point source loads.

ACCWP continued monitoring runoff and sediment at some of its fixed monitoring stations through the 1996-97 sampling season. The Program also instituted a number of special studies investigating individual pollutants. These studies included a characterization of pollutant occurrence and reduction in the Demonstration Urban Stormwater Treatment (DUST) Marsh, continued toxicity testing at multiple locations, and extensive studies of the insecticide diazinon (e.g. Scanlin and Feng 1997).

Ongoing Regional Efforts

In 1993, the San Francisco Regional Water Quality Control Board created the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP) in collaboration with regulated dischargers and dredgers. Each year the RMP analyzes water, sediment, and biota from throughout the Estuary for a variety of trace organic compounds, trace metals, and ancillary water quality parameters. ACCWP and other dischargers provide funding and contribute to discussion and review of results.

As a result of its 1998 review of data from the RMP and other sources, the Regional Board listed San Francisco Bay as impaired due to the following pollutants:

- Diazinon, an organophosphate (OP) pesticide
- Metals including copper, nickel, mercury, and selenium
- polychlorinated biphenyls (PCBs),
- chlordane, DDT, and dieldrin, long-lived OC pesticides

The U.S. EPA subsequently added dioxins and dioxin-like compounds to causes of Bay impairment, and listed urban creeks throughout the Bay Area as impaired by diazinon. Under the provisions of the Clean Water Act, the Regional Board must develop strategies to meet water quality standards by drafting a Total Maximum Daily Load (TMDL) plan for each of the listed POCs. Each TMDL will identify sources of the impairing pollutant to the water body, determine the total input that the water body can safely "handle," and allocate loadings of the contaminant among dischargers. The Regional Board is developing TMDLs for San Francisco Bay for mercury and PCBs, and a TMDL for diazinon in creeks; other TMDLs are scheduled for the near future. (TMDL documents available at http://www.swrcb.ca.gov/~rwqcb2/tmdlmain.htm).

To further assist the Regional Board in controlling POCs, the Bay Area Clean Water Agencies (BACWA) and Bay Area Stormwater Management Agencies Association (BASMAA) joined with the Regional Board to establish the Clean Estuary Partnership (CEP) in 2001. The purpose of the CEP is to work cooperatively to identify and fill data gaps to support development of scientifically valid TMDLs and other strategies for water quality attainment.

ACCWP Approach

As in the past, ACCWP will make use of an adaptive management strategy, allowing its stormwater management activities to evolve based upon findings and developments of these and other regional efforts and feedback from co-permittees regarding TMDL implementation.

The MYP includes three specific elements that will be used to focus stormwater monitoring and management efforts over the course of the permit:

II.D.1 Continued participation in regional efforts to gain understanding of impacts of POCs upon the Bay and to work to mitigate negative impacts through implementation of water quality attainment strategies

II.D.2 Characterization of the occurrence of POCs in Alameda County watersheds, and investigations to identify potential sources and information to support strategies for pollutant control

II.D.3 Use of traditional water quality indicators to describe the impacts of POCs associated with stormwater runoff upon Alameda County creeks

Each of these elements is discussed below. Management actions to address priority POCs are described in Pollutant Reduction Plans (PRPs) that will be refined and updated regularly. The Plan (ACCWP. 2003) includes draft PRPs for copper, mercury, pesticides (diazinon, other OP pesticides, and OC pesticides), and PCBs and dioxin-like compounds. In addition to monitoring activities, PRPs include other activities mentioned in Section IIE.

II.D.1 Pollutant Impacts to San Francisco Bay

Objective and Scope: Participate in regional efforts to a) gain understanding of impacts of specific pollutants upon the Bay; and b) mitigate negative impacts through implementation of water quality attainment strategies.

Background: The development of Water Quality Attainment Strategies, including TMDLs, is required because the San Francisco Bay-Delta and its tributaries have been designated as impaired water bodies under Section 303(d) of the federal Clean Water Act. There are several regional efforts that are currently helping to address unknowns surrounding pollutants of concern and their impacts upon the Bay. The ACCWP is an active participant in and provides financial support to two of the most important of these efforts, the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP) and the Clean Estuary Partnership (CEP).

The RMP was developed in 1993 to provide data describing the concentration of trace elements and trace organic contaminants in the San Francisco Estuary. Its objective is to aid management of pollution in the Estuary by providing information on the status and trends of contamination, sources and pathways of contamination and their relative importance, and the potential effects of contamination upon organisms that live in or use the Estuary. As such, the RMP is providing baseline information necessary to understanding the functioning of the Bay as an ecosystem..

The CEP is a collaborative effort among the Regional Board, treatment plant dischargers (BACWA), and urban runoff programs (BASMAA) to support development and implementation of TMDLS and other water quality attainment strategies for specific pollutants of concern in San Francisco Bay. The CEP is currently developing and conducting special studies to provide defensible scientific data on which to base TMDLs for mercury, PCBs and pesticide-related toxicity, as well as site-specific objectives for copper and nickel in the northern and central portions of the Bay.

After studies in the South Bay indicated that automobile brake pads may be the most significant source of copper in urban runoff, the Brake Pad Partnership (BPP) was initiated in 1996 as a collaboration among regulators, stormwater programs, brake materials manufacturers, scientists and environmentalists to address environmental problems from brake wear debris. The BPP's work includes research and monitoring, and.is an integral part of the TMDL implementation plan for copper in all parts of the Bay.

Approach: ACCWP attends annual meetings of the RMP and is represented through the BASMAA Monitoring Committee in other RMP committees and workgroups. In 2002, the RMP initiated changes in its water and sediment sampling programs based on changes recommend in a Five Year Review. The RMP will incorporate changes to its bioaccumulation monitoring program beginning in 2003. Details of these programs are available at http://www.sfei.org/rmp/index.html.

ACCWP provides representation for BASMAA on the CEP's Executive Management Board and Technical Committee. The CEP is in the process of developing and refining a Five Year Plan. Details of this program are available at http://www.cleanestuary.com. Although the Five-Year CEP budget is intended to cover most POC-related special studies that were formerly conducted by individual stormwater programs, ACCWP will to continue some monitoring activities involving:

- POCs that are not on the priority list for the CEP
- Studies of site conditions or source control issues that are particular to Alameda County
- Participation in CEP committees and workgroups

ACCWP has contributed support to the BPP directly and through BASMAA. ACCWP attends annual stakeholder meetings and is assisting the BPP with the watershed modeling portions of its action plan for evaluating fate and transport of copper originating from brake wear debris.

Activities:

No.	Description	Approx dates	Task ID, Status May 2003
1.	RMP participation	1993 - ongoing	MS-1.1 Ongoing
2.	CEP participation	FY02 - ongoing	MS-1.6 Ongoing, Five Year plan expected spring 2003

Related tasks and activities:

- Continue cooperation with Clean Estuary Partnership and other BASMAA programs in further characterizing spatial extent of loadings from watershed sources.
- Continue cooperation with Brake Pad Partnership in monitoring changes in brake pad manufacture and usage, and their expected impact upon receiving waters.

II.D.2 Spatial distribution, loadings and sources of Pollutants of Concern in watersheds

Objective and Scope: Characterize spatial occurrence and concentrations of priority POCs in Alameda County watersheds, and identify potential sources

Background: There are a number of POCs in the San Francisco Bay area that are long-lived in the environment and predominantly associated with sediments: polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury, organochlorine (OC) insecticides, and dioxins. These pollutants primarily affect the beneficial uses of fishing, wildlife habitat, and preservation of rare and endangered species. Section C.10 of the permit requires the Program to collect information to assist the Regional Board in estimating loadings for several of these pollutants.

Defensible estimates of the loadings of these pollutants to the Bay are difficult to generate, as are assessments of the exact impacts of these loadings. The ACCWP has initiated a monitoring program to assess the spatial distribution of these pollutants as an indicator of loadings to the Bay from County watersheds (Gunther et al 2003). The underlying assumption of this project is that bedded sediments with substantially higher pollutant concentrations than Bay sediments may indicate upstream pollutant sources. If sediments at the base of a watershed are consistently found to have significantly higher pollutant concentrations, then follow-up source investigations can be conducted to ascertain whether there are current, controllable sources discharging pollutants into stormwater conveyances.

Approach: Initial analysis of pollutant distribution and loadings involves collection of watershed sediments and analysis for PCBs, mercury, OC pesticides, PAHs, and dioxins. Follow-on work will be subject to coordination with the CEP, RMP and other regional data sources., but may include the following approaches:

- incorporation of additional analytes per the needs of upcoming TMDLs
- focus on source investigations identified as part of initial sampling efforts

Activities:

No.	Description	Approx dates	Task ID, Status May2003
1.	Initial fixed station Loads Assessment	FY1988/9-90/1	Complete (WCC, 1991)
2.	Characterization of diazinon occurrence in watersheds, uses, and wash-off characteristics; development of reduction strategy	FY 1995/6-2001/2	Complete (Scanlin and Feng 1997, others listed in Section IV)
3.	Initial investigation of spatial distribution of pollutants of concern in County watershed sediments	FY00/01 through FY03/04	MS-1.2 Completed for Hg, PCBs (Salop et al 2002a) MS-1.2 Dioxins reanalysis initiated February 2003

4.	Synthesis of background data and scientific information on specific POCs	FY00/01 through FY02/03	4.2.1 Completed for PAHs (Salop, et al., 2001) MS-3.1 Dioxins synthesis initiated March 2003
5.	Pilot source investigation studies in Glen Echo and Ettie Street drainages	FY/02 through FY02/03	MS-2.1 Complete (Salop, et al., 2002b), follow-up to be supported by Prop 13 grant to City of Oakland
6.	Investigation of source identification and remediation strategies	FY03/04 through FY 04/05	MS 2.1 Control options for POCs in sediment, initiated January 2003. MS-3.1 Dioxins synthesis
7.	Continue source investigations, as required	FY03/04-FY07/08	MS-2.1 Watersheds and analytes TBD
8.	Initiate trend monitoring program following identification of appropriate long term sites for sediment-related POCs	FY03/04-FY07/08	MS-1.2 Awaiting completion of source investigations and determination of sampling sites (Gunther et. al 2003)

WAUs and/or watersheds

WAU	Current status	Planned activities
1	Strawberry Creek, Codornices Creek Loads Assessment (1989-91); Strawberry Creek (2000) Codornices Creek and Cerrito Creek sampling (2000-01)	Write up results of 2000 Codornices Creek detailed sediment sampling
2	24th and Wood, 37th and 8th, 4th and Alice, Elmhurst Creek, Ettie Street Loads Assessment (1989-91); Arroyo Viejo, Ettie Street Pump Station, Glen Echo Creek, Lion Creek, Sausal Creek, and Seminary Creek sampling, 2000-01; Ettie Street and Glen Echo Creek source investigations, 2001	Continued Ettie Street source investigation via Prop 13 grant, anticipated to begin in 2004. Analysis of sediment dioxins in Ettie Street, Glen Echo Creek, Lion Creek, (2003)
3	Merced and Wicks Streets Loads Assessment (1989-91); San Leandro Creek sampling, 2000-01	Analysis of sediment dioxins in San Leandro Creek (2003)
4	Cotter Way, San Lorenzo Creek, Castro Valley Creek Loads Assessment (1989-91); Castro Valley Creek (2 sites) and San Lorenzo Creek sampling, 2000-01	Analysis of sediment dioxins in San Lorenzo Creek (2003)

5	Cabot Blvd. Loads Assessment (1989-91); Crandall Creek (2000) and Cabot Blvd / Line 4-A sampling (2000-01); Dry Creek, Pacific Street Loads Assessment (1989-91); Alameda Creek (2000-01) and Dry Creek sampling (2000)	Analysis of sediment dioxins in Cabot Blvd. / Line 4-A (2003); Analysis of sediment dioxins in Alameda Creek (2003)
6		Integrated in Niles sample
7	Alameda Creek sampling, 2000-01 (at Niles)	Analysis of sediment dioxins in Alameda Creek (2003)
8	Balentine Drive Loads Assessment (1989-91); Agua Caliente (2000), Balentine Drive, and Laguna Creek (2000-01) sampling	Analysis of sediment dioxins at Balentine Drive site (2003)

Related tasks and activities:

- Continue cooperation with Clean Estuary Partnership and other BASMAA programs in further characterizing spatial extent of loadings of priority pollutants from watershed sources.
- Continue cooperation with City of Oakland in implementing Prop 13 project to identify and cleanup sources of PCBs in the Ettie Street watershed (2004-2005)
- Continue cooperation with BASMAA member agencies in refining source investigation techniques.
- Monitor developments in techniques that can be used to estimate loadings from local watersheds.
- Continue cooperation with Brake Pad Partnership in investigation of copper loadings from Castro Valley Creek watershed as part of Proposition 13 grant.

II.D.3 Pollutants of Concern-long term trends in watersheds

Objective and Scope: Use traditional water quality indicators to describe the impacts of stormwater runoff upon instream beneficial uses in Alameda County creeks.

Background: Several POCs have potential to cause impacts to streams in Alameda County. These pollutants include organophosphate (OP) insecticides, copper, lead, and zinc, and these and/or other pollutants causing aquatic toxicity. Toxicity studies in the Castro Valley Creek watershed (Hansen 1995) documented that storm runoff was frequently toxic to standard aquatic test organisms and that diazinon was the most likely cause of this toxicity. Since then, diazinon, an OP insecticide, has been widely detected in creeks throughout the San Francisco Bay area. This is a management concern because the frequency of toxicity found suggests that potentially widespread impacts on aquatic invertebrates might be occurring.

Since the leading OP insecticides (diazinon and chlorpyrifos) are being phased out, a key objective of the monitoring program is to verify that the concentration of these substances, and the toxicity associated with them, decline over the next few years. Due to substitution of other insecticides, it is possible that toxicity may remain after OP insecticide concentrations decline. Thus, another monitoring program objective is to detect toxicity due to alternative insecticides that will likely be used by some consumers.

Copper is a widely used industrial and building material and is toxic to aquatic organisms, particularly in the dissolved phase. However, its presence in stormwater is largely due to its use as an important component of motor vehicle brake pads. The primary question for copper is therefore whether and to what extent its concentrations will decrease over time as a result of efforts at the national level to redesign brake pads. Despite such efforts, average copper concentrations in brake pads have been increasing over the past several years (but are expected to begin to decline at some point in the future). Because there are also natural sources of copper in local watersheds, it will be important to track the overall level of copper enrichment above background concentrations to determine the extent to which management actions are reducing copper concentrations in stormwater.

Specific management questions to be addressed initially through the long-term trend monitoring program include:

- Will wet weather diazinon concentrations decrease as expected?
- Will wet weather toxicity levels decrease in concert with diazinon?
- Will new insecticides cause wet weather toxicity?
- Will wet weather copper concentrations decrease as expected as brake pads are redesigned?
- What are the trends in wet weather concentrations of lead and zinc?

Due to the variability in contaminant concentrations in stormwater, detecting a statistically significant trend requires extensive sampling. Rather than attempt to detect a trend of continually declining concentrations over a period of time, the monitoring approach proposed here is based

on a "before – after" design, in which pollutant concentrations (or impacts in the case of toxicity) from before usage began to decline will be compared to concentrations after usage has declined. In this way, sampling effort can be distributed throughout the County rather than focused on overly intensive sample collections at one site. Information generated by this monitoring program will be used to assess the effectiveness of stormwater BMPs, better define current and potential problems, and help in developing improved management strategies such as TMDLs.

Approach: Initial sampling efforts will focus on gathering baseline water quality data to assist in identification of peak concentrations for pollutants prior to their expected decline. Depending on the constituent monitoring, more intensive follow-on sampling will be initiated at an appropriate time to attempt to observe reductions in pollutant concentrations / impacts. Refer to Gunther et al (2003) for details.

Activities

No.	Description	Approx dates	Task ID, Status May 2003
1.	Develop trend monitoring program	FY02/03	Complete (Gunther et al., 2003)
2.	Gather baseline ("before") data for OP pesticides, toxicity, copper, lead, and zinc	FY02/03 through FY07/08	Continuing
3.	Monitor trends in usage of OP pesticides and potential replacement pesticides	FY02/03 through FY07/08	Review & track project by TDC Environmental for "Trends in Pesticide Usage"
4.	Initiate "after" sampling following assessment that OP pesticide use has declined	Unknown	\contingent on statistical analyses per Gunther et al (2003)
5.	Initiate "after" sampling following assessment that copper concentrations in creek waters have declined	Unknown	

WAUs and/or watersheds (unfinished table)

WAU	Current status	Planned activities
1	Codornices Creek Loads Assessment (1988-90); Codornices Creek in-stream sampling (1991-92).	
2		
3		
4	Castro Valley Creek and San Lorenzo Creek Loads Assessment (1988-90); Castro Valley Creek in-stream sampling (1991-97); San Lorenzo Creek in-stream sampling (1991-93)	Collect baseline results for total copper concentrations, OP insecticides, and aquatic toxicity. Initiate long-term trend monitoring program.
5	Cabot Blvd / Line 4-A Loads Assessment (1988-1990)	

6	Alameda Creek Loads Assessment (1988-90); Alameda Creek in-stream sampling (1991-95)	
7	Alameda Creek Loads Assessment (1988-91); Alameda Creek in-stream sampling (1992-95)	
8	Balentine Drive Loads Assessment (1988-90); Laguna and Mission Creek toxicity sampling 2002 (2 sites)	

Related tasks and activities:

- Participation in Brake Pad Partnership, monitoring levels of copper in brake pad manufacturing.
- Continue cooperation with Brake Pad Partnership in investigation of loadings from Castro Valley Creek watershed as part of Proposition 13 grant.
- Participation in RMP Episodic Toxicity Monitoring Program. RMP has maintained an aquatic toxicity sampling station at San Lorenzo Creek from winter 2001-present.
- Copper concentrations in sediment will continue to be analyzed as part of the spatial distribution / loadings task currently in development by the ACCWP

II.E Review of Best Management Practices and their effectiveness

Objective: Evaluate the effectiveness of representative stormwater pollution prevention or control measures, as required in permit section C.8.a.

Background: Best Management Practices (BMPs) are measures that prevent or minimize pollutant discharges to the environment. Some are routine activities such as good housekeeping, spill prevention, or clean up of pollutants before they enter urban runoff. Others are structural treatment measures that are integrated with the stormwater conveyance system to remove pollutants from runoff before it enters creeks, lakes or other waterbodies. During its first two permit periods ACCWP member agencies established Performance Standards incorporating a variety of BMPs into several component areas: Public Information and Participation (PI/P); New Development and Post-Construction Controls; Illicit Discharge Control and Industrial Facilities Inspection; and Municipal Maintenance.

ACCWP's Monitoring component has conducted special studies to help refine the Performance Standards and assist co-permittees with effective application of BMPs (Table IV-1). In 2002 studies were initiated to provide technical support for extensive requirements in the third permit to provide treatment and hydromodification management for new development and significant redevelopment.

ACCWP's SQMP for FY2002-2008 (Plan) also includes Pollutant Reduction Plans (PRPs), aimed at controlling particular Pollutants of Concern in urban runoff. Some PRP activities represent new BMP approaches involving partnerships within the Program or with other agencies. PRPs will be updated at intervals as specified in Section C.10 of the new permit.

Approach: WAMS will review available information on BMP effectiveness from sources past studies by the Program or other agencies. ACCWP's Policy Level Workgroup (PLWG) will coordinate information gaps identified by various components and develop a strategy for addressing these needs. The Monitoring component will assist the PLWG by conducting technical studies where needed and communicating results and lessons learned.

Activities

No.	Description	Approx dates	Status May 2003
1.	Litcrature review and other support for Hydromodification Management Plan	FY2003-04	Planned
2.	Review available information on BMPs and their effectiveness,	FY2003-04	Proposed
3.	Identify information gaps in current knowledge	FY2004-05	Proposed
4.	Outline strategies for identifying and selecting representative BMPs for evaluation	FY2004-05	Proposed
5.	Prioritize information needs and develop strategy	FY2004-05	Proposed
6	Develop studies or review procedures	FY2004-06	Proposed
7	Conduct studies or implement procedures	FY2004-08	Proposed

Related tasks and activities:

- ACCWP's Policy Level Work Group will explore ways to improve the overall effectiveness of the Program; related technical studies may be included in future MYP updates..
- Other Program activities outside of the MYP include improvements to reports and identifying improved measures of effectiveness for individual components such as PI/P.

III. PLANNED ACTIVITIES FOR FY 2003-2008

This section summarizes the activities in the MYP. Detailed workplans for the next one or 2 years are presented in Section V, which will be updated annually.

III.A Listed by Component

III.A.1 Watershed Assessment

Task WA-1: Develop and maintain a GIS resource for watershed information

WA-1.1 **Watershed Inventory:** Provide base layers and basic map products for watershed assessment activities of Program, member agencies and interested public.
Long-term: Map base information (watersheds, landcover/landuse, creeks and channels) and assessment data (screening data, fisheries habitat and other biological indicators, watershed project areas) for all WAUs.
FY 02-04: Complete preliminary mapping of initial group of pilot watersheds (including Codornices, Sausal, San Lorenzo, Old Alameda and Laguna Creeks); refine existing information and fill data gaps for channel condition and riparian zone characterization. Identify additional priority watersheds for mapping.

WA-1.2 **Watershed assessment planning:** Develop a framework for ongoing coordination and planning of watershed assessment, prepare Multi-Year plan and annual updated workplans.
Long-term: Evaluate assessment status, interpret data at landscape level, adapt watershed assessment strategy as needed. Coordinate assessment planning and information with Regional Board staff and other agencies.
FY 02-04: Develop workplan for incorporating new data; Identify needs and priorities and consult with the local co-permittees or other watershed partners

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds

WA-2.1 **Indicators of creek health:** Develop and test indicators of general watershed condition.
Long-term: Rotate Rapid Bioassessment macroinvertebrate surveys through relatively natural stream reaches in all WAUs. Support regional coordination for protocol standards, data sharing and biocriteria development, subject to funding by BASMAA or other sources. Update fisheries resources maps for Alameda County.
FY 02-04: Continue macroinvertebrate community sampling in Sausal, San Lorenzo and Mission-Laguna watersheds; begin rotation to one new watershed. Coordinate annual meeting and other regional activities for Bay Area Macroinvertebrate Bioassessment Information Network (BASMAA Task of Regional Benefit). Outline a strategy for applying flow or other physical indicators of stream function, in coordination with SWAMP, Stream Protection Policy and other regional initiatives.

WA-2.2 **Volunteer Monitoring:** Increase the participation of community stakeholders in watershed stewardship and assessment, and improve coordination of volunteer groups with agencies and other stakeholders.
Long-term: Provide resources and training to citizen monitoring groups that are working with local watershed partners. Increase visibility and effectiveness by working with Watershed Assessment Resource Center (WARC) or other regional information sources.
FY02-04: Continue support of Talks in the Hallway to strengthen community involvement and interest in assessment issues; explore use of community volunteers to supplement macroinvertebrate field sampling or trash assessment.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders

WA-3.1 **Indicators of Contact Recreation:** Improve ability to assess risks to human health from light (non-swimming) contact recreation or activity in creeks.
Long-term: Provide guidance and information on microbial risks to human health to assist watershed managers. Identify potential alternative indicators and explore strategies for monitoring pathogens or other indicators.
FY02/04 continuing tasks: Develop guidance document for watershed managers to assist with interpretation of bacterial monitoring results. The document may include discussion of the following issues:

- guidance for interpreting current indicators (what are the tests, how are the results reported, and what do the results actually tell us)
- how current State standards were developed and are intended to be used (what are the uses they were developed to monitor for, how does this relate to typical uses and use intensity in Alameda County)
- problems inherent in current indicators
- Review of appropriate previous studies and what they tell us about the links between pathogens and indicators
- Brief discussion of alternative indicators under development (what are they, what is their potential, and what are their drawbacks)
- Review of existing sources of County public health information on water-related illnesses

Examine two local issues of water contact recreation, a review of Lake Merritt monitoring data, and a water contact recreation site inventory along the Alameda County shoreline. The Lake Merritt project will include a review of historic monitoring data as it relates to recreational uses supported within the Lake and analysis of the existing monitoring program to determine if it can be altered in order to generate information more useful to watershed managers. The water contact recreation inventory will result in a summary of the common water contact recreational uses supported at the County shoreline. Specific tasks include identification of existing recreational uses, and development of a GIS data layer and supporting documentation.

FY04-08 tasks: Continue ACCWP participation in local watershed pilot projects and assessments. Based on information generated through the water contact recreation inventory or on arising local issues, assist in development of monitoring programs and special studies as needed.

WA-3.2 **On-call watershed support:** Support watershed management efforts led by Program member agencies.
Long-term: Conduct local pilot projects or assist member agencies in conducting watershed inventory and planning. Develop and test a strategy for use of screening-level flow and physical habitat indicators.
FY02-04: Draft Watershed Framework to provide guidance on watershed-based management to municipal staff and other local groups. Provide technical assistance in design and implementation of watershed-specific monitoring plans. Review local watershed assessment efforts and
FY04-08: Refine list of potential physical indicators. Pilot field tests of indicators and checks of preliminary classifications based on fisheries and macroinvertebrate assessments

WA-3.3 **Website support:** Disseminate information about Alameda County watersheds and background on local watershed issues.
Long-term: Provide local watershed atlas and information resource to the public, creek groups and watershed stakeholders. Improve interactive response and coordination with other regional resources such as Oakland Museum and Contra Costa Water Web.
FY02-04: Augment watershed maps and other creek information for new section of ACCWP website to be launched FY02/03.. Increase the accessibility of monitoring and assessment data.

III.A.2 Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern which are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in Regional Monitoring Program.

MS-1.2 **TMDL data collection:** Continue sampling and reporting for Pollutants of Concern in sediment, including Mercury, PCB and organochlorine pesticides, as requested by Regional Board staff.
Long-term: Characterize watershed occurrences of pollutants of concern and support TMDL development, in coordination with contributions to the CEP.
FY02/03: Characterize occurrence of dioxins in ACCWP watershed sediments. In place of additional field sampling, archived sediments from the first two years of sampling will be analyzed for presence of dioxins and dioxin-like compounds. The laboratory results will be reviewed to gather information on spatial distribution and spatial and temporal variability.
FY04-08 tasks:
Implement sediment quality trend monitoring program: as outlined in the ACCWP Long-term Trend Monitoring Program, the Program will identify one to two target watersheds and begin trend monitoring in sediments. Initial analytes will include PCBs, mercury, copper, PAHs, and organochlorine pesticides, and may be adapted as management needs dictate.
Characterize County watersheds for other pollutants of concern, as required for TMDL development or as dictated by management concerns. Subject to available funds, collect and analyze watershed sediments for additional analytes.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Collect baseline stormwater monitoring data for Castro Valley Creek to assess long-term trends in selected Pollutants of Concern in County creeks.
FY02/04: Implement water quality trend monitoring program. As outlined in the ACCWP Long-term Trend Monitoring Program, the Program will begin collection of baseline data in the Castro Valley Creek watershed. Initial analytes will include toxicity, organophosphorous pesticides, copper, lead, and zinc, and may be adapted as management needs dictate.

MS-1.6 **Clean Estuary Partnership:** Contribution to CEP under terms of MOU between BASMAA, BACWA, Regional Board and any additional signatories.
Objective: Comply with MOU and the policies of CEP guidance committees to support CEP activities for controlling pollutants of concern including problem identification, characterization, linkage studies and development of implementation plans for source control and/or abatement.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs

MS-2.1 **Target pollutant special studies:** characterize details of distribution and impacts for Pollutants of Concern, test hypotheses.
Long-term: Conduct studies of Pollutants of concern, including investigation of potential sources in high priority watersheds. Support implementation strategies for TMDLs, including identification or refinement of specific control measures, in coordinaton with CEP contribution.
FY02/03 tasks:
Assessment of potential source control options. This project will be undertaken to assist with planning efforts for implementation of future water quality attainment strategies. The project will include tasks to identify tools that can be used for identification of potential source areas, to develop information on feasibility of cleanup of polluted upland sites, and to develop similar feasibility information on cleanup of sediments within the stormwater conveyance system (e.g., storm drain inlets, flood control channels, pump stations, etc.).
Dioxins in Bay Area sediments synthesis document.. Prepare a report outlining important background information on dioxins, including chemical makeup, sources, loadings, and impacts. (BASMAA Task of Regional Benefit)
FY02/04 other potential tasks:
Implement or facilitate source investigations in appropriate watersheds, following the models used in Ettie Street and Glen Echo watersheds. Determination of study watersheds will be based on concentrations of pollutants relative to ambient Bay conditions or on interim targets developed for specific pollutants as part of the TMDL development process.
Visual and photo assessments of trash in waterbodies, supported by more detailed inventory at selected sites
Review copper sources to stormwater in Alameda County.

MS-2.2 **Support effective implementation of BMPs:** provide technical information needed to support implementation of design standards for New/Re-development as required in new permit.
Long-term: Conduct studies as needed, such as hydrological/geomorphological analyses, prototype design scenarios, BMP evaluations
FY02-04: Provide technical information to support implementation of design standards for New/Re-development as required in new permit, including development of model design criteria and Hydromodification Management Plan (HMP).

Task MS-3: Provide technical information on management issues involving urban runoff

MS-3.1 **Special studies:** Address data gaps or management issues concerning pollutants of concern and urban runoff impacts.
Ongoing: as needed, including planning and needs assessment.

MS-3.2 **On-call technical support:** Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts

MS-4.1 **Coordinate with RMP, BASMAA and CEP:** maximize effective use of monitoring resources through coordination of effort among BASMAA member agencies, the RMP and CEP.
Ongoing: Chair and attend BASMAA Monitoring Committee meetings, participate in CEP committee meetings, RMP technical review and other special purpose technical or stakeholder discussions.

III.B Listed by WAU

Table III-1 summarizes distribution of planned monitoring and assessment among Watershed Assessment Units.

Table III-1a. ACCWP Planned Monitoring and Assessment activities in western Alameda County, FY02/03-FY03/04

Watershed Assess. Unit	1	2	3	4	5	8	
WAU name	**north of Bay Bridge**	**Oakland, south of Bay Bridge**	**Lower San Leandro**	**San Lorenzo**	**Hayward - Lower Alameda**	**Mission-Laguna**	**Fy02-04 Task ID**
Tier 1 -Screening Level							
Chemical-Physical Parameters	pilot screening 2002-2004	pilot screening 2002-2004	Pilot 2003-2004	pilot screening 2002-2004	pilot screening 2002-2004	pilot screening 2002-2004	MS-1.4 sampling
Bioassessment-macroinvertebrate	1 site 2003, 3 sites 2004	1 site 2002, 3 sites 2003, 5 sites 2004		5 sites 2002	2 sites 2004	4 sites 2002, 5 sites 2003	WA-2.1 sampling
Biological-Physical: Fish community and habitat							WA-1.1 planning, WA-3.2 field checking
Stream morphology							WA-2.1 potential
Flow							WA-2.1 potential
Tier 2-More Focused	Develop list of priority watersheds and issues in 2002-03						
Contaminant Chemistry	pilot screening 2002-2004	pilot screening, (L. Merritt monitoring by City-planned)		pilot screening 2002-2004	pilot screening 2002-2004	pilot screening 2002-2004	MS-1.4 selected parameters
Nutrients							MS-1.4 selected sites
Pathogens							WA-3.1 potential
Toxicity				Castro Valley Creek-post-diazinon phase-out, MS-1.3			MS-1.4 selected sites
Tier 3-TMDL/POC sampling							
Hg/PCB sediment survey	limited sampling at selected index sites in 2005-2008					(assist by city)	MS-1.2, MS-1.6
Hg/PCB Source investigation	*tbd	*tbd	*tbd				MS-2.1 or CEP
Chlorinated pesticides & PAH in sediment							MS-1.2, MS-1.6
Copper in stormwater				Castro Valley Creek 2003-2005,			MS-1.3
Diazinon in stormwater				Castro Valley Creek 2003-2005, track for reduction			MS-1.3
Trash		*2002-03		*2002-03	*2002-03		MS-2.1 pilot

Table III-1b. ACCWP Planned Monitoring and Assessment activities in eastern Alameda County

Watershed Assessment Unit	6	7	
WAU name	Alameda Creek-northern	Alameda Creek-southern	Fy02-04 Task ID
Tier 1 -Screening Level			
Chemical-Physical Parameters	pilot screening 2003-2004		MS-1.4 sampling
Chemical-Physical, basic screening by volunteers			
Bioassessment-macroinvertebrate			WA-2.1 sampling
Biological-Physical: Fish community and habitat			WA-1.1 planning, WA-3.2 field checking
Geophysical			
Stream morphology			WA-2.1 potential
Vegetation			
Flow			WA-2.1 potential
Tier 2-More Focused			
Contaminant Chemistry	pilot screening 2003-2004		MS-1.4 selected parameters
Nutrients			MS-1.4 selected sites
Pathogens			WA-3.1 potential
Toxicity			MS-1.4 selected sites
Geomorphic And Sediment Source Analysis			
Tier 3-TMDL/POC sampling			
Hg/PCB sediment survey			MS-1.2, MS-1.6
Hg/PCB Source investigation			MS-2.1 or CEP
Chlorinated pesticides & PAH in sediment			MS-1.2, MS-1.6
Copper in stormwater			MS-1.6
Diazinon in stormwater			
Trash			MS-2.1 pilot

IV. STATUS AND ACCOMPLISHMENTS

This section reviews highlights and recent accomplishments in three main component areas. During the first permit period (1991-1996) The Program's monitoring focused on evalutating the general effectiveness of control measures and routine monitoring of rainfall, runoff and water quality at representative fixed stations. During the second permit ACCWP initiated a component for Focused Watershed Management to determine the water quality benefits of watershed-specific approaches and improve community awareness and stewardship of watersheds. In 2000 the coordination and facilitation activities for watershed management were assigned to the Planning and Regulatory Compliance component while the new Watershed Assessment component was established to support the technical and informational needs of watershed managers and stakeholders.

IV.A Watershed Assessment and Focused Watershed Management

1988-90 **Loads Assessment Design:** Available data were compiled on watersheds, drainage areas and landuses to establish sampling stations at six stream stations representative of different watershed sizes and ten additional stations representing smaller catchments with a range of urban land use combinations.

2000-03 **Watershed Inventory:** The Program purchased remote sensing satellite data and used it to develop a preliminary classification of landcover types throughout the County. Additional spatial data for streets, buildings and other landuse features were obtained from co-permittees and other agencies to refine this dataset. A technical memo documenting the production of the landcover dataset was drafted and will include recommendations for further data checking and validation. Watershed boundaries were delineated for over 100 watersheds and subwatersheds and other resource information compiled from public data sources.

1999-03 **Indicators of creek health:** A general review of fisheries information for Alameda County (HES 1999) summarized fish habitat condition and fish communities in many creeks, and these data were assembled in database format. Existing fish community sampling data by Rob Leidy for streams in Alameda and Contra Costa Counties was also entered in table format and incorporated in a preliminary 2002 map reflecting the occurrence of fish communities in Alameda County. ACCWP began annual benthic macroinvertebrate surveys in Spring 2001 in the San Lorenzo, Sausal and Laguna Creek watersheds, ACCWP also organized the first regional discussion group meeting on macroinvertebrate bioassessment in February 2002, which has been continued as a BASMAA Task of Regional Benefit in collaboration with the Regional Board..

1999-03 **Indicators of Contact Recreation**: ACCWP supported weekly bacteriological sampling in Lake Merritt as a follow-up to ACFCWCD monitoring in the early 1990's, and also sampled creeks and outfalls leading to the Lake during storm events. Creeks and channels were also sampled during both wet and dry weather to assess the variability of coliform and fecal coliform samples from creeks. A literature review of potential indicators for human health risk was initiated and guidance for local managers is also under development.

1996-99 **San Leandro Creek Watershed Management Support:** The Program provided support for preparation of the Lower San Leandro Creek Watershed Management Plan (SLCWAC, 1999), including training of volunteer monitors to provide habitat inventory data and monthly water quality samples for the lower portions of the creek.

1995-03 **Volunteer Monitoring:** The Program produced several reports on volunteer monitoring by the Friends of San Leandro Creek during 1996-1998, including grab samples confirming the widespread occurrence of diazinon. During 1998-2000 the .Program assisted two additional watershed groups (Friends of Sausal Creek and Friends of Five Creeks), drafted guidance and training materials and sponsored pilot development of a new format "Talks in the Hallway" event for creek group networking. During 2001-2003 Program staff participated in a Technical Advisory Committee to assist state volunteer coordinators in developing new guidance documents and protocols and also helped produce a Streamside Biosurvey protocol for macroinvertebrate monitoring (posted on Clean Water Team website at http://www.swrcb.ca.gov/nps/availdoc.html). ACCWP also and participated in advisory meetings for the Watershed Assessment Resource Center to improve support for volunteer monitoring groups in the Bay Area.

1999-03 **On-call watershed support:** Technical assistance was provided in 1999 to the cities of Oakland and Piedmont in discussing management responses to water quality problems at Lake Merritt, and formation of a Lake Merritt Water Quality Task Force. In 2000 the Program supported the city of Fremont in preparing a draft monitoring plan for the Laguna Creek watershed. Other technical assistance included preparation of maps for co-permittee projects and grant applications.

IV.B Pollutants of Concern

1988-00 **Loads Assessment and fixed station sampling in creeks:** This multi-media program included rainfall and flow monitoring, wet and dry weather water quality sampling, sediment sampling and toxicity testing. Composite samples were collected over 11 events for a total of 98 station-events from December 1989 to March 1991. The resulting data were evaluated in an initial Loads Assessment report (WCC 1991) and further sampling was continued at a reduced number of stations. These data were reported in annual monitoring reports and integrated in a summary review of combined data from ACCWP and several other BASMAA agencies (WCC 1996). Copper and zinc exceeded water quality objectives more often than other metals, with sources predominantly from urbanized areas. Most of the Program's fixed-station stormwater sampling data was incorporated into an Access database structure in 2000 to facilitate searching and accommodate future sampling data.

1991-01 **PAH special studies:** Since PAHs were frequently detected during loads assessment studies, additional sampling was conducted in 1991-92 without conclusive results in identifying patterns or sources. In 2000-01 the Program analyzed watershed sediment samples for PAHs (Salop et al 2002a) and also reviewed technical literature on PAHs to assist interpretation and guide further sampling (Salop et al 2001).

1995-02 **Diazinon Special Studies:** After studies found toxicity in Castro Valley Creek and identified diazinon as a likely cause (Hansen 1995), ACCWP conducted an intensive characterization study by sampling stormwater runoff and also collecting grabs from tributaries and street gutters (Scanlin and Feng 1997). The results showed that diazinon sources were widely dispersed throughout the watershed and suggested that the observed amounts could result from residential applications in accordance with label instructions. The Program also found diazinon in creeks and ponds during dry weather, often changing in concentration when sampled at intervals of 1-3 days. In 2002 the Program completed a study of diazinon wash-off, partially funded by the Department of Pesticide Regulation, which demonstrated the potential for liquid-formulation diazinon to enter stormwater after application to paved surfaces.

2000-2001 **Surveys and special studies of TMDL pollutants:** In 2000 ACCWP conducted trial sampling of bedded sediments in Codornices Creek; and assisted in PCB congener analysis of Regional Board-collected samples from San Leandro Creek. Field techniques were refined for coordinated sampling of watershed sediments throughout the Bay Area in 2001 and 2002. sediment surveys for mercury, PCBs, PAHs and organochlorine pesticides

During this period the Program also completed source investigation of PCBs in the Glen Echo Creek and Ettie Street Pump Station watersheds, and assisted the city of Oakland in preparing a successful application for Prop 13 grant funds to implement cleanup efforts within the Ettie Street watershed. ACCWP also contributed support to the North Bay Copper-Nickel Study initiated by the Bay Area Clean Water Agencies

IV.C Evaluate the effectiveness of urban runoff BMPs

See Table IV-1 for reports and products related to BMP evaluation. Highlights include:

1991-98 **DUST Marsh studies:** The DUST Marsh system was constructed in 1983 as a demonstration constructed wetland to treat runoff from a 4.6 square mile drainage centered on Crandall Creek in Fremont. The Program conducted a series of special studies to identify the main constituents of concern and study performance in relation to metals, selenium and toxicity and diazinon. A floating log baffle was found to improve residence time of toxic storm water; study results were also used to recommend improvements in the management of vegetated channels.. Further studies also evaluated sediment toxicity, fish tissue effects and the long-term accumulation of contaminants in the system.

1998 **BASMAA database:** ACCWP developed a searchable database of monitoring and BMP studies by BASMAA members. Parameters and BMP types as well as main results or lessons can be output as printed abstracts. This product was submitted to BASMAA for further updates.

Table IV-1 Selected BMP Studies

Title	Pub date	Type
Management of Storm Water Facilities in Alameda County	Aug 92	report
Labeling of Storm Drainage Facilities	Jan 93	manual/handbook
Vegetated Channels Study	Jan 94	report
Surveys of Alameda County Residents' Awareness of & Attitudes Toward Stormwater Pollution	Feb 94	report
Storm Inlet Pilot Study	Mar 94	technical report
Roof Runoff Water Quality: A Literature Review	Aug 94	report
Vegetated Channels Management Feasibility Study	Dec 94	report
Street Sweeping Storm Inlet Modification Literature Review	Dec 94	report
General Guidance for Monitoring Effectiveness of Post-Construction Structural Best Management Practices	Apr 95	manual/handbook
Stormwater Resource Guide	Jan 96	report
Residential Yard & Garden Care Baseline Survey	May 96	report
Parking Lot BMP Manual Final Report	Jun 96	report
Channel Vegetation Manual	Jul 96	reference
Final Monitoring Report-Grass Swales at the Advo Facility, Newark	Oct 96	technical report
Best Management Practice Guide Retail Gasoline Outlets	Mar 97	manual/handbook
Cost Estimates for Reducing Discharges of Sediment-Laden Stormwater Along Redwood Road	Aug 97	technical report
Street Sweeper Solids Evaluation	Mar 98	report
DUST Marsh Long Term Evaluation	Oct 98	technical report
Analysis of Street Sweeping Data	Jun 99	technical report
Survey of Public Awareness of Advertising Campaign	Jul 99	report
Tule Pond Baseline Characterization	Nov 99	technical report
Stormwater Inlet Insert Devices Literature Review	Jan 00	report
Summary of the Sawcut BMP Effectiveness Study	Jun 00	report
Developing A Volunteer Storm drain Stenciling Program	n/a	manual/handbook
Training Workshop for Illicit Discharge Inspectors	n/a	manual/handbook
Review Of Leaf And Litter Control Alternatives	in prep	report
Unpaved Road BMP Guide	in prep	manual/handbook

V. DETAILED WORKPLANS

V.A. Fiscal Year 2002-2003

Watershed Assessment

Task WA-1: Develop and maintain a GIS resource for watershed information

WA-1.1 **Watershed Inventory:** Refine existing information for channel condition and riparian zone characterization, and identify data gaps related to preliminary watershed classification. Continue work on preliminary statistics or maps of initial pilot watersheds such as Codornices, Sausal, San Lorenzo, Old Alameda and Laguna Creeks);

Objective: Provide base layers and basic map products for watershed assessment activities of Program, member agencies and interested public.

WA-1.2 **Watershed assessment planning:** Develop subplan for Long-Term Watershed Assessment including framework for development of indicators, watershed priority list and timeline. Develop standards for data management and incorporating new data from potential partners and other sources.

Objective: Develop a framework for ongoing coordination and planning of watershed assessment.

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds

WA-2.1 **Indicators of creek health:** Continue macroinvertebrate community sampling in Sausal, San Lorenzo and Mission-Laguna watersheds, and develop a priority list for rotating assessments of other watersheds. Continue work with Bay Area Macroinvertebrate Bioassessment Information Network to coordinate activities with other bioassessment projects in Bay Area, Regional Board's Stream Protection Policy and other regional initiatives.

Objective: Develop and test indicators of general watershed condition.

WA-2.2 **Volunteer Monitoring:** Continue support of local-area Talks in the Hallway to strengthen community involvement and interest in assessment issues; explore use of community volunteers to supplement macroinvertebrate field sampling or trash assessment.

Objective: Increase the participation of community stakeholders in watershed stewardship and assessment, and improve coordination of volunteer groups with agencies and other stakeholders.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders

WA-3.1 **Indicators of Contact Recreation:** Continue support of local monitoring for coliform or other indicators. Complete literature review and review existing Alameda County data for purposes of drafting guidance for municipal staff and local creek or community groups.

Objective: improve ability to assess risks to human health from light (non-swimming) contact recreation or activity in creeks.

WA-3.2 **On-call watershed support:** Complete draft Watershed Framework to provide guidance on watershed-based management to municipal staff and other local groups. Identify candidate watersheds for focused technical support to co-permittees or their partners.

Objective: Support watershed management efforts led by Program member agencies.

WA-3.3 **Website support:** Provide watershed maps, links and other creek information in new "watersheds" section of ACCWP website.

Objective: Disseminate information about Alameda County watersheds and background on local watershed issues.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern which are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in Regional Monitoring Program.

Objective: Comply with Regional Board requirements and assist with the accomplishment of the RMP's objectives to provide regional characterization of pollution in the Bay.

MS-1.2 **TMDL data collection:** Reanalyze archived sediment samples for preliminary characterization of occurrence of dioxins in Alameda County creeks and channels.

Objective: Characterize watershed occurrences of pollutants of concern.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper in Castro Valley Creek. .

Objective: assess long-term trends in selected Pollutants of Concern in creeks as recommended in draft monitoring plan (Gunther and Bernstein, 2001).

MS-1.4 **Water Quality screening:** Implement a pilot screening project at 10-15 sites distributed among different creek and channel types. Conduct initial sampling near end of dry season for general parameters (temperature, pH, conductivity, DO, turbidity)and also selected chemical parameters (ammonia, nitrate, chlorine, copper, hardness, TSS). Consider additional toxicity testing or continuous temperature monitoring at selected sites and adapt procedures for second-phase screening near end of wet season.

Objective: Provide general assessment of water quality conditions in stream reaches.

MS-1.5 **Multi-Year Plan development:** Incorporate additional data types, refine queries and user interface for existing Access relational database of past fixed-station sampling data; develop conceptual plan for analyses of long-term and spatial trends.

Objective: Improve coordination and planning for ACCWP pollutant monitoring.

MS-1.6 **Clean Estuary Program Partnership:** Contribution to CEP under terms of MOU between BASMAA, BACWA, WSPA and Regional Board.

Objective: Comply with MOU and the policies of CEP guidance committees to support CEP activities for controlling pollutants of concern including problem identification, characterization, linkage studies and development of implementation plans for source control and/or abatement.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs

MS-2.1 **Target pollutant special studies:** Conduct pilot visual and photo assessments of trash in waterbodies, supported by more detailed inventory at selected sites. Coordinate procedures with prototype by Regional Board.

Objective: characterize details of distribution and impacts for Pollutants of Concern, and/or test hypotheses concerning their fate and transport.

MS-2.2 **Support New Development stormwater controls:** Develop model design scenarios to explore potential application of treatment and hydromodification controls, and develop preliminary maps as pilots for conceptual approach to determining areas eligible for Hydromodification Management Plan.

Objective: provide technical information needed to support implementation of design standards for New/Re-development as required in new permit.

Task MS-3: Provide technical information on management issues involving urban runoff

MS-3.1 **Special studies:** as needed, including planning and needs assessment.

Objective: Address data gaps or management issues concerning pollutants of concern and urban runoff impacts.

MS-3.2 **On-call technical support:** Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts

MS-4.1 **Coordinate with RMP, BASMAA and CEP** Attend BASMAA Monitoring Committee meetings, CEP technical meetings, participate in RMP technical review and other special purpose technical or stakeholder discussions.

Objective: maximize effective use of monitoring resources through coordination of effort among BASMAA member agencies, the RMP and the CEP.

ACCWP FY 2002-2003 Watershed Assessment and Monitoring Tasks and Budget

Task #	Description	FY 02-03 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory	$40,000	EIP
WA-1.2	Watershed assessment planning	$35,000	EIP/District
WA-2.1	Indicators of Creek Health	$15,000	AMS/District
WA-2.2	Volunteer Monitoring Support	$6,000	District
WA-3.1	Indicators for Contact Recreation	$10,000	AMS
WA-3.2	On-Call Watershed Support	$25,000	Tbd
WA-3.3	Web Site Development	$15,000	EIP/District
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$156,000**	
Monitoring & Special Studies			
MS-1.1	RMP fee	$151,000	
MS-1.2	TMDL data collection	$37,000	AMS
MS-1.3	Baseline trend monitoring	$20,000	AMS/District
MS-1.4	Water Quality Screening	$25,000	District
MS-1.5	Multi-Year Plan development	$20,000	AMS/District
MS-2.1	Pollutant source investigations	$27,000	AMS
MS-2.2	Studies supporting New Dev. provisions	$40,000	URS/EIP
MS-3.1	Unspecified special studies	$21,000	Tbd
MS-3.2	On-Call Technical Support	$6,000	AMS
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$30,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$25,000	District
	Subtotal	**$422,000**	
MS-1.6	Clean Estuary Partnership contribution	$150,000	
	Maximum Component Total	**$572,000**	

V.B. Fiscal Year 2003-2004 Proposed

Watershed Assessment

Task WA-1: Develop and maintain a GIS resource for watershed information

WA-1.1 **Watershed Inventory:** Pilot a classification mapping scheme for County watersheds based on available GIS data for landuse/landcover, channel network characteristics and riparian zone condition.

WA-1.2 **Watershed assessment planning:** Refine subplan for Long-Term Watershed Assessment including framework for development of indicators, watershed priority list and timeline. Identify main data gaps and potential sources or partners for future assessment work.

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds

WA-2.1 **Indicators of creek health:** Develop rotation strategy for sampling benthic macroinvertebrate communities in different watersheds, and develop a priority list for rotating assessments of other watersheds. Continue work with Bay Area Macroinvertebrate Bioassessment Information Network to coordinate activities with other bioassessment projects in Bay Area, Regional Board's Stream Protection Policy and other regional initiatives.

WA-2.2 **Volunteer Monitoring:** Continue support of local-area Talks in the Hallway to strengthen community involvement and interest in assessment issues; explore use of community volunteers to supplement macroinvertebrate field sampling or trash assessment.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders

WA-3.1 **Indicators of Contact Recreation:** Prepare guidance documents for municipal staff and local creek or community groups to manage local sites for light contact recreation. Identify possible strategies for improved monitoring of pathogen-related risk.

WA-3.2 **On-call watershed support:** Provide guidance and technical support for watershed-based management activities by copermitteees and local groups. .

WA-3.3 **Website support:** Transfer watershed indicator data and other creek information in new watersheds section of ACCWP website. Identify approaches for making monitoring and assessment data available in Web format.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern which are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in Regional Monitoring Program.

MS-1.2 **TMDL data collection:** Continue studies for Pollutants of Concern and TMDL implementation as requested by Regional Board staff. Coordinate any sediment sampling with design for baseline trend monitoring as described in Multi-Year Plan.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper in Castro Valley Creek.

MS-1.4 **Water Quality screening:** Refine pilot screening project and develop rotation schedule for additional sites.

MS-1.5 **Multi-Year Plan and database development:** Incorporate additional data types, refine queries and user interface for existing Access relational database of past fixed-station sampling data; develop plan for analyses of long-term and spatial trends.

MS-1.6 **Clean Estuary Program Partnership:** Contribution to CEP under terms of MOU between BASMAA, BACWA, WSPA and Regional Board.

MS-1.7 **Participate in Brake Pad Partnership Fate and Transport Studies:** Provide support to integrate Castro Valley-SWMM watershed model with air deposition and Bay models for copper from brake wear debris as part of Proposition 13 grant to Brake Pad Partnership (coordinated with Task MS-1.3)

Task MS-2: Evaluate the effectiveness of urban runoff BMPs

MS-2.1 **Target pollutant special studies:** Conduct pilot visual and photo assessments of trash in waterbodies, supported by more detailed inventory at selected sites. Coordinate procedures with prototype by Regional Board.

MS-2.2 **Support New Development stormwater controls:** Provide technical support as needed .

Task MS-3: Provide technical information on management issues involving urban runoff

MS-3.1 **Special studies:** as needed, subject to available funds.

MS-3.2 **On-call technical support:** Miscellaneous technical support as needed.

MS-3.3 **Environmental Monitoring for PCB Abatement Program in the Ettie Street Watershed:** Provide sediment sampling, analysis and other technical support to Proposition-13 funded pilot program in Oakland.

Task MS-4: Coordinate planning and reporting with related monitoring efforts

MS-4.1 **Coordinate with RMP, BASMAA and CEP** Attend BASMAA Monitoring Committee meetings, CEP technical meetings, participate in RMP technical review and other special purpose technical or stakeholder discussions.

ACCWP FY 2003-2004 Watershed Assessment and Monitoring Tasks and Budget

Task #	Description	FY 03-04 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory	$40,000	EIP
WA-1.2	Watershed assessment planning	$15,000	EIP/District
WA-2.1	Indicators of Creek Health	$15,000	AMS/District
WA-2.2	Volunteer Monitoring Support	$6,000	District
WA-3.1	Indicators for Contact Recreation	$10,000	AMS
WA-3.2	On-Call Watershed Support	$22,000	Tbd
WA-3.3	Web Site Development	$12,000	EIP/District
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$130,000**	
Monitoring & Special Studies			
MS-1.1	RMP estimated fee	$154,000	
MS-1.2	TMDL data collection[a]	$20,000	AMS
MS-1.3	Baseline trend monitoring	$20,000	AMS/District
MS-1.4	Water Quality Screening	$17,000	District
MS-1.5	Database and planning support	$10,000	AMS/District
MS-2.1	Pollutant source investigations[a]	$20,000	Tbd
MS-2.2	Studies supporting New Dev. provisions[b]	$40,000	Tbd
MS-3.1	Unspecified special studies	$0	Tbd
MS-3.2	On-Call Technical Support	$6,000	Tbd
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$30,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$25,000	District
	Subtotal	**$362,000**	
MS-1.6	Clean Estuary Partnership contribution[a]	$100,000	
	Maximum Component Total	**$462,000**	
MS-1.7	Brake Pad Fate and Transport Studies	$16,000[c]	District
MS-3.2	Environmental Monitoring for PCBs	$74,000[c]	AMS/District

[a] Clean Estuary Partnership contribution is partial substitution for RB-requested activities formerly under tasks MS-1.2, MS-2.1.

[b] Additional non-WAMS funds authorized by Management Committee for Hydromodification Maangement Plan development.

[c] Estimated budget for contracted work to be funded by grants to ACCWP partners

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VI.A. Literature cited

* denotes ACCWP planning document or report containing workplan description.

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VI.B. Acronyms and abbreviations

ACCWP	Alameda Countywide Clean Water Program (Program)
ACFCWCD	Alameda County Flood Control and Water Conservation District (District)
BAMBI	Bay Area Macroinvertebrate Bioassessment Information network
BACWA	Bay Area Clean Water Agencies (wastewater treatment plant discharges)
BASMAA	Bay Area Stormwater Management Agencies Association
BMI	Benthic macroinvertebrate
BMPs	Best Management Practices
BPP	Brake Pad Partnership
CEP	Clean Estuary Partnership
DUST Marsh	Demonstration Urban Stormwater Treatment Marsh
GIS	Geographic Information Systems
MYP	Multi-Year Plan for Monitoring and Assessment
NPDES	National Pollutant Discharge Elimination System
OC	Organochlorine (pesticides)
OP	Organophosphate (pesticides)
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
POCs	Pollutants of Concern
PRPs	Pollutant Reduction Plans
RMAS	Regional Monitoring and Assessment Strategy
RMP	Regional Monitoring Program for Trace Substances in the San Francisco Estuary
RWQCB	California Regional Water Quality Control Board, S. F. Bay Region (Region 2)
SQMP	Stormwater Quality Management Plan, July 2002-June 2008 (Plan)
SWAMP	Surface Water Ambient Monitoring Program (by RWQCB)
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
WAMS	Watershed Assessment and Monitoring Subcommittee
WAU	Watershed Assessment Unit
Zone 7	Zone 7 of ACFCWCD

Alameda Countywide Clean Water Program
Annual Monitoring Program Plan
and update to the Multi-Year Monitoring and Assessment Plan
NPDES Permit Provision C.8

February 27, 2004

INTRODUCTION

The Alameda Countywide Clean Water Program (ACCWP or Program) conducts data collection activities to monitor stormwater pollution, assess the condition of receiving waters, and study problems caused by urban runoff in creeks, lakes and other waterbodies, including San Francisco Bay. ACCWP's jointly funded General Program supports these activities on behalf of the Program's 17 member agencies, which are joint holders (Permittees) of a stormwater discharge permit issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB) under the National Pollutant Discharge Elimination System (NPDES).

In May 2003, ACCWP submitted a Multi-Year Plan for Monitoring and Assessment (MYP; ACCWP 2003b) to the RWQCB. The MYP described the Program's long-term plan for monitoring and assessment activities, as required by Provision C.8.b of the Program's reissued Municipal Stormwater Discharge NPDES Permit (Order R2-2003-0021) adopted on February 19, 2003 (Order; RWQCB 2003). Because of the adaptive nature of many special studies and watershed assessment activities, the MYP only provided detailed task descriptions for the first two years of the five-year permit period. The MYP outlined the objectives and potential tasks for the remaining years in general terms, and proposed that details of subsequent years will be developed through annual updates.

This monitoring program plan is being submitted to the RWQCB as an annual update to the MYP and also to comply with Provision C.8.c of the Order, which requires that

> The Permittees shall submit, by 100 days from the adoption of this order and on March 1st of each year thereafter, an annual monitoring program plan, acceptable to the Executive Officer, that includes clearly defined tasks, responsibilities, and schedules for implementation of monitoring activities for the next fiscal year designed to comply with these Monitoring Program requirements.

This document includes four sections:

1) An overview of objectives and recently completed or ongoing activities, which provides context for sections 2 and 3.
2) A detailed update on the Program's workplan for FY03/04, originally proposed in Section V of the MYP.
3) A proposed workplan and budget for FY04/05, listing tasks, responsibilities and estimated schedule for implementation.
4) References, including reports and other documents recently completed or in preparation.

1. OVERVIEW

ACCWP's Stormwater Quality Management Plan for Fiscal Years 2001/02 through 2007/08 (ACCWP 2003a) and the MYP describe two program components centered on data and information gathering activities:

- Watershed Assessment (WA) focuses on landscape-level attributes of watersheds and streams, and beneficial uses or management issues that are more specifically tied to the physical, biological or social conditions in individual watersheds
- Monitoring and Special Studies (MS) addresses pollutants and problems that are more uniformly distributed in urbanized areas, or for which the most relevant geographical scale for study and management is larger than individual watersheds.

Each component consists of several tasks related to long-term objectives identified in the Plan. Annual workplans and budgets are approved by ACCWP's Management Committee and implemented under the oversight of the Watershed Assessment and Monitoring Subcommittee.

An alternative organization of these activities is based on a series of elements or focus areas, grouped into three main sections of the MYP, each of which is related to specific management questions:

- **Watershed Assessment:** Are our creeks healthy? How can we restore them? Is it safe to play in the creeks?
- **Pollutants of Concern:** Is urban runoff a significant contributor of pollutants to San Francisco Bay?
- **Effectiveness Of Best Management Practices (BMPs):** Are Program actions making a difference?

Table 1 summarizes activities for each of these MYP elements. Individual rows in the table represent sequences of tasks in successive years, all related to a specific focus or element of the MYP. Individual cells correspond to individual component tasks or portions of tasks, and the task identification numbers in parentheses correspond to descriptions in the component workplans and budgets that follow. To provide added long-term perspective, Table 1 also displays selected tasks initiated in previous Fiscal Years and conceptual descriptions of follow-up activities for FY2005/06.

Activities recently completed are shown with gray shading in the table. They include:

- GIS inventory data was used to support ongoing development of a Hydromodification Management Plan (HMP) to assist implementation of permit provisions for New Development Balance Hydrologics and EIP Associates 2003; MS-2.2-03). Documentation for ACCWP's GIS dataset for landcover was completed (ACCWP 2003c; WA-1.2-04) and the dataset was used to provide watershed characterization information in the Watershed Management Integration Report (WMIR) submitted in compliance with permit provision C11 (ACCWP 2004; Task WA-1.1-04).

- Water quality probe data from Lake Merritt was reviewed in an interpretive report (Salop et.al. 2004; WA-3.2-01)) at the request of the City of Oakland-sponsored Lake Merritt Water Quality Task Force activities. This report explored the relationship of several environmental and management factors that may influence observed exceedances of dissolved oxygen.

- ACCWP prepared or co-sponsored two reports concerning dioxin-like compounds: Salop (2004 characterizes the occurrence of these compounds in sediment from Alameda County streams and channels (Task MS-1.2-03) and a BASMAA report by AMS and EOA (2004) provides general background and identifies potential source control options for reducing the amount discharged to the Bay in urban runoff (Task MS-2.1-03).

- A study of source control options for achieving load reductions in mercury and PCBs in urban runoff (Salop and Akashah 2004; MS-MS-2.1-03) that will be required by the RWQCB under its Total Maximum Daily Loads (TMDL) for these pollutants in San Francisco Bay.

- A literature review of management measures for controlling hydromodification impacts discussed potential implementation considerations for conditions in Alameda County (URS 2004; MS-2.2-03)

Follow-up activities to completed work and additional ongoing activities are described in the following workplans. Several of these activities may involve coordination with regional efforts including:

- Surface Water Ambient Monitoring Program (SWAMP) conducted by the RWQCB, which rotates data collection to different portions of the Bay Area each year.
- Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI), consisting of scientists, watershed managers, regulators and community members interested in development of an Index of Biological Integrity (IBI) for streams in the San Francisco Bay Area. One or more IBIs might eventually be used as indicators of creek and watershed health.
- Clean Estuary Partnership (CEP), a collaboration between regulators and stormwater and municipal dischargers that conducts scientific studies to support TMDLs and other efforts to improve water quality in the Bay and its watersheds.

Table 1. Summary of current and planned activities according to ACCWP's Multi-Year Plan.

Focus or MYP element	FY03 completed or ongoing	FY04 update	FY05 proposed	FY06 conceptual plan
Watershed Assessment (MYP Section IIC)				
Assessment planning	Overview of 5 year strategy in MYP (MS-1.5)	Detailed subplan, long-term workplan (WA-1.2)	coordinate additional dataset development with HMP (WA-1.2)	
Physical characterization	Preliminary HMP map and GIS data review (MS-2.2)	Technical documentation for landcover dataset (WA-1.2)	Improve channel and riparian datasets (WA-1.1, 1.2)	continuing GIS development (WA-1.1)
Physical characterization		review San Lorenzo pilot assessment to test GIS indicators (WA-3.2)	Evaluate Sausal or Laguna data with GIS, coordinate with SWAMP (WA-3.2)	to be determined
Biological indicators		3-year report and detailed workplan (WA-2.1)	preliminary stream classification (coordinate with GIS, regional efforts) (WA-1.1, 2.1)	test classification hypotheses (WA-2.1)
Biological indicators	Participate in BAMBI, BASMAA Task of Reg. Benefit (WA-2.1)	continue BAMBI participation & regional coordination (WA-2.1)	BAMBI regional data review, towards development of Index of Biological Integrity (WA-2.1, MS-1.5)	continuing (WA-2.1)
Biological indicators	Continue sampling BMIs (macroinvertebrates) (WA-2.1)	Coordinate BMI sampling with SWAMP plans, channel restoration projects (WA-2.1)	Continue sampling and identify further watersheds, consider relation of BMI and fisheries indicators (WA-2.1)	rotate sampling to new watersheds (WA-2.1)
Water Quality screening	Pilot creek sampling (MS-1.4)	continue sampling and draft 2 year report (MS-1.4)	continue sampling in new watersheds (MS-1.4)	continuing (MS-1.4)
Water Quality screening		Evaluate SOP's, coordinate assessment data within ACCWP and with SWAMP (MS-1.5)	to be determined	
Water Quality screening	Lake Merritt probe data review (WA-3.2-01)	Support or participate in further Lake Merritt studies (WA-3.2)		
Human uses & health risk	Interpretation guidance (MS-3.1-01)	Continuing (as WA-3.1)	Identify further priorities (WA-3.1)	to be determined
Human uses & health risk	Lake Merritt review (WA-3.1-02)	continuing; further monitoring & coordination (WA-3.1-03)		

Focus or MYP element	FY03 completed or ongoing	FY04 update	FY05 proposed	FY06 conceptual plan
Human uses & health risk	Overview of contact recreation sites (WA-3.1-02)	continuing	pilot monitoring or case studies as needed (WA-3.1)	to be determined
Integrate and present data	Website updates - new content system (WA-3.3)	Website updates including ACCWP members' site (WA-3.3)	Expand watershed assessment and monitoring pages (WA-3.3)	continuing (WA-3.3)
Integrate and present data		Watershed characterization for WMIR (WA-1.1)	To be determined	
Pollutants of Concern (MYP Section IID)				
Regional coordination	CEP and RMP (MS-1.1, 1.6, 4.1)	Continue CEP and RMP participation (MS-1.1, 1.6, 4.1)	Continue CEP and RMP participation (MS-1.1, 1.6, 4.1)	continuing (MS-1.1, 1.6, 4.1)
Distribution & loading	Dioxins background synthesis (MS-3.1)	no major studies; may identify potential needs for additional pollutant studies (MS-1.2)	Conduct additional studies as needed (MS-1.2, MS-3.1)	to be determined
Distribution & loading	Dioxins reanalysis (MS-1.2)		Collect sediment archives in coordination with pilot study (MS-1.2)	Reanalysis of archives to be determined
Source ID, case studies	Source ID studies in Ettie St and Glen Echo watersheds (MS-2.1)	Assist Oakland with sampling plan for Ettie Street PCB abatement grant (WA-3.2).	Conduct additional studies as needed (MS-3.1)	
Source ID, case studies		Design case study in Emeryville or San Leandro (MS-2.1)	Conduct case study (MS-2.1)	to be determined
Identify source controls	Control options review (MS-2.1)	Design pilot study for testing estimates of pollutant removal for control options (MS-1.2)	Control options pilot study on removal of TMDL pollutants by municipal and desilting practices (MS-1.2)	to be determined
Track trends	Baseline stormwater monitoring (MS-1.3)	Continuing, with added work for Brake Pad Partnership (MS-1.3, 1.7)	Continuing (MS-1.3)	Continuing (MS-1.3)
Best Management Practices (MYP Section IIE)				
Evaluation of effectiveness		HMP Literature Review Part B (MS-2.2)		
Evaluation of effectiveness	Control options review of sediment management practices (MS-2.1)	Review available information: coordinate with CEP project 4.12 (MS-4.1)	Identify gaps, criteria for follow-up priorities--coordinate with CEP and SFEI grant (MS-4.1) and MS-1.2	plan, conduct or cooperate with studies for evaluation (MS-4.1)

2. DETAILED WORKPLAN FOR FISCAL YEAR 2003/2004

This section lists component tasks that are planned or underway with ACCWP funds authorized for Watershed Assessment and Monitoring components in FY2003/2004, followed by an updated budget in Table 2. Names of responsible parties for the "Lead" column in the budget are abbreviated as follows:

District = Alameda County Flood Control and Water Conservation District (Program representation and administration)
AMS = Applied Marine Sciences, Inc. (technical consultant)
EOA = Eisenberg, Olivieri & Associates Inc. . (technical consultant)
EIP = EIP Associates .(technical consultant)
URS = URS Corporation. (technical consultant)
Tbd = to be determined

Watershed Assessment

Task WA-1: Develop and maintain a GIS resource for watershed information

WA-1.1 **Watershed Inventory:** Analyze distribution of land cover and imperviousness for Watershed Assessment Units throughout Alameda County and incorporate maps and summaries in the WMIR. Incorporate recent field survey information into data for urban creeks and flood control channels.

Objective: Provide base layers and basic map products for watershed assessment activities of Program, member agencies and interested public.

WA-1.2 **Watershed assessment planning:** Document data sources, methods and outstanding issues related to ACCWP Land Cover dataset. Draft a detailed subplan for Long-Term Watershed Assessment describing proposed methods for stream classification based on available GIS data and development of indicators, and approach for coordinating information with other agencies and groups for assessment of priority watersheds list. Prepare draft standards for data management and sharing.

Objective: Develop a framework for ongoing coordination and planning of watershed assessment.

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds

WA-2.1 **Indicators of Creek Health:** Continue sampling benthic macroinvertebrate communities at selected sites in Sausal, San Lorenzo and Mission-Laguna watersheds, and prepare three-year summary report for these watersheds, with discussion of potential for long-term tracking of channel restoration sites. Conduct new sampling in Berkeley-Oakland creeks as first year of coordinated two-year data collection in these watersheds with SWAMP. Facilitate third annual BAMBI meeting and participate in workgroup planning future activities supporting IBI development, including development of data management standards for BASMAA agencies.

Objective: Develop and test indicators of general watershed condition.

WA-2.2 **Watershed Projects Support:** Facilitate communications with community members and groups to work with ACCWP members and other agencies on volunteer monitoring and other watershed-based projects. Includes coordination and referral to other regional resources such as Watershed Assessment Resource Center and East Bay Watershed Center at Merritt College.

Objective: Increase the participation of community stakeholders in watershed stewardship and assessment, and improve coordination of volunteer groups with agencies and other stakeholders.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders

WA-3.1 **Indicators for Contact Recreation:** Complete review of existing Alameda County data and draft guidance for municipal staff and local creek or community groups on monitoring and interpretation of coliform or other indicators of human health risk at sites with light contact recreation. Identify possible strategies for improved monitoring of pathogen-related risk and provide technical assistance for local monitoring with appropriate indicators. Develop preliminary map of locations with extensive contact recreation. Continue support of local monitoring for coliform or other indicators.

Objective: improve ability to assess risks to human health from light (non-swimming) contact recreation or activity in creeks.

WA-3.2 **On-Call Watershed Support:** Develop GIS analyses of land cover and channel condition for the San Lorenzo Creek to complement the District's recently prepared "report card" based on detailed watershed assessment data, and use this as basis for a pilot model for classifying Bay Plain watersheds as outlined by Task WA-1.2. Facilitate planning of water quality investigations in Lake Merritt, in coordination

with SWAMP and other stakeholders. Assist City of Oakland with PCB abatement pilot project in the Ettie St. watershed by providing technical review of sampling plans and commenting on project reports as needed.

Objective: Support watershed management efforts led by Program member agencies.

WA-3.3 **Website Support:** Provide updates to existing ACCWP website and develop special members' pages to support and enhance internal Program communications. Develop new "watersheds" section of ACCWP website and provide maps, links and other information for local watersheds.

Objective: Disseminate information about Alameda County watersheds and background on local watershed issues.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern that are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP).

Objective: Comply with Regional Board requirements and assist with the accomplishment of the RMP's objectives to provide regional characterization of pollution in the Bay.

MS-1.2 **TMDL monitoring and implementation:** Design a follow-up study to refine estimated effectiveness of existing sediment management practices in reducing or avoiding loads of Pollutants of Concern from urban runoff. This study will focus on routine drop inlet cleaning, street sweeping and removal of sediment from flood control channels and evaluate the potential of these practices for increasing the rate of removal for PCBs and mercury as part of the required reductions proposed for stormwater managers under Bay TMDLs.

Objective: Characterize watershed occurrences of pollutants of concern and fill information needs for ACCWP implementation of TMDLs and other water quality attainment strategies.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper during at least eight storm events in Castro Valley Creek, including special coordination with Task MS-1.7. Diazinon and/or toxicity monitoring will be also be conducted and coordinated with regional monitoring recommendations being developed through the CEP.

Objective: assess long-term trends in selected Pollutants of Concern in creeks as recommended in draft monitoring plan (Gunther and Bernstein, 2003).

MS-1.4 **Water quality screening and miscellaneous monitoring:** Continue semiannual screening for basic water quality chemistry and selected pollutants at 10-15 sites distributed among different creek and channel types. Draft a 2-year interpretive report and consider strategies for additional or alternative sampling such as toxicity testing or continuous temperature monitoring at selected sites..

Objective: Provide general assessment of water quality conditions in stream reaches.

MS-1.5 **Data Management and planning support:** Refine field SOPs and documentation for water quality screening. Coordinate discussion of assessment data formats and exchange with SWAMP and other ACCWP partners.

Objective: Improve coordination and planning for ACCWP pollutant monitoring.

MS-1.6 **Clean Estuary Partnership:** Contribution to CEP as provided in MOU between BASMAA, BACWA, WSPA and Regional Board.

Objective: Follow the MOU and the policies of CEP guidance committees to support CEP activities for controlling pollutants of concern including problem identification, characterization, linkage studies and development of implementation plans for source control and/or abatement.

MS-1.7 **Participate in Brake Pad Partnership Fate and Transport Studies:** conduct creek monitoring and provide other support to integrate Castro Valley-Creek data in regional fate and transport model for copper from brake wear debris as part of Proposition 13 grant to Brake Pad Partnership (coordinated with Task MS-1.3).

Objective: support regional efforts to address copper loadings to the Bay.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs

MS-2.1 **Pollutant source investigations:** Plan case study characterizing Pollutants of Concern in sediments from an additional "old urban" watershed on the Bay Plain. Priority candidate watersheds are those with significant size and potential to contribute loads of legacy pollutants, such as Temescal or San Leandro Creeks. Depending on the degree of open channel in the watershed, sampling sites may include open channels, culverts or storm drain drop inlets.

Objective: characterize details of distribution and impacts for Pollutants of Concern, and/or test hypotheses concerning their fate and transport.

MS-2.2 **Studies supporting implementation of New Development permit provisions:** Complete preliminary maps to test GIS-based method to determining areas where HMP controls would apply. Review pertinent literature to clarify the technical basis for the proposed approach to HMP development, and identify potential management measures for inclusion. Prepare workplan for HMP development, and submit to Regional Board

Objective: provide technical information needed to support implementation of design standards for New and Re-Development as required in NPDES permit.

Task MS-3: Provide technical information on management issues involving urban runoff

MS-3.1 **Unspecified special studies:** No allocation for FY2003/04.

Objective: Address data gaps or management issues concerning pollutants of concern and urban runoff impacts.

MS-3.2 **On-Call Technical Support:** Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts

MS-4.1 **Coordinate with RMP, BASMAA and CEP** Chair BASMAA Monitoring Committee meetings, represent BASMAA in CEP technical meetings and workgroup meetings as needed, participate in RMP technical review and other special purpose technical or stakeholder discussions. Includes review and information sharing to support CEP project #4.12, which will develop a framework and methodology for evaluating the effectiveness of various BMPs in achieving load reductions for specific TMDL pollutants.

Objective: maximize effective use of monitoring resources through coordination of effort among BASMAA member agencies, the RMP and the CEP.

Table 2. FY 2003/2004 Watershed Assessment and Monitoring Tasks and Budget Update

Task #	Description	FY 03-04 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory[a]	$55,000	EIP/EOA
WA-1.2	Watershed assessment planning[a]	$20,000	EOA/District
WA-2.1	Indicators of Creek Health	$25,000	AMS/District
WA-2.2	Watershed Projects Support	$2,000	District
WA-3.1	Indicators for Contact Recreation	$10,000	Tbd
WA-3.2	On-Call Watershed Support[a]	$21,000	AMS/District
WA-3.3	Website Support	$15,000	EOA
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$158,000**	
Monitoring & Special Studies			
MS-1.1	RMP fee	$155,000	n/a
MS-1.2	TMDL monitoring/implementation	$20,000	AMS/District
MS-1.3	Baseline trend monitoring	$20,000	District
MS-1.4	Water quality screening, misc. monitoring	$20,000	District
MS-1.5	Data management and planning support	$5,000	AMS/District
MS-1.6	Clean Estuary Partnership contribution	$100,000	n/a
MS-2.1	Pollutant source investigations	$20,000	AMS
MS-2.2	Studies supporting New Dev. provisions	$40,000	AMS/EIP
MS-3.1	Unspecified special studies	$0	n/a
MS-3.2	On-Call Technical Support	$8,000	AMS
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$30,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$25,000	District
	Maximum Component Total	**$463,000**	
MS-1.7	Brake Pad Fate and Transport studies	$30,000	District (contract)

[a]Includes deferred FY 03 funds authorized by Management Committee to cover HMP mapping tasks

3. PROPOSED WORKPLAN FOR FISCAL YEAR 2004/2005

Watershed Assessment

Task WA-1: Develop and maintain a GIS resource for watershed information

WA-1.1 **Watershed Inventory:** Continue refinement of inventory data for channel condition and riparian zone characterization. Analyze landcover and channel attributes of focus watersheds as listed in WMIR, especially high priority watersheds for assessment. Develop pilot classifications of County watersheds based on available GIS data for land cover, channel network characteristics and riparian zone condition, and coordinate test with biological indicators, focusing on Sausal, San Lorenzo, and Laguna Creeks.

WA-1.2 **Watershed assessment planning:** Refine subplans for assessment of priority watersheds using physical and biological indicators, in coordination with other agencies and local stakeholders. Coordinate the development or acquisition of additional data needed for developing the HMP

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds

WA-2.1 **Indicators of Creek Health:** Incorporate macroinvertebrate data from initial focus watersheds into test of GIS classification in Task WA-1.1. Develop conceptual framework for including fish communities and other taxa in assessment data. Develop a rotation strategy for sampling macroinvertebrate communities in other priority watersheds and continue sampling as planned.. Continue work with BAMBI projects and facilitating regional partnerships.

WA-2.2 **Watershed projects assistance:** Facilitate communications with community members and groups to work with ACCWP members and other agencies on volunteer monitoring and other watershed-based projects. Includes coordination and referral to other regional resources such as Watershed Assessment Resource Center and East Bay Watershed Center at Merritt College.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders

WA-3.1 **Indicators for Contact Recreation:** Prepare guidance documents for municipal staff and local creek or community groups to manage local sites for light contact recreation. Work with co-permittees and other stakeholders to pilot additional monitoring or case studies at light contact sites.

WA-3.2 **On-Call Watershed Support:** Provide guidance and technical support for watershed-based management activities by copermitteees and local groups. Identify priorities and potential watersheds for additional support.

WA-3.3 **Website Support:** Incorporate watershed indicator data and other creek information in new watersheds section of ACCWP website. Identify additional approaches for making monitoring and assessment data available in Web format.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern that are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP).

MS-1.2 **TMDL monitoring and implementation:** Conduct pilot study of municipal practices involving sediment removal by sampling street sweeper tailings or sediment cleaned from drop inlets and conveyances for PCBs, mercury and other pollutants of concern. Archive additional replicates of sediment samples for potential further analyses.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper and diazinon in Castro Valley Creek, attempting to sample at least 5 storm events. Diazinon and/or toxicity monitoring will be coordinated with regional monitoring recommendations being developed through the CEP.

MS-1.4 **Water quality screening and miscellaneous monitoring:** Refine pilot screening project and develop rotation schedule for additional sites, including consideration of east County creeks.

MS-1.5 **Data Management and planning support:** Continue participation in regional coordination of data formats and review of joint macroinvertebrate dataset. develop a conceptual plan for analyses of long-term and spatial trends data.

MS-1.6 **Clean Estuary Partnership:** Contribution to CEP as provided in MOU between BASMAA, BACWA, WSPA and Regional Board.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs

MS-2.1 **Pollutant source investigations:** Conduct additional case study in selected watershed.

MS-2.2 **New Development support:** Provide coordination and technical support as needed, to assist development of HMP and other products required for compliance with permit (Note: most of this development activity is funded by a separate special budget authorized by the ACCWP Management Committee and described in separate workplans submitted according to C.3 provisions)

Task MS-3: Provide technical information on management issues involving urban runoff

MS-3.1 **Unspecified special studies:** Conduct special studies as needed, subject to available funds.

MS-3.2 **On-Call Technical Support:** Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts

MS-4.1 **Coordinate with RMP, BASMAA and CEP** Chair BASMAA Monitoring Committee meetings, represent BASMAA in CEP technical meetings and workgroup meetings as needed, participate in RMP technical review and other special purpose technical or stakeholder discussions. Includes review and coordination with SFEI on Urban BMP Evaluation project that will be initiated with Proposition 13 grant support, and will incorporate follow-up to CEP project #4.12..

Table 3. FY 2004/2005 Watershed Assessment and Monitoring Tasks and Budget

Task #	Description	FY 04-05 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory	$50,000	EIP/EOA
WA-1.2	Watershed assessment planning	$15,000	EOA/District
WA-2.1	Indicators of Creek Health	$23,000	AMS/District
WA-2.2	Watershed projects assistance	$3,000	District
WA-3.1	Indicators for Contact Recreation	$10,000	Tbd
WA-3.2	On-Call Watershed Support	$24,000	Tbd
WA-3.3	Website Support	$20,000	District/Tbd
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$155,000**	
Monitoring & Special Studies			
MS-1.1	RMP estimated fee	$160,000	n/a
MS-1.2	TMDL monitoring/implementation	$70,000	AMS/District
MS-1.3	Baseline trend monitoring	$34,000	District
MS-1.4	Water quality screening, misc. monitoring	$25,000	District/AMS
MS-1.5	Data management and planning support	$10,000	AMS/District
MS-1.6	Clean Estuary Partnership contribution	$100,000	n/a
MS-2.1	Pollutant source investigations	$35,000	AMS
MS-2.2	New Development support	$15,000	District
MS-3.1	Unspecified special studies	$30,000	Tbd
MS-3.2	On-Call Technical Support	$8,000	Tbd
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$35,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$27,000	District
	Component Total	**$569,000**	

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Alameda Countywide Clean Water Program
Annual Monitoring Program Plan
and update to the Multi-Year Monitoring and Assessment Plan
NPDES Permit Provision C.8

February 28, 2005

INTRODUCTION

The Alameda Countywide Clean Water Program (ACCWP or Program) conducts data collection activities to monitor stormwater pollution, assess the condition of receiving waters, and study problems caused by urban runoff in creeks, lakes and other waterbodies, including San Francisco Bay. ACCWP's jointly funded General Program supports these activities on behalf of the Program's 17 member agencies, which are joint holders (Permittees) of a stormwater discharge permit issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB) under the National Pollutant Discharge Elimination System (NPDES).

In May 2003, ACCWP submitted a Multi-Year Plan for Monitoring and Assessment (MYP; ACCWP 2003a) to the RWQCB. The MYP described the Program's long-term plan for monitoring and assessment activities, as required by Provision C.8.b of the Program's reissued Municipal Stormwater Discharge NPDES Permit (Order R2-2003-0021) adopted on February 19, 2003 (Order; RWQCB 2003). Because of the adaptive nature of many special studies and watershed assessment activities, the MYP only provided detailed task descriptions for the first two years of the five-year permit period. The MYP outlined the objectives and potential tasks for the remaining years in general terms, and specified that details of subsequent years' activities will be developed through topic-specific "subplans" and annual updates.

This monitoring program plan is being submitted to the RWQCB as an annual update to the MYP and also to comply with Provision C.8.c of the Order, which requires that

> The Permittees shall submit, by 100 days from the adoption of this order and on March 1st of each year thereafter, an annual monitoring program plan, acceptable to the Executive Officer, that includes clearly defined tasks, responsibilities, and schedules for implementation of monitoring activities for the next fiscal year designed to comply with these Monitoring Program requirements.

This document includes four sections:

1) An overview of objectives and recently completed or ongoing activities, which provides context for sections 2 and 3.
2) A detailed update on the Program's workplan for FY04/05.
3) A proposed workplan and budget for FY05/06, listing tasks, responsibilities and estimated schedule for implementation.
4) References, including reports and other documents recently completed or in preparation.

1. OVERVIEW

ACCWP's Stormwater Quality Management Plan for Fiscal Years 2001/02 through 2007/08 (ACCWP 2003b) and the MYP describe two program components centered on data and information gathering activities:

- Watershed Assessment (WA) focuses on landscape-level attributes of watersheds and streams, and beneficial uses or management issues that are more specifically tied to the physical, biological or social conditions in individual watersheds
- Monitoring and Special Studies (MS) addresses pollutants and problems that are more uniformly distributed in urbanized areas, or for which the most relevant geographical scale for study and management is larger than individual watersheds.

Each component consists of several tasks related to long-term objectives identified in the Plan. Annual workplans and budgets are approved by ACCWP's Management Committee and implemented under the oversight of the Watershed Assessment and Monitoring Subcommittee.

An alternative organization of these activities is based on a series of elements or focus areas, grouped into three main sections of the MYP, each of which is related to specific management questions:

- **Watershed Assessment:** Are our creeks healthy? How can we restore them? Is it safe to play in the creeks?
- **Pollutants of Concern:** Is urban runoff a significant contributor of pollutants to San Francisco Bay?
- **Effectiveness Of Best Management Practices (BMPs):** Are Program actions making a difference?

Table 1 summarizes Program activities for each of these MYP elements. Individual rows in the table represent sequences of tasks in successive years, all related to a specific focus or element of the MYP. Individual cells correspond to individual component tasks or portions of tasks, and the task identification numbers in parentheses correspond to descriptions in the component workplans and budgets that follow. To provide added long-term perspective, Table 1 also displays selected tasks initiated in previous Fiscal Years and conceptual descriptions of follow-up activities for FY2006/07.

Activities recently completed or planned for completion in FY04/05 are shown with gray shading in the table. They include:

- Recommendations for coordinating various indicators into ACCWP's watershed assessment program (Buchan, 2004; ACCWP Task WA-1.1-04)
- A summary report of macroinvertebrate biological assessment data collected through 2004 (ACCWP, in prep; Task WA-2.1-05)
- A summary report on pilot Water Quality Screening (Salop, et. al. in prep; Task MS-1.5-04)
- An updated long-term work plan for the Watershed Assessment Component, incorporating

recommendations from the above documents (ACCWP, in prep; Task WA-1.2-05).
- A Sampling and Analysis Plan for field investigation of source control options for achieving load reductions in mercury and PCBs in urban runoff that will be required by the RWQCB under its Total Maximum Daily Loads (TMDLs) for these pollutants in San Francisco Bay (Salop and Toll, 2004; Task MS-1.2-04).
- A report on stormwater monitoring in Castro Valley Creek (ACFCWCD 2005; Tasks MS-1.3-05 and MS-1.7-04).

Follow-up activities to completed work and additional ongoing activities are described in the workplans in sections 2 and 3 of this update.

Related Activities

ACCWP previously submitted a Watershed Management Integration Report (ACCWP 2004a), which included description and characterization of watersheds relevant to individual co-permittees, as required in Provision C.11 of the Order. Available GIS information was also incorporated in the Draft Hydrograph Modification Management Plan (Draft HMP, ACCWP 2004b) submitted in accordance with Provision C.3.f.

An increasing proportion of ACCWP's monitoring and assessment activities involve coordination with regional initiatives, either through direct Program participation or its membership in the Bay Area Stormwater Management Agencies Association (BASMAA). Regional activities related to ACCWP's Watershed Assessment and Monitoring activities include:

Surface Water Ambient Monitoring Program (SWAMP) conducted by the RWQCB, which collects physical, chemical and biological screening data in target watersheds throughout the Bay Area. SWAMP activities rotate to different portions of the Bay Area each year. An interpretive report summarizing the first two years of Region 2 data will be released in 2005.

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI) consists of scientists, watershed managers, regulators and community members who are interested in developing an Index of Biological Integrity (IBI) for streams in the San Francisco Bay Area, based on the composition of benthic macroinvertebrate (BMI) communities as an indicator of overall creek and watershed health. As part of Task WA-2.1, ACCWP coordinates its protocols for BMI sampling and analysis with SWAMP and other BASMAA agencies to produce an integrated regional dataset, and participates in the BAMBI workgroup for implementing IBI development. ACCWP also sponsors annual BAMBI meetings and hosts a BAMBI webpage at http://www.bayareabugs,org

Brake Pad Partnership (BPP) brings together regulators, brake pad manufacturers, stormwater management agencies, and environmentalists to evaluate the effects of brake wear debris as a source of copper to the southern part of San Francisco Bay. The BPP's Action Plan, funded by a Proposition 13 grant, includes monitoring and fate and transport studies of copper deposited in watersheds and in SF Bay. ACCWP is an active partner in this effort and previously received

funding for stormwater monitoring data designed to support the BPP's watershed modeling element. BASMAA also provides baseline funding for a stormwater program representative on the BPP Steering Committee. Website: http://www.suscon.org/brakepad/index.asp

Clean Estuary Partnership (CEP) is a collaboration between regulators and stormwater and municipal dischargers that conducts studies to support TMDLs and other efforts to improve water quality in the Bay and its watersheds. ACCWP makes annual contributions (Task MS-1.6) and also provides in-kind staff services for BASMAA representation (Task MS-4.1). Major CEP products completed in FY04/05, which are particularly relevant to stormwater management concerns, include:

- A series of Conceptual Model/Impairment Assessment reports summarizing the state of knowledge about individual Pollutants of Concern in San Francisco Bay (CEP Projects #4.29 - Legacy Organochlorine Pesticides; #4.30 - Diazinon and Pesticide-related Toxicity; #4.31 – Dioxins; #4.32- Selenium). Each report reviews available data against regulatory and screening benchmarks, evaluates potential impairment status, and discusses sources, environmental pathways and potential recovery processes in the Bay.
- Technical reports supporting implementation of Site Specific Objectives to replace the existing water quality objectives for copper in San Francisco Bay (CEP Project #4.11). This project also completed a review of copper sources from urban runoff, which lists source control activities that will be incorporated in future stormwater NPDES permits under a proposed Copper Management Strategy (TDC, 2004).
- An Urban Creeks Monitoring Plan (part of CEP Project #4.13) supports adaptive management of diazinon and pesticide-related toxicity in Bay Area urban creeks in accordance with the RWQCB's TMDL and Water Quality Attainment Strategy (WQAS) for Diazinon and Pesticide-Related Toxicity in Urban Creeks. This plan identifies ways to coordinate continuing monitoring by BASMAA programs to address the objectives of the TMDL/WQAS document. CEP Project #4.39 provided supplemental funds to fill gaps in existing monitoring programs for the FY04/05 season, including added toxicity analyses on ACCWP stormwater samples collected for Task MS-1.3-05.

Website: http://www.cleanestuary.org

Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP) monitors San Francisco Bay for sediment and water quality and also tests for pollutant effects in selected biota. A collaboration begun in FY04/05 between the RMP and the CEP will test and refine a "multi-box" model of Bay pollutant dynamics, which will be used for evaluating management actions and tracking long-term clean up efforts for TMDL pollutants.. The RMP is funded by regional NPDES dischargers, including ACCWP as specified in Provision C.8.b of the Order (Task MS-1.1). Website: http://www.sfei.org

Regional Group Permit is currently being developed to replace the Order for ACCWP and other Bay Area stormwater programs. The following workplan assumes that the general objectives of ACCWP's monitoring and assessment activities will be unchanged through FY05/06. Specific terminology, task organization and workplan details may be subject to change.

Table 1. Summary of current and planned activities according to ACCWP's Multi-Year Plan.

Focus or MYP element	FY04 completed or ongoing	FY05 update	FY06 proposed	FY07 conceptual plan
Watershed Assessment (MYP Section IIC)				
Assessment planning	Detailed subplan, long-term workplan (WA-1.2)	coordinate dataset refinement with HMP mapping(WA-1.1, WA-1.2)	Update subplans for assessing priority watersheds (WA-1.2)	to be determined
Physical characterization	WMIR & documentation for landcover dataset (WA-1.2)	Improve channel and riparian datasets (WA-1.1, 1.2)	Adapt procedures for field inventory of physical features, habitat (WA-1.1)	continuing GIS development (WA-1.1)
Physical characterization	Review of San Lorenzo pilot assessment to test GIS indicators (WA-1.2)	Evaluate Sausal or Laguna data with GIS data, coordinate with SWAMP (WA-3.2)	Pilot additional field inventory procedures in field (WA-1.1)	Report results of pilot inventory
Biological indicators	3-year report and revised workplan (WA-2.1)	Incorporate preliminary stream classification, review relation of BMI and fisheries indicators (WA-2.1)	test classification hypotheses (WA-2.1)	to be determined
Biological indicators	continue BAMBI participation & regional coordination (WA-2.1)	Regional data review, for developing Index of Biological Integrity (WA-2.1, MS-1.5)	coordinate with regional IBI efforts (WA-2.1)	continuing (WA-2.1)
Biological indicators	Coordinate BMI sampling with SWAMP sites in Group 2 watersheds, (WA-2.1)	Rotate sampling plan to Group 3 watersheds, and coordinate with channel restoration sites (WA-2.1)	Continue sampling in Group 3 and selected Group 2 sites (WA-2.1)	continuing (WA-2.1)
Water Quality screening	Draft 2 year summary report (MS-1.4)	Finalize report; continue sampling in new group of watersheds (MS-1.4)	continue sampling Year 2 in new watersheds (MS-1.4)	continuing (MS-1.4)
Water Quality screening	Evaluate SOP's, coordinate assessment data within ACCWP and with SWAMP (MS-1.5)	to be determined	to be determined	
Human uses & health risk	Continuing (as WA-3.1)	Identify further priorities (WA-3.1)	Identify further priorities (WA-3.1)	to be determined
Human uses & health risk	Overview of contact recreation sites (WA-3.1-02)	Plan pilot monitoring or case studies as needed (WA-3.1)	continuing	to be determined

Table 1 (continued)

Focus or MYP element	FY04 completed or ongoing	FY05 update	FY06 proposed	FY07 conceptual plan
Integrate and present data	Castro Valley monitoring report (MS-1.3-05, MS-1.7-04)	Complete bioassessment and water quality reports (WA-2.1, MS-1.4)	continuing (WA-2.1, WA-3.1, MS-1.4)	to be determined
Integrate and present data	Website updates including ACCWP members' site (WA-3.3)	Expand watershed assessment and monitoring pages (WA-3.3)	continuing (WA-3.3)	to be determined
Pollutants of Concern (MYP Section IID)				
Regional coordination	CEP and RMP (MS-1.1, 1.6, 4.1)	Continue CEP and RMP participation (MS-1.1, 1.6, 4.1)	Continue CEP and RMP participation (MS-1.1, 1.6, 4.1)	continuing (MS-1.1, 1.6, 4.1)
Distribution & loading	Sampling/analysis plan for TMDL pollutants and control options study (MS-1.2)	Continuing	Conduct additional studies as needed (MS-1.2, MS-3.1)	to be determined
Distribution & loading		Archive sediment replicates where practicable (MS-1.2, WA-3.2, etc.)		Reanalysis of archives to be determined
Source ID, case studies	Support Oakland's Ettie Street PCB abatement project (WA-3.2)	Supplemental sampling for Ettie Street priority sites (WA-3.2).	Conduct additional studies as needed (MS-3.1)	
Source ID, case studies		Design case study in Emeryville or San Leandro (MS-2.1)	Conduct case study (MS-2.1)	to be determined
Identify and test source controls	Pilot sampling for TMDL pollutants and sediment control options (MS-1.2)	Fall 2004 sampling for sweepers, cleaning and desilting reduced due to rain, continuing (MS-1.2)	Continuing field sampling and project reporting (MS-1.2)	to be determined
Track trends	Baseline stormwater monitoring (MS-1.3)	Continuing, with added CEP funding (MS-1.3)	Continuing (MS-1.3)	Continuing (MS-1.3)
Best Management Practices (MYP Section IIE)				
Evaluation of effectiveness	BASMAA partnership with CEP and regional projects reviewing post-construction BMPS (MS-4.1)	Reviewed CEP Project 4.12 literature review and report, support oversight group for follow-up Prop 13 project (MS-4.1)	Continuing.	Continuing.
Evaluation of effectiveness	sediment controls field study (MS-2.1)	Continuing; identify priorities for follow-up studies	Conduct studies as needed	To be determined

2. DETAILED WORKPLAN FOR FISCAL YEAR 2004/05

This section lists component tasks that are planned or underway with ACCWP funds authorized for Watershed Assessment and Monitoring components in FY2004/2005, followed by an updated budget in Table 2. Names of responsible parties for the "Lead" column in the budget are abbreviated as follows:

District = Alameda County Flood Control and Water Conservation District (Program representation and administration)
AMS = Applied Marine Sciences, Inc. (technical consultant)
EOA = Eisenberg, Olivieri & Associates Inc. . (technical consultant)
EIP = EIP Associates .(technical consultant)
URS = URS Corporation. (technical consultant)
Tbd = to be determined

Watershed Assessment

Task WA-1: Develop and maintain a GIS resource for watershed information.

WA-1.1 **Watershed Inventory:** Continue refinement of inventory data for channel condition and riparian zone characterization, and coordinate with mapping needs for the Final HMP. Analyze landcover and channel attributes of focus watersheds listed in WMIR, especially high priority watersheds for assessment. Develop pilot classifications of County watersheds based on available GIS data for land cover, channel network characteristics and riparian zone condition, and coordinate evaluation of pilot with biological indicators, focusing on Sausal, San Lorenzo, and Laguna Creeks.

Objective: Provide base layers and basic map products for watershed assessment activities of Program, member agencies and interested public.

WA-1.2 **Watershed assessment planning:** Draft a detailed long-term Watershed Assessment Work Plan establishing a framework for different scales of stream classification based on available GIS data, and proposing further tasks for testing and application of physical and biological indicators for watershed assessment. The Work Plan will also describe approaches for coordinating watershed data with other agencies and groups for assessment of focus watersheds from priority list in the Watershed Management Integration Report, and propose standards for data management and sharing.

Objective: Develop a framework for ongoing coordination and planning of watershed assessment.

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds.

WA-2.1 **Indicators of Creek Health:** Continue sampling benthic macroinvertebrate communities at selected long-term sites in Sausal, San Lorenzo and Mission-Laguna watersheds (Group 1), and begin 2-3 year sampling for 2-3 new urban watersheds in Hayward area or eastern Alameda County (Group 3). Complete summary report for Group 1 watersheds and other streams sampled during 2001-2004, including sites coordinated with SWAMP for 2004 in Berkeley and Oakland creeks (Group 2), and review of fisheries resource information. Sponsor fourth annual BAMBI meeting and participate in workgroup for IBI development, including development of data management standards for BASMAA agencies.

Objective: Develop and test indicators of general watershed condition.

WA-2.2 **Watershed Projects Support:** Facilitate communications with community members and groups to work with ACCWP members and other agencies on volunteer monitoring and other watershed-based projects. Includes coordination and referral to other regional resources such as Watershed Assessment Resource Center and East Bay Watershed Center at Merritt College.

Objective: Increase the participation of community stakeholders in watershed stewardship and assessment, and improve coordination of volunteer groups with agencies and other stakeholders.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders.

WA-3.1 **Indicators for Contact Recreation:** Prepare draft guidance for municipal staff and local creek or community groups on monitoring and interpretation of coliform or other indicators of human health risk at sites with light contact recreation, incorporating review of existing Alameda County data (URS 2003a) and of literature concerning alternative indicators (URS 2003b). Identify possible strategies for improved monitoring of pathogen-related risk and support local or pilot projects for monitoring with appropriate indicators. Develop preliminary list and map of locations with extensive contact recreation.

Objective: improve ability to assess risks to human health from light (non-swimming) contact recreation or activity in creeks.

WA-3.2 **On-Call Watershed Support:** Assist City of Oakland with PCB abatement pilot project in the Ettie St. watershed through supplemental sampling of potential PCB source locations. Review procedures and standards for GIS data management and watershed mapping.

Objective: Support watershed management efforts led by Program member agencies.

WA-3.3 **Website Support:** Provide updates to existing ACCWP website and develop special members' pages to support and enhance internal Program communications. Develop expanded "watersheds" section of ACCWP website and provide maps, links and other information for local watersheds.

Objective: Disseminate information about Alameda County watersheds and background on local watershed issues.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern that are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP).

Objective: Comply with Regional Board requirements and assist with the accomplishment of the RMP's objectives to provide regional characterization of pollution in the Bay.

MS-1.2 **TMDL monitoring and implementation:** Prepare Sampling and Analysis Plan (Salop and Toll, 2004) for follow-up study to evaluate desktop estimates of effectiveness of existing sediment management practices in reducing or avoiding loads of Pollutants of Concern from urban runoff (Salop and Akashah, 2004). Conduct field study to investigate wastes removed from routine drop inlet cleaning, street sweeping and desilting of flood control channels and evaluate the potential of these practices for increasing the rate of removal for PCBs and mercury to address TMDL load reductions proposed for stormwater programs.

Objective: Characterize watershed occurrences of pollutants of concern and fill information needs for ACCWP implementation of TMDLs and other water quality attainment strategies.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper during at least eight storm events in Castro Valley Creek, including special coordination with pesticide and/or toxicity monitoring recommended in the CEP Urban Creeks Monitoring Plan. Complete report for FY03/04 special monitoring to support Brake Pad Partnership studies of copper fate and transport.

Objective: assess long-term trends in selected Pollutants of Concern in creeks as recommended in draft monitoring plan (Gunther and Bernstein, 2003).

MS-1.4 **Water quality screening and miscellaneous monitoring:** Continue semiannual screening for basic water quality chemistry and selected pollutants at 10-15 sites distributed among different creek and channel types. Complete a 2-year interpretive report, evaluate strategies for additional or alternative sampling such as toxicity testing or continuous temperature monitoring, and rotate sampling locations to additional urban watersheds.

Objective: Provide general assessment of water quality conditions in stream reaches.

MS-1.5 **Data Management and planning support:** Refine field SOPs and documentation for water quality screening. Coordinate discussion of assessment data formats and exchange with SWAMP and other ACCWP partners.

Objective: Improve coordination and planning for ACCWP pollutant monitoring.

MS-1.6 **Clean Estuary Partnership:** Contribution to CEP as provided in MOU between BASMAA, BACWA, WSPA and Regional Board.

Objective: Support CEP activities for controlling pollutants of concern including problem identification, characterization, linkage studies and development of implementation plans for source control and/or abatement.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs.

MS-2.1 **Pollutant source investigations:** Plan case study characterizing Pollutants of Concern in sediments from an additional "old urban" watershed on the Bay Plain. Priority candidate watersheds are those with significant size and potential to contribute loads of legacy pollutants, such as Temescal or San Leandro Creeks. Depending on the degree of open channel in the watershed, sampling sites may include open channels, culverts or storm drain drop inlets.

Objective: characterize details of distribution and impacts for Pollutants of Concern, and/or test hypotheses concerning their fate and transport.

MS-2.2 **Studies supporting implementation of New Development permit provisions:** Provide coordination and technical management for development of assessment and design procedures described in the Draft HMP (ACCWP 2004b). (Note: most of the HMP technical projects are funded by a separate special budget authorized by the ACCWP Management Committee).

Objective: provide technical information needed to support implementation of design standards for New and Re-Development as required in NPDES permit.

Task MS-3: Provide technical information on management issues involving urban runoff.

MS-3.1 Unspecified special studies:

Objective: Address data gaps or management issues concerning pollutants of concern and urban runoff impacts.

MS-3.2 On-Call Technical Support: Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts.

MS-4.1 Coordinate with RMP, BASMAA and CEP Chair BASMAA Monitoring Committee meetings, represent BASMAA in CEP Technical Committee and workgroup meetings as needed, participate in RMP technical review and other special purpose technical or stakeholder discussions. Includes review of technical studies and development of implementation strategies to address load reductions for specific TMDL pollutants.

Objective: maximize effective use of resources through coordination of effort among BASMAA member agencies, the RMP and the CEP.

Table 2. FY 2004/2005 Watershed Assessment and Monitoring Tasks and Budget Update

Task #	Description	FY 04/05 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory	$33,000	EOA/District
WA-1.2	Watershed assessment planning	$32,000	EOA/District
WA-2.1	Indicators of Creek Health	$23,000	AMS/District
WA-2.2	Watershed Projects Support	$3,000	District
WA-3.1	Indicators for Contact Recreation	$10,000	AMS/District
WA-3.2	On-Call Watershed Support	$24,000	AMS/District
WA-3.3	Website Support	$20,000	AMS/District
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$155,000**	
Monitoring & Special Studies			
MS-1.1	RMP fee	$157,000	n/a
MS-1.2	TMDL monitoring/implementation	$70,000	AMS/District
MS-1.3	Baseline trend monitoring	$34,000	District
MS-1.4	Water quality screening, misc. monitoring	$25,000	District
MS-1.5	Data management and planning support	$10,000	AMS/District
MS-1.6	Clean Estuary Partnership contribution	$100,000	n/a
MS-2.1	Pollutant source investigations	$35,000	AMS
MS-2.2	Studies supporting New Dev. provisions	$16,000	AMS/District
MS-3.1	Unspecified special studies	$30,000	n/a
MS-3.2	On-Call Technical Support	$10,000	AMS
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$35,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$27,000	District
	Component Total	**$569,000**	

3. PROPOSED WORKPLAN FOR FISCAL YEAR 2005/2006

Watershed Assessment

Task WA-1: Develop and maintain a GIS resource for watershed information.

WA-1.1 **Watershed Inventory:** Review and adapt proposed procedures for data collection of physical and habitat information and indicators of urban impact on streams, and conduct pilot field study in one or more focus watersheds. Continue development of GIS data.

WA-1.2 **Watershed assessment planning:** Refine subplans for assessment of priority watersheds using physical and biological indicators recommended in the Watershed Assessment Work Plan, and coordinate field data collection with other agencies and local stakeholders.

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds.

WA-2.1 **Indicators of Creek Health:** Continue benthic macroinvertebrate sampling in long-term Group 1 streams and Year 2 in Group 3 watersheds. .Incorporate macroinvertebrate data from initial focus watersheds in classification Task WA-1.1. Continue work with BAMBI projects and regional partnership activities.

WA-2.2 **Watershed projects assistance:** Continue supporting community members and groups partnering with ACCWP members and other agencies on volunteer monitoring and other watershed-based projects. Includes coordination and referral to other regional resources.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders.

WA-3.1 **Indicators for Contact Recreation:** Prepare guidance documents for municipal staff and local creek or community groups to manage local sites for light contact recreation. Work with co-permittees and other stakeholders to pilot additional monitoring or case studies at light contact sites.

WA-3.2 **On-Call Watershed Support:** Provide guidance and technical support for watershed-based management activities by copermitteees and local groups. Identify priorities and potential watersheds for additional support.

WA-3.3 **Website Support:** Incorporate watershed indicator data and other creek information in new watersheds section of ACCWP website. Identify additional approaches for making monitoring and assessment data available in Web format.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern that are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP).

MS-1.2 **TMDL monitoring and implementation:** Complete field data collection and draft report for evaluation of the potential for ongoing sediment management practices to increase the rate of removal for PCBs and mercury to address TMDL load reductions proposed for stormwater programs. Archive additional replicates of sediment samples for potential further analyses.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper and diazinon in Castro Valley Creek, attempting to sample at least 5 storm events. Diazinon and/or toxicity monitoring will be coordinated with regional monitoring recommendations of the CEP Urban Creeks Monitoring Plan.

MS-1.4 **Water quality screening and miscellaneous monitoring:** Continue screening for selected parameters in urban creeks and priority watersheds.

MS-1.5 **Data Management and planning support:** Continue participation in regional coordination of data formats and review of joint macroinvertebrate dataset. Support use of long-term and spatial trends data in development of a Bay Area Index of Biological Integrity.

MS-1.6 **Clean Estuary Partnership:** Contribution to CEP as provided in MOU between BASMAA, BACWA, WSPA and Regional Board.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs.

MS-2.1 **Pollutant source investigations:** Conduct additional case study on potential discharges of legacy TMDL pollutants in a selected watershed with extensive industrial and commercial land use.

MS-2.2 **New Development support:** Provide coordination and technical support as needed, to assist implementation of the HMP and other new requirements related to provision C.3 of the Order. (Note: most of this development activity is funded by a separate special budget authorized by the ACCWP Management Committee)

Task MS-3: Provide technical information on management issues involving urban runoff.

MS-3.1 **Unspecified special studies:** Conduct special studies as needed, subject to available funds.

MS-3.2 **On-Call Technical Support:** Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts.

MS-4.1 **Coordinate with RMP, BASMAA and CEP** Chair BASMAA Monitoring Committee meetings, represent BASMAA in CEP Technical Committee and workgroup meetings as needed, participate in RMP technical review and other special purpose technical or stakeholder discussions. Participate in BASMAA's review and coordination with SFEI on Proposition 13-funded project for "Regional Stormwater Monitoring and Urban BMP Evaluation" and other regional initiatives related to water quality monitoring or TMDL implementation..

Table 3. FY 2005/2006 Watershed Assessment and Monitoring Tasks and Budget

Task #	Description	FY 05-06 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory	$50,000	EOA/District
WA-1.2	Watershed assessment planning	$15,000	EOA/District
WA-2.1	Indicators of Creek Health	$26,000	AMS/District
WA-2.2	Watershed projects assistance	$3,000	District
WA-3.1	Indicators for Contact Recreation	$12,000	Tbd
WA-3.2	On-Call Watershed Support	$24,000	Tbd
WA-3.3	Website Support	$15,000	District/Tbd
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$155,000**	
Monitoring & Special Studies			
MS-1.1	RMP estimated fee	$160,000	n/a
MS-1.2	TMDL monitoring/implementation	$60,000	AMS/District
MS-1.3	Baseline trend monitoring	$34,000	District
MS-1.4	Water quality screening, misc. monitoring	$25,000	District/AMS
MS-1.5	Data management and planning support	$10,000	AMS/District
MS-1.6	Clean Estuary Partnership contribution	$100,000	n/a
MS-2.1	Pollutant source investigations	$50,000	AMS
MS-2.2	New Development support	$10,000	District
MS-3.1	Unspecified special studies	$30,000	Tbd
MS-3.2	On-Call Technical Support	$8,000	Tbd
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$35,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$27,000	District
	Component Total	**$569,000**	

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Alameda Countywide Clean Water Program
Annual Monitoring Program Plan
and update to the Multi-Year Monitoring and Assessment Plan
NPDES Permit Provision C.8

March 1, 2006

INTRODUCTION

The Alameda Countywide Clean Water Program (ACCWP or Program) conducts data collection activities to monitor stormwater pollution, assess the condition of receiving waters, and study problems caused by urban runoff in creeks, lakes and other waterbodies, including San Francisco Bay. ACCWP's jointly funded General Program supports these activities on behalf of the Program's 17 member agencies, which are joint holders (Permittees) of a stormwater discharge permit issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB) under the National Pollutant Discharge Elimination System (NPDES).

In May 2003, ACCWP submitted a Multi-Year Plan for Monitoring and Assessment (MYP; ACCWP 2003a) to the RWQCB. The MYP described the Program's long-term plan for monitoring and assessment activities, as required by Provision C.8.b of the Program's reissued Municipal Stormwater Discharge NPDES Permit (Order R2-2003-0021) adopted on February 19, 2003 (Order; RWQCB 2003). Because of the adaptive nature of many special studies and watershed assessment activities, the MYP only provided detailed task descriptions for the first two years of the five-year permit period. The MYP outlined the objectives and potential tasks for the remaining years in general terms, and specified that details of subsequent years' activities will be developed through topic-specific "subplans" and annual updates.

This monitoring program plan is being submitted to the RWQCB as an annual update to the MYP and also to comply with Provision C.8.c of the Order, which requires that

> The Permittees shall submit, by 100 days from the adoption of this order and on March 1st of each year thereafter, an annual monitoring program plan, acceptable to the Executive Officer, that includes clearly defined tasks, responsibilities, and schedules for implementation of monitoring activities for the next fiscal year designed to comply with these Monitoring Program requirements.

This document includes four sections:

1) An overview of objectives and recently completed or ongoing activities, which provides context for sections 2 and 3.
2) A detailed update on the Program's workplan for F/05/06.
3) A proposed workplan and budget for FY06/07, listing tasks, responsibilities and estimated schedule for implementation.
4) References, including reports and other documents recently completed or in preparation.

1. OVERVIEW

ACCWP's Stormwater Quality Management Plan for Fiscal Years 2001/02 through 2007/08 (ACCWP 2003b) and the MYP describe two program components centered on data and information gathering activities:

- Watershed Assessment (WA) focuses on landscape-level attributes of watersheds and streams, and beneficial uses or management issues that are more specifically tied to the physical, biological or social conditions in individual watersheds
- Monitoring and Special Studies (MS) addresses pollutants and problems that are more uniformly distributed in urbanized areas, or for which the most relevant geographical scale for study and management is larger than individual watersheds.

Each component consists of several tasks related to long-term objectives identified in the Plan. Annual workplans and budgets are approved by ACCWP's Management Committee and implemented under the oversight of the Watershed Assessment and Monitoring Subcommittee.

An alternative organization of these activities is based on a series of elements or focus areas, grouped into three main sections of the MYP, each of which is related to specific management questions:

- **Watershed Assessment:** Are our creeks healthy? How can we restore them? Is it safe to play in the creeks?
- **Pollutants of Concern:** Is urban runoff a significant contributor of pollutants to San Francisco Bay?
- **Effectiveness Of Best Management Practices (BMPs):** Are Program actions making a difference?

Table 1 summarizes Program activities for each of these MYP elements. Individual rows in the table represent sequences of tasks in successive years, all related to a specific focus or element of the MYP. Individual cells correspond to individual component tasks or portions of tasks, and the task identification numbers in parentheses correspond to descriptions in the component workplans and budgets that follow. To provide added long-term perspective, Table 1 also displays selected tasks initiated in previous Fiscal Years and conceptual descriptions of follow-up activities for FY2007/08. Actual task priorities for Fiscal Years 06/07 and 07/08 may differ from those outlined here, subject to the requirements for the Municipal Regional Permit being developed for all Bay Area Phase 1 stormwater programs. The general range and types of activities is expected to be similar, though task organization and specific descriptions may change.

Activities recently completed or planned for completion in FY05/06 are shown with gray shading in the table. They include:

- A draft report on potential contributions of street sweeping and other sediment removal practices to contribute to load reductions of mercury and PCBs in urban runoff, to address the load allocations set by the RWQCB under its Total Maximum Daily Loads (TMDLs) for these pollutants in San Francisco Bay. Field sampling was completed in February 2006 according to a previously developed Sampling and Analysis Plan (Salop and Toll, 2004) and updates memos containing preliminary results were prepared for ACCWP, RWQCB and other interested parties. (Task MS-1.2).
- Supplemental sampling in street right-of-ways adjacent to priority properties identified during Oakland's PCB Abatement Project in the Ettie Street Pump Station watershed, with results reported for the city in Kleinfelder (2005); (WA-3.2-05).
- A summary report of macroinvertebrate biological assessment data collected through 2005 (ACCWP, in prep; Task WA-2.1-05).
- A summary report on pilot Water Quality Screening (Salop, et. al. in prep; Task MS-1.5-04)
- An updated long-term work plan for the Watershed Assessment Component, incorporating recommendations from the above documents (ACCWP, in prep; Task WA-1.2-05).
- Castro Valley Creek stormwater monitoring data, included in a CEP-sponsored report for regional FY04/05 urban creeks monitoring for pesticides and toxicity (Ruby 2005; Task MS-1.3).

Follow-up activities to completed work and additional ongoing activities are described in the workplans in sections 2 and 3 of this update.

Related Activities

ACCWP previously submitted a Watershed Management Integration Report (ACCWP 2004), which included description and characterization of watersheds relevant to individual co-permittees, as required in Provision C.11 of the Order. Available GIS information was also incorporated in the calibration models and data inputs for the Bay Area Hydrology Model (BAHM) being developed as a regional tool for implementing the Hydrograph Modification Management Plan (HMP, ACCWP 2005)..

An increasing proportion of ACCWP's monitoring and assessment activities involve coordination with regional initiatives, either through direct Program participation or its membership in the Bay Area Stormwater Management Agencies Association (BASMAA). Regional activities related to ACCWP's Watershed Assessment and Monitoring activities include:

Surface Water Ambient Monitoring Program (SWAMP) conducted by the RWQCB, which collects physical, chemical and biological screening data in target watersheds throughout the Bay Area. SWAMP activities rotate to different portions of the Bay Area each year. A statewide review of SWAMP program design is under way, and an interpretive report summarizing the first two years of Region 2 data is anticipated in 2006. Website: http://www.waterboards.ca.gov/swamp/

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI) consists of scientists, watershed managers, regulators and community members supporting development of an Index of Biological Integrity (IBI) for streams in the San Francisco Bay Area, which uses benthic macroinvertebrate (BMI) community structure as an indicator of overall creek and watershed health. As part of Task WA-2.1, ACCWP coordinates its protocols for BMI sampling and analysis with SWAMP and other BASMAA agencies to produce an integrated regional dataset, and participates in the BAMBI workgroup for implementing IBI development. ACCWP also sponsors annual BAMBI meetings and hosts a BAMBI webpage at http://www.bayareabugs,org

Brake Pad Partnership (BPP) brings together regulators, brake pad manufacturers, stormwater management agencies, and environmentalists to evaluate the effects of brake wear debris as a source of copper to the southern part of San Francisco Bay. The BPP's Action Plan, funded by a Proposition 13 grant, includes monitoring and fate and transport studies of copper deposited in watersheds and in SF Bay. ACCWP is an active partner in this effort; as part of Task MS-4.1, staff reviewed BPP products including workplans for watershed and Bay modeling, and refined estimates of copper loadings from brake-pad and non-brake sources. BASMAA also provides baseline funding for a stormwater program representative on the BPP Steering Committee. Website: http://www.suscon.org/brakepad/index.asp

Clean Estuary Partnership (CEP) is a collaboration between regulators and stormwater and municipal dischargers to conduct studies supporting TMDLs and other efforts to improve water quality in the Bay and its watersheds. ACCWP has provided annual contributions (Task MS-1.6) and in-kind staff services for BASMAA representation (Task MS-4.1). CEP partners have evaluated partnership effectiveness and agreed that future TMDL-related studies will be developed on an ad-hoc basis or through other programs such as the RMP and discharger groups. Major CEP products completed or in progress during FY05/06, which are particularly relevant to stormwater management concerns, include:

- Conceptual Model reports for individual Pollutants of Concern in San Francisco Bay, to update previous TMDL reports (CEP Projects #4.24 - Mercury; #4.25 - PCBs). Each report summarizes current knowledge and identifies gaps or issues to be considered during adaptive management of these pollutants as part of TMDL implementation.
- A report on potential strategies PCB reductions, to assist discussion and development of an Implementation Plan for the PCB TMDL (CEP Project #4.28). The report reviews the technical and regulatory framework for evaluating PCB sources and "hot spots", and options for municipalities to identify responsible parties and implement reductions in PCB loads.
- Resource documents describing potential stormwater program activities, effectiveness metrics and reporting intervals to be included in a Copper Management Strategy accompanying Site Specific water quality objectives for copper in San Francisco Bay (CEP Project #4.11). Potential source control activities focus on priority copper sources listed in a previous CEP review, for consideration in the Municipal Regional Permit (see below).

- A report on Urban Creeks Monitoring for pesticides and toxicity (CEP Project #4.39) to support adaptive management in accordance with the RWQCB's TMDL and Water Quality

Attainment Strategy (WQAS) for Diazinon and Pesticide-Related Toxicity in Urban Creeks. The CEP developed a monitoring plan that coordinates continuing monitoring by BASMAA programs to address the objectives of the TMDL/WQAS document (Ruby, 2006), and provided supplemental funds to fill gaps in existing monitoring programs for the FY04/05 season. The report includes ACCWP's ongoing stormwater sampling site at Castro Valley Creek (Task MS-1.3).

Website: http://www.cleanestuary.org

Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP) monitors San Francisco Bay for sediment and water quality and also tests for pollutant effects in selected biota. New special projects include initiating a network of monitoring stations on Bay Area refine understanding of watershed processes and loadings of pollutants of concern. The RMP is funded by regional NPDES dischargers, including ACCWP as specified in Provision C.8.b of the Order (Task MS-1.1). Website: http://www.sfei.org

Municipal Regional Permit (MRP) is currently being developed to replace the Order for ACCWP and other Bay Area Phase 1 stormwater programs. The following workplan assumes that the general objectives of ACCWP's monitoring and assessment activities will be unchanged through FY2006/07. Specific terminology, task organization and workplan details may change according to the final provisions of the MRP. Through Task MS-4.1, ACCWP staff have participated in preliminary Work Group drafting of the Monitoring element of the MRP, and will continue development of a companion guidance document for BASMAA. A public workshop process will produce further MRP drafts and a Tentative Order planned for Water Board consideration in late 2006. Website: http://www.waterboards.ca.gov/rwqcb2/mrp.htm

Table 1. Summary of current and planned activities according to ACCWP's Multi-Year Plan. (note: future activities subject to development of final proposed provisions for Municipal Regional Permit

Focus or MYP element	FY05 completed or ongoing	FY06 update	FY07 proposed*	FY08 conceptual plan*
Watershed Assessment (MYP Section IIC)				
Assessment planning	Detailed subplan, long-term workplan (WA-1.2)	Workplans for assessing Ward and Martin Canyon Creeks. (WA-1.2)	Initial planning for Zeile or Crandall watersheds	to be determined, subject to MRP
Physical characterization	Improve channel and riparian datasets (WA-1.1, 1.2)	Improve channel and riparian datasets (WA-1.1, 1.2)	Adapt procedures for field inventory of physical features, habitat (WA-1.1)	continuing GIS development (WA-1.1)
Physical characterization	Evaluate Sausal and Laguna data with GIS data, coordinate with SWAMP (WA-3.2)	Initiate Phase 1 rotating assessments for Ward and Martin Canyon, incorporate pilotnified Stream Assessment protocol (WA-1.1)	Initiate Phase 1 rotating watershed assessment for Zeile or Crandall; pilot additional field inventory procedures in field as needed (WA-1.1)	Continuing rotation (WA-1.1)
Biological indicators	2005 sampling and pilot temperature logging in Ward Creek; draft 4-year summary report (WA-2.1)	Updated workplan: continue sampling at selected long-term sites and Ward Creek; initiate sampling in Martin Canyon (WA- 2.1)	Continue sampling in Martin Canyon and selected long-term sites; begin sampling in Zeile or Crandall (WA-2.1)	Continuing rotation (WA-2.1)
Biological indicators	continue BAMBI participation & regional coordination (WA-2.1)	Participate in development of regional Index of Biological Integrity (WA-2.1, MS-1.5)	Apply IBI to existing data and coordinate with rotating watershed assessments (WA-2.1)	continuing (WA-2.1)
Water Quality screening	Draft 2 year summary report & revised plan (MS-1.4)	Begin sampling for new group of sites; temperature loggers in Martin Canyon (MS-1.4)	Continuing (MS-1.4)	continuing (MS-1.4)
Water Quality screening	Evaluate SOP's, coordinate assessment data with SWAMP (MS-1.5)	Revise design to coordinate with rotating watersheds and potential MRP priorities (MS-1.5)	to be determined, subject to MRP	to be determined
Human uses & health risk	Continuing (as WA-3.1)	Identify further priorities (WA-3.1)	Identify further priorities (WA-3.1)	to be determined
Human uses & health risk	Overview of contact recreation sites (WA-3.1-02)	Plan pilot monitoring or case studies as needed (WA-3.1)	continuing	to be determined
Integrate and present data	Castro Valley pesticide monitoring in CEP Urban Creeks report (MS-1.3, MS-1.6)	Complete bioassessment and water quality reports (WA-2.1, MS-1.4); initiate annual update for ongoing watershed assessments (WA-3.2)	Continue annual updates for ongoing watershed assessments. Other reporting to be determined (WA-2.1, WA-3.1, MS-1.4)	to be determined

Table 1 (continued)

Focus or MYP element	FY05 completed or ongoing	FY06 update	FY07 proposed*	FY08 conceptual plan*
Integrate and present data	Website updates including ACCWP members' site (WA-3.3)	Expand watershed assessment and monitoring pages (WA-3.3)	continuing (WA-3.3)	to be determined
Pollutants of Concern (MYP Section IID)				
Regional coordination	CEP and RMP (MS-1.1, 1.6, 4.1)	Continuing CEP and RMP participation (MS-1.1, 1.6, 4.1)	Continue RMP participation (MS-1.1, MS-4.1)	continuing (MS-1.1, MS-4.1)
Distribution & loading	Update memos on field study for TMDL pollutants and control options study (MS-1.2)	Draft report for field study of TMDL pollutants and sediment control options (MS-1.2)	Develop additional studies as needed, subject to TMDL priorities and MRP (MS-1.2, MS-3.1)	to be determined
Source ID or case studies	Support Oakland's Ettie Street PCB abatement project (WA-3.2)	Supplemental sampling for Ettie Street priority sites (WA-3.2).	Conduct additional studies as needed (MS-3.1)	
Source ID, case studies	Supplemental sampling for Ettie Street priority sites (WA-3.2).	Design sediment study in San Leandro Creek(MS-2.1)	Conduct sediment study (MS-2.1)	to be determined
Identify and test source controls	Field sampling for TMDL pollutants and sediment control options (MS-1.2)	Field sampling completed; regional studies coordination meeting (MS-1.2)	To be determined, subject to TMDL priorities and MRP (MS-1.2)	to be determined
Track trends	Baseline stormwater monitoring with added CEP funding (MS-1.3)	Continuing, including QA/QC tests (MS-1.3)	Continuing (MS-1.3)	Continuing (MS-1.3)
Best Management Practices (MYP Section IIE)				
Evaluation of effectiveness	CEP Project 4.12 literature review and report summarizing available knowledge (MS-4.12)	Support BASMAA participation in Advisory group for follow-up SFEI Demonstration BMP project (MS-4.1)	Continuing.	Continuing.
Evaluation of effectiveness	TMDL pollutants and sediment controls field study (MS-2.1)	Regional discussion and coordination meeting, development of MRP framework and companion guidance for BASMAA (MS-4.1)	To be determined subject to MRP	To be determined

2. DETAILED WORKPLAN FOR FISCAL YEAR 2005/06

This section lists component tasks that are planned or underway with ACCWP funds authorized for Watershed Assessment and Monitoring components in FY2004/2005, followed by an updated budget in Table 2. Names of responsible parties for the "Lead" column in the budget are abbreviated as follows:

District = Alameda County Flood Control and Water Conservation District (Program representation and administration)
AMS = Applied Marine Sciences, Inc. (technical consultant)
BH = Balance Hydrologics, Inc.
EOA = Eisenberg, Olivieri & Associates Inc. . (technical consultant)
GC = GeoSyntec Consultants
NGEM = Northgate Environmental Management, Inc.
URS = URS Corporation. (technical consultant)
Tbd = to be determined

Watershed Assessment

Task WA-1: Develop and maintain a GIS-based resource for watershed information.

WA-1.1 **Watershed Inventory:** Continue refinement of inventory data for channel condition and riparian zone characterization, and coordinate with mapping needs for the Final HMP. Begin Phase I of rotating watershed assessment in Ward Creek and Martin Canyon Creeks, by reviewing available information and conducting additional reconnaissance activities. .

Objective: Provide base GIS layers for watershed assessment activities, and develop more detailed data and assessment for specific priority watersheds.

WA-1.2 **Watershed assessment planning:** Complete a detailed long-term Watershed Assessment Work Plan incorporating a three-year cycle for assessing individual watersheds. Each rotation will include an initial reconnaissance phase resulting in a monitoring design appropriate to the watershed, followed by data collection and development of a final assessment report integrating both quantitative and qualitative information obtained from available sources.

Objective: Ongoing coordination and planning of watershed assessment.

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds.

WA-2.1 **Indicators of Creek Health:** Continue sampling benthic macroinvertebrate communities at selected long-term sites in Sausal, San Lorenzo and Mission-Laguna watersheds, continue Year 2 of sampling in Ward Creek and begin the first year of sampling for Martin Canyon Creek. Complete summary report for 2001-2005, and review of fisheries resource information. Sponsor fifth annual BAMBI meeting and participate in workgroup for IBI development. participate in conversion of ACCWP data to SWAMP-compatible standards and regional development of an Index of Biological Integrity for Bay Area streams.

Objective: Develop and test indicators of general watershed condition.

WA-2.2 **Watershed Projects Support:** Facilitate communications with community members and groups to work with ACCWP members and other agencies on volunteer monitoring and other watershed-based projects. Includes coordination and referral to other regional resources such as the Watershed Project, Alameda County Watershed Forum and East Bay Watershed Center at Merritt College.

Objective: Increase the participation of community stakeholders in watershed stewardship and assessment, and improve coordination of volunteer groups with agencies and other stakeholders.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders.

WA-3.1 **Indicators for Contact Recreation:** Complete draft guidance for municipal staff and local creek or community groups on monitoring and interpretation of coliform or other indicators of human health risk at sites with light contact recreation, incorporating previous reviews of existing literature and data Identify possible strategies for improved monitoring of pathogen-related risk and support local or pilot projects for monitoring with appropriate indicators. Develop preliminary list and map of locations with extensive contact recreation.

Objective: improve ability to assess risks to human health from light (non-swimming) contact recreation or activity in creeks.

WA-3.2 **On-Call Watershed Support:** Develop menu of approaches to geomorphic assessment of streams, and evaluate potential applications for watershed assessment;

Objective: Support watershed assessment and watershed management efforts by Program and member agencies.

WA-3.3 **Website Support:** Provide updates to existing ACCWP website and implement special members' pages to support and enhance internal Program communications. Une enhanced document management capabilities to develop expanded "watersheds"

section of ACCWP website and provide maps, links and other information for local watersheds.

Objective: Disseminate information about Alameda County watersheds and background on local watershed issues.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern that are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP).

Objective: Comply with Regional Board requirements and assist with the accomplishment of the RMP's objectives to provide regional characterization of pollution in the Bay.

MS-1.2 **TMDL monitoring and implementation:** Conduct further field sampling for follow-up study to refine desktop estimates of effectiveness of existing sediment management practices in reducing or avoiding loads of Pollutants of Concern from urban runoff (Salop and Akashah, 2004). Complete sampling of wastes removed from routine drop inlet cleaning, street sweeping and desilting of flood control channels and prepare draft report evaluating the potential of these practices for increasing the rate of removal for PCBs and mercury to address TMDL load reductions proposed for stormwater programs. Archive additional replicates of sediment samples for potential further analyses.

Objective: Characterize watershed occurrences of pollutants of concern and fill information needs for ACCWP implementation of TMDLs and other water quality attainment strategies.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper and diazinon during at least five storm events in Castro Valley Creek, including special coordination with pesticide and/or toxicity monitoring recommended in the CEP Urban Creeks Monitoring Plan.

Objective: assess long-term trends in selected Pollutants of Concern in creeks as recommended in draft monitoring plan (Gunther et al., 2003).

MS-1.4 **Water quality screening and miscellaneous monitoring:** Complete a 2-year interpretive report on semiannual screening for basic water quality chemistry and selected pollutants at 10-15 sites distributed among different creek and channel types. Pilot deployment of continuous temperature loggers in conjunction with

macroinvertebrate sampling sites. Develop revised strategies for future screening design in coordination with rotating watershed assessments and discussions for the MRP.

Objective: Provide general assessment of water quality conditions in Alameda County stream reaches.

MS-1.5 **Data Management and planning support:** Continue updating of field SOPs for water quality screening. Coordinate discussion of data formats and database management exchange with SWAMP, BASMAA and other ACCWP partners.

Objective: Improve documentation and planning for ACCWP pollutant monitoring, and enhance coordination of regional data collection.

MS-1.6 **Clean Estuary Partnership:** Contribution to CEP as provided in MOU between BASMAA, BACWA, WSPA and Regional Board.

Objective: Support CEP activities for controlling pollutants of concern including problem identification, characterization, linkage studies and development of implementation plans for source control and/or abatement.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs.

MS-2.1 **Pollutant source investigations:** Plan a study of bedded sediment in Lower San Leandro Creek, to characterize spatial and temporal variation in local concentrations of mercury, PCBs and other Pollutants of Concern. Study design will include a qualitative review of physical transport processes potentially affecting these variations in the channel and review of potential upland sources in the watershed.

Objective: characterize details of distribution and impacts for Pollutants of Concern, and/or test hypotheses concerning their fate and transport.

MS-2.2 **Studies supporting implementation of New Development permit provisions:** Provide coordination and technical management of projects supporting implementation of the HMP and other new requirements related to provision C.3 of the Order. (Note: most of this development activity is funded by a separate special budget authorized by the ACCWP Management Committee).

Objective: provide technical information needed to support implementation of design standards for New and Re-Development as required in NPDES permit.

Task MS-3: Provide technical information on management issues involving urban runoff.

MS-3.1 **Unspecified special studies:**

Objective: Address data gaps or management issues concerning pollutants of concern and urban runoff impacts.

MS-3.2 **On-Call Technical Support:** Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts.

MS-4.1 **Coordinate with RMP, BASMAA and CEP** Chair BASMAA Monitoring Committee meetings, represent BASMAA in CEP Technical Committee and workgroup meetings as needed, participate in RMP technical review and other special purpose technical or stakeholder discussions such as the Brake Pad Partnership. Includes review of technical studies, discussion of implementation strategies to address load reductions for specific TMDL pollutants, and participation in BASMAA's review with SFEI of their Proposition 13-funded project for "Regional Stormwater Monitoring and Urban BMP Evaluation". Also includes representing BASMAA in Monitoring Work Group for development of proposed MRP provisions, and helping develop guidance for BASMAA agencies in implementing future permit provisions for monitoring and assessment.

Objective: maximize effective use of resources through coordination of effort among BASMAA member agencies, the RMP and the CEP.

Table 2. FY 2005/2006 Watershed Assessment and Monitoring Tasks and Budget Update

Task #	Description	FY 05/06 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory	$50,000	EOA/District
WA-1.2	Watershed assessment planning	$15,000	EOA/District
WA-2.1	Indicators of Creek Health	$26,000	AMS/District
WA-2.2	Watershed Projects Support	$3,000	District
WA-3.1	Indicators for Contact Recreation	$12,000	AMS/District
WA-3.2	On-Call Watershed Support	$24,000	BH/District
WA-3.3	Website Support	$15,000	AMS/District
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$155,000**	
Monitoring & Special Studies			
MS-1.1	RMP fee	$160,000	n/a
MS-1.2	TMDL monitoring/implementation	$55,000	AMS/GC/ District
MS-1.3	Baseline trend monitoring	$50,000	District
MS-1.4	Water quality screening, misc. monitoring	$25,000	District/AMS
MS-1.5	Data management and planning support	$10,000	AMS/District
MS-1.6	Clean Estuary Partnership contribution	$100,000	n/a
MS-2.1	Pollutant source investigations	$45,000	AMS
MS-2.2	Studies supporting New Dev. provisions	$10,000	AMS/District
MS-3.1	Unspecified special studies	$22,000	URS/tbd
MS-3.2	On-Call Technical Support	$10,000	AMS/NGEM
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$35,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$27,000	District
	Component Total	**$569,000**	

3. PROPOSED WORKPLAN FOR FISCAL YEAR 2006/2007

Watershed Assessment

Task WA-1: Develop and maintain a GIS-based resource for watershed information.

WA-1.1 **Watershed Inventory:** Review and adapt protocols for data collection of physical and habitat information and indicators of urban impact on streams, for further use in rotating watershed assessments. Continue development of GIS data.

WA-1.2 **Watershed assessment planning:** Adapt subplan for rotating watershed assessment as needed for a new waterbody at next level of approved priority list: either Zeile or Crandall Creek. Coordinate long-term watershed assessment with proposed requirements for new Municipal Regional Permit, as they become available.

Task WA-2: Use a variety of indicators to assess the condition of streams and watersheds.

WA-2.1 **Indicators of Creek Health:** Continue benthic macroinvertebrate sampling in long-term streams and complete Year 2 in Martin Canyon. Begin Year 1 sampling in next rotating watershed (either Zeile or Crandall Creek). Continue work with BAMBI projects and regional partnership activities.

WA-2.2 **Watershed projects assistance:** Continue supporting community members and groups partnering with ACCWP members and other agencies on volunteer monitoring and other watershed-based projects. Includes coordination and referral to other regional resources.

Task WA-3: Provide useful watershed information to the Program and other watershed stakeholders.

WA-3.1 **Indicators for Contact Recreation:** Distribute guidance to assist municipal staff and local creek or community groups in managing local sites for light contact recreation. Work with co-permittees and other stakeholders to pilot additional monitoring or case studies at light contact sites.

WA-3.2 **On-Call Watershed Support:** Provide guidance and technical support for watershed-based management activities by Program, copermitteees and local groups. Identify priorities and potential watersheds for additional support.

WA-3.3 **Website Support:** Incorporate watershed indicator data and other creek information in new watersheds section of ACCWP website. Identify additional approaches for making monitoring and assessment data available in Web format.

Monitoring and Special Studies

Task MS-1: Characterize and track pollutants of concern that are found in urban runoff and have been identified as possible sources of impairment.

MS-1.1 **RMP contribution:** Contribution for required participation in the Regional Monitoring Program for Trace Substances in the San Francisco Estuary (RMP).

MS-1.2 **TMDL monitoring and implementation:** Develop or participate in additional studies, subject to priorities set by regional TMDLs and/or proposed provisions in MRP.

MS-1.3 **Baseline trend monitoring for Pollutants of Concern:** Continue stormwater monitoring for copper and diazinon in Castro Valley Creek, attempting to sample at least 5 storm events and including additional QA/QC tests. Diazinon and/or toxicity monitoring will be coordinated with regional monitoring recommendations of the CEP Urban Creeks Monitoring Plan.

MS-1.4 **Water quality screening and miscellaneous monitoring:** Establish revised waterbody list for screening and implement revised monitoring design..

MS-1.5 **Data Management and planning support:** Continue participation in regional coordination of data formats and application of joint macroinvertebrate dataset. to test and refine the Bay Area Index of Biological Integrity.

Task MS-2: Evaluate the effectiveness of urban runoff BMPs.

MS-2.1 **Pollutant source investigations:** Conduct sediment investigation in San Leandro Creek..

Task MS-3: Provide technical information on management issues involving urban runoff.

MS-3.1 **Unspecified special studies:** Conduct special studies as needed, subject to available funds.

MS-3.2 **On-Call Technical Support:** Miscellaneous technical support as needed.

Task MS-4: Coordinate planning and reporting with related monitoring efforts.

MS-4.1 **Coordinate with RMP, BASMAA and CEP** Continue to chair BASMAA Monitoring Committee meetings, represent BASMAA in MRP Work Group and other regional discussions as needed,

Table 3. FY 2006/2007 Watershed Assessment and Monitoring Tasks and Budget

Task #	Description	FY 06/07 Budget	Lead
Watershed Assessment			
WA-1.1	Watershed Inventory	$50,000	EOA/District
WA-1.2	Watershed assessment planning	$15,000	EOA/District
WA-2.1	Indicators of Creek Health	$26,000	AMS/District
WA-2.2	Watershed projects assistance	$3,000	District
WA-3.1	Indicators for Contact Recreation	$12,000	Tbd
WA-3.2	On-Call Watershed Support	$4,000	Tbd
WA-3.3	Website Support	$10,000	District/Tbd
WA-4.1	Reporting/component management	$10,000	District
	Component Total	**$130,000**	
Monitoring & Special Studies			
MS-1.1	RMP estimated fee	$165,000	n/a
MS-1.2	TMDL monitoring/implementation	$60,000	AMS/Tbd
MS-1.3	Baseline trend monitoring	$50,000	District
MS-1.4	Water quality screening, misc. monitoring	$20,000	District/AMS
MS-1.5	Data management and planning support	$10,000	AMS/District
MS-2.1	Pollutant source investigations	$50,000	AMS/Tbd
MS-3.1	Unspecified special studies	$0	Tbd
MS-3.2	On-Call Technical Support	$8,000	Tbd
MS-4.1	Coordinate w/RMP, BASMAA and CEP	$35,000	District
MS-5.1	WAMS Support	$20,000	District
MS-5.2	Reporting/component management	$27,000	District
	Component Total	**$445,000**	

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2004

City of San José
Urban Runoff Management Plan

Prepared by the
Environmental Services Department
September 2004

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

City of San José
Urban Runoff Management Plan
2004

Chapter 11: The Santa Clara Valley Urban Runoff Pollution Prevention Program

Prepared by the
Environmental Services Department
Watershed Protection Division
Urban Runoff Section
September 2004

Certification Statement

City of San José
URBAN RUNOFF MANAGEMENT PLAN
UPDATED SEPTEMBER 1, 2004

Certification Statement

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature by Duly Authorized Representative:

for RANDOLPH A. SHIPES
Deputy Director
Environmental Services Department
Watershed Protection

Acknowledgements

The City of San Jose's Urban Runoff Management Plan is a true interdepartmental effort. Our continued success is built upon the cooperation of hundreds of City employees. The future success of this plan will only be possible with the commitment and hard work of the following departments:

Department of Public Works

Department of Transportation

Department of Planning, Building and Code Enforcement

Department of Parks, Recreation, and Neighborhood Services

Department of Conventions, Arts, and Entertainment

Department of Finance

Environmental Services Department

General Services Department

San Jose International Airport

The Office of the City Attorney

The Redevelopment Agency of the City of San Jose

and

The Office of the City Manager

Preface

In February 2001, the San Francisco Bay Regional Water Quality Control Board (RWQCB) re-issued the City of San José's (City) National Pollutant Discharge Elimination System municipal separate storm drain systems permit[1] for the discharge of stormwater to local waterbodies. The permit was issued jointly to the Co-permittees of the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program); the Co-permittees include 12 other cities of northern Santa Clara County, the County of Santa Clara, and the Santa Clara Valley Water District.

The permit requires the submittal of an Urban Runoff Management Plan (URMP). The latest iteration was last submitted to Water Board in March 2002. The permit further requires that the City submit a compilation of all revisions to the URMP by September 1, 2004. This URMP has been prepared to fulfill the City's requirement for the revised plan submittal and is Chapter 11 of the Program-wide URMP.

The URMP identifies implementation activities that will be undertaken by various City Departments to comply with the federal and state requirements of the stormwater permit. These Program Elements address specific permit provisions (so called "C" Provisions 1-9). Key Program Elements, including Industrial and Commercial Inspection, Illicit Connection and Illegal Dumping, New and Redevelopment Planning Procedures, and Construction Inspection, have related Performance Standards[2] that define the level of effort needed to demonstrate control of stormwater discharges to the "maximum extent practicable."

The URMP guides implementation of permit requirements in the following ways:

1. incorporating Performance Standards into the City's implementation efforts;
2. updating the City's program strategy to ensure that municipal activities meet these Performance Standards; and
3. serving as a workplan to identify tasks, deliverables, and target dates for City programs.

The current permit stresses documentation of effort and effectiveness evaluation. To comply with this requirement, each set of Performance Standards has related milestones, a five-year workplan with targeted completion dates, and identification of responsible City Department(s). This structure allows the City to document actions and elicit the feedback needed to fulfill the continuous improvement process contemplated by the permit.

This feedback loop is completed through the Annual Reporting process that details milestone accomplishments during the reporting period and serves to update the City's

[1] NPDES Permit Number CA S029718, Water Board Order No. 01-024, adopted on February 21, 2001.

[2] Performance Standards are set forth for municipal activities that have the potential to affect the quality of stormwater discharged into the storm drain collection system, i.e., New Development Planning procedures; Construction Inspection procedures; Public Streets, Roads and Highways Operation and Maintenance (O&M); Storm Drain System O&M; Industrial and Commercial Inspections; Illicit Connections and Illegal Dumping; Water Utility O&M, and Public Information and Participation. The assumption is that its ownership and responsibility for system operation and maintenance places the municipality in the best position to control inputs to the system.

URMP workplan over the period of the permit. The Co-permittee Annual Report serves as both an internal and external check on planned activities such that the City may evaluate its use of program funds, target resources, and improve integration of the program with evolving watershed planning efforts.

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1. Background

The City of San José (City) has been charged with preserving one of the most important estuaries in the United States alongside a socially and economically complex urban community. Some of the strategies the City has developed to meet this challenge, along with a detailed description of the community framework, are presented below.

A. Community Setting

Located at the southern end of San Francisco Bay, San José encompasses much of eastern Santa Clara Valley (Valley). Framed by the Santa Cruz mountains to the southwest and the Diablo Range to the east, San José contains broad expanses of both valley floor and steep hillsides. From the adjacent hills, a number of perennial and intermittent streams flow northward through the valley to South San Francisco Bay (South Bay). These streams and most of San José are within the Coyote Creek Watershed and the Guadalupe River Watershed[3]. The Coyote Creek Watershed includes the following streams:

- Upper and lower Penitencia Creek from the Diablo Range,
- Silver Creek, also from the Diablo Range, and
- Fisher Creek flowing from the west side of the Coyote Valley.

The Guadalupe River Watershed drains the southwestern side of the Valley. Los Gatos and Alamitos Creeks flow from the Santa Cruz Mountains into San José's downtown via the Guadalupe mainstem.

Over the last fifty years, San José has grown from a farming community to the largest city in northern California and the eleventh largest city in the nation. The relatively rapid shift from an agricultural economy to its current diverse manufacturing and residential base has brought major changes to the area's rivers and creeks. Urbanization has meant significant hydrologic modifications to the watershed. Streams have been filled, culverted, and channelized. As more impervious parking lots, roads, and rooftops were built, riparian vegetation was removed to accommodate increasing flows and runoff levels.

B. Growth Pattern

Understanding San José's growth and land use patterns provides insight into the complexities of managing urban runoff. Between 1950 and 2000, San José's population saw a nine-fold increase, as shown in Figure 1. The City of San José encompasses 113,750 acres, of which approximately 89,000 acres are within the Urban Service Area (USA).

To manage growth, the City instituted an "Urban Service Area" (USA) concept in its *General Plan '75*. Under the USA concept, urban services, including storm sewers, are provided to properties within the USA but not outside it. As a result, more recent

[3] Hydrological areas 205.30 and 205.40, respectively.

residential developments have been confined to the lower foothills, infill encouraged, and light industry "campuses" channeled into two main zones in the north and south, along major freeway corridors. The City of San Jose's land use patterns are presented in Table 1, including vacant land which accounts for approximately 5.3% of the total land area.

Figure 1. San Jose Population Growth

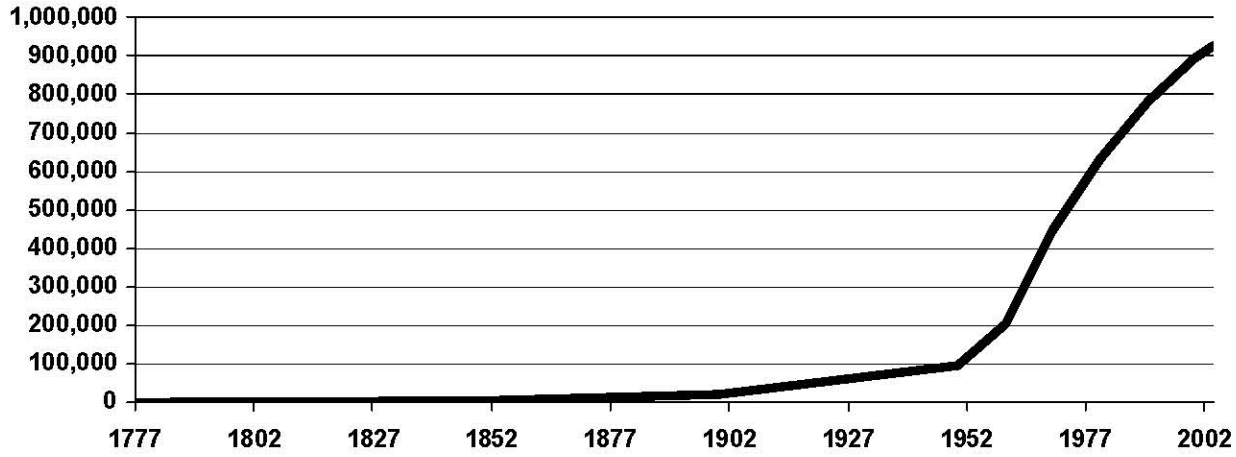

Table 1. San Jose Incorporated Area by Land Use

Land Use Category	Land Area, Acres (approx)	Percent of Total
Residential		
Single-Family	30,500	26.8%
Multi-Family	5,500	4.8%
Two-Family	2,000	1.8%
Mobile Home	750	0.7%
Subtotal	38,750	34.1%
Non-Residential		
Industrial	11,000	9.7%
Commercial	4,000	3.5%
Subtotal	15,000	13.2%
Other		
Roadways	17,500	15.4%
Hillsides/Open Space[1]	17,500	15.4%
Baylands/Wildlife Refuge[1]	8,500	7.5%
Parks	6,500	5.7%
Vacant	6,000	5.3%
Schools	4,000	3.5%
Subtotal	60,000	52.7%
Total	**113,750**	**100.0%**

[1]Category delineated July, 2004 and not within USA.

Runoff from urban uses typically flows untreated to storm drain inlets and is conveyed to the nearest stream or open channel through an outfall. San José has approximately 28,000 storm drain inlets, 935 miles of storm drain lines and 1,130 outfalls throughout its urban service area.

The historic and current growth patterns create several challenges and opportunities for urban runoff management; they include:

a) The older storm drain system infrastructure is located in San José downtown, along the lower mainstream of the Guadalupe, where flows are most often concentrated during storm events. Undersized and aging storm drains can result in additional maintenance costs and problems during large rainfall events.

   A program that addresses storm drain infrastructure needs as well as maintenance is key to protecting and maintaining the lower reaches of the Guadalupe River.

b) A large proportion of the housing stock, industrial and commercial development, and transportation infrastructure was constructed in an era when the impacts of urban runoff on watercourses and aquatic habitats were not a concern. Consequently, the storm drain system was designed to convey stormwater with a maximum of efficiency, but without any knowledge of modern environmental considerations.

   An aggressive public education program that encompasses pollution control practices designed for the general public is key to curtailing contamination from entering the storm drains.

c) Current development and future new development provide an excellent opportunity to apply pollution prevention practices during the planning and design phases of the project. This will help minimize or eliminate urban runoff during construction and after the project is complete.

C. "General Plan" Policies

To ensure that the community's vision is achieved, the City has also adopted, in its *San José 2020 General Plan*[4], goals and policies aimed at land use and future development. Several of the Plan's major goals are designed to protect the watershed resources within San José, including:

> *Riparian Corridor and Upland Wetland Protection: Preserve, protect and restore riparian corridors and upland wetlands.*
>
> *Bay and Baylands Protection: Preserve and restore natural characteristics of the Bay and adjacent lands, and recognize the role of the Bay's vegetation and water area in maintaining a healthy regional ecosystem.*
>
> *Hillside Development: Preserve the valuable natural resources of the hillsides.*

[4] *San José 2020 General Plan*, August 1994. City of San José, Planning, Building and Code Enforcement Department.

Soils and Geologic Conditions: Protect the community from the hazards of soil erosion, weak and expansive soils and geologic instability.

Urban Design: Require the highest standards of architectural and site design, and encourage the use of "Green Building" techniques for all development projects, both public and private.

Water Resource Protection: Protect water resources because they are vital to the ecological and economic health of the region and its residents.

The General Plan provides a framework from which land use policies and ordinances are developed and implemented. The General Plan is updated annually and policies and ordinances are revised or created based on needs identified through this annual process. The URMP implementation process provides a channel to gather information and identify needed land use and/or development policies and ordinances that need to be considered as part of General Plan updates and implementation processes. The URMP Annual Reporting process requires analysis of the City's performance on Program Elements contained herein. This analysis allows the City to identify problem areas and sources and propose solutions that can be linked back to policies and procedures carried out by other departments such as Planning, Building and Code Enforcement.

D. Stormwater Management in San Jose

When the stormwater management program began nearly 15 years ago, little was known or understood about how such a program might work. The City and its co-permittees were among the first cities in the nation to be permitted. The initial approach centered on collecting existing data and coordinating existing municipal activities. The City's Urban Runoff Management program has since evolved into a driver for a number of City activities and area-wide programs.

D-1. The Permit Landscape

The City along with the 12 other municipalities in Santa Clara County, the Santa Clara County, and the Santa Clara Valley Water District (SCVWD) applied for, and were jointly issued, the first Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit in 1990[5] issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB or Water Board). To coordinate permit compliance, the co-permittees entered into a Memorandum of Agreement[6] (MOA), establishing the Santa Clara Valley Nonpoint Source Pollution Control Program (the "Program," now known as the Santa Clara Valley Urban Runoff Pollution Prevention Program) in 1990. The Program submitted the first draft Stormwater Management Plan[7] (SWMP) in 1991, as a means to fulfill permit requirements.

[5] Regional Water Quality Control Board Order No. 90-094, issued on June 20, 1990

[6] The City Council approved entering the MOA on September 5, 1989, effective upon issuance of the permit. Formal MOA approval came on June 26, 1990.

[7] Draft submitted to the RWQCB January 1, 1991. *Stormwater Management Plan*. Santa Clara Valley Nonpoint Source Pollution Control Program.

The 1991 SWMP contained programs for area-wide and individual discharger implementation of control measures. The area-wide SWMP was administered by the Program and contained a variety of activities such as monitoring, model ordinance development, industrial discharger identification, pilot studies, and public education that were considered most effective if undertaken on a regional level. At that time, the City entered into an agreement, which is still in effect, to provide the Program with 30% of its budget.

The City's 1991 SWMP[8] focused on developing organizational capacity to implement control measures that could be most appropriately carried out at the municipal level. These control measures included:

a) establishing an illicit connection and illegal dumping elimination program aimed at strengthening and enforcing regulations to control littering, improper connections to storm drains, and cross connections to the sanitary sewer system;

b) initiating an inspection and permitting program focused on targeted industries;

c) implementing public agency programs that would establish the frequency of catch basin cleaning, provide programs for disposal of oil and hazardous waste, and curbside yard debris pick-up programs; and

d) public awareness campaigns such as storm drain inlet stenciling, and oil and waste recycling fact sheets.

The second SWMP was submitted in 1995 as the permit application for the second round permit issued in August 1995.[9] This SWMP contained a commitment to develop Performance Standards for each Control Measure or Program Element required in the permit.

D-2. URMP Development 1997

With the issuance of the second NPDES permit in 1995, the City was required to submit an updated plan detailing the following basics:

- programs that would be implemented;
- Performance Standards to establish a level of effort for program activities; and
- a work plan with a schedule for completion.

The purpose of this document is to fulfill the above requirements. It is titled the Urban Runoff Management Plan (URMP) and serves as a perpetual work plan for all of the City-committed responsibilities. The URMP will be updated in the co-permittee Annual Report every September. The Annual Report will detail accomplishments, lessons learned, and needed work plan revisions to ensure compliance with the terms of the NPDES permit for the applicable reporting period.

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[8] City of San Jose's Program was included in final submittal to the RWQCB: *Addendum to Draft Stormwater Management Plan: Summary of Community Specific Activities*, coordinated by the Santa Clara Valley Nonpoint Source Pollution Control Program.

[9] SFRWQCB Order No. 95-180 issued August 23, 1995 to the Santa Clara Valley Nonpoint Source Pollution Control Program and the municipalities as co-permittees.

D-3. URMP Development 2002 to Present

With the issuance of the third NPDES permit in 2001[10], the City continued its previous reporting requirements and the purpose of the URMP remained as stated above. The URMP was updated in 2002 to address new Program Elements contained in the permit in addition to new or revised performance standards. Such updates covered pesticide management, mercury, PCBs, dioxin, and construction inspection enhancements.

Subsequent URMP revisions are detailed in this submittal. They include new or revised performance standards for New and Redevelopment Planning Procedures and to address Rural Public Works. Revised or new SOPs have also been included for a host of program elements to conform to the revised performance standards and reflect current business practices.

[10] SFBRWQCB Order No. 01-024 adopted February 21, 2001 to the Santa Clara Valley Urban Runoff Pollution Prevention Program and the municipalities as co-permittees and issued March 28, 2001.

2. Components

This section addresses format and contents of the URMP, the City organizational structure, internal and external coordination of the various Program Elements, other related programs, program assessment, and budget allocation.

A. Format and Contents

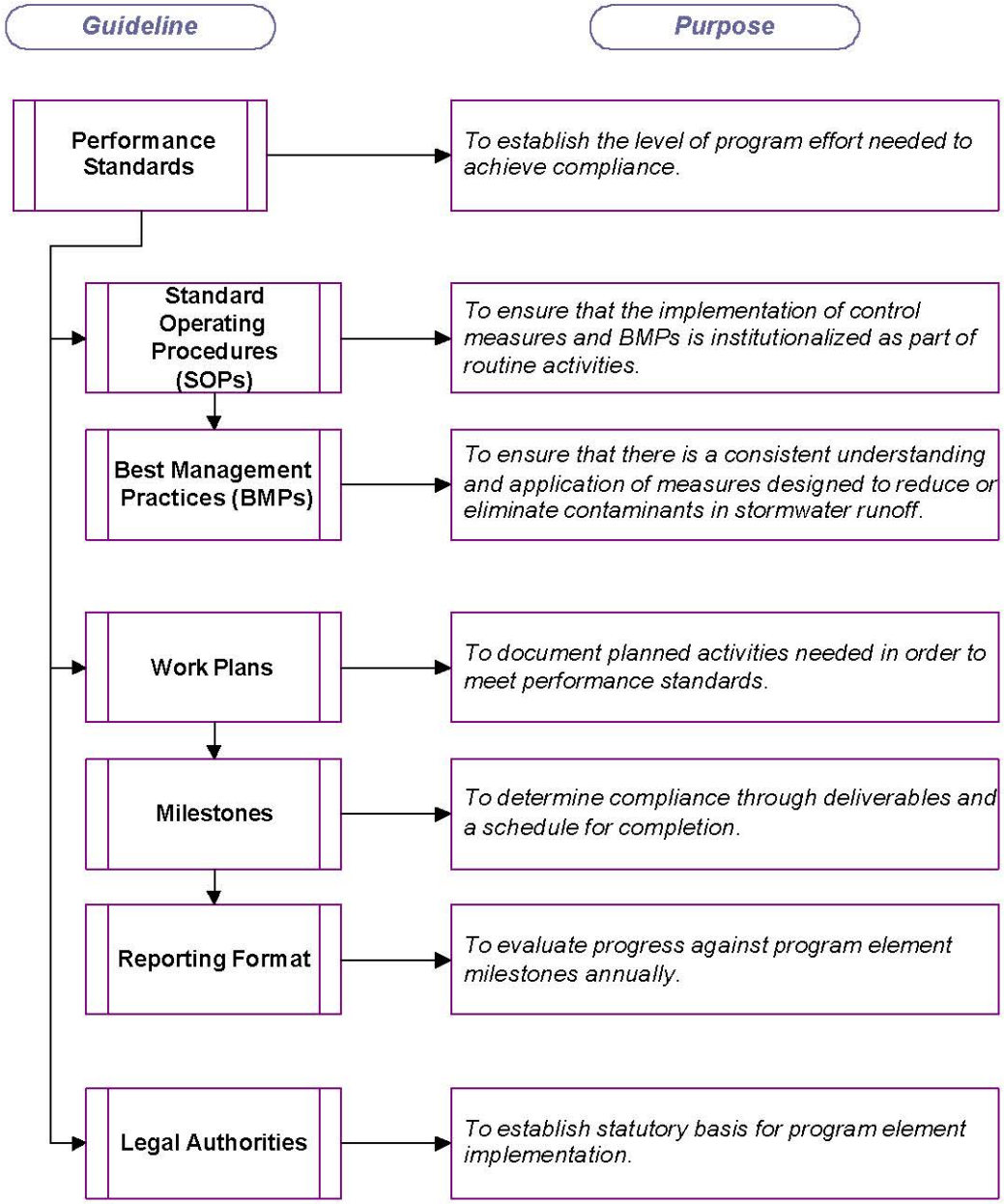
The URMP contains several Program Elements (also referred to as Control Measures); they are listed below and described in section B:

1. Illicit Connection/Illegal Dumping
2. Industrial/Commercial Discharges
3. New and Redevelopment
4. Construction Inspection
5. Public Streets, Roads & Highways Operations & Maintenance
6. Storm Drain System Operations & Maintenance
7. Water Utilities Operations & Maintenance
8. Pesticide Management
9. Mercury
10. Copper & Nickel Action Plans
11. Trash
12. Monitoring
13. Municipal Compliance
14. Public Information & Participation

Each Program Element follows a set of guidelines, as illustrated in the URMP Program Element Flowchart. For applicable elements, the Performance Standard associated with a Program Element is used as the basis for determining permit compliance. Other elements are driven by permit language. A Performance Standard is defined as *"the level of implementation necessary to demonstrate the control of pollutants in storm water to the maximum extent practicable."*

Each set of Performance Standards has related workplan tasks, a schedule of deliverables, and targeted completion dates. This structure allows the City to document actions and elicit feedback needed to fulfill the continuous improvement process contemplated by the permit. This feedback loop is completed through the annual reporting process that details milestone accomplishment during the reporting period.

Figure 2. URMP Program Element Flowchart



B. Coordination

ESD's Watershed Protection Division provides oversight of the stormwater permit and coordinates activities across departments. Individual Program Elements are implemented in those City Departments where existing responsibilities are consistent with the work that is required. For each Program Element, there is a lead group responsible for achieving the Performance Standard and meeting the associated "Milestone(s)." The

internal (City) and external (outside agencies) coordination process for the various Program Elements is illustrated in Table 2 and described below.

Table 2. URMP Coordination – City of San Jose

Program Element	Departments or ESD Sections	Outside Agencies/Organizations
1. Illicit Connection/Illegal Dumping	*ESD Watershed Enforcement* *Hazardous Incidence Team, Fire Dept* *Department of Transportation* *Planning, Building & Code Enforcement*	*Santa Clara Valley Water District* *Regional Water Quality Control Board* *Santa Clara County DA's Office* *Department of Fish & Game* *CA Dept of Motor Vehicles*
2. Industrial/Commercial Discharges	*ESD Watershed Enforcement* *Hazardous Incidence Team, Fire Dept* *ESD Source Control*	
3. New and Redevelopment	*Planning, Building & Code Enforcement* *Public Works* *Redevelopment Agency* *ESD Watershed Enforcement*	
4. Construction Inspection	*Public Works* *Planning, Building & Code Enforcement* *ESD Watershed Enforcement*	
5. Public Streets, Roads & Highways Operations & Maintenance	*Department of Transportation* *General Services* *Parks, Recreation & Neighborhood Services*	
6. Storm Drain Operations & Maintenance	*Department of Transportation* *Department of Public Works*	
7. Water Utilities Operations & Maintenance	*ESD Municipal Water*	
8. Pesticide Management	*General Services* *Department of Transportation* *Public Works* *Parks, Recreation & Neighborhood Services*	*SCVURPPP*
9. Mercury	*General Services* *ESD Integrated Waste Management* *ESD Marketing & Communications*	*SCVURPPP* *Clean Estuary Partnership* *Santa Clara County Household Hazardous Waste Program*
10. Copper & Nickel Action Plans	*ESD Marketing & Communications* *ESD Watershed Enforcement* *Planning, Building & Code Enforcement*	*South Bay POTWs* *SCVURPPP*
11. Trash	*Department of Transportation* *Parks, Recreation & Neighborhood Services* *General Services* *ESD Integrated Waste Management*	*SCVURPPP* *Santa Clara Valley Water District*
12. Monitoring		*SCVURPPP*
13. Municipal Compliance	*Department of Transportation* *General Services*	
14. Public Information & Participation	*ESD Marketing & Communications*	*SCVURPPP* *BASMAA, BAPPG, WMI*

B-1. Illicit Connections/Illegal Dumping (ICID)

The purpose of this Program Element is twofold:

- identifying and eliminating illicit connections to the storm drain system and cross-connection to the sanitary sewer system; and
- prevention, detection, and clean-up of illegal discharges and dumping into the storm drains and streams.

Implemented by ESD's Watershed Enforcement, the section has two full-time staff equivalents and maintains special internal arrangements for response to spills and containment of illegal dumping incidents with the following City Departments:

a) Fire Department's Hazardous Incidence Team, and
b) Department of Transportation.

Enforcement staff consults with the Planning Division of the Department of Planning, Building and Code Enforcement for identification of legal code-conforming solutions to existing illicit connections.

The Division routinely coordinates with the following outside agencies:

a) Santa Clara Valley Water District;
b) Regional Water Quality Control Board;
c) Santa Clara County District Attorney's Office - Environmental Crimes Unit and the Office of Toxics Enforcement;
d) Department of Fish and Game; and
e) State Department of Motor Vehicles (DMV).

B-2. Industrial/Commercial Discharges (IND)

This Program Element is designed to assess the compliance of San José businesses with federal, state, and local regulatory requirements regarding discharges to the storm drain system. The Watershed Enforcement section takes the lead in conducting this program. Enforcement inspectors inspect more than 2,500 businesses throughout the City per year. Enforcement has ten full-time inspectors performing inspections of a wide variety of companies with the potential to impact the storm sewer system. These include companies required to file a Notice of Intent (NOI) and prepare Storm Water Pollution Prevention Plans (SWPPPs) under federal and state law per the General Industrial Activity Stormwater Discharge Permit (GIASP) and those businesses not subject to specific permit requirements in targeted Standard Industrial Code (SIC) categories, such as restaurants, construction and others with a high exposure potential. The Enforcement inspectors provide the following services:

- inspections;
- outreach on stormwater issues and best management practices;
- enforcement in response to municipal code violations, where needed; and
- documentation of the above activities.

Ongoing coordination occurs with the City's Hazardous Materials (Hazmat) and ESD's Pretreatment Programs who conduct inspections of facilities with hazardous materials or industries with pretreatment requirements.

B-3. New and Redevelopment (NRD)[11]

Implementation of this program element is primarily the responsibility of the Department of Planning, Building and Code Enforcement (PBCE) under its Planning Division. Planning reviews private development projects, as well as projects proposed by the Redevelopment Agency, for compliance with stormwater requirements. Public Works is responsible for integrating stormwater requirements into the design and implementation of City projects.

Planning procedures have been established to ensure that siting, design, and engineering of developments conform to existing BMPs per the New and Redevelopment Performance Standard. These procedures had previously been incorporated into the Planning Department's permit review process in 1996.[12] In response to the expanded requirements for new development in the 2001 permit, SCVURPPP revised the New and Redevelopment Performance Standard in 2003[13]. The City has in turn incorporated changes into related policies and procedures. In October 2003, the revised City Policy on Post-Construction Urban Runoff Management was approved by City Council to reflect the new permit provisions. These provisions require revision of guidance documents for use by Planning Division staff and outside developers to incorporate numeric hydraulic sizing criteria into stormwater treatment measures.

The permit also requires that the City implement a program to verify the ongoing operation and maintenance of stormwater treatment measures. Planning and ESD's Watershed Enforcement will coordinate on this component. Workplans for meeting these requirements had been initiated with the March 2002 workplan submittal and are ongoing.

As implementation matures, new development provisions will impact the services and policies of other City departments. ESD and Planning coordinate with the departments of Transportation (DOT); General Services (GS); and Parks, Recreation, and Neighborhood Services (PRNS) to address policy and maintenance issues. ESD remains responsible for providing guidance and monitoring the Planning Division's progress in complying with revised permit provisions as well as reporting progress internally through the Core Service Performance Measures and externally to the Water Board in the Annual Report.

B-4. Construction Inspection (CON)

PBCE carries out planning site reviews and referrals for construction sites deemed to pose a high potential to discharge sediment. The Plan Implementation Division informs developers of the requirement to prevent sediment and other construction pollutants from entering the storm drains or the creeks, and includes the requirements as conditions in

[11] Formerly abbreviated as NDC.
[12] Annual Report, September 1, 1996. Santa Clara Valley Nonpoint Source Control Program, FY 95-96.
[13] Planning Procedures for New Development and Redevelopment, SCVURPPP, December 18, 2003.

development permits and tentative map approvals. Once a development project moves into the construction phase, the responsibility for ensuring that BMPs and erosion control measures are implemented falls largely to the units that inspect construction sites as part of their routine duties - Public Works (PW) and PBCE Building Division. The Environmental Services Department performs follow up inspections for escalated enforcement.

For private development projects, PW issues grading permits and requires that sites with high potential to discharge sediment (e.g. greater than 1 acre and/or hillside sites) to provide Erosion Control Plans and Storm Water Pollution Prevention Plans (SWPPPs). As part of their inspection duties, PW inspectors are responsible for ensuring conformance with the City's grading ordinance and for ensuring that private developers submit, and comply with, required Erosion Control Plans during grading and installation of infrastructure on the site. Inspectors enforce City regulations by issuing verbal warnings or written Notices of Unsatisfactory Conditions, and can refer sites to ESD inspectors to observe and cite.

Beginning in 2003, PBCE building inspectors identify and correct stormwater issues at sites where repeated inspections are a part of Building inspector responsibilities. Although this function excludes mechanical, electrical, and plumbing inspectors, all Building Division inspectors have been trained to report problems they encounter on an active site.

ESD's Watershed Enforcement inspectors assigned to the ICID program also respond to construction inspection referrals; these calls are treated much the same way as any ICID call. Referrals come from the public and other City staff, including PBCE and PW inspectors. ESD inspectors employ a tiered enforcement response plan, including education and cooperation (this lowest tier of enforcement response is also conducted by PBCE and PW inspectors), official warning notices, and penalty application - administrative or misdemeanor citations.

For public projects, the responsibility for ensuring BMPs are implemented during construction projects falls to the Public Works divisions responsible for construction project management.

ESD continues to provide training support to PW, PBCE, and ESD inspection groups and the development community regarding erosion control and good housekeeping BMPs.

B-5. Public Streets, Roads and Highways Operation and Maintenance (PSR)

The City's Department of Transportation (DOT) operates and maintains, directly or through contractual work, the streets, roads, and traffic systems within the City limits. This excludes County-maintained expressways and state-maintained (Caltrans) highways and freeways. This maintenance includes:

- road repair;
- resurfacing and reconstruction;
- striping; and
- maintenance of bridges and medians.

The goal of this program element is to further institutionalize the application of BMPs into SOPs for the wide range of activities associated with road maintenance and operations. ESD has worked with Transportation to identify applicable BMPs and SOPs and provide training to field staff.

ESD continues to provide training to Transportation staff on specific activities that could impact stormwater quality and good housekeeping BMPs that require continual implementation.

In December 2002, a new Performance Standard for Rural Public Works (RPW) was added to PSR[14]. The goal of the RPW Performance Standard is to minimize water quality impacts resulting from public works maintenance and support activities in rural areas.

The initial list of rural public works facilities under the jurisdiction of the City of San Jose was compiled[15] to include the largest City parks, which were reviewed for the following criteria:

1. Not serviced by an integrated municipal storm drain system; and
2. Not serviced by curbs and gutters; and
3. Contains roads or trails that are intended to be passable for a maintenance vehicle (i.e. 1/2 ton pick up truck or larger)

The Departments of Transportation; General Services; and Parks, Recreation and Neighborhood Services are responsible for RPW activities at the initial facilities identified. ESD has collaborated with the relevant departments to develop new SOPs and continues to support training sessions on the SOPs.

B-6. Storm Drain System Operations and Maintenance (SDO)

The City's Department of Transportation (DOT) operates and maintains the storm drain system. Operation and maintenance of the system include the following activities:

a) Sweeping of City streets to prevent pollutants and debris from entering the system;

b) Cleaning of storm drain inlets; and

c) Removal of debris from the stormwater lines.

Construction of new portions of the storm drain system is the responsibility of the Department of Public Works. The City has a Storm Drain Improvement Masterplan that identifies system needs and priorities for inclusion in the five-year Capital Improvement Plan.

[14] Rural Public Works Maintenance and Support Activities, SCVURPPP, December 19, 2002.
[15] 2002-2003 URMP Annual Report. Parks identified were Almaden Lake, Alum Rock, Emma Prusch Farm, Guadalupe River, Kelley, Lake Cunningham, Montgomery Hill, and Overfelt Gardens.

B-7. Water Utility Operations and Maintenance (WUOM)

The San José Municipal Water System (Muni Water) operates a drinking water supply treatment and conveyance system subject to this Performance Standard. Muni Water is part of the Businesses Services Division within ESD and is responsible for developing the Water Utility Pollution Prevention Plan (WUPPP), SOPs, and BMPs required for meeting this performance standard.

The City of San Jose's Water Utility Pollution Prevention Plan (WUPPP), including SOPs, and BMPs, was developed in June 1999. Muni Water staff continues to implement the Plan.

B-8. Pesticide Management (PM)

The goal of this program element is to reduce or eliminate the impact of pesticide use on water quality. This program is implemented as a cooperative effort among several departments. The City's General Services and Transportation Departments are responsible for pest, rodent and weed control at neighborhood and regional parks, road medians, rights of way, highway backups and streets. The City (ESD; DOT; General Services; Public Works; Convention, Arts and Entertainment; and the Redevelopment Agency) also utilizes the services of contractors for certain turf, ornamental and structural pest control.

The City has a Pesticide Management Committee (PMC) which consists of City staff from the following Departments: Transportation; General Services; Environmental Services; and Parks, Recreation & Neighborhood Services. The PMC collaborated to revise the Pollution Prevention Policy[16] to add a section on Integrated Pest Management (IPM). City Council approved the revised policy, which solidifies the City's commitment to apply IPM techniques in its approach to pest control and to require the same of contracted pest control operators. The PMC developed SOPs and BMPs for City operations, which include IPM measures. These departments coordinate to ensure that employees responsible for applying pesticides receive proper training on the IPM policy, SOPs and BMPs.

In addition, ESD is responsible for coordinating outreach to the public on pesticide use. Most outreach activity is conducted in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program or other regional groups.

B-9. Mercury (M)

The goal of this program element is to reduce the amount of mercury in urban runoff by minimizing the use of mercury-containing products in municipal operations, providing proper disposal services for mercury-containing products for residents and small businesses, and participating in monitoring efforts associated with TMDL development.

[16] A Resolution of the Council of the City of San Jose Approving the Revised City Council Policy for Pollution Prevention, adopted June 24, 2003.

In June 2003 the City revised its Pollution Prevention policy to minimize the release of pollutants into the water and air and reduce the generation of hazardous wastes. All City departments that procure and/or dispose of products and materials, or are involved in activities with the potential to cause water quality impairment, air pollution, or generation of hazardous wastes, will be responsible for implementing the provisions of this policy to the maximum extent practicable.

General Services Purchasing Division is responsible for the procurement of services and products for the City. Purchasing, often in cooperation with departments, establishes specifications for goods or services to be purchased. ESD and Purchasing work together to implement the City's Environmentally Preferable Purchasing Policy (EPPP) adopted by City Council in 2001. The EPPP is purposed to "minimize the negative environmental impacts of the City's activities by ensuring the procurement of services and products that reduce toxicity; conserve natural resources, material and energy; maximize recyclability and recycled content."

The County of Santa Clara administers the Household and Small Business Hazardous Waste (HHW) Program, which provides disposal of hazardous materials, including mercury-containing products, for residents and small businesses. The City, including ESD's Integrated Waste Management Division, supports the HHW Program activities by participating in coordination activities and providing a permanent space for the County to hold hazardous waste drop-off events.

ESD is also responsible for coordinating outreach to the public on mercury. Most outreach activity is conducted in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program or other regional groups.

In addition, the City has operated and maintained the National Mercury Deposition Network (MDN) site since January 2000, collecting samples, recording data, and sending both to the national MDN laboratory. The City also continues its support of the San Francisco Bay Regional Monitoring Program, AB 982 TMDL Public Advisory Group, WMI Guadalupe River Mercury TMDL[17] Workgroup, and the Clean Estuary Partnership. The City continues its commitment to work with the Water Board and stakeholders toward TMDLs that are technically defensible and feasible for implementation.

B-10. Copper & Nickel Action Plans (CNAP)

The purpose of this program is to implement the relevant baseline activities in the Copper and Nickel Action Plans. Activities in these action plans are attributed largely to the South Bay POTWs and to SCVURPPP as the responsible entities. Some activities, however, require specific actions by the SCVURPPP co-permittees or specified municipalities. The City implements activities pursuant to implementation of the baseline actions included in the Copper and Nickel Action Plans. These activities are in addition to those undertaken by SCVURPPP as a program.

Generally, the measures that require implementation at the municipal level are integrated into ongoing program elements. For example, outreach to industrial facilities is

[17] Total Maximum Daily Load

implemented through the Industrial/Commercial Inspection Program. ESD coordinates with other City departments as needed to ensure baseline activities are implemented.

B-11. Trash (TRA)

The purpose of this program element is to identify new and existing strategies to address litter problem areas having an impact on urban streams and waterways, and to respond to the November 14, 2001 Water Board 303(d) Staff Report which indicates an expectation for municipalities to assess trash impairments before the next 303 (d) listing cycle. ESD is responsible for coordinating this effort and works primarily with the Santa Clara Valley Urban Runoff Pollution Prevention Program (and its co-permittees, including the Santa Clara Valley Water District) to assess and address problem areas.

ESD coordinates with many City departments that administer programs providing clean-up services in public areas that may impact creeks and waterways. The Department of Parks, Recreation and Neighborhood Services (PRNS) is responsible for administering the Anti-litter, Adopt-a-Park and Adopt-a-Trail programs, which recruit volunteers to assist with litter clean-up citywide. PRNS, as a member of the Creek Connections Action Group, also assists with the coordination of Adopt-a-Creek activities including annual creek clean-up events.

The General Services Department is responsible for the maintenance of parks (including litter removal). The Department of Transportation (DOT) administers the Adopt-a-Street volunteer program and is responsible for maintaining landscaped medians, roadsides, and storm drain inlets.

ESD's Integrated Waste Management Division (IWM) is responsible for managing the collection of garbage and recycling from residential homes and City facilities (See section C-1 for further details on the Solid Waste Program). ESD also coordinates with PRNS, General Services, DOT and the Solid Waste Program to obtain information regarding trash management practices.

B-12. Monitoring (MON)

The City, in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) is required per permit provision C.7.b of NPDES Permit CAS029718 to submit to the Water Board, a Five-Year Receiving Waters Monitoring Plan. The Program submitted the final version of the plan on August 5, 2002 and a draft revised multi-year Receiving Waters Monitoring Plan on March 1, 2004. The Plan covers a number of pollutant control programs required by provisions C.7 and C.9 of the permit.

Additionally, the City supports ambient water quality monitoring through monetary contributions to SCVURPPP, the Regional Monitoring Program (RMP), and the CEP. City staff also chairs the Technical Committee of the CEP. Local stream monitoring has largely been undertaken by SCVURPPP and the SCVWD on behalf of the Program, although the City provides occasional staff support and monitoring equipment. Long-term characterization of the water quality of the South Bay has been the function of the

RMP, however as part of the SJ/SC WPCP NPDES permit[18] and Copper and Nickel Action Plans, the City carries out the required dry season monitoring for these pollutants.

The monitoring program will continue to develop in conjunction with the Santa Clara Basin Watershed Management Initiative (WMI). To ensure that the WMI goals are addressed, ESD staff is assigned to serve on various groups, including Watershed Assessment and Monitoring Subgroup, Bay Monitoring and Modeling Subgroup, and TMDL workgroups.

B-13. Municipal Compliance (MC)

The City owns and operates several Corporation Yards. Municipal facilities are required to comply with stormwater regulations. Efforts to reduce contaminated discharges from City facilities (Corporation Yards) must be similar to those required of private businesses. There are six yards that are assessed annually by ESD for stormwater compliance; three are managed by General Services (GS) and three are managed by the Department of Transportation (DOT). The Corporation Yards are: Central Service Yard (GS), Mabury Yard (DOT), Main Yard (GS), Municipal (or Police) Garage (GS), South Yard (GS), and West Yard (DOT).

In addition to the annual inspection conducted by ESD, GS conducts quarterly hazardous material inspections which include stormwater issues. Each Corporation Yard is required to maintain a Stormwater Pollution Prevention Plan (SWPPP).

ESD also coordinates with various departments to ensure that municipal training is conducted in support of the applicable program elements.

B-14. Public Information and Public Participation (PIP)

To meet the Permit requirements of changing specific behavior that negatively impacts stormwater quality and to increase the understanding and appreciation of creeks and the Bay, the City crafts its outreach to:

- educate citizens on behaviors which adversely affect water quality;
- increase understanding and appreciation of the South Bay watershed;
- promote reasonable alternatives to pollutant causing behavior; and
- provide citizens with opportunities to become involved in watershed protection.

The City's outreach efforts are aimed at the four audiences described in the NPDES Permit: General audiences, Targeted audiences, Citizen Participation and Education. Outreach efforts also support all other Program Elements, as required.

The City coordinates its outreach efforts with local and regional groups, including the SCVURPPP, Bay Area Stormwater Management Agencies Association (BASMAA), Bay Area Pollution Prevention Group (BAPPG), and the WMI. The goal is to develop and implement consistent, effective outreach and education programs. The City provides significant resources for region-wide outreach through these local and regional groups.

[18] San Jose / Santa Clara Water Pollution Control Plant, NPDES Permit No. CA0037842.

C. Other Related Programs

Two existing City programs that are not a part of the URMP, yet integral to urban runoff management, are explained below.

C-1. Solid Waste

The City's solid waste programs are managed by ESD's Integrated Waste Management Division (IWM). IWM programs serve more than 285,000 households and 21,000 businesses and institutions. This program contracts with private companies to provide services that are essential to the URMP, specifically:

- yard trimmings collection;
- used motor oil recycling;
- garbage, recyclables and large item collection; and
- disposal services for the City's street sweeping, qualified creek clean-ups, and illegal dumping collection programs.

Finally, ESD supports the County of Santa Clara HHW and Conditionally Exempt Small Quantity Generator Hazardous Waste Disposal programs, providing City residents and small businesses with a means of safely disposing hazardous waste.

C-2. Vehicle Trip Reduction

In an effort to address traffic congestion and pollution problems, the City implemented several programs focused on reducing commuter trips generated by its roughly 6,700 employees. The Department of Transportation is responsible for planning and managing these programs. Specific activities are conducted through designated transportation coordinators in all departments within the City.

Major programs include:

a) Ecopass and Subsidized Transit Passes: This program allows unlimited use of public transit. Passes are issued to participating full and part-time City employees.

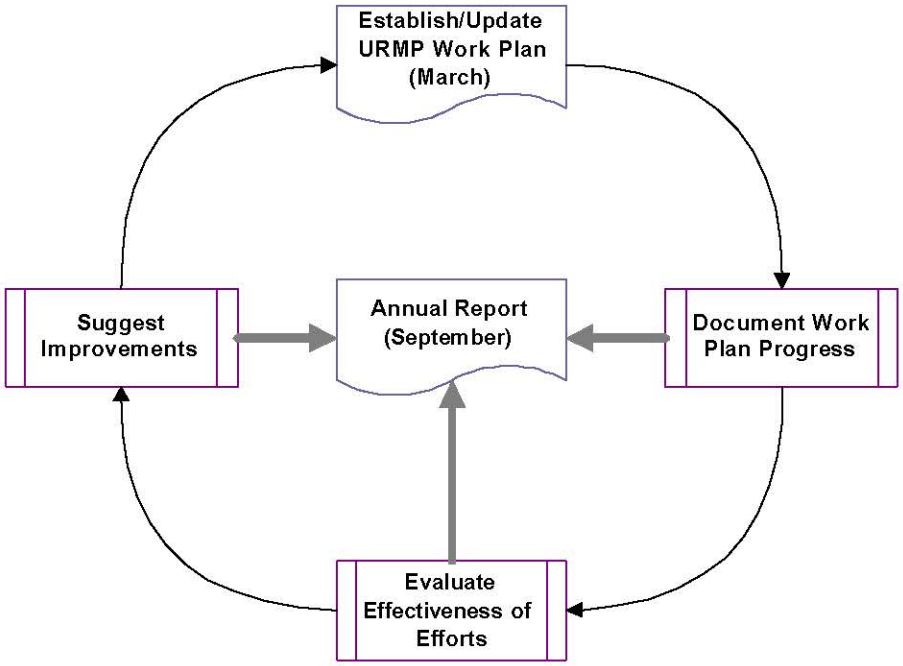
b) Guaranteed Ride Home Program: This program assures emergency transportation for employees who use commute alternatives to get to work. Taxi service is provided to these employees in the event that they encounter a work or personal emergency that requires immediate or unanticipated transportation to their home or other destinations related to the emergency.

D. Tracking and Evaluation

ESD's Watershed Protection (WP) Division is responsible for managing the urban runoff management program to achieve permit compliance. WP is the liaison with the area-wide SCVURPPP Management Committee, the co-permittees, and internal City Departments performing activities under the URMP. Within WP, the Urban Runoff Section is responsible for updating and reviewing workplan activities and coordinating annual reporting for each Program Element.

The URMP prescribes a framework for program implementation and identifies "milestones" that are to be completed by specified dates. Annual reports identify milestones achieved during the fiscal year using a standard reporting format[19]. The guiding principle for these activities is for City Departments to 1) document efforts undertaken; 2) provide evaluation of efforts and feedback on effectiveness of the activities; and 3) provide suggestions on ways to improve their programs and efforts.

Figure 3. Continuous Improvement Cycle Flowchart



[19] The standard format for annual reporting includes four subsections for each Program Element: 1) Self Evaluation Matrix, which provides the status of work plan activities; 2) Program Evaluation; 3) Responses to Water Board comments received; and 4) Additional Tables or Information as needed to demonstrate accomplishments or fulfills program-specific reporting requirements. See City of San José Urban Runoff Management Plan, *Annual Report 2002-2003*.

E. Funding

The City understands that addressing urban runoff problems takes long-term commitment and ongoing resources. Early on in the program, a funding mechanism was developed to provide the financial basis for program efforts.

In April 1991, the City Council adopted an ordinance establishing a Storm Drainage Service Use Charge.[20] The purpose of the charge was to provide: *a method for payment of all or any part of the cost and expense of improving the quality of storm and surface water runoff, the cost and expense of maintaining and operating the storm drainage system*, and for constructing and improving the system within the City. These fees are billed on the property tax bill. Of the $14 million, a majority of funding is devoted to direct and indirect program costs through the City's annual budget cycle. This allows the City flexibility to adapt program funding to near-term needs. Table 3 below gives approximate annual allocation of the budget[21].

The stormwater permit requires that Annual Work Plans be submitted to the Water Board each March in advance of the fiscal year. This precedes conclusion of the City's annual budget adoption process. Work Plan submittals are therefore subject to City appropriation of funding which occurs in June of each year.

Table 3. Annual Budget Allocation

Activities	City of San Jose Departments	Annual Budget
Street Cleaning & Storm Sewer O&M	Transportation	$ 7.6 Million
Pollution Control & Permit Compliance (Includes URMP oversight, enforcement inspection programs, studies, training, outreach, watershed management activities, and other support activities)	Environmental Services Public Works Planning, Building & Code Enforcement	$ 5.2 Million
Storm Sewer Improvements	*Storm Drain Capital Fund*	$ 1.8 Million
	Total Budget	$ 14.6 Million

[20] Ordinance No. 23781, amending Chapter 15.16 of Title 15 of the San José Municipal Code, adding a new Part 6.

[21] Based on *2004 Funds Management Report*, ESD, January 2004.

3. Program Element Performance Standards

This section sets forth the Performance Standards and the associated milestones that the City will work to achieve. A Performance Standard Matrix has been included for each of the Program Elements identified in the NPDES permit. The Matrix is modeled after the conditionally approved Performance Standards and has distinct references to the Standard Operating Procedures (Refer to Appendix B). Each Performance Standard Matrix is preceded by an introduction of the goals of the corresponding Program Element.

A. Illicit Connection & Illegal Dumping

The goal of this Program Element is to identify and eliminate illicit connections (IC) to storm drains and illegal dumping (ID) of non-stormwater into the storm drain system.

The ICID Program Element sets up a framework for timely response to complaints, referrals, and proactive investigations of ICID activities. The ESD Watershed Enforcement Section is responsible for the program and coordinates its activities with City Departments such as Fire, Public Works, and Transportation, and outside agencies such as the County HazMat Team. Inspectors in other agencies and departments may be in a position to observe an ICID activity in the course of their inspections. These inspectors routinely refer observed problems to Watershed Enforcement for resolution.

Environmental Inspectors within Watershed Enforcement conduct field activities and respond to complaints. Environmental Inspectors have the authority to enforce Title 1, Chapter 1.08, of the San José Municipal Code. They also have the authority and discretion to take progressive enforcement actions including issuance of inspection warrants, official notices of violation, and citations. City procedures preclude direct 911 calls; police or fire dispatchers receive calls and refer incidents to ESD. Most other calls are directed to the (408) 945-3000 number. This phone number is stenciled on the nearly 28,000 storm drains throughout the City.

All complaints are documented in the Environmental Enforcement Data Management System (EEDMS) database that is maintained by the Watershed Protection Division, in which Watershed Enforcement is included. The database enables the City to characterize complaints by type, location, and other information, as well as summarize the status of all cases into a table format. The City currently provides this information in the City's Annual Report and to the Santa Clara Valley Urban Runoff Pollution Prevention Program for compilation in the Program-wide Annual Report.

The effectiveness of activities under this Program Element is reviewed annually. The following information is collected and analyses provided in the City's Annual Report: analysis of types of problems identified; problem resolution; program development including outreach and education activities; and trends over time to support long-term solutions potentially including infrastructure replacement and structural retrofit.

ICID Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
ICID 1.	The City will respond to complaints regarding ICID dumping activities into the storm drain system and will ensure that the activity has ceased or is on a time schedule to cease.	♦ Refine and implement SOPs for responding to ICID complaints/referrals. ♦ Review effectiveness of the SOPs. ♦ Document complaint activity and follow up conducted.	As Needed *(First completed in 1990)* Annually Annually
ICID 2.	The City will conduct investigations of high priority areas. High priority is defined as areas with a high potential for non-stormwater discharges to the City's collection system.	♦ Maintain database to track ICID complaint information. ♦ Target areas for monitoring based analysis and trends observed. ♦ Conduct investigations of the high priority areas based on the results of the monitoring and/or historical complaint information.	Ongoing *(First completed in 1990)* Annually Ongoing
ICID 3.	The City will ensure that ICID Inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.	♦ Conduct training for ICID inspectors. ♦ Evaluate performance of inspectors and training protocols and modify the training program as needed.	Annually *(First completed in 1990)* Annually, in July
ICID 4.	The City will distribute outreach and technology transfer material containing applicable control measures and/or BMPs to target parties responsible for ICID activities.	♦ Audit existing outreach and technology transfer material. ♦ Determine the need for new and/or revised BMPs, and develop the material as necessary.	Annually, in August *(first completed in 1996)* Annually
ICID 5.	The City's Watershed Enforcement staff will review and evaluate the effectiveness of its SOPs in responding to complaints regarding illicit connections and illegal discharge dumping activities into the storm drain system.	♦ Document and evaluate effectiveness of SOPs, noting what worked well and what needs improvement	Annually

B. Industrial/Commercial Discharges

The goal of the Industrial/Commercial Discharger (IND) Control Program Element is to prevent unauthorized industrial and commercial sources of pollutants from entering the South Bay via the storm drain system.

Section 402 (p) of the Clean Water Act requires that specific types of industrial/ commercial facilities obtain a permit to discharge storm and non-storm water. The State Water Resources Control Board, through its California Stormwater Quality Task Force, has developed a statewide permit known as the General Industrial Activity Stormwater Discharge Permit (GIASP), to regulate such discharges. The Water Board met with the co-permittees and other interested stakeholders to interpret the GIASP requirements as applied to local industrial activities. This process also identified additional industries subject to regulations. The results of the process are reflected in the 1996 Water Board conditionally approved Performance Standard for Industrial/Commercial Discharger Control Program. The most recent GIASP was adopted by the Water Board in 1997.

The City has since modified its IND inspection program to reflect provisions in the City's 2001 stormwater permit[22]. Implemented by ESD's Watershed Enforcement Section, the performance standard for this program element incorporates the City's regulation of industrial and commercial facilities and the City's support of the State GIASP program. This performance standard defines a level of effort for facility inspection activities that will result in pollutant load reduction to the maximum extent practicable.

The City supports the State's implementation of the GIASP by inspecting new filers within one year, based on data available from the State. These inspections include:

- verification that an NOI has been filed;
- verification that the facility has a SWPPP, as required; and
- if not in compliance with the City's municipal code, review of BMPs and control measures in accordance with SWPPP.

The City also inspects new facilities added to the inventory (based on a business license database and selected SIC codes) for the potential that these facilities are required to file for coverage under the GIASP. Listed facilities are initially inspected to determine whether they pose a significant potential for discharging pollutants. The initial inspection involves identification of facility pollutants, possible contributions, and recommendations for control measures. Facilities found to pose a significant potential for pollutant discharge require ongoing inspection as a City-regulated facility, regardless of the requirement for coverage under the GIASP.

The potential to contribute pollution is thereafter used as a means to assign an inspection frequency to the facility. Inspection frequencies are determined according to the number of Areas of Concern (AOCs) identified at a site during inspection. An AOC is defined as a violation, or warning about a potential violation, issued to a facility during an inspection.

[22] SFBRWQCB Order No. 01-024 adopted February 21, 2001

There are a large number of facilities that require inspection; managing and tracking the data for these facilities is crucial to the ongoing efficacy of the inspection program. The database, EEDMS, is maintained by ESD's Watershed Protection Division and is frequently updated to add new facilities and delete facilities that have closed or moved. Facility information is obtained primarily through the City business license database. This information is supplemented through periodic review of yellow pages, reverse address directories, business directories, and inspector referrals.

EEDMS includes such information as:

- number and types of facilities inspected;
- number of facilities required/not required to submit NOIs;
- numbers and types of pollution problems identified;
- remedial actions taken; and
- numbers and types of enforcement actions.

Watershed Enforcement coordinates with other City departments and local agencies to implement, follow-up on, and enforce discharge requirements as needed.

IND Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
IND 1.	**NOI Filers:** The City will conduct inspections of those facilities that have filed an NOI with the State and appear on a list provided by the State.	♦ Conduct and document initial inspections of NOI Filers within one year. ♦ Maintain a database to track the inspection information. ♦ Identify new NOI filers and conduct inspection.	Ongoing *(First completed in 1997)* Ongoing *(First completed FY 93-94)* Annually
IND 2.	**Non Filer Investigations:** The City will inspect industrial facilities that may be subject to general permit requirements but are not found on the NOI filer list provided by the State and that conduct activities identified by the following SIC codes: 5015: Automobile Dismantlers 5093: Other Recycling Industries 3200 series: Stone Clay and Concrete Products Industry 4100 & 4200 series: Trucking Facilities that perform on-site vehicle repair, maintenance or washing.	♦ Identify industrial facilities that conduct activities with the SIC codes listed. ♦ Conduct and document initial inspections of industrial facilities with the SIC codes listed. ♦ Maintain a database to track the inspection information. ♦ Develop a priority list of facilities targeted for inspection during upcoming year.	Annually *(First completed FY 94-95)* Annually *(First completed in 1997)* Ongoing *(First completed FY 93-94)* Annually
IND 3.	**City Regulated Facilities:** The City will conduct inspections of City Regulated facilities identified below: *Food service facilities:* ▪ 2 or more AOCs* over a rolling three year time period – Every year ▪ 1 AOC over a rolling three year time period – Every two (2) years ▪ 0 AOCs over a rolling three year time period – Every three (3)years *All Other City Regulated facilities:* ▪ 2 or more AOCs over a rolling five year time period – Every year ▪ 1 AOC over a rolling five year time period – Every two (2) years ▪ 0 AOCs over a rolling five year time period – Every five (5) years ▪ 0 AOCs over a rolling five year time period with no exposure or potential for exposure – No further inspections *Facilities for which a referral or ICID complaint is received:* ▪ Immediately for violations and every year until they meet the above criteria. * AOC = Area of Concern	♦ Identify commercial facilities listed. ♦ Maintain a database to track the inspection information. ♦ Conduct and document inspection of the various facilities listed.	Annually *(First completed FY 95-96)* Ongoing *(First completed FY 93-94)* Annually

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
IND 4.	**Compliance:** The City will conduct industrial/commercial inspections to determine the existence of discharges or potential discharges which are illegal under local ordinances. The facility operator will be notified of observed areas of concern to be corrected and/or if official action on violations is necessary, it will take place under local enforcement procedures.	♦ Develop, and update as needed, an inspection frequency plan. ♦ Document enforcement actions taken as a result of inspections.	*(First completed FY 95-96 & Last updated in 2002)* Annually
IND 5.	**Training:** The City will ensure that industrial/commercial inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention	♦ Maintain a training plan. ♦ Conduct training for industrial/commercial inspectors.	Ongoing *(First completed in 1997)* Annually *(First completed in 1990)*
IND 6.	**Outreach:** The City will help develop and distribute outreach and technology transfer material containing applicable control measures and/or BMPs to industrial/commercial facility operators responsible for IND activities.	♦ Audit existing outreach and technology transfer material. ♦ Develop and/or modify existing outreach material, as needed.	Annually, in August *(First completed in 1996)* Annually
IND 7.	**NOI Filers Effectiveness Evaluation:** The City's Watershed Enforcement staff will review and evaluate the effectiveness of its inspections procedures and database tracking system.	♦ Document and evaluate the effectiveness of inspection procedures. ♦ Document and evaluate the effectiveness of the inspection database tracking system.	Annually Annually

C. New and Redevelopment

The goal of this Program Element is to institute post-construction planning and inspection procedures that abate water quality impacts resulting from new development. These post-construction procedures are intended to minimize stormwater pollution, erosion, and sedimentation to the maximum extent practicable and to meet new hydraulic sizing requirements for projects that create or replace one or more acres of impervious surface effective October 15, 2003.

The revised New and Redevelopment (NRD) Performance Standard is a high priority because the City anticipates a steady growth rate in the future, primarily in the form of infill development within the City's Urban Service Area. According to the City's General Plan, only 5.3 percent of the City's 113,500 acre incorporated area is vacant or unused and is designated for development. The majority of the City is already developed and has urban services and improvements. Typical new development in San José takes the form of infill development by way of demolition of existing structures on small, developed parcels and constructing new development that increases the density and height on the property. Land use decisions can impact water quality; therefore, this Program Element seeks to implement planning procedures and policies that minimize such impacts.

Pollution prevention is achieved through the application of site design, source control and treatment best management practices (BMPs) during the planning review phase of both private development and public projects.

The planning phase subjects proposed development projects to review for conformance with City policies, procedures and design guidelines. The review ensures that project plans include appropriate site design, source control measures, treatment BMPs, and environmental mitigation in the initial stage of the project and ultimately, as part of its design specifications.

The planning phase for private development is conducted by Department of Planning, Building, and Code Enforcement (PBCE) staff with review by other departments, including Public Works - Development Services Division, Fire, and Environmental Services. The Architectural Engineering Division of Public Works conducts the planning phase for public projects. It is during the planning phase that appropriately sized post-construction measures that prevent ongoing pollution are incorporated into the site design. Because post-construction measures must be identified during the planning phase, the NRD Performance Standard is focused on design review procedures and ensuring that 1) the City develops policies for including post-construction measures and mitigation (see Appendix B NRD SOPs); 2) City Planning staff and developers are aware of alternatives and appropriate technologies that can be used to reduce urban runoff pollution (see Attachment 1, NRD Work Plan)); and 3) these technologies are evaluated for their effectiveness. Accordingly, the Planning Department has updated its design review procedures and drafted revisions to the Guidance Manual on Selection of Stormwater Quality Control Measures. The Department also will continue to formulate new policies and ordinances as new technologies are proven effective at preventing urban runoff pollution.

The Performance Standards for Planning Procedures contained in this element were originally based on the Water Board's recommendations, which incorporated the mandates from the following publications:

- EPA's stormwater regulations[23];
- the Coastal Zone Act Reauthorization Amendments[24]; and
- the San Francisco Bay Estuary Project's Comprehensive Conservation and Management Plan[25].

These current Performance Standards are consistent with the goals and objectives of the NRD Activities component of SCVURPPP's URMP. Each Performance Standard element has a milestone that provides a basis for documenting performance and evaluating the effectiveness of the City's planning process.

[23] Title 40, Part 122, Code of Federal Regulations
[24] Coastal Zone Management Reauthorization Amendments of 1990, 6217
[25] San Francisco Estuary Institute. Comprehensive Conservation and Management Plan. June 1994. Prepared under Cooperative Agreement #CE-009486-02 with the U.S. Environmental Protection Agency by the Association of Bay Area Governments.

NRD Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
NRD 1.	The City (Co-Permittee) will have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Permit Provision C.3.a.i.).	♦ Complete review, evaluation, and modification, as necessary, of the existing legal authority.	Done 10/03 Revise by 04/05
NRD 2.	The City will provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for stormwater pollution prevention early in the application process, as appropriate for the type of project and location (C.3.m.).	♦ Develop and implement a procedure to provide, early in the application process, the development community with information and guidance materials related to construction and post-construction activities, site design guidelines, and other stormwater mitigation measures.	Ongoing
NRD 3.	The City will ensure that environmental documents required for those projects that fall under CEQA or NEPA review address both significant and cumulative stormwater quality impacts during the life for the project, and relevant permit requirements. These documents include EIRs, negative declarations and initial study checklists.	♦ Complete review, evaluation, and modification, as necessary, of the existing environmental documents.	Ongoing
NRD 4.	The City will encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measures that minimize stormwater pollutant discharges to the maximum extent practicable.	♦ Develop and implement a procedure to provide the development community with information and guidance materials related to site design and source control, and other stormwater mitigation measures. ♦ Identify and document existing site design standards and guidance documents and policies and revise if necessary.	Ongoing Ongoing
NRD 5.	The City will require developers of Group 1 projects deemed complete[26] on or after October 15, 2003, to design and implement the following measures to reduce stormwater pollution to the maximum extent practicable: ▪ Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality) and provide detention or retention as part of landscaping where feasible (C.3.b.i. and C.3.j.); ▪ Source controls shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k), including measures to discourage pesticide use (C.9.d.ii.); ▪ Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Provision C.3.d.	♦ Develop and implement a procedure to provide the development community with information and guidance materials for Group 1 projects related to site design, source control, treatment measures, and other stormwater mitigation measures, including the HMP when approved by the Water Board. ♦ Develop criteria and checklist to aid PBCE and PW in determining whether a development project should be required to incorporate post-construction treatment control measures and their related operation and maintenance requirements. ♦ Identify and document existing site design standards and guidance documents and policies and revise if necessary.	Ongoing Done 05/04 Done 09/03 and ongoing

[26] "Deemed completed" is defined as the date on which a development permit application is received by the City with the applicant's signature and all fees paid.

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
	▪ Increases in peak runoff flow and volume shall be managed for appropriate projects by implementing the guidance in the Program's Hydromodification Management Plan (HMP) for the specific stream receiving the discharge, following approval of the HMP by the Water Board (C.3.f.)	♦ Identify and document existing source control measures, guidance documents, and conditions of approval and revise if necessary. ♦ Propose revisions to current Policy on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria. ♦ Refine and modify development approval procedures as necessary to accommodate HMP implementation.	Done 09/03 and Ongoing Done 10/03. Revise 04/05. To be revised upon approval of HMP.
NRD 6.	The City will require developers of projects that disturb a land area of one acre or more to demonstrate conformance with the State General Construction Activity Storm Water Permit including filing of NOI, development of a SWPPP, et al.	♦ Complete review, evaluation, and modification, as necessary, of the existing Public Works and Planning procedures.	Done FY 02-03 and Ongoing
NRD 7.	The City will require developers of projects with potential for significant erosion and planned construction activity during the wet season to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.	♦ Complete review, evaluation, and modification, as necessary, of the existing Public Works and Planning procedures.	Ongoing
NRD 8.	The City will implement an operation and maintenance (O&M) verification program that includes: (C.3.e): ▪ Compiling a list of private and public properties and responsible operators for all stormwater treatment measures; ▪ Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction; ▪ Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.	♦ Draft policy and procedures necessary for an operation and maintenance verification program. ♦ Track and compile a list of priority projects inspected and inspection results. ♦ Draft summary of details of operation and maintenance verification program. ♦ Include as a condition of approval a requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof or operation and maintenance of such structural controls.	Policy done 10/03 and procedures drafted 06/04 Ongoing Drafted 06/04 Ongoing
NRD 9.	The City will ensure that municipal capital improvement projects include stormwater quality control measures during and after construction, appropriate for each project, and that contractors comply with stormwater quality control requirements during construction activities and maintenance activities (C.3.a.v.).	♦ Develop a procedure to ensure that contractors include stormwater quality control measures appropriate for each project, during and after construction. ♦ Begin tracking required data on public projects subject to C3 hydraulic sizing criteria requirements for Annual Report.	Ongoing Ongoing
NRD 10.	The City will provide training at least annually to its planning, building, and public works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention (C.3.a.vi).	♦ Modify current training program, as appropriate, and implement an annual training program for Planning, Public Works, Building, and Transportation staff.	Ongoing

D. Construction Inspection

The new Construction Inspection Performance Standards (CON) define the level of implementation that the City must attain to demonstrate that its construction inspection program controls stormwater quality to the maximum extent practicable. This performance standard forms the basis for measuring the City's construction inspection and enforcement program compliance.

Construction sites must include stormwater mitigation measures to conform to the City of San Jose's NPDES permit. City ordinance requires that a grading and drainage plan to be included in the project application. An Erosion Control Plan (ECP) may be required as a part of the grading and drainage plan, if the project is expected to have significant erosion potential. The City requires all construction sites greater than or equal to one acre to have a Storm Water Pollution Prevention Plan (SWPPP) and a copy of the Notice of Intent to conform to State General Permit for Construction Activities.

For private development projects expected to have significant erosion potential, City project managers and engineers require pre-construction meetings to be held prior to September 10th. At this meeting, the Department of Public Works (PW) project engineer and inspector discuss project construction schedules and erosion and sediment control expectations and strategies. The developer must describe his/her erosion control plan and procedures; potential revisions are discussed and agreed upon. By September 20th, a final erosion and sediment control plan must be submitted and approved by PW before wet weather operations are allowed. Other types of private development, which will have some activity but are not considered to have erosion potential, are sent a letter describing the City's expectations and requirements in order for work to be allowed to continue into the wet season.

All public projects, which are bid and awarded by PW, require contractors to include stormwater control measures for the project. This information is included in the bid specifications.

Per the City's SOPs, City construction inspectors are included in the erosion and sediment control review process, and their expectations (regarding grading operations, etc.) are conveyed to the general contractor and his/her subcontractor(s). During construction, the inspectors regularly inspect the site to ensure those grading operations and public infrastructure installations are conducted properly per the City's grading ordinance and Water Board guidance on erosion and sediment control. Specifically for erosion and sediment control inspections, inspectors review milestones such as making sure the site is protected and progressing as expected in the erosion control plan and narrative approved by the PW project engineer. All slopes and construction entrances are inspected regularly for stabilization. Inlet protection, creek outfalls, and sediment basin construction are all assessed. Before and after significant rainfall, all BMPs are checked for necessary dredging or other maintenance to ensure that they can adequately prevent pollutants from entering the storm sewer system or creeks. Failing BMPs are required to be redesigned or repaired.

Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the City's enforcement procedures, and followed

up with action(s) commensurate with the risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Water Board.

During structural construction, housekeeping practices at construction sites are key to preventing pollutants from entering storm drains. For this element, Building Code Inspectors from the Department of Planning, Building and Code Enforcement (PBCE) are responsible for field observation of BMP compliance. Since these inspectors frequently inspect sites as part of routine building permit compliance, they are in the best position to identify housekeeping problems at construction sites. Building Code Inspectors have been trained by Environmental Service Department's Watershed Enforcement Inspection staff on how to spot poor housekeeping practices and inform developers and contractors of observed problems.

The SOP for this program element includes procedures to guide the referral and transfer of project information between inspection staff from PBCE, PW, and the Watershed Enforcement (WE) inspectors. WE inspectors are available to provide escalated enforcement to achieve compliance at construction sites.

CON Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
CON 1.	The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites and prevent illicit discharges to storm drains and watercourses.	♦ Track and document incidents of housekeeping at construction sites.	Ongoing *(First completed in 2002)*
CON 2.	For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.	♦ Identify needed ordinance changes including timeline for revised grading ordinance.	As Needed *(Completed in 2003)*
CON 3.	The City inspects construction sites for adequacy of stormwater quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on the size of the project, site conditions, precipitation, and the project's potential impact on stormwater quality.	♦ Document inspections of active construction sites.	Ongoing *(First completed in 2001)*
CON 4.	Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.	♦ Document pre-season inspection of construction sites to ensure adequate implementation of winterizing BMPs, prior to the wet season.	Ongoing *(First completed in 2001)*
CON 5.	Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Water Board.	♦ Track and summarize notices and follow-up actions for annual reports.	Annually *(First completed in 2001)*
CON 6.	The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention. All inspectors receive training on the latest construction-related stormwater pollution prevention techniques and appropriate follow-up actions at least once every two years. The City keeps documentation that inspectors have received training.	♦ Track and document that inspectors have received training.	Annually *(First completed in 1998)*
CON 7.	The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.	♦ Evaluate outreach program and make improvements, as necessary.	Annually *(First completed in 2001)*
CON 8.	The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.	♦ Track the number of Public Works projects with these requirements.	Annually *(First completed in 1998)*

E. Public Streets, Roads, & Highways

Integrally connected to the City's storm drain system are the 2,250 miles of public streets, roads, and highways (PSR) that are maintained by the City. Operation and maintenance of these roads, sidewalks, medians, and other related structures occurs year-round regardless of weather conditions.

Like the storm drain system, road surfaces are impermeable, making them an efficient means of channeling water and pollutants to the storm drain system. In addition to surface runoff, street maintenance activities such as road repair and resurfacing, landscape maintenance, and road striping painting, are potential sources of stormwater pollution.

Section C.2 pursuant to NPDES Permit CA S029718, requires the City to submit, to the Executive Officer of the Water Board, a program element that identifies control measures to reduce pollutants in stormwater discharges from Public Streets, Roads, and Highways Operations and Maintenance. "Model" Performance Standards were developed by SCVURPPP, including provisions to routinely remove pollutants from City streets via street sweeping operations, as well as to control pollutants from regular operation and maintenance activities by carefully controlling water runoff from work activities and spills.

The City has been implementing Public Streets, Roads and Highways model BMPs and SOPs from the SCVURPPP Performance Standards as part of ongoing permit compliance efforts. These measures and their associated work plans are designed to provide a measurable and systematic approach to ensure compliance with the letter and intent of the permit.

In December 2002, a new Performance Standard for Rural Public Works (RPW) was added to the PSR program element. The goal of RPW Performance Standard is to minimize the water quality impacts resulting from public works maintenance and support activities in rural areas.

PSR Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
PSR 1.	The City will implement Best Management Practices (BMPs) for street, road, and highway operation and maintenance (O&M) activities to reduce pollutants in stormwater and eliminate illicit discharges to the maximum extent practicable.	♦ Produce SOPs and implement BMPs. ♦ Distribute and review SOPs annually. Incorporate SOP/BMP evaluation into annual training events.	(*Done FY 98-99*) Annually (*First completed in 1999*)
PSR 2.	The City will develop and implement a process to ensure that contractors employed to perform street, road, and highway O&M activities use appropriate BMPs.	♦ Train contract managers for PSR O&M contracts on related stormwater BMPs.	Annually (*First completed in 2002*)
PSR 3.	The City will provide annual training to its municipal staff in use of appropriate BMPs. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of the BMPs and Control Measures.	♦ Develop a training and staff feedback curriculum. ♦ Incorporate curriculum into tailgate meetings and other existing training opportunities.	*(Done FY 00-01)* Ongoing *(First completed in 2001)*
PSR 4.	The City will inform other parties (e.g., CalTrans, County of Santa Clara, and public utilities) conducting jurisdictional street and highway O&M activities of requirements to implement pollutant reduction BMPs and Control Measures in stormwater to maximum extent practicable and eliminate illicit discharges.	♦ Develop a procedure to inform other agencies (particularly PG&E and CalTrans) regarding relevant NPDES requirements.	*(Done FY 99-00)*
PSR 5.	As part of annual review process, the City will evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges. The review and evaluation will include input from the municipal maintenance staff that implement the BMPs.	♦ Establish a procedure to evaluate and incorporate any needed improvements in BMPs.	*(Done FY 01-02)*
PSR 6.	The City will extend its control measure strategy for PSR to address water quality impacts resulting from public works maintenance and support activities in rural areas.	♦ Identify City-owned properties that are applicable. ♦ Develop SOPs and BMPs for rural public works activities. ♦ Distribute and review SOPs annually. Incorporate SOP/BMP evaluation into annual training events.	Ongoing *(First completed in 2003)* *(Done FY 03-04)* Annually *(First completed in 2004)*

F. Storm Drain System O&M

The City storm drain system is designed to be an efficient means of conveying stormwater runoff away from City streets. Unfortunately, any pollutants that may be present in stormwater runoff can also be conveyed to the creeks as well. Pollutants can often bind to sediments, which can then accumulate in drain lines and catch basins. For this reason the cleaning of storm drain lines and catch basins is a key activity for controlling pollutants.

The City's program for operations and maintenance reaches all 157 square miles of the City and includes more than 850 miles of storm drain lines and 27,900 catch basins. The oldest parts of this infrastructure are in the central part of the City, along the Guadalupe River. Consequently, this older portion of the system, with its limited design capacity, is in need of constant maintenance.

Section C.2, pursuant to NPDES Permit CA S029718, requires the City to submit, to the Executive Officer of the Water Board, a program element that identifies control measures to reduce pollutants in stormwater discharges from Storm Drain Operations and Maintenance. This program must include provisions to address inlet and line maintenance, solid waste management, and opportunities for structural retrofit.

The Performance Standards developed by the SCVURPPP have set forth two levels of effort for routine inspection and cleaning - Tier I and Tier II. The City has committed to achieving Tier II level of maintenance both as a means to control pollution and to provide better flood control for its citizens.

The principle difference between Tiers I and II is the frequency of inspection and cleaning. While Tier I requires that all inlets/catch basins be inspected and cleaned (as needed) every other year and problem areas cleaned every year, Tier II requires inspection and cleaning every year with Problem Areas to be cleaned more than once a year. A Problem Area is defined as a storm drain inlet or catch basin and area surrounding the drain which floods as a result of normal rainfall or as a problem noted during routine inlet cleaning. A tracking system to address and document Problem Areas is included in the SDO Workplan.

For emergency response to spills and illegal dumping incidents, the Department of Transportation has prepared an Emergency Operations Manual. Elements of the Manual set forth steps which include containment and notification of appropriate agencies including the Fire Department's Hazardous Incidence Team and the ICID inspectors of the ESD Watershed Protection division.

SDO Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
SDO 1.	The City will implement BMPs for the storm drain system O&M to reduce pollutants in stormwater to the maximum extent practicable. Specific BMPs for each type of O&M activity are listed in the City's Workplan BMPs and Control Measures (Appendix B).	♦ Develop and implement an SOP and BMPs for storm drain system O&M that require attainment of Tier II level of maintenance.	Ongoing (*First completed in 1999)*
SDO 2.	The City will develop and implement processes for tracking problem areas and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.	♦ Develop a Storm Drain Operation & Maintenance procedure that includes implementation of BMPs and a procedure for tracking Problem Areas.	(*Done FY 99-00)*
SDO 3.	The City will develop and implement a process to ensure that contractors employed to perform storm drain O&M activities use the appropriate BMPs.	♦ Train contract managers for SDO O&M contracts on related stormwater BMPs.	Annually *(First completed in 2002)*
SDO 4.	The City will provide annual training to its municipal staff in use of appropriate BMPs and/or Control Measures. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of the BMPs and Control Measures.	♦ Deliver a training curriculum for City staff to be incorporated into existing training opportunities. ♦ Create a feedback mechanism to improve implementation and BMP effectiveness.	Annually (*First completed in 98-99)* (*Done FY 01-02)*
SDO 5.	As part of the annual review process, the City will evaluate data regarding cleaning activities and unusual flows observed during inspection. The review and evaluation will include consideration of storm drain structural retrofit.	♦ Develop procedures for documenting storm drain O&M activities (including inspections and review/evaluation of BMPs). ♦ Develop measures to evaluate cleaning activities and future planning and design.	(*Done FY 98-99)* Ongoing *(First completed in 2002)*
SDO 6.	As part of the annual review process, the City will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges.	♦ Distribute and review SOPs annually. Incorporate SOP/BMP evaluation into annual training events.	Annually (*First completed in 1999)*

G. Water Utilities O&M

The City's Municipal Water System (Muni Water) serves the areas of Alviso, Evergreen, Edenvale, Coyote Valley, and North San José. Muni Water supplies 26,000 customers, including approximately 102,000 individuals in residential, commercial, and industrial sectors.

Muni Water operation and maintenance activities involve treatment, conveyance and storage of water. Muni Water facilities include pumps to reservoirs, water lines, electrical controls, and treatment equipment. These activities have the potential to impact ambient water quality.

This Performance Standard is being implemented for water utilities operations and maintenance (WUOM) through several steps:

a) identify discharges of concern;

b) identify and evaluate control measures to reduce these discharges;

c) develop a Water Utility Pollution Prevention Plan (WUPPP), including Best Management Practices (BMPs) and an implementation schedule;

d) develop a curriculum and an implementation plan for training staff and contractors on the WUPPP elements;

e) develop a plan for annually evaluating the effectiveness of the WUPPP and gathering feed back from City staff.

This Performance Standard only applies to the City's Municipal Water System. San José Water Company and Great Oaks, which are both privately owned and operated water companies, are not included in or subject to the Performance Standard. These entities are responsible for their own storm water management plan, pursuant to state and federal requirements.

The water supply systems subject to this Performance Standard extend from the Municipal Water's source of supply to its customers' points of connection, and include treated and untreated potable water supply systems, reclaimed (recycled) water supply systems, raw water systems, and non-potable water.

WUOM Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
WUOM 1.	The City will conduct an inventory of all key operations and maintenance activities, and identify routine and unplanned non-stormwater discharges from these activities. This inventory will be conducted every three years. In addition, an evaluation of these activities will be done at least once a year.	♦ Deliver the survey of organizational units. ♦ Update list of O&M activities that result in discharges.	Annually *(First completed in 1998)* Every 3 years. Next inventory due 3/06. *(Last completed 3/03)*
WUOM 2.	The City will implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.	♦ Deliver the San Jose Municipal Water System WUPPP including O&M BMPs and implementation schedule.	Annually *(First completed in 1998)*
WUOM 3.	The City will conduct annual training for applicable staff and coordinate WUPPP elements with water utility project planning, including applicable WUPPP elements (BMPs, conditions, specifications, etc., in contract and service agreements).	♦ Deliver a curriculum and implementation plan for staff and contractor training which includes coordination of other performance standards.	Annually *(First completed in 1998)*
WUOM 4.	The City will evaluate the effectiveness of the WUPPP annually, maintain accurate documentation, and revise, as necessary, to achieve the goals of the URMP.	♦ Deliver a plan for documenting annual feedback from City staff responsible for implementing the WUPPP.	Annually *(First completed in 1999)*

H. Pesticide Management

The goals of the Pesticide Management program are to minimize pesticide use (particularly organophosphate pesticides) and to reduce the amount of pesticides in stormwater and landscape runoff. These control measures apply to pest management on municipally owned property performed by municipal employees and/or by commercial applicators that contract with the municipality. The control measures include outreach to other users within the City's jurisdiction regarding less toxic pest control methods and proper disposal of pesticides.

Pesticides are applied, or contracted to be applied, by the following departments: Transportation; General Services; Parks, Recreation & Neighborhood Services; Public Works; Convention, Arts & Entertainment; Environmental Services; and the Redevelopment Agency. In all cases the City's policy is to use the least toxic method consistent with adequate pest management. Organophosphate pesticides (OPs) are no longer used by the City of San José for any purpose. Commercial pest control services contracted by the City are instructed on City policy, which prohibits the use of OP insecticides. Most contract services themselves no longer carry or use these products.

As required by section C.9.d, of NPDES Permit CA S029718, the City is required to submit, to the Executive Officer of RWQCB, a plan for controlling pesticide use. This plan includes provisions to address municipal use of pesticides, and education and outreach on the use of pesticides by other sources in the City jurisdiction. The plan includes provisions to implement Integrated Pest Management (IPM) practices that minimize pesticide use and water quality impacts from pesticides. The City's plan is also consistent with the goals and objectives of the SCVURPPP Urban Runoff Management Plan (URMP, 1997, revised October 2000). The basic elements of the plan include:

- A process for tracking pesticide use on municipal property.
- A process to ensure that contractors employed by the City adhere to IPM practices.
- A City IPM policy.
- Development of BMPs and SOPs for implementing an IPM policy.
- Expansion of training, outreach, and monitoring activities to cover IPM issues and pesticide concerns.

The City pesticide management plan contains provisions to discourage pesticide use at new development sites by encouraging pest-resistant landscaping, minimization of impervious surface and other design strategies, and education of individuals who perform design and environmental reviews.

PM Performance Standard Matrix

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
PM 1.	The City will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring use of IPM techniques in the agency's operations; and, minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors.	♦ Develop an ordinance section stating City IPM policy for inclusion in Pesticide Management Plan.	(*Done FY 02-03*)
PM 2.	The City will develop and implement a Pesticide Management Plan with the goals of minimizing pesticide use and reducing the amount of pesticides in stormwater and landscape runoff to the maximum extent practicable.	♦ Draft a CSJ Pesticide Management Plan (PMP). ♦ Publish CSJ PMP in URMP.	(*Done FY 01-02*) (*Done FY 01-02*)
PM 3.	The City will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy.	♦ Develop SOPs and BMPs for implementing IPM policy, with provisions that will reduce water quality impacts from pesticide use. ♦ Update City URMP to incorporate model Pest Management Performance Standard, including description of legal authority (IPM policy and contract language), work plan elements, BMPs, and SOPs needed for implementation.	(*Done FY 02-03*) (*Done FY 02-03*)
PM 4.	The City will ensure that employees receive pest management training by implementing the following: a) Employees who apply pesticides for the City will obtain the appropriate training as required by County Ag. Commissioner and State Department of Pesticide Regulation (DPR); b) Employees within departments responsible for pesticide application will receive annual training on appropriate portions of City IPM Policy, SOPs, and BMPs, and latest IPM techniques; c) Employees who are not authorized to apply pesticides will be annually trained not to use over-the-counter pesticides at workplace, consistent with IPM Policy.	♦ Ensure that employees who apply pesticides for the agency obtain the appropriate training required by County Ag. Commissioner and State DPR. ♦ Provide annual training on IPM Policy, SOPs, and BMPs, and latest IPM techniques to employees within departments responsible for pesticide application. ♦ Annually inform employees who are not authorized / trained to apply pesticides not to use over-the-counter pesticides at workplace, consistent with IPM Policy ♦ Monitoring Mechanism I.B.1. Document and evaluate effectiveness of staff training conducted each year in annual reports.	Annually *(First completed prior to 2001)* Annually *(First completed in 2002)* Annually *(First completed in 2002)* Annually *(First completed in 2003)*

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
PM 5.	The City will develop and implement a process to ensure that contractors employed to conduct pest control and pesticide application on municipal property engage in pest control methods consistent with City IPM Policy. Specifically, the City will require contractors to: follow City IPM policy, BMPs, and SOPs; provide evidence of current IPM training, when feasible; and provide documentation of pesticide use on City property to the City in a timely manner.	♦ Develop and implement a process to ensure contractors employed to conduct pest control/pesticide application on municipal property engage in methods consistent with City IPM policy. ♦ Require through contract specifications that PCOs contracted for municipal applications to use pest control methods consistent with City's IPM policy. Specifically, require contractors to: a) follow City IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on City property to the City in a timely manner. ♦ Monitoring Mechanism III.A.1. Document numbers of PCOs receiving presentations and/or training on pesticide use by PCOs on municipal property.	Ongoing *(First completed in 2003)* Ongoing *(First completed in 2003)* Annually *(First completed in 2001)*
PM 6.	The City will identify in annual work plan, outreach activities it will conduct consistent with Program Pesticide Management Plan. Work plan elements will address outreach to residential and commercial pesticide users, pesticide retailers, and special districts. Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the City's own IPM practices, as applicable.	♦ Increase awareness of IPM so target audiences recall less toxic pest management messages and adopt IPM behaviors. Target audiences include residential and commercial users, pesticide retailers, municipal employees, and special districts. (Goal) ♦ Develop and implement education programs that target commercial businesses. ♦ Monitoring Mechanism: Document or estimate numbers of residents reached by outreach efforts, including events, web promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts by documenting calls to the Program's general and watershed campaign hotlines. ♦ Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, as recommended in the work plan to be developed by the Program. Implement the evaluation component of the work plan.	Annually *(First completed in 2002)* Annually *(First completed in 2002)* Annually *(First completed in 2002)* Annually *(First completed in 2002)*

#	PERFORMANCE STANDARD	ACTIVITIES	MILESTONE
PM 7.	The City will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.	♦ Work with HHW collection agencies to support, enhance, and publicize programs for pesticide disposal. ♦ Ensure that adequate pesticide disposal services exist for residents and conditionally exempt small quantity commercial generators. ♦ Provide hazardous waste disposal information to residents, through distribution of materials (e.g., utility bill insert, city newsletter, community events, etc.) or advertising in local media. ♦ Monitoring Mechanism V.A.1. Document that HHW collection programs adequately serve residents and businesses and that any exchange programs do not exchange organophosphate or banned pesticides.	Annually *(First completed 2002)* Annually *(First completed 2002)* Annually *(First completed 2002)* Annually *(First completed 2002)*
PM 8.	The City will develop and implement a process for tracking pesticide use on municipally-owned property.	♦ Develop and implement a process for tracking pesticide use on municipally owned property. Include reporting and justification for use of OP pesticides and BMPs employed during OP pesticide use. ♦ Monitoring Mechanism I.A.1. Document completion of tasks in annual reports. Use pesticide tracking process to document pesticide use.	Done FY 01-02 Annually *(First completed 2002)* Annually *(First completed 2002)*
PM 9.	The City will conduct periodic City-wide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. These pesticides, if found, will be properly disposed pursuant to appropriate waste disposal regulations.	♦ Conduct periodic City-wide search of chemical storage areas for pesticides no longer legal for application per EPA, State, and/or local requirements. Properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.	Annually *(First completed 2002)*
PM 10.	As part of annual reporting process, the City will review and evaluate, with input from municipal staff, the effectiveness of its Pest Management Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.	♦ Review and continuously improve the goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings if any. ♦ Monitoring Mechanism IX.A.1. Complete revised work plan that incorporates continuous improvement items, and report on completion of work plan tasks. ♦ Monitoring Mechanism VII.A.1. Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development and significant redevelopment projects, and percentage of new development / significant redevelopment projects for which pesticide reduction measures were required. (Draft Permit Provision C.3.n.)	Annually *(First completed 2001)* Annually *(First completed 2002)* Annually *(First completed 2002)*

Legal Authority

The following is a list of the City of San Jose's legal authority and local regulations that are used to assist in the implementation of the URMP. Copies of the full text of these ordinances, policies, and other documents are available to review during regular business hours at the Environmental Services Department; call (408) 945-3000 to make an appointment. Ordinances can also be found on the City of San Jose's website at www.sanjoseca.gov.

Ordinances

1.08.010 General Code Enforcement Authority

1.14.010 Administrative Compliance Orders

9.10.410 General Requirements

9.10.510 Sidewalks and Public Ways – Duty of Owners or Occupiers of Property

13.20.070 Depositing Articles Likely to Injure Vehicles Prohibited

13.44.190 Water Pollution Prohibited

15.10.200 Water Waste Prevention

15.14.515 Discharge into Storm Drain Prohibited

15.14.530 Protection from Accidental Discharge

15.14.625 Garbage

15.14.630 Oil and Grease Removal Devices

15.14.690 Power to Inspect

15.14.720 Civil Penalties

17.04.300 Excavation & Grading

17.04.430 Erosion Control

17.04.440 Grading Inspection

20.10.430 Construction Clean-Up

20.10.470 Storm Water Management – Projects disturbing less than one acre

20.10.480 Storm Water Management – Projects disturbing more than one acre

General Plan Policies

Water Resources Policies #1, 3, 5, 6, 7, 8, 9, 12

Bay and Bayland Policies #1, 2, 5, 6

Riparian Corridors and Upland Wetlands Policies #1, 2, 3, 4, 5, 8

Parks & Rec. Policy #5

Level of Service, Storm Drainage & Flood Control Policy #12

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_____. Multi-Year Receiving Waters Monitoring Plan, March 1, 2002 (Revised August 5, 2002)

_____. Draft Revised Multi-Year Receiving Waters Monitoring Plan, March 1, 2004

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Acronyms, Abbreviations, and Definitions

ACRONYMS & ABBREVIATIONS

BAPPG	Bay Area Pollution Prevention Group
BAASMA	Bay Area Stormwater Management Agencies
BMPs	Best Management Practices
CalTrans	California Department of Transportation
CETA	Cleaning Equipment Trade Association
CNAP	Copper/Nickel Action Plans
CON	Construction Inspection
DMV	Department of Motor Vehicles
DOT	Department of Transportation
DPR	California Department of Pesticide Regulation
DTSC	Department of Toxic Substances Control
DMV	California Department of Motor Vehicles
ESD	Environmental Services Department
EPPP	Environmentally Preferable Purchasing Policy
FY	Fiscal Year
GCASP	General Construction Activity Storm Water Discharge Permit
GIASP	General Industrial Activity Storm Water Discharge Permit
GS	General Services
HHW	Household Hazardous Waste
ICID	Illicit Connection/Illegal Dumping
IND	Industrial/Commercial Discharger Inspection Program
IPM	Integrated Pest Management
M	Mercury
Marcom	Marketing and Communications
MC	Municipal Compliance
MDN	Mercury Deposition Network
MEP	Maximum Extent Practicable
MOA	Memorandum of Agreement
MON	Monitoring

Muni Water	San Jose Municipal Water System
NRD	New and Redevelopment
NEPA	National Environmental Protection Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination Program
NPS	Nonpoint Source Pollution
O&M	Operation and Maintenance
OP	Organophosphate pesticides
PBCE	Planning, Building and Code Enforcement
PCO	Pest Control Operator
PG&E	Pacific Gas and Electric
PIP	Public Information and Participation
PM	Pesticide Management
PMC	Pesticide Management Committee
PMP	Pesticide Management Plan
PRNS	Parks Recreation and Neighborhood Services
Program	SCVURPPP
PSR	Public Streets, Roads and Highways
PW	Public Works
RDA	Redevelopment Agency
RMP	Regional Monitoring Program
RPW	Rural Public Works
RWQCB	Regional Water Quality Control Board (Water Board)
SCBWMI	Santa Clara Basin Watershed Management Initiative
SCC	Santa Clara County
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SCVWD	Santa Clara Valley Water District
SDO	Storm Drains Operation and Maintenance
SFEI	San Francisco Estuary Institute
SIC	Standard Industrial Classification
SJ	San Jose
SJPD	San Jose Police Department
SOPs	Standard operating Procedures
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan

The City	The City of San Jose
TMDL	Total Maximum Daily Load
TRA	Trash
UR	Urban Runoff
URMP	Urban Runoff Management Program
USA	Urban Service Area
WE	Watershed Envorcement
WMI	SCVWMI
WUOM	Water Utilities Operations and Maintenance
WUPPP	Water Utility Pollution Prevention Program

DEFINITIONS

ACTIVITIES	Individual tasks, that when combined with others, form a Work Plan to achieve a Milestone for a given Performance Standard.
ADVERSE IMPACT	A detrimental effect upon water quality or beneficial uses caused by a discharge or loading of a pollutant or pollutants. See also "Impact."
AOC	See Area of Concern.
AREA OF CONCERN	A violation based on the San Jose Municipal Code 15.14.530 issued to a facility during a storm water inspection.
BENEFICIAL USES	Existing or potential uses of receiving waters in the permit area as designated by the Regional Board in the Basin Plan.
BMP	See Best Management Practice.
BEST MANAGEMENT PRACTICE (BMP)	Activities, practices, facilities, and/or procedures that when implemented to their maximum efficiency will prevent or reduce pollutants in discharges. Examples of BMPs may include public education and outreach efforts, proper planning of development projects, proper clean out of catch basin inlets, and proper waste handling and disposal, among others.[27]
CALIFORNIA STORM WATER BEST MANAGEMENT PRACTICE HANDBOOKS	The technical manuals prepared under the direction of the California Stormwater Quality Association. Comprising four volumes -- Municipal, Industrial, New Development and Construction -- they provide guidance for selecting BMPs to reduce pollutants in storm water discharges. The most recent volumes are available at www.cabmphandbooks.com.
CITY OF SAN JOSE URBAN RUNOFF MANAGEMENT PLAN (SJURMP)	The City of San Jose's portion of the Countywide Urban Runoff Management Plan. This section of the Management Plan forms the implementation program to control storm water pollution within the city limits. The SJURMP identifies, among others, specific Program Elements, Performance Standards for these elements, and milestones, which measure whether performance standards have been met. The SJURMP identifies implementation actions necessary to identify pollutant sources, control measures and management practices that will result in reduction of pollutants in storm water discharges to maximum extent practicable. San Jose's URMP is one part of the overall URMP for the Santa Clara Valley.
CITY-REGULATED FACILITY	An industrial/commercial facility that is covered by the City of San Jose's Urban Runoff Industrial Inspection Program.
COMPLIANCE	Meeting all applicable conditions of the State's NPDES General Industrial Permit, the City of San Jose Municipal Code, Best Management Practices, and local standards as confirmed by a City inspection. No unauthorized non-storm water discharges occur from the site.

[27] This definition is derived from a compilation of Guidance Specifying Management Measures for Sources of NPS Pollution in Coastal Water. 1993. USEPA & NOAA. EPA-840-B-92-002, Final NPS Guidance, 12/17/87. USEPA, Washington, D.C, and Los Angeles, RWQCB Order No. 96-054.

CONDITIONALLY EXEMPTED DISCHARGES	Non-storm water discharges that need not be prohibited if identified by the Dischargers or the Executive Officer as not being sources of pollutants to receiving waters or if appropriate control measures to minimize the adverse impacts of such sources are developed and implemented under the URMP in accordance with Provision C.8.c.
CONSTRUCTION ACTIVITY	Clearing, grading, or excavation that results in soil disturbance. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility, nor does it include emergency construction activities required to immediately protect public health and safety.
CONTROL	To minimize, reduce or eliminate by technological, legal, contractual or other means, the discharge of pollutants from an activity or activities.
CONTROL MEASURE	Technically and economically feasible practices, equipment or other activities required to reduce and abate metals and other toxics as required per Waste Discharge Requirements[28] and issued pursuant to Section 304(l) of the Clean Water Act.
DISPOSAL	Intentional act in the placement of wastes or other materials to be thrown out or thrown away.
DISTURBED AREA	That area altered as a result of clearing, grading, and/or excavation of earth.
ECONOMICALLY FEASIBLE	Measures which reflect the greatest degree of pollutant reduction achievable at the least amount of investment taking into consideration technical, design, procedural and operation and maintenance costs.29
EFFECTIVENESS	A direct or indirect measure or indicator of how well a program, plan, or BMP achieves its intended purpose. Measures or indicators of effectiveness include, but are not limited to, detailed accounting of program accomplishments, funds expended, staff hours utilized, field surveys, amount of pollutants reduced, biosurveys, and quantitative data from water quality and sediment sampling.
EROSION	The wearing away of land surface primarily by wind or water. Erosion occurs naturally as a result of weather or runoff but can be accelerated by many activities, including clearing, grading, or excavation of the land surface.
EROSION CONTROL PLAN (ECP)	A set of BMPs designed to control surface runoff and erosion to prevent sediment movement offsite before, during, and after construction-related land disturbances.
FOOD SERVICE FACILITIES	Commercial or industrial facilities that prepare food for the public or for institutional patrons, and use or generate grease when preparing this food. "Food Service Facilities" do not include any facilities that do not use or generate grease in cooking or

[28] San Francisco Regional Board Cease and Desist Order No. 93-164.

[29] This definition derived from Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Water. 1993. USEPA & NOAA. EPA-840-B-92-002.

	preparing food, such as facilities that prepare food for off-site cooking and consumption.
GENERAL CONSTRUCTION ACTIVITY STORM WATER DISCHARGE PERMIT (GCASP)	The NPDES permit adopted by the State Water Resources Control Board, authorizing the discharge of storm water from construction sites under certain conditions.
GENERAL INDUSTRIAL ACTIVITY STORM WATER DISCHARGE PERMIT (GIASP)	The NPDES permit adopted by the State Water Resources Control Board, authorizing the discharge of storm water from industrial sites under certain conditions.
GOOD HOUSEKEEPING PRACTICE	A common practice related to the storage, use, or clean-up of materials performed in a manner that minimizes the discharge of pollutants. Examples include purchasing only the quantity of materials to be used at a given time, use of alternative and less harmful products, cleaning up spills and leaks, and storing materials in a manner that will contain any leaks or spills.
HAZARDOUS MATERIAL	Any material defined as hazardous by Chapter 6.95 of the California Health and Safety Code.
HAZARDOUS SUBSTANCE	Any substance designated pursuant to 40 CFR 302.
HAZARDOUS WASTE	A 'Hazardous Substance' or 'Hazardous Material' that is to be discharged, discarded, recycled, or processed.
HIGH PRIORITY AREAS	Areas suspected to have high incidence of Illicit Connection/Illegal Dumping activities based on historical information and results of monitoring studies.
ILLICIT CONNECTION	Any human-made conveyance that is connected to the storm drain system without a permit, excluding roof-drains and other similar type connections. Examples include channels, pipelines, conduits, inlets, or outlets that are connected directly to the storm drain system.
ILLEGAL DISCHARGE	Any discharge to the storm drain system that is prohibited under local, state, or federal statutes, ordinances, codes or regulations. This includes all non-storm water discharges except discharges pursuant to an NPDES permit and discharges that are exempted in accordance with San Jose Municipal Code Chapter 15.
ILLEGAL DISPOSAL	Any disposal, either intentional or unintentional, of material(s) or waste(s) that can pollute storm water or urban runoff.
IMPACT	Any actual or potential effect caused either directly or indirectly by the discharge of pollutants.
INDUSTRIAL ACTIVITY	"Industrial activity" as defined in 40 CFR 122.26(b)(14) refers to 11 categories of activities. Each of these activities is required to obtain a NPDES permit for storm water discharges associated with "industrial activity" as required by 40 CFR 122.26(c). See also General Construction Activity Storm Water Discharge Permit.
INDUSTRIAL/COMMERCIAL FACILITY	Any facility involved and/or used in the production, manufacture, storage, transportation, distribution, exchange or sale of goods and/or commodities, and any facility involved and/or used in providing professional and non-professional services. This category of facility includes, but is not limited to, any facility

	defined by the Standard Industrial Classifications (SIC). Facility ownership (federal, state, municipal or private) and profit motive of the facility are not factors in this definition.
INTEGRATED PEST MANAGEMENT (IPM)	An ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and the use of resistant varieties. Pesticides are used only after monitoring indicates that they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risk to human health, beneficial and non-target organisms, and the environment.
IPM	See Integrated Pest Management.
JURISDICTION	The geographic area within the boundaries of the City of San Jose subject to Municipal ordinance and regulation. The term is not intended to include facilities which the City is preempted or otherwise precluded from regulating.
LEGAL AUTHORITY	The ability of the City of San Jose to impose and enforce statutes, ordinances, and regulations to require control of pollutant sources and regulate the discharge of pollutants to the storm drain system, and to enter into interagency agreements, contracts, and memoranda of understanding. These powers are derived from the City Charter in accordance with the General Laws of the State. These powers are promulgated by the City through its municipal codes, ordinances, and statutes duly adopted by the City Council.
MAXIMUM EXTENT PRACTICABLE (MEP)	The standard for implementation of storm water management programs to reduce pollutants in storm water. MEP refers to storm water management programs taken as a whole. The implementation of MEP takes into account equitable consideration and competing facts, including, but not limited to the gravity of the problem, potential or actual public health risk, environmental benefits, pollutant removal effectiveness, regulatory compliance, public acceptance, implementability, cost and technical feasibility.[30]
MILESTONE	Deliverable designed to demonstrate compliance with the Performance Standard. Conventions for the description of the frequency include: - As Needed: Activity is conducted when necessary with no commitment to specific frequency. - Ongoing: Activity is conducted as a matter of routine business, throughout the year. - Annually: Activity is conducted typically once per year or during a season.
MONITORING	Activities, programs or tasks designed to obtain information,

[30] Section 402(p)(3)(B)(iii) of the Clean Water Act requires that municipal permits *"…shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."*

	evaluate and/or document status of URMP measures and milestones. The term "monitoring" as used is primarily one of three types:[31] **Implementation monitoring** which assesses whether activities were carried out as planned. **Effectiveness monitoring** which evaluates whether specific activities achieved the desired result. **Project monitoring**, the type of monitoring which assesses the impact of a particular activity or project on water quality.
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)	See Storm Drain System.
NPDES	See National Pollutant Discharge Elimination System.
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)	A permit issued by the USEPA, SWRCB or SFBRWQCB pursuant to the Clean Water Act section 402(p) that authorizes discharges to waters of the United States and requires the reduction of pollutants in the discharge.
NOI FILERS	Facilities that have filed for coverage under the State's NPDES General Permit for Discharges of Storm Water Associated with Industrial Activity.
NON-NOI FILERS	Facilities regulated under the State's NPDES General Permit for Discharges of Storm Water associated with Industrial Activity that have not filed for coverage under this permit and have not applied for an individual permit and/or an exemption certification, when required.
NONPOINT SOURCE (NPS) POLLUTION	Pollution caused by diffuse sources normally associated with agricultural, silvicultural, urban runoff, and runoff from construction activities, etc. Such pollution results in the human-made or human-induced alteration of the chemical, physical, biological, or radiological integrity of water. In practical terms, nonpoint source pollution does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition, or percolation. In the past, the City of San Jose Urban Runoff Management Program was known as the Nonpoint Source Program. The City has changed the name to more clearly convey the focus of the program's efforts on urban generated pollution reduction.
NON-SIGNIFICANT FACILITIES	Facilities determined to be non-significant contributors to storm water pollution based on the number of Areas of Concern (AOC) the facility has been issued over a rolling 3 year (food service) or five year (all other City Regulated facilities) time period. One AOC or less constitutes a non-significant facility.
NON-STORM WATER DISCHARGE	Any discharge to a municipal separate storm sewer that is not composed entirely of storm water.
OUTREACH AND EDUCATION PROGRAMS	Any planning, activities, materials, media, and other management practices designed to effect behavior that prevents or reduces

[31] *See* Monitoring Guidelines to Evaluate the Effects of Forestry Activities on Stream in the Pacific Northwest and Alaska. 1991. L. MacDonald. USEPA, Region 10, EPA/910/9-91-001.

	pollutants in storm water/urban runoff discharges.
PERFORMANCE STANDARDS	Level of implementation necessary to demonstrate the control of pollutants to the maximum extent practicable.[32]
POLLUTANT	Those "pollutants" defined in Section 502(6) of the federal Clean Water Act (33 U.S.C. § 1362(6)), or incorporated into California Water Code §13373. Examples of pollutants include, but are not limited to the following: - Commercial and industrial waste such as fuels, solvents, detergents, plastic pellets, hazardous substances, fertilizers, pesticides, slag, ash and sludge; - Metals such as cadmium, chromium, copper, lead, nickel, silver, zinc, and non-metals such as phosphorus and arsenic; - Petroleum hydrocarbons such as fuels, lubricants, surfactants, waste oils, solvents, coolants, and grease; - Excessive eroded soils, sediment, and particulate materials in amounts which may adversely affect the beneficial uses of the receiving waters, flora or fauna of the state. - Animal wastes - Substances having characteristics such as pH less than 6 or greater than 9, or unusual coloration or turbidity, or excessive levels of fecal coliform, or fecal streptococcus, or enterococcus. - The term "pollutant" shall not include uncontaminated storm water, potable water or recycled water generated by a lawfully permitted water treatment facility. - The term "pollutant" also shall not include any substance identified in this definition if, through compliance with the best management practices available, the discharge of such substance has been eliminated to the maximum extent practicable.
POLLUTANTS OF CONCERN	Pollutants that exhibit one or more of the following characteristics: - Current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water; - Elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms; or - The detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. Pollutants of concern may be different for each receiving water. For South San Francisco Bay, several studies have identified particular "pollutants of concern" these include copper, mercury, nickel, silver and selenium.[33]
POLLUTION PREVENTION	Any planning, schedules of activities, prohibitions of practices, implementation maintenance procedures or other management practices to prevent or reduce pollutants in storm water/urban

[32] San Francisco Bay RWQCB Order 95-180. NPDES Permit No. CAS029718.

[33] Metals Control Measures Plan (Vol. 1), 1996. Prepared by Woodward-Clyde Consultants, EOA, Inc. and Michael Drennan Associates for the Santa Clara Valley Nonpoint Source Pollution Control Program.

	runoff discharges.
POST-CONSTRUCTION ACTIVITY	Permanent storm water or erosion control techniques that remain in place after land construction has been completed.
POTABLE WATER SOURCES	Flows from drinking water storage, supply and distribution systems including flows from system failures, pressure releases, system maintenance, well development, pump testing, fire hydrant flow testing; and flushing and dewatering of pipes, reservoirs, vaults, and wells.
PROPER DISPOSAL	The act of disposing of material(s) in a lawful manner which ensures the protection of water quality and beneficial uses of receiving waters.
REGIONAL BOARD	The Governing Board of the California Regional Water Quality Control Board; the State agency with primary responsibility for the protection and maintenance of water quality. For purposes of this document, this means the California Regional Water Quality Control Board, San Francisco Bay Region.
RECEIVING WATERS	All surface water bodies within the permit area that are identified in the Basin Plan.
RUNOFF	Storm water and dry-weather flows from a drainage area that reaches a receiving or sub-surface waterbody.
SIC	See Standard Industrial Classification.
SWRCB	State Water Resources Control Board.
SEDIMENT	Organic or inorganic material carried by, or suspended in, water and settles to form deposits in the storm drain system or receiving waters.
SIGNIFICANT EROSION POTENTIAL	Risk of depositing sediment into watercourses or storm drains.
SIGNIFICANT FACILITIES	Facilities determined to be potentially significant contributors to storm water pollution based on the number of Areas of Concern (AOC) the facility has been issued over a rolling 3 year (food service) or five year (all other City Regulated facilities) time period. Two AOCs or more constitutes a significant facility.
SIGNIFICANT NON-COMPLIANCE	One or more of the following conditions at any facility: 1) An unauthorized non-storm water discharge to the storm sewer; 2) Negligent gross failure to implement BMPs; 3) Failure to meet compliance schedule milestones within 90 days after a compliance schedule date; and 4) Any other violation or group of violations which the City determines will adversely effect receiving waters.
SIGNIFICANT STORMWATER POLLUTION POTENTIAL	A project which causes substantial or potentially substantial adverse change in the quantity and/or quality of storm water runoff generated from the site.
SOURCE CONTROL	The primary approach to urban runoff management. Methods vary depending on the type of problem, examples include: - Reducing or eliminating the introduction of pollutants to a land area. Examples include reduced nutrient and pesticide

application.
- Preventing pollutants from leaving the site during land-disturbing activities. Examples include construction practices that minimize erosion.
- Preventing interaction between precipitation and introduced pollutants. Examples include diverting runoff from areas of land disturbance at construction sites, and parking lots.
- Protecting riparian habitat and other sensitive areas. Examples include protection and preservation of riparian zones, shorelines, wetlands, and highly erosive slopes.
- Protecting natural hydrology. Examples include the maintenance of pervious surfaces in developing areas (conditioned based on ground-water considerations), riparian zone protection, and water management.[34]

SOURCE MINIMIZATION — Planning or operational practices that reduce the amount of materials used and stored at a site.

STANDARD INDUSTRIAL CLASSIFICATION (SIC) — The statistical classification standard, organized by industry, underlying all establishment-based federal economic statistics. The SIC of a particular industry is determined using the latest Standard Industrial Classification Manual, prepared by the federal Office of Management and Budget. The SIC Code is useful for pollution prevention programs in that similarly categorized industries tend to use similar processes and chemicals.

STANDARD OPERATING PROCEDURES — Routine steps or actions that, if properly carried out, reduce the likelihood of pollutants entering the receiving waters.

STORM DRAIN SYSTEM — Streets, gutters, conduits, natural or artificial drains, channels and watercourses, or other facilities that are owned, operated, maintained or controlled by the City of San Jose and used for the purpose of collecting, storing, transporting, or disposing of storm water.

STORMWATER — Water that originated from atmospheric moisture (rainfall or snowmelt) and that falls onto land, water, or other surfaces.

STORM WATER MANAGEMENT PLAN (SWMP) — The original strategy and framework submitted by the Santa Clara Valley Urban Runoff Pollution Prevention Program to outline countywide efforts of all the co-permittees to comply with the Phase I NPDES permit.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) — A plan required of Industry and Construction Projects (disturbing one acre or more) by, and for which contents are specified in, the State of California General Permit for Storm Water Discharges Associated with Industrial Activities, and the General Permit for Storm Water Discharges Associated with Construction Activities. The purpose of such plans is to identify potential sources of pollution that can affect of the quality of storm water discharges from a site and to describe and ensure the implementation of practices to reduce pollutants in storm water discharges.

STORM WATER/URBAN RUNOFF — The part of precipitation (rainfall or snowmelt) which travels via

[34] This definition derived from Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Water. 1993. USEPA & NOAA. EPA-840-B-92-002.

	flow across a surface to the storm drain system or receiving waters. Examples of this phenomenon include the water that flows from a building's roof or parking lot when it rains (runoff from an impervious surface); and the water that flows from a vegetated surface when rainfall is in excess of the rate at which it can infiltrate into the underlying soil (runoff from a pervious surface).
TECHNOLOGY TRANSFER	Communications performed primarily by inspection staff, using outreach and education materials, in addition to any other media which conveys technical information on activities, practices, facilities, and/or procedures that meet the criteria of the Best Management Practices.
TIERED ENFORCEMENT	Progressive process of enforcement with escalating tiers of response based on the severity or persistence of a violation. Enforcement typically begins with voluntary approaches using education and cooperation. Higher tiers entail more formal communication and potential financial fines or other administrative actions.
TIME SCHEDULE FOR COMPLIANCE	A written plan of action, including a timeline, approved by the City, to bring a facility into compliance with storm water requirements.
TOXIC MATERIALS	For the purpose of this Plan, toxic materials means any material(s) or combination of materials which directly or indirectly cause(s) either acute or chronic toxicity in the water column.
TOXIC POLLUTANT	Those "pollutants," or combination of pollutants, defined in Sections 502(13) or 307(a)(1) of federal Clean Water Act (33 U.S.C.§ 1362(13)).
TRAINING	Curricula, activities, materials, media, and other information pertaining to performance of one's job, Standard Operating Procedures, and BMP implementation training designed to ensure employees understand application of measures to reduce pollutants in storm water/urban runoff discharges.
URBAN RUNOFF	See Storm Water/Urban Runoff.
USEPA	United States Environmental Protection Agency.
VEHICLE SERVICE FACILITIES	Publicly and privately owned facilities that repair, fuel, clean, service or dismantle cars, trucks, boats, airplanes or other motor vehicles.
WET SEASON	Typically the period of rainfall from October 15 to April 15.
WORK PLAN	A set of specific activities necessary to achieve Performance Standard Milestones.

Appendix A

BEST MANAGEMENT PRACTICES

Best Management Practices List

BMP – Program Element Matrix

Best Management Practices List

This is a reference list of Best Management Practices, outreach and technology transfer materials used by the City of San Jose to meet the requirements of the Permit and the goals of the Performance Standards set out in this URMP.

	Title	Language (s)	Format type	Target Audience (Main)	Target Audience (Sub)	Target Pollutant (s)	Message(s)	Source
1.	***A Clear Look at Our Water***	English	Booklet	All	General		Overview of water story - where it comes from to where it ends up.	SJ, ESD
2.	***Auto Dismantlers Best Management Practices***	English	Brochure	Commercial	Automotive		Recommended practices to assist your business in preventing environmental harm and unlawful discharges through pollutants reaching our creeks and the Bay.	SJ, ESD, WE
3.	***Auto Dismantlers Best Management Practices***	Spanish	Brochure	Commercial	Automotive		Recommended practices to assist your business in preventing environmental harm and unlawful discharges through pollutants reaching our creeks and the Bay.	SJ, ESD, WE
4.	***Auto Dismantlers Best Management Practices***	Vietnamese	Brochure	Commercial	Automotive		Recommended practices to assist your business in preventing environmental harm and unlawful discharges through pollutants reaching our creeks and the Bay.	SJ, ESD, WE
5.	***Auto Facts: How to Dispose of Automotive Fluids Correctly***	English	Fact Sheet	Residential	Automotive	Automotive Fluids	Describes how to correctly recycle used motor oil.	SJ, ESD, MarCom
6.	***Best Management Practices for Hospitals and Health Care Facilities***	English	Binder	Commercial	Hospitals		Guidelines for hospitals and health care facilities. Practices include Pollution prevention measures - administrative, laboratories, other departments, storm drain protection, wastewater flow reduction, waste storage and disposal.	SJ, ESD, WE
7.	***Best Management Practices for Industrial Storm Water Pollution Control***	English	Booklet	Commercial, industrial	General		BMPs for industry. Categories such as: Training and Education for Employees and Customers; Eliminating Improper Discharges to Storm Drains; Spill Prevention, Control, and Clean-up; Outdoor Process Equipment Operations and Maintenance; etc.	Program
8.	***Best Management Practices for Machine Shops***	English	Booklet	Commercial	Machine Shops		Guidelines for machine shops to reduce sanitary sewer discharges of heavy metals	SJ, ESD, WE
9.	***Best Management Practices for Printing and Photoprocessing Operations***	English	24-page Booklet	Commercial	Printing	Haz Waste	Guidelines for printing and photoprocessors to reduce heavy metals in discharges to the sanitary sewer.	SJ, ESD, WE
10.	***Best Management Practices for the Construction Industry. Earth-Moving Activities***	English	tri-fold pamphlet	Commercial	Construction	Sediment	Preventing storm drain pollution from earth-moving activities during construction. 1st in a series of 7.	Program
11.	***Best Management Practices for the Construction Industry. Fresh Concrete and Mortar Application***	English	tri-fold pamphlet	Commercial	Construction	Concrete	Preventing stormwater pollution from masonry and paving during construction. 2nd in a series of 7	Program

	TITLE	LANGUAGE (S)	FORMAT TYPE	TARGET AUDIENCE (MAIN)	TARGET AUDIENCE (SUB)	TARGET POLLUTANT (S)	MESSAGE(S)	SOURCE
12.	***Best Management Practices for the Construction Industry. General Construction and Site Supervision***	English	tri-fold pamphlet	Commercial	Construction		Preventing stormwater pollution from construction activities. 3rd in a series of 7	Program
13.	***Best Management Practices for the Construction Industry. Heavy Equipment Operation.***	English	tri-fold pamphlet	Commercial	Construction		Preventing stormwater pollution from heavy equipment operation on the construction site. 4th in a series of 7	Program
14.	***Best Management Practices for the Construction Industry. Landscaping, Gardening, and Pool Maintenance.***	English	tri-fold pamphlet	Commercial	Construction	Pool Water Discharge, Copper, Sediment	Preventing stormwater pollution from landscaping and swimming pool maintenance. 5th in a series of 7	Program
15.	***Best Management Practices for the Construction Industry. Painting and Application of Solvents and Adhesives***	English	tri-fold pamphlet	Commercial	Construction	Paint	Preventing stormwater pollution from paints, solvents, and adhesives. 6th in a series of 7.	Program
16.	***Best Management Practices for the Construction Industry. Roadwork and Paving***	English	tri-fold pamphlet	Commercial	Construction		Preventing stormwater pollution from roadwork. 7th in a series of 7.	Program
17.	***Blueprint for a Clean Bay***	English	Booklet	Commercial	Construction		BMPs for construction activities. Categories such as erosion control, general site maintenance, demolition waste, roadwork and pavement construction, contaminated soil and groundwater are included	BASMAA via Program
18.	***Builder's Reuse and Recycling Guide***	English	booklet	Commercial	Construction		A directory of construction and demolition material recycling firms.	SJ, ESD, IWM
19.	***Changing the Course of California's Water (Lindsey Report)***	English	Wire-bound book	All	General		Urban Runoff recent history, environmental impact, pollution prevention tips, and citizen call-to-action	Lindsey Museum
20.	***Clean Bay Blueprint***	English	22" x 34" Poster	Commercial	Construction		BMPs for construction activities. Included: useful phone numbers, material storage, spill clean-up, vehicle & equipment maintenance, earth-moving, erosion control, paints, solvents, adhesives, roadwork, pavement construction, waste disposal.	SJ, ESD, WE
21.	***Clean It!***	English	fanfold	Residential	General	Haz Waste	Guides to safer household cleaning methods that really work. 30 pages	Program
22.	***Construction Storm Water Pollution Control Compliance***	English	Binder	Commercial	Construction		General Construction & Site Supervision; Earth-Moving Activities; Roadwork & Paving; Heavy Equipment Operation; Fresh Concrete & Mortar Application; Landscaping, Gardening & Pool Maintenance; Painting & Application of Solvents & Adhesives; Home Repair &Remodeling BMPs	Program
23.	***Controlling Ants In Your House***	English	8.5" x 11" 2-sided Factsheet	Residential	General	Pesticides	Detection, prevention and less toxic controls of ants in the home.	Bay Area Water Pollution Prevention Agencies

	Title	Language (s)	Format Type	Target Audience (Main)	Target Audience (Sub)	Target Pollutant (S)	Message(s)	Source
24.	***Controlling Ants In Your House (Spanish)***	Spanish	8.5" x 11" 2-sided Factsheet	Residential	General	Pesticides	Detection, prevention and less toxic controls of ants in the home. Spanish language adapted from English "Controlling Ants In Your House". (Hormigas)	SJ, ESD, MarCom
25.	***Controlling Aphids In Your Garden***	English	8.5" x 11" 2-sided Factsheet	Residential	General	Pesticides	Detection, tolerance, less toxic controls, prevention for aphids. Includes a short list of products	Bay Area Water Pollution Prevention Agencies
26.	***Controlling Snails and Slugs In Your Garden***	English	8.5" x 11" 2-sided Factsheet	Residential	General	Pesticides	Detection, less toxic controls, prevention for snails and slugs. Includes a short list of products.	Bay Area Water Pollution Prevention Agencies
27.	***Controlling Yellowjackets Around Your Home***	English	8.5" x 11" 2-sided Factsheet	Residential	General	Pesticides	Identification, detection, less toxic controls, prevention of yellow jackets. Includes a short list of products	Bay Area Water Pollution Prevention Agencies
28.	***Cooling Towers Regulations, Pollution Prevention & Flow Reduction***	English	Fact Sheet	Commercial, Industrial, Institutional	Cooling Tower		Fact sheet notifying cooling tower owners of ban on tri-butyl tin. Provides chemical management information and tips on water conservation.	SJ, ESD, WE
29.	***Copper Plumbing and the Health of the Bay***	English	pamphlet	Commercial	Plumbing	Copper	Guidelines (BMPs) for plumbers working with copper pipes	SJ, ESD, WE
30.	***Dewatering from Construction Sites and In-Ground Utilities Maintenance Projects***	English	Booklet	Commercial, Municipal	Construction		Dewatering from construction sites and in-ground utilities maintenance projects. Applies to new construction, foundation work and utilities infrastructure installation or repair. Removing sediment from ground water and determining if contaminants are present.	SJ, ESD, WE
31.	***Do It Right (Spanish/English)***	Spanish/ English	20" x 23" poster.	Commercial	Automotive		Clear laminated poster describing 6 practices that will prevent polluted water from flowing out of your workplace and into storm drains.	SJ, ESD, WE
32.	***Do It Right (Vietnamese/English)***	Vietnamese / English	20" x 23" poster.	Commercial	Automotive		Clear laminated poster describing 6 practices that will prevent polluted water from flowing out of your workplace and into storm drains.	SJ, ESD, WE
33.	***Does Your Facility Need To Be Covered By The General Permit?***	English	stapled sheets	Industrial, Municipal	General		Industrial Stormwater Permit Worksheet- Who must comply?	SJ, ESD, WE
34.	***Draining Pools and Spas***	English	Quad-fold brochure, color	Residential	Pools And Spas	Pool Water Discharge, Copper, Sediment	Informs poolownersof the correct and acceptable method for cleaning pools, resolving problems without using copper algicides, and how to drain pools or spas	Program Spring 2004
35.	***Estuarywise***	English	Handbook	Residential	General		Handbook on the SF Bay-Delta Estuary. Includes tips on how to stop pollution; recipes for household cleaners, pest controls; product toxicity ratings; lists of household hazwaste collection programs; and community-wide restoration efforts (SF Estuary Inst)	Program

	TITLE	LANGUAGE (S)	FORMAT TYPE	TARGET AUDIENCE (MAIN)	TARGET AUDIENCE (SUB)	TARGET POLLUTANT (S)	MESSAGE(S)	SOURCE
36.	***Get to the Root of the Problem!***	English	Brochure	Residential	Plumbing	Copper	Copper root killer warnings	SJ, ESD, WE
37.	***Good Cleaning Practices To Protect Our Creeks And Bay***	Chinese	Tri-fold brochure	Commercial	Restaurant	FOG, Surface Cleaning	BMP for restaurants and food handling facilities. Guidelines for food handling, cleaning equipment, grease handling / disposal, spill clean-up and pavement cleaning	SJ, ESD, MarCom
38.	***Good Cleaning Practices To Protect Our Creeks And Bay***	English	Tri-fold brochure	Commercial	Restaurant	FOG, Surface Cleaning	BMP for restaurants and food handling facilities. Guidelines for food handling, cleaning equipment, grease handling / disposal, spill clean-up and pavement cleaning	SJ, ESD, MarCom
39.	***Good Cleaning Practices To Protect Our Creeks And Bay***	Korean	Tri-fold brochure	Commercial	Restaurant	FOG, Surface Cleaning	BMP for restaurants and food handling facilities. Guidelines for food handling, cleaning equipment, grease handling / disposal, spill clean-up and pavement cleaning	Program
40.	***Good Cleaning Practices To Protect Our Creeks And Bay***	Spanish	Tri-fold brochure	Commercial	Restaurant	FOG, Surface Cleaning	BMP for restaurants and food handling facilities. Guidelines for food handling, cleaning equipment, grease handling / disposal, spill clean-up and pavement cleaning	SJ, ESD, MarCom
41.	***Good Cleaning Practices To Protect Our Creeks And Bay***	Vietnamese	Tri-fold brochure	Commercial	Restaurant	FOG, Surface Cleaning	BMP for restaurants and food handling facilities. Guidelines for food handling, cleaning equipment, grease handling / disposal, spill clean-up and pavement cleaning	SJ, ESD, MarCom
42.	***Grease Removal Devices***	English	Flyer	Business	Restaurant	FOG	Restaurant advisory sheet regarding grease removal and disposal	SJ, ESD, WE
43.	***Grow It!***	English	fanfold	Residential	General	Pesticides, Fertilizers	Guides to the less toxic garden. Control pests & plant disease using less-toxic methods. 30 pages.	Program
44.	***Guidelines for Vehicle Service Facilities, Body Work***	English	Pamphlet	Commercial	Automotive		Body Work	Program
45.	***Guidelines for Vehicle Service Facilities, Body Work***	Spanish	Brochure	Commercial	Automotive		Body Work	SJ, ESD, WE
46.	***Guidelines for Vehicle Service Facilities, Body Work***	Vietnamese	Brochure	Commercial	Automotive		Body Work	SJ, ESD, WE
47.	***Guidelines for Vehicle Service Facilities, Changing Oil and Other Fluids***	English	Pamphlet	Commercial	Automotive	Automotive Fluids	Changing Oil and Other Fluids	Program
48.	***Guidelines for Vehicle Service Facilities, Engine & Parts Cleaning & Radiator Flushing***	English	Pamphlet	Commercial	Automotive	Automotive Fluids	Engine & Parts Cleaning & Radiator Flushing	Program
49.	***Guidelines for Vehicle Service Facilities, Keeping a Clean Shop***	English	Pamphlet	Commercial	Automotive		Keeping a Clean Shop	Program
50.	***Guidelines for Vehicle Service Facilities, Tips for Managers of Vehicle Service Facilities***	English	Pamphlet	Commercial	Automotive		Tips for Managers of Vehicle Service Facilities	Program
51.	***Guidelines for Vehicle Service Facilities, Washing Cars and Other Vehicles***	English	Pamphlet	Commercial	Automotive	Sediment, Oil & Grease	Washing Cars and Other Vehicles	Program

	Title	Language (s)	Format Type	Target Audience (Main)	Target Audience (Sub)	Target Pollutant (S)	Message(s)	Source
52.	***Guidelines for Vehicle Service Facilities, Washing Cars and Other Vehicles***	Spanish	Brochure	Commercial	Automotive	Sediment, Oil & Grease	Washing Cars and Other Vehicles	SJ, ESD, WE
53.	***Guidelines for Vehicle Service Facilities, Washing Cars and Other Vehicles***	Vietnamese	Brochure	Commercial	Automotive	Sediment, Oil & Grease	Washing Cars and Other Vehicles	SJ, ESD, WE
54.	***Handy Guide to Water-Saving Devices***	English	Flyer	Residential	Plumbing		Information on devices to reduce water usage	San Jose Water Co.
55.	***Hazardous substances in the auto shop***	English	Videotape	Business	Automotive	Haz Waste	Information Video regarding hazardous substances in an auto shop	SJ, ESD, MarCom
56.	***Hazardous Waste Disposal Program for Small Businesses in Santa Clara County***	English	tri-fold brochure	Business, Commercial	General	Haz Waste	Description of a hazardous waste drop-off program for small businesses that generate less than 100 kg (27 gal or 220 lbs) of hazardous waste each month.	Santa Clara Co., 299-7300
57.	***Help Prevent Illegal Dumping***	English / Spanish / Vietnamese	Tri-fold brochure	All	General		Describes illegal dumping along creeks and roads. Provides guides for proper disposal of common household items: bulky goods, construction and remodeling debris, household hazardous waste, tires.	
58.	***Help Protect Your Neighbors***	English	Brochure	Residential	General		Advisories regarding prevention of water pollution in the bay area and to the Bay.	SJ-SCWPCP
59.	***Home Maintenance Tips for a Cleaner Bay***	English	Brochure	Residential	General		How to plan home maintenance projects to protect water quality. Topics: car washing & repair, painting & furniture striping, concrete, masonry & asphalt repair, pool/spa maintenance, housecleaning, garden care, carpet cleaning	Program
60.	***IC/ID Card for Concrete Work***	Eng / Spa / Viet	5.5" x 8" card	All	Construction	Concrete	IC/ID Card listing directions for protecting storm drain and creeks from concrete work.	Program
61.	***IC/ID Card for Engine Degreasing***	Eng / Spa / Viet	5.5" x 8" card	All	Automotive	Oil & Grease	IC/ID Card listing directions for protecting storm drain and creeks from engine degreasing.	Program
62.	***IC/ID Card for General Dumping Into Storm Drain***	Eng / Spa / Viet	5.5" x 8" card	Residential	General		IC/ID Card listing directions for protecting storm drain and creeks from general dumping.	Program
63.	***IC/ID Card for Grey Water***	Eng / Spa / Viet	5.5" x 8" card	All	General		IC/ID Card listing directions for protecting storm drain and creeks from wash water.	Program
64.	***IC/ID Card for Hazardous Waste***	Eng / Spa / Viet	5.5" x 8" card	All	General	Haz Waste	IC/ID Card listing directions for protecting storm drain and creeks from hazardous wastes.	Program
65.	***IC/ID Card for Landscape Maintenance***	Eng / Spa / Viet	5.5" x 8" card	All	General	Sediment, Pesticides	IC/ID Card listing directions for protecting storm drain and creeks from landscape maintenance.	Program
66.	***IC/ID Card for Overwatering***	Eng / Spa / Viet	5.5" x 8" card	All	General		IC/ID Card listing directions for protecting storm drain and creeks from overwatering.	Program
67.	***IC/ID Card for Painting***	Eng / Spa / Viet	5.5" x 8" card	All	Construction	Paint	IC/ID Card listing directions for protecting storm drain and creeks from paints.	Program

	TITLE	LANGUAGE (S)	FORMAT TYPE	TARGET AUDIENCE (MAIN)	TARGET AUDIENCE (SUB)	TARGET POLLUTANT (S)	MESSAGE(S)	SOURCE
68.	***IC/ID Card for Residential Car Washing***	Eng / Spa / Viet	5.5" x 8" card	Residential	Automotive	Sediment	IC/ID Card listing directions for protecting storm drain and creeks from residential car washing.	Program
69.	***IC/ID Card for Saw Cut Slurry***	Eng / Spa / Viet	5.5" x 8" card	All	Construction	Sediment	IC/ID Card listing directions for protecting storm drain and creeks from saw cut slurry.	Program
70.	***IC/ID Card for Sediments***	Eng / Spa / Viet	5.5" x 8" card	All	Construction	Sediment	IC/ID Card listing directions for protecting storm drain and creeks from construction sediments.	Program
71.	***IC/ID Card for Storing Landscape Materials***	Eng / Spa / Viet	5.5" x 8" card	All	Construction		IC/ID Card listing directions for protecting storm drain and creeks from stored landscape materials.	Program
72.	***IC/ID Card for Vehicle Fluids***	Eng / Spa / Viet	5.5" x 8" card	All	Automotive	Automotive Fluids	IC/ID Card listing directions for protecting storm drain and creeks from auto fluids dripping from vehicles.	Program
73.	***Illegal Dumping (English/Chinese)***	Eng / Chn	Folder	All	General		Advisory that illegal dumping is a costly problem.	SJ, ESD, MarCom
74.	***Illegal Dumping Booklet (English/Vietnamese)***	Eng / Viet	Booklet	Residential	General		Booklet explaining why not to illegally dump and alternatives	SJ, ESD, IWM
75.	***Industrial Storm Water Pollution Control Compliance***	English	Binder	All	General		Contains sample Storm Water Prevention Pollution Plan, EPA regulations and booklet	Program
76.	***Interested Parties***	English	Stapled Sheets	Government	General		Overview of NPDES Industrial Stormwater Regulations	CRWQCB
77.	***Keeping Fleas Off Your Pets and Out of Your Yard***	English	8.5" x 11" 2-sided factsheet	Residential	General	Pesticides	Detection, prevention and less toxic controls of fleas in the home.	Bay Area Water Pollution Prevention Agencies
78.	***Keeping It All In Tune***	English	Quad-fold brochure	Residential	Automotive	Automotive Fluids	Provides facts on water pollution from automobiles. Provides guides for reducing or preventing urban runoff pollution from vehicle maintenance activities.	BASMAA
79.	***Keeping It All In Tune***	Spanish	Quad-fold brochure	Residential	Automotive	Automotive Fluids	Provides facts on water pollution from automobiles. Provides guides for reducing or preventing urban runoff pollution from vehicle maintenance activities.	BASMAA
80.	***Landscaping while protecting our creeks and Bay***	English	Tri-fold brochure	Residential	General	Pesticides, Fertilizers	Pollution prevention for residents doing concrete work, excavation, yard work.	SJ, ESD, WE
81.	***Larry's Auto Works haz. material management***	English	Videotape	Business	Automotive	Haz Waste	Information video regarding hazardous material management at Larry's Auto Works.	SJ, ESD, MarCom
82.	***MERCURY in the Environment***	English	Folder containing materials	Business	General	Mercury	Folder describing hazards and sources of mercury in the environment. 6 Card inserts describe gauges, manometers, barometers, vacuum gauges; switches and relays; thermometers; thermostats; fluorescent & HID lamps; thermostat probes.	
83.	***Mobile Cleaner Best Management Practices CETA***	English	Stapled sheets	Commercial	Mobile Cleaning		Workshop/Conference material produced by Cleaning Equipment Trade Association	CETA
84.	***No Dumping Flows to Bay Stencil***	English	Stencil, plastic	Residential	General		Storm drain stencil with instruction sheet; for business, industry,	Program

	Title	Language (s)	Format type	Target Audience (Main)	Target Audience (Sub)	Target Pollutant (s)	Message(s)	Source
							or county residents and volunteer groups; the stenciling of storm drain inlets brings nonpoint source pollution to the attention of the public and is a BMP for business and industry	
85.	***No Dumping Flows to Bay Stencil (Spanish)***	Spanish	Plastic stencil	Residential	General		Storm drain stencil with instruction sheet; for business, industry, or county residents and volunteer groups; the stenciling of storm drain inlets brings nonpoint source pollution to the attention of the public and is a BMP for business and industry	Program
86.	***No Dumping Flows to Bay Stencil (Vietnamese)***	Vietnamese	Plastic stencil	Industrial	General		Storm drain stencil with instruction sheet; for business, industry, or county residents and volunteer groups; the stenciling of storm drain inlets brings nonpoint source pollution to the attention of the public and is a BMP for business and industry	Program
87.	***Paint--Safe Use and Disposal***	English	Poster	All	Construction	Paint	Advice on the safe handling and disposal of paint.	City of Sunnyvale
88.	***Pests Bugging You?***	English	Brochure	Residential	General	Pesticides	Addresses environmentally safe pest control. Suggestions for choosing and caring for plants and pets	Program
89.	***Pests Bugging You? ?Le estan molestando las plagas? (Spanish)***	Spanish	Brochure	Residential	General	Pesticides	Addresses environmentally safe pest control. Suggestions for choosing and caring for plants and pets	Program
90.	***Please don't feed the wildlife "stickers"***	English	Premium	Institutions, Educational	General		Large sticker. Intended to be used at janitor's and laboratory sinks	SJ, ESD, WE
91.	***Pollution From Surface Cleaning***	English	Folder, glossy tri-fold	Commercial	Mobile Cleaning		For flatwork, sidewalks, plazas, building exteriors, parking areas, drive-throughs. Tips on proper cleaning and disposal methods.	BASMAA
92.	***Pollution Prevention Tips for Carpet Cleaners***	English	Tri-fold brochure	Commercial	Mobile Cleaning		Tri-fold containing tips on what to do with carpet cleaning fluids	Bay Area Waste Treatment Agencies
93.	***Pollution Solution for the Automotive Industry***	English	Pamphlet	Commercial	Automotive	Automotive Fluids	Regulations, BMPs; Poster on back side. (Older but still good information)	SJ, ESD, WE
94.	***Preventing Storm Drain Pollution***	English	20-page Booklet	Commercial, Industrial	General		Guidelines for commercial and light industrial facilities. Practices include: cleaning, repair and maintenance, equip., storage, docks, landscaping, spills, training.	SJ, ESD, WE May 2003
95.	***Quick, What's the Best Day to Protect Our Bay?***	English	Flyer	Residential	General		Suggestions for water conservation	SJ, ESD, MarCom
96.	***Recycle Plus–Tires***	English	Flyer	Residential	Automotive	Tires	Recycling tires advice	SJ, ESD, IWM
97.	***Resources for Pollution Prevention and Water Conservation***	English	Fact Sheet	All	General		Sheet with phone numbers to call for more information	SJ, ESD, MarCom
98.	***Restaurant Poster and Checklist***	English	Checklist and Poster	Commercial	Restaurant		Letter, checklist and poster for restaurants, grocery stores, delicatessens, cafeterias and bakeries. Describes and illustrates best cleaning practices using a checklist and a poster.	Program
99.	***Safe Use and Disposal of Pesticides***	English	Factsheet	Residential	General	Pesticides	Selection, safe use and storage, disposal of less toxic pesticides.	Bay Area Water

	TITLE	LANGUAGE (S)	FORMAT TYPE	TARGET AUDIENCE (MAIN)	TARGET AUDIENCE (SUB)	TARGET POLLUTANT (S)	MESSAGE(S)	SOURCE
							8.5" x 11" 2-sided factsheet.	Pollution Prevention Agencies
100.	***Sanitary Sewers***	English	Brochure	All	General		Information explaining sewer systems and Streets and Traffic services.	SJ, DoT
101.	***Santa Clara County Household Hazardous Waste Program***	English	Brochure	Residential	General		Describes the Santa Clara County's household hazardous waste program. Defines household hazardous waste. Describes how to dispose of these wastes. Lists other related services.	SCC, Dept of Env. Health
102.	***Santa Clara County Self Audit Program***	English	Tri-fold brochure	Commercial	General		Describes a hazardous waste program designed for small businesses that generate hazardous waste. Program is currently for: Vehicle repair and dismantlers; dry cleaners; photoprocessors; chiropractors; dental; medical; veterinary businesses.	SCC, HCMD
103.	***Sawcut Slurry***	English	Tri-fold brochure	Commercial	Construction		Follow this three-step procedure when saw-cutting to help protect the storm sewer system and the environment.	SJ, ESD, WE
104.	***Start at the Source, 1999 Edition***	English	Book, paperback	Commercial	Construction		Design guidance manual for stormwater quality protection through post-construction practices. Includes chapters on: Planning and Zoning; Site Design; Drainage Systems; Landscape Details; and Case Studies.	Program
105.	***Street Sweeping***	English	Brochure	All	General		Information on the City's street sweeping programs through the Dept of Streets and Traffic.	SJ, DoT
106.	***Streets & Traffic***	English	Brochure	All	General		Information of customer service and assistance available through Dept. of Streets and Traffic.	SJ, DoT
107.	***Switching to Water-Based Solutions for Parts Cleaning***	English	8.5" x 11" Booklet, 14 pages	Commercial	General		Tips on switching to water-based cleaners without causing water quality problems. Cleaning products and equipment; management and disposal of wastes; info to request from Vendors and Referral Shops; excerpts from the new BAAQMD regulations.	BAPPG
108.	***The Bay Begins at Your Front Door***	English	Brochure, Color	Residential	General		Shows how materials used in our daily lives "go down the drain". Gives suggestions for reducing pollution in the areas of Household & Home Maintenance, Lawn &Garden & Automotive activities	Program
109.	***The Bay Begins at Your Front Door***	Spanish	Brochure, b&w	Residential	General		Shows how materials used in our daily lives "go down the drain". Gives suggestions for reducing pollution in the areas of Household & Home Maintenance, Lawn &Garden & Automotive activities	Program
110.	***The Bay Begins at Your Front Door. Vinh San Francisco Bat Dau Tu Cua Truoc Cua Ban***	Vietnamese	Brochure	Residential	General		Shows how materials used in our daily lives "go down the drain". Gives suggestions for reducing pollution in the areas of Household & Home Maintenance, Lawn &Garden & Automotive activities	Program
111.	***Tips For A Healthy Beautiful Lawn***	English	8.5" x 11" 4-	Residential	General	Pesticides,	Irrigation, mowing, weeding, aeration, dethatching, fertilizing,	Bay Area Water

	Title	Language (s)	Format Type	Target Audience (Main)	Target Audience (Sub)	Target Pollutant (S)	Message(s)	Source
			page Factsheet			Fertilizers	substituting to maintain green lawns.	Pollution Prevention Agencies
112.	***Tired of Tires?***	English	Postcard	Residential	Automotive	Tires	Advice regarding the proper disposal of old tires	SJ, ESD, IWM
113.	***To Report Storm Drain Pollution - Pads***	English	notepad	Municipal	General		Short form for municipal employees to report storm drain pollution, 4" x 6", padded.	SJ, ESD, WE
114.	***Waste Audit Folder***	English	Folder containing materials	Commercial, Industrial	General		Contains information for San Jose businesses on solid waste reduction and recycling programs	SJ, ESD, IWM
115.	***Waste Minimization for the Commercial Printing Industry***	English	Factsheet	Industrial	Printing		Describes alternative management strategies to minimize hazardous waste, specifically for the commercial printing industry. (DTSC: 916-322-3670)	DTSC, Technology Clearinghouse
116.	***Wastewater Paths***	English	Poster	All	General		Where does the water go? Poster showing wastewater paths to the Bay and to reuse.	SJ, ESD, MarCom
117.	***Wastewater Plan Check***	English	Tri-fold brochure	Commercial, Industrial	General		Describes who needs a wastewater plan check and how to arrange for it.	SJ, ESD, MarCom
118.	***Water Policy Framework***	English	Document	All	General		City of San Jose's water policy	SJ, ESD, P&P
119.	***We're Stenciling Curbs!***	English	Flyer	General	General		Frequently asked questions about stormwater, storm drains and stenciling. 1 sheet	SJ, ESD, UR
120.	***We're Stenciling Curbs!***	Spanish	Flyer	General	General		Frequently asked questions about stormwater, storm drains and stenciling. 1 sheet	SJ, ESD, UR
121.	***When Ants Invade***	English	Tri-fold brochure	Residential	General	Pesticides	Describes how to keep ants away without the spray. Outreach piece supporting the 1999 1-888-BAY-WISE campaign.	BASMAA
122.	***Where Does the Water Go?***	English	Tri-fold brochure	Commercial	Mobile Cleaning		Guidelines for disposal of washwater from outdoor cleaning projects	Bay Area Waste Treatment Agencies and Stormwater Agencies
123.	***Wonderful Roses!***	English	8.5" x 11" 4-page factsheet	Residential	General	Pesticides, Fertilizers	Choosing the right rose. Planting roses. Caring for your roses. Managing common rose pests and diseases without pesticides. Less-toxic chemical controls. Includes a short list of products.	Bay Area Water Pollution Prevention Agencies
124.	***Your Shop Can Make a Difference***	English	Booklet	Commercial	Automotive	Automotive Fluids	BMPs for vehicle service facilities. Includes how to operate your shop to reduce antifreeze, heavy metals, oily wastes and other substances discharged into storm drains and sanitary sewers. (BASMAA)	Program

BMP – Program Element Matrix

#	TITLE	ICID	IND	NRD[1]	CON	PSR	SDO	WUOM	PM	MER	CNAP	TRA	MC	PIP
1.	*A Clear Look at Our Water*						N/A	N/A						X
2.	*Auto Dismantlers Best Management Practices (English)*	X	X	X			N/A	N/A						
3.	*Auto Dismantlers Best Management Practices (Spanish)*	X	X	X			N/A	N/A						
4.	*Auto Dismantlers Best Management Practices (Vietnamese)*	X	X	X			N/A	N/A						
5.	*Auto Facts: How to Dispose of Automotive Fluids Correctly*	X					N/A	N/A					X	X
6.	*Best Management Practices for Hospitals and Health Care Facilities*		X				N/A	N/A						
7.	*Best Management Practices for Industrial Storm Water Pollution Control*		X	X			N/A	N/A					X	
8.	*Best Management Practices for Machine Shops*		X	X			N/A	N/A					X	
9.	*Best Management Practices for Printing and Photoprocessing Operations*		X				N/A	N/A						
10.	*Best Management Practices for the Construction Industry. Earth-Moving Activities*	X	X	X	X		N/A	N/A						
11.	*Best Management Practices for the Construction Industry. Fresh Concrete and Mortar Application*	X	X	X	X	X	N/A	N/A						
12.	*Best Management Practices for the Construction Industry. General Construction and Site Supervision*	X		X	X	X	N/A	N/A						
13.	*Best Management Practices for the Construction Industry. Heavy Equipment Operation.*	X	X	X	X		N/A	N/A						
14.	*Best Management Practices for the Construction Industry. Landscaping, Gardening, and Pool Maintenance.*	X	X	X	X		N/A	N/A						X
15.	*Best Management Practices for the Construction Industry. Painting and Application of Solvents and Adhesives*	X	X		X	X	N/A	N/A						
16.	*Best Management Practices for the Construction Industry. Roadwork and Paving*	X	X	X	X	X	N/A	N/A						
17.	*Blueprint for a Clean Bay*	X		X	X	X	N/A	N/A						
18.	*Builder's Reuse and Recycling Guide*	X	X	X	X		N/A	N/A						
19.	*Changing the Course of California's Water (Lindsey Report)*						N/A	N/A						X
20.	*Clean Bay Blueprint*	X		X		X	N/A	N/A				X		
21.	*Clean It!*	X					N/A	N/A						X

[1] Formerly abbreviated as NDC

#	Title	ICID	IND	NRD[1]	CON	PSR	SDO	WUOM	PM	MER	CNAP	TRA	MC	PIP
22.	*Construction Storm Water Pollution Control Compliance*	X	X	X		X	N/A	N/A						
23.	*Controlling Ants In Your House*	X					N/A	N/A	X					X
24.	*Controlling Ants In Your House (Spanish)*	X					N/A	N/A	X					X
25.	*Controlling Aphids In Your Garden*	X					N/A	N/A	X					X
26.	*Controlling Snails and Slugs In Your Garden*	X					N/A	N/A	X					X
27.	*Controlling Yellowjackets Around Your Home*	X					N/A	N/A	X					X
28.	*Cooling Towers Regulations, Pollution Prevention & Flow Reduction*		X	X			N/A	N/A						
29.	*Copper Plumbing and the Health of the Bay*		X	X			N/A	N/A						
30.	*Dewatering from Construction Sites and In-Ground Utilities Maintenance Projects*		X	X	X		N/A	N/A						
31.	*Do It Right (Spanish/English)*	X	X				N/A	N/A					X	
32.	*Do It Right (Vietnamese/English)*	X	X				N/A	N/A					X	
33.	*Does Your Facility Need To Be Covered By The General Permit?*		X				N/A	N/A			X			
34.	*Draining Pools and Spas*		X	X			N/A	N/A			X			X
35.	*Estuarywise*						N/A	N/A						X
36.	*Get to the Root of the Problem!*			X			N/A	N/A						X
37.	*Good Cleaning Practices To Protect Our Creeks And Bay (Chinese)*		X				N/A	N/A						
38.	*Good Cleaning Practices To Protect Our Creeks And Bay (English)*		X				N/A	N/A						
39.	*Good Cleaning Practices To Protect Our Creeks And Bay (Korean)*		X				N/A	N/A						
40.	*Good Cleaning Practices To Protect Our Creeks And Bay (Spanish)*		X				N/A	N/A						
41.	*Good Cleaning Practices To Protect Our Creeks And Bay (Vietnamese)*		X				N/A	N/A						
42.	*Grease Removal Devices*		X				N/A	N/A						
43.	*Grow It!*						N/A	N/A	X					X
44.	*Guidelines for Vehicle Service Facilities, Body Work (English)*	X	X				N/A	N/A						X
45.	*Guidelines for Vehicle Service Facilities, Body Work (Spanish)*	X	X				N/A	N/A						X
46.	*Guidelines for Vehicle Service Facilities, Body Work (Vietnamese)*	X	X				N/A	N/A						X
47.	*Guidelines for Vehicle Service Facilities, Changing Oil and Other Fluids*	X	X				N/A	N/A					X	X
48.	*Guidelines for Vehicle Service Facilities, Engine & Parts Cleaning & Radiator Flushing*	X	X			X	N/A	N/A					X	X
49.	*Guidelines for Vehicle Service Facilities, Keeping a Clean Shop*	X	X				N/A	N/A					X	X

#	TITLE	ICID	IND	NRD[1]	CON	PSR	SDO	WUOM	PM	MER	CNAP	TRA	MC	PIP
50.	*Guidelines for Vehicle Service Facilities, Tips for Managers of Vehicle Service Facilities*	X	X			X	N/A	N/A					X	X
51.	*Guidelines for Vehicle Service Facilities, Washing Cars and Other Vehicles (English)*	X	X			X	N/A	N/A					X	X
52.	*Guidelines for Vehicle Service Facilities, Washing Cars and Other Vehicles (Spanish)*	X	X				N/A	N/A						X
53.	*Guidelines for Vehicle Service Facilities, Washing Cars and Other Vehicles (Vietnamese)*	X	X				N/A	N/A						X
54.	*Handy Guide to Water-Saving Devices*			X	X		N/A	N/A						X
55.	*Hazardous substances in the auto shop*		X				N/A	N/A					X	
56.	*Hazardous Waste Disposal Program for Small Businesses in Santa Clara County*		X				N/A	N/A	X	X				
57.	*Help Prevent Illegal Dumping*	X					N/A	N/A				X		X
58.	*Help Protect Your Neighbors*	X					N/A	N/A						X
59.	*Home Maintenance Tips for a Cleaner Bay*	X			X		N/A	N/A			X			X
60.	*IC/ID Card for Concrete Work*	X		X	X	X	N/A	N/A						X
61.	*IC/ID Card for Engine Degreasing*	X			X		N/A	N/A						X
62.	*IC/ID Card for General Dumping Into Storm Drain*	X		X	X	X	N/A	N/A				X		X
63.	*IC/ID Card for Grey Water*	X			X		N/A	N/A						X
64.	*IC/ID Card for Hazardous Waste*	X		X	X	X	N/A	N/A		X				X
65.	*IC/ID Card for Landscape Maintenance*	X			X	X	N/A	N/A	X					X
66.	*IC/ID Card for Overwatering*	X				X	N/A	N/A	X					X
67.	*IC/ID Card for Painting*	X		X	X		N/A	N/A						X
68.	*IC/ID Card for Residential Car Washing*	X					N/A	N/A			X			X
69.	*IC/ID Card for Saw Cut Slurry*	X		X	X	X	N/A	N/A						
70.	*IC/ID Card for Sediments*	X		X	X	X	N/A	N/A						X
71.	*IC/ID Card for Storing Landscape Materials*	X				X	N/A	N/A	X					X
72.	*IC/ID Card for Vehicle Fluids*	X				X	N/A	N/A					X	X
73.	*Illegal Dumping (English/Chinese)*	X					N/A	N/A				X		X
74.	*Illegal Dumping Booklet (English/Vietnamese)*	X					N/A	N/A				X		X
75.	*Industrial Storm Water Pollution Control Compliance*		X				N/A	N/A						
76.	*Interested Parties*		X	X	X		N/A	N/A						
77.	*Keeping Fleas Off Your Pets and Out of Your Yard*						N/A	N/A	X					X

#	Title	ICID	IND	NRD[1]	CON	PSR	SDO	WUOM	PM	MER	CNAP	TRA	MC	PIP
78.	*Keeping It All In Tune (English)*	X				X	N/A	N/A					X	X
79.	*Keeping It All In Tune (Spanish)*	X					N/A	N/A					X	X
80.	*Landscaping while protecting our creeks and Bay*	X					N/A	N/A						X
81.	*Larry's Auto Works haz. material management*		X				N/A	N/A					X	
82.	*MERCURY in the Environment*		X				N/A	N/A		X				
83.	*Mobile Cleaner Best Management Practices CETA*	X	X				N/A	N/A				X		
84.	*No Dumping Flows to Bay Stencil*	X	X	X	X		N/A	N/A				X		X
85.	*No Dumping Flows to Bay Stencil (Spanish)*	X	X	X	X		N/A	N/A				X		X
86.	*No Dumping Flows to Bay Stencil (Vietnamese)*	X	X	X	X		N/A	N/A				X		X
87.	*Paint--Safe Use and Disposal*	X	X		X	X	N/A	N/A						X
88.	*Pests Bugging You?*	X				X	N/A	N/A	X					X
89.	*Pests Bugging You? ?Le estan molestando las plagas? (Spanish)*	X					N/A	N/A	X					X
90.	*Please don't feed the wildlife "stickers"*		X				N/A	N/A						
91.	*Pollution From Surface Cleaning*	X	X			X	N/A	N/A				X		X
92.	*Pollution Prevention Tips for Carpet Cleaners*	X	X				N/A	N/A						
93.	*Pollution Solution for the Automotive Industry*		X			X	N/A	N/A					X	
94.	*Preventing Storm Drain Pollution*	X	X				N/A	N/A						
95.	*Quick, What's the Best Day to Protect Our Bay?*						N/A	N/A						X
96.	*Recycle Plus--Tires*						N/A	N/A				X		X
97.	*Resources for Pollution Prevention and Water Conservation*						N/A	N/A						X
98.	*Restaurant Poster and Checklist*	X	X				N/A	N/A						
99.	*Safe Use and Disposal of Pesticides*					X	N/A	N/A	X			X		X
100.	*Sanitary Sewers*					X	N/A	N/A						X
101.	*Santa Clara County Household Hazardous Waste Program*						N/A	N/A		X				X
102.	*Santa Clara County Self Audit Program*		X				N/A	N/A						
103.	*Sawcut Slurry*	X		X	X	X	N/A	N/A						
104.	*Start at the Source, 1999 Edition*			X	X		N/A	N/A						
105.	*Street Sweeping*						N/A	N/A						X

#	TITLE	ICID	IND	NRD[1]	CON	PSR	SDO	WUOM	PM	MER	CNAP	TRA	MC	PIP
106.	***Streets & Traffic***						N/A	N/A						X
107.	***Switching to Water-Based Solutions for Parts Cleaning***		X				N/A	N/A						
108.	***The Bay Begins at Your Front Door (English)***	X		X			N/A	N/A	X					X
109.	***The Bay Begins at Your Front Door (Spanish)***	X		X			N/A	N/A						X
110.	***The Bay Begins at Your Front Door. Vinh San Francisco Bat Dau Tu Cua Truoc Cua Ban (Vietnamese)***	X		X			N/A	N/A						X
111.	***Tips For A Healthy Beautiful Lawn***	X					N/A	N/A	X					X
112.	***Tired of Tires?***						N/A	N/A				X		X
113.	***To Report Storm Drain Pollution - Pads***						N/A	N/A					X	
114.	***Waste Audit Folder***		X				N/A	N/A						
115.	***Waste Minimization for the Commercial Printing Industry***		X				N/A	N/A						
116.	***Wastewater Paths***						N/A	N/A						X
117.	***Wastewater Plan Check***		X	X			N/A	N/A						
118.	***Water Policy Framework***		X				N/A	N/A						X
119.	***We're Stenciling Curbs! (English)***	X					N/A	N/A						X
120.	***We're Stenciling Curbs! (Spanish)***	X					N/A	N/A						X
121.	***When Ants Invade***						N/A	N/A	X					X
122.	***Where Does the Water Go?***	X		X			N/A	N/A						X
123.	***Wonderful Roses!***						N/A	N/A	X					X
124.	***Your Shop Can Make a Difference***	X	X				N/A	N/A					X	

Appendix B

STANDARD OPERATING PROCEDURES

Illicit Connection/Illegal Dumping

Industrial/Commercial Discharges

New and Redevelopment

Construction Inspection

Public Streets, Roads & Highways Operations & Maintenance

Storm Drain System Operations & Maintenance

Water Utilities Operations & Maintenance

Pesticide Management

ICID STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for the Illicit Connection/Illegal Dumping Program.

The various components of this section are organized as follows:

1. Watershed Enforcement Training and Procedures Manual Table of Contents Enforcement Response Plan
2. Standard Operating Procedures Flowchart
3. ICID Investigations Enforcement Actions Flow Chart Guidelines for Enforcement Response
4. Enforcement Response Plan
5. Guidelines for Enforcement Response
6. ICID Complaint Investigation
7. ICID Complaint Intake SOP

Watershed Enforcement Training and Procedures Manual

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1. **Enforcement Response Plan**

2. **Enforcement Procedures**
    a. Guidelines for enforcement response
    b. Administrative citations issuance
    c. Administrative citation amendment and dismissal
    d. Administrative citation appeals hearing
    e. Misdemeanor citations and court appearance
    f. Misdemeanor citation amendment
    g. Misdemeanor citation dismissal
    h. Compliance meeting
    i. Inspection warrant
    j. Official warning notice

3. **IND Procedures**
    a. Facility Inspection Procedure
    b. Facility Inspection Report
    c. Restaurant inspection procedure
    d. Sample collection

4. **IC/ID Procedures**
    a. IC/ID Complaint intake

b. IC/ID Investigations

c. Dye testing and TV/Video inspection

d. Leaf Blowing complaints

e. Pool Policy

f. Spill response and supervision of storm clean-up

5. References

a. GIASP/SIC/NOI Filers

b. IND Inspection Guidelines

c. ICID Investigation Guidelines

d. SJMC – Definitions

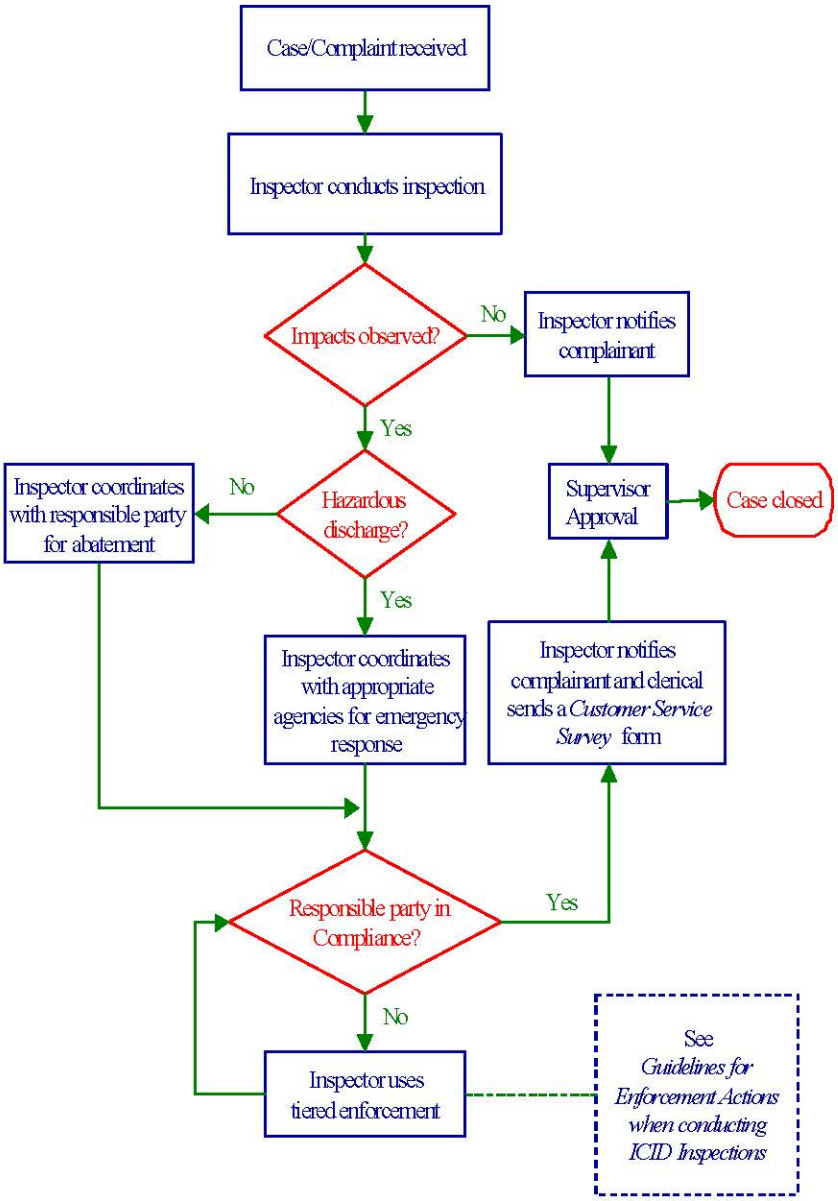
e. FAQ on Citations

f. SCC – DA Referral guidelines

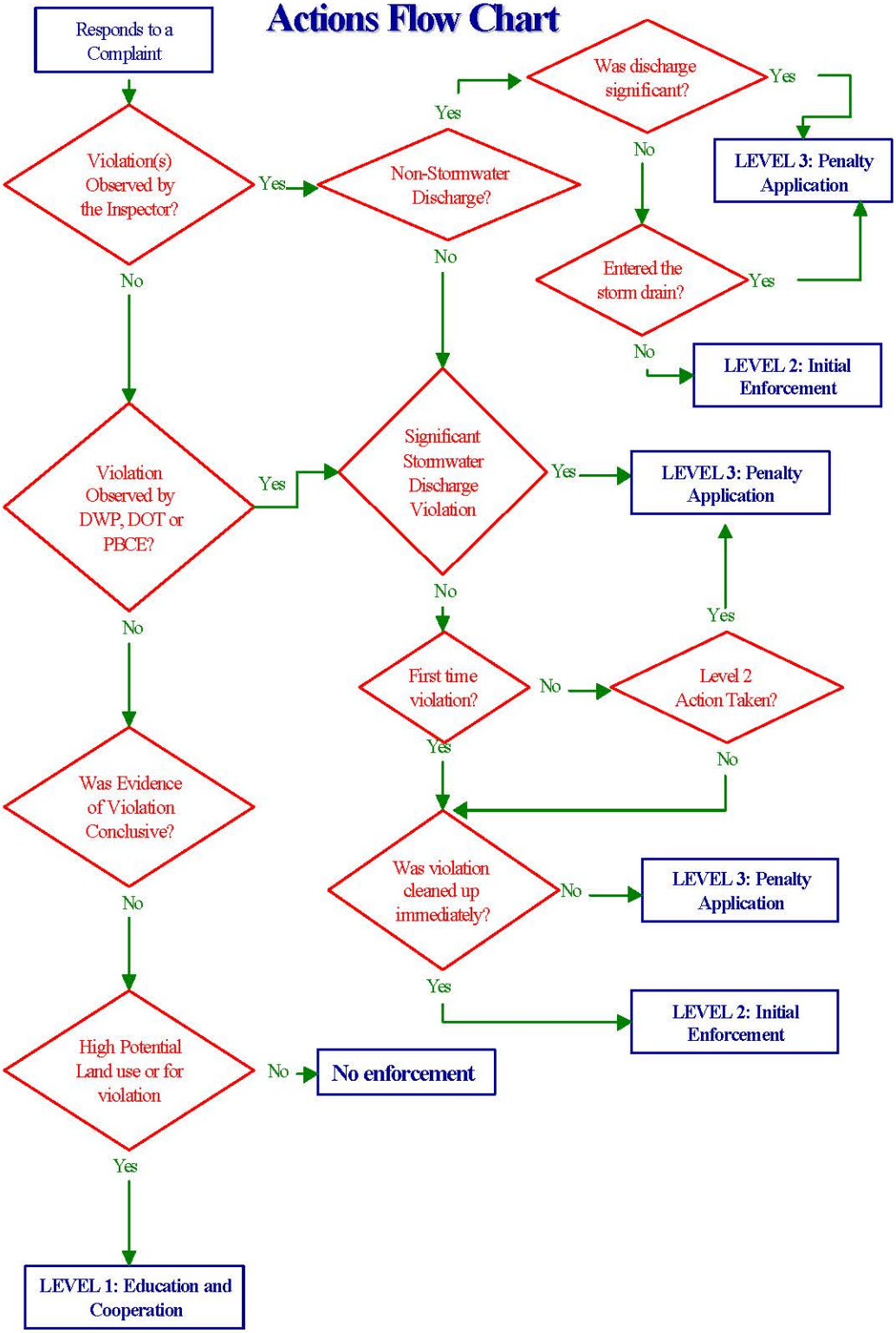
g. BMP List

Response Driven IC/ID Inspection

Standard Operating Procedures Flowchart



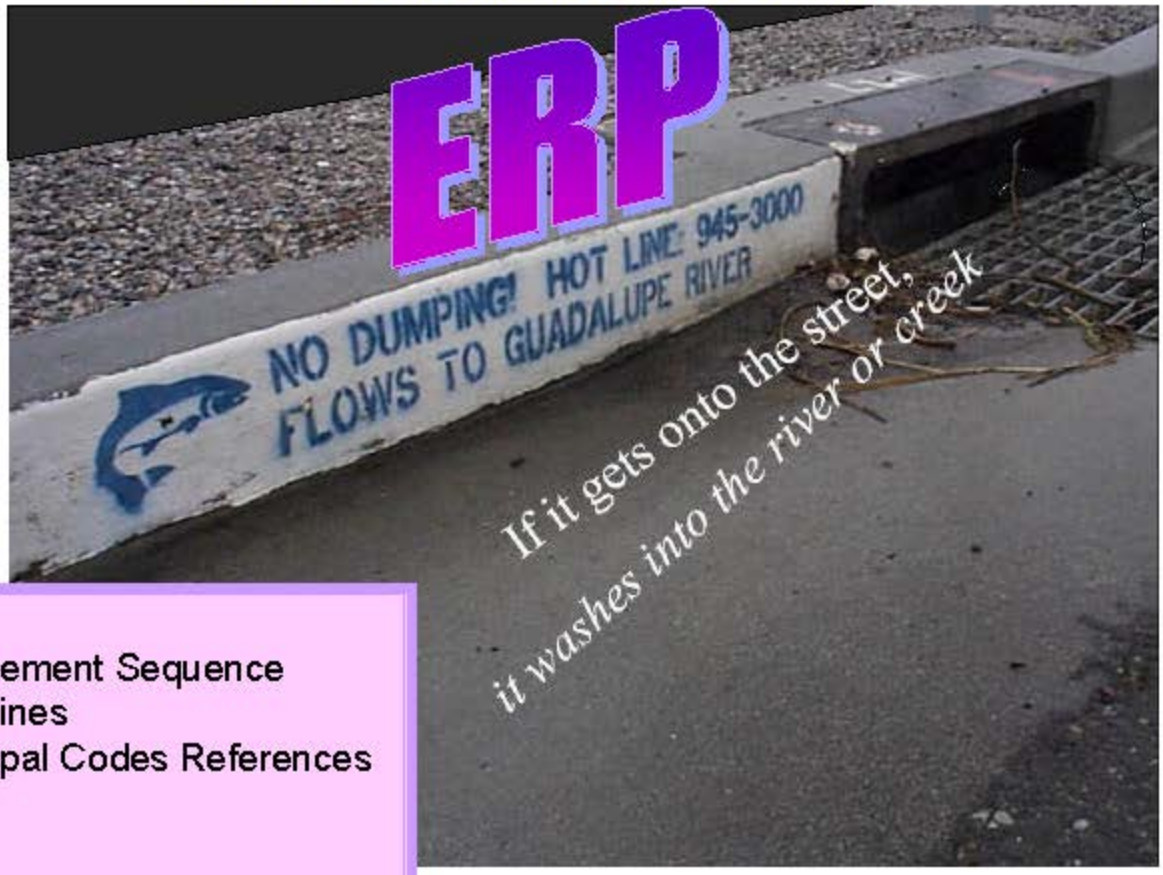
ICID Investigations Enforcement Actions Flow Chart



CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

WATERSHED ENFORCEMENT RESPONSE PLAN

ENVIRONMENTAL SERVICES DEPARTMENT
WATERSHED PROTECTION GROUP
WATERSHED ENFORCEMENT SECTION



Includes
- Enforcement Sequence Guidelines
- Municipal Codes References

Approved: _____

November 2003

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Appendix C
Enforcement Sequence Guidelines for ICID Investigations

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Enforcement Sequence Guidelines for Construction Inspections

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DISCLAIMER: The Watershed Enforcement Response Plan is intended solely as internal guidance for ESD staff. The City of San Jose – ESD reserves the right to act in variance with the guidance suggested in this document, based on an analysis of the specific circumstances involving the violation or potential violation. This internal guidance document may be revised without public notice to reflect subsequent changes in City of San Jose – ESD policies.

Introduction

The *Watershed Enforcement Response Plan* (WERP) outlines the procedures followed by the Watershed Enforcement section staff to identify, document, and respond to violations of the San Jose Municipal Code relating to stormwater and urban runoff pollution. The municipal codes used by the section to prevent and correct stormwater and urban runoff pollution are listed in Appendix B of the WERP. Incorporated into the WERP are specific criteria by which Watershed Enforcement staff can determine the level of enforcement most appropriate to the nature of the violation.

The WERP also describes the guidelines used to determine the level of enforcement action taken, on the basis of the gravity or seriousness of the violation and the duties of the Supervisor and Environmental Inspector.

Duties of the Watershed Enforcement staff

Duties of the Enforcement Coordinator

The primary role of the Enforcement Coordinator (EC) is to ensure that the Watershed Enforcement Response Plan (WERP) is followed in a timely and consistent manner. The Supervisor for the Watershed Enforcement section, or a higher-level manager overseeing that section, is the Enforcement Coordinator. The Enforcement Coordinator duties include the following:

- Reviews field reports and other documentation of inspections and violations, and makes a final determination on the level of enforcement to take. Ensures that enforcement actions taken are consistent and timely.
- Signs approval of administrative and misdemeanor citations.
- Coordinates and moderates compliance meetings and the preparation of compliance schedules.
- Coordinates outside agency and City and County attorneys' enforcement referrals.
- Reviews all written communication mailed to outside parties.
- Compiles compliance reports for the annual urban runoff program compliance reports.

Duties of the Enforcement Coordinator Assistant

The primary duty of Enforcement Coordinator Assistant (ECA) is to assist the Enforcement Coordinator with tracking compliance issues and schedules. The ECA has the following duties:

- Assist in the preparing for and conducting compliance meeting.
- Track compliance meeting schedules, written communications and deadline adherence.
- Assist inspectors in preparing files for any court cases.
- Prepare weekly or biweekly compliance reports, as required.
- Assists in compiling compliance reports for the annual urban runoff program compliance reports.

Duties of the Environmental Inspector

The primary duty of the inspector relating to this WERP is to recommend and issue the appropriate level of enforcement action based on the type of violation observed, using established guidelines. In addition to this, the following duties apply:

- Document all work associated with inspecting a facility or with responding to a complaint.
- Review case history for compliance.
- Prepare and issue routine enforcement actions.
- Schedule and arrange compliance meetings.
- Track RPs response to verbal warnings, official warning notices (OWNs), administrative citations, compliance schedules, and misdemeanor citations.
- Review all correspondence from Responsible Parties (RPs) to ensure all compliance issues are adequately addressed.
- Review compliance schedules and ensure that deadlines are being met.
- Prepare correspondence such as responses to written requests, OWNs, administrative citations, and compliance schedules.
- Enter all enforcement actions into the Enforcement Action Database.
- Collects all evidence as needed for court cases.

Enforcement Action Sequence Guidelines

The Enforcement Action Sequence Guidelines (Guidelines) in Appendices C and D provide a tiered approach to issuing enforcement actions to routine areas of concern. These enforcement actions include education and cooperation, *Official Warning Notices*, *Compliance Meetings*, and penalty application through *Administrative Citations* and *Misdemeanor Citations*.

Prior to taking any penalty application, the inspector must consult with the Enforcement Coordinator. The Enforcement Coordinator will ensure that the penalty proposed is consistent with the Guidelines and is appropriate to the level of violation.

Multiple violations can occur during a calendar day, but only one enforcement action will be issued to the RP for each section of the San Jose Municipal Code violated. If during an inspection multiple violations are discovered, occurring over a number of days, those violations will be grouped by day and each daily group of a SJMC violation will be issued an enforcement action.

When considering the type of enforcement action to be taken, the Guidelines serve as a minimum standard. Any escalation of enforcement actions will be documented on the applicable enforcement approval form. This documentation will include all the details for increased enforcement.

Types of Enforcement Actions

Education and cooperation is generally used for non-serious violations and is documented in the *Urban Runoff Inspection Report* or *ICID Complaint Report*. This includes providing the program's best management practices materials, technology transfer, and verbal instruction. It also includes a verbal warning of future enforcement actions if violations are not addressed.

An ***Official Warning Notice*** is generally issued for repetitive non-serious violations or a non-serious discharge enters the storm drain. It is also used for non-serious violations where the RP isn't accessible. In this case the inspector notifies the RP that a violation has occurred and directs the RP to take corrective actions. This notification serves as written documentation of violation, corrective measures and timeline for completion is provided to the RP. The Inspector may schedule additional inspections and/or evidence gathering, or may elect to implement more stringent enforcement action. The issuance of an *Official Warning Notice* will be documented in the case file.

An ***Administrative Citation*** is generally issued for a serious violation or for recurrent violations. The *Administrative Citation* documents the type of violation that has occurred and directs the RP to implement corrective measures to return to compliance. An *Administrative Citation* carries a monetary penalty. Table 1 lists the municipal codes used by the section to issue *Administrative Citations*.

A ***Compliance Schedule*** is used for violations that remain uncorrected as evidence by repeated violations or when there is need to better communicate resolution among various stakeholders. Most violations do not require a *Compliance Schedule*. The inspector will discuss the enforcement issues with the Enforcement Coordinator and the ECA. The inspector then schedules and sets up a Compliance Meeting with the RP and any necessary stakeholders at the Watershed Protection offices. During the meeting, a compliance schedule and timeline are established. The Inspector will then draft a *Compliance Schedule* that includes the agreed upon schedule and timeline. The compliance schedule is tracked by the inspector and reported to the ECA. The ECA will compile a report on the progress of all enforcement actions to the Enforcement Coordinator. If the timeline in the *Compliance Schedule* is not met, the case is referred to the City Attorney.

A ***Misdemeanor Citation*** is issued when a serious or recurrent violation occurs; where there is a risk of flight by the RP; or an outside agency has initiated enforcement actions. *Misdemeanor Citations* can only be issued by deputized officers. The RP is directed to appear in court. At the discretion of the judge, monetary penalty may be issued and a criminal record is created on the RP.

Outside Environmental Services Department Enforcement Referrals may be necessary if enforcement actions fail to obtain compliance or if issues impact multiple jurisdictions. All outside referrals must be approved by the Enforcement Coordinator unless:

- The referral does not include an enforcement element (such as calling Department of Transportation to pick up a can of paint, or requesting non-enforcement related information).
- There is an emergency hazardous condition requiring the Fire Department's immediate response.
- The complaint is not watershed related and needs to be forwarded either to Code Enforcement, the County, other municipal agencies or Department of Transportation.

The Enforcement Coordinator will provide a referral to City Attorney when the following conditions are met:

- There is evidence of environmental harm,
- When enforcement actions are performed by more than one agency, or
- When the RP still does not comply after exhausting the levels of enforcement described.

The Enforcement Coordinator will provide a referral to the County District Attorney when enforcement actions are performed by more than one agency.

Referrals to the Regional Board are conducted per the Santa Clara Urban Runoff Program Procedures.

Enforcement Timelines

Violations that discharge to the storm drain system or spills that may be washed into the storm drain must cease and be cleaned up immediately.

Violations that do not result in or cause an imminent threat to the storm drain have ten business days to be corrected before proceeding to the next Level of Enforcement. If an RP needs more time, they can send a written request describing the need for the time extension. The Environmental Inspector will send a letter either requesting further information, or a letter approving or denying the extension. Copies of all communication will be included in the case file with any written procedure clarifications documentation.

On rare occasions an inspector may be repeatedly denied access to a site. As a last resort, to insure that any violation at the site is detected and corrected, it is sometimes necessary to seek an inspection warrant. An inspection warrant is a bench order from a judge, sought so that inspections (and any subsequent enforcement actions) occur in a timely manner.

Appendix A

SJMC #	AC Fine* (1st offence)	Description	
9.10.410	$100.00	No accumulation, disposal or dumping of solid wasteon any private property or public place	
9.10.510	$50.00	Sidewalks, gutters and public ways – duty of owners and occupiers of property to keep free of solid waste	
15.10.200	$160.00	Water waste, or allowing water waste, is prohibited	
15.10.210	$160.00	Owners and managers have 5 days to repair leaking plumbing/irrigation systems	
15.10.220	$160.00	Water run-off prohibited except 15.10.240 (cleaning structures and surfaces) and 15.10.250 (washing vehicles)	
15.10.240	$160.00	Automatic positive self-closing valve for cleaning of structures and surfaces	
15.10.250	$160.00	Automatic positive self-closing valve when washing vehicles	
15.10.290	$25.00	No watering between 8:00 AM to 6:00 PM daylight savings time and 10:00 to 3:00 pacific time, unless using a bucket or automatic positive self-closing valve.	
15.14.515	$500.00	Discharge of sewage, industrial waste or other polluted waters to storm drain prohibited	
15.14.530	$500.00	Facilities must provide protection from accidental discharge to storm or sanitary sewer	
15.14.545	$500.00	No storm or other prohibited waters may be discharged to the sanitary sewer	
15.14.625	$500.00	Restaurants must pass garbage and food debristhrough a mechanical grinder prior to dischargingto sanitary. Grocery stores may not discharge garbage or food debris to sanitary.	
15.14.630	$500.00	Approved oil and grease removal devices required. Maintenance records stay on-site for 3 years. Maintenance frequency must be sufficient to prevent odors, surcharge or other violations.	
20.100.430	$500.00	Construction clean up of work site at least weekly. Public right-of-way must always be clear of dirt and debris.	
20.100.470	$500.00	(site area <1 acre.) Compliance with NPDES Storm Water Permit, including "Blueprint for a Clean Bay" BMPs. Submittal and compliance with Erosion Control Plan (ECP) may be required	
20.100.480	$500.00	1-5 acres	Compliance with NPDES General Construction Activities Permit required. Includes implementation (and maintain on-site) of a SWPPP, including BMPs; submittal of NOI to Regional Board; ECP (if required) using Construction BMPs; and submittal of NOI copy and ECP to City project engineer.
	$2500.00	5+ acres	

Table A-1: San Jose Municipal Code Sections relating to stormwater and urban runoff pollution.

These SJMC sections are also the basis for *Administrative Citations* issued by Watershed Enforcement.

* 2nd fine in 36 month period shall be equal to 125% of above amount
  3rd fine in 36 month period shall be equal to 150% of above amount

Appendix B

Enforcement Action Sequence Guidelines for Industrial/Commercial Facility Inspections

These guidelines set forth the tiered approach for enforcement used by City of San Jose's environmental inspectors. The guidelines are intended to ensure consistent application of enforcement actions on parties responsible for illegal discharges to the storm sewer system, pursuant to San Jose Municipal Code Sections and in furtherance with the IND performance standards as stated in the URMP.

The City's general policy is to first educate responsible parties, and provide them an opportunity to comply (Level 1). Where a responsible party fails or refuses to respond to an educational approach, or the circumstances of a violation call for it, enforcement actions are escalated in a stepwise fashion (Levels 2, 3).

LEVEL 1 EDUCATION AND COOPERATION

Inspector Action: To provide information on prevention and minimizing non-stormwater discharges by

1. **Describing best management practices (brochures, fact sheets, premium items, technology transfer, and verbal discussion.),**
2. **Identifying and documenting areas of concern and compliance date in the urban runoff facility inspection report, and**
3. **Giving a verbal warning.**

Applicable situation(s):

- Area of concern observed but nothing has entered into the storm drain and is completely cleaned up by the compliance date given by the inspector.
- Inspector observes non-serious discharge to storm drain at first inspection, but it is immediately and completely cleaned up.

LEVEL 2 OFFICIAL WARNING NOTICE

Inspector Action: Indicate seriousness of discharge while providing information and an opportunity to remedy or prevent violations in the following:

1. **Describing best management practices if not previously provided, (brochures, fact sheets, premium items, technology transfer, verbal discussion),**
2. **Issuing an *Official Warning Notice*, and**
3. **Giving a verbal warning.**

Applicable situation(s):

- Level 1 enforcement action previously issued.
- On a follow up inspection or an inspection of a facility that has been inspected previously an inspector observes the same or a new area of concern.
- RP not accessible a verbal warning but an appropriate location exists to post OWN (in mailbox, under windshield wiper, etc).

LEVEL 3 PENALTY APPLICATION

Inspector Action: Indicate seriousness of discharge by issuing either an *Administration Citation* or a criminal complaint/*Misdemeanor Citation.*

Note: Administrative Citations and Misdemeanor Citations must be approved by the supervisor before issuing.

A. *Compliance Schedule*

Applicable situation(s):

- Level 2 enforcement action previously issued.
- Compliance issues are numerous and complex.
- Discharge did not reach storm drain or it was a non-serious discharge.
- City Attorney referral not yet necessary.

B. *Administrative Citation*

Applicable situation(s):

- Level 2 enforcement action previously issued.
- Compliance Meeting did not bring resolution, or RP did not follow compliance schedule.
- Discharge into storm sewer and the impact is serious based on quality or quantity. Serious impact defined as any of the following:
    1. Large quantity: 10 gallons or more.
    2. Hazardous or toxic substance in any quantity.
    3. Adversely impacts receiving storm sewer system or water body.

Appendix B

C. *Criminal Complaint/Misdemeanor Citation*

Applicable situation(s):

- Level 2 enforcement previously issued and there is a flight risk possibility or immediately needs to be notified of wrongdoing.
- Discharge causes serious impact to the storm drain sewer system and there is a flight risk or immediately needs to be notified of wrongdoing.
- Enforcement action being conducted in coordination with another regulatory agency's enforcement actions.

Appendix C

Enforcement Action Sequence Guidelines for Illicit Connection and Illegal Dumping Investigations

These guidelines set forth the tiered approach for enforcement used by City of San Jose's Environmental Inspectors. The guidelines are intended to ensure consistent application of enforcement actions on parties responsible for illicit connections and illegal dumping/discharges to the storm sewer system pursuant to San Jose Municipal Code Sections and in furtherance with the ICID performance standard stated in the URMP.

The City's general policy is to initially educate responsible parties, and provide an opportunity to comply through clean up of the discharge [Level 1]. Where a responsible party fails or refuses to respond to an educational approach, or the circumstances of a violation call for it, enforcement actions are escalated in a stepwise fashion [Levels 2, 3].

LEVEL 1 EDUCATION AND COOPERATION

Inspector Action: Provide information on prevention and minimizing non-storm water discharges including:

1. **Describing best management practices [brochures, fact sheets, premium items, technology transfer, and verbal discussion].**
2. **Providing verbal warning.**
3. **Documenting violations in ICID Complaint Report.**
4. **Referring to IND program for inclusion into facility inspection database, if applicable.**

Applicable situation(s):

- Inspector believes an illegal discharge may have occurred, or could occur, however:
  - The discharge has not been observed by the inspector, and
  - Evidence is not conclusive, unable to determine suspects.
- Land use or activity is considered high potential for violation.

LEVEL 2 OFFICIAL WARNING NOTICE

Inspector Action: Indicate seriousness of discharge while providing information and an opportunity to remedy or prevent violations in the following:

1. **Describing best management practices if not previously provided, (brochures, fact sheets, premium items, technology transfer, verbal discussion),**
2. **Issuing an *Official Warning Notice*, and**
3. **Giving a verbal warning.**

Applicable situation(s):

- Responsible Party fails to adequately clean up a violation after Level 1 response at the site.
- A non-storm water discharge has occurred, but has not entered the storm sewer system or a water body.
- First time violations of a small quality (10 gallons or less) discharge into storm drain and clean up has been performed adequately and immediately.
- Already received written enforcement or verbal warning by another City department.

LEVEL 3 PENALTY APPLICATION

Inspector Action: Indicate seriousness of discharge by issuing either an *Administration Citations* or a criminal complaint/*Misdemeanor Citations*.

Note: Administrative Citations and Misdemeanor Citations must be approved by the supervisor before issuing.

A. *Compliance Schedule*

Applicable situation(s):

- Level 2 enforcement action previously issued.
- Compliance issues are numerous and complex.
- Discharge did not reach storm drain or it was a non-serious discharge.
- City Attorney referral not yet necessary.

B. Administrative Citation

Applicable situation(s):

- Level 2 enforcement action previously issued.
- Compliance Meeting did not bring resolution, or RP did not follow compliance schedule.
- Discharge into storm sewer and the impact is serious based on quality or quantity. Serious impact defined as any of the following:
  1. Large quantity: more than 10 gallons
  2. Hazardous or toxic substance in any quantity.
  3. Adversely impacts receiving storm sewer system or water body.

Appendix C

C. *Criminal Complaint/Misdemeanor Citation*

Applicable situation(s):

- Level 2 enforcement previously issued and there is a flight risk possibility or immediately needs to be notified of wrongdoing.
- Discharge causes serious impact to the storm drain sewer system and there is a flight risk or immediately needs to be notified of wrongdoing.
- Enforcement action being conducted in coordination with another regulatory agency's enforcement actions.

Appendix D

Enforcement Action Sequence Guidelines for Construction Site Inspections

These guidelines set forth the tiered approach for enforcement used by City of San Jose's environmental inspectors. The guidelines are intended to ensure consistent application of enforcement actions on parties responsible for illegal discharges to the storm sewer system, pursuant to San Jose Municipal Code Sections and in furtherance of the CON performance standards as stated in the URMP.

The City's general policy is to first educate responsible parties, and provide them an opportunity to comply (Level 1). Where a responsible party fails or refuses to respond to an educational approach, or the circumstances of a violation call for it, enforcement actions are escalated in a stepwise fashion (Levels 2, 3).

LEVEL 1 EDUCATION AND COOPERATION

Inspector Action: To provide information on prevention and minimizing non-stormwater discharges by

1. **Describing best management practices (brochures, fact sheets, premium items, technology transfer, and verbal discussion.),**
2. **Identifying and documenting areas of concern and compliance date in the Construction Inspection Notes Page, and**
3. **Giving a verbal warning.**

Application situation(s):

If it is raining:

- If construction activity occurring, there is no tracking and the entrances are rocked (gravel laid down to stop sediment), but there is no sweeper or planned sweeping.
- Any code violations present are immediately corrected and haven't resulted in discharges to storm.

If it is not *raining:*

- The entrances are rocked, but there is light tracking and a sweeper is not available (first offense).
- Any code violations present are immediately corrected and haven't resulted in discharges to storm.

Appendix D

LEVEL 2 OFFICIAL WARNING NOTICE

Inspector Action: Indicate seriousness of discharge while providing information and an opportunity to remedy or prevent violations in the following:

1. **Describing best management practices if not previously provided, (brochures, fact sheets, premium items, technology transfer, verbal discussion),**
2. **Issuing an *Official Warning Notice*, and**
3. **Giving a verbal warning.**

Applicable situation(s):

If it is raining:

- If there is any tracking but it is cleaned up prior to discharge of sediments to the storm drain.
- Any violations present that haven't yet resulted in a serious discharge to storm but cannot be immediately corrected. Serious impact defined as any of the following:
    1. Large quantity: 10 gallons or more.
    2. Hazardous or toxic substance in any quantity.
    3. Adversely impacts receiving storm sewer system or water body.
- Level 1 enforcement action previously issued.
- At a follow up construction inspection or an ICID inspection the inspector observes the same or a new area of concern.
- RP not accessible for a verbal warning but an appropriate location exists to post OWN (in mailbox, under windshield wiper, etc).

If it is not *raining:*

- The entrances are rocked, but there is light tracking and a sweeper is not available (second offense).
- They have tracking (light or heavy) and the entrances are not rocked (first offense).
- Any violations present that haven't yet resulted in a serious discharge to storm but cannot be immediately corrected. Serious impact defined as any of the following:
    1. Large quantity: 10 gallons or more.
    2. Hazardous or toxic substance in any quantity.
    3. Adversely impacts receiving storm sewer system or water body.
- Level 1 enforcement action previously issued.
- At a follow up construction inspection or an ICID inspection the inspector observes the same or a new area of concern.
- RP not accessible for a verbal warning but an appropriate location exists to post OWN (in mailbox, under windshield wiper, etc).

LEVEL 3 PENALTY APPLICATION

Appendix D

Inspector Action: Indicate seriousness of discharge by issuing either an *Administration Citation* or a criminal complaint/*Misdemeanor Citation.*

Note: Administrative Citations and Misdemeanor Citations must be approved by the supervisor before issuing.

A. *Compliance Schedule*

Applicable situation(s) (not an option for addressing violations when it is raining):

If it is not *raining:*

- The entrances are rocked, but there is light tracking and a sweeper is not available (after two warnings).
- They have light tracking and the entrances are not rocked (after one warning).
- They have heavy tracking and the entrances are not rocked, and situation has not been resolved after an administrative citation was issued.
- Level 2 enforcement action previously issued.
- Compliance issues are numerous and complex.
- Discharge did not reach storm drain or it was a non-serious discharge.
- City Attorney referral not yet necessary.

B. *Administrative Citation*

Applicable situation(s):

If it is raining:

- Discharge into storm sewer and the impact is serious based on quality or quantity.
- There is any tracking of mud, **and** there is any discharge to an unprotected storm drain, gutter or other conveyance leading to the storm drain.
- Level 2 enforcement action previously issued.
- Compliance Meeting did not bring resolution, or RP did not follow compliance schedule.

If it is not *raining:*

- Discharge into storm sewer and the impact is serious based on quality or quantity.
- They have heavy tracking and the entrances are not rocked (after one warning)
- Level 2 enforcement action previously issued.
- Compliance Meeting did not bring resolution, or RP did not follow compliance schedule.

C. *Criminal Complaint/Misdemeanor Citation*

Applicable situation(s):

- Level 2 enforcement previously issued and there is a flight risk possibility or immediately needs to be notified of wrongdoing.
- Discharge causes serious impact to the storm drain sewer system and there is a flight risk or immediately needs to be notified of wrongdoing.
- Enforcement action being conducted in coordination with another regulatory agency's enforcement actions.

Appendix F

Listing of Selected Watershed Enforcement Procedures Relating to Enforcement Actions

Procedure Number	Procedure Name
5205	Guidelines for use of the Enforcement Response Plan
5210	Administrative Citation Procedure: Issuance
5211	Administrative Citation Procedure: Appeals
5212	Administrative Citation Process: Amendment & Dismissal
5220	Compliance Meetings and Compliance Schedules
5230	Inspection Warrants
5240	Official Warning Notices
5250	Misdemeanor Citations and Court Appearances
5251	Misdemeanor Citation Amendment Procedure
5252	Misdemeanor Citation Dismissal Procedure
5260	Sample Collection
5310	Industrial Facility Inspection
5340	Restaurant and Food Service Facility Inspections
5362	Construction Inspection Procedures
5420	ICID Complaint Investigations

Appendix G

Acronyms

The following acronyms apply to the terms used in the Watershed Enforcement section's Enforcement Response Plan and their various procedures.

AOC	Area of Concern
AC	Administrative Citation. See "Citation, Administrative"
BMP	Best Management Practices
CSJ	City of San Jose
C-of-C	Chain of Custody
ECP	Erosion Control Plan
WERP	Enforcement Response Plan for Watershed Enforcement section
GCASP	General Construction Activity Storm Water Discharge Permit, also known as General Construction NPDES permit.
GIASP	General Industrial Activity Storm Water Discharge Permit, also known as General Industrial NPDES permit.
ICID	Illicit Connection, Illegal Dumping
IND	Industrial/Commercial Facilities
MS4	Municipally separate storm sewer system
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OWN	Official Warning Notice
QA/QC	Quality Assurance / Quality Control
RP	Responsible Party
Regional Board	California Regional Water Quality Control Board, San Francisco Bay Region. The Regional Board is a part of the California State Water Resource Control Board (State Board).
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SIC	Standard Industrial Classification.
SJMC	San Jose Municipal Code
SWPPP	Storm Water Pollution Prevention Plan
URMP	Urban Runoff Management Plan. See City of San Jose, Urban Runoff Management Plan
EPA	United States Environmental Protection Agency.
WE	The Watershed Enforcement section

Appendix G

Definitions

The following definitions apply to the terms used in the Watershed Enforcement (WE) section's Enforcement Response Plan (WERP) and their various procedures. Where applicable, definitions from the March 2002 City of San Jose Urban Runoff Management Plan Report are used.

Adverse Impact	A detrimental effect upon water quality or beneficial uses caused by a discharge or loading of a pollutant or pollutants. See also "Impact."
Area of Concern (AOC)	A violation issued to a facility during an Industrial/Commercial Facility (IND) or Illicit Connection/Illegal Dumping (ICID) storm water inspection.
Best Management Practice (BMP)	Activities, practices, facilities, and/or procedures that when implemented to their maximum efficiency will prevent or reduce pollutants in discharges. For WE procedure purposes BMPs include runoff treatment, as well as source control and source reduction of potential pollutant sources. BMPs are communicated to facilities in many ways, including but not limited to ICID and IND inspections (see "Tech Transfer").
California Regional Water Quality Control Board (Regional Board)	The Governing Board of the California Regional Water Quality Control Board; the State agency with primary responsibility for the protection and maintenance of water quality. For purposes of WE procedures, this means the California Regional Water Quality Control Board, San Francisco Bay Region.
Catch basins	Box-like underground concrete structures with openings in curbs and gutters designed to catch water from streets and pavements.
Citation, Administrative	A civil financial penalty imposed by the City of San Jose for a violation of a municipal code. It carries no criminal charges. Fine amounts are set in the schedule of fines by Council resolution.
Citation, Misdemeanor	A financial and criminal penalty. Fine amounts are set in the schedule of fines by resolution. This citation will become part of a criminal record for the responsible party. Court appearance is required.
City of San Jose Urban Runoff Management Plan (CSJ URMP)	The CSJ portion of the County-wide Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) Storm Water Management Plan that forms the implementation program to control storm water pollution within the city limits. San Jose's URMP is one part of the overall URMP for the Santa Clara Valley. The CSJ URMP is the work plan pursuant to section C.6.b of the CSJ MS4 NPDES permit, number CAS029718, Order 01-04. WE ICID & IND inspections are part of the CSJ URMP.
City Regulated Facility	Industrial and commercial facilities subject to the San Jose Municipal Code (SJMC), including but not limited to facilities covered by the WE IND Inspection Programs.
Compliance	No unauthorized non-storm water discharges occur at the site. Includes meeting all applicable conditions of: the General Construction NPDES permit (GCASP) or the General Industrial NPDES permit (GIASP); the SJMC; and BMPs, as confirmed by a City inspection
Compliance Meeting	A meeting with the Responsible Party (RP) to discuss the causes of non-compliance, corrective actions to achieve compliance, and a compliance schedule for the implementation of corrective actions.
Compliance Schedule	A written plan of corrective actions by the RP, including a timeline, approved by the City, to bring a facility into compliance.

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Construction Activity	Clearing, grading, or excavation that results in soil disturbance. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility, nor does it include emergency construction activities required to immediately protect public health and safety.
Deadfiling	A quality control review for cases closed by inspectors.
Discharge	Any release, spill, leak, pump, flow, escape, dumping, or disposal of any liquid, semi-solid or solid substance.
Disturbed Area	That area altered as a result of clearing, grading, and/or excavation of earth.
Watershed Enforcement Response Plan (WERP)	Outline of the procedures followed by WE staff to identify, document, and respond to urban runoff violations. Incorporated into the WERP are specific criteria (including the gravity or seriousness of the violation) by which WE staff can determine the level of enforcement most appropriate to the nature of the violation. The WERP also describes the duties of the WE staff.
Erosion	The wearing away of land surface primarily by wind or water. Erosion occurs naturally as a result of weather or runoff but can be accelerated by clearing, grading, or excavation of the land surface.
Erosion Control Plan (ECP)	A set of BMPs designed to control surface runoff and erosion to prevent sediment movement offsite before, during, and after construction-related land disturbances.
Food Service facilities	Commercial or industrial facilities that prepare food for the public or for institutional patrons, and use or generate grease (or other food related waste that can cause sewer blockages) when preparing this food.
General Construction Activity Storm Water Discharge Permit (GCASP)	The NPDES permit adopted by the State Water Resources Control Board, which authorizes the discharge of storm water from construction sites under certain conditions.
General Industrial Activity Storm Water Discharge Permit (GIASP)	The NPDES permit adopted by the State Water Resources Control Board which authorizes the discharge of storm water from industrial sites under certain conditions.
Hazardous Material	Any material defined as hazardous by Chapter 6.95 of the California Health and Safety Code.
Hazardous Substance	Any substance designated pursuant to Title 40 of the Code of Federal Regulations, Part 302 (40 CFR 302)
Hazardous Waste	A 'Hazardous Substance' or 'Hazardous Material' which is to be discharged, discarded, disposed, recycled, or processed.
Illicit Connection	Any human-made conveyance that is connected to the storm drain system without a permit, excluding roof-drains and other similar type connections. Examples include channels, pipelines, conduits, inlets, or outlets that are connected directly to the storm drain system.
Illicit Connection/Illegal Dumping (ICID) Program	A complaint driven program where WE inspectors investigate, educate and provide necessary enforcement to protect the storm drain system and the watershed from illicit connections, illegal discharges and illegal disposals.
Illegal Discharge	Any discharge to the storm drain system that is prohibited under local, state, or federal statutes, ordinances, codes or regulations. This includes all non-storm water discharges except discharges pursuant to an NPDES permit and discharges that are exempted in accordance with SJMC Chapter 15.
Illegal Disposal/ Dumping	Any disposal, either intentional or unintentional, of material(s) or waste(s) that can pollute storm water or urban runoff.

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Impact	Any actual or potential effect caused either directly or indirectly by the discharge of pollutants.
Industrial Activity	"Industrial activity" as defined in 40 CFR 122.26(b)(14) refers to 11 categories of activities. Each of these activities is required to obtain a NPDES permit for storm water discharges associated with "industrial activity" as required by 40 CFR 122.26(c). See also General Industrial Activity Storm Water Discharge Permit (GIASP).
Industrial/Commercial Facility	Any facility involved and/or used in either the production, manufacture, storage, transportation, distribution, exchange or sale of goods and/or commodities, and any facility involved and/or used in providing professional and non-professional services. This category of facility includes, but is not limited to, any facility defined by the Standard Industrial Classifications (SIC). Facility ownership (federal, state, municipal or private) and profit motive of the facility are not factors in this definition.
Industrial/Commercial (IND) Facility Program	A scheduled inspection program for commercial and industrial facilities identified in the CSJ URMP to have a possible impact to the storm drain system or the watershed.
Inspection Warrant	A bench order, issued by a judge, directing a private property owner to provide unimpeded access for conducting investigations or making inspections. An inspection warrant is needed when an inspector is denied access or is otherwise prevented from entering private property to conduct necessary investigations or inspections.
Municipally Separate Storm Sewer System (MS4)	See Storm Drain System.
National Pollutant Discharge Elimination System (NPDES)	A permit issued by the EPA, State Board or Regional Board pursuant to the Clean Water Act section 402(p) that authorizes discharges to waters of the United States and requires the reduction of pollutants in the discharge.
Notice of Intent (NOI)	An application by an Industrial/Commercial facility, sent to the Regional Board, asking to be covered under the GIASP NPDES Permit. Certain facilities are required to either apply for coverage under the GIASP or obtain their own, individual NPDES permit. The GIASP lists the SIC codes of facility types that must either submit an NOI or obtain individual NPDES permits. An NOI application must also include a Storm Water Pollution Prevention plan (SWPPP). Certification of the NOI signifies that the facility operator intends to comply with the provisions of the General Permit. (per GIASP Fact Sheet: Notification Requirements).
NOI Filers	Facilities that have filed for coverage under the State's GIASP NPDES Permit.
Non-NOI Filers	Facilities regulated under the State's GIASP NPDES Permit, which have not filed for coverage under this permit and have not applied for an individual permit and/or an exemption certification, when required.
Non-Significant Facilities	Facilities determined to be non-significant contributors to storm water pollution based on the number of Areas of Concern (AOC) the facility has been issued over a rolling 3 year (food service) or 5 year (all other City Regulated facilities) time period. One AOC or less constitutes a non-significant facility.
Non-Storm Water Discharge	Any discharge to a municipal storm drain system that is not composed entirely of storm water.
Official Warning Notice (OWN)	A written notice explaining the municipal code violation and the corrective measures that need to be taken by the RP.
Outfalls	The end points where the CSJ storm drain systems discharge into a stream, creek, or river, or the Bay.

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Pollutant

Those "pollutants" defined in Section 502(6) of the federal Clean Water Act (33 U.S.C. § 1362(6)), or incorporated into California Water Code §13373. Examples of pollutants include, but are not limited to the following:

- Commercial and industrial waste such as fuels, solvents, detergents, plastic pellets, hazardous substances, fertilizers, pesticides, slag, ash and sludge;
- Metals such as cadmium, chromium, copper, lead, nic kel, silver, zinc, and non-metals such as phosphorus and arsenic;
- Petroleum hydrocarbons such as fuels, lubricants, surfactants, waste oils, solvents, coolants, and grease;
- Excessive eroded soils, sediment, and particulate materials in amounts which may adversely affect the beneficial uses of the receiving waters, flora or fauna of the state.
- Animal wastes
- Substances having characteristics such as pH less than 6 or greater than 9, or unusual coloration or turbidity, or excessive levels of fecal coliform, or fecal streptococcus, or enterococcus.

The term "pollutant" shall not include uncontaminated storm water, potable water or recycled water generated by a lawfully permitted water treatment facility.

The term "pollutant" also shall not include any substance identified in this definition if, through compliance with the best management practices available, the discharge of such substance has been eliminated to the m*aximum extent practicable* (MEP). MEP refers to the standard for implementation of storm water management programs to reduce pollutants in storm water. MEP refers to storm water management programs taken as a whole. The implementation of MEP takes into account various equitable considerations and competing facts.

Post-Construction Activity

Permanent storm water or erosion control techniques that remain in place after land construction has been completed.

Proper Disposal

The act of disposing of material(s) in a lawful manner which ensures the protection of water quality and beneficial uses of receiving waters.

Responsible Party (RP)

The individual who is responsible for all activities associated with the facility, or individual who causes the violation.

Runoff

Storm water and dry-weather flows from a drainage area that reaches a receiving or sub-surface waterbody. During dry weather it is typically comprised of many base flow components, either contaminated with pollutants, or uncontaminated. (See Stormwater Runoff/Urban Runoff).

Sediment

Organic or inorganic material carried by, or suspended in, water and settles to form deposits in the storm drain system or receiving waters.

Serious Discharge

Discharge greater than ten gallons, or a discharge of hazardous waste or toxic substance/pollutant.

Significant Erosion Potential

Risk of depositing sediment into watercourses or storm drains.

Significant Facilities

Facilities determined to be potentially significant contributors to storm water pollution based on the number of Areas of Concern (AOC) the facility has been issued over a rolling 3 year (food service) or five year (all other City Regulated facilities) time period. Two AOCs or more constitutes a significant facility.

Significant Stormwater Pollution Potential

A project that causes substantial or potentially substantial adverse change in the quantity and/or quality of storm water runoff generated from the site.

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Standard industrial Classification (SIC)	The statistical classification standard, organized by industry, underlying all establishment-based federal economic statistics. The SIC of a particular industry is determined using the latest Standard Industrial Classification Manual, prepared by the federal Office of Management and Budget. The SIC Code is useful for pollution prevention programs in that similarly categorized industries tend to use similar processes and chemicals.
Standard Methods	Approved methods of water analysis listed in Title 40, Code of Federal Regulations (CFR), Part 136.3. Preservation requirements (containers, preservatives, temperature, etc.) should follow 40 CFR 136.3(e), Table II. If 40 CFR 136 is not applicable for some reason, refer to the most recent version of "Standard Methods for the Examination of Water and Wastewater".
Storm Drain System	Streets, gutters, conduits, natural or artificial drains, channels and watercourses, or other facilities that are owned, operated, maintained or controlled by the City of San Jose and used for the purpose of collecting, storing, transporting, or disposing of storm water. Also referred to as an MS4.
Storm Water	Water which originated from atmospheric moisture (rainfall or snowmelt) and that falls onto land, water, or other surfaces.
Storm Water Pollution Prevention Plan (SWPPP)	A plan required of Industry and developments (greater than one acres) by, and for which contents are specified in, the State of California General Permit for Storm Water Discharges Associated with Industrial Activities, and the General Permit for Storm Water Discharges Associated with Construction Activities. The purpose of such plans is to identify potential sources of pollution that can affect of the quality of storm water discharges from a site and to describe and ensure the implementation of practices to reduce pollutants in storm water discharges.
Storm Water Runoff	The part of precipitation (rainfall or snowmelt) which travels via flow across a surface to the storm drain system or receiving waters. Examples of this phenomenon include the water that flows from a building's roof or parking lot when it rains (runoff from an impervious surface); and the water that flows from a vegetated surface when rainfall is in excess of the rate at which it can infiltrate into the underlying soil (runoff from a pervious surface).
Technology Transfer	Communications performed primarily by inspection staff, using outreach and education materials, in addition to any other media which conveys technical information on activities, practices, facilities, and/or procedures that meet the criteria of the Best Management Practices.
Tiered Enforcement	A progressive enforcement process has three tiers: 1) voluntary compliance; 2) Incentive based through education and cooperation; and 3) enforcement. Timing or use of additional enforcement actions would be a function of the nature of the severity of the case as well as the cooperation of the potentially responsible parties.
Toxic Materials	For the purpose of this Plan, toxic materials means any material(s) or combination of materials which directly or indirectly cause(s) either acute or chronic toxicity in the water column. See "Pollutants".
Toxic Pollutant	Those "pollutants," or combination of pollutants, defined in Sections 502(13) or 307(a)(1) of federal Clean Water Act (33 U.S.C.§ 1362(13)). See "Toxic Materials" or "Pollutants".
Urban Runoff	See "Storm Water Runoff", or "Runoff".
Verbal Warning	A documented warning communicated orally to the RP directing the RP to take actions to correct an AOC.
Vehicle Service Facilities	Publicly and privately owned facilities that repair, fuel, clean, service or dismantle cars, trucks, boats, airplanes or other motor vehicles.
Wet Season	Typically the period of rainfall from October 15 to April 15.

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Environmental Services Department

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Subject: Guidelines for Enforcement Response (Watershed Enforcement)		Page 1 of 4	Section Number 5205
		Effective Date **01/02/2004**	Revised Date 7/28/2004
Approved By: John Mukhar	Signature:		Date: 02/06/2004

5205.1 PURPOSE

This procedure provides guidance to Environmental Inspectors on the decision process for determination of appropriate enforcement responses.

5205.2 POLICY

It shall be the policy of ESD that Environmental Inspectors will be familiar with this procedure and will use it to determine and follow appropriate level of enforcement response for violations of the San Jose Municipal Code (SJMC) relating to stormwater and urban runoff pollution.

5205.3 DEFINITIONS

Administrative Citation (AC) — A civil financial penalty imposed by the City of San Jose for a violation of a municipal code. It carries no criminal charges. Fine amounts are set in the schedule of fines by Council resolution.

Compliance Meeting — A meeting with the Responsible Party to discuss the causes of non-compliance, corrective actions to achieve compliance, and a compliance schedule for the implementation of corrective actions.

Misdemeanor Citation — A financial and criminal penalty. Fine amounts are set in the schedule of fines by resolution. This citation will become part of a criminal record for the responsible party. Court appearance is required.

Official Warning Notice (OWN) — A written notice explaining the municipal code violation and the corrective measures that need to be taken by the responsible party.

Responsible Party (RP) — The individual who is responsible for all activities associated with the facility, or individual who causes violation.

Verbal Warning	A documented warning communicated orally to the responsible party directing them to take actions to correct an 'Area of Concern'.
Watershed Enforcement Response Plan (WERP)	Outline of the procedures followed by WE staff to identify, document, and respond to stormwater and urban runoff violations. Incorporated into the WERP are specific criteria (including the gravity or seriousness of the violation) by which WE staff can determine the level of enforcement most appropriate to the nature of the violation. The WERP also describes the duties of the WE Supervisor and WE Inspectors.

5205.4 BACKGROUND

The Watershed Enforcement Section (WE) works cooperatively with the community to prevent and eliminate sources of urban runoff pollution to the City's storm drain system. It is the City's general policy to initially educate responsible parties, and provide an opportunity to comply through site clean up and violation corrections for area of concerns by giving a Verbal Warning (Level 1). Where a responsible party (RP) fails or refuses to respond to an educational approach, or the circumstances of a violation call for it, enforcement actions are escalated to either an Official Warning Notice (Level 2) or to a Compliance Meeting, Administrative or Misdemeanor Citation (Level 3).

This procedure assures uniformity of enforcement actions taken, based on the Watershed Enforcement Response Plan.

5205.5 LIMITATIONS

This policy applies to the determination of enforcement response relating to all violations of the San Jose Municipal Code relating to stormwater and urban runoff pollution.

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5205.6 PROCEDURE

RESPONSIBILITY	ACTION
Environmental Inspector	1. Performs site inspections according to the appropriate inspection procedure: • 5310 (Industrial/Commercial (IND) Facility Inspection), • 5420 (Illicit Connection/Illegal Discharge (ICID) Complaint Investigations), • 5340 (Food Service Facility Inspections), or • 5362 (Construction Inspection Procedures)
	2. Determines if there are any violations of the SJMC enforced by WE. If violations are observed, determines appropriate enforcement response according to guidelines contained in the WERP
	3. Verbal Warnings and Official Warning Notices are issued in the field immediately. Inspectors are trained on the appropriate use of these enforcement actions. For the procedure for issuing Official Warning Notices, see Procedure 5240.
	4. Compliance Meetings, if warranted, are arranged in the office and need supervisor approval per Procedure 5220. Compliance meeting are used to develop a special compliance schedule for the responsible party.
	5. Administrative Citations (ACs) are processed in the office and mailed to the RP. ACs require supervisor approval as per Procedure 5210.
	6. AC appeals are handled as per Procedure 5211. AC amendments and dismissals are handled as per Procedure 5212. Both procedures require supervisor approval.

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7. Misdemeanor Citations are completed in the field, but need supervisor approval prior to issuing as per Procedure 5250.

8. Misdemeanor Citation amendments and dismissals also need supervisor approval and are to be handled as per Procedure 5251 and 5252, respectively.

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		Effective Date **01/01/2004**	Revised Date 7/28/2004
Approved by: John Mukhar	Signature:		Date: 02/05/2004

5420.1 PURPOSE

This procedure guides the process of ICID investigations. Each ICID investigation represents a unique case and must be handled with a degree of flexibility. However, this framework should be utilized in order to ensure successful execution of enforcement actions, should they become necessary.

5420.2 POLICY

It shall be the policy for Environmental Inspectors performing ICID inspections to be familiar with this procedure and to utilize it as the framework for ICID inspection activities. In addition, Inspectors must understand and utilize inspection evaluation processes, as addressed in Attachment 5420-A, "Manual for Investigation and Elimination of Illegal Dumping."

5420.3. DEFINITIONS

Adverse Impact - A detrimental effect upon water quality or beneficial uses caused by a discharge or loading of a pollutant or pollutants. An **Impact** is defined as any actual or potential effect caused either directly or indirectly by the discharge of pollutants.
Deadfiling - A quality control review for cases closed by inspectors.
Illicit Connection/Illegal Dumping (ICID) Program - A complaint driven program where inspectors investigate, educate and provide necessary enforcement to protect the storm drain system and the watershed from illicit connections, illegal discharges and illegal disposals
Responsible Party (RP)- The individual who is responsible for all activities associated with the facility, or individual who causes the violation.
Serious Discharge - Discharge greater than ten gallons, or a discharge of hazardous waste or toxic substance/pollutant

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5420.4 BACKGROUND

Illicit connections to the Storm Sewer System and illegal disposal of materials to waterways are two activities addressed by the City's stormwater National Pollutant Discharge Elimination System (NPDES) permit. Both of these activities involve potentially criminal activity and require careful adherence to stipulated investigative processes. Failure to follow appropriate procedures can lead to unsupportable enforcement actions.

5420.5 LIMITATIONS

This policy applies to the investigation of all reported incidents of spills, dumping, disposal, or illicit connections to the storm sewer system.

5420.6 PROCEDURE

This process is initiated with the receipt of an incident report. ICID Complaints are received and logged by clerical or other staff. The Inspector assigned to follow-up on the complaint will be given the notes or called by cell-phone (see Procedure 5410).

RESPONSIBILITY	ACTION
Environmental Inspector	1. Evaluate ICID complaint. Contact complaining party if appropriate to clarify relevant facts (location, complaint details, etc) a. If any of the following appears probable from the notes, then the complaint should be prioritized for a same day response, if possible. Discharge or disposal going into storm sewer or receiving waters, and the impact is serious based on: • A large quantity (more than 10 gallons), or • A Hazardous or toxic substance in any quantity, or • Adversely impacts receiving storm sewer

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RESPONSIBILITY | ACTION

system or water body.

b. If none of the above appears probable based on complaint intake notes, follow-up on complaint may have a lesser priority (but within 5 days of receiving complaint).

2. If ICID complaint intake notes indicate either an adverse impact to storm drains or receiving waters due to hazardous discharge; or an illegal hazardous waste discharge or disposal; then ensure that the Hazardous Incident Team (HIT) has been notified.

3. If ICID complaint intake notes indicate a sanitary sewer overflow has occurred, or that cleaning or repair work on the storm sewer system is needed to mitigate an adverse impact, ensure that CSJ Department of Transportation has been notified.

4. If ICID complaint intake notes indicate a serious discharge or disposal to a creek or stream, ensure that the Santa Clara Valley Water District has been notified.

5. If ICID complaint intake notes indicate that a fish kill or similarly significant adverse impact to a receiving water has occurred, ensure that the State Department of Fish and Game has been notified.

6. Conduct site inspection:

   - Locate illicit connection, discharge or disposal location, and identify responsible party, if possible.
   - Evaluate impacts of event. Impact assessment is addressed in Attachment 5420-A. Notify other agencies as appropriate (see steps 2

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RESPONSIBILITY	ACTION
	through 5 above).
	• Follow Watershed Enforcement Response Plan (WERP), Appendix C ("Enforcement Action Sequence Guidelines for Illicit Connection and Illegal Dumping Investigations"), as needed for issuing on-site enforcement actions (issuing verbal warnings and Official Warning Notices). Give reasonable compliance deadlines consistent with Attachment 5420-A and WERP. • Deliver guidance for site cleanup and remediation. • Fill out ICID Complaint Report form.
	7. Perform data-entry at office. If complaining party requested a follow-up call, notify them of investigation results as appropriate.
	8. Continue follow-up inspections until problem is satisfactorily resolved. Facilities can request compliance date extensions in writing. The inspector will evaluate and discuss these requests with the Supervisor for approval.
	9. Discuss case with Supervisor as appropriate to determine if escalated enforcement action (administrative citations, referrals for criminal prosecution, etc) is needed, in conformance to the WERP.
	10. Close Case (Note, do not close a case without performing a site inspection.)

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RESPONSIBILITY	ACTION
	• Complete the Investigation Report Form.
	• Complete data entry. Prepare case for deadfiling after all violations are addressed and related follow-up inspections have occurred. • Submit to Supervisor for Review.
Supervisor	1. Review casefile. Refer back for follow-up inspection as needed. 2. If complete, change case status in database to show that it is approved as complete, sign and date hardcopy form, and forward file to Clerical.
Clerical	1. File hardcopies of case files.

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		Effective Date DRAFT	Revised Date 10/16/00
Approved by: John Mukhar	Signature:		Date:

2410.1 PURPOSE

This procedure provides uniform guidelines for the receipt and recording of IC/ID complaints reported to the Watershed Protection Group.

2410.2 POLICY

It shall be the policy that all staff members of the Watershed Protection Group know and use this procedure for recording IC/ID complaints.

2410.3 DEFINITIONS

IC/ID - Illicit Connection/Illegal Dumping
NPDES - National Pollutant Discharge Elimination System
NPS - Non-point Source
WPG - Watershed Protection Group

2410.4 BACKGROUND

Watershed Protection Group (WPG) receives numerous IC/ID complaints from a variety of sources. Under the terms of the City's stormwater National Pollutant Discharge Elimination System (NPDES) permit, WPG is required to act upon these complaints to effectively halt the sources of pollution they represent. WPG inspectors have only 5 working days to respond to IC/ID cases.

Proper receipt and recording of incoming IC/ID calls is the first step in effective management of complaint calls. Incoming calls should be handled such that:

- Exact and complete information is recorded;
- Key pieces of information are extracted, despite the varied level of knowledge of callers; and

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- Multiple calls regarding the same incident are detected to minimize duplicate efforts among inspection staff.

2410.5 LIMITATIONS

This policy applies to all staff in Watershed Protection Group.

2410.6 PROCEDURE

STEP	RESPONSIBLE	ACTION
1	Staff	When acting on a request or responding to a complaint of water and/or another substance being discharged, determine the severity of the incident to properly handle the call. Be certain the complaint is something that WPG handles. If unsure, ask someone. If the situation is dangerous or detrimental to human life **have the caller hang up and call 911**.
2	Staff	Record the complaint by filling out the Complaint Report Form. Make sure to get as much information as possible to help ensure and adequate investigation. Use the following to guide completion of the form: 1. Date: the date the complaint comes in and you are filling out the complaint form. 2. File #: leave blank 3. File address: where the problem occurred. 4. Cross street: closest cross street. 5. Census and District: leave blank.

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STEP	RESPONSIBLE	ACTION
		6. Received by: name of the person filling out the form. 7. Ex.#: phone extension of the person filling out the form. 8. Insp: leave blank. This complaint will be assigned to an inspector (Procedure 2560). 9. Complainant information: the name, address, and telephone number of the person calling in the complaint. (This information is for record only and never given out to anyone but the inspector involved.) Inform the caller that this information is confidential and for our records only. 10. Complaint: describe the problem. 11. License number: vehicle license plate, if applicable. 12. Ask the caller where they had found our phone number (for outreach purposes).
3	Staff	Forward form for inspector response. If the complaint is not detrimental to life but the violation is critical and in progress, forward form to NPS Inspection Supervisor (or, if unavailable, to Clerical staff) with instruction that the complaint is critical. If the complaint is not critical, forward to Clerical with the instruction that the complaint is not critical.
4	Supervisor or Clerical	If the complaint is critical, determine which Inspector covers the district and notify that Inspector. Inspectors carry cell phones and pagers. If unable to reach the inspector, or if they are not on duty, call any inspector on duty to immediately refer complaint to field staff.
5	Clerical	If the complaint is not critical, either contact the area inspector in

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STEP	RESPONSIBLE	ACTION
		the field or leave a voice mail message indicating the receipt of a new complaint and relevant information.
6	Clerical	Enter the data from form into the database. This should be completed within 1 business day to afford inspectors sufficient time to address complaint within 5 day time frame. Use the "check for duplicates" buttons in the database. If a case is a duplicate do not enter information. Fill out a duplicate message form and place in the assigned inspectors box.
7	Clerical	Create a file with database printout of IC/ID Complaint Report, place in a red folder, and put in mail slot for area inspector.

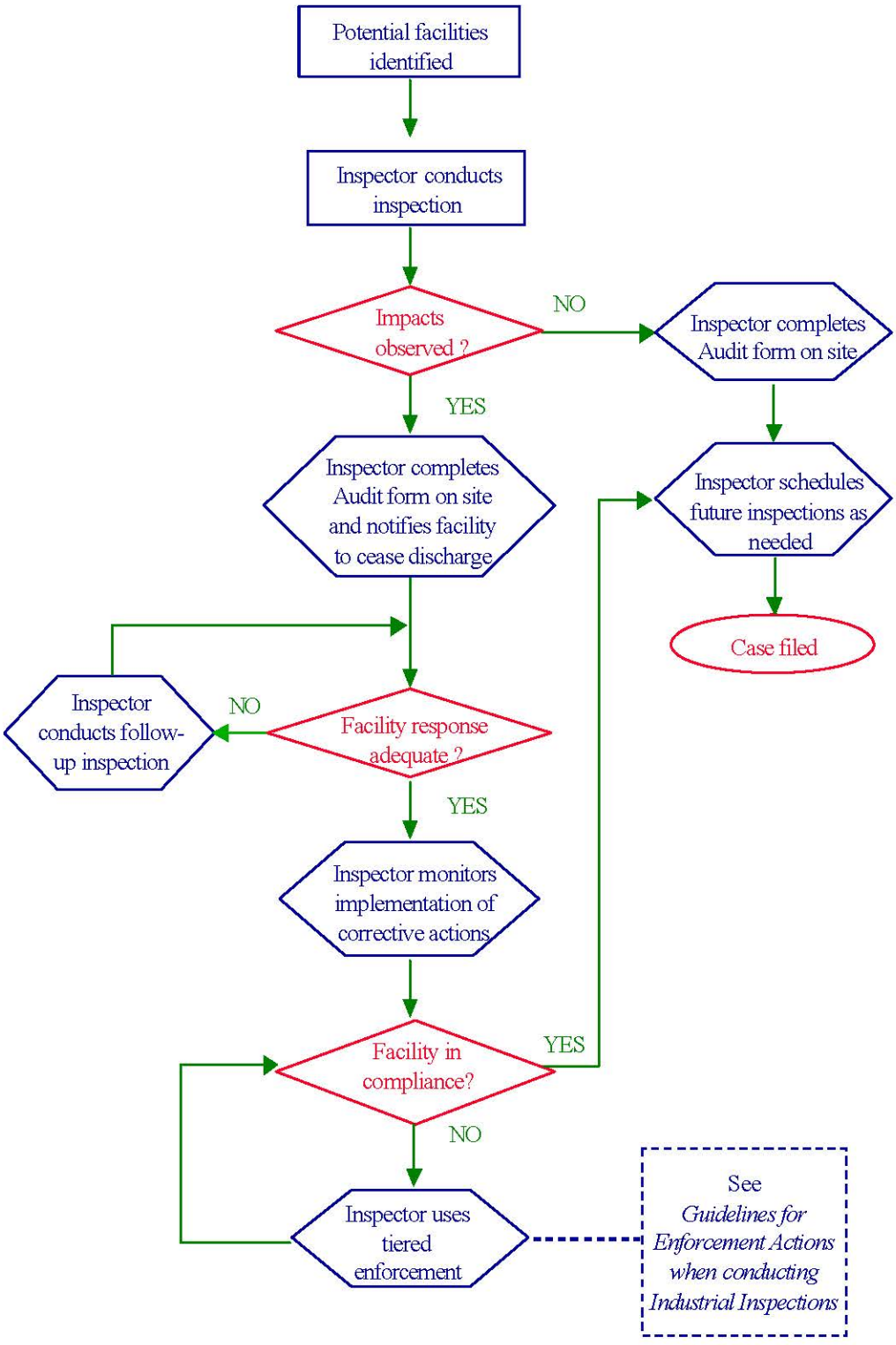
IND STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for the Industrial/Commercial Discharges Program.

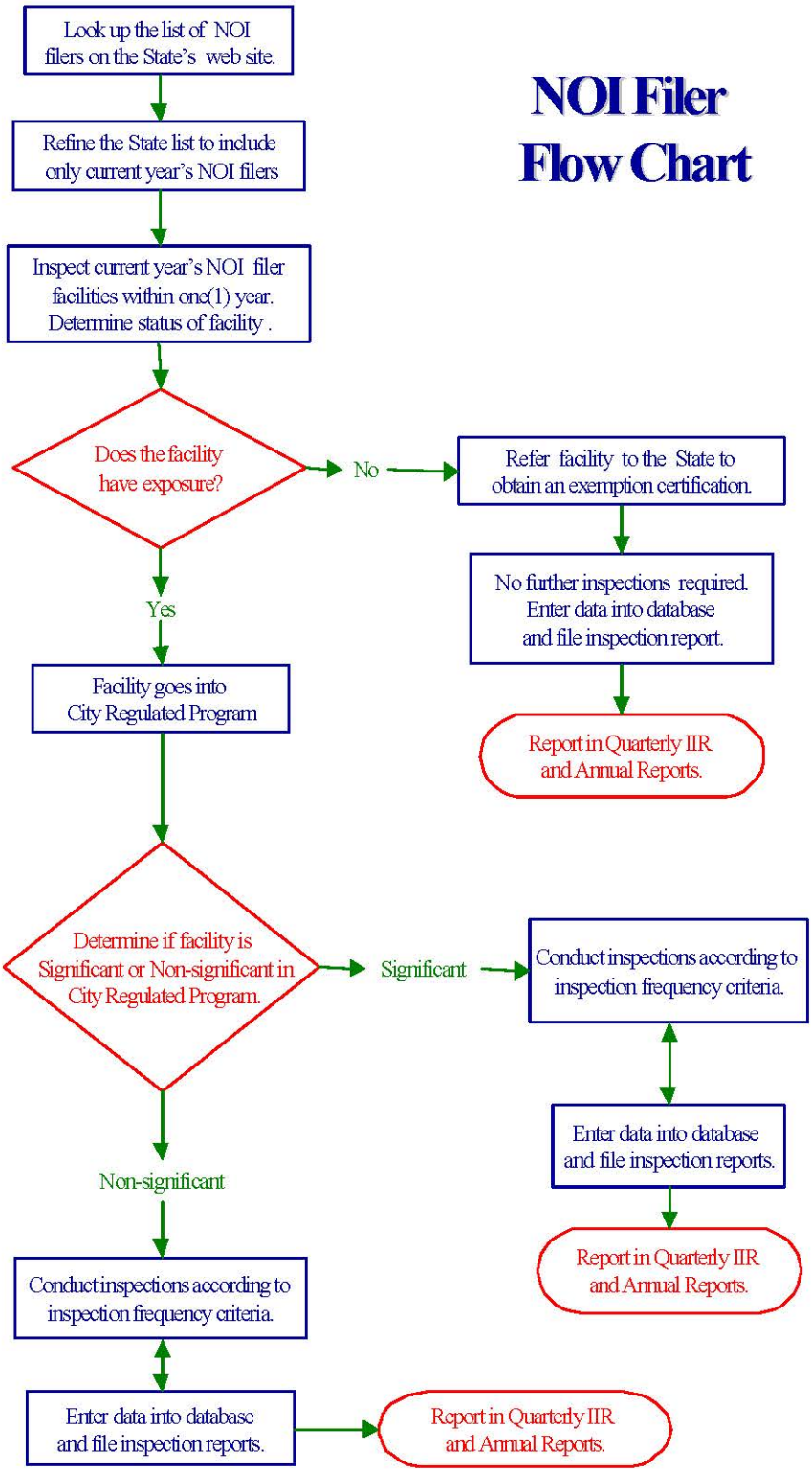
The various components of this section are organized as follows:

1. Watershed Enforcement Training and Procedures Manual Table of Contents – See ICID
2. Enforcement Response Plan – See ICID
3. Guidelines for Enforcement Response – See ICID
4. IND Standard Operating Procedures Flowcharts
   - NOI Filer Flowchart
   - Non-NOI Filer Flowchart
   - City Regulated Facility Flowchart
   - Category Groupings Table
   - Facilities Covered by GIAS Permit
   - IND Facility Categories for City of San Jose
   - Industrial Inspections Enforcement Actions Flowchart
5. Stormwater Facility Inspection Guidelines

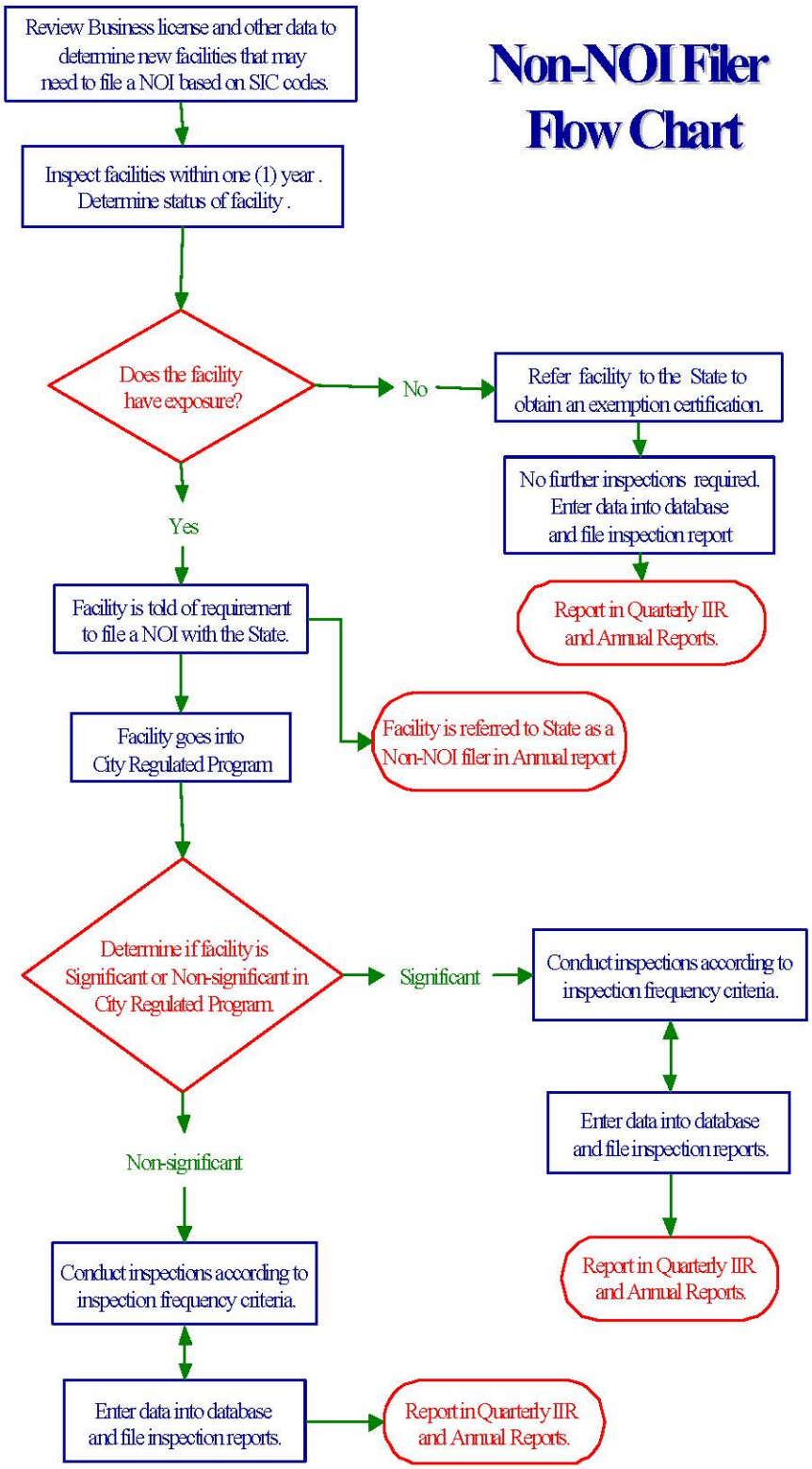
IND Standard Operating Procedures Flowchart



NOI Filer Flow Chart



Non-NOI Filer Flow Chart



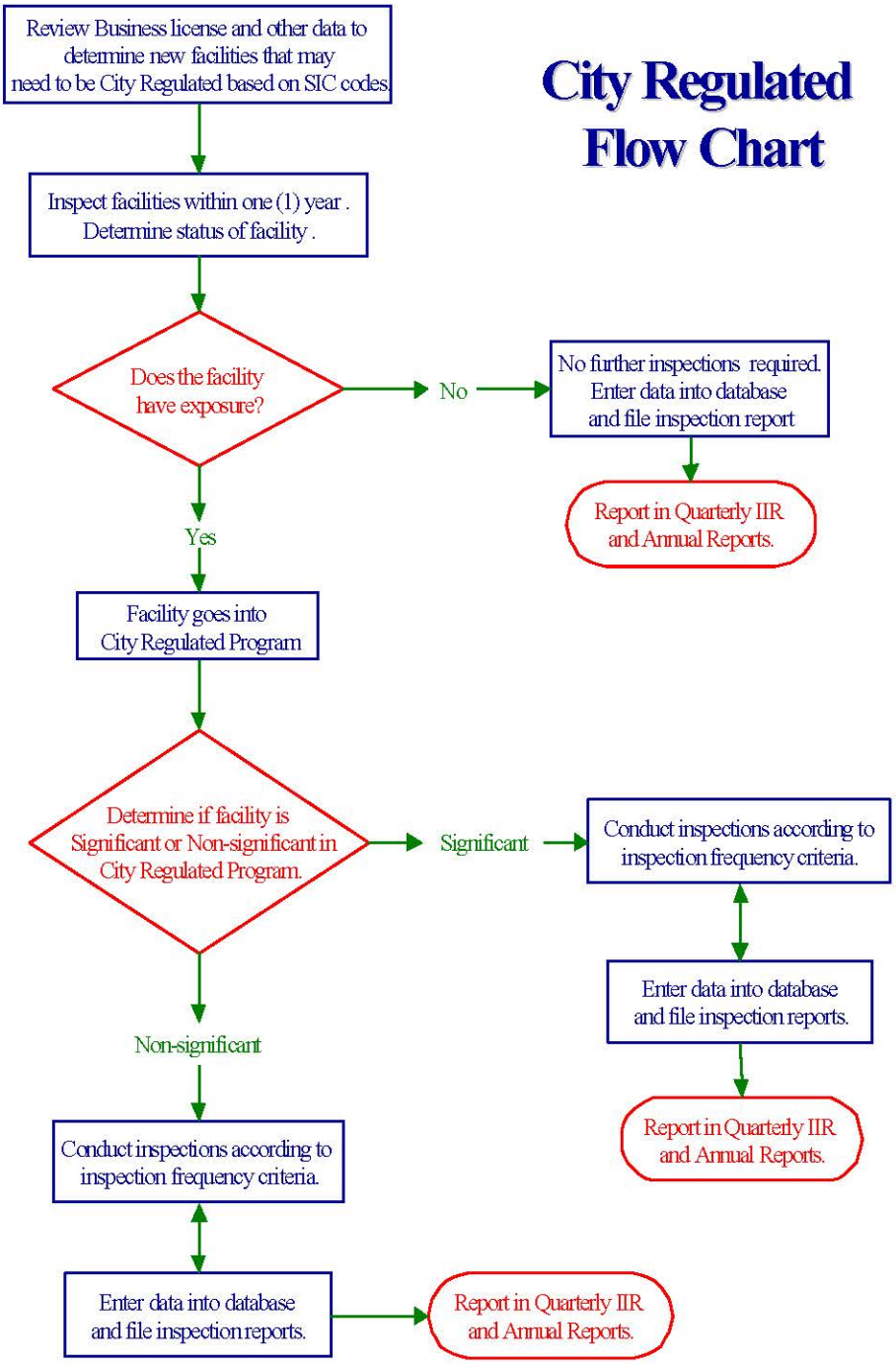

City Regulated
Flow Chart
Review Business license and other data to determine new facilities that may need to be City Regulated based on SIC codes.
Inspect facilities within one (1) year . Determine status of facility .
Does the facility have exposure?
No
No further inspections required. Enter data into database and file inspection report
Report in Quarterly IIR and Annual Reports.
Yes
Facility goes into City Regulated Program
Determine if facility is Significant or Non-significant in City Regulated Program.
Significant
Conduct inspections according to inspection frequency criteria.
Enter data into database and file inspection reports.
Report in Quarterly IIR and Annual Reports.
Non-significant
Conduct inspections according to inspection frequency criteria.
Enter data into database and file inspection reports.
Report in Quarterly IIR and Annual Reports.

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
00741	Veterinary Livestock Services	N/A	Other - Miscellaneous	20
00742	Veterinary Animal Specialties	N/A	Other - Miscellaneous	20
00751	Livestock Services, Except Veterinary	N/A	Other - Miscellaneous	20
00752	Animal Specialty Services, Except Veterinary	N/A	Other - Miscellaneous	20
01429	Crushed and Broken Stone, NEC	N/A	Concrete/Stone/Clay Products	14
01741	Masonry & Other Stonework	N/A	Concrete/Stone/Clay Products	14
01742	Plastering, Drywall, Acoustical & Insulation Work	N/A	Construction/Building	10
01743	Terrazo, Tile, Marble & Mosaic Work	N/A	Concrete/Stone/Clay Products	14
01771	Concrete Work	N/A	Concrete/Stone/Clay Products	14
02000	Mfg. (Bakery, Candy/Confec., Cheese, Dairy, Ice Cream, Ice,), Food Prep., Meat Packing Plants	10	Food service	2
02011	Meat Packing Plants	10	Food service	2
02013	Sausages & Meat Products	10	Food service	2
02015	Poultry Slaughtering, Dressing & Processing	10	Food service	2
02080	Alcohol/Beverage/Softdrink Mfg.	10	Food service	2
02084	Winery	10	Other - Winery	20
02200	Apparel/Screenprinting/Silk Screening/ Textile Mill Products	10	Other - Miscellaneous	20
02400	Wood Product Mfg.	2	Wood furniture & other products	17
02421	Saw & Planing Mills	2	Wood furniture & other products	17
02426	Hardwood Dimensions & Flooring Mills	2	Wood furniture & other products	17
02429	Special Product Sawmills, NEC	2	Wood furniture & other products	17
02431	Millwork	2	Wood furniture & other products	17
02434	Wood Kitchen Cabinets	10	Wood furniture & other products	17
02435	Hardwood Veneer & Plywood	2	Wood furniture & other products	17
02436	Softwood Veneer & Plywood	2	Wood furniture & other products	17

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
02439	Structural Wood Members, NEC	2	Wood furniture & other products	17
02441	Wood Boxes	2	Wood furniture & other products	17
02448	Wood Pallets & Skids	2	Wood furniture & other products	17
02449	Wood Containers, NEC	2	Wood furniture & other products	17
02451	Mobile Homes	2	Wood furniture & other products	17
02452	Prefabricated Wood Buildings & Components	2	Wood furniture & other products	17
02491	Wood Preserving	2	Wood furniture & other products	17
02493	Reconstituted Wood Products	2	Wood furniture & other products	17
02499	Wood Products, NEC	2	Wood furniture & other products	17
02500	Furniture/Fixture Mg.	10	Wood furniture & other products	17
02511	Wood Household Furniture	10	Wood furniture & other products	17
02512	Wood Household Furniture, Upholstered	10	Wood furniture & other products	17
02514	Metal Household Furniture	10	Misc. mfg. - Furniture	19
02515	Mattresses & Bedsprings	10	Misc. mfg. - Furniture	19
02517	Wood TV, Radio, Phono & Sewing Cabinets	10	Wood furniture & other products	17
02519	Household Furniture, NEC	10	Misc. mfg. - Furniture	19
02521	Wood Office Furniture	10	Wood furniture & other products	17
02522	Office Funiture, Except Wood	10	Misc. mfg. - Furniture	19
02531	Public Building & Related Furniture	10	Misc. mfg. - Furniture	19
02541	Wood, Office & Store Fixtures	10	Wood furniture & other products	17
02542	Partitions & Fixtures, Except Wood	10	Misc mfg -Office & Store fixtures	19
02599	Furniture & Fixtures, NEC	10	Wood furniture & other products	17
02600	Paper Mfg.	2	Misc. Mfg. - Paper	19
02631	Paperboard Mills	2	Misc. Mfg. - Paper	19
02700	Newspaper Publishing, Printing, Publishing	10	Other - Photographic/Printing	20
02711	Newspapers: Publishing & Printing	10	Other - Photographic/Printing	20

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
02721	Periodicals: Publishing & Printing	10	Other - Photographic/Printing	20
02731	Books: Publishing & Printing	10	Other - Photographic/Printing	20
02732	Book Printing, Not Publishing	10	Other - Photographic/Printing	20
02759	Commercial Printing	10	Other - Photographic/Printing	20
02791	Typesetting	10	Other - Photographic/Printing	20
02796	Platemaking & Related Services	10	Other - Photographic/Printing	20
02800	Chemical Mfg. (paint, cosmetics, petroleum & allied products)	2	Chemical Mfg.	18
02812	Alkalies & Chlorine	2	Chemical Mfg.	18
02813	Industrial Gases	2	Chemical Mfg.	18
02816	Inorganic Pigments	2	Chemical Mfg.	18
02819	Industrial Inorganic Chemicals, NEC	2	Chemical Mfg.	18
02821	Plastics, Materials & Nonvulcanizable Elastomers	2	Chemical Mfg.	18
02822	Synthetic Rubber (Vulcanized Elastomers)	2	Chemical Mfg.	18
02823	Cellulosic Man-Made Fibers	2	Chemical Mfg.	18
02824	Synthetic Organic Fibers, Exc. Cellulosic	2	Chemical Mfg.	18
02833	Medicinal Chemicals & Botanical Products	10	Misc mfg - Medical	19
02834	Pharmaceuticals	10	Misc mfg - Pharmaceuticals	19
02835	Diagnostic Substances	10	Misc mfg - Medical	19
02836	Biological Products, Exc. Diagnostic Substances	10	Misc mfg - Medical	19
02841	Soap & Detergents	2	Chemical Mfg.	18
02842	Specialties Cleaning, Polishing & Sanitation Preparations	2	Chemical Mfg.	18
02843	Surface Active & Finishing Agents, Sulfonated Oils	2	Chemical Mfg.	18
02844	Perfumes, Cosmetics & Toilet Preparations	2	Chemical Mfg.	18
02851	Paints, Varnishes, Lacquers, Enamels	2	Paint facilites	3
02861	Gum & Wood Chemicals	2	Chemical Mfg.	18
02865	Cyclic-Crudes, Intermediates, Dyes & Organic Pigments	2	Chemical Mfg.	18

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
02869	Industrial Organic Chemicals, NEC	2	Chemical Mfg.	18
02873	Nitrogenous Fertilizers	2	Chemical Mfg.	18
02874	Phosphatic Fertilizers	2	Chemical Mfg.	18
02875	Fertilizers, Mixing Only	2	Other - Miscellaneous	20
02879	Pesticides & Agricultural Chemicals	2	Pesticide Facilities	6
02891	Adhesives & Sealants	2	Chemical Mfg.	18
02892	Explosives	2	Chemical Mfg.	18
02893	Printing Ink	2	Chemical Mfg.	18
02895	Carbon Black	2	Chemical Mfg.	18
02899	Chemical Preparations, NEC	2	Chemical Mfg.	18
02911	Petroleum Refining	2	Other Petroleum Refining	20
02951	Paving Mixtures & Blocks	2	Misc. Mfg. - Petroleum & Coal	19
02952	Asphalt Felts & Coatings	2	Misc. Mfg. - Petroleum & Coal	19
02992	Lubricating Oils & Greases	2	Misc. Mfg. - Petroleum & Coal	19
02999	Products of Petroleum & Coal, NEC	2	Misc. Mfg. - Petroleum & Coal	19
03000	Rubber & Plastic Products	10	Misc. Mfg. - Rubber & Plastics	19
03011	Tires & Inner Tubes	10	Misc. Mfg. - Rubber & Plastics	19
03021	Rubber & Plastic Footwear	10	Misc. Mfg. - Rubber & Plastics	19
03052	Rubber & Plastic Hose & Belting	10	Misc. Mfg. - Rubber & Plastics	19
03053	Gaskets, Packing & Sealing Devices	10	Misc. Mfg. - Rubber & Plastics	19
03061	Molded, Extruded & Lathe-Cut Rubber Mechanical Goods	10	Misc. Mfg. - Rubber & Plastics	19
03069	Fabricated Rubber Products	10	Misc. Mfg. - Rubber & Plastics	19
03081	Plastic Unsupported Sheet & Film	10	Misc. Mfg. - Rubber & Plastics	19
03082	Plastic Unsupported Profile Shapes	10	Misc. Mfg. - Rubber & Plastics	19
03083	Plastic Laminated Plate & Sheet	10	Misc. Mfg. - Rubber & Plastics	19
03084	Plastic Pipe	10	Misc. Mfg. - Rubber & Plastics	19

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
03085	Plastic Bottles	10	Misc. Mfg. - Rubber & Plastics	19
03086	Plastic Foam Products	10	Misc. Mfg. - Rubber & Plastics	19
03087	Custom Compounding of Purchased Plastic Resins	10	Misc. Mfg. - Rubber & Plastics	19
03088	Plastic Plumbing Fixtures	10	Misc. Mfg. - Rubber & Plastics	19
03089	Plastic Products, NEC	10	Misc. Mfg. - Rubber & Plastics	19
03111	Leather Tanning & Finishing	2	Other - Miscellaneous	20
03200	Stone, Clay, Concrete, Cement, Concrete Plant	2	Concrete/Stone/Clay Products	14
03231	Glass Products Made of Purchased Glass	2	Misc. Mfg. - Glass	19
03241	Cement, Hydraulic	2	Concrete/Stone/Clay Products	14
03251	Brick & Structural Clay Tile	2	Concrete/Stone/Clay Products	14
03253	Ceramic Tile	2	Concrete/Stone/Clay Products	14
03255	Clay Refractories	2	Concrete/Stone/Clay Products	14
03259	Structural Clay Products, NEC	2	Concrete/Stone/Clay Products	14
03261	China Plumbing Fixtures & Fittings	2	Concrete/Stone/Clay Products	14
03264	Porcelain Electrical Supplies	2	Concrete/Stone/Clay Products	14
03269	Pottery Products, NEC	2	Concrete/Stone/Clay Products	14
03271	Concrete Block & Brick	2	Concrete/Stone/Clay Products	14
03272	Concrete Products, Except Block & Brick	2	Concrete/Stone/Clay Products	14
03273	Ready-Mixed Concrete	2	Concrete/Stone/Clay Products	14
03274	Lime	2	Concrete/Stone/Clay Products	14
03275	Gypsum Products	2	Concrete/Stone/Clay Products	14
03281	Cut Stone Products	2	Concrete/Stone/Clay Products	14
03291	Abrasive Products	2	Concrete/Stone/Clay Products	14
03292	Asbestos Products	2	Concrete/Stone/Clay Products	14
03295	Minerals & Earths: Ground Or Treated	2	Concrete/Stone/Clay Products	14
03296	Mineral Wool	2	Concrete/Stone/Clay Products	14

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
03297	Nonclay Refractories	2	Concrete/Stone/Clay Products	14
03299	Nonmetallic Mineral Products, NEC	2	Concrete/Stone/Clay Products	14
03312	Blast Furnaces, Coke Ovens, Steel & Rolling Mills	2	Metal Manufacturing	8
03313	Electrometallurgical Products	2	Metal Manufacturing	8
03315	Steel Wire Drawing & Nails & Spikes	2	Metal Manufacturing	8
03316	Cold Rolled Steel Sheet, Strip & Bars	2	Metal Manufacturing	8
03317	Steel Pipe & Tubes	2	Metal Manufacturing	8
03321	Gray Iron Foundries	2	Metal Manufacturing	8
03322	Malleable Iron Foundries	2	Metal Manufacturing	8
03324	Steel Investment Foundries	2	Metal Manufacturing	8
03325	Steel Foundries, NEC	2	Metal Manufacturing	8
03331	Primary Smelting & Refining Of Copper	2	Metal Manufacturing	8
03334	Primary Production Of Aluminum	2	Metal Manufacturing	8
03339	Primary Nonferrous Metals, NEC	2	Metal Manufacturing	8
03341	Secondary Smelting & Refining Of Nonferrous Metals	2	Metal Manufacturing	8
03351	Rolling, Drawing & Extruding Of Copper	2	Metal Manufacturing	8
03353	Aluminum Sheet, Plate & Foil	2	Metal Manufacturing	8
03354	Aluminum Extruded Products	2	Metal Manufacturing	8
03355	Aluminum Rolling & Drawing, NEC	2	Metal Manufacturing	8
03356	Rolling, Drawing & Extruding Of Nonferrous Metals	2	Metal Manufacturing	8
03357	Nonferrous Wire Drawing	2	Metal Manufacturing	8
03363	Aluminum Die Castings	2	Metal Manufacturing	8
03364	Nonferrous Die Castings, Exc Aluminum	2	Metal Manufacturing	8
03365	Aluminum Foundries	2	Metal Manufacturing	8
03366	Copper Foundries	2	Metal Manufacturing	8
03369	Nonferrous Foundries: Castings, NEC	2	Metal Manufacturing	8

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
03398	Metal Heat Treating	2	Metal Manufacturing	8
03399	Primary Metal Products, NEC	2	Metal Manufacturing	8
03400	Metal Fabrication, Metal Industries, Plating, Sheet Metal	10	Metal Manufacturing	8
03411	Metal Cans	10	Metal Manufacturing	8
03412	Metal Barrels, Drums, Kegs & Pails	10	Metal Manufacturing	8
03429	Hardware, NEC	10	Metal Manufacturing	8
03441	Fabricated Structural Steel	2	Metal Manufacturing	8
03442	Metal Doors, Sash, Frames, Molding & Trim	10	Metal Manufacturing	8
03443	Fabricated Plate Work	10	Metal Manufacturing	8
03444	Sheet Metal Work	10	Metal Manufacturing	8
03446	Architectural & Ornamental Metal Work	10	Metal Manufacturing	8
03448	Prefabricated Metal Buildings & Components	10	Metal Manufacturing	8
03449	Miscellaneous Metal Work	10	Metal Manufacturing	8
03462	Iron & Steel Forgings	10	Metal Manufacturing	8
03463	Nonferrous Forgings	10	Metal Manufacturing	8
03469	Metal Stampings, NEC	10	Metal Manufacturing	8
03471	Electroplating, Plating, Polishing, Anodizing & Coloring	10	Metal Manufacturing	8
03479	Coating & Engraving, NEC	10	Metal Manufacturing	8
03482	Small Arms Ammunition	10	Metal Manufacturing	8
03483	Ammunition, Large	10	Metal Manufacturing	8
03484	Small Arms	10	Metal Manufacturing	8
03491	Industrial Valves	10	Metal Manufacturing	8
03492	Fluid Power Valves & Hose Fittings	10	Metal Manufacturing	8
03493	Steel Spring, Except Wire	10	Metal Manufacturing	8
03494	Valves & Pipe Fittings, NEC	10	Metal Manufacturing	8
03495	Wire Springs	10	Metal Manufacturing	8

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
03496	Miscellaneous Fabricated Wire Products	10	Metal Manufacturing	8
03497	Metal Foil & Leaf	10	Metal Manufacturing	8
03498	Fabricated Pipe & Pipe Fittings	10	Metal Manufacturing	8
03499	Fabricated Metal Products, NEC	10	Metal Manufacturing	8
03500	Assembly, Machinery/Tools Mfg.	10	Machine shops	7
03511	Steam, Gas & Hydraulic Turbines & Engines	10	Machine shops	7
03519	Internal Combustion Engines, NEC	10	Machine shops	7
03523	Farm Machinery & Equipment	10	Machine shops	7
03524	Garden, Lawn Tractors & Equipment	10	Machine shops	7
03531	Construction Machinery & Equipment	10	Machine shops	7
03532	Mining Machinery & Equipment	10	Machine shops	7
03533	Oil Field Machinery & Equipment	10	Machine shops	7
03534	Elevators & Moving Stairways	10	Machine shops	7
03535	Conveyors & Equipment	10	Machine shops	7
03536	Hoists, Cranes & Monorails	10	Machine shops	7
03537	Industrial Trucks, Tractors, Trailers & Stackers	10	Machine shops	7
03540	Metalworking Machinery & Equipment	10	Machine shops	7
03541	Machine Shops, Jobbing, Tool & Die	10	Machine shops	7
03542	Machine Tools: Forming	10	Machine shops	7
03543	Industrial Patterns	10	Machine shops	7
03544	Dies, Tools, Jigs, Fixtures & Industrial Molds	10	Machine shops	7
03545	Machine Tool Accessories	10	Machine shops	7
03547	Rolling Mill Machinery & Equipment	10	Machine shops	7
03548	Welding Apparatus	10	Machine shops	7
03549	Metalworking Machinery, NEC	10	Machine shops	7
03552	Textile Machinery	10	Machine shops	7

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
03553	Woodworking Machinery	10	Machine shops	7
03554	Paper Industries Machinery	10	Machine shops	7
03555	Printing Trades Machinery & Equipment	10	Machine shops	7
03556	Food Products Machinery	10	Machine shops	7
03559	Special Industry Machinery, NEC	10	Machine shops	7
03561	Pumps & Pumping Equipment	10	Machine shops	7
03562	Ball & Roller Bearings	10	Machine shops	7
03563	Air & Gas Compressors	10	Machine shops	7
03564	Blowers & Fans	10	Machine shops	7
03565	Packaging Machinery	10	Machine shops	7
03566	Speed Changers, Drives & Gears	10	Machine shops	7
03567	Industrial Process Furnaces & Ovens	10	Machine shops	7
03568	Mechanical Power Transmission Equipment, NEC	10	Machine shops	7
03569	Industrial Machinery & Equipment, NEC	10	Machine shops	7
03570	Computers (include Hardware & Software)	10	Electronic/Electrical Components	9
03577	Computer Peripheral Equipment, NEC	10	Electronic/Electrical Components	9
03589	Service Industry Machines, NEC	10	Electronic/Electrical Components	9
03600	Mfg. (appliance, Electronic, Electric/Electronic Equip. semicon)	10	Electronic/Electrical Components	9
03612	Power, Distribution & Specialty Transformers	10	Electronic/Electrical Components	9
03624	Carbon & Graphite Products	10	Electronic/Electrical Components	9
03629	Electrical Industrial Apparatus, NEC	10	Electronic/Electrical Components	9
03643	Current-Carrying Wiring Devices	10	Electronic/Electrical Components	9
03671	Radio & TV Receiving Electron Tubes	10	Electronic/Electrical Components	9
03672	Printed Circuit Boards	10	Electronic/Electrical Components	9
03674	Semiconductors	10	Electronic/Electrical Components	9
03675	Electronic Capacitors	10	Electronic/Electrical Components	9

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
03676	Electronic Resistors	10	Electronic/Electrical Components	9
03677	Electronic Coils & Transformers	10	Electronic/Electrical Components	9
03678	Electronic Connectors	10	Electronic/Electrical Components	9
03679	Electronic Components, NEC	10	Electronic/Electrical Components	9
03691	Storage Batteries	10	Electronic/Electrical Components	9
03692	Primary Batteries: Dry & Wet	10	Electronic/Electrical Components	9
03695	Recording Media	10	Electronic/Electrical Components	9
03713	Truck & Business Bodies	10	Automotive	1
03714	Motor Vehicle Parts & Accessories	10	Automotive	1
03715	Truck Trailers	10	Automotive	1
03716	Motor Homes	10	Automotive	1
03721	Aircraft	10	Automotive	1
03724	Aircraft Engines & Engine Parts	10	Automotive	1
03728	Aircraft Parts & Equipment, NEC	10	Automotive	1
03731	Shipbuilding & Repairing	2	Automotive	1
03732	Boat Building & Repairing	2	Automotive	1
03743	Railroad Equipment	10	Automotive	1
03761	Guided Missiles and Space Vehicles	10	Automotive	1
03769	Guided Missile/Space Vehicle Parts & Equipment, NEC	10	Automotive	1
03792	Travel Trailers & Campers	10	Automotive	1
03795	Tanks & Tank Components	10	Automotive	1
03824	Fluid Meters and Counters	10	Machine shops	7
03825	Instruments for Measuring and Testing Electricity	10	Machine shops	7
03829	Measuring and Controlling Devices, NEC	10	Machine shops	7
03845	Electromedical & Electrotherapeutic Apparatus	10	Misc. Mfg - Medical	19
03851	Opthalmic Goods	10	Misc. Mfg - Medical	19

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
03940	Software, Sporting goods, Toys Mfg.	10	Misc. Mfg - Toys & Sports	19
03993	Signs & Advertising Displays	10	Misc. Mfg - Signs	19
03995	Burial Caskets	10	Misc. Mfg. - Caskets	19
03999	Manufacturing Industries, NEC	10	Misc. Mfg	19
04011	Railroads, Line-Hauling Operations	8	Transportation	11
04013	Switching & Terminal Services	8	Transportation	11
04111	Local & Suburban Transit	8	Transportation	11
04119	Local Transp., Pass. Transit, Ambulance & Limousine Service	8	Transportation	11
04120	Taxi Cab Company	8	Transportation	11
04121	Taxi Cabs	8	Transportation	11
04131	Intercity & Rural Bus Transportation	8	Transportation	11
04141	Local Bus Charter Service	8	Transportation	11
04142	Bus Charter Service, Except Local	8	Transportation	11
04151	School Buses	8	Transportation	11
04173	Bus Terminal & Services Facilities	8	Transportation	11
04200	Motor Freight Transportation & Warehouse	8	Transportation	11
04212	Trucking with repair, Courier, Delivery, Moving Company Shipping	8	Transportation	11
04213	Trucking, Except Local	8	Transportation	11
04214	Local Trucking With Storage	8	Transportation	11
04215	Courier Services, Except Air	8	Transportation	11
04225	Storage/Warehouse Facility	10	Other - Storage	20
04226	Special Warehousing & Storage, NEC	8	Other - Storage	20
04231	Terminal & Joint Terminal Maintenance Facilities	8	Transportation	11
04500	Air courier, airline, Charter Service	8	Transportation	Aiport
04512	Air Trans portation, Scheduled	8	Transportation	Aiport
04513	Air Courier Services	8	Transportation	Aiport

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
04522	Air Transportation, Nonscheduled	8	Transportation	Aiport
04581	Airports, Flying Fields, & Terminal Services	8	Transportation	Aiport
04612	Crude Petroleum Pipelines	N/A	Other - Petroleum Pipelines	20
04613	Refined Petroleum Pipelines	N/A	Other - Petroleum Pipelines	20
04941	Water Supply	N/A	Other - Miscellaneous	20
04971	Irrigation Systems	N/A	Other - Miscellaneous	20
04950	Sanitary Services	5	Landfills	16
04952	Sewerage Systems	9	Other - Miscellaneous	20
04953	Refuse Systems	4 or 5	Other - Miscellaneous or Landfills	16 or 20
04959	Sanitary Services, NEC	N/A	Other - Miscellaneous	20
05012	Automobiles & Other Motor Vehicles Wholesale	N/A	Automotive	1
05013	Motor Vehicle Supplies & New Parts Wholesale	N/A	Automotive	1
05014	Tires & Tubes, Wholesale	N/A	Automotive	1
05015	Motor Vehicle Parts, Used Wholesale (auto dismantling to sell parts)	6	Auto Dismantlers	13
05032	Brick, Stone & Related Construction Materials Wholesale	N/A	Concrete/Stone/Clay Products	14
05051	Metal Service Centers	N/A	Metal Manufacturing	8
05065	Electronic Parts & Equipment Wholesale	N/A	Electrical Components	9
05082	Construction & Mining Machinery & Equipment Wholesale	N/A	Construction/Building	10
05083	Farm & Garden Machinery & Equipment Wholesale	N/A	Construction/Building	10
05093	Scrap and Waste Materials (includes auto dismantlers for scrap)	6	Recycling Yards	12
05169	Chemicals & Allied Products, NEC Wholesale Distribution	N/A	Other - Miscellaneous	20
05171	Petroleum Bulk Stations & Terminals	8	Transportation	11
05198	Paints, Varnishes & Supplies Wholesale	N/A	Paint facilities	3
05261	Retail Nurseries & Garden Stores	N/A	Construction/Building	10
05511	Airplane/Auto Sales, Boat/Mobile Home Dealer	N/A	Automotive	1
05521	Motor Vehicle Dealers (Used Only)	N/A	Automotive	1

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
05531	Auto Stereo, Auto Supply/Parts, Tire, Cellular/Telephone; Sales/Dealer	N/A	Automotive	1
05541	Gas Station, Service Station	N/A	Automotive	1
05812	Restaurant/Food Service	N/A	Food Service	2
07213	Linen Supply	N/A	Other - Laundry	20
07217	Carpet & Upholstery Cleaning	N/A	Cleaning Services	5
07218	Industrial Launderers	N/A	Other - Laundry	20
07342	Disinfecting & Pest Control Services	N/A	Pesticides	6
07349	Building Cleaning & Maintenance Services, NEC	N/A	Cleaning Services	5
07353	Heavy Construction Equipment Rental & Leasing	N/A	Construction/Building	10
07384	Photofinishing Laboratories	N/A	Other - Photographic/Printing	20
07399	Vehicle Related, NEC	N/A	Automotive	1
07513	Truck Rental and Leasing, Without Drivers	N/A	Automotive	1
07530	Auto Repair, Mehcanical, Diversified auto Repair	N/A	Automotive	1
07532	Auto Body/Paint/Upholstery Shop, Auto Wash	N/A	Automotive	1
07533	Automotive Exhaust System Repair Shops	N/A	Automotive	1
07534	Tire Retreading & Repair Shops	N/A	Automotive	1
07536	Automotive Glass Replacement Shops	N/A	Automotive	1
07537	Automotive Transmission Repair Shops	N/A	Automotive	1
07538	General Automotive Repair Shop	N/A	Automotive	1
07539	Automotive Repair Shops, NEC	N/A	Automotive	1
07542	Auto Wash/Polishing, Lube, Automotive	N/A	Automotive	1
07549	Auto-Appraiser, Detail, Oil Change, Tow Service, Claims Adjuster	N/A	Automotive	1
07692	Welding Repair	N/A	Other -Welding	20
07996	Amusement Parks	N/A	Other -Amusement Parks	20
08731	Commercial Physical & Biological Research	N/A	Other -Research	20
			Dry Cleaners	4

Table 1. Category Groupings

(Linking SIC #, GIAS Permit Categories, and Program/City Categories)

SIC #	Nature of Business	General Permit Category # (See Table 2)	Program Category	Program Category # (See Table 3)
			Corporation Yards	15

Table 2. Facilities Covered by GIAS Permit*

General Permit Category #	General Permit Category	40 CFR* *	SIC***
1	Facilities subject to Storm Water Effluent Limitations Guidelines, New Source Performance Standards, or Toxic Pollutant Effluent Standards	411 – Cement Mfg., 412 – Feedlots, 418- Fertilizer Mfg., 419 – Petroleum Refining, 422 – Phosphate Mfg., 423 – Steam Electric, 434 – Coal Mining, 436 – Mineral Mining and Processing, 440 – Ore Mining and Dressing, 443 – Asphalt Emulsion.	
2	Manufacturing Facilities		24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3441, and 373
3	Oil and Gas/Mining Facilities		10-14
4	Hazardous Waste Treatment, Storage, or Disposal Facilities		
5	Landfills, Land Application Sites, and Open Dumps		
6	Recycling Facilities		5015, 5093
7	Steam Electric Power Generating Facilities		
8	Transportation Facilities		40, 41, 42 (except 4221-4225), 43, 44, 45 and 5171
9	Sewage or Wastewater Treatment Works		
10	Manufacturing Facilities where Industrial Materials, Equipment, or Activities are **EXPOSED** to Storm Water		20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, and 4221-4225

* April 17, 1997 GIAS Permit's Attachment 1

** 40 Code of Federal Regulations (CFR) Subchapter N - Effluent Guidelines and Standards (Parts 400--471)

*** Standard Industrial Classification (SIC) Codes

Table 3. IND Facility Categories for the City of San Jose

(Developed by AHTG to use for Program-wide Reporting
September 7, 2001 Memo's 17 categories + 3 City categories)

Category #	Program Category	Current AHTG Municipal Category
1	Automotive	Automotive sales, engine and body repair, gas stations, car washes, parking, vehicle services
2	Food Service	Eating and drinking establishments, including cafeterias, delis, bakeries, mobile food
3	Paint Facilities	Manufacturing and retailing
4	Dry Cleaners	Dry cleaners
5	Cleaning Services	Mobile washers, building cleaning, carpet cleaning
6	Pesticide Facilities	Manufacturing and retailing; pesticide applicators
7	Machine Shops	Industrial machinery and equipment
8	Metal Manufacturing	Metal fabricating, finishing, plating, metal work (40 CFR 413, 433)
9	Electric/Electrical Components	Manufacturing (40 CFR 469)
10	Construction/Building	Retail, trade contractors, construction, landscape and garden businesses
11	Local Transit; Highway Transport	Electric, Gas and Sanitary Services, Trucking Industries
12	Recycling yards	Assembling, breaking up, sorting and wholesale distribution of scrap and waste materials. This includes auto wreckers engaged in dismantling automobiles for scrap.
13	Auto Dismantlers	Dismantling motor vehicles for the purpose of selling parts.
14	Concrete/Stone/Clay Products	Manufacturing cement, structural clay products, pottery, concrete and gypsum products, cut stone, abrasive and asbestos products, and other products from materials taken principally from the earth in the form of stone, clay and sand.
15	Corporation Yards	PG&E, Caltrans, School bus, VTA, Municipal
16	Landfills	Dumps; Garbage collecting, destroying and processing; Landfill; Rubbish collection and disposal.
17	Wood Furniture & Other Products	Manufacturing finished articles made entirely or mainly of wood or related materials.
18	Chemical Manufacturing	Manufacturing/producing basic chemicals, chemical products to be used in further manufacture (synthetic fibers, etc.) and finished chemical products to be used for ultimate consumption or as materials or supplies in other industries (such as cosmetics, soaps, fertilizers)
19	Misc. Manufacturing	Caskets, Furniture, Glass, Jewelry/Precious Metal, Manufacturing Industries-NEC, Medical, Office & Store Fixtures, Paper, Petroleum & Coal, Pharmaceuticals, Rubber & Plastics, Signs, Toys & Sports
20	Other	**Other includes:**
		Air Conditioning Services Amusement Parks Chiropractors Commercial Areas Florist Hazardous Waste Laboratories Laundries Medical and Dental Labs Miscellaneous

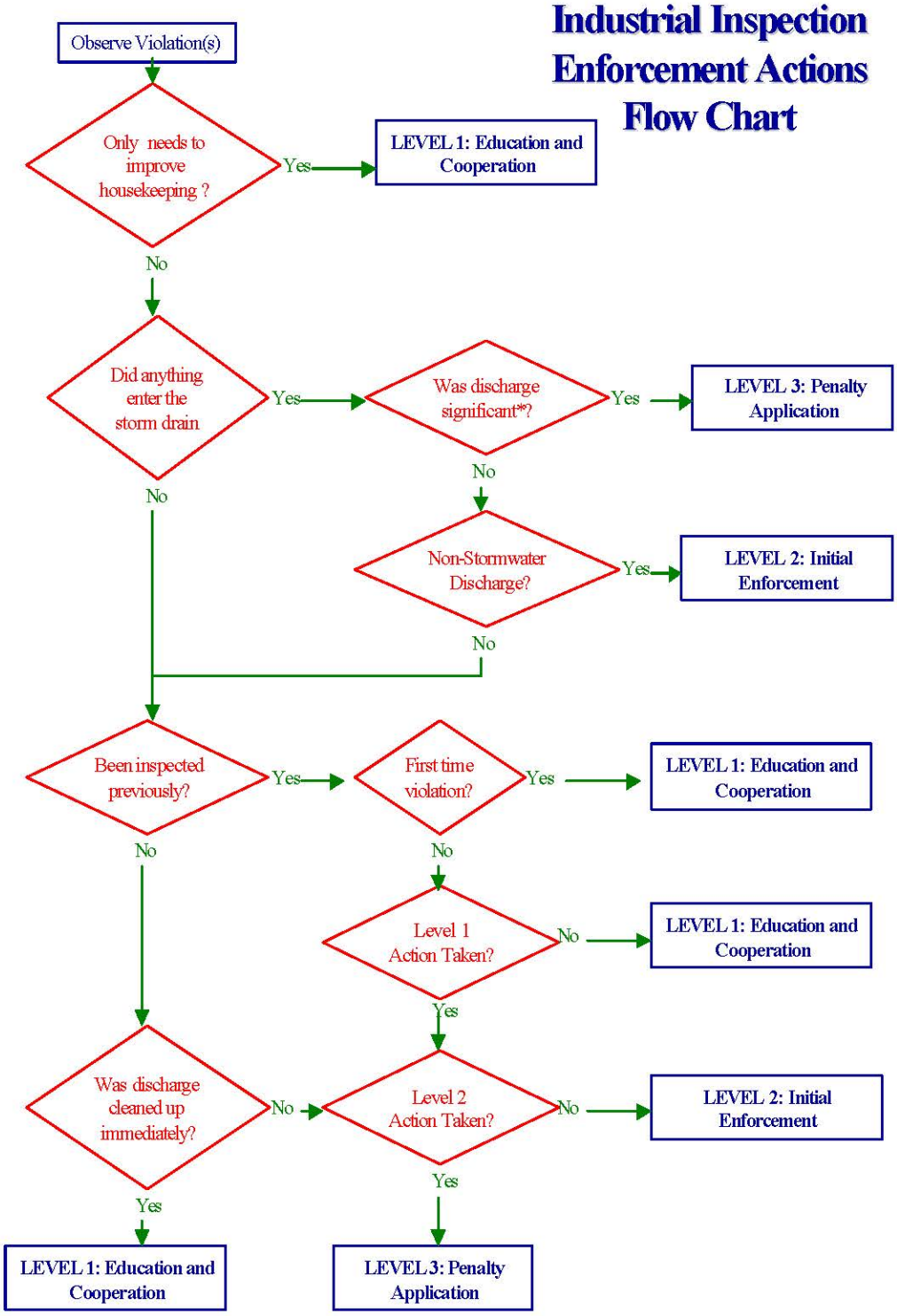
Category #	Program Category	Current AHTG Municipal Category
		Petroleum Pipelines Petroleum Refining Photographic/Printing Property Management Radiologists Steam Electric Power Generation (per permit) Storage Veterinarians Welding/Iron Works Welding Repair Winery Underground Storage Tanks

Note:

1. Removed Cabinetry, Wood furniture and Miscellaneous Manufacturing (Misc. Mfg) from the original Program "Others" list and created the "Wood Furniture & Other Products" category and the Misc. Mfg category. Removed Plastics Mfg from "Others" list and placed in Misc. Mfg–Rubber & Plastics; Removed Pharmaceuticals Mfg from "Others" list and placed in Misc. Mfg-Pharmaceuticals. Removed Jewelry/Precious Metal for "Others" list and placed in Misc. Mfg-Jewelry/Precious Metal.
2. Added "Chemical Manufacturing" category.
3. Added to "Others" list: Air Conditioning Services, Petroleum Pipelines, Property Management, Steam Electric Power Generation, Welding Repair.
4. Glossary of Abbreviations:

- & = and
- etc = et cetera (and so forth)
- misc = miscellaneous
- mfg = manufacturing
- NEC = not elsewhere classified

Industrial Inspection Enforcement Actions Flow Chart



STORM WATER FACILITY INSPECTION GUIDELINES

(for use with SCV-NPS inspection notice)

August 1997

Section 1. General Information

Section	What To Look For	Recommended Control Measures	Reference Materials
1.1 NOI	>If required, ask if a Notice of Intent (NOI) for coverage under General Permit has been submitted. >Make visual verification of NOI.	If NOI has not been filed, but is required, advise facility to contact RWQCB.	Available at RWQCB SCV NPS-Program Storm Water Handbook Com./Ind. Inspector Workshop Handbook Calif. Storm Water BMP Industrial Handbook
1.2 SWPPP& SWMP	>If NOI has been submitted, make visual verification of Storm Water Pollution Prevention Plan (SWPPP). >Also, make visual verification of Storm Water Monitoring Plan (SWMP).	If SWPPP and SWMP are required but not on site, advise facility to contact the RWQCB regarding NPDES requirements.	Same as above
PLEASE NOTE THAT THE ABOVE SECTION REFERS TO THE PRE PRINTED ITEMS ON THE FRONT OF INSPECTION NOTICE BELOW ITEM # 15.			

Section 2. Indoor Activities

Section	What To Look For	Recommended Control Measures	Reference Materials
2.1 Floor Cleaning	>Verify where floor cleaning water, wax, and unused stripper are disposed. Make visual inspection of janitorial floor drains and sinks. Inspect outdoor drains and surfaces for signs of improper disposal of waste liquids. e.g., stains. >Verify that waste liquids from automated floor cleaning equipment holding tanks are discharged to the sanitary sewer.	Explain to the facility representative that all janitorial and maintenance staff should be advised to properly dispose of all unused product and wastewater's either to the sanitary sewers (within local POTW discharge limits), or hauled away. Discharges could be regulated under H&S, F&G, UFC, HMSO, SDO, or local municipal codes. Same	SCV NPS-Program Carpet cleaning BMP CETA Mobile Washer BMP
2.2 Indoor Equip. Cleaning	>Determine how indoor machinery, products, and equipment are cleaned. >Verify where waste water from equipment cleaning is discharged.	Discharge to sanitary (within local POTW discharge limits) or recycle. If indoor equipment is taken outdoors to be washed, refer to 3.2. Consult with POTW or managed as Haz. waste (consult with local Haz. Waste Compliance Agency).	

Section	What To Look For	Recommended Control Measures	Reference Materials
2.3 Indoor Mfg. Residues Spills	>Ask facility contact how all interior spills and leaks are cleaned and disposed of. Look for any evidence of past spills/stains on interior floor especially near exits/doorways. >Verify that absorbent or spill control materials are readily available. >Check to see if there are any manufacturing or process residues or dust present near any exterior doorways or openings where they can be tracked out, such as residues from grinding equipment, sawing equipment, washing tubs.	Proper disposal depending on type of substance. If Haz. Waste refer to local Haz. Waste Compliance Agency. Appropriate absorbent materials shall be kept readily accessible and designated employees should be trained on proper spill response techniques. Consult with local Haz. Waste Agency for proper disposal of spent absorbent. Relocate machinery. Install protective boom, dike or trough. Improve housekeeping.	Machine Shop BMP SCV NPS-Program Vehicle Service Facility BMP
IC	>Investigate any suspicious interior floor drains and verify which sewer they connect to. Note that floor sinks and drains in older building s may have formerly been located outdoors but are currently located indoors due to past remodeling.	Review plumbing schematics if available. If necessary, ask operator to. conduct a dye test to verify connection. All interior floor drains and sumps should be plumbed to the sanitary sewer or closed loop treatment system.	
	CSJ/CEA 12-19-95 INSLIST 3		

Section 3 Outdoor Activities

Section	What To Look For	Recommended Control Measures	Reference Materials
3.1 Veh.& Equip. Fuel Dispensing Areas	>Determine if there is a fuel tank(s) on site. >Determine if fuel dispensing equipment is exposed to storm water. Verify dewatering procedures for above ground tank farms secondary containment areas. >Check to see if fueling or transfer of any chemical from one vessel to another is done near a storm drain.	Some items in this section are responsibility of local Hazardous Materials or fire prevention agency. Refer to appropriate enforcement agencies as needed. Discharges could be regulated under F&G, HMSO, UFC, or local municipal codes. Effect a method to protect all adjacent storm drains in event of spill. Keep absorbent material and booms readily at hand. Booms can be strategically placed inside storm drains to help absorb small volume spills (if it does not	

Section	What To Look For	Recommended Control Measures	Reference Materials
		present a flood hazard). A special check valve may be installed, consult with Building Dept.	
	>Look for residual fuel on any part of the fuel dispensing equipment, surrounding pavement, or in adjacent storm drains.		
	>Check that absorbent materials are readily available near fueling station if applicable.	Consult with local Haz. Waste compliance agency regarding proper disposal of spent absorbent.	
3.2 Veh.& Equip. washing	>Verify that floor mats equipment and equipment screens/filters are not washed where discharge could reach a storm drain (this is common in restaurants).	See below.	SCV-NPS-Program Restaurant BMP CETA mobile washers BMP SCV- NPS Vehicle service BMP
	>Verify if a pressure washer is used to wash vehicles or equipment.	All vehicles and equipment rinse water should be discharged into approved sanitary sewer drain. All waste water resulting from power washing of contaminated surfaces may be subject to some type of pre-treatment prior to entering the sanitary sewer. Consult with local POTW.	
	>Determine if vehicles are washed at site and where rinse water is disposed.	Recycle wash water in a closed loop system.	
3.3 Veh.& Equip. Maint.	>Determine if vehicles are maintained at site, and if there are any associated impacts to any outdoor areas.	If leaks or drips occur under vehicles ask facility to place drip pans under them.	SCV-NPS Veh. Service facilities BMP BAASMA City of SV Veh. Service BMP
	>Inspect all outdoor drains and suspicious indoor drains in the vehicle maintenance area, if applicable.	Conduct dye test to verify proper connection. Insure that wash water used to clean specialized equipment is not disposed to the storm drain directly or indirectly.	
	>Verify if specialized equipment is maintained on site (i.e. forklifts, 5th wheels, etc.).		
3.4 Material storage	>Determine if any raw materials and their by-products are exposed to rain water.	Store loose materials under cover or in bermed areas if possible.	
	>Determine if any (non-hazardous) raw materials and their by-products are transferred in a manner that causes impact to storm drain.	Place protective covers or similar devices over storm drains and increase housekeeping in these areas.	
	>Also determine if raw material/by products are transferred from one package to another in or adjacent to any storm drains.		
3.5	>Verify if facility stores or disposes of	In cases where hazardous materials or waste storage consult with your local	

Section	What To Look For	Recommended Control Measures	Reference Materials
Waste Storage	hazardous materials, hazardous wastes, or any other substances at the site.	Hazardous Materials/ Waste enforcement agency and POTW.	
	>Verify if rain water can enter any double-contained areas, and how these areas are drained once rain water comes into contact with these materials.	If non- hazardous substances are involved, general housekeeping measures should be implemented. Protect storm drain by relocating substance to covered area, berming or covering substance or installing an approved protective device at storm drain inlets.	
	>Determine if transfer of hazardous materials, waste, or non-hazardous substances may potentially impact storm drain.	If Haz. Waste refer to appropriate agency.	
	>Determine if there are any storm drains adjacent to any storage areas.	Effect method to monitor and protect storm drain inlet from accidental discharge.	
3.6 Con-struction Activities	>Determine if on-going or future construction activities are planned at the site and whether contractors are advised or required to protect storm sewer from accidental discharge.	Facility shall be responsible to advise or require contractors to protect storm drains where applicable. Advise facility that if 5 acres or more are disturbed a general construction permit (NPDES) is required.	Available at RWQCB Calif. storm water BMP Construction handbook.
	>If construction activities are current, determine if soil will be disturbed causing it to be washed into the storm drain by rain or landscape irrigation.	Placement of filter fabrics in combination with swales or berms to protect storm drain inlets.	SCV-NPS Construction BMP
	>Verify that construction workers are not washing tools, and/or equipment adjacent to any storm drains.	Training programs or incorporate storm control verbage into future contracts.	
	>Verify that construction materials are not disposed to storm drain directly or indirectly.	Construction debris and materials such as paint, mineral spirits, drywall compounds, adhesives, and other solvents should be properly disposed of. If haz. waste refer to appropriate agencies..	Erosion and Sediment control Measures, ABAG
	>Ask facility rep if construction contractors are aware of storm drain protection measures applicable to their trade (i.e. concrete cutters).		
3.7	>Determine if facility power washes pavement or any other exterior hard surfaces.	Provide for adequate protection of the storm drain system. Consult listed BMP'S for additional info.	CETA mobile washers BMP Outdoor cleaning BMP,

Section	What To Look For	Recommended Control Measures	Reference Materials
Power washing	>Determine how exterior walls, structures, silos, tanks are washed and where wash water is disposed. >Ask facility rep if there are any power or steam cleaning units at the site.		NBAPPA
3.8 outdoor equipment storage	>Inspect all scrap yards, vehicle storage lots or areas where retired/surplus equipment is stored; determine where storm drains are in relation to these areas.	Cover oily and soiled equipment with a leak proof cover. Drain all automotive related fluids prior to storage and dispose of properly. Drip pans	
3.9 Process residues	>Determine if any manufacturing process that creates any type of residue is done outdoors and if this residue can impact storm drain. >Inspect outdoor process areas. >Inspect any outdoor equipment, eg, grinders, saws, paint spraying, etc.	Improve housekeeping or relocate process to a covered location. Protect adjacent storm drains. Relocate equipment to covered location or isolate adjacent storm drain inlets. Refer any airborne nuisances to BAAQMD.	
3.10 Gen.House-keeping	>Determine general overall condition of facility. Is housekeeping done on regular basis? Are there accumu lations of debris, refuse, or litter present?	Make necessary recommendations to effect a improved general housekeeping policy on a regular and consistent basis.	
3.11 Irrigation and Landscape .	>Determine if landscape contractors are properly disposing of lawn clippings and other vegetative wastes. >Inspect storm drains for vegetative wastes. >Inspect paving around landscaping to see if sprinklers are over watering and causing undue erosion and run-off of associated chemicals. >Check to see if pesticides, herbicides or fertilizers are applied to landscaping and how much and how often. >Verify that landscape equipment is washed	Have facility rep. contact the landscaping contractor to improve general housekeeping and to provide temporary protection of all impacted storm drain inlets while conducting landscape activities. Refer all pesticide/herbicide application problems to the S.C. County Ag. Dept. Filter and discharge to sanitary sewer within POTW limits.	

Section	What To Look For	Recommended Control Measures	Reference Materials
	properly, away from paved areas /storm drain.		

Section 4. Equipment

Section	What To Look For	Recommended Control Measures	Reference Materials
4.1 Air compressor	>Inspect any air compressor units which are exposed to storm water for residual grease on the tank or motor surface. >Inspect area beneath air compressor bleed line. Determine if any oily substance is being released which could impact the storm drain.	Relocate compressor to a covered location. Repair oil leaks. Place a catch pan below bleed valve and dispose of on a regular basis.	SCV-NPS Industrial BMP
4.2 HVAC Chillers Refrig.	>Determine if air conditioning units (generally found on roof) and chillers have a condensate line which is plumbed to a roof storm drain. >Determine if air conditioning and chiller units are treated with descaling or anti-algae agent. > Determine if HVAC units are annually flushed with any type of chemical by a servicing contractor. >If larger refrigeration units exist, verify where defrost water or condensate is discharged. >Determine if condensate from any unit comes into contact with pollutants when discharged.	For existing buildings, non-contaminated discharge can go to the storm drain. For new development or remodel discharge will go to sanitary. Consult with local planning/building Dept. Facility representative is responsible to direct HVAC contractor to properly dispose of all flushing agent residues and by pass condensate line while flushing unit. Facility representative is responsible to ensure that defrost water does not come into contact with any pollutant either directly or indirectly. Same.	same as above
4.3 Air scrubbers	>Determine if air scrubbers are allowing particulate to deposite on any surface which will eventually contact rain. >Inspect wet scrubbers discharge point.	Advise facility representative to repair air scrubbers and remove existing debris. A protective catch pan may be placed around scrubber if feasible. Refer any fall out violations/issues to BAAQMD. Wet scrubbers must discharge to the sanitary sewer.	SCV-NPS Industrial BMP
4.4	>If facility has a basement parking lot, verify if rain water drains to the storm drain.	Advise facility representative that only rain water can be pumped to storm drain. Any debris surrounding inside sump should be removed on	

Section	What To Look For	Recommended Control Measures	Reference Materials
Basement sumps	Inspect bottom of storm sump drain and ask how and it is cleaned. >Find out if floors are power washed--if so, how is the waste water discharged. >Determine if automotive fluid spills and/or drips are cleaned with absorbent. >Determine if anyone washes cars in the basement parking lot. This should include mobile auto detailers.	regular maintenance schedule and not allowed to enter the storm drain. Screen mesh or filter fabric may be installed on sump grate to assist in protecting sump from particulate debris as long as it will not cause flood hazard. Consult appropriate agency regarding proper disposal of sump debris. Advise Facility rep. that all floor cleaning contractors must protect storm drain.	CETA Mobile washers guidelines
4.5 Boilers	>Determine if boiler blow-down discharge impacts any adjacent storm water inlet or channel, directly or indirectly. >Determine if boiler is treated with scaler or algaecide and if any leakage is present. >Determine if boiler vents to the roof, and if so, will this vapor recondense on roof and make contact with stormwater run-off.	All treated boiler discharge must be discharged to the sanitary sewer or recycled / reuse in an approved closed loop system. Discharge from boiler chemical additives may meet hazardous waste criteria. If so, refer to local haz. waste compliance agency for proper storage and disposal. Advise facility rep. to repair condensate pipe and redirect flow to sanitary sewer.	
4.6 C/B condition	Inspect all catch basins and drop inlets for debris or other foreign material and have facility clean or remove debris properly.	Advise facility rep. to clean catch basins on regular maintenance schedule. Attaching protective devices such as screens or filter fabric may be an option as long as it does not create flood or safety hazard. Identify all storm drains with stencil. “Do Not Dump Flows to Bay”	
4.7 Refuse dumpster & compactor	>Determine if dumpster lids are closed when dumpster is not in use. Verify if dumpster is stored near a storm drain inlet or channel and look for any leaks.. >If dumpster is an open-top/roll-off bin, or recycle bin, determine if it is covered; if it fills with rain water, determine how rain water is discharged. >Verify that plugs are installed on dumpsters and are not leaking.	Have facility keep lids closed when not in use or exchange bin if it has no lids. Relocate dumpsters and bins away from storm drains.Repair any leaking dumpsters. Have contaminated rain water discharged to sanitary sewer if it is within POTW limits. Consult with POTW. Install plugs or exchange dumpsters.	SCV-NPS Rest.BMP

Section	What To Look For	Recommended Control Measures	Reference Materials
	>Verify that compactor leachate or associated hydraulic fluid does not leak into or adjacent to any storm drain or the pavement. >Determine if refuse hauler dumps or empties dumpsters or bins near a storm drain.	Protect storm drain. Repair compactor. Leaked material can be absorbed and absorbent placed in compactor. Liquid can also go to sanitary sewer.	
4.8 Cooling Towers	>Determine if cooling towers discharge/blow down can directly or indirectly impact the storm sewer.(some towers are located on the roof). >Determine if cooling towers are treated with chemicals and if chemicals are stored adjacent to any storm drains.	All cooling tower discharges must be directed to the sanitary sewer. Refer any chemical storage problems to local Haz. Mat. enforcement agency. Also contact POTW.	
4.9 Emg. Shwr.	>Verify that outdoor emergency showers do not discharge to the storm sewer.	Consult with POTW . Prevent contaminated water from entering the storm drain.	
4.10 Filter Backflush	>Determine if any outdoor equipment filters are back-flushed or back-washed at the site, including filters for pools and fountains (diatom. earth). >Check if any filters from equipment are re-used and washed on site. How is filter medium disposed?	Redirect discharge to sanitary sewer or collect and dispose of solids into refuse container. For commercial and institutional swimming pool facilities, refer filter medium disposal issues to S.C.Co. Health Dept. Consumer Protection Div.	
4.11 Floor sinks/drains	>Look for any outdoor industrial floor sinks/drains which may be non-original Installations or illicit connections. >Investigate all suspicious exterior surface drains or grated slot drains and verify ,if possible, which sewer they connect to, especially those drains formerly outdoors but now indoors or under covered structures.	Replumb drains with proper building permits or seal drains if this will not cause a flood hazard. Review existing plumbing schematics or have dye tests conducted. NOTE: If facility is currently or was a fruit cannery, many of it's outdoor surface drains may be connected to the sanitary sewer.	
4.12	>Inspect area around outdoor grease interceptor cover and verify if rain water can	Have facility rep. clean immediate debris and clean this area on a regular basis especially after having interceptor pumped by a septic	SCV-NPS Rest. BMP

Section	What To Look For	Recommended Control Measures	Reference Materials
Grease Interceptor Tallow containers	carry residual grease to the storm drain. >Determine if tallow containers are stored where they can come into contact with run-off. >Inspector outdoor tallow containers for residual grease in, on or around the container. >Ask facility rep if outdoor grease interceptors ever overflows.	hauler. Residual grease must be collected or washed back into interceptor. Relocate to a covered area. Replace or exchange bins and clean on a regular basis. Refer to POTW for inadequate maintenance. Protect storm drain relocate to a covered area. Refer to POTW for inadequate maintenance.	
4.13 Grnd. H2O Treatment Discharge	>Groundwater treatment discharge Determine if groundwater is being treated at the site and where it is discharged. Verify there is an NPDES permit at the site for discharge.	Consult with RWQCB or SCVWD. For discharge to the storm drain ask if a NPDES permit has been issued. If discharged to sanitary ask for POTW permit.	
4.14 Grnd. H2O Dewatering Devices	>Determine if any groundwater is discharged from the site, and verify which sewer it connects to. > Review spill control plaintiff applicable. >Determine if pumped water contacts any pollutants before it is discharged.	Uncontaminated groundwater infiltrations need not be prohibited unless they are identified by a public agency or the RWQCB as sources of pollutants to receiving waters. Consult with SCVWD and RWQCB.	
4.15 Loading areas	>Inspect all loading dock drains for any potential pollutant. Inspect for truck fluid leaks. >Check if materials that could impact storm drain are loaded or transferred at the dock. >Determine if docks are washed and the method of waste water disposal.	Have debris from catch basins removed on a regular basis. Protect from accidental spillage by placing absorbent booms or covers over drains or use valved inlet inserts if safe and feasible. If materials are Hazardous advise local Haz. Mat. Enforcement agency. Have all dock wash water diverted to the sanitary sewer or use dry clean methods.	SCV-NPS Industrial BMP
4.16 Parking lot	>Inspect parking lots associated with industrial and commercial activities for any excessive vehicle fluid leaks or spills.	Have facility clean up spills with the three step method on a regular basis.(1) Sweep up particles.(2) Absorb with rags or absorbent. (3) Mop up area.	SCV-NPS Veh. Service BMP
4.17 Ponds Fountains	>Determine if there are any ponds or decorative fountains at the site and if their overflow drains are connected to the storm	Discharge to the sanitary sewer or reuse for irrigation, this includes all pool filter backwash and associated debris.	

Section	What To Look For	Recommended Control Measures	Reference Materials
pools	drain directly or indirectly. >Determine if ponds or fountains are treated with copper-based algaecides(Shock) ,growth inhibitors, or other agents.. >Determine if pond or fountain filters are back flushed into any storm drain. (Diatom. earth)	 Consult POTW.	Local Ordinance
4.18 Roof Vents & Equipment	>Inspect all roof vents, exhaust hoods and down spouts for contaminants such as: residual cooking grease (Food service fac.),caustic sol'n, process residues. >Look for residual machinery process residues on roof (paper dust, saw dust, steam condensate). >Check for residual paint residue on roof near paint booth vent. Inspect wave solder roof vents or similar roof vents associated with hooded work stations.	Excessively greasy roof vents should be cleaned on a regular basis especially during the wet season. Catchment pans or trays should also be installed at the base of these vents if feasible. Repair or have duct work properly sealed. Place protective devices around roof storm drains which will not create a hazard. Consult with local Hazardous Material or Waste enforcement agency as well as BAAQMD for control measures. Have any solids properly disposed of and have facility rep. repair unit and clean on a regular basis.	
4.19 R.O. & D.I.	>Verify that reverse osmosis units (RO) reject water is in no way impacting the storm drain. >Verify that Deionization units (DI) are back-flushed.>Deionization units can be regenerated; ask if they are regenerated on or off site. Reverse osmosis membranes need to be cleaned; ask how they clean membranes.	Consult POTW for requirements. Divert reject water from R.O. unit to sanitary sewer. Divert D.I. Back flush water to the sanitary sewer.	CSJ/CEA 12-19-95 INSLIST 3

NRD STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for the New and Redevelopment Program.

The various components of this section are organized as follows:

1. Responsibilities of the Planning, Building, and Code Enforcement Department - Planning Division
2. Responsibilities of the Public Works Department
3. Responsibilities of the Planning, Building, and Code Enforcement Department - Building Division
4. NDC Standard Operating Procedures Flowchart
5. 1997 Council Adopted Residential Design Guidelines
6. Environmental Clearance Application
7. Initial Study Template
8. CEQA Guidance Document
9. Post-Construction Urban Runoff Management Policy 6-29 revised 10/07/2003
10. City of San José - Memorandum 1: Response to Development Application
11. City of San José - Memorandum 2: Response to Development Application
12. Stormwater Runoff Data Application Form

Planning, Building and Code Enforcement Department - Planning Division
The Department of Planning, Building & Code Enforcement is responsible for incorporating post-construction mitigation measures into new development projects and works with Public Works to ensure Group One projects which create or replace one acre or more of impervious surface are numerically sized in accordance with Policy 6-29. Planning project managers are responsible for ensuring that the Public Works conditions for construction activities are incorporated into projects that require earth disturbance.

1. Preliminary Review :

   Project managers inform applicants about the post-construction requirements on a case-by-case basis for projects generating significant storm water quality impacts. Staff determines whether the project creates or replaces one acre or more of impervious surface and if so, informs the applicant of the stormwater runoff numeric sizing requirements for pollutants. Providing this information at the preliminary review stage ensures that the applicant has ample time to incorporate appropriately sized post-construction mitigation measures into the design of projects.

2. Submittal of Development Application Package:

   The applicant prepares the appropriate application forms, including the stormwater runoff data application form, and required project plans identifying specific mitigation measures included into the project. Planning staff distributes the completed application to appropriate City departments and outside agencies including Santa Clara Valley Water District for review and comment.

3. Inter-departmental Initial Project and Environmental Review:

   Planning project managers, in consultation with the Planning Urban Runoff coordinator and Public Works staff, review all projects to assess their impact on urban-runoff for construction and post-construction activities. Staff checks that projects which create or replace one acre or more of impervious surface include numerically size treatment BMPs in accordance with Policy 6-29. Planners also review environmental documents such as Initial Study and Environmental Clearance application to assess if the project would result in a significant environmental impact in the area of stormwater quality.

4. 30 Day Letter - Inform the Applicant about the NPDES Requirements:

   Planning project managers inform applicants of specific NPDES permit requirements, including whether BMPs are required to be numerically sized, for both construction and post-construction activities within 30 days after the application is filed.

5. Project Revisions:

   Based on the City's comments, the applicant revises project plans as necessary to ensure that they adequately reflect the NPDES permit

requirements. If numerically sized BMPs are required, staff works with Public Works staff to ensure the BMPs are appropriately sized and appropriately located.

6. Environmental Clearance:

   Planners in Planning's Environmental section address stormwater quality issues in Environmental Impact Reports and Project Managers in Implementation address stormwater quality issues in Initial Studies and Negative Declarations. Staff uses the Guidance document developed by the Program to assist in the review. The EIR and/or the Initial Study and Negative Declaration document identifies mitigation measures as appropriate for both construction and post-construction activities.

7. Project Approval:

   Planning project managers include specific mitigation measures as identified during the environmental and project review stages in the project as permit conditions. Projects requiring post-construction mitigation measures also prepare and submit maintenance plans. These permit conditions provide the City with a legal authority to implement the NPDES permit requirements.

Public Works Department

The Department of Public Works is responsible for ensuring that construction activities comply with the NPDES permit requirements. Public Works notifies the Planning staff of each project which needs to prepare a Storm Water Pollution Prevention Plan (SWPPP) and/or an Erosion Control Plan (ECP).

1. Initial Project Review:

   Public Works project managers review all projects to assess whether numerically sized post-construction BMPs are required and the project's potential impact on urban runoff for construction. For all projects that require earth disturbance, Public Works project managers notify Planning staff that the project needs to prepare a SWPPP and/or an ERC. These memos are incorporated into Planning's 30-day letters.

2. Project Revisions:

   Based on the City's comments, the applicant revises project plans as necessary to ensure that they adequately reflect the NPDES permit requirements. If numerically sized BMPs are required, staff checks that a certification document which certifies that the post-construction pollutant BMPs are sized in accordance with Policy 6-29, is submitted by the applicants' engineer and ensures the BMPs are appropriately sized and appropriately located.

3. Submittal of Grading and Street Improvements Plans:

After projects receive Planning approval, the applicant submits Grading and Street Improvement Plans identifying specific NPS mitigation measures. All Street Improvements Plans require stenciling of catch basin inlets.

4. Issuance of Grading, Street Improvement Permits, and Public Works Clearance:

   Public Works project managers review grading and street improvement plans for all projects. Depending on the location of the project and timing of grading, a project may be required to prepare Erosion Control Plans. Prior to the issuance of a grading permit, projects greater than or equal to one acre are also required to submit a copy of the Notice Of Intent to the Public Works Department. After the Public Works requirements are fulfilled, the applicant receives a clearance. The Public Works Clearance allows the applicant to obtain Building Permits.

Planning, Building, and Code Enforcement Department - Building Division

The Building Division of the Department of Planning, Building & Code Enforcement reviews all plans to ensure that they comply with the uniform construction codes and all conditions specified in planning permits.

1. Submittal of Building Plans:

   Applicants submit plans to the Building Division after obtaining Planning and Public Works approvals.

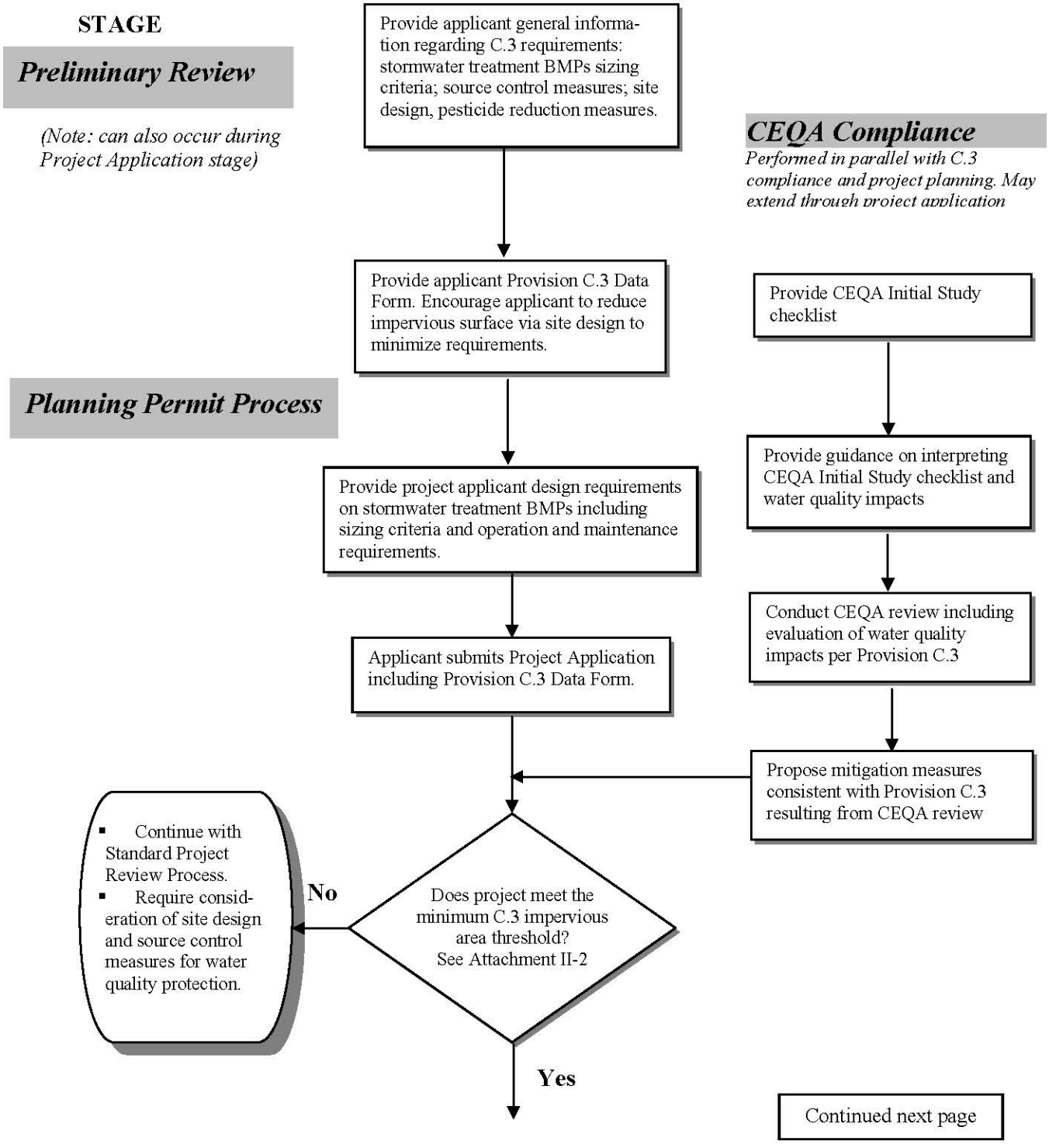
2. Review of Building Plans:

   Building staff reviews the plan to ensure that the project is built in compliance with the uniform construction codes and all requirements as specified in planning permits, including numerically sized BMPs.

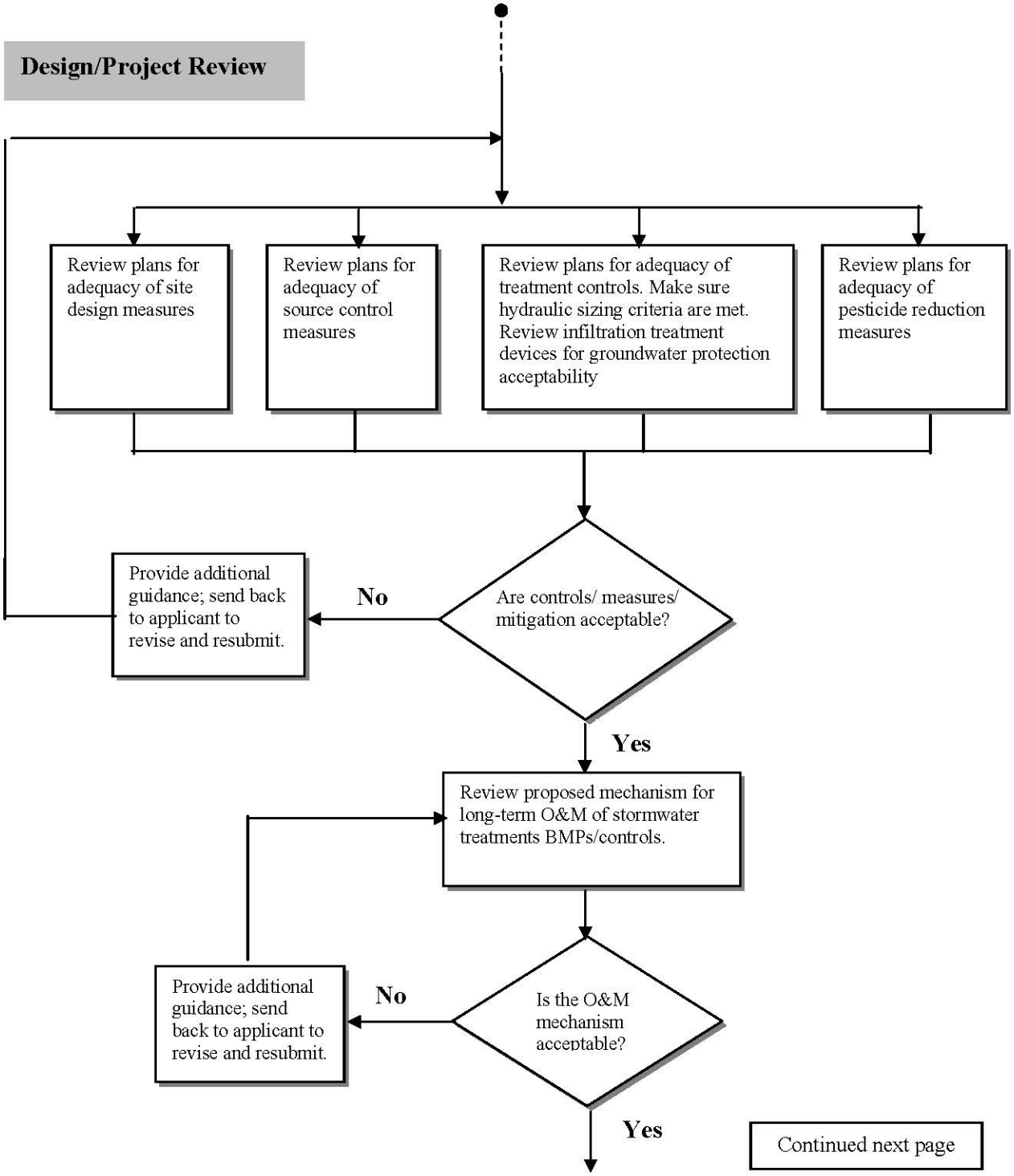
3. Issuance of Building and Plumbing Permits:

   Building Division issues appropriate permits to the applicant after all requirements have been incorporated into the project.

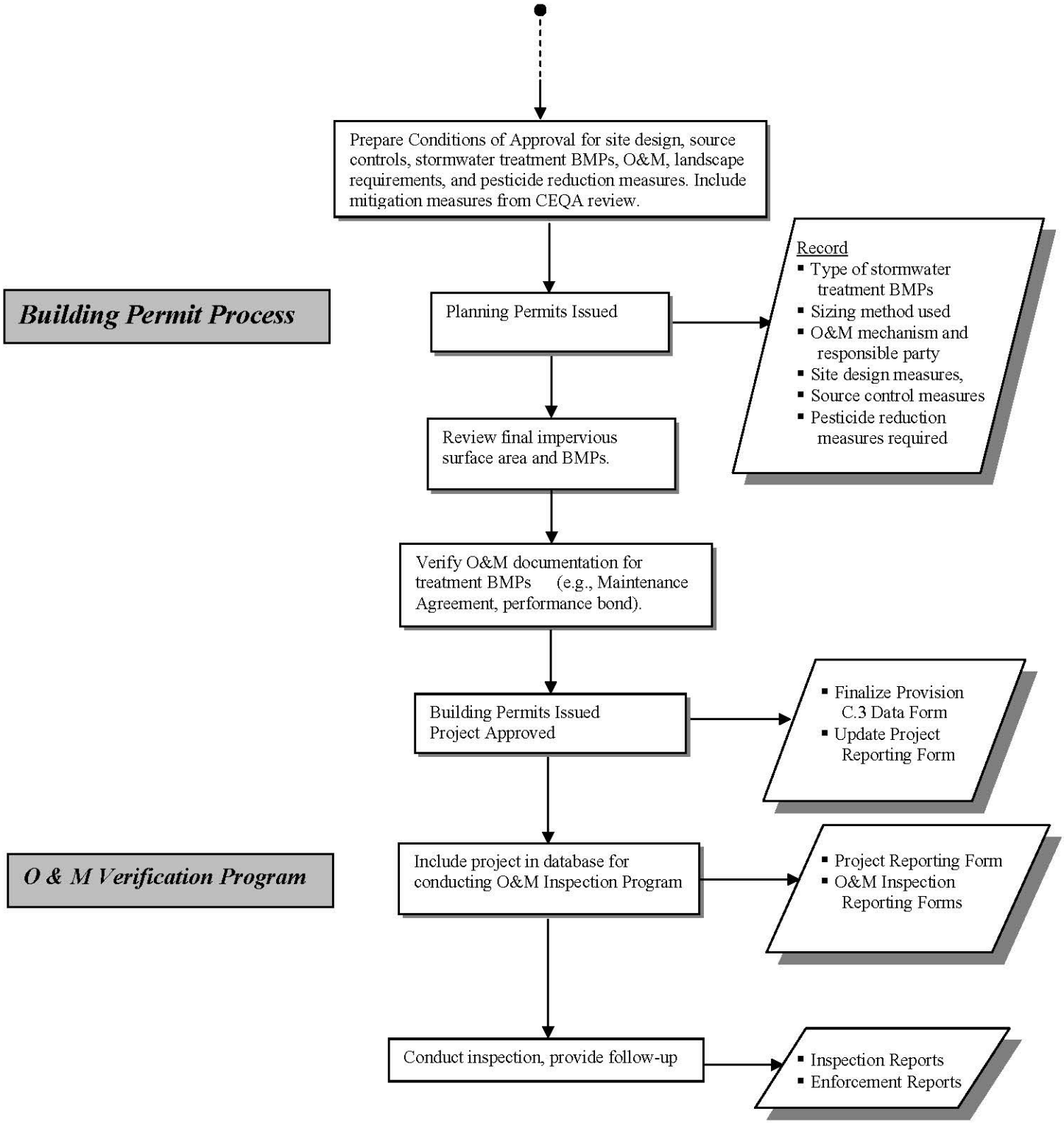
SCVURPPP Typical Development Review Process
Incorporating Provision C.3 Stormwater Requirements



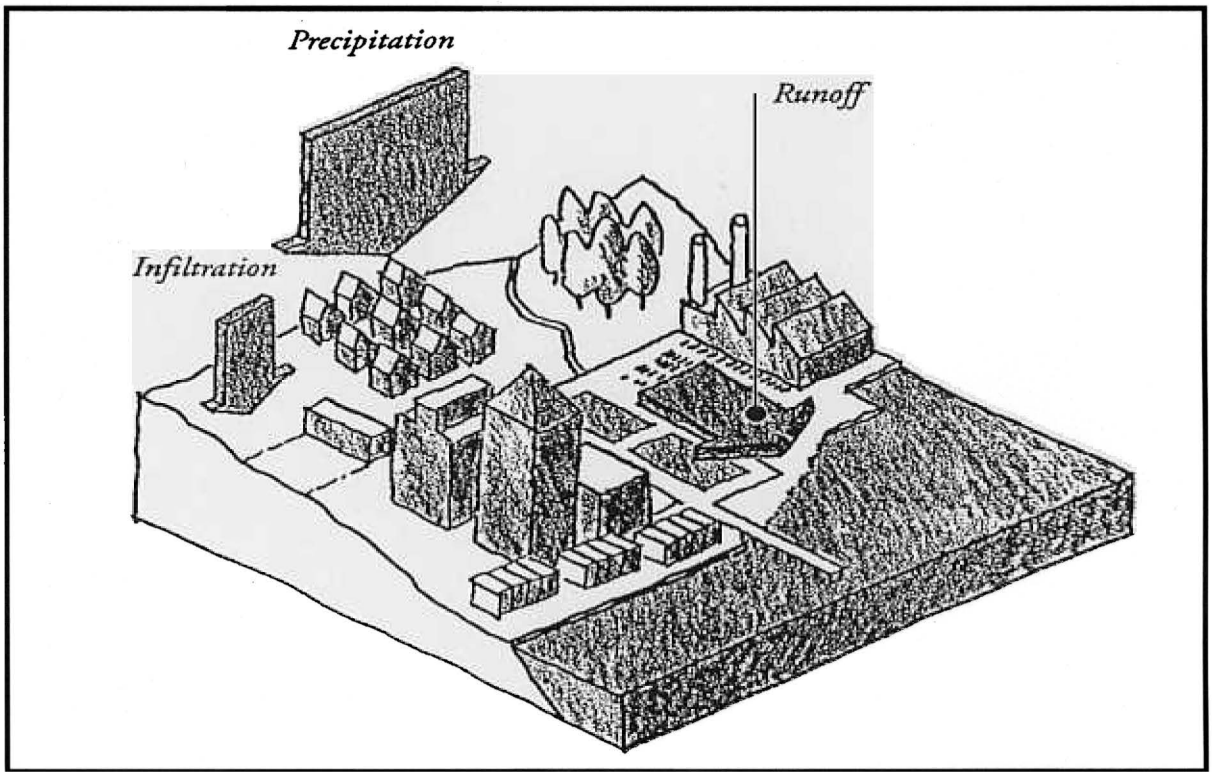
SCVURPPP Typical Development Review Process
Incorporating Provision C.3 Requirements (continued)



SCVURPPP Typical Development Review Process
Incorporating Provision C.3 Requirements (continued)



CHAPTER 15
Storm Water Pollution Control



DEFINITION

Rain water runoff picks up pollutants from ground and paved areas and carries them into the storm drainage system. This type of pollution is often referred to as storm water pollution. Primary sources of storm water pollution include sediments from construction sites, fluid leaks from automobiles, and herbicides and pesticides from landscaped areas. Storm water pollution is also referred to as non-point source pollution because it originates from a variety of sources as opposed to a single point source, such as a factory or sewage treatment plant.

INTENT

The primary goal of this chapter is to identify measures to ensure that storm water runoff from projects will maintain pre-development characteristics in terms of quantity and quality to the best extent possible.

The Federal Clean Water Act requires local municipalities to implement measures to control pollution from their storm drainage system. In conformance with these requirements, the City of San Jose obtained a National Pollutant Discharge Elimination System (NPDES) permit from the San Francisco Regional Water Quality Control Board. The permit requires the City to implement control measures to reduce storm water pollutants from construction sites and areas of new development.

Storm water pollutants are of major concern because they are not treated before discharged into creeks and, ultimately the San Francisco Bay. These pollutants pose a serious threat to the environment, in particular to fish and birds. Today, storm water pollution is responsible for as much as 80% of the pollution in a variety of waterways throughout the United States.

Environmentally sensitive site planning and incorporation of design elements in new residential projects can prevent storm water pollution by treating runoff on site, reducing the volume of surface runoff, and increasing infiltration; thereby preventing pollutants from getting into the Bay. This chapter recommends several site planning and design measures that can help achieve these goals. The concept of storm water pollution control is an emerging topic with new studies and technological solutions continuing to be developed.

Chapter 15

Storm Water Pollution Control

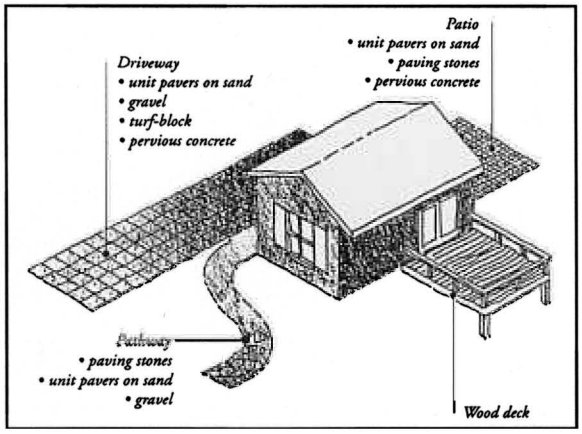


Fig. 15-1: Permeable surfaces are encouraged as alternatives for areas traditionally paved with impervious materials.

As new policies are adopted by the City and/or other regulatory agencies, new residential development proposals should comply with their recommendations. There are several publications that provide additional information and innovative ideas including *Start at the Source, Residential Site Planning & Design Guidance Manual for Storm Water Quality*, and *California Storm Water Best Management Practice Handbook.*

GUIDELINES

A. Minimization Of Hardscape Areas

The hardscape or impervious areas of a site should be minimized in order to maximize permeable surfaces which absorb and biodegrade certain toxins. This will also reduce the volume of runoff into the storm drainage system.

1. For detached unit projects, hardscape in yard areas should utilize alternative surfaces such as raised wood decks, special perforated paving systems or unmortared brick, stone or tile which allows absorption at joints and reduces runoff. Similar surface materials should be used for areas such as sideyards and entry walkways (Fig. 15-1).

2. Multi-story buildings are preferred over single-story buildings with the same floor area, to reduce the building footprint and maximize permeable surfaces.

3. Streets, driveways and parking areas should be as small as possible within allowable standards.

B. Minimize Directly Connected Impervious Areas. Impervious areas directly connected to the storm drain system are the greatest contributor to storm water pollution. Breaks in such areas, by means of landscaping or other permeable surfaces, can allow absorption into the soil and avoidance or minimization of discharge into the storm drain system.

C. Rooftop Drainage

Where practical, roof tops should drain in part or in entirety into landscaped areas on site where lot size and soil conditions are adequate to absorb such runoff. Several downspouts should be provided to better distribute rain run off into various areas of the adjacent landscape. Face of curb drains which facilitate direct and unfiltered runoff to the curb are generally discouraged.

D. Paved Area Runoff Control

For larger attached unit developments, measures to control unfiltered runoff of paved areas should be included in projects. The following are examples of measures which can help achieve this goal;

1 Parking areas should drain into vegetative or grassy swales that are incorporated into large common landscaped areas within a project or perimeter landscaping. Such swales can filter out, absorb and biodegrade certain toxins before the remaining run off discharges into the storm system (Fig. 15-2). Vegetative swales can be incorporated into the required perimeter landscaping of a project.

2. Small shallow water quality ponds can be built within recreation areas to serve as both small playfields during the dry season and storm water filtration devices during rain periods (Fig. 15-3).

3. Driveways, where possible, should drain into adjacent on-site landscaped areas.

4. Other physical mitigation measures as approved by the City.

E. Minimization Of Grading

Grading which results in steeper slopes should be minimized, to the extent possible, in order to reduce the erosion of topsoil and increased runoff caused by steeper slopes.

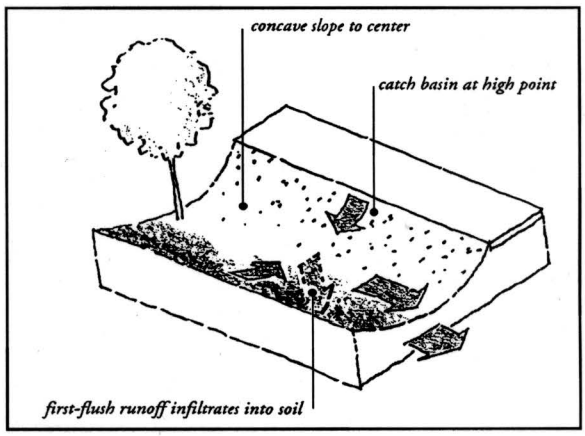


Fig. 15-2: Swales should be located to filter runoff from parking areas.

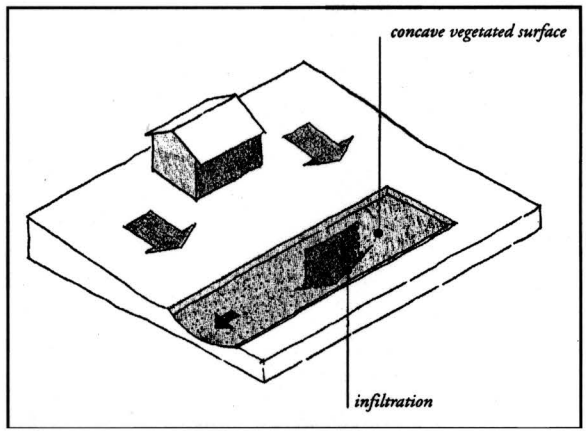


Fig. 15-3: A shallow basin can do double duty as conventional landscaping and effective biofilter.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CITY OF SAN JOSE

Department of Planning, Building and Code Enforcement
Planning Divisions, 801 North First Street, Rm 400
San Jose, California 95110-1795
(408) 277-4576
Website: www.ci.san-jose.ca.us/planning/sjplan

ENVIRONMENTAL CLEARANCE APPLICATION

TO BE COMPLETED BY PLANNING DIVISION STAFF		
FILE NUMBER:		RECEIPT #: _____
ND GRANTED:	EIR REQUIRED:	AMOUNT: _____
PROJECT MANAGER:	ENVIRONMENTAL COORDINATIOR:	DATE: _____
		BY: _____
NOTES:		

TO BE COMPLETED BY APPLICANT (PLEASE TYPE OR PRINT IN INK)		
I. GENERAL INFORMATION		
NAME OF APPLICANT		DATE
ADDRESS		
E-MAIL ADDRESS	DAYTIME PHONE NUMBER ( )	FAX NUMBER ( )
NAME OF PROPERTY OWNER		DATE
ADDRESS		DAYTIME PHONE NUMBER ( )
NAME OF DOCUMENT PREPARER *(IF DIFFERENT FROM ABOVE)* OR ENVIRONMENTAL CONSULTANT		DATE
ADDRESS	DAYTIME PHONE NUMBER ( )	FAX NUMBER ( )
NAME OF PROJECT		
PROJECT LOCATION		
STREET ADDRESS		
ASSESSOR'S PARCEL NUMBER(S)		

Note; Information regarding the Assessor's Parcel Number can be obtained from the County Assessor's Office, County of Santa Clara 70 West Hedding Street, 5th Floor, San Jose, CA 95110, Phone (408) 299-3227.

ENVIRONMENTAL CLEARANCE APPLICATION

PROVIDE THE FOLLOWING PLANNING INFORMATION BELOW:

Note: Information regarding General Plan, Specific Plan, and Zoning information can be obtained at the City of San Jose Department of Planning, Building and Code Enforcement , 801 North First Street, Room 400, San Jose, CA 95110 Phone (408) 277-4576.

ZONING DISTRICT:	GENERAL PLAN DESIGNATION:

IS THE PROJECT CONSISTENT WITH THE ZONING AND GENERAL PLAN? (STAFF)

LIST ANY PERMITS THAT ARE REQUIRED FOR THE PROJECT FROM THE CITY OF SAN JOSE AND OTHER LOCAL, STATE, OR FEDERAL AGENCIES (SITE DEVELOPMENT PERMIT, PLANNED DEVELOPMENT PERMIT, DEPARTMENT OF FISH AND GAME PERMIT, ETC.):

LIST ANY PROFESSIONAL REPORTS PREPARED FOR THE PROJECT SITE KNOWN TO THE APPLICANT (I.E., GEOLOGIC, HAZARDOUS MATERIALS, ARCHAEOLOGICAL, ENVIRONMENTAL IMPACT REPORTS, ETC.,)

II. DESCRIPTION OF THE PROJECT

Written Description of the Project:

SIZE OF THE SITE: _____ gross acres	BUILDING SQUARE FOOTAGE: _____ square feet
NUMBER OF FLOORS:	BUILDING HEIGHT: _____ feet
FLOOR AREA RATIO: _____	AMOUNT OF OFF-STREET PARKING PROVIDED: _____ spaces

WHAT PERCENTAGE OF THE SITE WILL BE OCCUPIED BY BUILDINGS, PARKING/DRIVEWAYS, AND LANDSCAPING/ OPEN SPACE:

Project Site Uses	Amount of Area	Percentage of Total Project Area
Building (footprint)		
Parking/Driveways		
Landscaping/Open Space		
Total		100 %

DOES THE PROJECT PROPOSE THE DEMOLITION OR ALTERATION OF ANY EXISTING STRUCTURES ON THE PROJECT SITE? NO YES

If yes, describe below:

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

IS THE PROJECT A LAND USE PRESENTLY EXISTING IN THE SURROUNDING NEIGHBORHOOD *(within 500 feet of the project site)*? NO YES

HAS A COMMUNITY MEETING BEEN HELD TO DISCUSS THE PROJECT WITH NEIGHBORS?

NO YES When: _____ # attending: _____ Notification Process: _____ *(mailing, newspaper, etc.)*

If yes, indicate what issues were discussed with neighbors:

IF THE PROJECT IS **RESIDENTIAL** PROVIDE THE INFORMATION BELOW:

Type of units: (i.e., single-family detached, multi-family, etc.) _____
Number of each type of unit: _____ Density per net acre: _____
Bedroom count: _____ Estimated population*: _____
**Units x Persons per Household: SFDetached = 3.43; SFAttached = 2.88; 2-4 units = 3.12; 5+ units = 2.29; Mobile Homes = 2.23*

IF THE PROJECT IS **COMMERCIAL** PROVIDE THE INFORMATION BELOW:

Neighborhood or Regionally oriented: _____
Number and type of establishments: (i.e., restaurant, department store, etc.)_____
_____
Square footage of each: _____
Number of shifts per workday: _____ Number of employees per shift: _____
Hours of Operation:_____ Drive-through uses: _____

IF THE PROJECT IS **INDUSTRIAL** PROVIDE THE INFORMATION BELOW:

Number and type of establishments: _____
Square footage of each: _____
Number of shifts per workday: _____ Number of employees per shift: _____
Hours of Operation:_____

IF THE PROJECT IS **INSTITUTIONAL** PROVIDE THE INFORMATION BELOW:

Major functions: _____
Square footage and other relevant characteristics: _____
_____
Number of shifts per workday: _____ Number of employees per shift: _____
Service area: _____
Hours of Operation:_____

IF THE PROJECT **IS MIXED USE**, INCLUDE INFORMATION FROM ABOVE WHICH IS RELEVANT:

WILL HAZARDOUS MATERIALS BE USED AS A PART OF THE OPERATION OF ANY OF THE ESTABLISHMENTS ON THE PROJECT SITE? NO YES
If yes, discuss below:

IF REQUIRED, HAS A HAZARDOUS MATERIALS STORAGE PERMIT BEEN OBTAINED FOR THE OPERATION OF THE PROJECT? NO YES

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

IF REQUIRED, LIST THE APPROPRIATE STATE AND FEDERAL PERMITS THAT HAVE BEEN OBTAINED FOR THE USE, HANDLING, AND STORAGE OF HAZARDOUS MATERIALS ON THE SITE:

DISCUSS BRIEFLY THE PHYSICAL AND ENGINEERING ASPECTS OF THE PROJECT, INCLUDING THE FOLLOWING:

Is grading or excavation contemplated? NO YES

If Yes: Cut: _____ volume in cubic yards; depth in _____feet max
Fill: _____ volume in cubic yards; depth in _____feet max

DESCRIBE EXTERIOR LIGHTING PROPOSED FOR SECURITY, PARKING LOTS, AND PEDESTRIAN PATHS, INCLUDING TYPE OF LIGHTING, PROPOSED HEIGHT, AVERAGE FOOTCANDLE, AND PROXIMITY TO SENSITIVE RECEPTORS:

DISCUSS ANY CHANGES IN THE DRAINAGE PATTERNS, ABSORPTION RATES, AND AMOUNT OF SURFACE RUNOFF RESULTING FROM THE PROJECT:

UTILITIES

Indicate the availability of the utilities for the project and name the utility provider below:

Utility	Availability	Name of Provider:
Water		
Sanitary Sewer		
Storm Sewer		
Solid Waste/Recycling		
Natural Gas/Electric		

PUBLIC IMPROVEMENTS: INDICATE ANY PUBLIC IMPROVEMENTS NECESSARY FOR THE PROJECT (DEDICATIONS, HALF-STREETS, STOP LIGHTS, ETC.):

RESERVATION OF LAND FOR PUBLIC FACILITIES: INDICATE ANY RESERVATION OF LAND FOR PUBLIC FACILITIES NECESSARY FOR THE PROJECT (SCHOOLS, PARKS, TRANSIT FACILITIES, ETC.):

PROJECT OBJECTIVES: INDICATE THE COMMUNITY BENEFITS DERIVED FROM THE PROJECT:

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

III. ENVIRONMENTAL SETTING

- LIST THE CURRENT LAND USES ADJACENT TO THE PROJECT SITE (undeveloped, commercial, residential, etc.)

North:

East:

South:

West:

LAND USE

- LIST THE CURRENT LAND USES ON THE PROJECT SITE (UNDEVELOPED, COMMERCIAL, RESIDENTIAL USES, ETC.)

- DOES THE PROJECT SITE CONSIST OF AGRICULTURAL LAND? NO YES

If yes, describe below the type of use (orchards, row crops, greenhouses, etc.):

- LIST SPECIFIC LAND USES THAT WERE PREVIOUSLY ON THE SITE FOR THE LAST 5 YEARS.

GEOLOGIC HAZARDS

Note: A Geologic Report may be required for the project if it is located in a Geologic Hazards Zone. Information regarding geologic hazards may be obtained from the City of San Jose Public Works Department, 801 North First Street, Room 308, San Jose, CA 95110, Phone (408) 277-5161.

- DESCRIBE THE GEOLOGICAL CHARACTERISTICS OF THE SITE INCLUDING TOPOGRAPHY AND ANY UNIQUE GEOLOGIC FEATURES (I.E. ROCK OUTCROPS, ETC.)

- LIST KNOWN FAULT(S) CLOSEST TO THE PROJECT SITE AND DISTANCE AND LOCATION IN RELATION TO THE PROJECT SITE (E.G., SILVERCREEK FAULT LOCATED ONE MILE TO THE NORTHEAST OF THE PROJECT SITE):

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

• IS ANY PART OF THE PROJECT SITE SUBJECT TO GEOLOGIC HAZARDS INCLUDING EROSION, LANDSLIDE, LIQUEFACTION, EXPANSIVE SOILS, SUBSIDENCE OF THE LAND? NO YES
Please describe below:

• DESCRIBE THE SOIL TYPES ON THE PROJECT SITE (I.E., CLASS I, CLASS II).

WATER RESOURCES

Note: Information regarding waterways and flooding conditions can be obtained from the City of San Jose Public Works Department, 801 North First Street, Room 308, San Jose, CA 95110, Phone (408) 277-3133.

• ARE THERE ANY NATURAL WATERWAYS OCCURRING ON THE PROJECT SITE OR WITHIN 300 FEET OF THE PROJECT SITE? NO YES
If yes, discuss below the name, type of waterway and the distance to the project site:

• LIST THE FLOOD ZONE AND PANEL NUMBER WITHIN WHICH THE PROJECT SITE IS LOCATED.

Flood Zone: _____ Panel Number: _____

• IS THE PROJECT SITE LOCATED WITHIN AN AREA SUBJECT TO FLOODING (I.E., WITHIN THE 100-YEAR FLOOD PLAIN): NO YES

BIOLOGICAL RESOURCES

Note: The biological resources section may require an arborists or biotics report prepared by a qualified consultant. Information regarding biological resources may be obtained at City of San Jose Department of Planning, Building and Code Enforcement, 801 North First Street, Room 400, San Jose, CA 95110, Phone (408) 277-4576.

• DESCRIBE THE BIOTIC FEATURES OF THE SITE, INCLUDING OPEN SPACES, LANDSCAPING ON THE SITE AND ANY UNIQUE BIOLOGICAL FEATURES.

• DOES THE SITE CONTAIN ANY KNOWN ENDANGERED THREATENED, SPECIAL STATUS ANIMAL OR PLANT SPECIES? NO YES
If yes, list below:

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

• DOES THE SITE CONTAIN ANY KNOWN IMPORTANT WILDLIFE BREEDING, NESTING OR FEEDING AREAS?
If yes, list below: NO YES

• IS THERE RIPARIAN CORRIDOR HABITAT OCCURRING ON OR WITHIN 300 FEET TO THE SITE (I.E. VEGETATION OCCURRING ALONG THE BANKS OF A WATERWAY)? NO YES
If yes, discuss below:

• WILL THE PROJECT BE CONSTRUCTED WITHIN 100 FEET OF THE TOP OF BANK OR EDGE OF RIPARIAN VEGETATION OF ANY WATER WAY? NO YES
If yes, discuss below:

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

- In the table below, list any existing trees on the project site including their species, size, condition, and disposition. Indicate if any of the trees are ordinance-size trees. In addition, indicate trees to be removed and trees to be retained as part of the project. If additional space is required, attach supplemental pages.

(Note: Trees size is determined by measuring the circumference of the tree trunk at 24 inches above natural grade – Ordinance-size trees are defined as trees measuring 56 inches in circumference at 24 inches above natural grade).

Photos of each ordinance-size tree must be submitted. The location of all trees on the site must be specified on a site plan.

Number	Tree Species	Size (circumference)	Ordinance-Size Trees	Condition of Tree	Tree to be Removed	Tree to be Retained
Example	*Coast Live Oak*	*62 inches*	*Yes*	*Good*	*No*	*Yes*
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						

- ARE THERE HERITAGE TREES ON THE PROJECT SITE? (STAFF) NO YES

If yes, list the number of trees, size of trees and species below:

Heritage Tree List Number:	Address/Location:	Location of Tree on Project Site:	Species

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

TRANSPORTATION/CIRCULATION

Note: Information regarding transportation and circulation issues can be obtained from the, City of San Jose Public Works Department, 801 North First Street, Room 308, San Jose, CA 95110, Phone (408) 277-5161.

• NAME AND DESCRIBE THE ROADWAYS PROVIDING ACCESS TO THE PROJECT SITE (E.G., FOUR-LANE ROADWAY WITH MEDIAN, ETC.):

• IS THE PROJECT SITE CURRENTLY SERVED BY MASS TRANSIT (I.E., BUS SERVICE, LIGHT-RAIL, ETC.): NO YES
If yes, list routes below:

• IS THE PROJECT SITE WITHIN 2,000 FEET BY PUBLIC RIGHTS-OF-WAY OF A LIGHT RAIL STATION? NO YES
If yes, list which station:

MINERAL RESOURCES

• DOES THE PROJECT SITE CONTAIN ANY KNOWN IMPORTANT MINERAL RESOURCES? NO YES
If yes, list below:

AIR QUALITY

Note: An air quality analysis prepared by a qualified consultant is required for any project that proposes diesel generators. Information can be obtained from the City of San Jose Planning, Building and Code Enforcement Department, 801 North First Street, Room 400, San Jose, CA 95110, Phone (408) 277-4576.

• IS THE PROJECT SITE LOCATED ADJACENT TO A USE THAT GENERATES ODORS (I.E. LANDFILLS, COMPOSTING, ETC.)? NO YES
If yes, discuss below:

HAZARDOUS MATERIALS

Note: Information regarding hazardous materials issues can be obtained from the City of San Jose Environmental Services Department, 777 North First Street, Suite 400, San Jose, CA 95110, Phone (408) 277-5161.

• ARE PESTICIDES CURRENTLY USED ON THE SITE FOR EITHER AGRICULTURAL PRODUCTION OR LANDSCAPE MAINTENANCE OPERATION? NO YES
If yes, discuss below:

• ARE THERE ACTIVE OR ABANDONED WELLS ON THE PROJECT SITE? NO YES
If yes, discuss below:

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

• ARE HAZARDOUS MATERIALS CURRENTLY BEING USED AS A PART OF THE PRESENT BUSINESS OPERATING ON THE SITE? NO YES

If yes, discuss below:

• IF REQUIRED, DOES THE CURRENT OWNER/OPERATOR HAVE A HAZARDOUS MATERIALS STORAGE PERMIT? NO YES

• IF REQUIRED, LIST THE APPROPRIATE STATE AND FEDERAL PERMITS THAT HAVE BEEN OBTAINED FOR THE USE, HANDLING, AND STORAGE OF HAZARDOUS MATERIALS FOR PREVIOUS OPERATIONS ON THE PROJECT SITE:

• HAS THE PROJECT SITE EVER BEEN OCCUPIED BY A GAS STATION OR AUTO REPAIR FACILITY? NO YES

• DOES THE SITE HAVE UNDERGROUND STORAGE OF CHEMICALS OR UNDERGROUND STORAGE TANKS? NO YES

If yes, describe below the type of storage use (i.e., gasoline, diesel, etc.):

• IS THE PROJECT SITE LISTED ON ANY LOCAL, STATE AND/OR FEDERAL REGULATORY DATABASE DUE TO HAZARDOUS MATERIALS CONTAMINATION (STAFF): NO YES

If yes, discuss below:

• HAVE ANY SOILS/GROUNDWATER TESTS EVER BEEN CONDUCTED ON THIS PROPERTY IN RELATION TO POTENTIAL HAZARDOUS MATERIALS CONTAMINATION? NO YES

If yes, discuss below:

• HAS THE REMEDIATION OF HAZARDOUS MATERIALS EVER BEEN PERFORMED ON THE PROJECT SITE? NO YES

If yes, discuss below:

• DOES THE PROJECT PROPOSE THE DEMOLITION OF ANY STRUCTURE THAT MAY CONTAIN HAZARDS SUCH AS ASBESTOS OR LEAD PAINT? NO YES

if yes, discuss below:

• HAVE BUILDINGS ON THE SITE BEEN TESTED FOR PRESENCE OF ASBESTOS AND LEAD BASED PAINT? NO YES

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

NOISE

Note: An acoustical analysis is required for any project that exposes people to noise in excess of established Ciy or State standards. Information regarding noise issues can obtained from City of San Jose Department of Planning, Building and Code Enforcement, 801 North First Street, Room 400, San Jose, CA 95110 Phone (408) 277-4576.

- IS THE PROJECT SITE LOCATED WITHIN THE AIRPORT LAND USE COMMISSION PLAN NOISE ZONE (65 CNEL)? NO YES

- IS THE PROJECT LOCATED ADJACENT TO A MAJOR NOISE/VIBRATION SOURCE (I.E., RAILWAY, MAJOR ROADWAY, ETC.)? NO YES

If yes, list below:

PUBLIC SERVICES

- LIST THE NAME, ADDRESS AND APPROXIMATE DISTANCE OF THE NEAREST FIRE STATION:

- IF THE PROJECT IS **RESIDENTIAL** PROVIDE THE INFORMATION BELOW:

LIST THE NAME, ADDRESS AND APPROXIMATE DISTANCE OF THE NEAREST ELEMENTARY, MIDDLE AND HIGH SCHOOL:

- LIST NAME OF NEAREST LOCAL AND REGIONAL PARKS AND RECREATIONAL FACILITIES:

AESTHETICS

Note: Information regarding aesthetics can obtained from the San Jose 2020 General Plan available for review at City of San Jose Department of Planning, Building and Code Enforcement, 801 North First Street, Room 400, San Jose, CA 95110 Phone (408) 277-4576.

- IS THE PROJECT SITE LOCATED ADJACENT TO A SCENIC HIGHWAY? NO YES

If yes, list below:

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ENVIRONMENTAL CLEARANCE APPLICATION

CULTURAL RESOURCES

Note: Information regarding historical and archaeological resources can be obtained from the San Jose Historic Resources Inventory available for review at City of San Jose Department of Planning, Building and Code Enforcement, 801 North First Street, Room 400, San Jose, CA 95110 Phone (408) 277-4576.

• LIST THE NUMBER AND APPROXIMATE AGE OF ANY STRUCTURES ON THE PROJECT SITE (USE ASSESSOR'S INFORMATION TO IDENTIFY THE DATE OF CONSTRUCTION):

• DESCRIBE THE ARCHITECTURAL STYLE OF ANY STRUCTURES ON THE PROJECT SITE (I.E., VICTORIAN, MEDITERRANEAN, COLONIAL, RANCH, SAN JOSE PROVINCIAL, ETC.):

• ARE ANY STRUCTURES ON THE PROJECT SITE LISTED AS CITY LANDMARKS, CANDIDATE CITY LANDMARKS, STRUCTURES OF MERIT, OR LISTED OR DETERMINED ELIGIBLE FOR LISTING ON THE NATIONAL OR CALIFORNIA REGISTER OF HISTORIC PLACES? NO YES

If yes, describe below:

• IS THE PROJECT SITE LOCATED WITHIN AN AREA OF KNOWN ARCHAEOLOGICAL SENSITIVITY? (STAFF)
NO YES

IV. CERTIFICATION AND DISCLOSURE STATEMENT FOR THE APPLICATION FOR ENVIRONMENTAL CLEARANCE

The attached Application for Environmental Clearance has been prepared by _____ doing business as (indicate the legal name for dba designation, such as individual, "a partnership", "a corporation", etc.)

_____

The above-named, now has or will have the following direct or indirect economic interest in the development of, or, after its completion, the operation of the project for which the Application for Environmental Clearance has been submitted.

I/We declare, under penalty of perjury, that the statements furnished above, and in the attached exhibits, pertaining to the environmental information of the proposed project and to my/our economic interest or interests in that project are complete, true and correct to the best of my/our knowledge and belief.

If any of the facts represented here change it is my responsibility to inform the City of San Jose.

Executed on _____ at _____, California

PREPARER'S
SIGNATURE(S)

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CITY OF SAN JOSE
Department of Planning, Building and Code Enforcement
Planning Divisions, 801 North First Street, Rm 400
San Jose, California 95110-1795
(408) 277-4576
Website: www.ci.san-jose.ca.us/planning/sjplan

ENVIRONMENTAL CLEARANCE APPLICATION CHECK SHEET

TO BE COMPLETED BY PLANNING DIVISION STAFF

FILE NUMBER	STAFF	DATE RECEIVED

Required Copies	DOCUMENTS
2	**APPLICATION FORM correctly filled out** ☐ Aerial Photo (8 1/2' x 11' or 11' x 17') ☐ Site Plan (8 1/2' x 11' or 11' x 17') ☐ Vicinity Map (8 1/2' x 11' or 11' x 17') ☐ Photographs of site and surrounding properties ☐ Certification and Disclosure Statements signed by preparer
2	☐ **COUNTY ASSESSOR'S PARCEL MAP**
	FEES ☐ Application Fees ☐ Environmental Fees ☐ Public Noticing Fee ☐ Additional Charges ☐ Record Retention Fees

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CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CITY OF SAN JOSE

Department of Planning, Building and Code Enforcement
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ENVIRONMENTAL CLEARANCE APPLICATION

INSTRUCTIONS

Please prepare the application form, environmental analysis, and other required information listed below and return them, in conjunction with other required forms for your project (i.e., Planned Development Permit/Amendment, Conditional Use Permit/Amendment, Rezoning, etc.) by appointment, to the Department of Planning, Building and Code Enforcement. Applications will only be accepted for processing if they are complete.

1. **Completed Application Form.** Each application shall be signed by the preparer of the application. Original signatures are required. **Two** copies of the application shall be submitted for each site.

   The application must contain the following:

   (a) Aerial photograph (8 ½" x 11" or 11" x 17")
   - Minimum scale 1"= 200'
   - Include a north arrow and the scale of the photograph
   - Include date of the photograph
   - The site shown in the center of the photograph
   - Clearly outline and identify the site

   Note; The City's set of mylar aerial photos are located at San Jose Blue Print, 835 W. Julian Street, San Jose, CA 95126 Phone; (408) 295-5770

   (b) Site Plan (drawn to scale) showing the proposed project. (8 ½" X 11" or 11" X 17")

   (c) Vicinity Map that shows the surrounding roadways, schools, etc., (8 ½" X 11")
   - Include a north arrow
   - Site in the center of the map with North at the top of the page
   - Clearly outline and identify the site
   - Name each surrounding street
   - Label all land uses within 500 feet of the site

   (d) Photographs of the site and surrounding properties
   - Snapshots or Polaroid photos will be accepted
   - Mount on (8 ½" X 11") paper
   - Identify the subject of each photograph

2. **County Assessor's Parcel Map.** Provide a copy of the Assessor's Parcel Map (APN) showing the subject property. This map can be obtained from the County Assessor's Office at 70 West Hedding Street, 5th Floor, San Jose, CA or from the Planning Division, City Hall, Room 400.

3. **Noticing the Neighborhood**. Refer to the Public Outreach Policy for a full description of the City's public notification procedures. Public Hearing notices will be mailed for development proposals at least 10 calendar days before the date set for hearing for a project. Notices will be sent to all property owners and residents within 300 feet for Very Small projects, 500 feet for Standard Development Proposals and a minimum of 1,000 feet for large or controversial projects as detailed in the Public Outreach Policy.

4. **Fees.** An application fee, associated Public Noticing fee(s), and the appropriate Environmental application fees are due at the time of filing (see fee schedule). Checks are made payable to the "City of San Jose".

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Department of Planning, Building and Code Enforcement
STEPHEN M. HAASE, AICP, DIRECTOR

INITIAL STUDY

PROJECT FILE NO.:

PROJECT DESCRIPTION:

PROJECT LOCATION:

GENERAL PLAN DESIGNATION: **ZONING:**

SURROUNDING LAND USES:

PROJECT APPLICANT'S NAME AND ADDRESS:

DETERMINATION

On the basis of this initial study:

☐	I find the proposed project could not have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
☐	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the project proponent has agreed to revise the project to avoid any significant effect. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	I find the proposed project could have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT(EIR) is required.
☐	I find the proposed project could have a significant effect on the environment, but at least one effect has been (1) adequately analyzed in a previous document pursuant to applicable legal standards, and (2) addressed by mitigation measures based on the previous analysis as described in the attached initial study. An EIR is required that analyzes only the effects that were not adequately addressed in a previous document.
☐	I find that although the proposed project could have a significant effect on the environment, no further environmental analysis is required because all potentially significant effects have been (1) adequately analyzed in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (2) avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are included in the project, and further analysis is not required.

Date

Signature

Name of Preparer:
Phone No.: (408) 277-4576

Issues	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Information Sources*
I. AESTHETICS - Would the project:					
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☐	1,2
b) Substantially damage scenic resources, including, but not limited to, trees, rock out-croppings, and historic buildings within a state scenic highway?	☐	☐	☐	☐	1,2
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☐	1,2
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☐	☐	1,2
e) Increase the amount of shade in public and private open space on adjacent sites?	☐	☐	☐	☐	1,2

FINDINGS:

MITIGATION MEASURES:

II. AGRICULTURE RESOURCES - Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☐	1,3,4
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☐	1,3,4
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☐	1,3,4

FINDINGS:

MITIGATION MEASURES:

III. AIR QUALITY - Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☐	1,14
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☐	1,14
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is classified as non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☐	1,14
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☐	1,14
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☐	1,14

FINDINGS:

MITIGATION MEASURES:

Issues	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Information Sources*
IV. BIOLOGICAL RESOURCES - Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☐	1,10
b) Have a substantial adverse effect on any aquatic, wetland, or riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☐	1,6,10
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act including, but not limited to, marsh, vernal pool, coastal, etc., through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☐	1,6
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☐	1,10
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☐	1,11
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☐	1,2

FINDINGS:

MITIGATION MEASURES:

V. CULTURAL RESOURCES - Would the project:					
a) Cause a substantial adverse change in the significance of an historical resource as defined in CEQA Guidelines §15064.5?	☐	☐	☐	☐	1,7
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5?	☐	☐	☐	☐	1,8
c) Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature?	☐	☐	☐	☐	1,8
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☐	1,8

FINDINGS:

MITIGATION MEASURES:

VI. GEOLOGY AND SOILS - Would the project:					
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
1) Rupture of a known earthquake fault, as described on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	☐	☐	☐	☐	1,5,24
2) Strong seismic ground shaking?	☐	☐	☐	☐	1,5,24
3) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☐	1,5,24

Issues	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Information Sources*
4) Landslides?	☐	☐	☐	☐	1,5,24
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☐	1,5,24
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☐	1,5,24
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☐	1,5,24
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☐	1,5,24

FINDINGS:

MITIGATION MEASURES:

VII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☐	1
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☐	1
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☐	1
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☐	1,12
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☐	1,2
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☐	1
g) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☐	1,2
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☐	1

FINDINGS:

MITIGATION MEASURES:

VIII. HYDROLOGY AND WATER QUALITY - Would the project:

a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☐	1,15

Issues	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Information Sources*
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☐	1
c) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on-or off-site?	☐	☐	☐	☐	1
d) Result in increased erosion in its watershed?	☐	☐	☐	☐	1
e) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-or off-site?	☐	☐	☐	☐	1
f) Substantially alter drainage patterns due to changes in runoff volumes and flow rates?	☐	☐	☐	☐	
g) Result in increased impervious surfaces and associated increased runoff as specified in the NPDES permit and the City's Post Construction Urban Runoff Management Policy?	☐	☐	☐	☐	
h) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☐	1,17
i) Result in an increase in pollutant discharges to receiving waters such as heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash?	☐	☐	☐	☐	1,17
j) Result in an increase in any pollutant for which the water body is already impaired as listed on the Clean Water Act Section 303 (d) list available from the State Water Resources Control Board?	☐	☐	☐	☐	
k) Result in alteration of receiving water quality during or following construction including clarity, temperature, and level of pollutants?	☐	☐	☐	☐	
l) Substantially alter surface water quality, or marine, fresh, or wetland waters as specified in the NPDES permit?	☐	☐	☐	☐	
m) Substantially alter ground water quality as specified in the NPDES permit?	☐	☐	☐	☐	
n) Cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses as specified in the NPDES Permit, General Plan, and City policy?	☐	☐	☐	☐	
o) Otherwise substantially degrade water quality?	☐	☐	☐	☐	1
p) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☐	1,9
q) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☐	1,9
r) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☐	1
s) Be subject to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☐	1

FINDINGS:

MITIGATION MEASURES:

Issues	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Information Sources*
IX. LAND USE AND PLANNING - Would the project:					
a) Physically divide an established community?	☐	☐	☐	☐	1,2
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☐	1,2
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☐	1,2

FINDINGS:

MITIGATION MEASURES:

X. MINERAL RESOURCES - Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☐	1,2,23
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☐	1,2,23

FINDINGS:

MITIGATION MEASURES:

XI. NOISE - Would the project result in:					
a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☐	1,2,13,18
b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☐	1
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☐	1
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☐	1
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☐	1
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☐	1

FINDINGS:

MITIGATION MEASURES:

XII. POPULATION AND HOUSING - Would the project:					
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☐	1,2
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☐	1
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☐	1

Issues	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Information Sources*

FINDINGS:

MITIGATION MEASURES:

XIII. PUBLIC SERVICES - Would the project:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
Fire Protection?	☐	☐	☐	☐	1,2
Police Protection?	☐	☐	☐	☐	1,2
Schools?	☐	☐	☐	☐	1,2
Parks?	☐	☐	☐	☐	1,2
Other Public Facilities?	☐	☐	☐	☐	1,2

FINDINGS:

MITIGATION MEASURES:

XIV. RECREATION

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☐	1,2
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☐	1,2

FINDINGS:

MITIGATION MEASURES:

XV. TRANSPORTATION / TRAFFIC - Would the project:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio of roads, or congestion at intersections)?	☐	☐	☐	☐	1,2,19
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☐	1,2,19
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☐	1,19
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible land uses (e.g., farm equipment)?	☐	☐	☐	☐	1,19
e) Result in inadequate emergency access?	☐	☐	☐	☐	1,20
f) Result in inadequate parking capacity?	☐	☐	☐	☐	1,18
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☐	1,2,18

FINDINGS:

Issues	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Information Sources*

MITIGATION MEASURES:

XVI. UTILITIES AND SERVICE SYSTEMS - Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☐	1,15
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☐	1,2,21
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☐	1,17
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☐	1,22
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☐	1,21
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☐	1,21
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☐	1,21

FINDINGS:

MITIGATION MEASURES:

XVII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to (1) degrade the quality of the environment, (2) substantially reduce the habitat of a fish or wildlife species, (3) cause a fish or wildlife population to drop below self-sustaining levels, (4) threaten to eliminate a plant or animal community, (5) reduce the number or restrict the range of a rare or endangered plant or animal, or (6) eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☐	1,10
b) Does the project have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects and the effects of other current projects.	☐	☐	☐	☐	1,16
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☐	1

FINDINGS:

MITIGATION MEASURES:

CHECKLIST REFERENCES

1. Environmental Clearance Application – File No.
2. San Jose 2020 General Plan
3. USDA, Soil Conservation Service, Soil Survey of SC County, August 1968
4. USDA, Soil Conservation Service, Important Farmlands of SC County map, June 1979
5. State of California's Geo-Hazard maps / Alquist Priolo Fault maps
6. Riparian Corridor Policy Study 1994
7. San Jose Historic Resources Inventory
8. City of San Jose Archeological Sensitivity Maps
9. FEMA Flood Insurance Rate Map, Santa Clara County, 1986
10. California Department of Fish & Game, California Natural Diversity Database, 2001
11. City of San Jose Heritage Tree Survey Report
12. California Environmental Protection Agency Hazardous Waste and Substances Sites List, 1998
13. City of San Jose Noise Exposure Map for the 2020 General Plan
14. BAAQMD CEQA Guidelines, Bay Area Air Quality Management District. April 1996, revised 1999.
15. San Francisco Bay Regional Water Quality Control Board 1995 Basin Plan
16. Final Environmental Impact Report, City of San Jose, SJ 2020 General Plan
17. Santa Clara Valley Water District
18. City of San Jose Title 20 Zoning Ordinance
19. San Jose Department of Public Works
20. San Jose Fire Department
21. San Jose Environmental Services Department
22. San Jose Water Company, Great Oaks Water Company
23. California Division of Mines and Geology
24. Cooper Clark, San Jose Geotechnical Information Maps, July 1974
25.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

ATTACHMENT II-7

CEQA Guidance Related to Provision C.3 Stormwater Requirements

- Table: CEQA Initial Study Guidance for Project Applicants
- Additional Resources for Environmental Review Process
- Table: Guidance for Co-Permittee Review/Modification of CEQA Procedures and Local CEQA Guidance

SCVURPPP Guidance for Project Applicants in Addressing Stormwater Quality Concerns During CEQA Review

The following table provides supplemental guidance to project applicants in completing the initial study checklist to address urban runoff water considerations during project environmental review.

CEQA Guidelines Question	Additional Issues to Address Stormwater Quality Concerns within the CEQA Initial Study Checklist
CHECKLIST CHAPTER IV: BIOLOGICAL RESOURCES	
IV.b) Will the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	The evaluation of a project's effect on sensitive natural communities should encompass aquatic and wetland habitats. Consider "aquatic and wetland habitat" as examples of sensitive habitat.
CHECKLIST CHAPTER VIII: HYDROLOGY AND WATER QUALITY	
VIII.a) Will the project violate any water quality standards or waste discharge requirements?	The evaluation of a project's compliance with water quality standards should consider the project's potential effect on water bodies on the Section 303(d) list[1], as well as the potential for conflict with applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses.
VIII.d) Will the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	The evaluation of a project's effect on drainage patterns should refer to the final approved SCVURPPP Hydromodification Management Plan (HMP), where applicable, to assess the significance of altering existing drainage patterns and to develop any mitigation measures. The evaluation of hydromodification effects should also consider any potential for streambed or bank erosion downstream from the project.
VIII.e) Will the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	The evaluation of a project's potential to create or contribute runoff should consider whether the project meets the NPDES permit's Group 1 or Group 2 criteria. The response to this question will indicate how Provision C.3 requirements will be met. Applicants must address Provision C.3 requirements in environmental documents for projects that meet Group 1 or Group 2 criteria.
VIII.f) Would the project otherwise substantially degrade water quality?	The evaluation of a project's potential to degrade water quality should consider whether a project has the potential to result in a significant impact to surface water quality, marine, fresh, or wetland waters, or to groundwater quality. As with every category of environmental impact, effects must be considered both during and after construction. The evaluation of water quality impacts should include a description of how the project will comply with the requirements of SCVURPPP's NPDES permit and the State's Construction General Permit. The description should also include a statement that the project should avoid creation of mosquito larval sources that would subsequently require chemical treatment to protect human and animal health.

[1] Available at: http://www.swrcb.ca.gov/rwqcb2/tmdlmain.htm

Additional Potential Water Quality Impacts

Additionally, the San Francisco Regional Board staff has expressed the concern that the following potential water quality impacts not be overlooked during CEQA review:

- Seasonal creeks;
- Stream crossing impacts;
- Turbidity limitation for discharged water;
- Whether increased runoff from increasing impervious surface will impact water ecology (along with storm drain capacity and flood control);
- Hydrograph modification;
- Endangered species;
- Off-site impacts to channels; and
- Appropriateness of runoff mitigation.

Additional Resources for the Environmental Review Process

Staff planners, engineers and consultants responsible for environmental reviews may find the following references useful for evaluating water quality impacts.

1. San Francisco Bay Regional Water Quality Control Board, 1995 Basin Plan and Amendments: (http://www.swrcb.ca.gov/rwqcb2/basinplan.htm).
2. Bay Area Stormwater Management Agencies Association, Start at the Source, 1999: (http://www.scvurppp.org).
3. California BMP Handbooks (New Development and Redevelopment, Construction Maintenance): (http://www.cabmphandbooks.com/).
4. Santa Clara Valley Urban Runoff Management Program, NPDES Permit Order No. 01-024 and NPDES Permit Order No. 01-119: (Appendix A and http://www.scvurppp-w2k.com/NPDES_Permit.htm)
5. 303 (d) Impaired Water Body List and TMDLs: (http://www.swrcb.ca.gov/rwqcb2/tmdlmain.htm)
6. San Jose Council Policy on Post-Construction Urban Runoff Management: (www.ci.san-jose.ca.us/planning/sjplan/counter/stormwater/pol_stormwater.pdf)
7. Santa Clara Valley Water District, Soils Data Mapping, 2003. (CDs have been provided to Co-permittees).
8. Santa Clara Valley Water District, Results of the Water Resources Collaborative that provides guidance on Water District review of projects near streams (under development): (http://www.valleywater.org/index.htm).

Guidance for Co-permittees' Review/Modification of CEQA Procedures and Local CEQA Guidance

CEQA Guidelines Question	Corresponding C.3.m Example Question(s)	Recommended Action
CHECKLIST CHAPTER IV: BIOLOGICAL RESOURCES		
IV.b) Will the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	x. Will the project impact aquatic, wetland, or riparian habitat?	The evaluation of a project's effect on sensitive natural communities should encompass aquatic and wetland habitats. Co-permittees may revise any local CEQA guidance to identify "aquatic and wetland habitat" as examples of sensitive habitat. It is also recommended that Co-permittees evaluate, as an adverse impact, changes to sensitive habitats that favor the development of mosquitoes and other biting flies that may pose a threat to public health.
CHECKLIST CHAPTER VI: GEOLOGY AND SOILS		
VI.b) Will the project result in substantial soil erosion or the loss of topsoil?	v. Will the proposed project result in increased erosion in its watershed?	No change is recommended in Co-permittees' procedures for responding to Checklist question VI.b. The issue raised by the C.3.m example question is addressed under Checklist question VIII.d.
CHECKLIST CHAPTER VIII: HYDROLOGY AND WATER QUALITY		
VIII.a) Will the project violate any water quality standards or waste discharge requirements?	vi. Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, will it result in an increase in any pollutant for which the water body is already impaired? ix. Will the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?	The evaluation of a project's compliance with water quality standards should consider the project's potential effect on water bodies on the Section 303(d) list, as well as the potential for conflict with applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses. Co-permittees may revise any local CEQA guidance to specify that these water quality standards be considered.
VIII.d) Will the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	iv. Will the proposed project create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes? v. Will the proposed project result in increased erosion in its watershed?	The evaluation of a project's effect on drainage patterns should refer to the final approved SCVURPPP Hydromodification Management Plan (HMP), where applicable, to assess the significance of altering existing drainage patterns and to develop any mitigation measures. The evaluation of hydromodification effects should also consider any potential for streambed or bank erosion downstream from the project. Co-permittees may revise any local CEQA guidance to include these instructions regarding the evaluation of hydromodification effects.

Guidance for Co-permittees' Review/Modification of CEQA Procedures and Local CEQA Guidance

CEQA Guidelines Question	Corresponding C.3.m Example Question(s)	Recommended Action
VIII.e) Will the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	iii. Will the proposed project result in increased impervious surfaces and associated increased runoff?	The evaluation of a project's potential to create or contribute runoff should consider whether the project meets the NPDES permit's Group 1 or Group 2 criteria. The response to this question will indicate how Provision C.3 requirements will be met. Co-permittees should advise applicants of the need to address Provision C.3 requirements in environmental documents for projects that meet Group 1 or Group 2 criteria.
VIII.f) Would the project otherwise substantially degrade water quality?	i. Would the proposed project result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical stormwater pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash). ii. Would the proposed project result in significant alteration of receiving water quality during or following construction? vii. Would the proposed project have a potentially significant environmental impact on surface water quality, to marine, fresh, or wetland waters? viii. Would the proposed project have a potentially significant adverse impact on ground water quality?	The evaluation of a project's potential to degrade water quality should consider whether a project has the potential to result in a significant impact to surface water quality, marine, fresh, or wetland waters, or to groundwater quality. As with every category of environmental impact, effects must be considered both during and after construction. The evaluation of water quality impacts should include a description of how the project will comply with the requirements of SCVURPPP's NPDES permit and the State's Construction General Permit. The description should also include a statement that the project should avoid creation of mosquito larval sources that would subsequently require chemical treatment to protect human and animal health. Co-permittees may include these instructions in any local CEQA guidance.

City of San José, California

CITY COUNCIL POLICY

TITLE	PAGE	POLICY NUMBER
	1 of 10	6-29
POST-CONSTRUCTION URBAN RUNOFF MANAGEMENT	EFFECTIVE DATE February 3, 1998	REVISED DATE 10/07/2003

APPROVED BY COUNCIL ACTION
February 3, 1998, Item 9d.; October 7, 2003, Item 7.3;

BACKGROUND

The Federal Clean Water Act requires local municipalities to implement measures to control pollution from their storm sewer systems to the maximum extent practicable. Under the auspices of the Clean Water Act, as well as other Federal and State legislation since 1990, the San Francisco Regional Water Quality Control Board (RWQCB) has issued and reissued an area-wide National Pollutant Discharge Elimination System (NPDES MS4) Permit to the fifteen Co-permittees of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) for the discharge of storm water from urban areas in Santa Clara County. The fifteen SCVURPPP Co-permittees are the City of San Jose, twelve other municipalities within the Santa Clara Basin watershed area, the County of Santa Clara, and the Santa Clara Valley Water District.

Under the provisions of the SCVURPPP Permit, each of the co-permittees, including the City of San Jose, is required to implement control measures/best management practices (BMPs) to reduce storm water pollution from new development or redevelopment projects to the maximum extent practicable. In October 2001, SCVURPPP Permit Provision C.3 (New and Redevelopment Performance Standards) was revised to require that certain types of new and redevelopment projects include storm water runoff treatment control measures; that the treatment measures be designed to treat a specified volume or flow of storm water runoff from the project site; and that the measures be maintained for the life of the project.

PURPOSE

It is the purpose of this policy to establish an implementation framework, consistent with current SCVURPPP NPDES MS4 Permit requirements, for incorporating storm water runoff pollution control measures into new development and redevelopment projects to reduce storm water runoff pollution from new development and redevelopment projects to the maximum extent practicable.

DEFINITIONS

Brownfields Project: A project located on abandoned, idle, or under-utilized property where expansion or redevelopment is complicated by real or perceived environmental contamination.

Expansion Projects: Projects involving a Land Use of Concern (see below) and proposing expansion of fifty percent (50%) or more of the previously existing built development, site area, or use. An Expansion Project may also include a change of use on an existing site when no new buildings or pavement are proposed if that change results in the potential for increases in the deposition of Pollutants of Concern on the site. New uses that require an increase in on-site surface parking or result in an increase in on-site vehicular traffic would meet this criterion. Changes of use to any of the major Land Uses of Concern described in this Policy may also be considered an Expansion Project. A Major Expansion is an Expansion Project that creates one acre (43,560 square feet) or more of impervious surface area.

Impervious Surface: Any surface on or above ground that prevents the infiltration or passage of water into the soil. Impervious surfaces include, but are not limited to, non-absorbent rooftops, paved or covered patios, driveways, parking lots, paved walkways, compacted soil or rock, and streets. This category includes streets, roads, highways, and freeways that are under the City of San Jose's jurisdiction and that create one acre (43,560 square feet) or more of new impervious surface and any newly constructed paved surface used primarily for the transportation of automobiles, trucks, motorcycles, and other motorized vehicles. Excluded from this category are public sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features.

Land Uses of Concern: Uses that have the greatest potential to contribute high levels of pollutant loading from Pollutants of Concern, including, but not limited to: gas stations, auto wrecking yards, loading docks, heavy automotive uses, and various other heavy industrial and commercial uses.

Major Impervious Surface Area: One acre (43,560 square feet) or more of impervious surface area.

Major Project: New development projects that create one acre (43,560 square feet) or more of impervious surface area; new streets, roads, highways and freeways built under

the City's jurisdiction that create one acre (43,560 square feet) or more of impervious surface area; and Significant Redevelopment Projects.

One Single-Family Home: A project or project expansion consisting of one single-family home that is not part of a larger common plan of development. One single-family home is excluded from the requirement to implement appropriate storm water runoff treatment control measures. An equivalent water quality benefit should be provided by the maintenance of at least one street tree or by complying with section 20.30.440 of the City of San Jose Municipal Code, which provides limitations on the amount of paved surface in front setback areas.

Pollutants of Concern: Identified Pollutants of Concern in the SCVURPPP Permit include certain heavy metals (copper, nickel and mercury), excessive sediment production from erosion due to anthropogenic activities, petroleum hydrocarbons from sources such as used motor oil, microbial pathogens of domestic sewage origin from illicit discharges, the pesticides diazinon, chlordane, dieldrin and DDT, excessive nutrient loads which may cause or contribute to the depletion of dissolved oxygen and/or toxic concentrations and dissolved ammonia, and other pollutants which may cause aquatic toxicity in the receiving waters.

Post-Construction Best Management Practice (BMP): A method, activity, maintenance procedure, or other management practice designed to reduce the amount of stormwater pollutant loading from a site. Examples of Post-Construction BMPs include proper materials storage and housekeeping activities, public and employee education programs, and storm inlet maintenance and stenciling.

Post-Construction Treatment Control Measure: A site design measure, landscape characteristic or permanent storm water pollution prevention device, installed and maintained as part of a new development or redevelopment project, that is designed to reduce storm water pollutant loading from a site; is installed as part of a new development or redevelopment project; and is maintained in place after construction has been completed. Examples of runoff treatment control measures include infiltration devices (e.g., vegetative swales/biofilters, insert filters, and oil/water separators) or detention/retention measures (e.g., detention/retention ponds). Post-Construction Treatment Control Measures are a category of BMPs.

Regional BMP or Treatment Control Measure: Regional or municipal storm water detention/treatment facilities, or land acquisition/conservation programs that protect or enhance water quality/beneficial uses, or other specific projects/programs (or designated functions/components of projects/programs) that protect or enhance water quality/beneficial uses in a manner equivalent to that which would be provided by the installation of on-site measures, and that are specifically identified as eligible alternative compliance options in the annual Workplan submitted by the City pursuant to the SCVURPPP Permit.

Significant Redevelopment Projects: A project on a previously developed site that results in addition and/or replacement of one acre (43,560 square feet) or more of impervious surface. Interior remodel, routine maintenance or repair, and exterior surface replacement or repaving are expressly excluded from this definition. Excluded from this category are interior remodels and routine maintenance or repair. Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed.

Smart Growth Projects: A Smart Growth Project may be any one or a combination of the following:

a. Transit Oriented Project;

b. Project within the Urban Core;

c. Project within a redevelopment project area, adopted pursuant to the Community Redevelopment Law, (Health & Safety Code §§ 33000 *et seq.*)

d. Low-income, moderate-income, or senior housing project, meeting one of the criteria of Government Code Section 65915(b)(1) or 65915(b)(2);

e. Brownfields Project.

Total Project Cost: Includes the construction (labor) and materials cost of the physical improvements proposed; but does not include land, transaction, financing, permitting, demolition or off-site mitigation costs.

Transit Oriented Project: A project located within 2,000 feet of an existing or planned light rail or bus station (not including simple bus stops that are not stations), terminal, project-dedicated van or bus shuttle service station, or major transfer point, or within 3,000 feet of an existing or planned BART, heavy rail, or intermodal station, or a project supplying less than one-half parking space per residential dwelling unit, or ninety percent (90%) or less of the parking required by Tables 20-190, 20-200, and 20-210 of Title 20 of the City of San Jose Municipal Code where the City makes findings that a limited parking supply is justified by existing or planned transit opportunities.

Trees Eligible for Post-Construction Treatment Control Measure Credit: New trees planted within 30 feet of impervious surfaces are eligible for Post-Construction Treatment Control Measure Credit. 100 square feet of Credit may be given for each new deciduous tree, and 200 square feet of Credit may be given for each new evergreen tree (see minimum sizes below). Post-Construction Treatment Control Measure Credits also apply to existing trees kept on a site if the trees' canopies are within 20 feet of impervious surfaces. The Credit is the square-footage equal to one-half of the existing tree canopy. No more than 25% of a site's impervious surface can be treated through the use of trees. Trees required by the City of San Jose for tree removal mitigation will not count toward Post-Construction Treatment Control Measure Credit. Trees required by the

City of San Jose to fulfill the requirements of street trees will not count toward Post-Construction Treatment Control Measure Credit. The trees selected shall be suitable species for the site conditions and the design intent. Trees should be relatively self-sustaining and long-lived.

To receive Post-Construction Treatment Control Measure Credit, new deciduous trees must be at least 24-inch box in size and at least 2 inches in diameter as measured 2 feet above finished grade and new evergreen trees must be at least 24-inch box in size and at least 6 feet tall as measured from finished grade. Trees planted to meet storm water treatment facility planting requirements will not also receive Post-Construction Treatment Control Measure Credit.

The Post-Construction Treatment Control Measure Credit applies to existing trees of 4-inch diameter or greater as measured 2 feet above finished grade. Credit is based on one half of the square footage of the tree canopy. Protection during construction shall be in the form of minimizing disruption of the root system.

Urban Core: Projects that are (1) infill development of vacant or underutilized land within areas that are already developed with urban uses and served with urban infrastructure (e.g., sanitary sewers, water, etc.) and are not located on the urban fringe; or (2) any area designated on the San Jose General Plan Land Use/Transportation Diagram for Transit Corridor Residential (20+ DU/AC), Residential Support for the Core (25+ DU/AC), Core Area, Neighborhood Business District, or Transit-Oriented Development Corridor; or (3) commercial or industrial development at a floor area ratio greater than 1; or (4) residential development at a density of not less than eight dwelling units per acre and within one-half mile of existing development meeting any of the three criteria above. The Urban Core includes all "Transit Oriented Projects" and designated Redevelopment Areas (*see* Health and Safety Code §§ 25000, et seq.).

POLICY

This Policy establishes that Major Projects will be required to install Post-Construction Treatment Control Measures meeting specified hydraulic sizing criteria, according to the following schedule, except where impracticable:

* October 15, 2003 - Major Projects requiring a permit or other direct approval from the RWQCB, including Major Projects requiring RWQCB certification under Section 401 of the Clean Water Act, and Major Projects involving Land Uses of Concern;

* February 15, 2005 - all other Major Projects.

This Policy also establishes the criteria for establishing impracticability and for evaluating Alternative Compliance Measures.

This Policy further establishes that projects that are not subject to Post-Construction Treatment Control Measure requirements should include specific measures for reducing storm water pollution to the maximum extent practicable if the project incorporates new Major Impervious Surface Area or Major Expansion of a use or built development. In addition, the policy establishes general guidelines and minimum BMPs for Land Uses of Concern. Finally, it requires that all Post-Construction Treatment Control Measures must be maintained to operate effectively.

NUMERIC SIZING CRITERIA FOR POST-CONSTRUCTION TREATMENT CONTROL MEASURES

Except as specified below, Major Projects shall include a Post-Construction Treatment Measure that incorporates, at a minimum, the following hydraulic sizing design criteria to treat storm water runoff from the impervious surface area of the Project. Where a Significant Redevelopment Project results in an increase, or replacement, of more than fifty percent (50%) of the impervious surface of a previously existing development, which was not subject to storm water control measures, the entire impervious area of the project site must be included in the application of the sizing criteria. Where a Significant Redevelopment Project results in an increase, or replacement, of not more than fifty percent (50%) of the impervious surface of a previously existing development, which was not subject to storm water control measures, only the net new impervious surface area must be included in the application of the sizing criteria.

i. **Volume Hydraulic Design Basis:** Treatment control measures whose primary mode of action depends on volume capacity, such as detention/retention units or infiltration devices (biofilters /vegetative swales, insert filters and oil/water separators), shall be designed to treat storm water runoff equal to:

   a. the maximized storm water quality capture volume for the area, based on historical rainfall records, determined using the formula and volume capture coefficients set forth in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (199*8), pages 175-178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or

   b. the volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Appendix D of the *California Stormwater Best Management Practices Handbook,* (1993), using local rainfall data.

ii. **Flow Hydraulic Design Basis:** Treatment control measures whose primary mode of action depends on flow capacity, such as vegetative swales, sand filters, or wetlands, shall be sized to treat:

a. 10% of the 50-year peak flow rate; or

b. the flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or

c. the flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

Project applicants will be responsible for verifying the rainfall data used to meet the above criteria and for providing engineering certification that the criteria have been met.

LIMITATIONS ON USE OF INFILTRATION TREATMENT MEASURES - INFILTRATION AND GROUNDWATER PROTECTION

In order to protect groundwater from pollutants that may be present in urban runoff, treatment control measures that function primarily as direct infiltration devices (such as infiltration trenches and infiltration basins) must meet, at a minimum, the following conditions:

i. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration devices are to be used;

ii. Use of infiltration devices shall not cause or contribute to degradation of groundwater water quality objectives;

iii. Infiltration devices shall be adequately maintained to maximize pollutant removal capabilities;

iv. The vertical distance from the base of any infiltration device to the seasonal high groundwater mark shall be at least 10 feet.

v. Unless storm water is first treated by a means other than infiltration, infiltration devices shall not be recommended for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; or any other land use or activity which may pose a high threat to groundwater quality, as designated by the City;

vi. Infiltration devices shall be located a minimum of 100 feet horizontally from any water supply wells.

ALTERNATIVES TO INSTALLATION OF POST-CONSTRUCTION TREATMENT CONTROL MEASURES

At the City's discretion, projects may provide an Alternative Measure, as defined below, in lieu of demonstrating compliance with the numeric sizing criteria, where installation of Post-Construction Treatment Control Measures are impracticable.

i. Impracticability - installation of a Post-Construction Treatment Control Measure may be found impracticable if any one of the following conditions is shown to exist:

a. Inadequate space or soil conditions for an on-site treatment control measure;

b. Limitations on the ability of a treatment control measure to address pollutants of concern;

c. The site is within an area where infiltration would not be permitted and another type of treatment is impracticable;

d. Projected costs of the required measure (cost of labor and materials for the treatment measure, plus the cost of dedicating land to the treatment measures in lieu of otherwise allowable use) would exceed two percent (2%) of Total Project Costs;

e. The project is a Smart Growth Project, or a publicly funded or sponsored project determined by the City to have community or environmental benefits, including senior or child care centers or similar projects;

f. Installation of measures would result in the inability of the project sponsor or City to comply with other regulatory requirements at the federal, state and local levels (for example, seismic building code requirements); or

g. Maintenance, inspection and/or monitoring measures would impose an undue burden on the project sponsor or City.

ii. Alternative Measures - Major Projects which are not required to install Post-Construction Treatment Control Measures on-site must provide equivalent protection or enhancement of water quality/beneficial uses through one of the following Alternative Measures:

a. Regional Solution. Participation in a Regional Project or Program that has capacity/credit to address storm water impacts equivalent to the impacts produced by the subject Major Project. Where feasible, the Regional Project must discharge to/address the receiving waters affected by the subject Major Project.

b. Water Quality Benefit Project. In its discretion, the City may find that all Smart Growth Projects provide equivalent water quality benefit. For other projects, Alternative Measures may be found by the City to exist where the project sponsor documents that the development of the site itself, the nature of the site design, its location in the watershed and/or the proposed change in use protects/enhances water quality/beneficial uses such that post-project water

quality/beneficial uses conditions are likely to equal or exceed pre-project conditions.

c. Equivalent Project - The project provides treatment for a pollutant loading or volume of storm water runoff that is equivalent to the treatment that would be provided by the otherwise required Post-Construction Control Treatment Measure. Equivalent projects may include off-site treatment, stream restoration or other activities that limit or mitigate impacts from excessive erosion or sedimentation.

GENERAL PROVISIONS FOR ALL LAND USES

All new multi-family residential and non-residential projects including new Major Impervious Surface Areas or projects proposing Major Expansion should include Post-Construction Treatment Control Measures to the maximum extent practicable. For all projects with suitable landscape areas, vegetative swales or other biofilters are recommended because they are relatively economical and require limited maintenance. If these measures are not feasible or adequate to treat the volume or flow of runoff required for Major Projects, other post-construction BMPs/treatment control measures should be incorporated.

MINIMUM BMPs FOR MAJOR LAND USES OF CONCERN

Gas Stations or Equipment Fueling Facilities: All new fueling stations or expansion of such uses should include the following BMPs. 1) Install and maintain a treatment control measure. 2) Pave the fueling area floors with an impermeable surface (i.e., portland cement concrete or equivalent smooth impervious surface). 3) Cover the fueling areas with a canopy or cover that extends a minimum of ten feet in each direction from each pump. Alternatively, cover the fueling areas with a canopy or cover that has minimum dimensions equal to or greater than the area within the grade break or fuel dispensing area. (The fuel dispensing area is defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater. In no case should the canopy or cover drain onto the fueling area.) 4) Grade the fuel area to prevent water draining toward the fueling area. 5) Grade the fuel area with the minimum slope necessary to prevent ponding. 6) Separate the fueling area from the rest of the site by a grade break that prevents run-on of storm water to the maximum extent practicable. 7) Dry sweep the fueling area routinely. 8) Stencil all on-site storm drains in conformance with the City's requirements. 9) Prepare a spill cleanup plan in conformance with the City of San Jose Fire Code.

Auto Wrecking Yards: All new auto wrecking yards or major expansion of such uses should include the following: 1) install and maintain a treatment control measure; 2) pave all outside vehicle storage areas; 3) cover fluids drainage areas; 4) pave fluids drainage areas with impermeable materials; 5) construct a berm around fluids drainage areas and grade the site to prevent water draining toward this working area; 6) remove and store

batteries in conformance with the City Fire Code; and 7) prepare and execute the spill prevention plan in conformance with the City Fire Code.

Loading Docks: All new loading docks or major expansion of such uses should include the following: 1) pave the loading dock floor with an impermeable surface; 2) cover the loading dock; 3) grade the site to minimize run-on to and runoff from the loading area; 4) position roof downspouts to direct storm water away from the loading area; 5) drain water from the loading dock areas to the sanitary sewer, or divert and collect the water for ultimate discharge to the sanitary sewer; 6) equip loading dock areas draining directly to the sanitary sewer with a spill control valve or equivalent device that is kept closed during periods of operation; 7) install door skirts between the trailers and the building to prevent exposure of loading activities to rain.

Other Unenumerated Uses of Concern: Other Land Uses Of Concern not enumerated in this policy generating equivalent amounts of heavy pollutants may need to include specific BMPs to treat storm water pollutants. Those BMPs would be determined in conjunction with the development permit for the project.

OPERATION AND MAINTENANCE

All Post-Construction Treatment Control Measures included in new projects must be installed, operated, and maintained by qualified personnel. On-site inlets must be stenciled in conformance with City requirements; and cleaned out at least once per year, prior to the wet season.

The property owner/site manager must keep a maintenance and inspection schedule and record to ensure that the treatment control measures continue to operate effectively. Copies of this schedule and record must be provided to the City upon request, and must be made available for inspection at the site at all times.

Trees approved for Post-Construction Control Measure Credit shall be maintained and protected on the site after construction and for the life of the development (until any approved redevelopment occurs in the future). During the life of the development, trees approved for Post-Construction Treatment Control Measure Credit shall not be removed without approval from the City. Trees that are removed or die shall be replaced within six (6) months with species approved by the City of San Jose.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Department of Planning, Building and Code Enforcement
STEPHEN M. HAASE, AICP, DIRECTOR

TO: Mike Enderby, Project Manager

FROM: Bill Scott
Urban Runoff Coordinator

SUBJECT: **See Below**

DATE: May, 5 2004

SUBJECT: **PDC04-029** – Planned Development Rezoning to allow up to 636,100 square-feet of retail commercial use on a 55.1 gross acre site.

BACKGROUND

Under the provisions of both the State of California Regional Water Quality Control Board Order No. 01-119 and City's *Post Construction Urban Runoff-Management Policy*, the proposed project is considered a "Significant Redevelopment Project." A Significant Redevelopment Project is any project on a previously developed site that results in addition and/or replacement of one acre (43,560 square feet) or more of impervious surface (as described by Order Provision No. C.3 c.i.3 and on Page 4 of City's Post Construction Urban Runoff-Management Policy). Construction and post-construction best management practices and measures (BMPs), are required for new development or redevelopment projects to minimize pollutants and flow of runoff into the Municipal Sewer System (MS4) and receiving waters.

As per State requirements, all Development Permit applications, as of October 15, 2003, may be subject to additional quantitative requirements for post construction urban runoff treatment. (Please see pages 4-5 of this memo for more specific information). Also, several links to are provided at the end of this memorandum that will provide examples of typical treatment installations and detail more information regarding the benefits and disadvantages of various treatment controls as well as suggested maintenance techniques.

SUBMITTAL ITEMS: The project should employ measures to detain and/or infiltrate water on site as well, as employ site design measures and source control measures to reduce the volume and velocity of runoff created as follows:

1. **Stormwater Data Sheet** Please complete parts c. d. e. and f. of the "project size" section of the Stormwater Data Sheet, that is included as part of your Application.

2. **Increase Landscaped Areas/Minimize Directly Connected Impervious Areas.** As proposed there is too much hardscape. Landscaped areas should be increased. The initial Site Plan depicts vast amounts of impervious surfaces (90% buildings and parking areas). The Stormwater Data Sheet indicates that the project proposes to minimize connected impervious surfaces a method to treat stormwater runoff. The project Site Plan, Landscape Plan and Grading and Drainage Plan should be revised to depict those ample landscaped areas, especially in parking areas and between buildings. Not only would provision of ample landscaped areas begin to address the treatment of stormwater runoff but also these landscaped areas would ultimately provide a secondary benefit by supporting the high quality "town square" type of design commitment that was made at the General Plan stage.

3. **Swales**. Landscaped open space areas should be provided and swales or vegetative filters should be included in the landscaped open space areas. Please provide details, dimensioned and to scale, showing installation of all treatment controls. Proposed maintenance information should also be provided.

4. **Parking.** Stormwater runoff will decrease under project conditions as the amount of impervious surfaces (buildings and pavement) decreases. A parking structure is recommended over the vast expanse of paved areas as the preferred method to accommodate the required on-site parking. The parking structure should be connected with a pretreatment device to the sanitary sewer, and a permit would be required from the Water Pollution Control Plant.

5. **Bicycle Parking.** To minimize automobile trips, bicycle parking should be provided in conformance with Section 20.90 Part Four of the San Jose Zoning Ordinance.

6. **Roof Downspouts.** All roof downspouts should be disconnected from the storm sewer system and should drain into an unpaved, pervious, and appropriately landscaped areas. Please show elevation details and clearly note where downspout will be disconnected and where roof runoff is proposed to drain. Avoid directing downspout water into an area that is too small for adequate drainage. Generally, downspout water drainage areas should be located at least 10 feet away from building foundations and retaining walls. Please consult with a professional engineer to determine the appropriate minimum distance requirement and consider how to protect the foundation from water. Building elevation details should show the downspout disconnection.

7. **Trees**. Trees provide an effective method for capturing rainfall (thereby reducing stormwater volume), reducing heat island effects, and encouraging pedestrian activity. We encourage you to plant as many trees as practicable. Please locate trees away from swales and other landscape areas that will serve as runoff detention or filtering measures. Tree roots tend to impede runoff infiltration into soil and the trees can suffer from the frequent inundation that is characteristic of swales

8. **Pervious Paving.** Turf block or other pervious paved surfaces should be provided to the maximum extent possible. Pervious paving can be used for emergency vehicle access (EVA) roads, parking areas and pedestrian circulation areas. In addition, there are often aesthetic as well as environmental benefits gained from use of pervious paving material in a project. For emergency access areas the Uniform Fire Code/902.2.2 and T-19 -State Fire Marshal, access roads must be all-weather surfaced and support a minimum of 69,000 lbs. There are many permeable paving options that will achieve these purposes. Please contact your urban runoff coordinator for assistance in selecting appropriate types of pervious paving.

9. **Pedestrian Circulation and Sidewalks.** Automobile trips create many of the pollutants found in urban runoff. To encourage use of mass transit to the project site, we recommend pedestrian connections from nearby transit be designed so that they are safe and attractive. To minimize runoff, we also recommend that you provide pervious paved surfaces for pedestrian connections to parking areas. Ungrouted unit pavers should be used for paved pedestrian areas. Pathways should be shaded with trees and landscaped to absorb runoff. The feasibility of draining sidewalks into park strips or other landscaped areas should be discussed with Public Works.

7. **Pesticide Minimization.** Landscaping should be designed to minimize irrigation and runoff, promote surface infiltration where appropriate, and minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.

8. **Illegal Dumping to Storm Drain Inlets and Waterways.** All on-site drain inlets that are connected to the municipal separate storm sewer system (MS4) must be labeled "No Dumping—Flows to Bay." Please contact the City of San Jose, Department of Public Works, at (408) 277-5161 to obtain free stencils

9. **Regular Sweeping and Maintenance of Outdoor Areas.** The final Development Permit will require establishment of a Homeowners Association (HOA) or equivalent to provide for on-going maintenance. Sidewalks and parking lots must be swept regularly to prevent the accumulation of litter and debris. Debris resulting from pressure washing must be trapped and collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser must be collected and discharged to the sanitary sewer and must not be discharged to a storm drain. The applicant must contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

10. **Trash Enclosures/Loading and Storage Area. Refuse Areas.** Buildings should provide a covered and enclosed area for dumpsters and recycling containers. The area should be designed to prevent water run-on to the area and runoff from the area. Areas around trash enclosures, recycling areas, and food compactor enclosures should not discharge to the storm drain system. Any drains installed beneath dumpsters and compactors serving food service facilities should be connected to a grease removal device prior to discharging to the sanitary sewer. The applicant should contact the Water Pollution Control Plant for specific connection and discharge requirements.

11. **Loading Areas.** To the extent feasible, loading areas should be covered and graded to minimize run-on and runoff. Roof downspouts should be positioned to direct stormwater away from the loading area. Water from loading areas should be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. The applicant should contact the Water Pollution Control Plant for specific connection and discharge requirements. Loading areas draining directly to the sanitary sewer should be equipped with a fail-safe valve, which should be kept closed during periods of operation. Door skirts between the trailers and the building should be installed to prevent exposure of loading activities to rain.

12. **Outdoor Equipment/Materials Storage.** Outdoor equipment and materials storage areas should be covered or designed to limit the potential for runoff to contact pollutants. Storage areas containing non-hazardous liquids should be covered by a roof and contained by berms, dikes, liners or vaults. The storage area may be required to drain to the sanitary sewer system. The applicant should contact the Water Pollution Control Plant for specific connection and discharge requirements. Any hazardous materials regulated by Chapter 17.68 of the San Jose Municipal Code on the site must be used and stored in full compliance with the City's Hazardous Material Ordinance and the Hazardous Materials Management Plan for the site approved by the San Jose Fire Prevention Bureau.

13. **Storm Water Pollution Prevention Plan (SWPPP).** This project results in a land disturbance of more than one acre. Prior to the commencement of any clearing, grading, or excavation, the project shall comply with the State Water Resources Control Board's National Pollutant Discharge Elimination System (NPDES) General Construction Activities Permit as follows:

a) The applicant shall develop, implement, and maintain a Storm Water Pollution Prevention Plan (SWPPP) to control the discharge of storm water pollutants including sediments associated with construction activities.

b) The applicant shall file a Notice of Intent (NOI) with the State Water Resources Control Board (SWRCB.)

Along with these documents, the applicant may also be required to prepare an Erosion Control Plan. The Erosion Control may include BMPs as specified in the California Storm Water Best Management Practice Handbook for reducing impacts on the City's storm drainage system from construction activities. Prior to the issuance of a grading permit, the applicant shall submit copies of the NOI and Erosion Control Plan (if required) to the City Project Engineer, Department of Public Works, Room 308, 801 North First Street, San Jose, California 95110-1795. To obtain an NOI application and further information about the Erosion Control Plan and the NPDES permit requirements, please call the Department of Public Works at (408) 277-5161 or the SWRCB at (916) 657-1146. The applicant shall maintain a copy of the most current SWPPP on site, and shall provide a copy to any City representative or inspector on demand.

12. **Additional Information.** We recommend that you review the publications entitled *Start and the Source* and *the California Stormwater Best Management Practice New Development and Redevelopment Handbook*. These publications and other guidance documents and illustrations regarding installation and maintenance of urban runoff structural treatment controls at the following web addresses:

http://www.ci.san-jose.ca.us/planning/sjplan/counter/stormwater/index.htm

http://www.ci.san-jose.ca.us/planning/sjplan/counter/stormwater/startatsource.pdf

http://www.epa.gov/OW-OWM.html/mtb/mtbfact.htm

http://www.cabmphandbooks.com/Development.asp

http://www.rougeriver.com/pdfs/stormwater/tpm59.pdf

Typical urban runoff treatment control installation drawings can be found in Appendix H of Portland's 2002 Stormwater Management Manual viewable at the following link:

http://www.cleanrivers-pdx.org/tech_resources/smm/2002%20Stormwater%20Manual/Adobe%20Acrobat%202/S)%20AppendixH-%20Supplemental%20Drawings.pdf

13. **BMP Limitations** . Please note that soil types, groundwater levels, geohazards such as liquefaction, and proximity of building foundations, are just some of the issues to be considered when choosing and designing a treatment control. We therefore recommend that the applicant work closely with the applicant's engineers and other appropriate consultants.

The C.3 Provision takes effect October 15th!

BULLETIN UPDATE: October 10, 2003

In October 2001, the Regional Water Quality Control Board (RWQCB) issued a revised National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES MS4 Permit) to the City of San Jose and 14 other co-permittees that have land area which drains to South San Francisco Bay. The other co-permittees include the County of Santa Clara, 12 other municipalities in the county, and the Santa Clara Valley Water District. Together, these jurisdictions constitute the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). The revised Permit includes new stormwater discharge requirements for new development and redevelopment.

The Department of Planning, Building and Code Enforcement (PBCE) is moving forward with the procedures to implement the new development and redevelopment requirements of Provision C.3 of the revised Permit for the City of San Jose. PBCE is working closely with the Redevelopment Agency, Environmental Services Department, Public Works Department, and other City departments in this effort. To facilitate implementation of the new requirements, the City Council adopted changes to the Zoning Ordinance and the Post-Construction Urban Runoff Management Policy on October 7, 2003. The purpose of this Bulletin is to provide notice to the development community of the new ordinances, policies, and procedures the City will implement of October 15, 2003.

ANALYSIS

1. **Applicability**. As of October 15, 2003, the revised NPDES MS4 Permit establishes requirements for certain private new and redevelopment projects, excluding those for which a development application has been deemed complete by the City of San Jose before October 15, 2003. These projects include:

   i. *New commercial, industrial, or residential developments that create a total of one acre (43,560 square feet) or more of impervious surface, including roof area, streets and sidewalks.*

   ii. *Significant redevelopment projects.* Any project on a previously developed site that results in addition or replacement of impervious surface with a combined total of one acre (43,560 square feet) or more is deemed a "Significant Redevelopment" project. Where an existing Significant Redevelopment project that was not previously subject to stormwater treatment measures results in an increase, or replacement of, more than fifty percent of existing impervious surfaces the entire project must be evaluated for compliance. Conversely, where the project results in an increase or replacement of less than fifty percent of existing impervious surface, only that affected portion must be included in treatment design. Excluded from this category are interior remodels, routine maintenance or repair, roof or exterior surface replacement and repaving.

2. **Numerically Sized Post-Construction Treatment Control Measures.** Major Projects including: new development projects that create one acre (43,560 square feet) or more of impervious surface area; new streets, roads, highways and freeways built under the City's jurisdiction that create one acre (43,560 square feet) or more of impervious surface area; and Significant Redevelopment Projects will

be required to install Post-Construction Treatment Control Measures meeting specified hydraulic sizing criteria, according to the following schedule, except where impracticable:

- October 15, 2003 - Major Projects requiring a permit or other direct approval from the RWQCB, including Major Projects requiring RWQCB certification under Section 401 of the Clean Water Act, and Major Projects involving Land Uses of Concern; and

- February 15, 2005 - all other Major Projects.

3. **Waiver/Alternative Compliance.** The City has adopted a waiver program as a component of the Post-Construction Urban Runoff Management Policy, revised on October 7, 2003. This Policy establishes the criteria for establishing impracticability and for evaluating Alternative Compliance Measures. Where it is impracticable to install treatment facilities on a project's site, the waiver program allows certain projects to pursue alternative means of dealing with the impact of storm runoff pollution by providing another equivalent water quality benefit. The revised Post-Construction Urban Runoff Management Policy is available at: http://www.ci.san-jose.ca.us/planning/sjplan/counter/stormwater/index.htm

4. **Regional Solutions.** As a longer-term solution, the waiver/alternative compliance program may allow a project to participate in a regional or watershed stormwater treatment facility, without a showing of impracticability on the individual project site. Currently this type of regional solution is not an available option.

5. **Developers' Input.** The City welcomes feedback from developers and other interested parties. We encourage you to bring your comments or questions to future Developers Roundtable meetings or you may contact Planning staff directly (see below).

6. **New Ordinances, Policies, and Guidance documents.** On October 7, 2003 City Council adopted revisions to the Zoning Ordinance and the Post-Construction Urban Runoff Management Policy to provide consistency with the C.3 Provision, including acceptable waiver/alternative compliance approaches. These documents and guidance for implementing the C.3 requirements are available at the Planning webpage at:

   http://www.ci.san-jose.ca.us/planning/sjplan/

7. **PBCE contacts.** The Urban Runoff coordinator in PBCE is Bill Scott (408-277-8553, bill.scott@sanjoseca.gov). He reports to Jenny Nusbaum and Laurel Prevetti. Additional City staff members across many departments are currently involved in interdepartmental efforts to respond to the new NPDES Permit requirements.

8. **Additional Guidance.** SCVURPPP and the Regional Board are holding workshops to provide training to developers on the implementation of the C.3 Provision. SCVURPPP also collaborated with the Bay Area Stormwater Management Agency Association (BASMAA) to publish *Using Site Design Techniques to Meet Development Standards for Stormwater Quality*, a companion volume to the previously published guidance manual entitled *Start at the Source*. Together, these two volumes provide step-by-step guidance for implementing the requirements of the NPDES Permit with the numeric sizing criteria required by the C.3 Provision.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Department of Planning, Building and Code Enforcement
STEPHEN M. HAASE, AICP, DIRECTOR

TO: Lee Elena, Project Manager

FROM: Bill Scott
Urban Runoff Coordinator

SUBJECT: **See Below**

DATE: May, 6 2004

SUBJECT: **PDC04-031** – Planned Development Rezoning to allow up to 4,073,032 square-feet of commercial/industrial use and up to 3,417 single-family detached and attached residential units on a 312 gross acre site.

BACKGROUND

Under the provisions of both the State of California Regional Water Quality Control Board (RWQB) Order No. 01-119 and City's *Post Construction Urban Runoff Management Policy*, the proposed project is considered a "Significant Redevelopment Project." Construction and post-construction best management practices and measures (BMPs), are required for new development or redevelopment projects to minimize pollutants and flow of runoff into the Municipal Sewer System (MS4) and receiving waters. As per State requirements, all Development Permit applications, as of October 15, 2003, may be subject to additional quantitative requirements for post construction urban runoff treatment. (Please see pages 4-5 of this memo for more specific information). Also, several links to are provided at the end of this memorandum that will provide examples of typical treatment installations and detail more information regarding the benefits and disadvantages of various treatment controls as well as suggested maintenance techniques.

SUBMITTAL ITEMS: The project should employ measures to detain and/or infiltrate water on site as well, as employ site design measures and source control measures to reduce the volume, velocity and duration of runoff created as follows:

1. **Stormwater Data Sheet** Please complete and submit the Stormwater Data Sheet, that is included as part of your Application for Planned Development Rezoning.

2. **On-site Detention** Post project runoff should not exceed estimated pre-project runoff rates. The project should employ measures to detain and/or infiltrate water on site as well, as employ site design measures and source control measures to reduce the volume and velocity of runoff created. If the project proposes a new outfall into a waterway directly, it will require RWQCB certification. Typically the RWQCB can be anticipated to impose requirements for water quality treatment that go beyond what the City's NPDES Permit or the City's ordinances and policies would otherwise require.

3. **Plans.** Please provide Site Plans, Grading and Drainage Plans and Landscape sheets that clearly depict types and locations of stormwater treatment control measures. Project site design for each phase or project component should indicate that expanses of impervious areas, such as parking lots and street widths have been minimized and are broken-up by ample landscaped areas. Additional comments will be provided once more detailed plan-set materials have been submitted.

4. **Swales**. Ample landscaped open space areas should be provided and swales or vegetative filters should be included in the landscaped open space areas. Please provide details, dimensioned and to scale, showing insta llation of all treatment controls. Proposed maintenance information should also be provided.

5. **Parking Structures** . Stormwater runoff will decrease under project conditions as the amount of impervious surfaces (buildings and pavement) decreases. Parking structures are recommended to accommodate the required on-site parking. The parking structure(s) should be connected with a pretreatment device to the sanitary sewer, and a permit would be required from the Water Pollution Control Plant.

6. **Bicycle Parking.** To minimize automobile trips, bicycle parking should be provided in conformance with Section 20.90 Part Four of the San Jose Zoning Ordinance.

7. **Roof Downspouts.** All roof downspouts should be disconnected from the storm sewer system and should drain into an unpaved, pervious, and appropriately landscaped areas. At the Permit stage, please show elevation details and clearly note where downspout will be disconnected and where roof runoff is proposed to drain. Avoid directing downspout water into an area that is too small for adequate drainage. Generally, downspout water drainage areas should be located at least 10 feet away from building foundations and retaining walls. Please consult with a professional engineer to determine the appropriate minimum distance requirement and consider how to protect the foundation from water. Building elevation details should show the downspout disconnection.

8. **Trees** . Trees provide an effective method for capturing rainfall (thereby reducing stormwater volume), reducing heat island effects, and encouraging pedestrian activity. We encourage you to plant as many trees as practicable. Please locate trees away from swales and other landscape areas that will serve as runoff detention or filtering measures. Tree roots tend to impede runoff infiltration into soil and the trees can suffer from the frequent inundation that is characteristic of swales

9. **Pervious Paving.** Turf block or other pervious paved surfaces should be provided to the maximum extent possible. Pervious paving can be used for emergency vehicle access (EVA) roads, parking areas and pedestrian circulation areas. In addition, there are often aesthetic as well as environmental benefits gained from use of pervious paving material in a project. For emergency access areas the Uniform Fire Code/902.2.2 and T-19 -State Fire Marshal, access roads must be all-weather surfaced and support a minimum of 69,000 lbs. There are many permeable paving options that will achieve these purposes. Please contact your urban runoff coordinator for assistance in selecting appropriate types of pervious paving.

10. **Pedestrian Circulation and Sidewalks.** Automobile trips create many of the pollutants found in urban runoff. To encourage use of mass transit to the project site, we recommend pedestrian connections from nearby transit be designed so that they are safe and attractive. To minimize runoff, we also recommend that you provide pervious paved surfaces for pedestrian connections to parking areas. Ungrouted unit pavers should be used for paved pedestrian areas. Pathways should be shaded with trees and landscaped to absorb runoff. The feasibility of draining sidewalks into park strips or other landscaped areas should be discussed with Public Works.

7. **Pesticide Minimization.** Landscaping should be designed to minimize irrigation and runoff, promote surface infiltration where appropriate, and minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.

8. **Illegal Dumping to Storm Drain Inlets and Waterways.** All on-site drain inlets that are connected to the municipal separate storm sewer system (MS4) must be labeled "No Dumping—Flows to Bay." Please contact the City of San Jose, Department of Public Works, at (408) 277-5161 to obtain free stencils

9. **Regular Sweeping and Maintenance of Outdoor Areas.** The final Development Permit will require establishment of a Homeowners Association (HOA) or equivalent to provide for on-going maintenance. Sidewalks and parking lots must be swept regularly to prevent the accumulation of litter and debris. Debris resulting from pressure washing must be trapped and collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser must be collected and discharged to the sanitary sewer and must not be discharged to a storm drain. The applicant must contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

10. **Trash Enclosures/Loading and Storage Area. Refuse Areas.** Buildings should provide a covered and enclosed area for dumpsters and recycling containers. The area should be designed to prevent water run-on to the area and runoff from the area. Areas around trash enclosures, recycling areas, and food compactor enclosures should not discharge to the storm drain system. Any drains installed beneath dumpsters and compactors serving food service facilities should be connected to a grease removal device prior to discharging to the sanitary sewer. The applicant should contact the Water Pollution Control Plant for specific connection and discharge requirements.

11. **Loading Areas.** To the extent feasible, loading areas should be covered and graded to minimize run-on and runoff. Roof downspouts should be positioned to direct stormwater away from the loading area. Water from loading areas should be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. The applicant should contact the Water Pollution Control Plant for specific connection and discharge requirements. Loading areas draining directly to the sanitary sewer should be equipped with a fail-safe valve, which should be kept closed during periods of operation. Door skirts between the trailers and the building should be installed to prevent exposure of loading activities to rain.

12. **Outdoor Equipment/Materials Storage.** Outdoor equipment and materials storage areas should be covered or designed to limit the potential for runoff to contact pollutants. Storage areas containing non-hazardous liquids should be covered by a roof and contained by berms, dikes, liners or vaults. The storage area may be required to drain to the sanitary sewer system. The applicant should contact the Water Pollution Control Plant for specific connection and discharge requirements. Any hazardous materials regulated by Chapter 17.68 of the San Jose Municipal Code on the site must be used and stored in full compliance with the City's Hazardous Material Ordinance and the Hazardous Materials Management Plan for the site approved by the San Jose Fire Prevention Bureau.

13. **No Copper, Nickel, or Zinc for Construction.** Due to the identification of these metals as pollutants in local waterways, the use of copper, nickel, and zinc in exterior construction materials such as roofing, ornamental usage, or building cladding, is strongly discouraged.

14. **Storm Water Pollution Prevention Plan (SWPPP).** This project results in a land disturbance of more than one acre. Prior to the commencement of any clearing, grading, or excavation, the project shall comply with the State Water Resources Control Board's National Pollutant Discharge Elimination System (NPDES) General Construction Activities Permit as follows:

a) The applicant shall develop, implement, and maintain a Storm Water Pollution Prevention Plan (SWPPP) to control the discharge of storm water pollutants including sediments associated with construction activities.

b) The applicant shall file a Notice of Intent (NOI) with the State Water Resources Control Board (SWRCB.)

Along with these documents, the applicant may also be required to prepare an Erosion Control Plan. The Erosion Control may include BMPs as specified in the California Storm Water Best Management Practice Handbook for reducing impacts on the City's storm drainage system from construction activities. Prior to the issuance of a grading permit, the applicant shall submit copies of the NOI and Erosion Control Plan (if required) to the City Project Engineer, Department of Public Works, Room 308, 801 North First Street, San Jose, California 95110-1795. To obtain an NOI application and further information about the Erosion Control Plan and the NPDES permit requirements, please call the Department of Public Works at (408) 277-5161 or the SWRCB at (916) 657-1146. The applicant shall maintain a copy of the most current SWPPP on site, and shall provide a copy to any City representative or inspector on demand.

15. **Pool, Spa, and Fountain Discharges.** Pool (including swimming pools, hot tubs, spas and fountains)discharge drains should not be connected directly to the storm drain or sanitary sewer system. (Exception: Public pool discharge drains must be connected to the sanitary sewer system, per County Department of Environmental Health requirements.) When draining is necessary, a hose or other temporary system should be directed into a sanitary sewer clean out. The clean out should be installed in a readily accessible area, such as within 10 feet of the pool. The applicant should contact the Water Pollution Control Plant for specific connection and discharge requirements.

16. **Structural Treatment Controls.** Please provide section details, dimensioned and to scale, showing installation of all proposed treatment controls. Proposed maintenance information should also be provided. In addition, your soils and geotechnical report should address whether or not the soil conditions are appropriate for the runoff treatment measures being proposed. Information regarding the benefits and disadvantages of various treatment controls and suggested maintenance techniques can be found in fact sheets available as a PDF at the following web addresses:

http://www.epa.gov/OW-OWM.html/mtb/mtbfact.htm

http://www.cabmphandbooks.com/Development.asp

17. **Additional Information.** We recommend that you review the publications entitled *Start and the Source* and *the California Stormwater BestManagement Practice New Development and Redevelopment Handbook*. These publications and other guidance documents and illustrations regarding installation and maintenance of urban runoff structural treatment controls at the following web addresses:

http://www.ci.san-jose.ca.us/planning/sjplan/counter/stormwater/index.htm

http://www.ci.san-jose.ca.us/planning/sjplan/counter/stormwater/startatsource.pdf

http://www.epa.gov/OW-OWM.html/mtb/mtbfact.htm

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18. **BMP Limitations** . Please note that soil types, groundwater levels, geohazards such as liquefaction, and proximity of building foundations, are just some of the issues to be considered when choosing and designing a treatment control. We therefore recommend that the applicant work closely with the applicant's engineers and other appropriate consultants.

The C.3 Provision takes effect October 15th!

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ANALYSIS

1. **Applicability**. As of October 15, 2003, the revised NPDES MS4 Permit establishes requirements for certain private new and redevelopment projects, excluding those for which a development application has been deemed complete by the City of San Jose before October 15, 2003. These projects include:

   i. *New commercial, industrial, or residential developments that create a total of one acre (43,560 square feet) or more of impervious surface, including roof area, streets and sidewalks.*

   ii. *Significant redevelopment projects.* Any project on a previously developed site that results in addition or replacement of impervious surface with a combined total of one acre (43,560 square feet) or more is deemed a "Significant Redevelopment" project. Where an existing Significant Redevelopment project that was not previously subject to stormwater treatment measures results in an increase, or replacement of, more than fifty percent of existing impervious surfaces the entire project must be evaluated for compliance. Conversely, where the project results in an increase or replacement of less than fifty percent of existing impervious surface, only that affected portion must be included in treatment design. Excluded from this category are interior remodels, routine maintenance or repair, roof or exterior surface replacement and repaving.

2. **Numerically Sized Post-Construction Treatment Control Measures.** Major Projects including: new development projects that create one acre (43,560 square feet) or more of impervious surface area; new streets, roads, highways and freeways built under the City's jurisdiction that create one acre (43,560 square feet) or more of impervious surface area; and Significant Redevelopment Projects will

be required to install Post-Construction Treatment Control Measures meeting specified hydraulic sizing criteria, according to the following schedule, except where impracticable:

- October 15, 2003 - Major Projects requiring a permit or other direct approval from the RWQCB, including Major Projects requiring RWQCB certification under Section 401 of the Clean Water Act, and Major Projects involving Land Uses of Concern; and

- February 15, 2005 - all other Major Projects.

3. **Waiver/Alternative Compliance.** The City has adopted a waiver program as a component of the Post-Construction Urban Runoff Management Policy, revised on October 7, 2003. This Policy establishes the criteria for establishing impracticability and for evaluating Alternative Compliance Measures. Where it is impracticable to install treatment facilities on a project's site, the waiver program allows certain projects to pursue alternative means of dealing with the impact of storm runoff pollution by providing another equivalent water quality benefit. The revised Post-Construction Urban Runoff Management Policy is available at: http://www.ci.san-jose.ca.us/planning/sjplan/counter/stormwater/index.htm

4. **Regional Solutions.** As a longer-term solution, the waiver/alternative compliance program may allow a project to participate in a regional or watershed stormwater treatment facility, without a showing of impracticability on the individual project site. Currently this type of regional solution is not an available option.

5. **Developers' Input.** The City welcomes feedback from developers and other interested parties. We encourage you to bring your comments or questions to future Developers Roundtable meetings or you may contact Planning staff directly (see below).

6. **New Ordinances, Policies, and Guidance documents.** On October 7, 2003 City Council adopted revisions to the Zoning Ordinance and the Post-Construction Urban Runoff Management Policy to provide consistency with the C.3 Provision, including acceptable waiver/alternative compliance approaches. These documents and guidance for implementing the C.3 requirements are available at the Planning webpage at:

   http://www.ci.san-jose.ca.us/planning/sjplan/

7. **PBCE contacts.** The Urban Runoff coordinator in PBCE is Bill Scott (408-277-8553, bill.scott@sanjoseca.gov). He reports to Jenny Nusbaum and Laurel Prevetti. Additional City staff members across many departments are currently involved in interdepartmental efforts to respond to the new NPDES Permit requirements.

8. **Additional Guidance.** SCVURPPP and the Regional Board are holding workshops to provide training to developers on the implementation of the C.3 Provision. SCVURPPP also collaborated with the Bay Area Stormwater Management Agency Association (BASMAA) to publish *Using Site Design Techniques to Meet Development Standards for Stormwater Quality*, a companion volume to the previously published guidance manual entitled *Start at the Source*. Together, these two volumes provide step-by-step guidance for implementing the requirements of the NPDES Permit with the numeric sizing criteria required by the C.3 Provision.

ADDITIONAL INSTRUCTIONS FOR
STORMWATER RUNOFF DATA

The California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), requires that the City of San Jose demonstrate compliance with the National Pollution Discharge Elimination System (NPDES) Permit issued to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP).

In order to comply with the NPDES Permit requirements, the City of San Jose must provide the RWQCB with the following information requested below. Thank you for your cooperation in compliance.

INSTRUCTIONS

What Projects Apply?
All applicants creating, adding, or replacing **5,000 square feet or more of impervious surface*** on the project site must fill out the following information and submit it along with their application for a Planning permit to the Department of Planning, Building and Code Enforcement, Room 400, City Hall, 801 North First Street, San Jose.

What is an Impervious Surface?
An impervious surface prevents the infiltration or passage of water into the soil. Impervious surfaces include rooftops, paved or covered patios, driveways, parking lots, paved walkways, and streets.

For more information on the selection of Best Management Practices for stormwater pollution prevention, please refer to ***Start at the Source*** by BASMAA and ***the Guidance Manual on Selection of Stormwater Quality Control Measures***. These documents are available for purchase in the Department of Planning, Building and Code Enforcement at Room 400, City Hall, 801 North First Street, San Jose. You may also contact Jenny Nusbaum at: jenny.nusbaum@ci.sj.ca.us or (408) 277-4576.

* DO NOT INCLUDE routine maintenance work such as reroofing, or resurfacing of existing paved areas, in the calculation of impervious surface.

TO BE COMPLETED BY PLANNING DIVISION STAFF	
PROJECT FILE NO.:	
TO BE COMPLETED BY APPLICANT	
PROJECT DESCRIPTION	**PROJECT LOCATION**
ASSESSOR'S PARCEL NUMBER(S):	
APPLICANT NAME (please print)	**DAYTIME TELEPHONE NO:** ( )

PROJECT TYPE (Check all that apply):

❑ Residential ❑ Commercial
❑ Industrial ❑ Public/Quasi Public
❑ Agricultural ❑ Other _____

EXISTING USES ON SITE:

❑ Residential ❑ Commercial
❑ Industrial ❑ Public/Quasi Public
❑ Agricultural ❑ Other _____

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

ADDITIONAL INSTRUCTIONS FOR
STORMWATER RUNOFF DATA

PROJECT SIZE:

a. Site size: _____ sq. ft.

b. Existing impervious surface area (includes land covered by buildings, sheds, patios/covers, parking lots, streets, sidewalks, paved walkways and driveways): _____ sq. ft.

c. Impervious surface area created, added, or replaced: _____sq. ft.

d. Total impervious surface area (new + existing): _____sq. ft.

e. Percent increase/replacement of impervious surface area (i.e. c/b multiplied by 100: _____%

Estimated area of land disturbance during construction: _____sq. ft.
(including clearing, grading, or excavating).

HAZARDOUS MATERIALS:

Will or have hazardous materials been used or stored on site? ❑ Yes ❑ No

a. If yes, please provide list and quantity of materials and note previous location and proposed location on site plan:

_____

b. If required, has a Hazardous Materials Management Plan been approved for the site? ❑ Yes ❑ No

TYPES OF STORMWATER CONTROL MEASURES: proposed with project (please refer to item below and check all that apply):

❑ Stormwater Treatment ❑ Source Control ❑ Site Design

SPECIFIC STORMWATER CONTROL MEASURES (Check all that apply):

Storm water Treatment	Source Controls	Site Design
❑ Biofilter (veg. swale/strip)	❑ Wash area/racks, drain to sanitary sewer	❑ Minimize land disturbance
❑ Detention basin (dry)	❑ Covered dumpster area, drain to sanitary sewer	❑ Minimize impervious surfaces
❑ Detention pond (wet)	❑ Swimming pool drain to sanitary sewer	❑ Minimum impact street or parking lot design
❑ Underground detention	❑ Beneficial landscaping (minimizes irrigation, runoff, pesticides and fertilizers; promotes stormwater treatment)	❑ Cluster structures/pavement
❑ Media filter (sand, organic matter, bioretention)	❑ Outdoor material storage protection	❑ Disconnect downspouts (make sure they don't drain on to paved areas)
❑ Hydrodynamic device (commercially available in-line treatment unit)	❑ Covers and drains for loading docks, maintenance bays, and fueling areas	❑ Pervious driveway design
❑ Infiltration trench	❑ Maintenance (street sweeping, catch basin cleaning, etc.)	❑ Microdetention in landscape
❑ Porous pavement	❑ Other _____	❑ Preserve open space
❑ Wetland basin		❑ Protect riparian and wetland areas, riparian buffers
❑ Wetland channel		❑ Other _____
❑ Inlet filter		
❑ Other _____		

PLEASE CALL THE APPOINTMENT DESK AT (408) 277-8820 FOR AN APPLICATION APPOINTMENT.

CON STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for the Construction Inspection Program

The various components of this section are organized as follows:

Private Development Projects

1. Public Works – Project Approval & Implementation
2. Public Works – Construction Site Inspections
3. Public Works – Handoff
4. Building – Construction Site Inspections & Handoff
5. Environmental Services – Construction Site Inspections
6. Environmental Services – Feedback
7. Citywide Coordination

Public Projects

8. Public Project Approval
9. Public Project Inspections

City of San José
Urban Runoff Management Plan

STANDARD OPERATING PROCEDURE
CONSTRUCTION INSPECTION PROGRAM

JULY 2004

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Introduction

The purpose of this procedure set is to minimize sediment and contaminated runoff flowing from construction sites into the storm drain system. The procedures identify the responsibilities of all City construction inspection and building inspection personnel, to include: Public Works Inspectors; Building Inspectors in Planning, Building and Code Enforcement; and Environmental Services Enforcement Inspectors.

Background

Construction Inspection is one of several program element activities required under the City's Urban Runoff National Pollutant Discharge Elimination System (NPDES) permit. As in the case of all program elements, the NPDES permit refers to Performance Standards that define "the level of implementation necessary to demonstrate the control of pollutants in stormwater to the maximum extent practicable." The City and other co-permittees in the Santa Clara Valley Urban Runoff Pollution Prevention Program adopted a Construction Inspection performance standard in 1996, which was revised in 2002. This performance standard establishes eight guidelines as indicated below:

Table 1. Construction Inspection Performance Standards

CON 1 – Site Housekeeping The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites and prevent illicit discharges to storm drains and watercourses.
CON 2 – Local Ordinance For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.
CON 3 – Construction Inspection Frequency The City inspects construction sites for adequacy of storm water quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on the size of the project, site conditions, precipitation, and the project's potential impact on storm water quality.
CON 4 – Wet Season Preparation Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.
CON 5 – Inspection and Site Evaluation Follow-up Construction sites with inadequate erosion/sediment controls are given verbal and/or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with the risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Regional Board.
CON 6 – Municipal Training The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to storm water pollution prevention. All inspectors receive training on the latest construction-related storm water pollution prevention techniques and appropriate follow up actions at least once every two years. The City keeps documentation that inspectors have received training.

CON 7 – Outreach The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.
CON 8 – Public Works Projects The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.

Definitions

- BMPs – Best Management Practices
- ECP – Erosion Control Plan
- SOPs – Standard Operating Procedures
- Construction Inspection Personnel – All City of San Jose personnel who perform inspections of construction sites as a part of their duties under the Department of Public Works (DPW), Environmental Services Department (ESD), or Department of Planning, Building and Code Enforcement (PBCE).

Overview

City Organization

Within the City of San Jose there are three departments primarily responsible for various aspects of permitting, inspection, and enforcement functions that comprise the Construction Inspection program element.

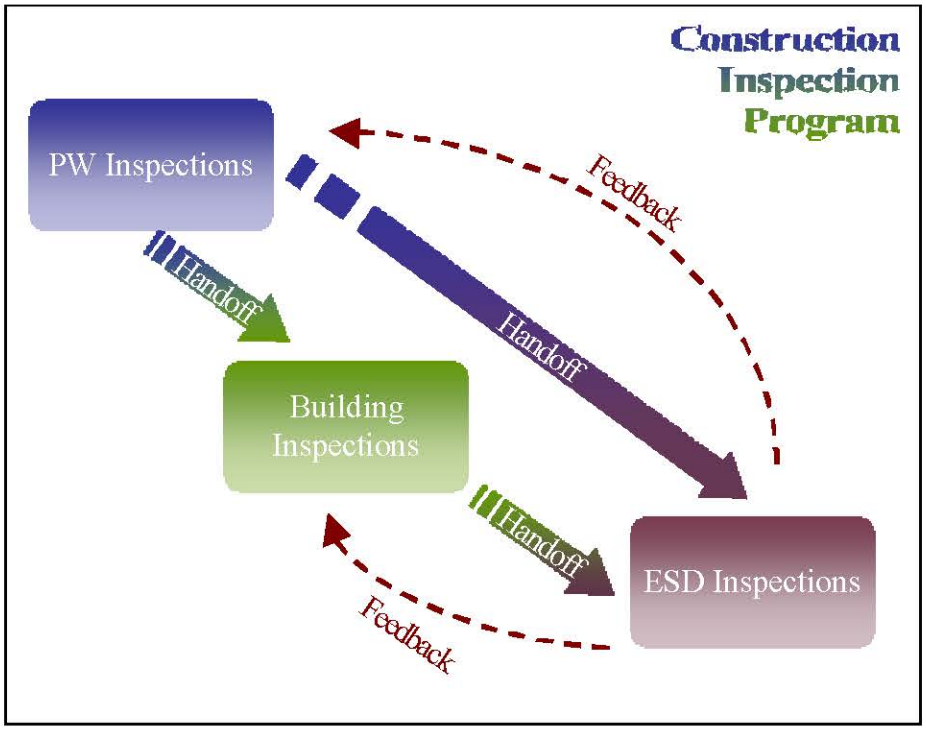
1. Department of Planning, Building, and Code Enforcement (PBCE) carries out planning site reviews and referrals for construction sites deemed to pose high potential to discharge sediment. The Plan Implementation Division informs developers of the requirement to prevent sediment and other construction pollutants from entering the storm drains or the creeks, and includes the requirements as conditions in development permits and tentative map approvals. Planning staff also conducts Developers' Roundtable Workshops every six weeks to keep the development community informed of requirements and impending changes to the rules. The Building Division assigns roughly 50 building inspectors to inspect sites in the later phases of construction. Beginning in 2003, Building inspectors identify and correct storm water issues at sites where repeated inspections are a part of Building inspector responsibilities; this function excludes mechanical, electrical, and plumbing inspectors. But all inspectors have been trained to report problems they encounter on an active site.

2. Department of Public Works (DPW) issues grading permits and requires that sites with high potential to discharge sediment (e.g. greater than 5 acres and/or hillside sites) to provide Erosion Control Plans and Storm Water Pollution Prevention Plans (SWPPPs). There are several divisions within Public Works that provide inspectors and engineers who visit construction sites. These personnel are divided into groups that focus on various construction project specialties: landscape, public buildings, City-owned capital projects (roads, bridges, sewers), private residential and commercial projects, airport projects, and utilities. Most sediment and erosion control issues arise from large construction projects, either public or private. For that reason, the Public Works inspectors in various divisions integrate stormwater issues into their routine inspection duties. In the Transportation and Development Services (TDS) Division, 35 inspectors and engineers are organized into six project teams to monitor large private projects and another 28 inspectors and engineers address roads and

bridges projects. The Engineering and Construction Division includes about 31 inspectors and engineers dedicated to monitoring sanitary and storm sewers projects, and the Parks and Recreation Facilities Division has 20 project managers and 10 inspectors.

3. Environmental Service Department (ESD) maintains and interprets the City's NPDES permit and develops Performance Standards in cooperation with the Regional Water Quality Control Board and other co-permittees in the Santa Clara Valley Urban Runoff Pollution Prevention Program. ESD also devotes two full time Illicit Connection / Illegal Dumping inspectors who carry out official enforcement actions under the Urban Runoff Construction Inspection program element. In order to ensure the most prompt response at Construction sites ESD also makes its 10 Industrial & Commercial Program inspectors available to respond to incidents at Construction sites. Generally, these inspectors are called in for enforcement action on construction sites that appear to be discharging sediment or other construction pollutants into the City's storm drain system or local creeks.

Figure 1. Overview of Construction Inspection Program Procedures



Annual Inspector Training

Inspector training covering the topics of construction site erosion control, sediment control, and housekeeping procedures will be conducted with support from Environmental Services Department (ESD) at least annually. Inspectors need to attend the trainings at least once every two years. On an annual basis, supervisory staff and field staff will review and evaluate these SOPs and any other BMPs in use to evaluate their effectiveness in reducing pollutants in storm water and eliminating illicit discharges. This review and evaluation will normally coincide with the annual municipal training on City Urban Runoff NPDES requirements.

Private Development

Public Works – Project Approval & Implementation

Public Works issues grading permits, with projects categorized by type according to the potential for soil erosion from the project site. Fees, grading permit requirements, and wet season preparation are then implemented according to the project type. The wet season is defined as beginning October 15th and ending April 15th the subsequent year. A development project cannot grade a site with potential to cause erosion/discharge sediment during the wet season without an Erosion Control Plan (ECP), approved by a State-registered engineer and accepted by the City. DPW collects an Erosion Control Plan review/inspection fee. Erosion/sediment fees are due year-round and provide for inspection of sites that encounter rain even outside the wet season. Table 2 summarizes how projects are categorized and what requirements are attributed to each type.

Table 2. Grading Permits Requirements by Type

PROJECT TYPE	DESCRIPTION	FEE	REQUIREMENTS
Type 1	A hillside project (greater than or equal to 5% slope across project site) **and** project proposes movement of greater than or equal to 1,000 cubic yards of dirt, **or** Project site is adjacent to a watercourse (creek, river, or channel) **and** proposes to move greater than or equal to 1,000 cubic yards of dirt.	$2,500	Erosion Control Plan to be submitted to the City for review and acceptance. A meeting of the project developer, civil engineer, erosion specialist (if any), and contractors (general /grading) with the City Public Works Project Engineer and City Public Works Inspector.
Type 2	A hillside project (greater than or equal to 5% slope across project site) **and** project proposes to move less than 1,000 cubic yards of dirt, **or** Project site is adjacent to a watercourse **and** proposes to move less than 1,000 cubic yards of dirt, **or** Project site is flat (less than 5% slope across the project site **and** area disturbed is greater than or equal to 1 acre.	$850	Erosion Control Plan to be submitted to the City for review and acceptance. Project developer, civil engineer, erosion specialist (if any), and contractors (general /grading) attend a City-sponsored Erosion/Sediment Control Training session prior to the wet season. Type 2 projects that are adjacent to a watercourse may present special concerns and may require a meeting between the project developer and City Public Works staff.
Type 3	Project site is flat (less than 5% slope across project site) **and** area disturbed is less than 1 acre.	$375	Use of "Blueprint for a Clean Bay." No special meetings or training sessions and no requirement for an Erosion Control Plan to be filed.

Public Works staff conducts outreach prior to the wet season. They also receive monthly certifications from developers indicating the status of required control measures. Table 3 below summarizes the procedure for Public Works' administration of the approval and implementation of Erosion Control Plans as part of the Construction Inspection Program.

Table 3. Procedure for ECP Acceptance and Implementation

STEP	RESPONSIBILITY	ACTION
1	Program Manager	Identify development projects that will be grading during the winter season (October 15th to April 15th of the following year) by July 15th. Categorize projects by type (Type 1, 2 or 3)
2	Program Manager and Project Engineers	Prior to wet season, conduct outreach to development community through Developer Roundtable meetings. Send letters to Types 1, 2 and 3 project owners informing them of the erosion control requirements for their project. Also attach copy of *Blueprint for a Clean Bay* to Type 3 letters. Letter content includes: • Whether an ECP is required; • That project erosion/sediment control measures must be in place by October 15th; and • Control measures must be maintained throughout the wet season.
3	Project Engineers	Schedule a formal meeting with each Type 1 project owner/applicant, consultants, contractor and City Inspector.
4	Program Manager	Schedule mass training for all Type 2 project owners/applicants, consultants, contractors and City Inspectors.
5	Project Engineers	Review and accept Erosion Control Plans submitted for Types 1 and 2 projects. Request copy of NOI and SWPPP from applicable projects. Collect required erosion fee. Collect owner-required Monthly Certifications for Types 1 and 2 projects throughout rainy season. The monthly certification is a written letter from the Developer to the City. It must state either: a) that the project's proposed control measures are in place and functioning, or b) an explanation why the project's proposed control measures are not in place along with a compliance schedule.
6	Program Manager	Provide Chief Inspector a location map and a complete list of Types 1, 2 and 3 projects. Update AMANDA with project information.
7	Project Engineers	Work closely with Project Inspectors during the winter season on erosion and sediment control issues.

Public Works – Construction Site Inspections

DPW inspectors and engineers that visit sites as members of project teams, spend a fair amount of time on large, complex construction sites. Their inspections cover a very broad range of issues and they are frequently on-site during phases of active grading operations. For this reason, Public Works Inspectors are much more actively involved in monitoring, documenting, and correcting the erosion and sediment control problems they observe. Public Works Inspectors enforce City regulations by issuing verbal warnings or written Notices of Unsatisfactory Conditions with respect to Erosion Control Plans and SWPPPs. For formal enforcement of erosion and sediment control violations, Public Works Inspectors can notify inspectors from Environmental Services Department (ESD) to observe and cite. The table below summarizes DPW's procedure for inspecting Construction sites.

Table 4. Procedure for Public Works Inspections

STEP	RESPONSIBILITY	ACTION
1	Inspectors	Provide Project Engineers with plan review comments and perform pre-rainy season site inspections for Types 1 and 2 projects. Coordinate erosion and sediment control problems or deficiencies with Chief Inspector and Project Engineer. Identify and document violation of Erosion and Sediment Control requirements for each project. If a significant discharge of sediments or pollutants to a water body is observed, report to ESD Response Team at (408) 945-3000. If minor deficiency is observed, issue a Verbal Warning to contractor and document action taken. If deficiency is not corrected after Verbal Warning, issue Notice of Unsatisfactory Condition and if not corrected, refer violation to ESD. Provide copies of notices given to Project Engineers. Perform inspections before and after a storm event. Complete weekly Inspection Reports for each project during the rainy season and submit to Chief Inspector. See Attachment 1.
2	Chief Inspector	Provide bi-weekly inspection updates to Program Manager.

Public Works – Handoff

While DPW are onsite frequently during the early stages of a construction project, their involvement decreases as a project completes grading. Additionally, DPW refer sites as needed to ESD for escalated enforcement. The table below summarizes Public Works' handoff of relevant inspection information to other departments.

Table 5. Procedure for Public Works Handoff

STEP	RESPONSIBILITY	ACTION
1	Inspectors	When referring a site to ESD, contact Enforcement staff via phone or email and transmit site information and inspection documentation via message or fax.
2	Chief Inspector	Provide copies of written Notices to ESD and Building for reference during subsequent inspections and enforcement.

Building – Construction Site Inspections & Handoff

In general, Building Inspectors from PBCE conduct inspections of mechanical, electrical, plumbing and structural systems based on building permits for new construction. Since Building Inspectors usually visit sites in the latter phases of construction, after the sites have been graded, most large-scale grading and erosion control problems are over before the Building Inspectors arrive. Still, as more contractors access a site, Building Inspectors have an opportunity to observe how "housekeeping issues" are being addressed at the site. While all inspectors are trained to identify high priority construction site issues, the Building Inspectors who serve as "Inspectors of Record" for sites are tasked with inspecting for storm water issues and taking follow up actions. Inspections are recorded on the hard copy "inspection slip" and tracked in the AMANDA Data Management System used by PBCE & DPW to track development related activities.

Table 6. Procedure for Building Inspections & Handoff

STEP	RESPONSIBILITY	ACTION
1	Supervising Inspector Program Manager	Prior to rainy season, obtain list of Type 1, 2 and 3 projects from Public Works Program Manager. Include other substantial projects for Step 2 notification, below.
2	Inspectors/ Supervising Inspector	Prior to each rainy season, deliver written notice reminding on-site job superintendents for applicable projects of their responsibility to take action limiting any polluted discharge into creeks or storm system. Note on inspection slip that notice was delivered, using NPDES as the inspection code and OK as the result. This inspection code and result will open an inspection process in the AMANDA database system to allow reports and tracking of NPDES inspections.
3	Inspector	For large projects (which have an assigned Inspector of Record), when storm water site issues are observed during routine construction permit inspection, notify job superintendent to correct the condition and note on Inspection Notice that superintendent was notified. Enter "NPDES" Code onto inspection slip, with the result "Correction Needed." At next routine inspection of above project, "NPDES" will automatically be included on inspection slip as an inspection requested. If problem is resolved, mark "OK" as the NPDES inspection result. If problem is not resolved, again discuss with job superintendent and mark inspection result as "CN." For small projects (where no further inspection is planned), when storm water site issues are observed, refer to ESD and annotate the inspection slip with NPDES and CN. If there is a significant discharge (e.g., cannot be stopped immediately, significant clean up is required, or no superintendent onsite and it is raining), refer to ESD.
4	Inspector/ Supervising Inspector	If Step 3 results in "CN", call ESD to report observed problem as appropriate, and facilitate AMANDA report listing NPDES inspections and results for ESD. Report will include permit #, project location, address, dates of "NPDES" inspections and results of inspections. ESD then follows-up for enforcement and the Inspection slip is annotated to reflect referral to ESD.

Environmental Services – Construction Site Inspections

ESD inspectors assigned to construction inspection issues respond to complaint calls; these calls are treated much the same way any Illicit Connection/Illegal Discharge (IC/ID) call is handled. Calls come from PBCE and DPW inspectors and the public. ESD inspectors are trained to issue tiered enforcement response actions: education and cooperation (this lowest tier of enforcement response is also conducted by PBCE and DPW inspectors), official warning notices, and penalty application – administrative or misdemeanor citations.

Inspection response and enforcement actions are done in accordance with the adopted Watershed Enforcement Response Plan (WERP). See Attachment 2: *Enforcement Action Sequence Guidelines for Construction Site Inspections*.

Table 7. Procedure for Environmental Services Inspection and Enforcement

STEP	RESPONSIBILITY	ACTION
1	Inspector	Performs site inspections. Documents results in Environmental Enforcement Data Management System.
2	Inspector	Determines if there are any violations of the city's municipal codes. If violations are observed, determines appropriate enforcement response according to guidelines contained in the Watershed Enforcement Response Plan. Types of enforcement response: *Official Warning Notice* — A written notice explaining the municipal code violation and the corrective measures that need to be taken by the Responsible Party. *Administrative Citation* — A civil financial penalty imposed by the City of San Jose for a violation of a municipal code. It carries no criminal charges. Fine amounts are set in the schedule of fines by Council resolution. *Misdemeanor Citation* — A financial and criminal penalty. Fine amounts are set in the schedule of fines by resolution. This citation will become part of a criminal record for the responsible party. Court appearance is required.
3	Supervisor	Reviews administrative or misdemeanor citation with Inspector. Discusses enforcement response actions to be taken or follow-up needed. Advises inspector of any changes necessary.
4	Inspector	Documents violations and required corrective measures, and enforcement response in case file. Closes case when all items of enforcement response have been addressed.
5	Supervisor	Reviews closure of cases and "dead files" if approved.

Environmental Services – Feedback

Once ESD has completed enforcement actions on a construction site, the Inspector reports back to the reporting party the outcomes of the inspection and enforcement activities. If the party is from the public, then follow up is done via phone call. If the reporting party is a DPW or Bldg Inspector, a written response is sent and copied to the corresponding Chief Inspector. Response includes dates and outcomes of inspections, enforcement actions taken, and any scheduled follow up to be conducted by ESD.

Citywide Coordination

The Environmental Services Department conducts bi-weekly coordination meetings with City staff responsible for implementing the URMP, including the Construction Inspection Program. Construction Inspections are a regular topic of these meetings, which offer an opportunity for the departments to discuss specific site challenges, coordination issues, and overall program performance. Additional meetings are held as needed to resolve more complex issues. For Construction Inspections, the personnel are:

NAME	DEPARTMENT	PHONE NUMBER
Bill Smith	ESD (Coordinator)	945-5176
Martha Trejo	DPW (Chief Inspector)	998-6173

Timm Borden	DPW (Deputy Director)	277-3236
Bob Stevens	PBCE (Chief Bldg Inspector)	277-4586
John Mukhar	ESD (Enforcement Program Manager)	945-5304
Bhavani Yerrapotu	ESD (Enforcement Supervisor, Stormwater)	945-5326

Public Projects

Public Project Approval

Public Projects are required to follow erosion control and site clean-up measures found in *City of San Jose Standard Specifications, July 1992*. The City is ultimately responsible for production of the SWPPP. For Projects where City staff prepares the SWPPP (for example, Parks Facilities), a completed SWPPP must be prepared prior to approval of a given project so that SWPPP requirements will be listed when the project is put out for bid. The SWPPP may be prepared by a licensed engineer contracted by the City, but responsibility for preparation and adherence to the SWPPP will always fall under the City's purview. City engineers and inspectors conduct project-specific meetings with general contractors and grading contractors to review, approve, and periodically revise the project's SWPPP requirements.

New provisions regarding stormwater management in the Standard Specifications and been developed and will take effect in FY 04-05. These new provisions will be added to the existing Section 10-2 and will reinforce the responsibility of contractors on public projects to comply with storm water regulations. The provisions include a separate bid amount for the implementation of the SWPPP, a requirement for monthly certification from contractors certifying that BMPs are in place and being maintained, and the delay of invoice payment if such certifications are not kept current.

Public Project Inspections

During construction, Public Works project managers and inspectors monitor construction sites for adherence to the project Storm Water Pollution Prevention Plan (SWPPP). Deficiencies are corrected and the inspections are documented. ESD inspectors may also identify deficiencies and are empowered to enforce against the contractor for failure to implement and maintain adequate BMPs.

Attachments

Attachment 1. Public Works Inspection Report Form

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Public Works Department
Development Services Division
EROSION & SEDIMENT CONTROL INSPECTION REPORT

Permit Number: _____ Project Number: _____ Inspector: _____

Project Name: _____ Location: _____

? Submit copy of weekly report to office ?

Sheet _____ of _____

MONTH ☐☐ YEAR ☐☐

DAY OF THE MONTH

INSPECTION CHECKLIST	Date Installed
HYDROSEEDING / HYDROMULCHING	
MATTING / EROSION CONTROL BLANKETS	
1. Reinstall if dislocated or failed	
STABILIZED CONSTRUCTION ACCESS	
1. Check for tracking of mud/dirt onto streets, sidewalk, etc.	
2. Replace gravel when voids present	
3. Remove mud/dirt from pavement within 24 hours	
INLET PROTECTION	
1. Replace clogged filter fabric immediately	
2. No more than 6 inches of sediment	
SILT FENCE	
1. Check for torn or collapsed areas	
2. No more than 6 inches of sediment	
SEDIMENT TRAP	
1. No more than 6 inches of sediment	
SEDIMENT BASINS	
1. Check sediment storage zone (No more than half full)	
2. Check that debris has been removed from outfall	
WATTLES / FIBER ROLLS	
1. Repair or replace split, torn, unraveling or slumping fiber rolls	
OTHER INSPECTION AREAS	

DEFICIENCIES / ACTIONS TAKEN / OTHER COMMENTS

WEATHER CONDITIONS
Before, during or after rain event

ACTIONS
VERBAL – Verbal Warning
NOTICE – Notice of Unsatisfactory Condition
REFER TO ESD

All actions taken must include date and time of action, required or recommended corrective actions, and date deficiency is to be corrected.

Include logs and attach photos when referring to ESD.

Phone No:

Developer:

24-Hour Phone No.:

Responsible Person:

Attachment 2. Enforcement Action Sequence Guidelines for Construction Site Inspections

Enforcement Action Sequence Guidelines for Construction Site Inspections

These guidelines set forth the tiered approach for enforcement used by City of San Jose's environmental inspectors. The guidelines are intended to ensure consistent application of enforcement actions on parties responsible for illegal discharges to the storm sewer system, pursuant to San Jose Municipal Code Sections and in furtherance of the CON performance standards as stated in the URMP.

The City's general policy is to first educate responsible parties, and provide them an opportunity to comply (Level 1). Where a responsible party fails or refuses to respond to an educational approach, or the circumstances of a violation call for it, enforcement actions are escalated in a stepwise fashion (Levels 2, 3).

INSPECTOR ACTION	APPLICATION SITUATION (IF RAINING)	APPLICATION SITUATION (IF NOT RAINING)
LEVEL 1 - EDUCATION AND COOPERATION		
To provide information on prevention and minimizing non-stormwater discharges by 1. Describing best management practices (brochures, fact sheets, premium items, technology transfer, and verbal discussion.), 2. Identifying and documenting areas of concern and compliance date in the Construction Inspection Notes Page, and 3. Giving a verbal warning.	• If construction activity occurring, there is no tracking and the entrances are rocked (gravel laid down to stop sediment), but there is no sweeper or planned sweeping. • Any code violations present are immediately corrected and haven't resulted in discharges to storm.	• The entrances are rocked, but there is light tracking and a sweeper is not available (first offense). • Any code violations present are immediately corrected and haven't resulted in discharges to storm.
LEVEL 2 - OFFICIAL WARNING NOTICE		
Indicate seriousness of discharge while providing information and an opportunity to remedy or prevent violations in the following: 1. Describing best management practices if not previously provided, (brochures, fact sheets, premium items, technology transfer, verbal discussion), 2. Issuing an *Official Warning Notice*, and 3. Giving a verbal warning.	• If there is any tracking but it is cleaned up prior to discharge of sediments to the storm drain. • Any violations present that haven't yet resulted in a serious discharge to storm but cannot be immediately corrected. Serious impact defined as any of the following: 1. Large quantity: 10 gallons or more. 2. Hazardous or toxic substance in any quantity. 3. Adversely impacts receiving storm sewer system or water body. • Level 1 enforcement action previously issued. • At a follow up construction inspection or an ICID inspection the inspector observes the same or a new area of concern. • RP not accessible for a verbal warning but an appropriate location exists to post OWN (in mailbox, under	• The entrances are rocked, but there is light tracking and a sweeper is not available (second offense). • They have tracking (light or heavy) and the entrances are not rocked (first offense). • Any violations present that haven't yet resulted in a serious discharge to storm but cannot be immediately corrected. Serious impact defined as any of the following: 1. Large quantity: 10 gallons or more. 2. Hazardous or toxic substance in any quantity. 3. Adversely impacts receiving storm sewer system or water body. • Level 1 enforcement action previously issued. • At a follow up construction inspection or an ICID inspection the inspector observes the same or a new area of concern. • RP not accessible for a verbal warning but an appropriate location exists to

INSPECTOR ACTION	APPLICATION SITUATION (IF RAINING)	APPLICATION SITUATION (IF NOT RAINING)
	windshield wiper, etc).	post OWN (in mailbox, under windshield wiper, etc).
LEVEL 3 - PENALTY APPLICATION		
Indicate seriousness of discharge by issuing either an *Administration Citation* or a criminal complaint/*Misdemeanor Citation.* Note: Administrative Citations and Misdemeanor Citations must be approved by the supervisor before issuing.		
A. Compliance Schedule	Not an option	• The entrances are rocked, but there is light tracking and a sweeper is not available (after two warnings). • They have light tracking and the entrances are not rocked (after one warning). • They have heavy tracking and the entrances are not rocked, and situation has not been resolved after an administrative citation was issued. • Level 2 enforcement action previously issued. • Compliance issues are numerous and complex. • Discharge did not reach storm drain or it was a non-serious discharge. • City Attorney referral not yet necessary.
B. Administrative Citation	• Discharge into storm sewer and the impact is serious based on quality or quantity.· • There is any tracking of mud, and there is any discharge to an unprotected storm drain, gutter or other conveyance leading to the storm drain. • Level 2 enforcement action previously issued. • Compliance Meeting did not bring resolution, or RP did not follow compliance schedule.	• Discharge into storm sewer and the impact is serious based on quality or quantity. • They have heavy tracking and the entrances are not rocked (after one warning) • Level 2 enforcement action previously issued. • Compliance Meeting did not bring resolution, or RP did not follow compliance schedule.
C. Criminal Complaint/Misdemeanor Citation	• Level 2 enforcement previously issued and there is a flight risk possibility or immediately needs to be notified of wrongdoing. • Discharge causes serious impact to the storm drain sewer system and there is a flight risk or immediately needs to be notified of wrongdoing. • Enforcement action being conducted in coordination with another regulatory agency's enforcement actions.	

PSR STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for Public Streets, Roads, and Highways Program, which includes the Rural Public Works Program.

The various components of this section are organized as follows:

Department of Transportation

1. Spill Control in the Field
2. Litter/Debris Control
3. Leak Prevention
4. Street Sweeping
5. Vehicle and Equipment Cleaning and Maintenance in the Field
6. Pavement Marking Installation and Removal
7. Landscape Chemical Application
8. Roadway Irrigation System and Repair
9. Pavement Maintenance
10. SOP & BMP Annual Effectiveness Reviews
11. BMP: Saw-Cut Procedures

Parks, Recreation, & Neighborhood Services Department

12. Environmental Permitting for Rural Public Works Activities
13. Irrigation System Repair Adjacent to Roadways & Creeks
14. Landscape Chemical Application
15. Leak Prevention
16. Litter/Debris Control & Leaf Cleaning
17. SOP & BMP Annual Effectiveness Reviews
18. Spill Control in the Field
19. Unpaved Roads and Trails/Embankment Maintenance and Repair
20. Vehicle and Equipment Cleaning and Maintenance in the Field

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **1 of 4**	Section Number **01.01**
	Effective Date 6/1/00	Revised Date 08/02/04

01.01.1 PURPOSE

This procedure provides instructions for using spill-cleaning equipment in the field. Runoff pollution control guidance for general spill response is included in the Standard Operating Procedures for Spill Response for each of the City's corporation yards. Other related runoff pollution control guidance is included in the Standard Operating Procedures for *Spill Response*.

01.01.2 BACKGROUND

- Spills and leaks will occur from time to time. Some spilled materials, such as certain paints, cleaners and solvents may seem harmless because they are labeled "non-toxic" or "biodegradable." However, they are often far from harmless. Many of these materials are actually poisonous to the plants and animals that live in our creeks and in San Francisco Bay. Other chemicals, such as vehicle fuels and lubricants have long been known to be toxic. For these reasons, spills must be cleaned-up as soon as possible, before they can contaminate our waterways.
- For more information refer to City of San Jose Municipal Code 17.68.450 (Reporting Unauthorized Discharge) and 17.68.460 (Cleanup Responsibility).

01.01.3 POLICY

The Department of Transportation expects all of its employees to conduct their work to ensure that material spills in the field are avoided and that spills are responded to immediately and correctly. The goal of these procedures is to ensure that spill equipment is properly used so spills are quickly and properly contained, picked-up, disposed of, and documented. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with these procedures.

01.01.4 DEFINITIONS

Spill sizes are defined as follows:

- Small spill: up to 5 gallons
- Medium spill: 6-41 gallons
- Large spill: over 42 gallons

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **2 of 4**

Non-hazardous materials spills are defined as those involving:

- Concrete wash water
- Sawcut slurry
- Dirt, sand, and other sediment

Hazardous materials spills include, *but are not limited to*, the following (check the MSDS for the material if unsure):

- Solvents
- Adhesives
- Vehicle fluids (fuels, hydraulic fluid, antifreeze, etc…)
- Paints
- Landscape chemicals

At minimum, a spill kit shall include:

- a U.S. DOT-approved 6-gallon bucket with a "spin" top
- hazardous waste labels
- three sets of "Nitrile" surgical-type gloves
- granular absorbent material ("kitty litter")
- hydrophilic pads
- "pig" blanket
- three large plastic garbage bags
- one shovel

Responsibilities are defined as follows:

- Vehicle Driver/Crew Leader- person driving a truck, sweeper, paving machine, or operating other street maintenance equipment or a designated responsible party
- Supervisory Staff - management staff in the Department of Transportation
- Staff Responsible for Spill - person who accidentally caused the spill
- Department of Transportation Staff – any non-management employee of the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **3 of 4**

01.01.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Vehicle Driver/ Crew Leader**	**Pre-departure Spill Kit Check (conduct at beginning of each shift)** • Ensure that vehicle has spill kit • Check spill kit to make sure all components are present • Make sure lids of all spill kit containers are secure • Contact supervisor if spill kit is missing or incomplete
	Supervisory Staff	• Contact GSD to request spill kit or spill cleaning equipment
2.	**Staff Responsible for Spill**	**For Small spills (up to 5 gallons):** • Use appropriate personal protection before beginning clean-up (gloves, boots, etc.). • Use "dry" methods to clean the spill-do not wash spill area with water or other liquids. • As much as possible, clean-up and contain the spill by using "kitty litter," rags or absorbent pads. • Identify substance spilled (hazardous or non-hazardous). Read the container label. Refer to the MSDS if necessary. • Block storm drain inlets and divert flow of material away from gutters or inlets to ensure spilled materials do not reach storm drain. As necessary, use pea gravel bag check dams, pig blankets and/or secure catch basin inlet with filter fabric • Ensure that all traffic is diverted from spilled substance by posting a sign or cone. • For spills on dirt areas, dig up and remove contaminated soil. **For Medium spills (6 – 41 gallons) add:** • Contact the Department of Transportation Dispatcher to report the spill. If applicable, provide the I.D. number of affected catch basin(s). • Contact Supervisory Staff. **For Large Hazardous spills (over 42 gallons) add:** • Call HIT UNIT (911 or 111 on City phone), and Dispatch (x-4373).
	Dispatcher	• Contact Department of Transportation "Complaint Truck" to bring additional spill clean-up supplies to the spill site.
2.	**Supervisory Staff**	**For Medium spills (6 – 41 gallons):** • Contact ESD Duty Inspector at 945-3000. **For Large spills (over 42 gallons) add:** • Call HIT UNIT (911 or 111 on City phone). • Contact State Office of Emergency Services (1-800-852-7550).
3.	**Staff Responsible for Spill**	**Disposal of Spent Spill Cleaning Materials** • Sweep up the used absorbent and place it in the spill kit bucket, or other designated container. Label the container with labels supplied in the spill kit. • If spill occurs in dirt area, place removed contaminated soil in spill kit bucket or other designated container. Label the container with labels supplied in the spill kit. • If rags or absorbent pads were used, place in either the spill kit or a plastic garbage bag included with the spill kit. Label the bucket or bag with labels supplied in the spill kit. • Bring spent spill cleaning materials to the corporation yard and place in approved disposal location.

	Staff Responsible for Spill	**Spill Documentation** • Alert supervisor to log-in spill.
5.	**Supervisory Staff**	• Document all spill activity in spill logs (located in Hazardous Materials Management Plan binder) and ensure records are kept on-site.
6.	**Department of Transportation Staff**	For spills witnessed off-site which are not caused by staff, contact the ESD Duty Inspector at 945-3000.
	Supervisory staff	**General Guidance** • Ensure all appropriate staff are aware of spill kit materials and spill cleaning procedures.

01.01.6 REFERENCES

- SJMC 17.68.450
- SJMC 17.68.460
- California Governor's Office of Emergency Services, "Hazardous Material Spill/Release Notification Guidance," January 2002.
- City of San Jose Urban Runoff Management Plan, 2002, Public Roads, Streets and Highways Operation and Maintenance Performance Standards

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Litter/Debris Control**	Page **1 of 2**	Section Number **01.02**
	Effective Date 06/01/00	Revised Date 08/02/04

01.02.1 PURPOSE

This procedure provides instructions for controlling urban runoff pollution during the collection of litter and debris. Guidance for cleaning spills and leaks is included in the Standard Operating Procedures for *Spill Response* and *Spill Control in the Field*. The Storm Water Pollution Prevention Plan (SWPPP) for each of the City's corporation yards contains guidance on materials stockpiling and the use of designated debris storage areas.

01.02.2 BACKGROUND

Properly removing litter and debris from the City's rights-of-way will help reduce the amount of contaminants discharged to the storm drain system. Minimizing these contaminants will limit harmful impacts to animals and plants living in downstream creeks and San Francisco Bay.

01.02.3 POLICY

It is the policy of the Department of Transportation to remove litter and debris from the City right-of-way on a continuous basis. The goal of these procedures is to ensure that litter and debris are removed, transported and disposed of in ways that minimize water pollution as much as possible. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper methods of litter and debris collection, transportation and disposal. All Department staff are required to understand and comply with these procedures.

01.02.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – non-supervisory laborers in the Department of Transportation
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Litter/Debris Control**	Page **2 of 2**

01.02.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**Litter and Debris Collection Schedule** • The General Complaint truck crew removes non-hazardous debris in the right-of-way on a continuous basis. • Landscape Services crews remove debris from landscaped areas in the right-of-way on a continuous basis. • Blight Abatement crews remove debris from the right-of-way in five Redevelopment areas on a continuous basis. • Blight Abatement crews empty five civic litter modules in the Paseo de San Antonio twice per week.
2.	**Field Staff**	**Hazardous Material Response** • If debris is suspected of being hazardous, follow the procedures contained in the DOT Emergency Response Manual. • Contact the DOT Dispatcher to coordinate removal by the City's HIT Unit.
	Dispatcher	• Contact the City's HIT Unit to remove possible hazardous debris.
3.	**Field Staff**	**Site Clean-Up** • As necessary, after collecting the debris, use dry methods, such as sweeping or vacuuming, to clean the collection site. • If leachate has leaked from civic litter modules, contact Supervisory Staff to arrange for cleaning.
	Supervisory Staff	• Contact the General Complaint Truck to arrange for leachate removal from around City-maintained civic litter modules. • If dripped leachate is a problem around contractor-maintained litter facilities, contact the ESD Integrated Waste Management, Civic Services Division, at 277-5533.
4.	**Field Staff**	**Transporting Litter and Debris to the Corporation Yard** • It is important to prevent collected litter and debris from leaking or blowing out of City vehicles as it is transported to the corporation yard for temporary storage. • Plastic, paper or other lightweight debris shall be placed under a secured tarp or in an enclosed container (bag, lidded can or bucket) as it is picked-up. • Wet, dripping debris shall be placed in a waterproof container (bag, lidded can or bucket) as it is picked-up.
5.	**Field Staff**	**Litter and Debris Disposal** • Litter and debris shall be unloaded from the City vehicle to the designated debris storage area(s) at the corporation yard (see the SWPPP for the particular corp yard).
6.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of litter and debris control procedures.

01.02.6 REFERENCES

- City of San Jose Urban Runoff Management Plan, 2002, Public Roads, Streets and Highways Operation and Maintenance Performance Standards

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Leak Prevention**	Page **1 of 2**	Section Number **01.03**
	Effective Date 6/1/00	Revised Date 08/02/04

01.03.1 PURPOSE

This procedure provides instructions for minimizing leaks from vehicles and equipment. Runoff pollution control guidance for spill response is included in the Standard Operating Procedures for Spill Response for each of the City's corporation yards, and in the Standard Operating Procedures for *Spill Response, Spill Control in the Field*, and *Vehicle and Vehicle and Equipment Cleaning in the Field.*

01.03.2 BACKGROUND

Vehicle fuels, lubricants, pesticides and other chemicals and materials associated with street maintenance have long been known to be damaging to plants and animals. Unchecked leakage from vehicles and equipment can cause toxic chemicals and clogging sediments to be washed into storm drains, creeks and San Francisco Bay. For this reason, vehicles and equipment must be keeps in good working order to minimize leaks that could contaminate our waterways.

For more information refer to City of San Jose Municipal Code 17.68.450 (Reporting Unauthorized Discharge) and 17.68.460 (Cleanup Responsibility).

01.03.3 POLICY

The Department of Transportation expects all of its employees to operate their vehicles and equipment to ensure that leaks are minimized. The goal of these procedures is to ensure that vehicles and equipment routinely inspected, maintained and operated to reduce leaks as much as possible. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with these procedures.

01.03.4 DEFINITIONS

Responsibilities are defined as follows:

- Vehicle Driver/Crew Leader - person driving a truck, paving machine, or operating other street maintenance equipment or their designated responsible party
- Field Staff - any non-management employee of the Department of Transportation
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Leak Prevention**	Page **2 of 2**

01.03.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Vehicle Driver/ Crew Leader**	**Pre-departure Inspection (conduct at beginning of each shift)** • Inspect pavement under and around vehicles to check for leaks. • Inspect equipment on vehicles to check for leaks. • Check spray rigs (landscape maint.) for leaks and worn hoses. • Inspect seals on vehicles and equipment for signs of wear or malfunction.
2.	**Field Staff**	**Leak Reporting** • Report leakage from other DOT vehicles or equipment to Supervisory staff. • Report leakage from other City vehicles or equipment to Supervisory staff.
	Supervisory staff	• Contact GSD to request vehicle or equipment maintenance. • Report leakage from other City vehicles or equipment to Environmental Enforcement at 945-3000.
3.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of leak prevention procedures.

01.03.6 REFERENCES

- SJMC 17.68.450
- SJMC 17.68.460
- CalTrans Storm Water Quality Handbook Maintenance Staff Guide May 2003, Appendix B Activity Cut Sheets, E Family – Landscaping, Chemical Vegetation Control

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Street Sweeping**	Page **1 of 2**	Section Number **1.04**
	Effective Date 6/1/00	Revised Date 08/02/04

1.04.1 PURPOSE

This procedure provides instructions for controlling pollutants that can result from mechanical sweeping operations.

1.04.2 BACKGROUND

Street sweeping has been proven through numerous studies to be effective in removing non-point source pollutants from our streets and roadways. Thus, the continuation of this maintenance activity is critical to the City achieving compliance with its NPDES permit. If performed correctly, sweeping operations can maximize its effectiveness in pollutant removal.

1.04.3 POLICY

The Department of Transportation expects all of its employees to conduct their work in a manner that minimizes the introduction of contaminants into the storm drainage system to the greatest extent practicable. The goal of these procedures is to ensure that sweeping personnel conduct their work in such a manner. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with these procedures.

1.04.4 DEFINITIONS

Responsibilities are defined as follows:

- Sweeper Driver - person driving the street sweeping vehicle
- Heavy Equipment Staff – person or persons who are assigned the duty of retrieving debris at designated temporary dump site
- Vehicle Maintenance Staff – any city employee who performs routine maintenance or cleaning of a sweeper
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Street Sweeping**	Page **2 of 2**

1.04.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Sweeper Driver**	**Sweeper Operations** • Use caution when encountering materials that may be hazardous. Sweep around such debris and notify dispatch or SJ20 to issue work order to ensure that Hazmat team will be contacted. • Adjust brooms to achieve maximum sweeping efficiency. • Operate vehicle within the speed recommended by the manufacturer. • Check hopper frequently to prevent overloading.
	Supervisory Staff	• Contact Environmental Enforcement at 945-3000 to report hazardous materials that are discovered by staff. • Conduct storm water pollution prevention awareness training for all employees involved in street sweeping.
2.	**Streets and Traffic Staff**	**Debris Storage and Pick-up** • Properly dispose of sweeper debris only at approved dump sites • Dump site should be as far away from catch basin as practical, without interfering with passing traffic, or altering the general location of the dump site. Minimum desired distance from CB is 100 feet. • Resweep debris area following pick-up by Heavy Equipment Driver
	Heavy Equipment Staff	• Schedule work to ensure pick-up of sweeper debris on the same day that the debris was deposited on the street. • Transport debris to nearest City Corporation Yard and deposit in General Debris piles. • Contact sweeper driver to perform final clean-up of dumpsite.
3.	**Sweeper Driver**	**Sweeper Maintenance** • Clean sweepers in an approved area to capture solid material and prevent pollutants from running into storm drain system. Sweeper should never be rinsed or washed down in the field.
	Vehicle Maintenance Staff	• Clean sweepers in an approved area to capture solid material and prevent pollutants from running into storm drain system

1.04.6 REFERENCES

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Vehicle and Equipment Cleaning and Maintenance in the Field**	Page **1 of 3**	Section Number **01.05**
	Effective Date 6/1/00	Revised Date 08/02/04

01.05.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from cleaning and maintaining vehicles and equipment in the field. Runoff pollution control guidance for vehicle and equipment cleaning in the corporation yards is included in the Storm Water Pollution Prevention Plans for each of the City's corporation yards. Other related runoff pollution control guidance is included in the Standard Operating Procedures for *Concrete Installation; Pavement Repair; Landscape Chemical Application; Leak Prevention*; *Spill Response* and *Spill Control in the Field.*

01.05.2 BACKGROUND

Many vehicle fuels, lubricants, pesticides and other chemicals used for street maintenance are known to be toxic to animals and plants. When these materials drip on to paved surfaces, they can be inadvertently washed to storm drains and find their way to downstream creeks and the San Francisco Bay. To minimize possible contamination of our waterways, routine vehicle and equipment cleaning and maintenance should occur only in the corporation yards, where they can be serviced in areas that do not discharge to storm drains. Field servicing of vehicles and equipment shall be conducted only if, by not doing so, there is a risk of spills or leaks.

01.05.3 POLICY

The Department of Transportation expects all of its employees to conduct their work to minimize spills and leaks. The goal of these procedures is to identify when it is appropriate to clean or maintain vehicles or equipment in the field. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained to limit the field servicing of vehicles and equipment. All Department staff are required to understand and comply with these procedures.

01.05.4 DEFINITIONS

Responsibilities are defined as follows:

- Equipment Operator – person driving truck, sweeper, paving machine, or other vehicle or using DOT equipment or tools
- Supervisory Staff - management staff in the Department of Transportation
- Field Staff – non-supervisory laborers in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Vehicle and Equipment Cleaning and Maintenance in the Field**	Page **2 of 3**

01.05.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Equipment Operator**	**Paving Vehicle and Equipment Cleaning** • Major routine vehicle cleaning shall be done in the corporation yards. • The paving box shall be cleaned over the work area. • Diesel shall not be used on the dump trucks hauling hot asphalt concrete. • Extreme caution shall be used when using diesel or citrus cleaner in the field. • Make sure an approved spill kit is on-hand prior to beginning cleaning. • Diesel used for tool and equipment cleaning shall be transported to the job site in an approved fuel container. • Use a funnel to transfer spent cleaner back in to the approved fuel container. • Spent diesel shall be disposed of to the designated 55-gallon drum in the corporation yard. • Used citrus cleaner shall be disposed of to the debris transfer pile. • In the event of a diesel spill, follow the SOP for *Spill Control in the Field*.
2.	**Field Staff**	**Concrete Finishing Tool Cleaning** • When possible, concrete finishing tools shall be cleaned in the corporation yard • Follow the SOP for *Handling and Disposal of Concrete and Cement.* • If concrete-finishing tools must be cleaned in the field, the wash water shall be taken back to the corporation yard for proper disposal. • Concrete rinse water shall not be drained to gutters or catch basins • If concrete rinse water is spilled, follow SOP for *Spill Control in the Field.*
3.	**Field Staff**	**Other DOT Equipment Cleaning** • Landscape chemical spray equipment shall not be cleaned in the field. All cleaning shall occur in the corporation yard. • Pavement marking equipment shall not be cleaned in the field. All cleaning shall occur in the corporation yard. • If unsure if field cleaning is permitted, contact the Supervisory staff.
	Supervisory Staff	• If unsure if field cleaning is permitted, contact the ESD Duty Inspector at 945-3000.
4.	**Equipment Operator**	**Vehicle or Equipment Maintenance:** • Routine maintenance shall occur in the corporation yards. • If there is a vehicle or equipment breakdown, evaluate whether continuing to operate the machinery in its malfunctioning condition would result in a potential leakage risk. • If there is no leakage risk from doing so, return malfunctioning machinery to corporation yard for repair. • If malfunctioning machinery would result in a leakage risk if moved, evaluate if field servicing would reduce this risk. • If servicing malfunctioning machinery in the field would be less of a leakage risk than driving it back to the corporation yard, fix equipment at the job site. • If field servicing is necessary and the driver or operator is not able to do so, call Supervisory staff for assistance.
	Supervisory Staff	• Contact GSD to request assistance with field servicing vehicle or equipment. • If spill occurs, follow the SOP for *Spill Control in the Field*.
5.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of vehicle and equipment cleaning and maintenance procedures.

STANDARD OPERATING PROCEDURES

01.05.6 REFERENCES

- City of San Jose Urban Runoff Management Plan, 2002, Public Roads, Streets and Highways Operation and Maintenance Performance Standards

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Pavement Marking Installation and Removal**	Page **1 of 2**	Section Number **01.06**
	Effective Date 6/1/00	Revised Date 08/02/04

01.06.1 PURPOSE

This procedure provides instructions for controlling runoff pollution that could occur during pavement marking installation and removal. Other related runoff pollution control guidance is included in the South Yard Storm Water Pollution Prevention Plan (SWPPP) and the Standard Operating Procedures for *Vehicle and Equipment Cleaning and Maintenance in the Field, Leak Prevention* and *Spill Control in the Field.*

01.06.2 BACKGROUND

Pavement marking installation involves the use of paints, solvents and/or adhesives. The removal of pavement markings may generate paint chips and sediment. Many of the chemicals used in these activities are poisonous to the plants and animals that live in our creeks and in San Francisco Bay. In addition, sediments may clog fish spawning grounds and otherwise damage wildlife habitats. To minimize possible harm to our waterways, every effort should be made to minimize the amount these materials entering the storm drain system during pavement marking installation and removal.

01.06.3 POLICY

The Department of Transportation expects all of its employees to conduct their work to minimize the introduction of contaminants into the storm drainage system. Supervisory staff shall ensure that all appropriate staff and contract personnel receive training on these procedures. All Department staff are required to understand and comply with these procedures.

01.06.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – person installing or removing the pavement marking
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Pavement Marking Installation and Removal**	Page **2 of 2**

01.06.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**Pavement Marking Installation** • Prior to leaving the South Yard, check vehicles and equipment for leaks (per SOPs for *Leak Prevention*). • Prior to leaving the South Yard, make sure a spill kit is on each painting truck. • All paint loading shall occur in the South Yard. • In the event of a spill, follow the procedures in the DOT Spill Response Manual and the SOPs for *Spill Control in the Field*. • Clean up and dispose of all waste per the applicable MSDS. • Any paint chips dislodged from the legend stencils shall be vacuumed or swept up, placed in a plastic bag or other secure container and taken back to the South Yard for proper disposal (see the South Yard SWPPP regarding designated disposal location).
2.	**Field Staff**	**Pavement Marking Removal** • Although lead paint is no longer used, if the paint to be removed is yellow and could have been installed prior to 1973, it might contain lead. Contact supervisory staff to have paint tested for lead. • Lead-free grindings resulting from the removal of pavement legends or striping shall be vacuumed or swept up, placed in a plastic bag or other secure container and taken back to the South Yard for proper disposal. • If paint contains lead, sweep or blow all grindings into plastic bags. Label bags to identify them as containing lead. Return bags to the South Yard for proper disposal.
	Supervisory Staff	• Contact HIT UNIT to arrange for lead testing and, as necessary, disposal of lead-bearing grindings.
3.	**Field Staff**	**Vehicle and Equipment Cleaning and Maintenance** • All vehicle cleaning and maintenance shall occur in the corporation yard (per the SOPs for *Vehicle and Equipment and Cleaning and Maintenance in the Field*). • Legend stencil cleaning shall be done at the South Yard in a designated location that is covered and where the wash water is directed to the sanitary sewer (see the South Yard SWPPP).
4.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of pavement marking installation and removal procedures.

01.06.6 REFERENCES

- City of San Jose Urban Runoff Management Plan, 2002, Public Roads, Streets and Highways Operation and Maintenance Performance Standards

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Landscape Chemical Application**	Page **1 of 2**	Section Number **01.07**
	Effective Date 6/1/00	Revised Date 08/02/04

01.07.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from the application of herbicides, pesticides and fertilizers. Other related runoff pollution control guidance is included in the Standard Operating Procedures for *Spill Control in the Field* and *Leak Prevention*.

01.07.2 BACKGROUND

Many herbicides, pesticides and fertilizers are toxic to the plants and animals that live in our creeks and in San Francisco Bay. For this reason, these chemicals must be stored, mixed and applied carefully to minimize contamination of our waterways.

01.07.3 POLICY

The Department of Transportation expects all of its employees to conduct their work to minimize the introduction of contaminants into the storm drainage system. It is recognized that the State of California regulates the application of these chemicals. The goal of these procedures is raise the awareness of landscape chemical applicators as to the impacts of their activities on water quality and local wildlife so that adverse impacts are minimized. Supervisory staff shall ensure that all appropriate staff and contract personnel receive training on these procedures. All Department staff are required to understand and comply with these procedures.

01.07.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – person mixing and applying herbicides, pesticides or fertilizers
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Landscape Chemical Application**	Page **2 of 2**

01.07.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**Equipment Maintenance** • Check fuel level in equipment at the beginning of the shift. • When possible, fuel equipment at the corporation yard. • If fueling must be done in the field, do so away from gutters and storm drain inlets. • Calibrate the spray rig at the beginning and middle of each shift. • Clean spray equipment at a designated location at the corporation yard, not in the field.
2.	**Field Staff**	**Chemical Mixing and Application** • Mix only as much of the particular landscaping chemical as is needed for the specific application. • Mix landscaping chemicals in the landscaping, away from catch basins and gutters. • Apply landscaping chemicals only as specified on the label. • Avoid applying fertilizer during wet weather. • Remove fertilizer inadvertently applied to paved areas by sweeping or rinsing it to landscaping (away from catch basins). • In the event of a spill, follow the SOP for *Spill Control in the Field.*
	Supervisory Staff	• In the event of a spill, follow the SOP for *Spill Control in the Field*
3.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of landscape chemical application procedures.

01.07.6 REFERENCES

CalTrans Storm Water Quality Handbook Maintenance Staff Guide May 2003, Appendix B Activity Cut Sheets, E Family – Landscaping, Chemical Vegetation Control

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Roadway Irrigation System Repair**	Page **1 of 2**	Section Number **01.08**
	Effective Date 6/1/00	Revised Date 08/02/04

01.08.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from roadway irrigation system repair. Other related runoff pollution control guidance is included in the Standard Operating Procedures for *Spill Control in the Field.*

01.08.2 BACKGROUND

Irrigation system breakdowns and repair frequently generate mud and debris. If these contaminants are discharged to the storm drain system, they may be harmful to animals and plants living in downstream creeks and San Francisco Bay. Sediments may clog fish spawning grounds and otherwise damage wildlife habitats. To minimize possible harm to our waterways, when repairing the City's irrigation systems, every effort should be made to minimize the amount of sediment and debris entering the storm drain system.

01.08.3 POLICY

The Department of Transportation expects all of its employees to conduct their work to minimize the introduction of contaminants into the storm drainage system. The goal of these procedures is to guide technicians to inspect the affected storm drain system and clean up after the irrigation system is repaired. Supervisory staff shall ensure that all appropriate staff and contract personnel receive training on these procedures. All Department staff are required to understand and comply with these procedures.

01.08.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – person performing the irrigation system repair
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Roadway Irrigation System Repair**	Page **2 of 2**

01.08.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**General Response** • Valve off water to the broken line as soon as possible. • Repair the system as soon as the break is noticed. • Prevent dislodged soil from entering catch basins. If necessary, use pea gravel bag check dams, pig blankets and/or block catch basin inlet with filter fabric • Pour muddy water bailed from repair location into the adjacent landscaping. If possible, bail to bucket or drum to settle before draining. Do not pour muddy water in the gutter or catch basin.
2.	**Field Staff**	**Storm Drain System Inspection** • If repair involves pipe blow-out and occurs during wet weather, check for excessive loose soil in gutter or on pavement. Loose soil should be removed from these areas and stockpiled under a tarp, if it is raining. • After the repair is finished check the downstream catch basin(s) for accumulated mud and debris.
3.	**Field Staff**	Storm Drain System Cleaning • As necessary, based on the storm drain inspection, remove mud and debris from the gutter and/or catch basins. • If field staff suspects that mud had flowed into the downstream storm drain pipe, contact the Supervisory staff to arrange additional clean-up. • Replace dislodged soil in hole after irrigation system has been repaired.
	Supervisory Staff	• As necessary, arrange for "Vactor" truck to clean storm drain lines downstream of repair site.
4.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of roadway irrigation system repair procedures.

01.08.6 REFERENCES

CalTrans Storm Water Quality Handbook Maintenance Staff Guide May 2003, Appendix B Activity Cut Sheets, E Family – Landscaping, Irrigation Line Repairs

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Pavement Maintenance**	Page **1 of 2**	Section Number **01.09**
	Effective Date 6/1/00	Revised Date 08/02/04

01.09.1 PURPOSE

This procedure provides instructions for controlling pollutants that can result from pavement maintenance activities, including crack and joint repair, chip seal, pothole repair and removal and replacement of asphalt concrete.

01.09.2 BACKGROUND

Pavement maintenance involves the grinding, removal and placement of construction and native material. These operations have the potential to generate mud and other construction debris. If these contaminants are discharged to the storm drain system, they may be harmful to animals and plants living in downstream creeks and San Francisco Bay. Sediments may clog fish spawning grounds and otherwise damage wildlife habitats. To minimize possible harm to our waterways, when performing pavement maintenance, every effort should be made to minimize the amount of sediment and debris entering the storm drain system.

01.09.3 POLICY

The Department of Transportation expects all of its employees to conduct their work in a manner that minimizes the introduction of contaminants into the storm drainage system to the greatest extent practicable. The goal of these procedures is to ensure that pavement maintenance personnel conduct their work in such a manner. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with these procedures.

01.09.4 DEFINITIONS

Responsibilities are defined as follows:

- Maintenance Personnel – any person performing crack and joint repair, chip seal, pothole repair and removal and replacement of asphalt concrete or other pavement maintenance activities.
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Pavement Maintenance**	Page **2 of 2**

01.09.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Maintenance Personnel**	**General Pavement Maintenance Operations** • Perform a pre and post-operational check of all equipment used to observe any failures of the equipment that could result in the spillage of fluids or materials • Prior to performing work, inspect work area and protect affected drainage systems, especially Drainage Inlets and manhole covers, where loose asphalt concrete and pavement materials can cause sediment and/or toxicity problems. Take precautions not to spill or dispose of any material into these facilities. • Place drip pans or other absorbent material under paving equipment when not in use. • Do not leave paving or removed material along the side of the roadway for extended periods of time to prevent rain water from leaching sediment or other pollutants into the storm drain sewer. • Prior to cleaning equipment in field, ensure that a spill kit is readily available. • When cleaning equipment, use an appropriate container to capture and excess material or solvent. • If a leak or spill does occur, initiate proper clean-up. Refer to Spill Response SOP.
	Supervisory Staff	• Conduct storm water pollution awareness training for all employees involved in this operation
2.	**Maintenance Personnel**	**Pothole Repair** • Avoid pothole repairs in wet weather, when possible. It is recognized that during periods of rain, emergency pothole repairs must be performed to minimize vehicle hazards. If these circumstances arise, use products that can be applied in wet weather that do not run upon contact with rain water. • Regularly repair potholes to reduce sediment loading.
3.	**Maintenance Personnel**	**Removal and Replacement of Asphalt Concrete** • Collect and recycle removed asphalt material whenever possible. • Properly dispose of old asphalt and/or grindings when not recycled • Avoid repair work during wet weather conditions
4.	**Maintenance Personnel**	**Chip Seal** • Cover or dike drainage affected inlets if necessary • Thoroughly sweep up loose aggregate with power sweeper. Two separate sweeps should be scheduled for every pavement zone: one occurring within 72 hours after the placement of the Chip Seal, and one, approximately 30-60 days following the placement of the Chip Seal. • Check all DI's within the pavement area to ensure that rock and/or other construction debris has not been deposited. If necessary, remove grate and clean.
	Supervisory Staff	• Upon completion of the final sweep, notify Drainage Inlet Cleaning Crew to begin work on DI's within pavement area using Vactor vehicles.

01.09.6 REFERENCES

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **SOP & BMP Annual Effectiveness Reviews**	Page **1 of 2**	Section Number **1.10**
	Effective Date 06/30/02	Revised Date 08/02/04

1.10.1 PURPOSE

This procedure provides instructions for the annual review of the effectiveness of Department of Transportation (DOT) Standard Operating Procedures (SOP) and Best Management Practices (BMP) for storm water pollution prevention.

1.10.2 BACKGROUND

DOT maintains and uses a number of SOPs and/or BMPs aimed at preventing or limiting pollutants from entering the storm drain system as a result of vehicle operations, maintenance work on roads and storm drain systems, or from application of landscape chemicals. Pollutants of concern are asphaltic compounds, fuels, lubricants, solvents, cleaners, sediment, herbicides, fertilizers and pesticides, litter, debris, and illegally dumped hazardous materials. These SOPs include, but are not limited to, procedures for:

- Pavement Maintenance Operations
- Field Cleaning Paving Vehicles and Equipment
- Handling and Disposal of Concrete/Cement
- Vehicle and Equipment Maintenance
- Roadway Irrigation System Repair
- Landscape Chemical Application
- Leak Prevention
- Litter/Debris Control
- Pavement Marking Installation and Removal
- Street Sweeping
- Spill Clean-up
- Infrastructure Maintenance Division Storm Drain System Problem Area Report

1.10.3 POLICY

The Department of Transportation (DOT) expects all of its employees to conduct their work in a manner that minimizes the introduction of contaminants into the storm drain system to the greatest extent practicable. The goal of these procedures is to ensure that DOT crews have up-to-date and accurate BMPs and SOPs for storm water pollution prevention. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of the applicable BMPs and SOPs for their job duties. All Department staff are required to understand and comply with these procedures.

STANDARD OPERATING PROCEDURES

Subject: **SOP & BMP Annual Effectiveness Reviews**	Page **2 of 2**

1.10.4 DEFINITIONS

- Supervisory Staff – management staff in DOT
- Field Staff – non-supervisory laborers in DOT
- Equipment Operator – person driving truck, paving machine, or other vehicle or using DOT equipment or tools
- Heavy Equipment Staff – person or persons who are assigned the duty of retrieving debris at designated temporary dump sites
- Maintenance Personnel – any person performing crack and joint repair, chip seal, pothole repair, and removal and replacement of asphalt concrete or other pavement maintenance activities
- Sweeper Driver – person driving the street sweeping vehicle
- Vehicle Driver/Crew Leader – person driving a truck, sweeper, paving machine, or operating other street maintenance equipment or a designated responsible party or parties
- BMPs – Best Management Practices
- SOPs – Standard Operating Procedures
- ESD – Environmental Services Department.

1.10.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Supervisory staff, Field staff, and ESD staff**	• On an annual basis, DOT supervisory staff and field staff will review and evaluate the effectiveness of DOT SOPs and any other BMPs in use in reducing pollutants in storm water and eliminating illicit discharges. This review and evaluation will normally occur as a part of the annual municipal training on City Urban Runoff NPDES requirements. This training is conducted by ESD staff in the May/June time frame.
	ESD staff	• During training, feedback will be gathered from affected DOT supervisory and field staff. The feedback will be circulated and evaluated by ESD and DOT supervisory staff. Any proposed changes to SOPs and BMPs resulting from this process will go through the ESD Watershed Analysis Division and the DOT Street Services Division for approval.
2.	**ESD staff**	• A summary of the findings and results of this process will be described in the City of San Jose Urban Runoff Management Plan Annual Report which is submitted in September of each year.

1.10.6 REFERENCES

CITY OF SAN JOSE - MEMORANDUM

TO: Terry Murdock
Don Schulz

FROM: James A. Leitner

SUBJECT: **BMP: SAW-CUT PROCEDURES**

DATE: June 4, 1999

APPROVED:

DATE:

Thank you for you comments on our proposed BMP distributed on March 22, 1999. Your resourcefulness and creativity have helped us to create a BMP that attains both high acceptance from the crews and greater effectiveness in pollutant removal. Below is our latest iteration of the BMP. It shall apply to all asphalt and PCC saw-cutting operations. Please review the procedures and guidelines for controlling saw cutting slurry.

For all saw-cutting operations, the following rules apply:

- The saw cut operator and his crew are responsible for any contamination reaching the storm inlet system.
- Never saw during a rain event or if rain is forecasted.
- Use burlap sacks filled with approved material. Place burlap bags in the prevailing flow direction. If practical place burlap sacks just before storm inlets.
- Avoid the use of sandbags as they contribute to storm inlet siltation. Approved fill material for the bags include pea gravel, and drain rock. The choice of material should consider whether the crew wishes to dam saw-cut slurry, or filter it. Field experience has shown that drain rock ¾" or larger tends to provide little visible filtration.

For most paving operations, the following guidelines are to be followed:

- Continually monitor water passing through the sacks to assure it is clear and clean. Create second sack barrier if first isn't adequate. Likewise, create a third barrier if first two don't clean up the water. Bring adequate number of pre-made burlap sacks for anticipated number of check dams. Any water that leaves the site via a drainage inlet or past the last check dam shall be monitored for clarity.
- Upon completion of saw-cutting, sweep slurry residue on the street into piles. Allow liquids to drain toward curb and gather remaining solids with hand tools for disposal at the Service Yards. Use a vacuum to collect any remaining residue.
- Once liquid has dissipated from the slurry at the curb and gutter, pick up solids with a shovel. Vacuum any remaining residue.
- Saw cut slurry may be directed to alligatored area only if that pavement section is to be immediately excavated and removed.
- Survey site to ensure that site is no longer contaminated. Repeat any steps above if necessary.

Sawcutting may be performed under conditions that do not permit the construction of check dams. These conditions include high traffic conditions, and inadequate distance to a catch basin to perform proper filtration. Under these circumstances, our department recommends the following procedure:

- Construct dam around the catch basin or at nearest practical location.
- Immediately remove all slurry material from the saw-cut area by following behind the saw-cut operator with a vacuum cleaner
- Collected slurry shall be stored and transported in 55 gallon drums or other approved containers.
- Collected slurry shall be returned to the Service Yards for proper decanting.

Under our procedures, crews will be asked to collect and dispose of slurry waste. If slurry is concentrated or mostly solid, debris may be dumped directly onto the "dirty rubble" pile. If slurry has a high water content, the following procedure should be followed:

- Slurry should be allowed to rest for at least 24 hours or more to allow silt to settle from the liquid.
- Upon completion of the Service Yard Capital Improvement Project, sanitary sewer facilities will be available for decanting slurry at all of the Streets and Traffic service yards. Ultimately, all decanting should be directed to a sanitary sewer. At present, all decanting at the Mabury Yard shall be to the sanitary sewer via a manhole located directly behind the wash rack. When decanting into sanitary sewer lines, crews shall continue to employ check dams to prevent blockage of sanitary lines with silt. However, when decanting directly into a wash rack, no check dams are necessary. In either case, decanting should cease as soon as fluid turns cloudy. Remaining slurry can be disposed onto the "dirty rubble" pile.
- Until sanitary facilities are completed, settled slurry may be decanted into storm facilities. Decant clear water off top of waste receptacle at the yard using a siphon pump. If water is to be directed toward the storm sewer, place a drain rock check dam along curb and gutter to prevent accidental spillage from reaching storm inlet. As soon as the siphon fluid turns cloudy, stop decanting and deposit remaining slurry onto the "dirty rubble" pile.

Please comment on the proposed procedures. Upon approval by Environmental Services, this procedure will become an attachment to the Paving Operations BMP. Please contact me at x5503 or Raymond Ho of my staff at x2571 for your reaction to this procedure proposal.

JAMES A. LEITNER,
Senior Civil Engineer
Street Services Division

JAL: rh

C: Paul Ledesma, ESD
Klay Lund, ESD
Kevin O'Connor

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Environmental Permitting for Rural Public Works Activities**	Page **1 of 3**	Section Number **04.13**
	Effective Date 01/01/04	Revised Date N/A

04.13.1 PURPOSE

This procedure provides instruction for when an environmental permit or written exemption is required for Rural Public Works (RPW) activities.

04.13.2 BACKGROUND

Rural Public Works activities have the potential to generate various pollutants such as mud, construction/repair debris, wood chips, pruning debris and leaves, etc. If these contaminants are discharged to the storm drain system or directly into waterways, they may be harmful to animals and plants living in downstream creeks and San Francisco Bay. Sediments may clog fish spawning grounds and otherwise damage wildlife habitats. To minimize possible harm to our waterways, when performing RPW activities, every effort should be made to minimize the amount of sediment and debris entering the storm drain system or waterways.

04.13.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to conduct their work in such a way as to minimize the introduction of contaminants into the storm drainage system and waterways. The goal of this procedure is to ensure that necessary environmental permits are acquired when PRNS staff or contractors are performing RPW activities. The permitting process will help minimize, to the maximum extent practicable, the impacts of the activities on water quality. Supervisory staff shall ensure that all appropriate staff and contract personnel receive training on this procedure. All Department staff are required to understand and comply with this procedure.

04.13.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – non-supervisory laborers in Parks, Recreation, & Neighborhood Services
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Environmental Permitting for Rural Public Works Activities**	Page **2 of 3**

04.13.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Supervisory Staff**	**Permits or Written Exemptions** Permits or written exemptions shall be obtained prior to performing planned work such as culvert replacements, slide repairs, bank stabilization, etc. Maintenance supervisors shall keep in their possession copies of permits for work being performed under their supervision Permits or written exemptions are required for work involving any of the following: A) Discharge or placement of any structure within the banks of the stream or channel (including rip rap, concrete or asphalt, and woody material) B) Dredging, removal or modification of any structure, fill, sediment, large woody debris or vegetation within the banks of the stream or channel C) Any work that potentially alters the habitat of any endangered species (including streams, tributaries, lakes, ponds, certain ditches, beaches, wetlands, marshes, banks, riparian areas, and upland areas) **NOTE:** Emergency conditions may require that work be performed prior to obtaining written permits or exemptions. Maintenance managers and/or supervisors shall complete report forms for emergency work involving any of the elements described in A-C above. Forms shall document that emergency work was performed in response to valid conditions and should be submitted to the proper regulatory agencies. **The City is subject to enforcement action by one or more of the environmental agencies, listed below, if work performed is found to be unnecessary.** Forms shall be forwarded to the appropriate internal authority at the earliest opportunity and not more than three working days after completion of work.

2.	**Supervisory Staff**	**Jurisdiction of Various Agencies** The jurisdiction of the various agencies that must be contacted in response to work performed in areas identified in step 1 above are as follows: A) Regional Water Quality Control Board 1. Certification under section 401 of the Clean Water Act (CWA) is required whenever project activities require a Federal permit (such as an Army Corps of Engineers nationwide permit or individual permit issued under Section 404 of the CWA for a discharge to waters of the U.S. Discharges may include landfill, rip rap slope protection, bridge piers, outfall structures, etc. 2. Waste Discharge Requirements (WDR's) are required for all proposed discharges above and below ordinary high water, that may impact beneficial uses of Waters of the State. For some discharges, it is possible to obtain waiver of WDR. "Fill", and thus structures, are considered discharges. B) U.S. Army Corps of Engineers 1. Certification under Section 404 of the CWA is required for discharges of dredge or fill material into waters of the U.S. 2. Certification under Section 10 of the Rivers and Harbors Act is required for structures or work affecting navigable waters of the U.S. C) California Department of Fish and Game 1. Section 1600 Streambed Alteration Agreements are required for work in any riparian corridor, even if no actual work is performed in the stream channel. D) Santa Clara Valley Water District 1. Encroachment permits are required for any work within 50 feet of a watercourse in Santa Clara County, or for work that will result in the discharge of water to a watercourse. (NOTE: The District's Ordinance 83-2 is being revised and an increase in the width of the corridor within which encroachment permits are required is being considered) E) Bay Conservation and Development Commission (BCDC) 1. Approval is required for all work in or within 100 feet of the San Francisco Bay.
	Supervisory Staff	**General Guidelines** • Schedule maintenance and repair activities for dry weather. • Ensure all appropriate staff are aware of environmental permitting for RPW activities procedures. • In the event of a spill, follow the SOP *Spill Control in the Field (Section #04.01).*

04.13.6 REFERENCES

City of San Jose Urban Runoff Management Plan, 2002, Rural Public Works Maintenance and Support Activities Performance Standards

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Irrigation System Repair Adjacent to Roadways & Creeks**	Page **1 of 2**	Section Number **04.08**
	Effective Date 01/01/04	Revised Date N/A

04.08.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from irrigation system repair adjacent to roadways & creeks. Other related runoff pollution control guidance is included in the Standard Operating Procedure *Spill Control in the Field (Section #04.01)*.

04.08.2 BACKGROUND

Irrigation system breakdowns and repair frequently generate mud and debris. If these contaminants are discharged to the storm drain system, they may be harmful to animals and plants living in downstream creeks and San Francisco Bay. Sediments may clog fish spawning grounds and otherwise damage wildlife habitats. To minimize possible harm to our waterways, when repairing the City's irrigation systems, every effort should be made to minimize the amount of sediment and debris entering the storm drain system.

04.08.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to conduct their work to minimize the introduction of contaminants into the storm drainage system. The goal of this procedure is guide technicians to inspect the affected storm drain system and clean up after the irrigation system is repaired. Supervisory staff shall ensure that all appropriate staff and contract personnel receive training on this procedure. All Department staff are required to understand and comply with this procedure.

04.08.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – person performing the irrigation system repair
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Irrigation System Repair Adjacent to Roadways & Creeks**	Page **2 of 2**

04.08.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**General Response** • Valve off water to the broken line as soon as possible. • Repair the system as soon as the break is noticed. • Prevent dislodged soil from entering catch basins. If necessary, use pea gravel bag check dams, pig blankets and/or block catch basin inlet with filter fabric • Pour muddy water bailed from repair location into the adjacent landscaping. If possible, bail to bucket or drum to settle before draining. Do not pour muddy water in the gutter or catch basin.
2.	**Field Staff**	**Storm Drain System Inspection** • If repair involves pipe blow-out and occurs during wet weather, check for excessive loose soil in gutter or on pavement. Loose soil should be removed from these areas and stockpiled under a tarp, if it is raining. • After the repair is finished check the downstream catch basin(s) for accumulated mud and debris.
3.	**Field Staff**	Storm Drain System Cleaning • As necessary, based on the storm drain inspection, remove mud and debris from the gutter and/or catch basins. • If field staff suspects that mud had flowed into the downstream storm drain pipe, contact the Supervisory staff to arrange additional clean-up. • Replace dislodged soil in hole after irrigation system has been repaired.
	Supervisory Staff	• As necessary, arrange for "Vactor" truck to clean storm drain lines downstream of repair site.
4.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of roadway irrigation system repair procedures. • In the event of a spill, follow the SOP *Spill Control in the Field (Section #04.01).*

04.08.6 REFERENCES

CalTrans Storm Water Quality Handbook Maintenance Staff Guide May 2003, Appendix B Activity Cut Sheets, E Family – Landscaping, Irrigation Line Repairs

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Landscape Chemical Application**	Page **1 of 2**	Section Number **04.07**
	Effective Date 01/01/04	Revised Date N/A

04.07.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from the application of herbicides, pesticides and fertilizers. Other related runoff pollution control guidance is included in the Standard Operating Procedures *Spill Control in the Field (Section #04.01)* and *Leak Prevention (Section #04.03)*.

04.07.2 BACKGROUND

Many herbicides, pesticides and fertilizers are toxic to the plants and animals that live in our creeks and in San Francisco Bay. For this reason, these chemicals must be stored, mixed and applied carefully to minimize contamination of our waterways.

04.07.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to conduct their work to minimize the introduction of contaminants into the storm drainage system. It is recognized that the State of California regulates the application of these chemicals. The goal of this procedure is to raise the awareness of landscape chemical applicators as to the impacts of their activities on water quality and local wildlife so that adverse impacts are minimized. Supervisory staff shall ensure that all appropriate staff and contract personnel receive training on this procedure. All Department staff are required to understand and comply with this procedure.

04.07.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – person mixing and applying herbicides, pesticides or fertilizers
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Landscape Chemical Application**	Page **2 of 2**

04.07.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**Equipment Maintenance** • Check fuel level in equipment at the beginning of the shift. • When possible, fuel equipment at the corporation yard. • If fueling must be done in the field, do so away from gutters and storm drain inlets. • Calibrate the spray rig at the beginning and middle of each shift. • Clean spray equipment at a designated location at the corporation yard, away from storm drains, and not in the field.
2.	**Field Staff**	**Chemical Mixing and Application** • Mix only as much of the particular landscaping chemical as is needed for the specific application. • Mix landscaping chemicals in the landscaping, away from storm drains and gutters. • Apply landscaping chemicals only as specified on the label. • Avoid applying fertilizer during wet weather. • Remove fertilizer inadvertently applied to paved areas by sweeping or rinsing it to landscaping (away from storm drains). Fertilizer should be removed as soon as possible, but definitely before sprinkler/irrigation use or a storm event. • In the event of a spill, follow the SOP *Spill Control in the Field (Section #04.01)*
	Supervisory Staff	• In the event of a spill, follow the SOP *Spill Control in the Field (Section #04.01)*
3.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of landscape chemical application procedures.

04.07.6 REFERENCES

CalTrans Storm Water Quality Handbook Maintenance Staff Guide May 2003, Appendix B Activity Cut Sheets, E Family – Landscaping, Chemical Vegetation Control

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Leak Prevention**	Page **1 of 2**	Section Number **04.03**
	Effective Date 01/01/04	Revised Date N/A

04.03.1 PURPOSE

This procedure provides instructions for minimizing leaks from vehicles and equipment. Runoff pollution control guidance for spill response is included in the Standard Operating Procedures for Spill Response for each of the City's corporation yards, and in the Standard Operating Procedures *Spill Control in the Field (Section #04.01)*, and *Vehicle and Equipment Cleaning in the Field (Section #04.05)*.

04.03.2 BACKGROUND

Vehicle fuels, lubricants, pesticides and other chemicals and materials associated with street maintenance have long been known to be damaging to the environment, plants and animals. Unchecked leakage from vehicles and equipment can cause toxic chemicals and clogging sediments to be washed into storm drains, creeks and San Francisco Bay. For this reason, vehicles and equipment must be keeps in good working order to minimize leaks that could contaminate our waterways.

For more information refer to City of San Jose Municipal Code 17.68.450 (Reporting Unauthorized Discharge) and 17.68.460 (Cleanup Responsibility).

04.03.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to operate their vehicles and equipment to ensure that vehicle engine and equipment leaks are minimized. The goal of this procedure is to ensure that vehicles and equipment are routinely inspected, maintained, and operated to reduce leaks as much as possible. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with this procedure.

04.03.4 DEFINITIONS

Responsibilities are defined as follows:

- Vehicle Driver/Crew Leader - person driving a truck, or operating other Parks, Recreation, & Neighborhood Services equipment or their designated responsible party
- Parks, Recreation, & Neighborhood Services Staff - any non-management employee of Parks, Recreation, & Neighborhood Services
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Leak Prevention**	Page **2 of 2**

04.03.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Vehicle Driver/ Crew Leader**	**Pre-departure Inspection (conduct at beginning of each shift)** • Inspect pavement under and around vehicles to check for leaks. • Inspect equipment on vehicles to check for leaks. • Check spray rigs (landscape maint.) for leaks and worn hoses. • Inspect seals on vehicles and equipment for signs of wear or malfunction.
2.	**Parks, Recreation, & Neighborhood Services Staff**	**Leak Reporting** • Report leakage from other Parks, Recreation, & Neighborhood Services vehicles or equipment to Supervisory staff. • Report leakage from other City vehicles or equipment to Supervisory staff.
	Supervisory staff	• Contact GSD to request vehicle or equipment maintenance. • Report leakage from other City vehicles or equipment to Environmental Enforcement at 945-3000.
3.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of leak prevention procedures. • In the event of a spill, follow the SOP *Spill Control in the Field (Section #04.01).*

04.03.6 REFERENCES

- SJMC 17.68.450
- SJMC 17.68.460
- CalTrans Storm Water Quality Handbook Maintenance Staff Guide May 2003, Appendix B Activity Cut Sheets, E Family – Landscaping, Chemical Vegetation Control

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Litter/Debris Control & Leaf Cleaning**	Page **1 of 2**	Section Number **04.02**
	Effective Date 01/01/04	Revised Date N/A

04.02.1 PURPOSE

This procedure provides instructions for controlling urban runoff pollution during the collection of litter, debris, and leaves. Guidance for cleaning spills and leaks is included in the Standard Operating Procedure *Spill Control in the Field (Section #04.01)*.

04.02.2 BACKGROUND

Properly removing litter, debris, and leaves from the City's park lands will help reduce the amount of contaminants discharged to the storm drain system. Minimizing these contaminants will limit harmful impacts to animals and plants living in downstream creeks and San Francisco Bay.

04.02.3 POLICY

It is the policy of Parks, Recreation, & Neighborhood Services to remove litter, debris, and leaves from the City park lands on a continuous basis. The goal of this procedure is to ensure that litter, debris, and leaves are removed, transported and disposed of in ways that minimize water pollution as much as possible. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper methods of litter, debris, and leaf collection, transportation and disposal. All Department staff are required to understand and comply with this procedure.

04.02.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – non-supervisory laborers in Parks, Recreation, & Neighborhood Services
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services
- DOT – Department of Transportation

04.02.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**Litter, Debris, and Leaf Collection** • The DOT General Complaint truck crew removes non-hazardous debris in the right-of-way on a continuous basis. • Park maintenance crews remove debris and leaves from park lands.

STANDARD OPERATING PROCEDURES

Subject: **Litter/Debris Control & Leaf Cleaning**	Page **2 of 2**

2.	**Field Staff**	**Hazardous Material Response** • If debris is suspected of being hazardous, contact the DOT Dispatcher (x4373) to coordinate removal by the City's HIT Unit (911, or 111 on City phone). • Dispose of hazardous material/waste properly, according to all federal, state, and local regulations.
	Dispatcher	• Contact the City's HIT Unit to remove possible hazardous debris.
3.	**Field Staff**	**Site Clean-Up** • As necessary, after collecting the debris, use dry methods, such as sweeping or vacuuming, to clean the collection site.
4.	**Field Staff**	**Transporting Litter, Debris, and Leaves to the Corporation Yard** • It is important to prevent collected litter, debris, and leaves from leaking or blowing out of City vehicles as it is transported to the corporation yard for temporary storage. • Plastic, paper or other lightweight debris shall be placed in an enclosed container (e.g. bag, lidded can or bucket) or secured in such a way so as not to fly out of the vehicle. If necessary, place debris under a secure tarp. • Wet, dripping debris shall be placed in a waterproof container (bag, lidded can or bucket) as it is picked-up.
5.	**Field Staff**	**Litter, Debris, and Leaf Disposal** • Litter, debris and leaves shall be unloaded from the City vehicle to the designated debris storage area(s) at the corporation yard.
6.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of litter, debris, and leaf control procedures. • In the event of a spill, follow the SOP *Spill Control in the Field (Section #04.01).*

04.02.6 REFERENCES

- City of San Jose Urban Runoff Management Plan, 2002, Rural Public Works Maintenance and Support Activities Performance Standards

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **SOP & BMP Annual Effectiveness Reviews**	Page **1 of 2**	Section Number **4.10**
	Effective Date 01/01/2004	Revised Date N/A

04.10.1 PURPOSE

This procedure provides instructions for the annual review of the effectiveness of Parks, Recreation, & Neighborhood Services (PRNS) Standard Operating Procedures (SOP) and Best Management Practices (BMP) for storm water pollution prevention.

04.10.2 BACKGROUND

Parks, Recreation, & Neighborhood Services maintains and uses a number of SOPs and/or BMPs aimed at preventing or limiting pollutants from entering the storm drain system as a result of vehicle operations, maintenance work on roads and storm drain systems, or from application of landscape chemicals. Pollutants of concern are fuels, lubricants, solvents, cleaners, sediment, herbicides, fertilizers and pesticides, litter, debris, and illegally dumped hazardous materials. These SOPs include, but are not limited to, procedures for:

- Spill Control in the Field
- Litter/Debris Control & Leaf Cleaning
- Leak Prevention
- Vehicle and Equipment Cleaning and Maintenance in the Field
- Landscape Chemical Application
- Irrigation System Repair Adjacent to Roadways & Creeks
- SOP & BMP Annual Effectiveness Reviews
- Unpaved Roads and Trails/Embankment Maintenance
- Environmental Permitting for Rural Public Works Activities

04.10.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to conduct their work in a manner that minimizes the introduction of contaminants into the storm drain system to the greatest extent practicable. The goal of this procedure is to ensure that PRNS crews have up-to-date and accurate BMPs and SOPs for storm water pollution prevention. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of the applicable BMPs and SOPs for their job duties. All Department staff are required to understand and comply with this procedure.

04.10.4 DEFINITIONS

- Supervisory Staff – management staff in Parks, Recreation, & Neighborhood Services

- Field Staff – non-supervisory laborers in Parks, Recreation, & Neighborhood Services
- Equipment Operator – person driving truck, or other vehicle or using Parks, Recreation, & Neighborhood Services equipment or tools
- Maintenance Personnel – any person performing crack and joint repair, chip seal, pothole repair, and removal and replacement of asphalt concrete or other pavement maintenance
- BMPs – Best Management Practices
- SOPs – Standard Operating Procedures
- ESD – Environmental Services Department.

04.10.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Supervisory staff, Field staff, and ESD staff**	• On an annual basis, Parks, Recreation, & Neighborhood Services supervisory staff and field staff will review and evaluate the effectiveness of PRNS SOPs and any other BMPs in use in reducing pollutants in storm water and eliminating illicit discharges. This review and evaluation will normally occur as a part of the annual municipal training on City Urban Runoff NPDES requirements.
	ESD staff	• During training, feedback will be gathered from affected Parks, Recreation, & Neighborhood Services supervisory and field staff. The feedback will be circulated and evaluated by ESD and PRNS supervisory staff. Any proposed changes to SOPs and BMPs resulting from this process will go through the ESD Urban Runoff PRNS for approval.
2.	**ESD staff**	• A summary of the findings and results of this process will be described in the City of San Jose Urban Runoff Management Plan Annual Report, which is submitted in September of each year.

04.10.6 REFERENCES

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **1 of 4**	Section Number **04.01**
	Effective Date 01/01/04	Revised Date N/A

04.01.1 PURPOSE

This procedure provides instructions for using spill-cleaning equipment in the field. Runoff pollution control guidance for general spill response is included in the Standard Operating Procedures for Spill Response for each of the City's corporation yards.

04.01.2 BACKGROUND

- Spills and leaks will occur from time to time. Some spilled materials, such as certain paints, cleaners and solvents may seem harmless because they are labeled "non-toxic" or "biodegradable." However, they are often far from harmless. Many of these materials are actually poisonous to the plants and animals that live in our creeks and in San Francisco Bay. Other chemicals, such as vehicle fuels and lubricants have long been known to be toxic. For these reasons, spills must be cleaned-up as soon as possible, before they can contaminate our waterways.
- For more information refer to City of San Jose Municipal Code 17.68.450 (Reporting Unauthorized Discharge) and 17.68.460 (Cleanup Responsibility).

04.01.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to conduct their work to ensure that material spills in the field are avoided and that spills are responded to immediately and correctly. The goal of this procedure is to ensure that spill equipment is properly used so spills are quickly and properly contained, picked-up, disposed of, and documented. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with this procedure.

04.01.4 DEFINITIONS

Spill sizes are defined as follows:

- Small spill: up to 5 gallons
- Medium spill: 6-41 gallons
- Large spill: over 42 gallons

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **2 of 4**

Non-hazardous materials spills include, *but are not limited to*, those involving:

- Concrete pour wash water
- Sawcut slurry
- Dirt, sand, and other sediment in areas where they are not intended to be.

Hazardous materials spills include, *but are not limited to*, the following (check the MSDS for the material if unsure):

- Solvents
- Adhesives
- Vehicle fluids (fuels, hydraulic fluid, antifreeze, etc…)
- Paints
- Landscape chemicals

At minimum, a spill kit should be located in each vehicle engaged in activities that could result in a spill (e.g. pesticide application) and at the Corporation Yard, and shall include:

- a U.S. DOT-approved 6-gallon bucket with a "spin" top
- hazardous waste labels
- three sets of "Nitrile" surgical-type gloves
- granular absorbent material ("kitty litter')
- hydrophilic pads
- "pig" blanket
- three large plastic garbage bags
- one shovel

Responsibilities are defined as follows:

- Vehicle Driver/Crew Leader- person driving a truck, or operating other Parks, Recreation, & Neighborhood Services maintenance equipment or a designated responsible party
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services
- Staff Responsible for Spill - person who accidentally caused the spill
- Parks, Recreation, & Neighborhood Services Staff – any non-management employee of Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **3 of 4**

04.01.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Vehicle Driver/ Crew Leader**	**Pre-departure Spill Kit Check (conduct at beginning of each shift)** • Ensure that vehicle has spill kit - this applies to vehicles engaged in activities that could result in spills (e.g.. pesticide application) • Check spill kit to make sure all components are present • Make sure lids of all spill kit containers are secure • Contact supervisor if spill kit is missing or incomplete (in order to have the necessary items ordered)
	Supervisory Staff	• Contact GSD to request spill kit or spill cleaning equipment
2.	**Staff Responsible for Spill**	**For Small spills (up to 5 gallons):** • Use appropriate personal protection before beginning clean-up (gloves, boots, etc.). • Use "dry" methods to clean the spill. Do not wash spill area with water or other liquids. • As much as possible, clean-up and contain the spill by using "kitty litter," rags or absorbent pads. • Identify substance spilled (hazardous or non-hazardous). Read the container label. Refer to the MSDS if necessary. • Block storm drain inlets and divert flow of material away from gutters or inlets to ensure spilled materials do not reach storm drain. As necessary, use pea gravel bag check dams, pig blankets and/or secure catch basin inlet with filter fabric • Ensure that all traffic is diverted from spilled substance by posting a sign or cone. • For spills on dirt areas, dig up and remove contaminated soil and dispose of properly, according to all federal, state, and local regulations. • Report spill to Supervisory Staff. **For Medium spills (6 – 41 gallons) add:** • Contact the DOT Dispatcher to report the spill. If applicable, provide the I.D. number of affected catch basin(s). • Contact Supervisory Staff. **For Large Hazardous spills (over 42 gallons) add:** • Call HIT UNIT (911 or 111 on City phone), and DOT Dispatch (x-4373). • Contact Supervisory Staff.
	Dispatcher	• Contact DOT "Complaint Truck" to bring additional spill clean-up supplies to the spill site.
	Supervisory Staff	**For Medium spills (6 – 41 gallons):** • Contact ESD Duty Inspector at 945-3000 to report spill. **For Large spills (over 42 gallons) add:** • Call HIT UNIT (911 or 111 on City phone) to report spill. • Contact State Office of Emergency Services (1-800-852-7550) to report spill. • Contact ESD Duty Inspector at 945-3000 to report spill.

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **4 of 4**

3.	**Staff Responsible for Spill**	**Disposal of Spent Spill Cleaning Materials** • Sweep up the used absorbent and place it in the spill kit bucket, or other designated container. Label the container with labels supplied in the spill kit. • If spill occurs in dirt area, place removed contaminated soil in spill kit bucket or other designated container. Label the container with labels supplied in the spill kit. • If rags or absorbent pads were used, place in either the spill kit or a plastic garbage bag included with the spill kit. Label the bucket or bag with labels supplied in the spill kit. • Bring spent spill cleaning materials to the corporation yard and place in approved disposal location.
	Staff Responsible for Spill	**Spill Documentation** • Alert supervisor to log-in spill.
4.	**Supervisory Staff**	**Spill Documentation** • Document all spill activity in spill logs (located in Hazardous Materials Management Plan binder) and ensure records are kept on-site.
5.	**Parks, Recreation, & Neighborhood Services Staff**	For spills witnessed off-site, which are not caused by staff, contact the ESD Duty Inspector at 945-3000 to report spill.
6.	**Supervisory staff**	**General Guidance** • Ensure all appropriate staff are aware of spill kit materials and spill cleaning procedures.

04.01.6 REFERENCES

- SJMC 17.68.450
- SJMC 17.68.460
- California Governor's Office of Emergency Services, "Hazardous Material Spill/Release Notification Guidance," January 2002.
- City of San Jose Urban Runoff Management Plan, 2002, Rural Public Works Maintenance and Support Activities Performance Standards

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Unpaved Roads and Trails/Embankment Maintenance and Repair**	Page **1 of 4**	Section Number **04.12**
	Effective Date 01/01/04	Revised Date N/A

04.12.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from the maintenance and/or repair of unpaved roads and trails/embankments. Other related runoff pollution control guidance is included in the Standard Operating Procedures for *Spill Control in the Field* and *Leak Prevention*.

04.12.2 BACKGROUND

Unpaved road and trail/embankment maintenance and/or repair involves the removal and placement of construction and native material. These operations have the potential to generate mud and other construction debris. If these contaminants are discharged to the storm drain system, they may be harmful to animals and plants living in downstream creeks and San Francisco Bay. Sediments may clog fish spawning grounds and otherwise damage wildlife habitats. To minimize possible harm to our waterways, when performing unpaved road and trail/embankment maintenance and/or repair, every effort should be made to minimize the amount of sediment and debris entering the storm drain system or going directly into waterways.

04.12.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to conduct their work to minimize the introduction of contaminants into the storm drainage system. The goal of these procedures is to ensure that maintenance and/or repairs of unpaved roads and trails/embankments are conducted in a manner that minimizes, to the maximum extent practicable, the impacts of the activities on water quality. Supervisory staff shall ensure that all appropriate staff and contract personnel receive training on these procedures. All Department staff are required to understand and comply with these procedures.

04.12.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – non-supervisory laborers in Parks, Recreation, & Neighborhood Services
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services
- DOT – Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Unpaved Roads and Trails/Embankment Maintenance**	Page **2 of 4**

04.12.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**Pro-active Maintenance** • Inspect drainage facilities, including cross drains, on a regular basis to ensure that sufficient drainage is provided during storm periods, so that runoff diverted onto slopes does not cause erosion. Report and remediate any observed erosion problems as soon as possible. • Place gravel bags at storm drain catch basins to control sediment from entering the storm drains. • Place straw bales at the trailheads where mudslides might otherwise have occurred (e.g. Inspiration Trail, stairs behind Youth Science Institute) • Install water bars along sections of erosion-prone trails. • Ensure that erosion prevention and sediment control is provided for storm drain outfalls.
2.	**Field Staff**	**Road, Trail/Embankment Maintenance and Repairs** **1. Erosion Prevention and Sediment Controls** • Conduct routine visual observations of road and trail conditions. • When a roadway, trail and/or embankment problem is noted, notify supervisor that DOT may need to be consulted regarding the need for debris clearing and repairs. • Maintain vegetative cover on medians and embankments to prevent soil erosion, trap pollutants and slow the rate of storm water runoff. Adjust mowing heights to allow substantial stubble. Leave clippings in place or apply mulch as additional cover. • For roadside areas with exposed soils, vegetate the area, preferably with a mulch or binder that will hold soils in place while the vegetation is establishing. Native vegetation should be used if possible. • If vegetation cannot be established immediately, apply temporary erosion control mats/blankets, straw, or gravel as appropriate. • If sediment is already eroded and mobilized in roadside areas, temporary controls should be installed. These may include: sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, etc. • Use measures that break the slopes to reduce the problems associated with concentrated flow volumes and runoff velocities. • Avoid moving large quantities of earth. If large quantities must be moved, such as when regrading is necessary to repair or reconfigure an embankment, make sure sediment controls are used.

STANDARD OPERATING PROCEDURES

Subject: **Unpaved Roads and Trails/Embankment Maintenance**	Page **3 of 4**

	Field Staff	**Road, Trail/Embankment Maintenance and Repairs (cont.)** **2. Vegetation Controls** • Preserve existing vegetation to the maximum extent practicable within a riparian corridor in order to provide erosion prevention and sediment control, watershed protection, habitat protection, landscape beautification, dust control, pollution control and shade cover. Existing vegetation may be modified if restoring the riparian corridor with native vegetation species. • Keep removed vegetation, including clippings, chips, and pruning debris away from storm drain inlets and watercourses. • When loading or chipping brush into a parked truck, do not leave leaves, twigs, chips, or other debris in the gutter or shoulder. • When working on a slope, avoid loosening soil that could erode into drainage systems. Loosen only the amount of soil needed to remove the vegetation. • Avoid loosening soil or removing vegetation when rain is expected. • Avoid using machinery on slopes greater than 30% whenever possible. • Minimize the use of heavy equipment on saturated soils. **3. Maintenance Activities Unique to Unpaved Rural Roads** • Perform regular inspection to determine if grading is needed to maintain smooth drivable surfaces that are adequately sloped to drain water from the surface without creating erosion problems. Choose appropriate grading, crowning, inslope or outslope, and drainage for road sections. • Consider using additional road surface drainage such as rolling dips, water bars, water bars/breaks or open-top culverts, to safely remove runoff that consistently builds up on the road surface or inside ditch. • Monitor for soft spots or areas of poor subsurface drainage in subgrade. Fill and re-compact holes in subgrade. Provide subsurface drainage if needed. • Monitor and re-grade rolling dips if needed. • Clean ditch and re-build berm for water bars, as needed. • Monitor open-top culverts after storms and clean as needed. • Monitor for potholes, washboarding, and areas of poor surface drainage on gravel surface roads. Re-slope, smooth, and compact where necessary. • Water, fertilize, re-seed and mow vegetative surface treatments when necessary. • Re-apply mulches and fabric surface treatments as needed. • Monitor fords after storms. Repair as needed.
	Supervisory Staff	• Consult with DOT regarding the need for debris clearing and roadway, trail and/or embankment repair. When necessary, make appropriate arrangements for DOT services. • Schedule maintenance and repair activities for dry weather. • Ensure all appropriate permits or written exemptions are acquired, as necessary, for work being conducted by field staff or contractors. • In the event of a spill, follow the SOP for *Spill Control in the Field*

STANDARD OPERATING PROCEDURES

Subject: **Unpaved Roads and Trails/Embankment Maintenance**	Page **4 of 4**

04.12.6 REFERENCES

City of San Jose Urban Runoff Management Plan, 2002, Rural Public Works Maintenance and Support Activities Performance Standards

CITY OF SAN JOSE
Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Vehicle and Equipment Cleaning and Maintenance in the Field**	Page **1 of 2**	Section Number **04.05**
	Effective Date 01/01/04	Revised Date N/A

04.05.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from cleaning and maintaining vehicles and equipment in the field. Runoff pollution control guidance for vehicle and equipment cleaning in the corporation yards is included in the Storm Water Pollution Prevention Plans for each of the City's corporation yards. Other related runoff pollution control guidance is included in the Standard Operating Procedures *Landscape Chemical Application (Section #04.07); Leak Prevention (Section #04.03)*; *Spill Control in the Field (Section #04.01)*.

04.05.2 BACKGROUND

Many vehicle fuels, lubricants, pesticides and other chemicals used for street maintenance are known to be toxic to the environment, animals and plants. When these materials drip on to paved surfaces, they can be inadvertently washed to storm drains and find their way to downstream creeks and the San Francisco Bay. To minimize possible contamination of our waterways, routine vehicle and equipment cleaning and maintenance should occur only in designated areas within the corporation yards, where they can be serviced in areas that do not discharge to storm drains. In corporation yards where no wash rack is available, vehicles should be washed in dirt areas, which have no potential for wash water runoff to storm drains or waterways. Field servicing of vehicles and equipment shall be conducted only if, by not doing so, there is a risk of spills or leaks.

04.05.3 POLICY

Parks, Recreation, & Neighborhood Services expects all of its employees to conduct their work to minimize spills and leaks. The goal of this procedure is to identify when it is appropriate to clean or maintain vehicles or equipment in the field. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained to limit the field servicing of vehicles and equipment. All Department staff are required to understand and comply with this procedure.

04.05.4 DEFINITIONS

Responsibilities are defined as follows:

- Equipment Operator – person driving truck, or other vehicle or using Parks, Recreation, & Neighborhood Services equipment or tools
- Supervisory Staff - management staff in Parks, Recreation, & Neighborhood Services
- Field Staff – non-supervisory laborers in Parks, Recreation, & Neighborhood Services

STANDARD OPERATING PROCEDURES

Subject: **Vehicle and Equipment Cleaning and Maintenance in the Field**	Page **2 of 2**

04.05.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
3.	**Equipment Operator/ Field Staff**	**Vehicle and Equipment Cleaning** • Major routine equipment cleaning shall be done in the corporation yards. • Landscape chemical spray equipment shall not be cleaned in the field. All cleaning shall occur in the corporation yard. • Vehicles that haul garbage shall not be cleaned in the field. All cleaning shall occur in the corporation yard. • In the event of a spill, follow the SOP *Spill Control in the Field (Section #04.01)*. • If unsure if field cleaning is permitted, contact the Supervisory staff.
	Supervisory Staff	• If unsure if field cleaning is permitted, contact the ESD Duty Inspector at 945-3000.
4.	**Equipment Operator/ Field Staff**	**Vehicle or Equipment Maintenance:** • Routine maintenance shall occur in the corporation yards. • If there is a vehicle or equipment breakdown, evaluate whether continuing to operate the machinery in its malfunctioning condition would result in a potential leakage risk. • If there is no leakage risk from doing so, return malfunctioning machinery to corporation yard for repair. • If malfunctioning machinery would result in a leakage risk if moved, evaluate if field servicing would reduce this risk. • If servicing malfunctioning machinery in the field would be less of a leakage risk than driving it back to the corporation yard, fix equipment at the job site. • If field servicing is necessary and the driver or operator is not able to do so, call Supervisory staff for assistance.
	Supervisory Staff	• Contact GSD to request assistance with field servicing vehicle or equipment. • If spill occurs, follow the SOP *Spill Control in the Field (Section #04.01)*.
5.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of vehicle and equipment cleaning and maintenance procedures.

04.05.6 REFERENCES

- City of San Jose Urban Runoff Management Plan, 2002, Rural Public Works Maintenance and Support Activities Performance Standards

SDO STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for the Municipal Storm Drain Operations & Maintenance Program.

The various components of this section are organized as follows:

1. Spill Control in the Field
2. Litter/Debris Control
3. Leak Prevention
4. Vehicle Equipment Cleaning and Maintenance in the Field
5. SOP & BMP Annual Effectiveness Reviews
6. Infrastructure Maintenance Division Storm Drain System Problem Area Report (IMSPAR)

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **1 of 4**	Section Number **01.01**
	Effective Date 6/1/00	Revised Date 08/02/04

01.01.1 PURPOSE

This procedure provides instructions for using spill-cleaning equipment in the field. Runoff pollution control guidance for general spill response is included in the Standard Operating Procedures for Spill Response for each of the City's corporation yards. Other related runoff pollution control guidance is included in the Standard Operating Procedures for *Spill Response*.

01.01.2 BACKGROUND

- Spills and leaks will occur from time to time. Some spilled materials, such as certain paints, cleaners and solvents may seem harmless because they are labeled "non-toxic" or "biodegradable." However, they are often far from harmless. Many of these materials are actually poisonous to the plants and animals that live in our creeks and in San Francisco Bay. Other chemicals, such as vehicle fuels and lubricants have long been known to be toxic. For these reasons, spills must be cleaned-up as soon as possible, before they can contaminate our waterways.
- For more information refer to City of San Jose Municipal Code 17.68.450 (Reporting Unauthorized Discharge) and 17.68.460 (Cleanup Responsibility).

01.01.3 POLICY

The Department of Transportation expects all of its employees to conduct their work to ensure that material spills in the field are avoided and that spills are responded to immediately and correctly. The goal of these procedures is to ensure that spill equipment is properly used so spills are quickly and properly contained, picked-up, disposed of, and documented. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with these procedures.

01.01.4 DEFINITIONS

Spill sizes are defined as follows:

- Small spill: up to 5 gallons
- Medium spill: 6-41 gallons
- Large spill: over 42 gallons

STANDARD OPERATING PROCEDURES

Non-hazardous materials spills are defined as those involving:

- Concrete wash water
- Sawcut slurry
- Dirt, sand, and other sediment

Hazardous materials spills include, *but are not limited to*, the following (check the MSDS for the material if unsure):

- Solvents
- Adhesives
- Vehicle fluids (fuels, hydraulic fluid, antifreeze, etc…)
- Paints
- Landscape chemicals

At minimum, a spill kit shall include:

- a U.S. DOT-approved 6-gallon bucket with a "spin" top
- hazardous waste labels
- three sets of "Nitrile" surgical-type gloves
- granular absorbent material ("kitty litter")
- hydrophilic pads
- "pig" blanket
- three large plastic garbage bags
- one shovel

Responsibilities are defined as follows:

- Vehicle Driver/Crew Leader- person driving a truck, sweeper, paving machine, or operating other street maintenance equipment or a designated responsible party
- Supervisory Staff - management staff in the Department of Transportation
- Staff Responsible for Spill - person who accidentally caused the spill
- Department of Transportation Staff – any non-management employee of the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **3 of 4**

01.01.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Vehicle Driver/ Crew Leader**	**Pre-departure Spill Kit Check (conduct at beginning of each shift)** • Ensure that vehicle has spill kit • Check spill kit to make sure all components are present • Make sure lids of all spill kit containers are secure • Contact supervisor if spill kit is missing or incomplete
	Supervisory Staff	• Contact GSD to request spill kit or spill cleaning equipment
2.	**Staff Responsible for Spill**	**For Small spills (up to 5 gallons):** • Use appropriate personal protection before beginning clean-up (gloves, boots, etc.). • Use "dry" methods to clean the spill-do not wash spill area with water or other liquids. • As much as possible, clean-up and contain the spill by using "kitty litter," rags or absorbent pads. • Identify substance spilled (hazardous or non-hazardous). Read the container label. Refer to the MSDS if necessary. • Block storm drain inlets and divert flow of material away from gutters or inlets to ensure spilled materials do not reach storm drain. As necessary, use pea gravel bag check dams, pig blankets and/or secure catch basin inlet with filter fabric • Ensure that all traffic is diverted from spilled substance by posting a sign or cone. • For spills on dirt areas, dig up and remove contaminated soil. **For Medium spills (6 – 41 gallons) add:** • Contact the Department of Transportation Dispatcher to report the spill. If applicable, provide the I.D. number of affected catch basin(s). • Contact Supervisory Staff. **For Large Hazardous spills (over 42 gallons) add:** • Call HIT UNIT (911 or 111 on City phone), and Dispatch (x-4373).
	Dispatcher	• Contact Department of Transportation "Complaint Truck" to bring additional spill clean-up supplies to the spill site.
2.	**Supervisory Staff**	**For Medium spills (6 – 41 gallons):** • Contact ESD Duty Inspector at 945-3000. **For Large spills (over 42 gallons) add:** • Call HIT UNIT (911 or 111 on City phone). • Contact State Office of Emergency Services (1-800-852-7550).
3.	**Staff Responsible for Spill**	**Disposal of Spent Spill Cleaning Materials** • Sweep up the used absorbent and place it in the spill kit bucket, or other designated container. Label the container with labels supplied in the spill kit. • If spill occurs in dirt area, place removed contaminated soil in spill kit bucket or other designated container. Label the container with labels supplied in the spill kit. • If rags or absorbent pads were used, place in either the spill kit or a plastic garbage bag included with the spill kit. Label the bucket or bag with labels supplied in the spill kit. • Bring spent spill cleaning materials to the corporation yard and place in approved disposal location.

STANDARD OPERATING PROCEDURES

Subject: **Spill Control in the Field**	Page **4 of 4**

	Staff Responsible for Spill	**Spill Documentation** • Alert supervisor to log-in spill.
5.	**Supervisory Staff**	• Document all spill activity in spill logs (located in Hazardous Materials Management Plan binder) and ensure records are kept on-site.
6.	**Department of Transportation Staff**	For spills witnessed off-site which are not caused by staff, contact the ESD Duty Inspector at 945-3000.
	Supervisory staff	**General Guidance** • Ensure all appropriate staff are aware of spill kit materials and spill cleaning procedures.

01.01.6 REFERENCES

- SJMC 17.68.450
- SJMC 17.68.460
- California Governor's Office of Emergency Services, "Hazardous Material Spill/Release Notification Guidance," January 2002.
- City of San Jose Urban Runoff Management Plan, 2002, Public Roads, Streets and Highways Operation and Maintenance Performance Standards

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Litter/Debris Control**	Page **1 of 2**	Section Number **01.02**
	Effective Date 06/01/00	Revised Date 08/02/04

01.02.1 PURPOSE

This procedure provides instructions for controlling urban runoff pollution during the collection of litter and debris. Guidance for cleaning spills and leaks is included in the Standard Operating Procedures for *Spill Response* and *Spill Control in the Field*. The Storm Water Pollution Prevention Plan (SWPPP) for each of the City's corporation yards contains guidance on materials stockpiling and the use of designated debris storage areas.

01.02.2 BACKGROUND

Properly removing litter and debris from the City's rights-of-way will help reduce the amount of contaminants discharged to the storm drain system. Minimizing these contaminants will limit harmful impacts to animals and plants living in downstream creeks and San Francisco Bay.

01.02.3 POLICY

It is the policy of the Department of Transportation to remove litter and debris from the City right-of-way on a continuous basis. The goal of these procedures is to ensure that litter and debris are removed, transported and disposed of in ways that minimize water pollution as much as possible. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper methods of litter and debris collection, transportation and disposal. All Department staff are required to understand and comply with these procedures.

01.02.4 DEFINITIONS

Responsibilities are defined as follows:

- Field Staff – non-supervisory laborers in the Department of Transportation
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Litter/Debris Control**	Page **2 of 2**

01.02.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field Staff**	**Litter and Debris Collection Schedule** • The General Complaint truck crew removes non-hazardous debris in the right-of-way on a continuous basis. • Landscape Services crews remove debris from landscaped areas in the right-of-way on a continuous basis. • Blight Abatement crews remove debris from the right-of-way in five Redevelopment areas on a continuous basis. • Blight Abatement crews empty five civic litter modules in the Paseo de San Antonio twice per week.
2.	**Field Staff**	**Hazardous Material Response** • If debris is suspected of being hazardous, follow the procedures contained in the DOT Emergency Response Manual. • Contact the DOT Dispatcher to coordinate removal by the City's HIT Unit.
	Dispatcher	• Contact the City's HIT Unit to remove possible hazardous debris.
3.	**Field Staff**	**Site Clean-Up** • As necessary, after collecting the debris, use dry methods, such as sweeping or vacuuming, to clean the collection site. • If leachate has leaked from civic litter modules, contact Supervisory Staff to arrange for cleaning.
	Supervisory Staff	• Contact the General Complaint Truck to arrange for leachate removal from around City-maintained civic litter modules. • If dripped leachate is a problem around contractor-maintained litter facilities, contact the ESD Integrated Waste Management, Civic Services Division, at 277-5533.
4.	**Field Staff**	**Transporting Litter and Debris to the Corporation Yard** • It is important to prevent collected litter and debris from leaking or blowing out of City vehicles as it is transported to the corporation yard for temporary storage. • Plastic, paper or other lightweight debris shall be placed under a secured tarp or in an enclosed container (bag, lidded can or bucket) as it is picked-up. • Wet, dripping debris shall be placed in a waterproof container (bag, lidded can or bucket) as it is picked-up.
5.	**Field Staff**	**Litter and Debris Disposal** • Litter and debris shall be unloaded from the City vehicle to the designated debris storage area(s) at the corporation yard (see the SWPPP for the particular corp yard).
6.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of litter and debris control procedures.

01.02.6 REFERENCES

- City of San Jose Urban Runoff Management Plan, 2002, Public Roads, Streets and Highways Operation and Maintenance Performance Standards

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Leak Prevention**	Page **1 of 2**	Section Number **01.03**
	Effective Date 6/1/00	Revised Date 08/02/04

01.03.1 PURPOSE

This procedure provides instructions for minimizing leaks from vehicles and equipment. Runoff pollution control guidance for spill response is included in the Standard Operating Procedures for Spill Response for each of the City's corporation yards, and in the Standard Operating Procedures for *Spill Response, Spill Control in the Field*, and *Vehicle and Vehicle and Equipment Cleaning in the Field.*

01.03.2 BACKGROUND

Vehicle fuels, lubricants, pesticides and other chemicals and materials associated with street maintenance have long been known to be damaging to plants and animals. Unchecked leakage from vehicles and equipment can cause toxic chemicals and clogging sediments to be washed into storm drains, creeks and San Francisco Bay. For this reason, vehicles and equipment must be keeps in good working order to minimize leaks that could contaminate our waterways.

For more information refer to City of San Jose Municipal Code 17.68.450 (Reporting Unauthorized Discharge) and 17.68.460 (Cleanup Responsibility).

01.03.3 POLICY

The Department of Transportation expects all of its employees to operate their vehicles and equipment to ensure that leaks are minimized. The goal of these procedures is to ensure that vehicles and equipment routinely inspected, maintained and operated to reduce leaks as much as possible. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of spill cleaning equipment and materials. All Department staff are required to understand and comply with these procedures.

01.03.4 DEFINITIONS

Responsibilities are defined as follows:

- Vehicle Driver/Crew Leader - person driving a truck, paving machine, or operating other street maintenance equipment or their designated responsible party
- Field Staff - any non-management employee of the Department of Transportation
- Supervisory Staff - management staff in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Leak Prevention**	Page **2 of 2**

01.03.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Vehicle Driver/ Crew Leader**	**Pre-departure Inspection (conduct at beginning of each shift)** • Inspect pavement under and around vehicles to check for leaks. • Inspect equipment on vehicles to check for leaks. • Check spray rigs (landscape maint.) for leaks and worn hoses. • Inspect seals on vehicles and equipment for signs of wear or malfunction.
2.	**Field Staff**	**Leak Reporting** • Report leakage from other DOT vehicles or equipment to Supervisory staff. • Report leakage from other City vehicles or equipment to Supervisory staff.
	Supervisory staff	• Contact GSD to request vehicle or equipment maintenance. • Report leakage from other City vehicles or equipment to Environmental Enforcement at 945-3000.
3.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of leak prevention procedures.

01.03.6 REFERENCES

- SJMC 17.68.450
- SJMC 17.68.460
- CalTrans Storm Water Quality Handbook Maintenance Staff Guide May 2003, Appendix B Activity Cut Sheets, E Family – Landscaping, Chemical Vegetation Control

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Vehicle and Equipment Cleaning and Maintenance in the Field**	Page **1 of 3**	Section Number **01.05**
	Effective Date 6/1/00	Revised Date 08/02/04

01.05.1 PURPOSE

This procedure provides instructions for controlling runoff pollution from cleaning and maintaining vehicles and equipment in the field. Runoff pollution control guidance for vehicle and equipment cleaning in the corporation yards is included in the Storm Water Pollution Prevention Plans for each of the City's corporation yards. Other related runoff pollution control guidance is included in the Standard Operating Procedures for *Concrete Installation; Pavement Repair; Landscape Chemical Application; Leak Prevention*; *Spill Response* and *Spill Control in the Field.*

01.05.2 BACKGROUND

Many vehicle fuels, lubricants, pesticides and other chemicals used for street maintenance are known to be toxic to animals and plants. When these materials drip on to paved surfaces, they can be inadvertently washed to storm drains and find their way to downstream creeks and the San Francisco Bay. To minimize possible contamination of our waterways, routine vehicle and equipment cleaning and maintenance should occur only in the corporation yards, where they can be serviced in areas that do not discharge to storm drains. Field servicing of vehicles and equipment shall be conducted only if, by not doing so, there is a risk of spills or leaks.

01.05.3 POLICY

The Department of Transportation expects all of its employees to conduct their work to minimize spills and leaks. The goal of these procedures is to identify when it is appropriate to clean or maintain vehicles or equipment in the field. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained to limit the field servicing of vehicles and equipment. All Department staff are required to understand and comply with these procedures.

01.05.4 DEFINITIONS

Responsibilities are defined as follows:

- Equipment Operator – person driving truck, sweeper, paving machine, or other vehicle or using DOT equipment or tools
- Supervisory Staff - management staff in the Department of Transportation
- Field Staff – non-supervisory laborers in the Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Vehicle and Equipment Cleaning and Maintenance in the Field**	Page **2 of 3**

01.05.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Equipment Operator**	**Paving Vehicle and Equipment Cleaning** • Major routine vehicle cleaning shall be done in the corporation yards. • The paving box shall be cleaned over the work area. • Diesel shall not be used on the dump trucks hauling hot asphalt concrete. • Extreme caution shall be used when using diesel or citrus cleaner in the field. • Make sure an approved spill kit is on-hand prior to beginning cleaning. • Diesel used for tool and equipment cleaning shall be transported to the job site in an approved fuel container. • Use a funnel to transfer spent cleaner back in to the approved fuel container. • Spent diesel shall be disposed of to the designated 55-gallon drum in the corporation yard. • Used citrus cleaner shall be disposed of to the debris transfer pile. • In the event of a diesel spill, follow the SOP for *Spill Control in the Field*.
2.	**Field Staff**	**Concrete Finishing Tool Cleaning** • When possible, concrete finishing tools shall be cleaned in the corporation yard • Follow the SOP for *Handling and Disposal of Concrete and Cement.* • If concrete-finishing tools must be cleaned in the field, the wash water shall be taken back to the corporation yard for proper disposal. • Concrete rinse water shall not be drained to gutters or catch basins • If concrete rinse water is spilled, follow SOP for *Spill Control in the Field.*
3.	**Field Staff**	**Other DOT Equipment Cleaning** • Landscape chemical spray equipment shall not be cleaned in the field. All cleaning shall occur in the corporation yard. • Pavement marking equipment shall not be cleaned in the field. All cleaning shall occur in the corporation yard. • If unsure if field cleaning is permitted, contact the Supervisory staff.
	Supervisory Staff	• If unsure if field cleaning is permitted, contact the ESD Duty Inspector at 945-3000.
4.	**Equipment Operator**	**Vehicle or Equipment Maintenance:** • Routine maintenance shall occur in the corporation yards. • If there is a vehicle or equipment breakdown, evaluate whether continuing to operate the machinery in its malfunctioning condition would result in a potential leakage risk. • If there is no leakage risk from doing so, return malfunctioning machinery to corporation yard for repair. • If malfunctioning machinery would result in a leakage risk if moved, evaluate if field servicing would reduce this risk. • If servicing malfunctioning machinery in the field would be less of a leakage risk than driving it back to the corporation yard, fix equipment at the job site. • If field servicing is necessary and the driver or operator is not able to do so, call Supervisory staff for assistance.
	Supervisory Staff	• Contact GSD to request assistance with field servicing vehicle or equipment. • If spill occurs, follow the SOP for *Spill Control in the Field*.
5.	**Supervisory staff**	**General Guidelines** • Ensure all appropriate staff are aware of vehicle and equipment cleaning and maintenance procedures.

STANDARD OPERATING PROCEDURES

Subject: **Vehicle and Equipment Cleaning and Maintenance in the Field**	Page **3 of 3**

01.05.6 REFERENCES

- City of San Jose Urban Runoff Management Plan, 2002, Public Roads, Streets and Highways Operation and Maintenance Performance Standards

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **SOP & BMP Annual Effectiveness Reviews**	Page **1 of 2**	Section Number **1.10**
	Effective Date 06/30/02	Revised Date 08/02/04

1.10.1 PURPOSE

This procedure provides instructions for the annual review of the effectiveness of Department of Transportation (DOT) Standard Operating Procedures (SOP) and Best Management Practices (BMP) for storm water pollution prevention.

1.10.2 BACKGROUND

DOT maintains and uses a number of SOPs and/or BMPs aimed at preventing or limiting pollutants from entering the storm drain system as a result of vehicle operations, maintenance work on roads and storm drain systems, or from application of landscape chemicals. Pollutants of concern are asphaltic compounds, fuels, lubricants, solvents, cleaners, sediment, herbicides, fertilizers and pesticides, litter, debris, and illegally dumped hazardous materials. These SOPs include, but are not limited to, procedures for:

- Pavement Maintenance Operations
- Field Cleaning Paving Vehicles and Equipment
- Handling and Disposal of Concrete/Cement
- Vehicle and Equipment Maintenance
- Roadway Irrigation System Repair
- Landscape Chemical Application
- Leak Prevention
- Litter/Debris Control
- Pavement Marking Installation and Removal
- Street Sweeping
- Spill Clean-up
- Infrastructure Maintenance Division Storm Drain System Problem Area Report

1.10.3 POLICY

The Department of Transportation (DOT) expects all of its employees to conduct their work in a manner that minimizes the introduction of contaminants into the storm drain system to the greatest extent practicable. The goal of these procedures is to ensure that DOT crews have up-to-date and accurate BMPs and SOPs for storm water pollution prevention. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper use of the applicable BMPs and SOPs for their job duties. All Department staff are required to understand and comply with these procedures.

STANDARD OPERATING PROCEDURES

Subject: **SOP & BMP Annual Effectiveness Reviews**	Page **2 of 2**

1.10.4 DEFINITIONS

- Supervisory Staff – management staff in DOT
- Field Staff – non-supervisory laborers in DOT
- Equipment Operator – person driving truck, paving machine, or other vehicle or using DOT equipment or tools
- Heavy Equipment Staff – person or persons who are assigned the duty of retrieving debris at designated temporary dump sites
- Maintenance Personnel – any person performing crack and joint repair, chip seal, pothole repair, and removal and replacement of asphalt concrete or other pavement maintenance activities
- Sweeper Driver – person driving the street sweeping vehicle
- Vehicle Driver/Crew Leader – person driving a truck, sweeper, paving machine, or operating other street maintenance equipment or a designated responsible party or parties
- BMPs – Best Management Practices
- SOPs – Standard Operating Procedures
- ESD – Environmental Services Department.

1.10.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Supervisory staff, Field staff, and ESD staff**	• On an annual basis, DOT supervisory staff and field staff will review and evaluate the effectiveness of DOT SOPs and any other BMPs in use in reducing pollutants in storm water and eliminating illicit discharges. This review and evaluation will normally occur as a part of the annual municipal training on City Urban Runoff NPDES requirements. This training is conducted by ESD staff in the May/June time frame.
	ESD staff	• During training, feedback will be gathered from affected DOT supervisory and field staff. The feedback will be circulated and evaluated by ESD and DOT supervisory staff. Any proposed changes to SOPs and BMPs resulting from this process will go through the ESD Watershed Analysis Division and the DOT Street Services Division for approval.
2.	**ESD staff**	• A summary of the findings and results of this process will be described in the City of San Jose Urban Runoff Management Plan Annual Report which is submitted in September of each year.

1.10.6 REFERENCES

CITY OF SAN JOSE
Department of Transportation

STANDARD OPERATING PROCEDURES

Subject: **Infrastructure Maintenance Division Storm Drain System Problem Area Report (IMSPAR)**	Page **1 of 2**	Section Number **2.01**
	Effective Date 06/30/02	Revised Date N/A

2.01.1 PURPOSE

This procedure provides instructions for reporting, recording, and evaluating problem areas within the Storm Drain System.

2.01.2 BACKGROUND

During the course of routine and emergency storm drain inlet clean-out operation and street sweeping operations, City maintenance crews have the opportunity to observe problems affecting the flow or quality of storm water entering the City's Storm Drain System. Pollutants of concern are asphaltic compounds, fuels, lubricants, solvents, cleaners, sediment, herbicides, fertilizers and pesticides, litter, debris, and illegally dumped hazardous materials.

2.01.3 POLICY

The Department of Transportation (DOT) expects all of its employees to conduct their work in a manner that minimizes the introduction of contaminants into the storm drain system to the greatest extent practicable. The goal of these procedures is to ensure that DOT crews recognize and report problem areas within the Storm Drain System to their supervisor. Supervisory staff shall ensure that all appropriate staff and contract personnel are trained in the proper reporting of problem areas, and will record problem areas reported in the Infrastructure Maintenance Division Storm Drain System Problem Area Report (IMSPAR) spreadsheet. All Department staff are required to understand and comply with these procedures.

2.01.4 DEFINITIONS

- Supervisory Staff – management staff in DOT
- Field Staff – non-supervisory laborers in DOT
- Equipment Operator – person driving truck, paving machine, or other vehicle or using DOT equipment or tools
- SOPs – Standard Operating Procedures
- DPW – Department of Public Works
- ESD – Environmental Services Department

STANDARD OPERATING PROCEDURES

Subject: **Infrastructure Maintenance Division Storm Drain System Problem Area Report (IMSPAR)**	Page **2 of 2**

2.01.5 PROCEDURES

STEP	RESPONSIBILITY	CONTROL MEASURES
1.	**Field staff**	• Maintenance crews will be encouraged to report to their supervisors any persistent or unusual problems observed within the Storm Drain System. Reportable problems include but are not limited to: ➢ Chronic or unusual blockages of the Storm Drain lines or inlets caused by leaf fall, trash, tree roots, or structural problems. ➢ Large and continual accumulations of excess mud and sediment in gutters, Storm Drain lines or inlets. ➢ Accumulations of cement in gutters and Storm Drain inlets. ➢ Evidence of large amounts of trash and litter being passed into and through the Storm Drain system. ➢ Any evidence of illegal dumping of hazardous chemicals, oil, paint, or solvents.
	Supervisory Staff	• Enter reports of problem areas into the IMSPAR spreadsheet. Data entry will include: ➢ Date ➢ Location ➢ Nature of Problem • If the problem is of an urgent nature, such as the report of a large flow of sediment to the storm drain or a potentially toxic chemical spill, the supervisor shall ensure that appropriate emergency services are notified immediately: ➢ HIT Unit (911 or 111 on City phone) ➢ State Office of Emergency Services (1-800-852-7550) ➢ ESD Duty Inspector (945-3000)
2.	**Supervisory Staff**	• Annually, in June, DOT will produce the IMSPAR.
	Division Managers, Senior Engineers, and Maintenance Superintendents from DOT, ESD Watershed Analysis staff, and DPW staff	• Review the annual IMSPAR for indications that any portion of the Storm Drain System is in need of structural refit or upgrade to prevent excess passage of trash, sediment or other pollutants. • The data will also be reviewed for indications that greater emphasis on pollution prevention enforcement or outreach efforts may need to be performed in a given drainage area.

2.01.6 REFERENCES

WUOM STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for the Water Utility Operation and Maintenance Program.

The various components of this section are organized as follows:

1. Types of Discharges
2. Standard Operating Procedure Sheets for Planned and Unplanned Discharges
3. Discharge Activity Checklists
4. City contact information

WUO&M Standard Operating Procedures

This section describes Standard Operating Procedures for each water utility discharge activity with urban runoff pollution potential. These procedures were established June, 1999, and are contained in the City's Water Utility Operation and Maintenance Discharge Pollution Prevention Plan.

A Types of Discharges

For planning for water utility activities and record-keeping, discharges are categorized as being either planned or unplanned. Planned discharges are those that occur routinely or can be scheduled. Unplanned discharges are those which are expected to occur, but the exact timing may not be known. Unplanned discharges may be sudden or accidental.

B Standard Operating Procedure Sheets

Each SOP is contained on a single sheet and includes one or more BMP. SOPs describe the pollutants of concern and the equipment and methods/BMPs needed to control pollution resulting from the activity. Beginning on page 16, these sheets are arranged in alphabetical order by discharge activity name.

The BMPs are designed to reduce, or eliminate, pollutants from water utility operations and maintenance discharge activities. BMPs rely on site specific approaches to pollution control, depending upon the field conditions and characteristics of the discharge to make a determination. Permanent modifications may eliminate the need for implementing BMPs. The, Water Utility Discharges BMP Selection Matrix on page 7, summarizes the BMP(s) required for a particular discharge activity.

SOPs sheets have been prepared for the following discharge activities:

PLANNED DISCHARGES
Artesioning Wells
Hydrant Flushing
Pressure Release Valve/Blow-Offs
Tank Cleaning
Water Meter Testing
Well First Flush-To-Waste Cycle
Well Rehabilitation and Maintenance

UNPLANNED DISCHARGES
Main/Service Line Break
Sheared Hydrants
Sump/Vault Pumping

C Discharge Activity Checklists

To assist with record-keeping and activity planning, checklists are provided for both planned and unplanned discharges (see pages 10-13). Completion of a checklist is required for discharges of more than 50,000 gallons or smaller discharges having a turbidity of more than 50 NTU and/or chemical additives with concentrations in excess of those in drinking water. Both the Planned and Unplanned Discharge Activity checklists prompt the user to note the BMPs used, any monitoring conducted and to assess BMP effectiveness. The Planned Discharge Checklist also provides guidance for identifying discharge options, selecting the BMPs to be used and briefing staff on the discharge requirements. The original of each completed checklist shall be retained by Muni Water and a copy sent to the Watershed Analysis Section of the City's Environmental Services Department.

D City Contact Information

Table 2, Contact Information, on page 14, lists the title and name of those with knowledgeable staff, their telephone number, their area of expertise and/or responsibility and instances when they should be called. These contact people can provide guidance on technical and procedural questions and in case of a discharge emergency.

PLANNED DISCHARGE ACTIVITY CHECKLIST
For Water Utility Operation and Maintenance

For discharges with one or more of the following: volumes greater than 50,000 gallons; turbidity>50 NTU; chemical additives with concentrations higher than in drinking water.

Location: _____
Zone: _____
Date of Discharge: _____
Name of Person Completing Form: _____
Date Form Completed:_____

o CIRCLE THE NUMBER NEXT TO THE DISCHARGE ACTIVITY:

Treated Water:
1. Hydrant flushing
2. Pressure release valve blow-offs
3. Meter testing in the field
4. Reservoir (tank) cleaning

Groundwater:
1. Well rehab./maint.
2. Well first-flush-to-waste

Recycled (Reclaimed) Water:
1. Reservoir (tank) cleaning
2. Meter testing in the field
2. Pump station operation discharges
3. Blow-offs

o IDENTIFY THE DISCHARGE OPTION(S) TO BE USED FOR THIS ACTIVITY:

- o Reuse water
- o Dust control
- o Irrigation
- o Construction compaction
- o Discharge to the sanitary sewers
- o Discharge to the storm drain system or a creek using applicable control measures as described below.
- o Other:_____

o IDENTIFY THE CONTROL MEASURES TO BE USED:

Check all of the control measures that apply:
- o Check and clean flow path/catch basin
- o Discharge to landscaping
- o Protect landscaping (visqueen and/or plywood)
- o Discharge to sanitary sewer
- o Filter bag/silt sack at catch basins/discharge lines
- o Filter fabric at catch basins
- o Sand bags/gravel berms or booms at catch basins
- o Energy dissipation (incl. using utility truck wheel well)
- o Settling ponds
- o Surface/passive aeration (for N. San Jose or Edenvale discharges only)
- o Chemical chlorine neutralization (in N. San Jose Zone or Edenvale Zone)
- o Chemical neutralization of chloramine (in Evergreen Zone)
- o Analytical water quality testing for suspected pollutants (attach results when obtained)
- o Other: _____

o BRIEF STAFF ON THE SELECTED DISCHARGE OPTIONS, BMPS, AND CONTROL MEASURES

o PROCEED WITH NECESSARY NOTIFICATIONS: o Not Applicable

Who (name and organization):_____; When:_____(a.m./p.m.)

Who (name and organization):_____; When:_____(a.m./p.m.)

Who (name and organization):_____; When:_____(a.m./p.m.)

PLANNED DISCHARGE ACTIVITY CHECKLIST (cont.)
For Water Utility Operation and Maintenance

o INSTALL CONTROL MEASURES

o CARRY OUT THE DISCHARGE ACTIVITY IN ACCORDANCE WITH STANDARD OPERATING PROCEDURES:

- o Time begun:_____ o Time ended:_____
- o Estimated actual discharge rate:_____
- o Estimated actual discharge volume:_____
- o Monitor the control measure(s) (see below)

o CLOSE THE OPERATION:

- o Remove the control measure(s)
- o Inspect flow path for erosion damage and/or sediment deposition
- o Inspect the receiving stream, if practical, for erosion damage or sediment deposition
- o Cleanup:
  - o Remove/dispose of collected sediments and debris
  - o Remove all materials used in discharge operation

o MONITORING RECORD:

DISCHARGE WATER	TIME INSPECTED	CONTROL MEASURES	TIME INSPECTED

o NOTES REGARDING THE IMPLEMENTATION OF THE CONTROL MEASURES:

o BMP EVALUATION (problems encountered, suggested improvements, or other items which maybe used to improve the BMP):

Send Copies to:
- o Supervisor (original)
- o ESD, Environmental Enforcement Division
- o Others:_____

UNPLANNED DISCHARGE ACTIVITY CHECKLIST
For Water Utility Operations and Maintenance

For discharges with one or more of the following: volumes greater than 50,000 gallons; turbidity>50 NTU; chemical additives with concentrations higher than in drinking water.

Location: _____
Zone: _____
Date of Discharge: _____
Name of Person Completing Form: _____
Date Form Completed:_____

- o APPLICABILITY:
  - o Water main/service breaks
  - o Sheared hydrants
  - o Other: _____
  - o Artesioning wells
  - o Sump/vault pumping
- o PROCEDURE:
  - o As applicable, stop the discharge as soon as possible
  - o Inspect flow path
  - o Remove potential pollutants from the flow path
  - o If the repairs or corrective actions will cause additional discharge of water, then:
  - o Install BMP Control Measure(s):
    - o Sediment Control:
      - o Discharge to sanitary
      - o Filter bag/silt sack at catch basins/discharge lines
      - o Other:_____
      - o Filter bag/silt sack at catch basins
      - o Sand bags/gravel/berms/booms at catch basins
      - o Settling pond
    - o Erosion Control:
      - o Discharge to landscaping
      - o Protect landscaping with visqueen and/or plywood
      - o Other:_____
    - o Dechlorination/dechloramination:
      Method: _____
    - o Other BMP(s) (describe): _____
  - o DISCHARGE OPERATION:
    - o Time Began: _____
    - o Time Ended: _____
    - o Estimated Discharge Rate: _____ g.p.m. or c.f.s.
    - o Monitoring: (see back)
  - o CLOSE OPERATION: o Removed Sediment/Debris o Removed Control Measures
    o Inspected Receiving Storm Drain and/or Stream
- o NOTIFICATIONS:
  - o Who: _____ When:_____ (a.m./p.m.)
  - o Who: _____ When:_____ (a.m./p.m.)
  - o Who: _____ When:_____ (a.m./p.m.)

UNPLANNED DISCHARGE ACTIVITY CHECKLIST (CONT.)
For Water Utility Operations and Maintenance

o MONITORING RECORD:

DISCHARGE WATER	TIME INSPECTED	CONTROL MEASURES	TIME INSPECTED

o NOTES REGARDING THE IMPLEMENTATION OF THE CONTROL MEASURES:

o BMP EVALUATION (problems encountered, suggested improvements, or other items which maybe used to improve the BMP) :

Send Copies to:
- o Supervisor (original)
- o Environmental Services Department, Environmental Enforcement Division
- o Others: _____

TABLE 2

City of San Jose
CONTACT INFORMATION

Title/Name	When to Notify	Location	Day Phone	Pager	Cellular	24-Hour Phone	E-Mail
Stand-by Supervisor (per on-call schedule)	1. Rescheduling discharges to avoid potential pollution 2. Questions about BMP use /SOPs	SJ Muni Water	(see 24 hr phone)	277-4123 #0445	---	277-4123 #0445	---
Jim Irving, Supervisor of Muni Water Division	1. Coordination with ESD, Public Works or other divisions 2. Questions about record-keeping 3. Need for water quality testing 4. Inspection of P.O. work 5. Questions about training 6. Recommended BMP modifications 7. Need for Discharge Inventory	SJ Muni Water	277-5180 or 277-2557	994-0237	981-5086	277-4123 #0445	Jim.Irving@ci.sj.ca.us
Environ. Enforcement: On-Duty Staff	1. Discharge options	SJ ESD	945-3000			945-3000	
Bill Smith, Associate Environmental Services Specialist, Watershed Analysis Section	1.Recommended BMP modifications 2. WUDPPP revisions 3. Questions about Performance Standard 4. Record-keeping and annual reporting	SJ ESD	945-3054				BillSmith@ci.sj.ca.us
Mansour Nasser, Senior Civil Engineer	1. Coordination with SJ Muni Water 2. Inspection of contracted CIPs or work by private contractor on City water lines 3. Questions about BMPs use /SOPs 4. Questions about record-keeping	SJ Muni Water	277-3671 or 277-2558	944-8170			Mansour.Nasser@ci.sj.ca.us

ARTESIONING WELLS

Pollutants of Concern: Sediment from erosion
Equipment: N/A
Methodology:
For wells draining to an adjacent creek channel:

1. Inspect the discharge point at the creek end of the storm drain line at least every six months for evidence of erosion problems
2. As needed, replace or augment existing rip-rap or other permanent erosion control measures

Record-Keeping

1. If control measures are required for erosion problems, Muni Water staff shall complete the Planned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at controlling erosion and ease of BMP use.

HYDRANT FLUSHING

Pollutants of Concern: Sediment from erosion, turbidity, wash-off of materials on adjacent pavement
Equipment: Flushing tubes, valve wrenches, safety equipment, utility truck
Methodology:

1. Set up safety equipment and traffic control.
2. Check and clear flow path between hydrant and downstream catch basin(s)
    - Manually clear large debris items, if any
    - Sweep leaves and/or litter
    - If area contains significant pollutant potential, clean area by sweeping or using shop vac (or reschedule flushing/flow testing to follow City street sweeping schedule)
    - Clean out catch basins if flow will be impeded by existing material inside or on grate
    - Place litter and debris in City truck for proper disposal
3. Park city utility truck on pavement so that a wheel well is opposite the hydrant outlet
4. Install the flushing tubes
5. Look for turbidity. As necessary:
    - Install silt sacks in downstream catch basin(s), or
    - Install sand bags or booms around downstream catch basin(s)
6. Direct flow toward the utility truck wheel well to keep flow from discharging across street and causing erosion and traffic problems.
7. Continue flowing fire hydrant until discharge is clear (however, ensure that the flow volume from each hydrant discharge is less than 50,000 gallons by adjusting flushing frequency, if necessary)
8. After flushing or testing is completed, inspect the flow path and catch basin(s) and remove any remaining debris for proper disposal

Record-Keeping

1. Record duration of flushing on Fire Hydrant Maintenance Program form (Attachment A)
2. If the turbidity concentration of the discharge requires use of sediment control measures, Muni Water staff shall complete the Planned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at sediment control and ease of BMP use.

ATTACHMENT 'A'

City of San Jose
Municipal Water System Division

FIRE HYDRANT MAINTENANCE PROGRAM

Hydrant ID # _____

Hydrant Location: _____

Date Flushed _____

Main Size: _____

Remarks:_____

_____

_____

_____

_____

_____

_____

Main or Service Line Break

Pollutants of Concern: Sediment from erosion, chlorine/chloramine
Equipment: Backhoe, dump truck, utility truck, compressor, tamper, jack hammer, repair clamp, safety equipment
Methodology:

1. Set up safety equipment and traffic control
2. Stop the flow of water as soon as possible. Application of this BMP is secondary to action necessary to stop the flow of water and protect public safety.
3. Isolate the area of the break
4. Check and clear the flow path
5. Notify affected residents and businesses of the interruption of the water supply
6. Call Underground Service Alert (USA) Locates before digging
7. Proceed with repairs, using appropriate BMPs for erosion and sediment control
   - Erosion control BMPs may include (but are not limited to) identifying and protecting landscaped areas using plywood or visqueen
   - Sediment control BMPs may include (but are not limited to):
     a. Filter fabric under catch basin grates
     b. Silt sacks in catch basins
     c. Sand bags, gravel berms or booms around catch basins
8. If the discharge is located in the North San Jose and the discharge is anticipated to be greater than 50,000 gallons, use chlorine controls, which may include (but are not limited to):
   - Surface or passive aeration
   - Chemical neutralization of chlorine
9. If the discharge is located in the Evergreen Zone and is anticipated to be greater than 50,000 gallons, neutralize chloramine using sodium thiosulfate or sodium bisulfite, according to AWWA standards (C652).
10. After the break has been repaired, inspect the flow path and catch basins and remove any remaining debris for proper disposal.

Record-Keeping

After the line break has been repaired, if the turbidity concentration of the discharge required the use of sediment control measures or the discharge was greater than 50,000 gallons, Muni Water staff shall complete the Unplanned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at diverting contaminants from the discharge and ease of BMP use.

Pressure Release Valve/Blow-Offs

Pollutants of Concern: Sediment from erosion, turbidity, wash-off of materials on adjacent pavement
Equipment: Blow-off tube, valve wrenches, safety equipment
Methodology:

1. Set up safety equipment and traffic control
2. Check and clear flow path between release valve and downstream catch basin
   - Manually clear large debris items, if any
   - Sweep leaves and/or litter
   - Call for a sweeper if area contains significant pollutant potential (or reschedule blow-off discharge to follow sweeping schedule)
   - Clean out catch basins if flow will be impeded by existing material inside or on grate
   - Place litter and debris in City truck for proper disposal
3. Install the blow-off tubes
4. Evaluate for turbidity problems. As necessary:
   - Install sand bags or booms around the downstream catch basin, or
   - Install silt sacks in the downstream catch basin
5. Direct flow to pavement
6. After the valve has been blown-off, inspect the flow path and catch basin and remove any remaining debris for proper disposal

Record-Keeping

If the turbidity concentration of the discharge requires use of sediment control measures, Muni Water staff shall complete the Planned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at erosion and sediment control and ease of BMP use.

Sheared Hydrants

(8 "wet barrel" type at Towers, Lexann and Silvercreek Roads)

Pollutants of Concern: Sediment from erosion, turbidity, chlorine/chloramine
Equipment: Valve wrenches, safety equipment
Methodology:

1. Set up safety equipment and traffic control
2. Stop the flow of water as soon as possible. Application of this BMP is secondary to action necessary to stop the flow of water and protect public safety.
3. Isolate the hydrant
4. Check and clear the flow path, if possible
5. Proceed with repair and if practical, use appropriate BMPs for erosion and sediment control
   - Erosion control BMPs may include (but are not limited to) identifying and protecting landscaped areas using plywood or visqueen
   - Sediment control BMPs may include (but are not limited to):
     a. Filter fabric under catch basin grates
     b. Silt sacks in catch basins
     c. Sand bags, gravel berms or booms around catch basins
6. After the break has been repaired, inspect the flow path and catch basins and remove any remaining debris for proper disposal

Record-Keeping

After the hydrant has been repaired, if the turbidity concentration of the discharge required the use of sediment control measures or the discharge was greater than 50,000 gallons, Muni Water staff shall complete the Unplanned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at diverting contaminants from the discharge and ease of BMP use.

Sump/Vault Pumping

Pollutants of Concern: Sediment from erosion, turbidity, wash-off of materials on adjacent pavement, and groundwater contaminants (hydrocarbons, solvents, etc.)
Equipment: Pump, safety equipment
Methodology:

1. Set up safety equipment and traffic control
2. Open the sump or vault and, as feasible:
   - Estimate the discharge volume
   - Observe if the water could contain chemical contaminants
     a. Visual: discoloration, oily sheen, floating material
     b. Smell: gasoline, solvents, hydrogen sulfide, other
   - If observations indicate no contamination, skip to Item 5, below
3. If contamination is suspected but the source is unknown, delay the pumping operation to sample and test the water. Contact the supervisor regarding the need for interrupting operations and for analytical testing.
4. If analytical testing determines that the water is contaminated, contact the Environmental Service Department at 945-3000 regarding discharge options (such as possible discharge to the sanitary sewer or other options)
   - If permissible and physically possible, pump contaminated water to sanitary sewer
   - If it is not possible to discharge to a sanitary manhole or clean-out for regulatory or physical reasons, pump the water to a tank truck or other sealed container and transport it to a disposal site authorized to accept it
5. If the discharge is not contaminated as determined by visual and olfactory observation:
   - Evaluate the standing water for turbidity problems. As necessary use:
     a. Filter fabric under the catch basin grate
     b. Silt sacks on the outlet line or in the catch basin
     c. Sand bags, gravel berms or booms around the catch basin
   - Check and clear flow path between hydrant and downstream catch basin(s)
     a. Manually clear large debris items, if any
     b. Sweep leaves and/or litter
     c. Clean out catch basins if flow blocked by existing material inside or on grate
     d. Place litter and debris in City truck for proper disposal
   - Set-up the sump pump to discharge to the pavement, making sure that the flow is not causing an erosion problem
   - After pumping is completed, inspect the flow path and catch basin and remove any remaining debris for proper disposal

Record-Keeping

1. If analytical water quality testing was required due to possible chemical contamination, City staff responsible for water sampling shall document sampling date, discharge location and testing results.
2. After the sump or vault has been pumped, if runoff pollution control measures were required, Muni Water staff shall complete the Unplanned Discharges Checklist to document discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at diverting contaminants from the discharge and ease of BMP use.

Tank Cleaning

Pollutants of Concern: Turbidity, chlorine/chloramine
Equipment: Per Contractor
Methodology:

1. Chlorine control BMPs are required if the discharge volume is >50,000 gallons.
2. Sediment control BMPs are required if the turbidity of the discharge is >50 NTU.
3. Include a contract provision requiring the contractor to submit a plan to the City explaining the use of appropriate turbidity and/or chlorine control BMPs.
4. Direct the contractor to review the Santa Clara Valley Urban Runoff Pollution Prevention Plan model Water Utility Operation and Maintenance Discharge Pollution Prevention Plan:
   - Chlorine/Chloramine BMPs could include (but are not limited to) surface or passive aeration or chemical neutralization of chlorine/chloramine (follow AWWA standards for sanitizing covered reservoirs)
   - Turbidity BMPs could include (but are not limited to) using silt sacks or a temporary settling basin
5. Staff from Muni Water will inspect work for compliance with BMP plan and/or need to modify plan

Record-Keeping

1. Muni Water staff shall complete the Planned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at diverting contaminants from the discharge and ease of BMP use.

Water Meter Testing (2" and larger)

Pollutants of Concern: Sediment from erosion and wash-off of materials on adjacent pavement

Equipment: Test trailer, wrenches, fire hydrant hose, test port pipe fitting, ladder, gas detection equipment, safety equipment

Methodology:

1. Set up safety equipment and traffic control
2. Check and clear flow path between water meter and downstream catch basin
   - Manually clear large debris items, if any
   - Sweep leaves and/or litter
   - Call for a sweeper if area contains significant pollutant potential (or reschedule blow-off discharge to follow sweeping schedule)
   - Clean out catch basins if flow will be impeded by existing material inside or on grate
   - Place litter and debris in City truck for proper disposal
3. Direct flow to pavement away from landscaping
4. After testing the meter, inspect the flow path and catch basin and remove any remaining debris for proper disposal

Record-Keeping
Not applicable-flow volumes and chemical concentrations below thresholds.

Well First Flush-to-Waste Cycle

Pollutants of Concern: Turbidity and erosion
Staff: One staff person to inspect/sample
Equipment: Prepared sample bottle
Methodology:

For wells draining to an adjacent creek channel:

1. Inspect the discharge point at the creek end of the storm drain line at least every six months for evidence of erosion problems.
2. As needed, replace or augment existing rip-rap or other permanent erosion control measures.

For all wells:

1. If a turbidity problem (such as from iron bacteria) is anticipated from the discharge due to low groundwater table or well maintenance problem, sample and test the well water to determine the turbidity concentration and whether the well should be kept in service.
2. If the turbidity is >50 NTU and the well must be kept in service, direct the first flush discharge to a temporary settling basin or to the sanitary sewer
   - Consider modifying the start-up cycle of the well to run more frequently and for a longer period to reduce the build-up of contaminants
   - If modifying the start-up cycle does not clear-up the turbidity problem, temporary shallow settling basins may be installed in unpaved areas adjacent to the well
     a. Size the pond(s)to hold 3,000-4,500 gallons for each well discharged
     b. Construct the ponds using low dirt berms (8-12" tall) to allow for quick evaporation
     c. After the discharge evaporates, dispose of the remaining debris to a landfill
   - If it is not possible to install a temporary settling basin, consider discharging to the sanitary sewer. Prior to beginning any discharge to the sanitary sewer, contact the Water Pollution Control Plant at 945-3000.

Record-Keeping

1. If control measures are required for turbidity problems, Muni Water staff shall complete the Planned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at erosion control and diverting contaminants from the discharge and ease of BMP use.
2. The City staff responsible for inspection shall complete the Planned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at diverting contaminants from the discharge and ease of BMP use.

Well Rehabilitation and Maintenance

Pollutants of Concern: Chlorine and turbidity
Equipment: Per contractor
Methodology:

1. Chlorine control BMPs are required if the discharge volume is >50,000 gallons or if the chlorine concentration is >1.5 mg/l.
2. Include a contract provision requiring the contractor to submit a plan to the City explaining the use of appropriate turbidity and/or chlorine control BMPs.
   - Direct the contractor to review the Santa Clara Valley Urban Runoff Pollution Prevention Plan Model Water Utility Operation and Maintenance Discharge Pollution Prevention Plan
   - Chlorine BMPs could include (but are not limited to) surface or passive aeration or chemical neutralization of chlorine
   - Turbidity BMPs could include (but are not limited to) the use of silt sacks, flow diversion to settling ponds, or discharge to the sanitary sewer
   - Prior to beginning any discharge to the sanitary sewer, contact the Water Pollution Control Plant
3. Depending on the nature of the contracted work, a Public Works or a Muni Water inspector will check work for compliance with BMP plan and/or need to modify plan

Record-Keeping

1. The City staff responsible for inspection shall complete the Planned Discharges Checklist to document the discharge location, BMPs used, date of BMP installation, flow volume, duration of BMP use (if applicable), BMP effectiveness at diverting contaminants from the discharge and ease of BMP use.

PM STANDARD OPERATING PROCEDURES

This section contains specific Standard Operating Procedures for the Pesticide Management Program.

The various components of this section are organized as follows:

1. Providing the City's Integrated Pest Management(IPM) Policy to Contractors Who Perform Pesticide Application Work on Municipal Property

2. City Of San Jose Integrated Pest Management Best Management Practices and Standard Operating Procedures

City of San Jose
Integrated Pest Management
Standard Operating Procedure

Providing the City's Integrated Pest Management (IPM) Policy to Contractors Who Perform Pesticide Application Work on Municipal Property

Purpose: To ensure that all contractors employed by the City who perform pesticide application work on municipal property are provided with a copy of the City's IPM policy.

Responsible Party: All City personnel that administer City contracts that include pesticide application work on municipal property.

Methodology:
The City's IPM policy is provision number four of the City's Pollution Prevention Policy (Council Policy number 4-5). The City's contract managers can choose from the following methods to ensure that a contractor who performs pesticide application work on municipal property is provided with a copy of the City's IPM policy:

1. Include a copy of the City's IPM policy in the contractor solicitation documents, e.g., Request for Proposal or Request for Quote.
2. Include a copy of the City's IPM policy in the specifications of the contract.
3. Meet with the contractor and review the City's IPM policy.
4. Mail a copy of the City's IPM policy to the contractor.

Contract managers must document that a contractor has received the City's IPM policy.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

City of San Jose
Integrated Pest Management

Best Management Practices
and
Standard Operating Procedures

December 2002

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I. INTRODUCTION

This document has been compiled to assist personnel performing pest management and/or pesticide application on City property, including contractors, in the use of integrated pest management.

On an annual basis, supervisory staff and field staff from affected City Departments will review the effectiveness of these SOPs and any other BMPs in use in order to evaluate their effectiveness in reducing pollutants in storm water and eliminating illicit discharges. This review and evaluation will normally occur as a part of annual municipal training on City Urban Runoff NPDES requirements. The Environmental Services Department (ESD) in conjunction with the affected City Departments normally conducts this training in the May/June timeframe.

II. DEFINITIONS

BEST MANAGEMENT PRACTICE (BMP)	Activities, practices, facilities, and/or procedures that when implemented to their maximum efficiency will prevent or reduce pollutants in discharges. Examples of BMPs may include public education and outreach efforts, proper planning of development projects, proper clean out of catch basin inlets, and proper waste handling and disposal, among others.
CITY DEPARTMENT	Any department of the City of San Jose and includes any pesticide applicator hired by a City department to apply pesticides on City property.
CONTRACT	A binding written agreement, including but not limited to, a contract, lease, permit, license, or easement between a person, firm, corporation or other entity, and a City department, which grants a right to use or occupy property of the City of San Jose for a specified purpose or purposes.
CONTRACTOR	A person, firm, corporation or other entity that enters into a contract with the City of San Jose.
DEFOLIATING	Includes killing or artificially accelerating the drying of plant tissues, with or without causing abscission.
DOT	Department of Transportation – City of San Jose.
EQUIPMENT OPERATOR	City personnel driving truck, or other vehicle or using City equipment or tools.
ESD	Environmental Services Department – City of San Jose.
FIELD STAFF	Non-supervisory personnel in the DOT, PRNS, GS, and/or PW.
FUNGI	Parasitic plants which have no leaves, flowers, or chlorophyll (mildews, molds, rusts, mushrooms) and reproduce by means of spores.
FUNGICIDE	Any substance that kills fungi or inhibits the growth or reproduction of spores.
GS	General Services Department – City of San Jose.

INSECTS	Any animal within the class of animals which are known as "Insecta" or any similar animal such as a centipede, spider, mite, tick, or louse.
INTEGRATED PEST MANAGEMENT (IPM)	An ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and the use of resistant varieties. Pesticides are used only after monitoring indicates that they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risk to human health, beneficial and non-target organisms, and the environment.
MAINTENANCE PERSONNEL	Any person monitoring threshold levels, taking preventative or corrective actions, or applying a pesticide.
MAXIMUM EXTENT PRACTICABLE (MEP)	The standard for implementation of storm water management programs to reduce pollutants in storm water. MEP refers to storm water management programs taken as a whole. The implementation of MEP takes into account equitable consideration and competing facts, including, but not limited to the gravity of the problem, potential or actual public health risk, environmental benefits, pollutant removal effectiveness, regulatory compliance, public acceptance, implementability, cost and technical feasibility.
MOLLUSK	Any invertebrate animal having a soft body typically covered by a shell.
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)	A permit issued by the United States Environmental Protection Agency, State Water Resources Control Board or San Francisco Bay Regional Water Quality Control Board pursuant to the Clean Water Act section 402(p) that authorizes discharges to waters of the United States and requires the reduction of pollutants in the discharge.

PEST	Any of the following that is, or is liable to become, dangerous or detrimental to the agricultural or nonagricultural environment of the state: (a) Any insect, predatory animal, rodent, nematode, or weed. (b) Any form of terrestrial, aquatic, or aerial plant or animal, virus, fungus, bacteria, or other microorganism (except viruses, fungi, bacteria, or other microorganisms on or in living man or other living animals). (c) Anything that the director, by regulation, declares to be a pest.
PESTICIDE	Means pesticide as defined in Section 12753 or Chapter 2 of Division 7 of the California Food and Agriculture Code - Pesticide includes any of the following: (a) Any spray adjuvant. (b) Any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, as defined in Section 12754.5, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever.
PERSONAL PROTECTIVE EQUIPMENT (PPE)	Means apparel and devices worn to minimize human body contact with pesticides or pesticide residues that must be provided by an employer and are separate from, or in addition to, work clothing. PPE may include, chemical resistant suits, chemical resistant gloves, chemical resistant footwear, respiratory protection devices, chemical resistant aprons, chemical resistant headgear, protective eyewear, or a coverall (one- or two-piece garment).
PRNS	Department of Parks, Recreation, & Neighborhood Services – City of San Jose.
PW	Department of Public Works – City of San Jose.
RODENT	All members of the order Rodentia and all rabbits and hares.

SPRAY ADJUVANT	Any wetting agent, spreading agent, deposit builder, adhesive, emulsifying agent, deflocculating agent, water modifier, or similar agent, with or without toxic properties of its own, which is intended to be used with another pesticide as an aid to the application or effect of the other pesticide, and sold in a package that is separate from that of the pesticide other than a spray adjuvant with which it is to be used.
STANDARD OPERATING PROCEDURE (SOP)	Routine steps or actions, that if properly carried out, reduce the likelihood of pollutants entering the receiving waters.
SUPERVISORY STAFF	Management staff in the DOT, PRNS, GS, and/or PW.
URBAN RUNOFF/ STORM WATER	The part of precipitation (rainfall or snowmelt) which travels via flow across a surface to the storm drain system or receiving waters. Examples of this phenomenon include the water that flows from a building's roof or parking lot when it rains (runoff from an impervious surface); and water that flows from vegetated surface when rainfall is in excess of the rate at which it can infiltrate into the underlying soil (runoff from a pervious surface).
WEED	Any plant out of place. (a) Broadleaf weed is a dicot plant (two or more leaves). (b) Grassy weed is a monocot plant (one leaf or more from a central source).

III. IPM Best Management Practices (BMPs)

Integrated Pest Management
Best Management Practice

IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.

Understanding pest characteristics and needs is essential to implementing IPM effectively. Pests seek habitats that provide basic needs such as air, moisture, food, and shelter. Pest populations can be prevented or controlled by creating inhospitable environments, by removing some of the basic elements pest need to survive, or by simply blocking their access into buildings. Pests may also be managed by other methods such as sanitation, traps, vacuums, or pesticides. An understanding of what pests need in order to survive is essential before action is taken. Pest-prevention measures reduce the need for pesticide applications and include sanitation and structural repair, employing physical and mechanical controls such as screens, traps, weeders, air doors, vacuums, etc.

- **Sanitation** - Removal or reduction of food source. Removing conditions that attract or favor the infestation.

- **Physical Exclusion** - Selective caulking of cracks and crevices to eliminate pest accessibility, avenues of access or hiding areas, or items brought into a building that may have been stored.

- **Mechanical/Biological Controls** - Concentrate on monitoring and controlling threshold levels using pheromone, sticky traps, or HEPA filter vacuum. Introducing or enhancing pests' natural enemies may also be a tactic in this area.

- **Chemical Treatments** - Many different kinds of pesticides are currently available for use against structural pests. An appropriate application uses the least toxic and most effective and efficient technique and material. Due to their potentially toxic nature, these materials should be applied by qualified applicators in a manner to ensure maximum efficiency, with minimal hazard. Where required, pesticides should be applied when occupants are not present in areas where they may be exposed to materials applied. Re-entry

into the affected area will be allowed according to the instructions on the pesticide labels. Where required, posting will be done.

Inspection, Identifying, and Monitor

An IPM program consists of a cycle of inspecting, identifying, monitoring, evaluating, and choosing the appropriate method of control. Inspection and accurate identification of pests are vital steps in IPM to ensure that control methods will be effective. Once the pest has been identified and the source of its activity pinpointed, habitat modifications—primarily, exclusion, repair, and sanitation efforts—may greatly reduce the prevalence of the pest. Monitoring includes inspecting areas for pest evidence, entry points, food, water, and harborage sites, and estimating pest population levels. The information gained through monitoring is evaluated to determine whether the action threshold has been exceeded and what can be done in the way of prevention.

Action Threshold Level

These are the levels of pest populations or site environment conditions that require remedial action. The pest manager and the occupants of the structure set the action threshold. It is determined by deciding, based on the sensitivities of the structure's occupants, how many pests can be tolerated. The presence of some pests does not, in itself, necessarily require action.

When pest populations exceed pre-set action thresholds, action must be taken. Precise recommendations or actions to achieve specific results are an essential part of an IPM program. Specific recommendations, including an explanation of the benefits, should be based on the evaluation of all available data obtained through inspecting, identifying, and monitoring.

Recommendation of Pest Control Vendor for Action Plan of Control

The State Department of Pesticide Regulation or the County Department of Agriculture can provide information on pesticide applicator certification.

Pest control firms should work with the pest manager and the responsible building manager to solve pest control problems. The contract should specify the use of IPM principles and practices in meeting pest management objectives. Contracts should be written to provide expected results. Pest management objectives specific to the site should be jointly developed, agreed upon, and written into the contract. Any special health concerns (such as for individuals with allergies) should be noted and reflected in the pesticides that can be utilized, or excluded from use.

Training of Building Personnel

Education is a vital component of pest management. All occupants of a building must understand the basic concepts of IPM and who to contact with questions or problems. Staff needs to understand how their own behavior helps alleviate or contributes to pest problems. Specific instructions should be provided on what to

do and what not to do. For example, staff should not bring and use pesticides of their own on City sites. Only designated qualified personnel should apply pesticide products, including those purchased at a retail store. Educating and training staff is important to the success of an in-house IPM program.

Training Points for Inside Sites:

Typical Pests:
Mice, rats, cockroaches, ants, flies, wasps, hornets, yellow jackets, spiders, microorganisms, termites, carpenter ants, and other wood-destroying insects.

Entryways:
Doorways, overhead doors, windows, holes in exterior walls, openings around pipes, electrical fixtures, or ducts.

- Keep doors shut when not in use.
- Place weather stripping on doors.
- Caulk and seal openings in walls.
- Install or repair screens.
- Install air curtains.
- Keep vegetation, shrubs, and wood mulch at least one (1) foot away from structures.

Offices:
Offices, cubicles, hallways, conference rooms.

- Allow food and beverages only in designated areas.
- If indoor plants are present, keep them healthy. When small insect infestations appear, remove them manually.
- Keep areas as dry as possible by removing standing water and water damaged or wet materials.
- Routinely clean areas, removing dust and debris, and emptying waste receptacles as needed.
- Frequently vacuum carpeted areas.

Food Preparation and Serving Areas:
Dining room, main kitchen, break rooms, snack area, vending machines, and food storage rooms.

- Store food and waste in containers that are inaccessible to pests. Containers must have tight lids and be made of plastic, glass, or metal. Waste should be removed at the end of each day.
- Place screens on vents, windows, and floor drains to prevent cockroaches and other pests from using unscreened ducts or vents as pathways.

- Create inhospitable living conditions for pests by reducing the availability of food and water—remove food debris, sweep up all crumbs, fix dripping faucets and leaks, and dry out wet areas.
- Improve cleaning practices, including promptly cleaning food preparation equipment after use and removing grease accumulation from vents, ovens, and stoves. Use caulk or paint to seal cracks and crevices.
- Capture rodents by using mechanical or glue traps. (Note: Mechanical traps, including glueboards, used in rodent control must be checked daily. Dispose of killed or trapped rodents within 24 hours.

Rooms and Areas with Extensive Plumbing:
Bathrooms, rooms with sinks, locker rooms, dishwasher rooms, swimming pools, and greenhouses.

- Promptly repair leaks and correct other plumbing problems to deny pests access to water.
- Routinely clean floor drains, strainers, and grates. Seal pipe chases.
- Keep areas dry. Avoid conditions that allow formation of condensation. Areas that never dry out are conducive to molds and fungi. Increasing ventilation may be necessary.
- Store paper products or cardboard boxes away from moist areas and direct contact with the floor or the walls. This practice allows for ease in inspection.

Maintenance Areas:
Boiler room, mechanical room, janitorial-housekeeping areas, and pipechases.

- After use, promptly clean mops and mop buckets; dry mop buckets and hang mops vertically on rack above floor drain.
- Allow eating only in designated areas.
- Clean trashcans regularly, use plastic liners in trashcans, and use secure lids.
- Keep areas clean and dry as possible, and remove debris.

Applying Pesticides

All pesticides used in the U.S. must be EPA registered, and the registration number must be listed on the label. Although EPA registers pesticides for use within the United States, the pesticide must also be registered for use in California by the Department of Pesticide Regulation. The fact that a particular product is registered does not mean that it is "safe" under all conditions of use. Read and follow the pesticide label directions, know how to apply and handle these chemicals, and try to minimize the exposure to children, adults, and other non-target species.

The following general recommendations should minimize exposure to people and other non-target species when the application of pesticides is being considered:

- Read and follow label instructions.

- Choose a pesticide that is labeled for the specific site, intended for the pest you are trying to control, and as target specific as possible, rather than broad spectrum.
- Determine the right amount of pesticide to purchase and use.
- Use a spot-treatment method of application when pesticide treatments are required. Treat only the obviously infested areas. This procedure helps conserve predators and parasites needed to reduce future pest populations and increases the time between outbreaks.
- Limit the use of sprays, foggers, or volatile formulations. Instead use bait and crack and crevice application when possible. Look for crack and crevice label instructions on how to apply the pesticide. These treatments maximize the exposure of the pest to the pesticide while minimizing pesticide exposure for the occupants.
- Place all rodenticides, for rats and mice, either in locations not accessible to children and non-target species or in tamper resistant bait boxes. Securely lock or fasten shut the lids of all bait boxes. Place bait in the baffle-protected feeding chamber of the box. Never place bait in the runway of the box.
- Where required, apply when occupants are not present or in areas where they will not be exposed to the material applied. Note any re-entry time limits listed on the label, and be aware that some residues can remain long after application.
- Use proper protective clothing or equipment when applying pesticides, per the pesticide label and all regulations.
- Properly ventilate areas after pesticide application per label requirements.
- Where required, notify building occupants of upcoming pesticide applications.
- After applying, store and/or dispose of unused pesticides properly.
- Keep copies of current pesticide labels, consumer information sheets, MSDSs, and pesticide use records.

Evaluation of Results After Control Steps

Evaluate results to determine if pest management objectives are reached. The City must evaluate the results of practicing IPM to determine if pest management objectives have been met. Accurate records of inspecting, identifying, and monitoring activities show changes in the site environment (reduced availability of food, water, or shelter), physical changes (exclusion and repairs), pest population changes (increased or reduced numbers, older or younger pests), or changes in the amount of damage or loss.

Record Keeping

Keep written records of all aspects of the program.

Successful practice of IPM relies on accurate record keeping. Keeping accurate records leads to better decision-making and more efficient procurement. Accurate records of inspecting, identifying, and monitoring activities show changes in the site environment (reduced availability of food, water, or shelter), physical changes (exclusion and repairs), pest population changes (increased or

reduced numbers, older or younger pests), or changes in the amount of damage or loss.

A complete and accurate pest management log should be maintained for each property and kept in the office of the pest manager. Pesticide use records should also be maintained to meet State, County and local regulatory requirements. The logbook should contain the following items:

- A copy of the Pest Management Plan and service schedule for the property.
- A copy of the current EPA-registered label and the current MSDS for each pesticide product used on City property.
- Pest surveillance data sheets, which record, in a systematic fashion, the type and number of pests or other indicators of pest population levels revealed by the monitoring program for the site. Examples include date, number, location and rodent species trapped or carcasses removed as well as a date, number, and location of new rat burrows observed.
- A diagram noting the location of pest activity, including the location of all traps, trapping devices, and bait stations in or around the site.

References:

- University of California Statewide Integrated Pest Management Project website
- EPA, Office of Pesticide Programs - Pest Control in the School Environment: Adopting Integrated Pest Management. August 1993.

IV. IPM STANDARD OPERATING PROCEDURES (SOPs)

Integrated Pest Management
Standard Operating Procedure

1. Aquatic Weed Control

Purpose:
To control **broadleaf and grassy weeds** on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Reward, Aquamaster

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **weeds** on City property that contain water the following procedures will be used.

- Establish threshold level of acceptance.
- Create safe water ways that contain plant and animal in City facilities.
- Use less toxic controls such as cultural practices and aeration.
- Use pesticides only if population exceeds threshold level or at discretion of supervisor.

Integrated Pest Management
Standard Operating Procedure

2. Weed Control

Purpose:
To control **broadleaf and grassy weeds** on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Reward, Dimension,Karmex DF, Pendulum WDG, 3.3Ec, 2G, Ronstar G, Scythe, Surflan A.S.,Trimec, MSMA, Grassgetter, Weedhoe, Aquamaster, Manage, Roundup Pro, Roundup Pro Dry, Turflon ester,

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **weeds** in city facilities the following procedures will be used.

- Establish threshold level of acceptance.
- Create safe play areas, & sports fields, medians and right of way areas.
- Use less toxic controls such as cultural practices such as aeration and fertilization. water
- Use pesticides only if population exceeds threshold level, or at discretion of supervisor.

Integrated Pest Management
Standard Operating Procedure

3. Disease Control

Purpose:
To control **fungi caused disease damage** on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
None used at this time.

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **fungal diseases** (i.e. Powdery Mildew, Anthracnose, etc.) on City property the following procedures will be used.

- Establish threshold level of acceptance.
- Use plant species and varieties that resist pests and diseases.
- Use cultural practices i.e., sanitation, cultivation, fertilization, pruning, mowing, and irrigation that reduce pest and disease problems.
- Routinely monitor for damage symptoms, particularly following weather patterns, which favor the disease.
- Accurately identify the disease problem.
- Use pesticides only if damage exceeds the acceptable threshold level, or at the discretion of supervisor.

Integrated Pest Management
Standard Operating Procedure

4. Insect Control

Purpose:
To control unacceptable **insect populations** (i.e. scale, aphids, tussock moth, etc.) on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Orthene, Talstar, Conserve, Imidacloprid (Merit), Niban, Deltagard, BP 300, Dormant Oil, Superior Oil

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **insect populations** on City property the following procedures will be used.

- Establish threshold level of acceptance.
- Determine location of **insect** habitats and pathways.
- Monitor for **insect** presence by honeydew excretions underneath tree canopy, egg masses on plant material, etc.
- Remove all sources of food and water available to **insect populations**. Clean the facility.
- Seal cracks and crevices in walls, floors, and ceilings as necessary.
- Monitor for beneficial insect presence or apply bacteria material, or dormant oil for control.
- Use less toxic controls first when feasible.
- Use pesticides only if population exceeds threshold level or at discretion of supervisor.
- For Tulip trees (Liriodendron tulipifera), apply Imidacloprid or other recommended pesticide by soil injection while trees are dormant in January.
- Spray Tulip trees with Dormant Oil prior to bud break in March.
- Spray Tulip trees with Superior Oil plus Imidacloprid or other recommended Caution rated insecticide in May/June only if threshold level of a substantial buildup of honeydew under the tree canopy is exceeded.

Integrated Pest Managment
Standard Operating Procedure

5. Roach Control

Purpose:
To control **cockroach** populations on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Conquer EC; Maxforce Stations; Maxforce Gel; Drione dust

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **cockroaches** on City property the following procedures will be used.

- Establish threshold level of acceptance.
- Determine location of **roach** habitats and pathways.
- Remove all sources of food and water available to **roach** populations. Clean the facility.
- Seal cracks and crevices in walls, floors and ceilings.
- Set traps in **cockroach** pathways, check regularly, keep track of numbers of **roaches** trapped and direction of travel to establish location of **roach** populations.
- Use less toxic controls first – when feasible.
- Use pesticides only if population exceeds threshold level, or at discretion of supervisor, or if threats to human health exist.

Integrated Pest Management
Standard Operating Procedure

6. Wasp Control

Purpose:
To control **wasp** populations on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Drione dust; Talstar FMC

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **wasps** on City property the following procedures will be used.

- Establish threshold level of acceptance.
- Determine location of **wasp** habitats and pathways.
- Remove all sources of food and water available to **wasp** populations. Clean the facility.
- Seal cracks and crevices in walls, floors and ceilings.
- Set traps in **wasp** inhabited areas, check regularly, keep track of numbers of **wasps** trapped.
- Use less toxic controls first – when feasible.
- Use pesticides only if population exceeds threshold level, or at discretion of supervisor, or if threats to human health exist.

Integrated Pest Management
Standard Operating Procedure

7. Mollusks Control

Purpose:
To control **snails & slugs** on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Deadline

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **snails & slugs** on City property the following procedures will be used.

- Establish threshold level of acceptance.
- Create safe play areas, medians and right of way areas.
- Use less toxic controls such as cultural practices such as timing of irrigation.
- Use pesticides only if population exceeds threshold level or at discretion of supervisor.

Integrated Pest Management
Standard Operating Procedure

8. Vertebrate Control

Purpose:
To control **vertebrate** populations (i.e. gophers, moles, ground squirrels, etc.) on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Fumitoxin; P.C.Q. Rodent Bait, Strychnine

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **vertebrates** on City property the following procedures will be used.

- Establish threshold level of acceptance.
- Determine location of **vertebrate** habitats and pathways.
- Remove all sources of food and water available to **vertebrate** populations. Clean the facility.
- Seal cracks and crevices in walls, floors and ceilings.
- Set traps in **vertebrate** pathways, check regularly, keep track of numbers of **vertebrates** trapped and direction of travel to establish location of **vertebrate** populations.
- Use less toxic controls first – when feasible.
- Use pesticides only if population exceeds threshold level, or at discretion of supervisor, or if threats to human health exist.

Integrated Pest Management
Standard Operating Procedure

9. Mouse and Rat Control

Purpose:
To control **Mouse and Rat** populations on City property and minimize use of pesticides to the maximum extent practicable.

List of Pesticides Commonly Used:
Contrac; P.C.Q. Rodent Bait

Responsible Party:
All City personnel as well as contract personnel applying pesticides for City public projects or on City property.

Methodology:
In order to control **Mouse and Rat** on City property the following procedures will be used.

- Establish threshold level of acceptance.
- Determine location of **Mouse and Rat** habitats and pathways.
- Remove all sources of food and water available to **Mouse and Rat** populations. Clean the facility.
- Seal cracks and crevices in walls, floors and ceilings.
- Set traps in **Mouse and Rat** pathways, check regularly, keep track of numbers of **Mouse and Rat** trapped and direction of travel to establish location of **Mouse and Rat** populations.
- Use less toxic controls first – when feasible.
- Use pesticides only if population exceeds threshold level, or at discretion of supervisor, or if threats to human health exist.

Attachment 1

2004-2005 Work Plans

The attached work plans were submitted to the Water Board on March 1, 2004 and have not been revised to conform wholly to the proposed September 2004 Urban Runoff Management Plan. Future work plans will be revised to reflect the 2004 URMP.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

CITY OF SAN JOSE, CALIFORNIA
ENVIRONMENTAL SERVICES DEPARTMENT
Watershed Protection Division
4245 Zanker Road • San Jose, California 95134
Telephone: (408) 945-3000 • Fax: (408) 934-0476

February 25, 2004

Dr. Adam W. Olivieri
Program Manager
Santa Clara Valley Urban Runoff Pollution Prevention Program
699 Town & Country Village
Sunnyvale, CA 94086

Subject: Submittal of FY 2004-05 Work Plan for the Urban Runoff Management Plan

Dear Dr. Olivieri:

Attached is the annual work plan for the City of San Jose Urban Runoff Management Plan (URMP) for FY 2004-2005 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. This submittal should be included as part of the Santa Clara Valley Urban Runoff Pollution Prevention Program's March 1, 2004 Work Plan submittal to the California Regional Water Quality Control Board, San Francisco Bay Region.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment of knowing violations.

If you have any questions regarding these work plans, please contact Melody Tovar of my staff at (408) 945-5346.

Sincerely,

Randolph A. Shipes
Deputy Director
Environmental Services Department
Watershed Protection

Encl: FY 2004-2005 Work Plan

City of San Jose
FY 2004-2005 WORK PLAN
FOR CITY'S URBAN RUNOFF MANAGEMENT PLAN

Certification Statement

"I certify, under penalty of law, that this work plan and related URMP revisions were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Del D. Borgsdorf
City Manager

Submitted on March 1, 2004

City of San José

Urban Runoff Management Plan

Chapter 11:

Santa Clara Valley Urban

Runoff Pollution Prevention Program

Attachment 1: Work Plans, FY 04-05

Prepared by the Environmental Services Department

March 1, 2004

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Introduction

This compilation of annual work plans for the City of San Jose Urban Runoff Management Plan (URMP) has been developed for FY 2004-2005 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. The work plans include tasks, responsibilities, and schedules needed to implement the program elements in the URMP. The Environmental Services Department coordinates development and review of the work plans in cooperation with staff from all affected City departments.

The Permit requires that annual work plans be submitted to the Regional Board by March 1 of each year. This submission precedes completion of the City's annual budget development and approval process. While the work plans are developed using the best available information regarding budget forecasts, all activities in the work plans are subject to the approval of funding by the City Council in June of each year.

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Illicit Connection / Illegal Dumping

ICID Work Plan

This program element is implemented pursuant to permit provision C.2. The City's Environmental Inspectors continue to conduct ICID investigations.

ICID 1 - Response to Complaints

The City of San Jose will respond to complaints regarding IC/ID dumping activities into the storm drain system and will ensure that the activity has ceased or is an allowable discharge.

#	Activities	Compliance Date	Responsible Party
A.	Update database system to track IC/ID complaint information.	Done FY 02-03	ESD-WE
B.	Document to RWQCB annually the number of IC/ID complaints that City received, & that activity has ceased or is an allowable discharge.	Annually	ESD-WE
C.	Document to the RWQCB annually follow-up activities from each IC/ID complaint response. (Table 1 in the Annual Report)	Annually	ESD-WE
D.	Review effectiveness of standard operating procedures for responding to IC/ID complaints.	Ongoing	ESD-WE
E.	Work with SCVURPPP to refine administrative procedure for providing referrals to the Regional Board.	~~6/03~~ **6/30/05**	ESD-WE, Program
F.	Revise standard operating procedures to incorporate results of ICID 1E.	~~6/03~~ **6/30/05**	ESD-WE, Program

ICID 2 - Investigations

The City of San Jose will conduct investigations of high priority areas. High Priority is defined as areas with a high potential for non-storm water discharges to the City's collection system.

#	Activities	Compliance Date	Responsible Party
A.	Identify high priority areas, primary types & sources of IC/ID pollution based on complaints, historical inspection records, inspector knowledge and monitoring information.	Annually	ESD-WE
	1. Perform GIS analysis on frequently occurring IC/ID sources and/or types.	FY 03-04	ESD-UR
B.	Conduct investigations of high priority areas based on ICID 2A.	Ongoing	ESD-WE
C.	Document to the RWQCB that high priority areas have been conducted, per Table 2 in revised reporting format.	Annually	ESD-WE

ICID 3 - Inspector Training

The City of San José will ensure that IC/ID inspectors are adequately trained in inspection procedures, documentation, and enforcement related to storm water pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for IC/ID inspectors.	Annually, **Q1**	ESD-WE
B.	Provide and document on-the-job training and other training opportunities, such as inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

ICID 4 - Outreach and Technology Transfer

The City of San Jose will distribute outreach and technology transfer material containing applicable control measures and/or BMPs to target parties responsible for IC/ID activities.

#	Activities	Compliance Date	Responsible Party
A.	Develop and/or modify existing outreach material, as needed, based on report developed under ICID 4B	Ongoing, **as needed**	ESD-WE
B.	Determine need for new outreach and technology transfer material by getting feedback from inspectors regarding 1) continuing problem activities 2) discharge types and 3) monitoring and complaint data, 4) usefulness of existing outreach and technology transfer material.	Ongoing	ESD – MarComm ESD-UR
C.	Document to RWQCB that outreach technology transfer material and/ or BMPs have been distributed; tracked in Urban Runoff database.	Annually	ESD-UR
D.	Develop and implement standard operating procedures to gather customer feedback on IC/ID services.	Development Done FY 02-03 Implementation Ongoing	ESD-WE

ICID 5 - SOPs Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its SOPs in responding to complaints regarding illicit connections and illegal discharge dumping activities into the storm drain system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate effectiveness of SOPs	Annually	ESD-WE
B.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

Industrial & Commercial Dischargers

IND Work Plan

Pursuant to permit provision C.2, the City continues to conduct Industrial and Commercial facility inspections based on the new inspection frequency schedule and collect the information needed to meet enhanced reporting requirements. Some activity descriptions have been revised to match practices adopted in 2002.

IND 1 - Notice of Intent (NOI) Filers

The City of San José will conduct inspections of those facilities that have filed an NOI with the State and appear on a list provided by the State.

#	Activities	Compliance Date	Responsible Party
A.	Annually, obtain NOI filer database from State with annual information, review information and identify new NOI facilities for inspection next year.	Annually	ESD-WE
B.	Conduct and document initial inspections of NOI Filers within one year using the inspector checklist form to determine **exposure and** ~~*whether the facility constituted a significant or non-significant potential threat to discharge pollutants to the storm drain collection system;*~~ assign a future inspection frequency to each facility accordingly. Document whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site.	Ongoing	ESD-WE
C.	Conduct & document annual inspections of facilities determined to ~~*be Significant Facilities*~~ **have exposure** in accordance with inspection frequency schedule.	Ongoing	ESD-WE
D.	~~*Collect information during inspections on the potential for storm water pollution at industrial and commercial facilities in order to determine the appropriate inspection frequency for the various facilities*~~	~~*Ongoing*~~	ESD-WE
E.	Conduct & document inspections of facilities that need to file an NOI at least once every five years for facilities determined ~~*to be Non-Significant*~~ **have exposure** in accordance with inspection frequency schedule. Enter inspection information from the inspector facility audit form onto the database.	Ongoing	ESD-WE
F.	~~*Collect information during inspections on the potential for storm water pollution at industrial and commercial facilities in order to determine the appropriate inspection frequency for the various facilities*~~	~~*Ongoing*~~	ESD-WE
G.	Update the database to track the inspection information from the inspector checklist and to include all NOI filer SIC codes required by the Industrial Activities Storm Water General Permit	Ongoing	ESD-WE

IND 2 - Non-Filer Investigations

The City of San José will inspect industrial facilities that may be subject to general permit requirements but are not found on the NOI filer list provided by the State.

#	Activities	Compliance Date	Responsible Party
A.	Identify industrial facilities that conduct activities with the SIC codes listed in the IND SOPs.	Annually	ESD-WE
B.	Develop a list of facilities targeted for inspection during upcoming year that may be subject to general permit requirements for NOI based on business licenses, etc.	Annually	ESD-WE
C.	Conduct and document initial inspections of industrial facilities with the SIC codes listed referenced in IND 2A, using the inspector checklist form to document whether the facility constituted a significant or non-significant potential threat to discharge pollutants to the storm drain collection system, whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site.	Ongoing	ESD-WE
D.	Conduct & document annual inspections of facilities determined to be Significant Facilities in accordance with implementation schedule. Add the facility to appropriate database(s) and assign an inspection frequency. If the facility inspected is determined to need to file an NOI and is not able to provide an NOI, SWPPP or SWMP, refer to the RWQCB.	Ongoing	ESD-WE
E.	Work with the Program's Industrial Inspection Ad Hoc TG on an Administrative procedure for providing referrals to the Regional Board and document providing referrals to the Regional Board for facilities with significant problems.	~~6/30/03~~ **Pending Implementation by Program**	ESD-WE, ESD-UR

IND 3 - City Regulated Facilities

The City of San José will conduct inspections of City Regulated facilities as identified below:

Type	Frequency
Food service facilities	2 or more AOCs* over a rolling three year time period - Every year 1 AOC over a rolling three year time period – Every two (2) years 0 AOCs over a rolling three year time period - Every three (3)years
All Other City Regulated facilities	2 or more AOCs* over a rolling five year time period – Every year 1 AOC over a rolling five year time period – Every two (2) years 0 AOCs over a rolling five year time period but have exposure – Every five (5) years 0 AOCs over a rolling five year time period with no exposure or potential for exposure – No further inspections
Facilities for which a referral or ICID complaint is received	As soon as practicable for violations and every year until they meet the above criteria.

*Area of Concern (AOC) = A violation based on the San Jose Municipal Code 15.14.530 issued to a facility during a storm water inspection.

#	Activities	Compliance Date	Responsible Party
A.	Determine industrial/commercial facilities identified in the IND SOPs for inspection in each FY.	Annually, Q1	ESD-WE
B.	Conduct and document inspections of City Regulated facilities, other than food service facilities, at least once every five (5) years in accordance with the inspection frequency schedule. If determined to have no impact or no potential for pollution, will not be scheduled for future inspection.	Ongoing	ESD-WE
C.	Conduct and document inspections of City Regulated food service facilities at least once every three (3) years. Initial approved performance standards require inspections every three years. If determined to have no impact or no potential for pollution, will not be scheduled for future inspection.	Ongoing	ESD-WE
D.	Conduct and document inspections for which a referral or complaint was received within one year. After the inspections, enter the information from the inspector facility inspection report onto the database.	Ongoing	ESD-WE
E.	Develop a database to track the inspection information from the inspector facility inspection report. **1. Implement new Environmental Enforcement Data Management System**	Done FY 02-03 **FY 03-04**	ESD-WE **ESD-WE**
F.	Revise database to track inspection information from inspector facility inspection report and to include new industrial program categories.	As Needed	ESD-WE
G.	For B, C, D, and E, collect information during inspections on the potential for storm water pollution at City Regulated facilities in order to determine the appropriate inspection frequency for the various facilities.	Ongoing	ESD-WE
H.	Develop an inspection frequency plan to track frequency of inspections. Implement & update, as needed, the inspection frequency plan.	Development: Done FY 01-02 Implementation ~~As Needed~~ **Ongoing** **Updated as needed**	ESD-WE

IND 4 - Compliance

The City of San José will conduct industrial/commercial inspections to determine the existence of discharges or threatened discharges, which are illegal under local ordinances. The facility operator will be notified of observed areas of concern to be corrected and/or if official action on violations is necessary, it will take place under local enforcement procedures.

#	Activities	Compliance Date	Responsible Party
A.	Document facilities that have enforcement actions, and the type of enforcement actions, conducted *for* the existence of discharges or	Ongoing	ESD-WE

#	Activities	Compliance Date	Responsible Party
	threatened discharges that are illegal under local ordinances.		

IND 5 - Training

The City of San José will ensure that industrial/commercial inspectors are adequately trained in inspection procedures, documentation, and enforcement related to storm water pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Develop training procedures.	Done	ESD-WE
B.	Conduct initial training based on the training procedures for new industrial/commercial inspectors.	As Needed	ESD-WE
C.	Provide on-the-job training and other training opportunities such as industrial/commercial inspection workshops.	Ongoing	ESD-WE

IND 6 - Outreach

The City of San Jose will help develop and distribute outreach and technology transfer material containing applicable control measures and/or BMPs to industrial/commercial facility operators responsible for IND activities.

#	Activities	Compliance Date	Responsible Party
A.	Identify and list existing outreach and technology transfer material (See Appendix C, Matrix C2). Distribute applicable outreach and technology transfer material to industrial/commercial facility operators per Appendix C, Table 2. Document to the RWQCB that outreach and technology transfer material and/or BMPs have been distributed, as needed, to industrial/commercial facility operators.	Annually Distribution: Ongoing	ESD-UR
B.	Determine usefulness of outreach and technology transfer materials by obtaining feedback from industrial/ commercial facilities. Obtain feedback from inspectors about the effectiveness of existing outreach and technology transfer material.	As Needed	ESD-UR

IND 7 - NOI Filers Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its NOI Filers inspections procedures and database tracking system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate the effectiveness of NOI Filers inspections procedures.	Annually	ESD-WE
B.	Document and evaluate the effectiveness of the NOI Filers database tracking system.	Annually	ESD-WE

#	Activities	Compliance Date	Responsible Party
C.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

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Monitoring

MON Work Plan

The City, in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) has submitted, to the RWQCB, a Multi-Year Receiving Waters Monitoring Plan required per permit provision C.7.b. The final version of the plan was submitted March 1, 2002. The Multi-Year Plan covers a number of pollutant control programs required by C.7 and C.9 provisions of the permit. The City continues to support Program staff in the implementation of the plan by commenting on annual plans, providing guidance for sampling within the City, and participating in the Watershed Analysis Ad Hoc Task Group.

The 2001 C.9 permit provisions require implementation of control programs for Copper, Nickel, Mercury, Pesticides, PCBs, and Dioxin-like compounds. The City continues to support and assist the Program efforts to address these control and monitoring efforts. Additionally, the City is actively involved as stakeholder and workgroup member for the Guadalupe Mercury TMDL effort, and will continue to contribute and comment on products and reports generated by Baywide TMDLs for copper, nickel, mercury and PCBs.

PCB Control Program

Analytical characterization work to support the PCB Control Program, required under provision C.9.e, has been completed. The Program is currently working on next steps with BAASMA and CEP.

Initial PCB analysis was performed on sediments found in selected urban storm drain systems. At this point, no known controllable sources of PCBs have been identified. Results of the follow-up analytical work have been reviewed and further sampling work to identify controllable sources was undertaken in October and November of 2002. The final PCB control plan approach was submitted by the SCVURPPP Program by July 1, 2002. In addition, the City continues to implement activities described in "Next Steps" from the Year Two PCB Case Study Report submitted to the Regional Board in July 2003.

#	Activities	Compliance Date	Responsible Party
A.	Identify sampling sites that may contain PCB contaminated sediment based on land use, anecdotal information, and suitability of the site for data collection.	Done, 6/00	
B.	Conduct initial sampling at four sites determined by Task A.	Done 10/00 & 3/01	
C.	Prepare and submit to the Program a case study report for drainage areas associated with initial PCB sampling.	Done 10/01	
D.	Conduct a second round of sampling at 10 additional sites selected for follow up study.	Done 11/01	
E.	Submit a report on second-year watershed characterization studies to	Done FY 01-02	

#	Activities	Compliance Date	Responsible Party
	the regional board.		
F.	Complete draft work plan with additional actions related to identifying PCBs sources & implementing controls & schedule for their completion.	Done FY 01-02	
G.	Begin implementation of final PCB Control Plan upon approval.	~~*TBD*~~ **Done FY 02-03 & Ongoing**	ESD

Dioxin-like Compound Control Program

Characterization of dioxins based on existing data has begun Program-wide. The Program is collaborating with Alameda County who has already initiated an investigatory program for Dioxin-like compounds.

This Dioxin-like Compound Control Program will develop procedures to identify, assess, and manage controllable sources of Dioxin-like compounds found in urban runoff.

#	Activities	Compliance Date	Responsible Party
A.	Characterize distribution of Dioxin-like compounds in the urban runoff system based on existing data.	Done FY 01-02	
B.	Begin implementation of SCVURPPP plan to characterize distribution of Dioxins.	In Progress at Program Level	
C.	Submit plan that identifies control measures / management practices to eliminate or reduce discharges of Dioxins, if needed.	TBD	

Sediment Control Program

The City's sediment control program falls predominantly within the Construction Inspection (CON) section of this work plan. Sediment monitoring activities also continue in conjunction with the SCVURPPP Five-Year Receiving Waters Monitoring Plan.

Pilot Monitoring Programs

In addition to the above listed control programs, the City concluded activities performed in support for the two Monitoring Pilot Programs that were begun in 1997. These pilot programs generated data that helped develop the follow-on programs of IND 6 (outreach to industrial and commercial dischargers) and the SCVURPPP Five-Year Receiving Waters Monitoring Plan.

MON 1 - Industrial Storm Water Monitoring Pilot Program

This program sampled key industrial sites to determine the significance of metal contaminate storm water discharges associated with industrial activities. The ultimate objective from this

project of educating industrial and commercial dischargers about developing and implementing SWPPPs and BMPs has now been turned over to the Industrial and Commercial Dischargers section of this workplan under item IND 6.

#	Activities	Compliance Date	Responsible Party
A.	Review data used to estimate the industrial contribution of pollutants to storm system in MCMP.	Done, 5/97	
B.	Identify monitoring objectives based on issues identified in Task A. Select industry group.	Done, 6/97	
C.	Identify willing industry participants. Review site SWPPPs.	Done, 7/97	
D.	Design sampling program for industry sites identified per Task C.	Done, 8/97	
E.	Conduct sampling during first 30 minutes of effective storm events.	Done, 4/98	
F.	Analyze data per the program objectives.	Done, 5/98	
G.	Develop guidance for industry to improve SWPPP implementation and monitoring.	Done, 6/98	
H.	Provide technology transfer information and training to industry and municipal inspectors. 1. Identify facilities for general outreach/awareness programs 2. Develop education materials for general outreach programs. Identify appropriate forum for outreach efforts. 3. Train trade organizations in Industrial Activities Storm Water General Permit requirements. Gain involvement developing outreach programs. Conduct outreach. 4. Identify industrial facilities for focused BMP development. 5. Gain participation of trade organizations in identifying significant pollutant sources and developing appropriate BMPs. 6. Conduct program to develop BMPs and measure effectiveness.	Done FY 01-02 Ongoing as part of IND 6	

MON 3 - First Flush Monitoring Program

First flush discharge areas along The Coyote Creek and Guadalupe River were monitored for three wet seasons. The City provided data to the Program for analysis and comparison to other data in June of 2002. The Program submitted a final report to the Regional Board in 2003; it was included as appendix C-2 in the Program's 02-03 Annual Report.

#	Activities	Compliance Date	Responsible Party
A.	Identify sampling sites based on land use, and suitability of the site for data collection.	Done, 6/97	
B.	Train staff on sampling procedures, protocols and safety measures.	Done, 9/97	
C.	Collect representative samples from first effective rainfall and every opportune rainfall event of the season.	Done 4/98 thru 4/00	

#	Activities	Compliance Date	Responsible Party
D.	Analyze each season's data to characterize runoff constituents.	Done 6/98 thru 6/00	
E.	Provide screen of analysis to further identify location and extent of pollutants for source control and outreach efforts.	Done 7/98 thru 6/00	
F.	Based on analysis, provide information for targeting sampling.	Done FY 02-03	
G.	Compare results with other sites, regional monitoring efforts, trends and other data to provide indication of relative magnitude of pollutant problem.	Done FY 02-03	
H.	Explore modeling approaches to characterize water quality in the watershed and target additional monitoring efforts.	Done FY 02-03	
I.	Provide data to SCVURPPP Program as part of 5-Year Monitoring Program.	Done FY 02-03	

New and Redevelopment

NDC Work Plan

The New and Redevelopment C.3 provision in the NPDES permit of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) requires all dischargers covered by the permit, including the City, to modify their project review processes as needed to incorporate conditions of approval in permits for applicable projects, as defined in the provision, to ensure that pollutant discharges are reduced by incorporation of treatment measures and other appropriate source control and site design measures, and increases in runoff flow are managed in accordance with the provision to the maximum extent practicable.

The City met the October 15, 2003 deadline for beginning implementation of hydraulic sizing requirements for stormwater treatment BMPs. Implementation of these requirements will be phased in for additional projects during 04-05. The City will begin implementation of peak flow control requirements, as required in the permit, following approval of a SCVURPPP Hydromodification Management Plan (HMP) by the Regional Board.

NDC 1 - Legal Authority

The City of San José **has and** will **continue to** evaluate the adequacy of its legal authority to implement new development control measures as it considers modifications to its development plan review and approval procedures.

NDC 2 - Guidance to Developers

The development community is provided with guidance on post construction measures as early in the application process as possible.

#	Activities	Compliance Date	Responsible Party
A.	Draft necessary revision(s) to Guidance Manual on Selection of Stormwater Quality Control Measures to allow incorporation of hydraulic sizing design criteria and provide to developers.	Done FY 02-03	PBCE, ESD, PW, RDA
B.	Provide development community with revised information and guidance materials concerning any adopted on site design, building permit requirements and hydraulic sizing design criteria and maintenance requirements for BMPs for stormwater treatment measures	Ongoing	PBCE, ESD, PW, RDA
	1. Coordinate w/ development community on proposed hydraulic sizing criteria for structural stormwater treatment measures and any proposed revisions to Guidance Manual and policy through workshops and regular meetings.	~~6/30/03~~ **Ongoing**	PBCE, ESD, PW, RDA
	2. Develop guidance material regarding maintenance responsibilities for any adopted structural stormwater treatment measures requirements.	~~6/30/03~~ **Done FY 02-03**	PBCE, ESD, PW, RDA, Program

NDC 3 - CEQA Requirements

Environmental documents required for those projects that fall under CEQA or NEPA review, such as EIRs, negative declarations, and initial study checklists, will address:

1) Storm water quality impacts for land development during construction and after construction has been completed (both significant and cumulative),
2) Required permits, and
3) Specific mitigation measures related to storm water quality.

#	Activities	Compliance Date	Responsible Party
A.	Review and evaluate the City's Environmental Review procedures to improve the review for water quality impacts and identification of mitigation measures. (Provision C.3.m.)	~~*03/01/03*~~ **Ongoing**	PBCE, ESD, PW, RDA
	1. Identify areas where new or additional water quality review processes and related documents or checklist questions are needed and propose schedule for revision.		PBCE, ESD, PW, RDA
	2. Implement any necessary revisions to water quality questions and procedures, if needed.		PBCE, ESD, PW, RDA
B.	Report on revisions made to environmental review processes.	~~*FY 02-03 Annual Report*~~ **Annually**	PBCE, ESD, PW, RDA

NDC 4 - Project Mitigation Measures and Provision. C.3. design requirements implementation

Developers of projects with significant storm water pollution potential will be required by the City of San José to mitigate storm water quality impacts to the maximum extent practicable, through proper site planning and design techniques and/or addition of permanent storm water quality control measures

#	Activities	Compliance Date	Responsible Party
A.	Propose revisions to current Policy on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	~~*7/01/03*~~ **Done FY 03-04**	PBCE, ESD, PW, RDA
	1. Revise policy as needed for Group 2 & HMP implementation	**4/15/05**	PBCE, ESD, PW, RDA
B.	Review and modify development permit approval procedures as necessary for adopted revisions.	~~*7/01/03*~~ **Done FY 03-04**	PBCE, ESD, PW, RDA
	1. Develop criteria & checklist to aid Department of Planning, Building & Code Enforcement & Department of Public Works planners & engineers in determining whether a development project should be required to incorporate post-construction treatment control measures & their related operation and maintenance requirements.	~~*7/01/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
	2. Draft standard conditions of approval as necessary to ensure	~~*7/01/03*~~	PBCE, ESD, PW,

#	Activities	Compliance Date	Responsible Party
	proper selection, design of and installation of structural stormwater treatment measures per Provision C.3.b., c., d.	**Done FY 02-03**	RDA
	3. Draft standard conditions of approval as necessary to ensure proper maintenance of structural stormwater treatment measures. (Provision C.3.e.)	~~*7/01/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
	4. Refine and modify development approval procedures as needed to accommodate HMP and Group 2 implementation	**4/15/05**	PBCE, ESD, PW, RDA
C.	Implement any new adopted development conditions of approval, and procedures to developments with significant storm water pollution potential. (Provision C.3.b.)	~~*7/01/03*~~ **Ongoing**	PBCE, ESD, PW, RDA
D.	Collect data on the projects for enhanced annual reporting. Produce a list of projects and data tracked for the last two years and provide to SCVURPPP for analysis. (Prov. C.3.c.)	~~*FY 02-03*~~ Annually ~~*thereafter*~~	PBCE, ESD, PW, RDA
E.	Draft post-construction treatment BMP certification procedures. (Provision C.3.h)	~~*07/01/03*~~ **Done FY 03-04**	PBCE, ESD, PW, RDA
	1. Evaluate implementing an alternative certification program and develop one if deemed necessary. (Provision C.3.h.)	**Done FY 02-03**	PBCE, ESD, PW, RDA
G.	First report to City Council on Alternatives Program. (Provision C.3.g.)	~~*6/30/03*~~ **Done FY 03-04**	PBCE, ESD, PW, RDA
H.	Develop list of Annual Reporting requirements from Provision C.3. Design data tracking needs and protocols.	~~*06/30/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
	1. Compile a list of new development and redevelopment projects by name, type of project, site acreage, site acreage or square footage, square footage of new impervious surface, treatment BMPs and numeric sizing criteria used for applicable projects. Also, the source control measures required and pesticide reduction measures.	~~*FY 03-04*~~ Annually ~~*thereafter*~~	PBCE, ESD, PW, RDA
	2. Track name and location of projects in the Alternatives Program, project type and size, percent impervious surface, reason for granting waiver, terms of waiver, equivalent benefit provided, alternative treatment project or regional project receiving the benefit and date of completion of the alternative treatment project or regional project.	~~*FY 03-04*~~ Annually ~~*thereafter*~~	PBCE, ESD, PW, RDA
I.	Participate on SCVURPPP's Hydromodification Management Plan work group and develop procedures for limiting peak stormwater runoff discharge rates from development projects. (Provision C.3.f.)	~~*HMP due 10/03*~~ **Ongoing as Needed**	PBCE, ESD, PW, RDA
J.	Review the design standards and guidance for opportunities to make revisions that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures. Such revisions are listed in Provision C.3.j.	~~*6/30/04 Annually thereafter*~~ **Due 9/15/03 Done FY 03-04**	PBCE, ESD, PW, RDA
	1. Identify and document existing site design standards and guidance documents and policies.		PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	2. Compile a Report on Site Design Measures and Revised Standards: Identify areas where new or additional site design measures are needed and propose timeline for revision.		PBCE, ESD, PW, RDA
	3. Revise Site Design Measures and Standards, if necessary.		PBCE, ESD, PW, RDA
K.	Review the existing source control measures contained in site design standards, guidance documents and conditions of approval for opportunities to limit storm water pollution. (Provision C.3.k.)	~~*6/30/03*~~ Ongoing	PBCE, ESD, PW, RDA
	1. Identify and document existing source control measures, guidance documents, and conditions of approval.		PBCE, ESD, PW, RDA
	2. Compile a Report on Existing Source Control Measures: Identify areas where new or additional source control measures are needed and propose timeline for revision of conditions of approval and guidance		PBCE, ESD, PW, RDA
	3. Revise conditions of approval and guidance, if needed.		PBCE, ESD, PW, RDA
L.	Review General Plan and revise as necessary to incorporate water quality and watershed protection principles and policies, and summarize revisions made. (Provision C.3.l.)	7/1/05	PBCE
	1. Identify and document existing General Plan principles and policies. Compile a Report on Existing General Plan principles and policies.		PBCE
	2. Identify areas where new or additional General Plan principles or policies are needed and propose timeline for revision, if needed.		PBCE
	3. Make revisions to General Plan principles and policies, if needed, per work plan.		PBCE
M.	Develop & propose enhanced reporting format for documenting use of pesticide reduction measures at development sites. (Provision C.3.n. & C.9.ii.)	Done	PBCE, ESD, PW, RDA
	1. Based on City's Pesticide Management Plan, establish criteria for tracking percentage of new development projects for which pesticide reduction measures were required & begin tracking. (Provision C.3.n. & C.9.d.ii)	~~*6/30/03*~~ **Done FY 03-04** Implementation Ongoing	PBCE, ESD, PW, RDA

NDC 5 - Developer Conformance with State Requirements

Developers of projects that disturb a land area of ~~*five*~~ **one** acre~~s~~ or more are required by the City to demonstrate conformance with the State General Construction Activity Storm Water Permit including filing of NOI, development of a SWPPP, et al. (Note: beginning in 1/03, the applicable land area changed **from 5 acres** to one acre or more.)

#	Activities	Compliance Date	Responsible Party
A.	Include as condition of approval for projects that disturb a land area of one acre or more, a requirement to demonstrate coverage under the	Ongoing	PBCE, PW, RDA

#	Activities	Compliance Date	Responsible Party
	State General Construction Activity Storm Water Permit.		
B.	Track the projects that contained above condition of approval.	Annual Report	PBCE, PW, RDA
C.	Review, evaluate, and modify, as necessary, existing Planning procedures & conditions of approval to incorporate change in applicable land area to one acre or more starting 01/03.	Done FY 02-03	PBCE

NDC 6 - Developer Erosion Control Plans

Developers of projects with potential for significant erosion and planned construction activity during the wet season are required by the City of San José to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

#	Activities	Compliance Date	Responsible Party
A.	Include as a condition of approval for applicable projects a requirement to prepare and implement an erosion and sediment control plan.	Ongoing	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Ongoing	PBCE, PW, RDA

NDC 7 - Operation and Maintenance for Structural Storm Water Controls

Developers of projects that include installation of permanent structural storm water controls are required by the City of San José to establish and provide a method for operation and maintenance of such structural controls.

#	Activities	Compliance Date	Responsible Party
A.	Work with SCVURPPP to ~~*revise NDC 7 Performance Standard.*~~ **develop guidance for implementing O&M Program.**	~~*06/30/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
B.	Draft policy and procedures for an operation and maintenance verification program.	~~*10/15/02*~~ **Policy Drafed** Done FY 02-03 **Procedures 6/30/04**	PBCE, ESD, PW, RDA
C.	Draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities. (Provision C.3.e.)	~~*6/30/03*~~ **6/30/04**	PBCE, ESD, PW, RDA
D.	Include as a condition of approval a requirement that developers of projects that include installation of permanent structural storm water controls are required to establish and provide proof of operation and maintenance of such structural controls.	**Done** FY 03-04 Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	1. Develop model permit conditions with fact sheets to include in use permits where appropriate. ~~*Develop procedures for verifying maintenance of post-construction treatment BMP will be maintained.*~~	~~*3/01/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
	2. In-ground BMPs	~~*7/15/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
	3. Landscape and all others	10/15/03 **Done FY 02-03**	PBCE, ESD, PW, RDA
	4. Compile a list of projects & responsible operators subject to C.3.e. provision.	**FY 03-04 Annually thereafter**	PBCE, ESD, PW, RDA
E.	Track and compile a list of priority properties inspected and inspection results. (Provision C.3.e.iii.)	Ongoing ~~*thereafter*~~	PBCE, ESD, PW, RDA
	1. **Revise** ~~*Determine*~~ criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency.	~~*03/30/03*~~ **6/30/04**	PBCE, ESD, PW, RDA
	2. **Revise** ~~*Develop*~~ local inspection program for verification of proper O & M.	~~*06/30/03*~~ **6/30/04**	PBCE, ESD, PW, RDA

NDC 8 - Applicability to Public Projects

The City of San José will include storm water quality control measures during and after construction, appropriate for each municipal capital improvement project, and that contractors comply with storm water quality control requirements during construction activities.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a process to ensure that municipal capital improvement projects install structural storm water quality control measures as necessary.	~~*07/01/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
	1. Participate on SCVURPPP work group tasked with developing a technical guidance document for use by municipal staff to ensure that the document includes standard specifications and details, sizing methodologies, & model conditions of approval acceptable for use in City projects as necessary. (Provision C.3.b. & d.)	~~*6/30/03*~~ **Ongoing**	PBCE, ESD, PW, RDA
	2. Review and revise Redevelopment Agency Project ~~*approval*~~ **Request for Proposal** procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	~~*07/01/03*~~ **6/30/04**	PBCE, RDA
	3. Review and Revise Public Works Capital Improvement Project approval procedures and Road Improvement Project approval procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	~~*07/01/03*~~ **Done FY 02-03**	PBCE, ESD, PW, RDA
B.	Review, evaluate, and modify the procedures, as necessary.	~~*07/01/03*~~ As needed ~~*thereafter*~~	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
C.	Begin tracking required data on the public projects subject to Provision C.3. hydraulic sizing criteria requirements for Annual Report.	~~07/01/03~~ **Done FY 03-04**	PBCE, PW, RDA
D.	Monitor development of City's Green Building program for opportunities to discourage architectural use of copper in development projects (Prov. C.9.a.) and to incorporate urban runoff considerations.	Ongoing	PBCE, ESD, PW, RDA

NDC 9 - City Staff Training

Key City staff is trained on planning procedures, policies, design guidelines, and BMPs for storm water pollution prevention annually.

#	Activities	Compliance Date	Responsible Party
A.	Provide training to Planning and Public Works staff on planning procedures, policies, design guidelines, and BMPs for storm water pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA
B.	Provide training to Redevelopment Agency and Department of Transportation staff on planning procedures, policies, design guidelines, and BMPs for storm water pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA, DOT
C.	Revise the training protocol to incorporate any newly adopted Provision C.3. permit requirements and related revised procedures.	~~7/01/03~~ **As Needed**	PBCE, ESD, PW, RDA
D.	Train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval and the importance of minimizing pesticide use in runoff from development sites. (Provision C.3.n. and Provision C.9.d.ii)	Ongoing	PBCE, ESD, PW, RDA

NDC 10 - Development Plan Review and Approval Procedures Effectiveness Evaluation

The City of San Jose will review and evaluate the effectiveness of its development plan review and approval procedures.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in review and approval process.	Annually	PBCE, ESD, PW, RDA
B.	Document and evaluate what worked well and what needs improvement.	Annually	PBCE, ESD, PW, RDA

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Construction Inspection

CON Work Plan

This program element is implemented pursuant to permit provision C.2. The control measures discussed in this work plan apply to both private development projects and municipal public works construction projects. These control measures are implemented at construction project sites as part of the City's construction inspection and enforcement program.

FY 04-05 will be the second full year of implementation for the Standard Operating Procedure (SOP) for Construction Inspections that was developed for the 03-04 season. This new SOP includes the method by which PB&CE Building Division Inspectors address housekeeping measures at construction sites, in addition to the established roles of Environmental Services and Public Works inspectors.

FY 04-05 will also be the first season of implementation for the new language that was added as Sections 10-2 and 20-5.06 in the City of San Jose Department of Public Work's Standard Specifications. Revised in January 2004, these specifications include a separate bid amount for the implementation of the SWPPP, monthly certification from contractors certifying that BMPs are in place and being maintained, and the delay of invoice payment if such certifications are not kept current.

CON 1 - Site Housekeeping

The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites and prevent illicit discharges to storm drains and watercourses.

#	Activities	Compliance Date	Responsible Party
A.	PB&CE Building Division Inspectors develop SOPs to address housekeeping measures at construction sites.	~~6/02~~ **Done FY 03-04**	PBCE-Bldg
B.	Develop hand-off procedure for transferring project information and status to ensure Building Inspectors are informed of project site data collected by Public Works Inspectors.	~~6/02~~ **Done FY 03-04**	PBCE-Bldg, PW ESD
C.	Track & document incidents of housekeeping issues at construction sites.	Ongoing	PBCE-Bldg, PW ESD-WE

CON 2 - Local Ordinance

For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.

#	Activities	Compliance Date	Responsible Party
A.	Review existing legal authority to conduct and enforce construction site inspections, if necessary revise.	Done FY 02-03	
B.	Identify needed ordinance changes 1. Identify timeline for revised grading ordinance	Done FY 02-03 Done FY 02-03	
C.	Develop SOPs & conduct training for inspection of construction sites requiring erosion control plans before wet season. Include enforcement (see Environmental Engineering Enforcement Procedures)	Annually	PW ESD-UR ESD-WE

CON 3 - Construction Inspection Frequency

The City inspects construction sites for adequacy of storm water control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on size of project, site conditions, precipitation, & project's potential impact on storm water quality.

#	Activities	Compliance Date	Responsible Party
A.	Review construction inspection procedures to incorporate performance standards requirements for monthly inspections into SOPs.	Done FY 02-03	
B.	Document inspections of active construction sites.	Annually	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD
	1. Evaluate use of Amanda system for tracking inspection information.	06/30/04	PW PBCE-Bldg ESD
C.	Evaluate the effectiveness of the construction inspection program and make improvements, as necessary.	Done FY 01-02	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD

CON 4 - Wet Season Preparation

Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.

#	Activities	Compliance Date	Responsible Party
A.	Review and revise, as needed, procedures for Public Works staff regarding wet season construction requirements.	As Needed	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD
	1. Develop and implement revised standard specifications for public	FY 03-04	PW-AE, ECS,

#	Activities	Compliance Date	Responsible Party
	projects.	Ongoing	PRF, TDS
B.	Document pre-season inspection of construction sites to ensure adequate implementation of winterizing BMPs, prior to the wet season.	Annually	PW-AE, ECS, PRF, TDS

CON 5 - Inspection and Site Evaluation Follow-up

Construction sites with inadequate erosion/sediment controls are given verbal and/or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with the risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Regional Board.

#	Activities	Compliance Date	Responsible Party
A.	Draft and implement procedures for follow-up actions and graduated levels of enforcement, to be used on construction sites.	Done FY 02-03	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD
B.	Track and summarize notices and follow-up actions for annual reports.	Annually	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD
C.	Evaluate the feasibility of increasing the # of staff with the authority to issue enforcement actions.	~~6/30/03~~ **FY 03-04**	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD

CON 6 - Municipal Training

The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to storm water pollution prevention. All inspectors receive training on the latest construction-related storm water pollution prevention techniques and appropriate follow up actions at least once every two years. The City keeps documentation that inspectors have received training.

#	Activities	Compliance Date	Responsible Party
A.	Revise training curriculum to incorporate revised notice and follow-up requirements and graduated levels of enforcement. Develop training materials to address wet season construction and housekeeping. Develop training materials to address dry season construction and housekeeping.	~~6/03~~ **Done FY 02-03**	ESD-UR ESD-WE PW PBCE-Bldg Also Program & RWQCB
B.	Develop training schedule and staff feedback plan regarding	~~6/03~~	ESD-UR

#	Activities	Compliance Date	Responsible Party
	inspection procedures.	**Done FY 02-03**	
C.	Conduct training for Public Works, ESD, and Building Inspection staff on new standard operating procedures for erosion control plan review inspection process (at least once every 2 years). Conduct training of Planning, Building & Code Enforcement-Building Division inspectors regarding housekeeping BMPs. Train DPW & PBCE inspectors on new SOPs for inspection during wet season. Train DPW & PBCE inspectors on new SOPs for inspection during dry season.	Ongoing	ESD-UR ESD-WE PW PBCE-Bldg Also Program & RWQCB
D.	Track and document that inspectors have received training.	Annually	ESD-UR
E.	Evaluate the training curriculum and frequency and improvements, as necessary.	Annually	ESD-UR

CON 7 - Outreach

The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.

#	Activities	Compliance Date	Responsible Party
A.	Review outreach/technology transfer materials and make improvements, as necessary 1. Develop outreach materials to address wet season construction.	Annually ~~6/03~~ **Done FY 02-03**	ESD-UR ESD-WE ESD-UR ESD-WE
B.	Review SOPs for distributing outreach/technology transfer material by inspectors.	~~6/03~~ **Done FY 02-03**	ESD-UR ESD-WE
C.	Conduct outreach sessions to development community.	~~6/03~~ **Ongoing, Q2**	ESD-UR ESD-WE PW PBCE-Bldg Also Program & RWQCB
D.	Document outreach to development community.	Annually	ESD-UR
E.	Evaluate outreach program and make improvements, as necessary.	Annually	ESD-UR ESD-WE PW PBCE-Bldg

CON 8 - Public Works Projects

The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.

#	Activities	Compliance Date	Responsible Party
A.	Develop & conduct training for Public Works capital improvement project staff (Architectural Engineering Design & Construction and Streets, Bridges & Sewers Design and Construction) on contract language & enforcement.	Done FY 02-03 Annually	PW-AE, ECS, PRF, TDS ESD
B.	Track the number of Public Work projects with these requirements	~~6/03~~ **Annually**	PW-AE, ECS, PRF, TDS

CON 9 - Construction Inspection Effectiveness Evaluation

The City of San Jose will review and evaluate effectiveness of its construction inspection SOPs and BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in construction inspection SOPs and BMPs.	Annually	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD-WE ESD-UR
B.	Document and evaluate what worked well and what needs improvement.	Annually	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD-WE ESD-UR

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Public Streets, Roads, & Highways

PSR Work Plan

This program element is implemented pursuant to permit provision C.2.

Training will continue to cover the SOPs and appropriate BMPs for Department of Transportation activities with the highest potential for storm water pollution. These activities include spill response, resurfacing, sealing and patching, saw-cutting, street sweeping, landscape chemical application, concrete installation, pavement stripping, legend removal, and catch basin inspection after irrigation repair. BMP effectiveness evaluation from crew members is obtained during the training sessions.

Rural Public Works SOPs were written in FY 03-04 and staff training related to storm water pollutant reduction during operations and maintenance activities in the City's regional and neighborhood parks and other "rural areas" is scheduled for the current fiscal year. This training will be conducted annually for the near term.

PSR 1 - Implementation of BMPs

The City of San José will implement Best Management Practices (BMPs) for street, road, and highway operation and maintenance (O&M) activities to reduce pollutants in storm water and eliminate illicit discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Identify BMPs currently used by staff as well as areas where BMPs still need to be developed per baseline model.	Done	DOT, ESD
B.	Audit areas beyond the scope of the baseline model.	Done	DOT, ESD
C.	Develop additional BMPs based on audit results as needed.	Done	DOT, ESD
D.	Develop SOPs based on BMPs.	Done	DOT, ESD
E.	Create plan to integrate BMPs and SOPs into training program.	Done	DOT, ESD
~~F.~~	~~Deleted~~	~~Deleted~~	
G.	Update BMPs as indicated.	Annually	DOT, ESD

PSR 2 - Contractor Use of BMPs

The City of San José will develop & implement a process to ensure that contractors employed to perform street, road, & highway O&M activities use appropriate BMPs adopted by the agency.

#	Activities	Compliance Date	Responsible Party
A.	Contract managers for public street, road, and highway O&M contracts will be trained on related storm water BMPs annually.	Done FY 02-03 Annually	DOT, ESD
B.	Investigate the development of standard contract language for PSR maintenance activities.	6/30/04	DOT, ESD

PSR 3 - City Staff Annual Training

The City of San José will provide annual training to its municipal staff in the use of appropriate BMPs. The City will also provide a mechanism for obtaining feedback from staff on the implementation and effectiveness of the BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Identify training goals by reviewing level of use of BMPs by staff.	Done	DOT, ESD
B.	Identify training opportunities.	Annually	DOT, ESD
C.	Create training modules for affected City staff and contractors formatted for available training opportunities.	Done FY 01-02 **As needed**	DOT, ESD
D.	Create collateral material based on training modules.	Done FY 01-02 **As needed**	DOT, ESD
E.	Schedule training with affected supervisors. **1. Improve the focus of the training on the specific BMPs used by a section.**	Annually **6/30/04**	DOT, ESD DOT, ESD

PSR 4 - Notification of Public Agencies

The City of San José will inform other parties (e.g., CalTrans, the County of Santa Clara, and public utilities) conducting street, road, and highway O&M activities within its jurisdiction of the requirements to implement BMPs and Control Measures to reduce pollutants in storm water to the maximum extent practicable and eliminate illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Identify conditions under which another agency will be notified of City O&M operations.	Done	
B.	Draft notification procedure.	Deferred	
C.	Review and comment from internal and external stakeholders.	Deferred	
D.	Distribute final policy to internal & external organizations &	Deferred	

#	Activities	Compliance Date	Responsible Party
	agencies.		

PSR 5 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in storm water and eliminating illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual effectiveness reporting, including sub-procedures for gathering feedback from affected supervisors and for modifications to BMPs & SOPs as necessary.	Done FY 01-02	DOT, ESD
	1. Review Procedures for annual effectiveness evaluation. Consider obtaining feedback from supervisors on how to assess BMP effectiveness and the use of training sessions with staff as an opportunity to evaluate BMPs and SOPs.	**FY 04-05**	**DOT, ESD**
B.	Review and comment on draft procedure from stakeholders.	Done FY 01-02	DOT, ESD
C.	Distribute final procedure to stakeholders.	Done FY 01-02	DOT, ESD

PSR 6 - Rural Public Works Maintenance and Support Activities

The goal of the Rural Public Works Performance Standard is to minimize the water quality impacts resulting from public works maintenance and support activities in rural areas.

#	Activities	Compliance Date	Responsible Party
A.	~~*Identify rural public works facilities that are under City of San Jose jurisdiction.*~~ (reworded for clarity) **Identify City-owned properties that are applicable under the RPW performance standard.**	~~*6/30/03*~~ **Done FY 02-03**	PRNS, GS, DOT, ESD
	1. Evaluate the feasibility of using GIS information to identify additional applicable properties, if any.	**6/30/04**	PRNS, GS, DOT, ESD
B.	Develop or adapt Standard Operating Procedures (SOPs) and Best Management Practices (BMPs) for rural public works activities.	~~*12/31/03*~~ **Done FY 03-04**	PRNS, DOT, GS, ESD
C.	Provide annual training on appropriate SOPs/BMPs to City staff that perform rural public works operations & maintenance activities.	3/31/04	PRNS, DOT, GS, ESD
D.	Through contract specifications, require contractors hired by the City to use appropriate SOPs/BMPs when performing rural public works construction or maintenance.	6/30/05	PRNS, DOT, GS, ESD
E.	Annually conduct an evaluation of the effectiveness of the rural public works program, report the results in the Urban Runoff Annual Report. Identify items for continuous improvement.	Begin w/FY 03-04 Annually	PRNS, DOT, GS, ESD

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Storm Drain System Operation & Maintenance

SDO Work Plan

The Department of Transportation Standard Operating Procedures for catch basin cleaning and Problem Area reporting continues to be the focus of crew training. A map overlay has been created on Geographic Information System (GIS) that assigns serial numbers to each of the City's more than 27,000 storm drain inlets. This map overlay is currently in use as a means to facilitate problem area reporting in the Storm Drain system.

SDO 1B indicates that the City is performing Tier II inspection and cleaning for catch basins. Severe budget constraints in the coming year may require that the City perform inspection and cleaning to some modified version of Tier II in FY 04-05.

SDO 1 - O&M BMP Implementation

The City of San José will implement best management practices (BMPs) for the storm drain system operation and maintenance (O&M) to reduce pollutants in storm water to the maximum extent practicable. Specific BMPs for each type of O&M activity will be those listed in the City's Work Plan BMPs and Control Measures (Section 3).

#	Activities	Compliance Date	Responsible Party
A.	Audit BMPs.	Annually	DOT, ESD
B.	Implement an annual inspection and cleaning work plan to achieve a Tier 2 level review.	Done Ongoing	DOT
C.	Create procedure for collecting data on Problem Areas from City field personnel.	Done	
D.	Review and revise procedure for collecting data on Problem Areas from City field personnel.	Done FY 01-02	
E.	Create plan for coordinating data tracking between ICID & Storm Drain Management System databases. Include analysis of data to identify trends for targeting solutions.	Done FY 01-02	
F.	Review and revise plan for coordinating data tracking between ICID & Storm Drain Management System databases. Include analysis of data to identify trends for targeting solutions.	Done FY 01-02	
G.	Develop SOPs based on BMPs.	Done	
H.	Create any additional required BMPs, including structural controls.	~~*Done*~~ **Ongoing as Needed**	DOT, ESD
I.	Develop SOPs based on BMPs and other programs or solutions identified by database analysis including revision of Problem Area list.	~~*Done*~~ **Ongoing as Needed**	DOT, ESD

#	Activities	Compliance Date	Responsible Party
J.	Create plan integrating BMPs and SOPs into training program.	~~*Done*~~ **Ongoing as Needed**	DOT, ESD
~~*K.*~~	~~*Allocate appropriate resources for supporting work plan*~~	Deleted FY 03-04	

SDO 2 - Problem Tracking and Process Improvement

The City of San José will develop and implement processes for tracking problem areas and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Determine reporting requirements, including tracking Problem Areas.	Done	
B.	Create criteria for collecting data from City field personnel for the purposes of determining Problem Areas.	Done	
C.	Develop procedures for documenting frequency, nature, and type of recurring problem. Coordinate the data from ICID & Storm Drain Management System databases.	Done	
D.	Create procedure for data reports to be used to update Problem Area list. Include process and criteria for analyzing ICID trends.	Done FY 01-02	
E.	Revise documentation and problem area reporting procedure to improve reporting performance.	As Needed	DOT, ESD
F.	Produce Problem Area report.	~~*Done FY 01-02*~~ Annually	DOT
G.	Create plan for addressing Problem Areas through ICID enforcement/ education activities, additional BMP development, program development or retrofit.	Done FY 02-03	
H.	~~*Implement work plan*~~	Deleted FY 03-04	

SDO 3 - Contractor Use of BMPs

All City SDO O&M is conducted in-house, and City staff receives BMP/SOP training annually. The only time storm drain maintenance might be contracted out would be for a rare flood emergency situation. The City has standard specifications that cover storm drain BMPs for construction activities.

#	Activities	Compliance Date	Responsible Party
A.	Contract managers for storm drain construction contracts will be trained on related storm water BMPs annually.	~~*Done FY 02-03*~~ Annually	DOT, ESD

SDO 4 - Staff Training and BMP Feedback

The City of San José will provide annual training to its municipal staff in use of appropriate BMPs and/or Control Measures. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Identify training goals by reviewing training needs of other performance standards.	Done	
B.	Provide training prior to the rainy season. **Improve the focus of the training on the specific BMPs used by a section.**	Annually	DOT, ESD
C.	Create training modules for affected City staff formatted for available training opportunities.	~~*Done FY 01-02*~~ **Ongoing as Needed**	DOT, ESD
D.	Produce schedule for training.	~~*Done FY 01-02*~~ Annually	DOT, ESD

SDO 5 - Data Analysis

As part of the annual review process, the City of San José will evaluate data regarding cleaning activities and unusual flows observed during inspection. The review and evaluation will include consideration of storm drain structural retrofit.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual review and evaluation of data.	Done FY 01-02	
B.	Include provisions for monitoring of trash as a part of routine outfall inspection.	Evaluated FY 02-03	
C.	Review and comment from stakeholders.	Done FY 01-02	
D.	Distribute final procedure to stakeholders.	Done FY 02-03	

SDO 6 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in storm water and eliminating illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Review with supervisors to get feedback and information on how to assess BMP effectiveness.	6/30/04	DOT, ESD
B.	Use annual training sessions with staff as an opportunity to evaluate the effectiveness of BMPs & SOPs.	Annually	DOT, ESD

Pesticide Management Workplan

PM Work Plan

This program element is implemented pursuant to permit provision C.9.d. Progress continues with implementing pest control BMPs and training staff on Integrated Pest Management (IPM) techniques. An IPM Policy was adopted in June 2003, as part of the City's Pollution Prevention Policy.

PM 1 - Integrated Pest Management

The City will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring use of IPM techniques in the agency's operations; and, minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors.

#	Activity	Compliance Date	Responsible Party
A.	Develop a section stating City IPM policy for inclusion in Pesticide Management Plan.	~~6/03~~ **Done FY 02-03**	

PM 2 - Pesticide Management Plan

The City will develop and implement a Pesticide Management Plan that will minimize pesticide use and reduce the amount of pesticides in storm water and landscape runoff to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Draft a City of San Jose Pesticide Management Plan.	Done FY 01-02	
B.	Submit plan for City Manager approval.	Done FY 01-02	
C.	Publish City Management Plan in URMP.	Done FY 01-02	

PM 3 - IPM SOPs and BMPs

The City will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy

#	Activities	Compliance Date	Responsible Party
A.	Develop a list of pest specific SOPs & BMPs for implementing IPM policy.	Done FY 01-02	
B.	For each type of pest problem identified, seek model SOPs and BMPs from published literature.	Done FY 01-02	
C.	Incorporate or develop appropriate IPM measures into City SOPs & BMPs.	~~6/03~~ **Done FY 02-03**	GS, DOT, ESD

#	Activities	Compliance Date	Responsible Party
		Ongoing as Needed	
D.	Update City URMP to incorporate model Pest Management Performance Standard, including description of legal authority (IPM policy & contract language), work plan elements, BMPs, & SOPs needed for implementation.	~~*6/03*~~ **Done FY 02-03**	ESD

PM 4 - City Employee Training

The City will ensure that employees receive pest management training by implementing the following:

1. Employees who apply pesticides for the City will obtain the appropriate training as required by County Ag. Commissioner and State Department of Pesticide Regulation (DPR);

2. Employees within departments responsible for pesticide application will receive annual training on appropriate portions of City IPM Policy, SOPs, and BMPs, and latest IPM techniques;

3. Employees who are not authorized to apply pesticides will be annually trained not to use over-the-counter pesticides at workplace, consistent with IPM Policy.

4. Annual internal outreach will be conducted to employees, who do not necessarily purchase or apply pesticides during their course of work, on less toxic pest control and to encourage employees to use IPM techniques away from work.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that employees who apply pesticides for the agency obtain appropriate training required by County Ag. Commissioner & State DPR.	Annually	GS, DOT
B.	Provide annual training on IPM Policy, SOPs, and BMPs, and latest IPM techniques to employees within departments responsible for pesticide application. Include in training, annually informing employees who are not authorized / trained to apply pesticides not to use over-the-counter pesticides at workplace, consistent with IPM Policy. **1. Develop and integrate an IPM policy (approved June 2003) training into pesticide applicator training.**	~~*Done FY 01-02*~~ Annually **12/03**	GS, DOT, ESD **GS, DOT, ESD**
C.	**Monitoring Mechanism I.B.1.** Document and evaluate effectiveness of staff training conducted each year in annual report. **1. Develop and implement a class evaluation/survey for IPM training classes conducted by City staff.**	Annually **12/03**	GS, DOT, ESD **GS, DOT, ESD**
D.	Public Education & Outreach Task II.A.14 Conduct internal outreach on less toxic pest control to employees who do not necessarily purchase ~~*of*~~ **or** apply pesticides during the course of their work (to encourage employees to use IPM techniques away from work).	~~*Done FY 02-03*~~ Annually	ESD

PM 5 - Contractor Pesticide Management Requirements

The City will develop and implement a process to ensure that contractors employed to conduct pest control and pesticide application on municipal property engage in pest control methods consistent with City IPM Policy. Specifically, the City will require contractors to:

- follow City IPM policy, BMPs, and SOPs;
- provide evidence of current IPM training, when feasible; and
- provide documentation of pesticide use on City property to the City in a timely manner.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a process to ensure contractors employed to conduct pest control/pesticide application on municipal property engage in methods consistent with City IPM policy.	~~*6/03*~~ **Ongoing**	GS, DOT, ESD, PRNS, PW, RDA
B.	Develop a list of all contractors employed by the City who perform pest application work.	Done FY 01-02	GS, DOT, ESD, PRNS, PW, RDA
	1. Review and update list of contractors.	**6/30/04**	GS, DOT, ESD, PRNS, PW, RDA
C.	Implement a procedure to provide to each contractor a copy of the City IPM policy developed in Activity 2.A. above	~~*6/03*~~ **Done, FY 02-03**	GS, DOT, ESD, PRNS, PW, RDA
D.	Identify pest specific SOPs and BMPs, developed in Activity 3.B above, that are appropriate in each contractor's case.	6/03	GS, DOT, ESD
E.	~~*Require City contracted PCOs to implement appropriate BMPs through contract specifications.*~~	~~*6/03*~~ **Deleted See PM 5.F**	
F.	Require **through contract specifications that** PCOs contracted for municipal applications: a) follow City IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on City property to the City in a timely manner.	~~*6/03*~~ **Ongoing**	GS
G.	**Monitoring Mechanism III.A.1.** Document numbers of PCOs receiving presentations and/or training on pesticide use by PCOs on municipal property.	~~*6/03*~~ Annually ~~*thereafter*~~	GS, ESD

PM 6 - Pesticide Management Outreach

The City will identify outreach activities it will conduct consistent with Program Pesticide Management Plan. Work plan elements will address outreach to residential and commercial pesticide users, pesticide retailers, and special districts. Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the City's own IPM practices, as applicable.

#	Activities	Compliance Date	Responsible Party
A.	Increase awareness of IPM so target audiences recall less toxic pest management messages and adopt IPM behaviors. Target audiences include residential pesticide users, professional pest control businesses, customers of professional pest control businesses, pesticide retailers, school districts, and other special districts.	Annually	ESD
B.	Prepare IPM stories and press releases to local media.	Annually	ESD
C.	In conjunction with Program, provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., VTA, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	~~*6/03*~~ **Pending Implementation by Program**	ESD
D.	Create & provide fact sheets & materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program.	Annually Ongoing	ESD
E	Identify, Develop and implement education programs that target commercial businesses.	Done; Ongoing	ESD
F	**Monitoring Mechanism:** Document or estimate numbers of residents reached by outreach efforts, including events, web promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts by documenting calls to the Program's general and watershed campaign hotlines.	Annually	ESD
G	**Monitoring Mechanism IV.A.1.** Document outreach efforts targeting businesses, recommended in the work plan, to be developed by the Program. Implement evaluation component of the work plan.	Annually	ESD

PM 7 - HHW Pesticide Disposal

The City will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.

#	Activities	Compliance Date	Responsible Party
A.	Work with HHW collection agencies to support, enhance, and publicize programs for pesticide disposal.	Annually	ESD
B.	Verify that adequate pesticide disposal services exist for residents and	~~*Done FY 01-02*~~	ESD

#	Activities	Compliance Date	Responsible Party
	conditionally exempt small quantity commercial generators.	Annually	
C.	Provide hazardous waste disposal information to residents, through distribution of materials (e.g., utility bill insert, city newsletter, community events, etc.) or advertising in local media.	Annually	ESD
D.	**Monitoring Mechanism V.A.1.** Document that HHW collection programs adequately serve residents and businesses and that any exchange programs do not exchange organophosphate or banned pesticides.	Annually	ESD

PM 8 - City Pesticide Use Tracking

The City will develop and implement a process for tracking pesticide use on municipally-owned property.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a pilot pesticide tracking process for Diazinon and Chlorpyriphos products.	Done FY 01-02 ~~*Annually*~~	
B	As part of the PMP, develop and implement a process for tracking pesticide use on municipally owned property. Include reporting and justification for use of OP pesticides and BMPs employed during OP pesticide use. **1. Evaluate feasibility of implementing electronic data management system for pesticide use.**	~~*6/03*~~ **Done, FY 02-03** Ongoing **12/31/04**	GS, DOT,ESD **GS, DOT, ESD**
C.	**Monitoring Mechanism I.A.1.** Use pesticide tracking process to document pesticide use in annual reports.	Annually	GS, DOT, ESD, PRNS, PW, RDA

PM 9 - City Pesticide Inventory Search

The City will conduct periodic citywide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. These pesticides, if found, will be properly disposed pursuant to appropriate waste disposal regulations

#	Activities	Compliance Date	Responsible Party
A.	All Departments conduct Citywide search of chemical storage areas for pesticides no longer legal for application per EPA, State, and/or local requirements. Properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.	Annually	GS, DOT

PM 10 - Pesticide Management Plan / IPM Policy Review

As part of annual reporting process, The City will review and evaluate, with input from municipal staff, the effectiveness of its Pest Management Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Review and continuously improve goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Regional Board staff and other interested parties, and results of local performance review meetings if any.	Annually	GS, DOT, ESD, PRNS, PW, RDA
B.	**Monitoring Mechanism IX.A.1.** Complete revised work plan that incorporates continuous improvement items, and report on completion of work plan tasks.	Annually	GS, DOT, ESD, PRNS, PW, RDA
C.	**Monitoring Mechanism VII.A.1.** Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development & significant redevelopment projects, & percentage of new development/ significant redevelopment projects for which pesticide reduction measures were required. (Draft Permit Provision C.3.n.)	Annually	PW, RDA, ESD

Mercury Workplan

M Work Plan

This program element is implemented pursuant to permit provision C.9.c. In 2003, the Program approved a Guidelines document on the management of mercury-containing products by a municipal agency. The City will continue to implement management practices consistent with the guidelines.

The timing for outreach efforts regarding fluorescent tube recycling will be tailored to coincide with the County's implementation of a retail store drop-off program for fluorescent tubes.

M 1 - Municipal Use of Mercury-Containing Products

The City will eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

#	Activities	Compliance Date	Responsible Party
A.	Complete and report results of survey of mercury-containing products used by City departments. **1. Conduct a follow-up Mercury-containing product survey**	Done FY 02-03 **FY 03-04**	ESD ESD
B.	Develop a mercury policy requiring the virtual elimination of mercury from controllable sources in urban runoff from agency operations.	Done FY 02-03	ESD, GS, DOT
C.	Implement SCVURPPP guidelines for mercury-containing products reduction and management. These guidelines will include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, & reduction in use of mercury-containing products.	~~*FY 03-04*~~ **Ongoing**	ESD, GS, DOT
D.	Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines (to be developed).	Annually	ESD

M 2 - Household Hazardous Waste Collection

The City will Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

#	Activities	Compliance Date	Responsible Party
A.	Provide mercury-containing products disposal services for residents and small businesses.	Ongoing	ESD-IWM
B.	Work with HHW collection agencies to develop and help publicize	~~*6/30/04*~~	ESD, Program

#	Activities	Compliance Date	Responsible Party
	fluorescent light recycling program to ensure maximum recycling.	**Ongoing**	

M 3 - Monitoring and Science

The City will participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

#	Activities	Compliance Date	Responsible Party
A.	Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee. - The City of San Jose will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San Jose.	Ongoing	ESD

M 4 - Regional, State, and Federal Coordination

Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

#	Activities	Compliance Date	Responsible Party
A.	Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup.	Ongoing	ESD
B.	Support & participate in WMI Watershed Action Plan development.	Ongoing	ESD

M 5 - Public Education and Outreach

Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees.

#	Activities	Compliance Date	Responsible Party
A.	Work with Program to develop and begin to implement a fluorescent light recycling outreach program to educate residential users and encourage proper disposal of fluorescent lights.	FY 03-04	ESD
B.	Work with Program to develop and begin to implement a fluorescent light recycling outreach program to educate small businesses and conditionally exempt small quantity generators and encourage proper disposal of fluorescent lights.	FY 03-04	ESD
C.	Coordinate with municipal inspectors to integrate mercury outreach	FY 03-04	ESD

#	Activities	Compliance Date	Responsible Party
	to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.		
D.	Develop and distribute "tailgate safety meeting cards" about mercury to inspectors and other municipal employees. (The Program will first review the product developed by the Fairfield-Suisun Sewer District when it is made available to the Bay Area Pollution Prevention Group (BAPPG).)	TBD	ESD
E.	Attend community events and distribute outreach materials. **See Attachment A: Outreach Activities Summary**	~~*As Needed*~~ **Ongoing**	ESD
F.	**Monitoring Mechanism V.B.** Document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	Annually	ESD, Program

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Water Utilities Operations & Maintenance

WUO&M Work Plan

The City's Water Utility program is ongoing and is implemented pursuant to permit provision C.2.

WUO&M 1 - Inventory of O&M Activities

The City of San José's Municipal Water System will conduct an inventory of all-key operations and maintenance activities, and identify routine and unplanned non-storm water discharges from these activities. This inventory will be conducted every three years and evaluated at least once a year.

#	Activities	Compliance Date	Responsible Party
A.	Review current procedures for operations and maintenance.	3/03 Annually	ESD-Muni
B.	Three-year update of list.	3/03 Every 3 years Next Due 3/06	ESD-Muni

WUO&M 2 - Implementation of WUPPP

The City of San José's Municipal Water System will implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.

#	Activities	Compliance Date	Responsible Party
A.	Implement WUPPP/Report on activities	Annually	ESD-Muni

WUO&M 3 - Staff Training and Contractor WUPPP Compliance

The City of San José's Municipal Water System will conduct annual training for municipal staff and coordinate WUPPP elements with water utility project planning, including WUPPP elements (BMPs, conditions, specifications, etc., in contract and services agreements).

#	Activities	Compliance Date	Responsible Party
A.	Develop training program.	Done 11/98	ESD-Muni
B.	Implement training program.	Annually	ESD-Muni

WUO&M 4 - WUPPP Effectiveness Evaluation

The City of San José's Municipal Water System will evaluate the effectiveness of the WUPPP annually. Maintain accurate documentation and revise the WUPPP as necessary.

#	Activities	Compliance Date	Responsible Party
A.	Develop evaluation program.	Annually	ESD-Muni
B.	Provide progress and update report to Santa Clara Valley Urban Runoff Pollution Prevention Program.	Annually	ESD-Muni

Public Information / Participation
Formerly Residential Outreach and Education (ROE)

PIP Work Plan

For FY 2004-2005, the City's PI/P work plan will focus on the following objectives:

1. Provide support for Santa Clara Basin Watershed Management Initiative (WMI) and Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) activities. This will be done primarily through participation in the Watershed Education and Outreach (WE&O) Ad Hoc Task Group, and participation in the WMI Communications and Outreach Subgroup.
2. Support watershed awareness through classroom education programs by participating in the WE&O Schools Work Group, the Alviso Environmental Education Center (EEC) Work Group, the City's Youth Watershed Education Team (YWET), and to the general public by promoting community-based involvement, such as the biannual creek cleanups conducted through the Creek Connections Action Group.

Training and Outreach
Other sections of this work plan contain elements related to training and outreach to specific target audiences. They can be found at ICID 4, IND 6, CON 7, NDC 2, PM 6, M 5, and CNAP-CB-1. For a list of Outreach Activities, see Attachment A: Outreach Activities Summary. Training that is specifically for municipal staff is listed as part of the Municipal Compliance section of the Work Plans.

PI/P 1 - Public Awareness

The City of San José will promote general citizen awareness regarding the functions of the storm drain system, pathways and sources of urban runoff pollution to the South Bay watershed, behaviors that adversely affect water quality, what a watershed is, and activities citizens can participate in to learn about and benefit the watershed.

#	Activities	Compliance Date	Responsible Party
A.	Identify, support and participate in appropriate community events to further general public awareness.		ESD
	1. Work with Program events work group, and WE&O ad hoc Task Group.	Ongoing	ESD, Program
B.	Support, and/or develop and implement school and youth education programs. Projects include:		
	1. Participate in WE&O Schools work group.	Ongoing	ESD, Program
	2. Participate in the Alviso Education Center work group.	Ongoing	ESD, Program
	3. Participate in City Education programs such as the Youth Watershed Education Team, Rangers in Schools, etc.	Ongoing	ESD

#	Activities	Compliance Date	Responsible Party
C.	Give presentations upon request that focus on storm water messages to elementary through college grade levels**, neighborhood groups, etc**.	As Needed	ESD
D.	Participate in WMI Outreach, and coordinate WMI outreach with Watershed Watch and Program efforts.	Ongoing	ESD, WMI, Program
	1. Participate in Watershed Watch campaign.	Ongoing	ESD, Program

PI/P 2 - Targeted Outreach

The City of San José will develop and implement targeted residential outreach and education campaigns, based on identification of up to two high priority pollutants, to effectively reduce pollutant-causing behaviors and promote Best Management Practices.

#	Activities	Compliance Date	Responsible Party
A.	Identify General Residential practices contributing to stormwater pollution. Identify reasonable alternatives to pollutant causing behavior.		ESD, Program
	1. Review surveys and applicable reports	Ongoing	ESD
	2. Review 945-3000 hotline calls information	Ongoing	ESD
	3. Meet with inspectors to discuss **and document** residential outreach needs	Ongoing	ESD
	4. Prepare report identifying residential outreach needs and tasks	Annually	ESD
B.	Identify ICID practices and target audience(s) contributing to pollution.		ESD
	1. Review ICID reports	Ongoing	ESD
	2. Review 945-3000 hotline calls information	Ongoing	ESD
	3. Meet with ICID inspectors to discuss **and document** outreach needs	Ongoing	ESD
	4. Prepare report identifying ICID outreach needs and tasks	Annually	ESD-Marcom
C.	Promote selected residential and ICID messages through regional activity (e.g. Program PIP, BASMAA PIP, BAPPG Spanish radio ad messages, Media Relations PSAs)		
	1. Report on targeted residential and ICID outreach activity	Annually	ESD-Marcom
	2. Participate in the Program's Pesticide and Mercury ad hoc task groups.	Ongoing	ESD, Program

PI/P 3 - Citizen Involvement Programs

The City of San José will support and/or develop and implement citizen involvement programs designed to increase citizen understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support and/or develop involvement opportunities for San Jose residents		
	1. Participate in creek clean-ups on a bi-annual basis through in-kind staff support for the Creek Connections Action Group.		ESD, PRNS
	• Fall creek cleanup	Coastal Cleanup Day, Q1 FY 03-04	ESD, PRNS
	• Spring creek Cleanup	National Rivers Day, Q4 FY 03-04	ESD, PRNS
B	Promote WMI's Public Participation Opportunities list.		
	1. Report on actions promoting Public Participation Opportunities list.	Annually	ESD

PI/P 4 - Outreach Evaluation

The City of San José will develop and implement evaluation and feedback mechanism(s) to determine the effectiveness of outreach and education campaigns and evaluate changes in citizen awareness and understanding.

#	Activities	Compliance Date	Responsible Party
A.	Implement selected evaluation tools.		**ESD**
	1. Work with Program, WMI, and Watershed Watch AHTG to Plan for Program's Watershed watch campaign follow-up Survey	Triennially- FY ~~03-04~~ **06-07**	**ESD, Program**
	2. Report on survey and evaluation activity during the report period	Annually	**ESD**
B.	Annually review, modify and report on outreach plans based on effectiveness results.		**ESD**
	1. Produce written report on effectiveness of outreach activities conducted in prior fiscal year.	Annually	**ESD**

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Municipal Compliance

During FY 2002-2003, the City began developing new policies regarding Integrated Pest Management and mercury containing product use and disposal. These efforts were added to the City of San Jose URMP work plan in the Pesticide Management (PM) and Mercury (M) sections. For this reason, those items have been deleted from this section.

Municipal training continues to be a key element for most program elements. Specific program elements that include municipal training activities include ICID 3, IND 5, NDC 9, CON 2, CON 6, CON 8, PSR 2, PSR 3, PSR 6, SDO 3, SDO 4, PM 4, and WUO&M 3. For a list of planned training activities, see Attachment B: Municipal Training Schedule.

Municipal Training

Municipal Training is a critical function of the City's NPDES Permit. Municipal compliance is dependent on the level and quality of the training provided.

#	Activities	Compliance Date	Responsible Party
A.	Identify training needs.	Annually	ESD-UR
B.	Develop curricula.	~~*Done 6/02*~~ As Needed	ESD-UR
C.	Conduct training	Annually	ESD-UR

Municipal Facilities Assessment and Compliance

Municipal facilities are required to comply with storm water regulations. Efforts to reduce contaminated discharges from City facilities must be similar to those required of private businesses. While many elements for permit compliance are in place, the City requires a systematic approach to City facilities compliance at the level of effort required in the URMP.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Corp Yard assessments and inspections.	Annually	ESD-UR, GS, DOT
	1. Conduct Citywide meeting to discuss Hazardous Material, Safety, and Storm water issues for City corporation yards (up to two times per year).	**Annually**	**GS, ESD, DOT, Fire, Police**
B.	Municipal Facilities SWPPPs.	Annually	ESD-UR, GS, DOT
C.	~~*Develop and formalize policies to develop proper disposal of mercury containing products.*~~ Superseded by M Work Plan	Deleted FY 03-04	

Integrated Pest Management

Assist with development of performance standards for integrated pest management for municipal use and comply with requirements developed.

#	Activities	Compliance Date	Responsible Party
A.	Assist with performance standard development.	Done FY 01-02	
B.	~~*Coordinate implementation of performance standards.*~~ Superseded by PM Work Plan.	Deleted FY 03-04	
C.	~~*Create and update existing policies and ordinances.*~~ Superseded by PM Work Plan.	Deleted FY 03-04	

Copper / Nickel Action Plans

CNAP Work Plan

This element is implemented pursuant to provisions C.9.a and b of the stormwater permit. Activities in the copper and nickel action plans are attributed largely to the South Bay POTWs and to SCVURPPP as the responsible entities. Some activities, however, require specific actions by the SCVURPPP co-permittees or specified municipalities. Summarized here are activities pursuant to implementation of the baseline actions included in the Copper and Nickel Action Plans. These are in addition to those undertaken by SCVURPPP as a program. A complete update on implementation of the Action Plans can be found in the SCVURPPP Annual Report.

CB-1 - Vehicle Washing Operations

#	Activities	Target Date	Responsible Party
A.	Have member of San Jose team trained to lead mobile cleaners certification seminar.	Done FY 02-03	
B.	Support Program in hosting mobile cleaners certification seminar. **1. Promote list of certified mobile cleaning service providers.**	~~*6/30/04*~~ **Done FY 03-04** **Next FY 05-06** **Ongoing**	ESD **ESD**
C.	Distribute coupons in support of Program partnership with Western Car Wash Association.	~~*9/30/03*~~ **Done FY 03-04** **Continue in FY 04-05 pending implementation by Program.**	ESD
D.	Develop and distribute charity car wash outreach material.	Done FY 02-03	

CB-3 - Industrial Discharges

#	Activities	Target Date	Responsible Party
A.	Work with Program to discuss results of CSJ outreach efforts and potentially develop improvements to the IND Performance Standard.	6/30/04	ESD
B.	Publish BMP info on copper from roof vents.	Done FY 01-02	ESD
C.	Continue Distribution of info regarding copper from roof vents. Develop BMP for distribution and mail to permitted industries. **1. Follow up with pertinent dischargers to evaluate need for additional effort.**	3/31/04 **6/30/05**	ESD **ESD-WE**
D.	Continue NOI Filers project.	Ongoing	ESD-WE

CB-6 - Reducing Traffic Congestion

#	Activities	Target Date	Responsible Party
A.	Summarize San Jose efforts that address traffic congestion management.	6/30/04	ESD PBCE Planning

CB-8 - Watershed Assessments and New Development

#	Activities	Target Date	Responsible Party
A.	See NDC section for details on San Jose implementation of C.3 permit provisions.		

CB-11 - Street Sweeping and Storm System O&M

#	Activities	Target Date	Responsible Party
A.	Track quantitative data on the tons of material removed and disposed of and other relevant street sweeping program data.	6/30/04 **Annually**	ESD-IWM DOT

CB-12 - Pools and Spas

#	Activities	Target Date	Responsible Party
A.	Work with SCVURPPP to develop outreach material directed at pool owners.	Done FY 02-03	
B.	Work with SCVURPPP to develop and implement distribution plan for the pool materials.	6/30/04	ESD
C.	Distribute outreach materials at events, public counters, and post on City website.	6/30/04 **Ongoing**	ESD

CB-21 - Architectural Use of Copper

#	Activities	Target Date	Responsible Party
A.	Continue to discourage architectural use of copper during Planning application review.	Ongoing	PBCE-Planning
B.	Continue to monitor progress of San Jose Green Building program to identify opportunities for discouraging architectural use of copper.	Ongoing	PBCE-Planning ESD-UR

NB-1 – Discharges from Construction sites

#	Activities	Target Date	Responsible Party
A.	See NDC and CON program elements for activities that address erosion control.	Ongoing	

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Trash

TRA Work Plan

This program element has been added for FY 04-05 and is being implemented in support of the Program's Trash Work Plan dated March 1, 2003. The City's strategy is to inventory and evaluate current trash management practices and to maximize or tailor the most effective ones for ongoing implementation. The City's activities will focus on assistance with the development of an evaluation strategy, implementation of trash evaluations, and the implementation or refinement of trash management practices.

TRA 1 - Inventory, Document and Evaluate Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Complete Program survey of existing trash management practices.	Done FY 03-04	ESD

TRA 2 - Document and Map Known Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/ incidents and eradication efforts.	Done FY 03-04	ESD, GS, PRNS
B.	Compile trash problem location data/information and submit to Program for conversion to coordinates for GIS mapping.	Done FY 03-04	ESD

TRA 3 - Conduct Trash Evaluations

#	Activities	Target Date	Responsible Party
A.	Work with Program to select trash evaluation methodology.	4/30/04	ESD
B.	Assist Program with planning and organizing of training workshop for municipal staff.	5/31/04	ESD
C.	Participate in the Training Workshop.	5/31/04	ESD
D.	Identify which entities will conduct trash evaluations (e.g. municipal staff, volunteer groups, etc.).		
E.	Conduct trash evaluations and submit to Program staff.		
	1. Coyote Watershed	12/31/04	ESD
	2. Remaining San Jose locations	FY 05-06	ESD

TRA 4 - Develop Standardized Documentation and Reporting Format

#	Activities	Target Date	Responsible Party
A.	Work with Program to develop a reporting format to document trash management activities in Annual Reports.	6/30/04	ESD

TRA 5 - Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Assist Program staff with the documentation and analysis of trash evaluation results.	12/31/04	ESD
B.	Identify high priority trash areas using trash evaluation results.		
	1. Coyote Watershed	12/31/04	ESD
	2. Remaining San Jose locations	FY 05-06	ESD

TRA 6 - Identify and Implement Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Identify reasonable trash management practices to address high priority areas (in TRA 7B).	Ongoing (Start 7/31/04)	ESD, PRNS, GS
B.	Begin implementation or refinement of trash management practices at high priority areas to the maximum extent practicable.	Ongoing (Start 1/31/05)	ESD, PRNS, GS
C.	Document and report implementation of trash management actions.	7/31/05	ESD

TRA 7 - Review and Update Performance Standards Relevant to Trash Management

#	Activities	Target Date	Responsible Party
A.	Assist with the review and update of existing standards that address BMPs or control measures relevant to trash management.	4/30/05	ESD

Permit Reapplication

This work plan element has been added for FY 04-05.

Provision C.14 of the permit stipulates that the current permit expires on February 21, 2006 and that the Dischargers must file for reapplication not later than 360 prior to that, or by February 26, 2005.

Permit Reapplication Preparation

#	Activities	Target Date	Responsible Party
A.	Compile all changes to URMP as part of reapplication for next permit. (C.2.b)	9/1/04	ESD
B.	Participate in permit development and negotiation processes.	Beginning 02/01/05	ESD

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Attachment A: Outreach Activities Summary

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	❍ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
1.	**Storm Drain Stenciling** San Jose Conservation Corps to stencil approximately 5,000 storm drain inlets throughout the City with the appropriate neighborhood creek name and 945-3000 hotline number.	❍		FY 04-05	
2.	**Regional partnerships** Participate in BAPPG Spanish Radio campaign, BASMAA/BACWA Media Relations campaign, Clean Estuary Partnership, etc.	❍	PI/P 2.C	FY 04-05	
3.	**Classic Car Wash Promotion** (PROGRAM) Support Watershed Watch campaign's Classic Car Wash promotion	❍	CNAP, CB-1	TBD	♦ Materials distributed
4.	**Program Event Support** As needed, staff Watershed Watch Booth and/or provide outreach materials to select Watershed Watch Campaign events.	❍	PIP 1.A.	As needed	♦ Materials distributed
5.	**Website Revisions** Complete revisions to the Watershed Protection website	❍		FY 04-05	
6.	**BMP Reprints** Reprint selected Outreach materials as needed	❍		FY 04-05	
7.	**Print "Preventing Storm Drain Pollution" BMP in two languages** Print run for Spanish and Vietnamese language versions of this Brochure	◎: Commercial		FY 04-05	
8.	**Home and Garden Show(s)** Attend and distribute information	◎: Residential	PI/P 1.A. PM 6.A.	Spring 05	♦ # People talked to ♦ Materials distributed
9.	**Industrial Users Academy** Give stormwater, Pollution prevention and GIASP compliance information to industries permitted to the Water Pollution Control Plant	◎: Plant-permitted Industries	IND 6.A. PI/P 1.A.	FY 04-05	♦ Participant surveys
10.	**Outreach to Development Community** PW & ESD staffs to conduct training on erosion and sediment control for private developers of	◎: Developers	CON 7.C. NDC 2	FY 04-05	♦ Participant surveys

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	○ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
	type 2 projects. PBCE Planning and PW also conduct roundtable meetings with developers where information regarding stormwater requirements is shared.				
11.	**IPM Store Partnership** (PROGRAM) Create & provide fact sheets & materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program. There are currently nine stores in San Jose participating in the IPM store partnership.	◎	PM 6.D.	FY 04-05 dates TBD	
12.	**Vehicle Maintenance Outreach** Investigate partnering with existing City outreach on Traffic Safety to carry vehicle maintenance messages	◎	ICID 4	FY 04-05	
13.	**Mercury Outreach** Investigate opportunities to include mercury messages in the City's residential newsletter, participation in the Home Show events, and support the County's Universal Waste Take-back Pilot Program	◎	M5 PIP 2.C.	FY 04-05	
14.	**Coastal Clean-up Day** Creek Clean-up event coordinated with County-wide effort	✋	PI/P 3.A.	Fall 04	♦ Participant surveys ♦ Amount picked up
15.	**National Rivers Clean-up Day** Creek Clean-up event coordinated with County-wide effort	✋	PI/P 3.A.	Spring 05	♦ Participant surveys ♦ Amount picked up
16.	**Requests for Brochures** Distribute outreach materials upon request	✎	PI/P 1.A.	FY 04-05	
17.	**Wacky Watersheds Workshops** Present South Bay Water Connections curriculum to middle school educators within San Jose/Santa Clara Water Pollution Control Plant service area. The educators will also receive a tour of the Don Edwards San Francisco Bay National Wildlife Refuge.	✎	PI/P 1.B.	TBD	♦ Participant surveys ♦ Follow-up call of attendees
18.	**Water Awareness Program** Also called Rangers in Schools. Presentations focusing on Pollution Prevention. *It's Wet It's Wild It's Water!* Curriculum distributed to teachers.	✎	PI/P 1.B. PI/P 1.C.	FY 04-05	♦ Survey of teachers ♦ Survey of students
19.	**Slow the Flow** Grant to Don Edwards Alviso Environmental Education Center to host 9 different types of events: special events, interpretive programs, teacher orientation, field trips, in-class presentations, outreach presentations, workshops, special visits and interpretive displays.	✎		FY 04-05	♦ Done by Grantee

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	○ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
20.	**Youth Watershed Education Grants** Grant program for educators	✎		FY 04-05	♦ Audit of projects
21.	**High School Activities** Select and pilot feasible approaches to high school education	✎		FY 04-05	
22.	**Additional ZunZun Presentations** Additional 50 ZunZun presentations in San Jose, contingent on Grant approval	✎	PI/P 1.B.	FY 04-05	
23.	**IPM Outreach** Prepare IPM stories and press releases for local media. Investigate opportunities to include IPM messages in the City's outreach to businesses.	◎	PM 6.B. PM 6.E.	FY 04-05	

Attachment B: Municipal Training Schedule

PS ID #	TOPIC	SPONSORED OR HELD BY	DEPT/DIVISION/SECTION ATTENDING	# SESSIONS	TENTATIVE FY 04/05 SCHEDULE
ICID 3A & 3B	Construction Inspection Training	ESD Watershed Enforcement	ESD Watershed Enforcement	1	10/04
ICID 3A & 3B	Annual Training for IC/ID Inspectors	ESD Watershed Enforcement	ESD Watershed Enforcement	1	06/04
IND 5C	Training for IND Inspectors	ESD Watershed Enforcement	ESD Watershed Enforcement	1	06/04
CON 2C	Wet Weather Construction Site Preparation & Inspection	DPW, ESD	PW	2	9/04
CON 6C	Construction Site Planning and Management For Water Quality Protection	SCVURPPP & Regional Board	PW, ESD, PB&CE, PRNS		9/04
CON 6C	SOPs for inspections during wet and dry season to include procedures for erosion control plan review inspection process	DPW, ESD	PW Inspections, PBCE Building Inspectors		9/04
CON 7C	Erosion & Sediment Control Training for Type 2 Private Development Projects	DPW & ESD	Private Developers, PW, ESD		9/04
CON 8A	Erosion Control Information To Be Included In Contract Language For Capital Improvement Projects Training For PW Construction Project Management	PW & ESD	PW		TBD
NDC 9A, 9B, & 9D	NPDES C.3 Training	Various	PBCE, PW, RDA, ESD		
PSR 2A	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	10/04
PSR 3C & 3E	Storm Water Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/04
PSR 6C	Stormwater Pollution Prevention Training – Rural Public Works	PRNS, ESD	PRNS	2	03/04
SDO 3A	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation,	2	10/04

PS ID #	Topic	Sponsored or Held By	Dept/Division/Section Attending	# Sessions	Tentative FY 04/05 Schedule
			Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers		
SDO 4B & 4C	Storm Water Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/04
PM 4A	Worker Safety training per DPR requirements	GS, ESD, Target Specialty Products	DOT, GS, PRNS, ESD	1	12/04
PM 4B	Training on IPM Policy & Techniques.	GS, ESD	DOT, GS, PRNS, ESD	1	12/04
WUO&M 3B	Water Utility Operation & Maintenance Discharge Training	ESD (Muni Water)	Muni Water Operations & Maintenance Crews		12/04

Glossary

AHTG	Ad Hoc Task Group
BMP	Best Management Practices
CAO	City Attorney's Office
CEP	Clean Estuary Partnership
DOT	Department of Transportation
ESD	Environmental Services Department
ESD-MarComm	Marketing & Communication Section
ESD-Muni	City of San Jose Municipal Water System
ESD-UR	Urban Runoff Section
ESD-WE	Watershed Enforcement Section
GS	General Services Department
HHW	Household Hazardous Waste
PBCE	Department of Planning, Building and Code Enforcement
POTW	Publicly Owned Treatment Works
PRNS	Department of Parks, Recreation and Neighborhood Services
PW	Public Works Department
PW-AE	Architectural Engineering Division of PW
PW-ECS	Engineering and Construction Services Division of PW
PW-PRF	Parks and Recreational Facilities Division of PW
PW-TDS	Transportation & Development Services of PW
RDA	Redevelopment Agency
RWQCB	Regional Water Quality Control Board
SCVURPPP or Program	Santa Clara Valley Urban Runoff Pollution Prevention Program
SOP	Standard Operating Procedure
SWPPP	Storm Water Pollution Prevention Program
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
WMI	Watershed Management Initiative

City of San José

Urban Runoff Management Plan

Chapter 11:

Santa Clara Valley Urban

Runoff Pollution Prevention Program

Attachment 1: Work Plans, FY 05-06

Prepared by the Environmental Services Department

March 1, 2005

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Environmental Services Department
WATERSHED PROTECTION

February 22, 2005

Dr. Adam W. Olivieri
Program Manager
Santa Clara Valley Urban Runoff Pollution Prevention Program
699 Town & Country Village
Sunnyvale, CA 94086

Subject: Submittal of FY 2005-06 Work Plan for the Urban Runoff Management Plan

Dear Dr. Olivieri:

Attached is the annual work plan for the City of San José Urban Runoff Management Plan (URMP) for FY 2005-2006 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. This submittal should be included as part of the Santa Clara Valley Urban Runoff Pollution Prevention Program's March 1, 2005 Work Plan submittal to the California Regional Water Quality Control Board, San Francisco Bay Region.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment of knowing violations.

If you have any questions regarding these work plans, please contact Melody Tovar of my staff at (408) 382-8845.

Sincerely,

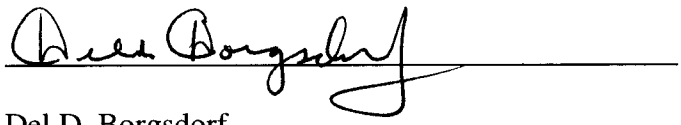
Randolph A. Shipes
Deputy Director
Environmental Services Department
Watershed Protection Division

Encl: FY 2005-2006 Work Plan

City of San José
FY 2005-2006 WORK PLAN
FOR CITY'S URBAN RUNOFF MANAGEMENT PLAN

Certification Statement

"I certify, under penalty of law, that this work plan and related URMP revisions were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



Del D. Borgsdorf
City Manager

Submitted on March 1, 2005

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Introduction

This compilation of annual work plans for the City of San José Urban Runoff Management Plan (URMP) has been developed for FY 2005-2006 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. The work plans include tasks, responsibilities, and schedules needed to implement the program elements in the URMP. The Environmental Services Department coordinates development and review of the work plans in cooperation with staff from all affected City departments.

The Permit requires that annual work plans be submitted to the Water Board by March 1 of each year. This submission precedes completion of the City's annual budget development and approval process. While the work plans are developed using the best available information regarding budget forecasts, all activities in the work plans are subject to the approval of funding by the City Council in June of each year.

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Illicit Connection / Illegal Dumping

ICID Work Plan

This program element is implemented pursuant to permit provision C.2 and C.6.a.ii. The City's Environmental Inspectors located within the Environmental Services Department, Watershed Protection Division continue to conduct ICID investigations.

ICID 1 - Response to Complaints

The City of San José will respond to complaints regarding IC/ID dumping activities into the storm drain system and will ensure that the activity or is on a time schedule to cease.

#	Activities	Compliance Date	Responsible Party
A.	Update database system to track IC/ID complaint information.	Done FY 03-04	ESD-WE
B.	Document complaint activity, the number of IC/ID complaints that the City received, and that the activity has ceased or is an allowable discharge.	Annually	ESD-WE
C.	Document to the Water Board annually follow-up activities from each IC/ID complaint response.	Annually	ESD-WE
D.	1. Review effectiveness of standard operating procedures for responding to IC/ID comp laints.	Ongoing	ESD-WE
	2. Refine and implement standard operating procedures for responding to ICID complaints/referrals.	Ongoing	ESD-WE
E.	Work with SCVURPPP to refine administrative procedure for providing referrals to the Water Board.	Pending Implementation by Program	ESD-WE, Program
F.	Refine and implement standard operating procedures to incorporate results of ICID 1E.	Pending Implementation by Program	ESD-WE, Program

ICID 2 - Investigations of High Priority Areas

The City of San José will conduct investigations of high priority areas. High Priority is defined as areas with a high potential for non-storm water discharges to the City's collection system.

#	Activities	Compliance Date	Responsible Party
A.	Target areas for monitoring by identifying high priority areas, primary types and sources of IC/ID pollution based on complaints, historical inspection records, inspector knowledge, and monitoring information.	Annually	ESD-WE
	1. Perform GIS analysis on frequently occurring IC/ID sources and/or types.	Done F Y 03-04	ESD-UR

#	Activities	Compliance Date	Responsible Party
B.	Conduct investigations of high priority areas based on ICID 2A.	Ongoing	ESD-WE
C.	Document to the Water Board that investigations of high priority areas have been conducted.	Annually	ESD-WE

ICID 3 - Inspector Training

The City of San José will ensure that IC/ID inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for IC/ID inspectors.	Annually, Q1	ESD-WE
B.	Provide and document on-the-job training and other training opportunities, such as inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

ICID 4 - Outreach and Technology Transfer

The City of San José will distribute outreach and technology transfer material containing applicable control measures and/or BMPs to target parties responsible for IC/ID activities.

#	Activities	Compliance Date	Responsible Party
A.	Determine need for new and/or revised outreach and technology transfer material by getting feedback from inspectors regarding 1) continuing problem activities; 2) discharge types; 3) monitoring and complaint data; and 4) usefulness of existing outreach and technology transfer material.	Ongoing	ESD-MarComm ESD-UR
B.	Develop, audit and/or modify existing outreach material, as needed, based on report developed under ICID 4A.	Ongoing, as needed	ESD-WE
C.	Document to Water Board that outreach technology transfer material and/or BMPs have been distributed.	Annually	ESD-UR
D.	Develop and implement standard operating procedures to gather customer feedback on IC/ID services.	Development Done FY 02-03 Implementation Ongoing	ESD-WE

ICID 5 - SOPs Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its SOPs in responding to complaints regarding illicit connections and illegal discharge dumping activities into the storm drain system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate effectiveness of SOPs.	Annually	ESD-WE
B.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

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Industrial & Commercial Dischargers

IND Work Plan

Pursuant to permit provision C.2, the City continues to conduct Industrial and Commercial facility inspections based on an inspection frequency schedule and collect the information needed to meet enhanced reporting requirements.

IND 1 - Notice of Intent (NOI) Filers

The City of San José will conduct inspections of those facilities that have filed an NOI with the State and appear on a list provided by the State.

#	Activities	Compliance Date	Responsible Party
A.	Annually, obtain NOI filer database from State with annual information, review information and identify new NOI facilities for inspection the following year.	Annually	ESD-WE
B.	Conduct and document initial inspections of NOI Filers within one year using the inspector checklist form to determine exposure and assign a future inspection frequency to each facility accordingly. Document whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site.	Ongoing	ESD-WE
C.	Conduct and document annual inspections of facilities determined to have exposure in accordance with inspection frequency schedule.	Ongoing	ESD-WE
D.	Conduct and document inspections of facilities that need to file an NOI at least once every five years and in accordance with the inspection frequency schedule identified in IND 3.	Ongoing	ESD-WE
E.	Maintain the database to track the inspection information from the inspector checklist and to include all NOI filer SIC codes required by the Industrial Activities Stormwater General Permit.	Ongoing	ESD-WE

IND 2 - Non-Filer Investigations

The City of San José will inspect industrial facilities that may be subject to general permit requirements but are not found on the NOI filer list provided by the State and that conduct activities identified by the following SIC codes:

5015: Automobile Dismantlers

5093: Other Recycling Industries

3200 series: Stone, Clay and Concrete Products Industry

4100 & 4200 series: Trucking Facilities that perform on-site vehicle repair, maintenance or washing.

#	Activities	Compliance Date	Responsible Party
A.	Identify industrial facilities that conduct activities with the SIC codes listed in the IND SOPs.	Annually	ESD-WE
B.	Develop a list of facilities targeted for inspection during upcoming year that may be subject to general permit requirements for NOI based on business licenses, etc.	Annually	ESD-WE
C.	Conduct and document initial inspections of industrial facilities with the SIC codes listed referenced in IND 2A, using the inspector checklist form to document whether the facility constituted a potential threat to discharge pollutants to the storm drain collection system, whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site. Maintain database.	Ongoing	ESD-WE
D.	Conduct & document annual inspections of facilities determined to have exposure in accordance with implementation schedule. Add the facility to appropriate database(s) and assign an inspection frequency. If the facility inspected is determined to need to file an NOI and is not able to provide an NOI, SWPPP or SWMP, refer to the RWQCB.	Ongoing	ESD-WE
E.	Work with the Program's Industrial Inspection Ad Hoc TG on an Administrative procedure for providing referrals to the Water Board and document providing referrals to the Water Board for facilities with significant problems.	Pending Implementation by Program	ESD-WE, ESD-UR

IND 3 - City Regulated Facilities

The City of San José will conduct inspections of City Regulated commercial facilities as identified below:

Type	Frequency
Food service facilities	2 or more AOCs* over a rolling three year time period - Every year 1 AOC over a rolling three year time period – Every two (2) years 0 AOCs over a rolling three year time period - Every three (3)years
All Other City Regulated facilities	2 or more AOCs* over a rolling five year time period – Every year 1 AOC over a rolling five year time period – Every two (2) years 0 AOCs over a rolling five year time period but have exposure – Every five (5) years 0 AOCs over a rolling five year time period with no exposure or potential for exposure – No further inspections
Facilities for which a referral or ICID complaint is received	As soon as practicable for violations and every year until they meet the above criteria.

*Area of Concern (AOC) = A violation based on the San José Municipal Code 15.14.530 issued to a facility during a stormwater inspection.

#	Activities	Compliance Date	Responsible Party
A.	Determine industrial/commercial facilities identified in the IND SOPs for inspection in each FY.	Annually, Q1	ESD-WE
B.	Conduct and document inspections of City Regulated facilities, other than food service facilities, at least once every five (5) years in	Ongoing	ESD-WE

#	Activities	Compliance Date	Responsible Party
	accordance with the inspection frequency schedule. If determined to have no impact or no potential for pollution, will not be scheduled for future inspection.		
C.	Conduct and document inspections of City Regulated food service facilities at least once every three (3) years. Initial approved performance standards require inspections every three years.	Ongoing	ESD-WE
D.	Conduct and document inspections for which a referral or complaint was received within five days of complaint received and second inspection within one year.	Ongoing	ESD-WE
E.	Develop a database to track the inspection information from the inspector facility inspection report. 1. Implement new Environmental Enforcement Data Management System	Done FY 02-03 Done FY 03-04	ESD-WE ESD-WE
F.	Maintain database to track inspection information from inspector facility inspection report and to include new industrial program categories.	Ongoing	ESD-WE
G.	For B, C, D, and E, collect information during inspections on the potential for stormwater pollution at City Regulated facilities in order to determine the appropriate inspection frequency for the various facilities.	Ongoing	ESD-WE
H.	Develop an inspection frequency plan to track frequency of inspections. Implement & update, as needed, the inspection frequency plan.	Development: Done FY 01-02 Implementation Ongoing Updated as needed	ESD-WE

IND 4 - Compliance

The City of San José will conduct industrial/commercial inspections to determine the existence of discharges or potential discharges which are illegal under local ordinances. The facility operator will be notified of observed areas of concern to be corrected and/or if official action on violations is necessary, it will take place under local enforcement procedures.

#	Activities	Compliance Date	Responsible Party
A.	Document facilities that have enforcement actions and the type of enforcement actions conducted for the existence of discharges or threatened discharges that are illegal under local ordinances.	Ongoing	ESD-WE

IND 5 - Training

The City of San José will ensure that industrial/commercial inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for IND inspectors.	Annually, Q1	ESD-WE
B.	Maintain a training plan and provide and document on-the-job training and other training opportunities such as industrial/commercial inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

IND 6 - Outreach

The City of San José will help develop and distribute outreach and technology transfer material containing applicable control measures and/or BMPs to industrial/commercial facility operators responsible for IND activities.

#	Activities	Compliance Date	Responsible Party
A.	Identify and list existing outreach and technology transfer material.	Annually	ESD-UR
B.	Distribute applicable outreach and technology transfer material to industrial/commercial facility operators. Document to the RWQCB that outreach and technology transfer material and/or BMPs have been distributed, as needed, to industrial/commercial facility operators.	Distribution: Ongoing See PIP Program Element in Annual Report	ESD-UR
C.	Determine usefulness of outreach and technology transfer materials by obtaining feedback from industrial/commercial facilities. Obtain feedback from inspectors about the effectiveness of existing outreach and technology transfer material and develop and/or modify existing outreach material.	As Needed	ESD-UR

IND 7 - NOI Filers Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its inspections procedures and database tracking system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate the effectiveness of NOI Filers inspections procedures.	Annually	ESD-WE
B.	Document and evaluate the effectiveness of the NOI Filers database tracking system.	Annually	ESD-WE
C.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

New and Redevelopment

NRD Work Plan

The New and Redevelopment C.3 provision in the NPDES permit of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) requires all dischargers covered by the permit, including the City, to modify their project review processes as needed to incorporate conditions of approval in permits for applicable projects, as defined in the provision, to ensure that pollutant discharges are reduced by incorporation of treatment measures and other appropriate source control and site design measures, and increases in runoff flow are managed in accordance with the provision to the maximum extent practicable.

The City began phased implementation of hydraulic (also referred to as numeric) sizing requirements for stormwater treatment BMPs in conformance with Policy 6-29 on October 15, 2003. The City will begin implementation of peak flow control requirements, as required in the permit, following approval of a SCVURPPP Hydromodification Management Plan (HMP) by the Water Board.

NRD 1 - Legal Authority

The City of San José will have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Provision C.3.a.i).

#	Activities	Compliance Date	Responsible Party
A.	Revise Municipal Code to ensure adequate legal authority to implement new development control measures (C.3.a.i).	As Needed.	PBCE, ESD, PW

NRD 2 - Guidance to Developers

The City will provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for stormwater pollution prevention, as appropriate for the type of project and location.

#	Activities	Compliance Date	Responsible Party
A.	1. Draft necessary revisions to Guidance Manual on Selection of Stormwater Quality Control Measures to allow incorporation of hydraulic sizing design criteria and provide to developers. 2. Refine Guidance Manual on Selection of Stormwater Quality Control Measures to incorporate HMP measures, as necessary.	Done FY 02-03 Pending	PBCE, ESD, PW, RDA
B.	Provide development community with revised information and guidance materials concerning any adopted on site design, building permit requirements, hydraulic sizing design criteria and HMP criteria, and maintenance requirements for BMPs for stormwater	Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	treatment measures.		
	1. Coordinate w/development community on proposed hydraulic sizing criteria for structural stormwater treatment measures, HMP criteria and any proposed revisions to Guidance Manual and policy through workshops and regular meetings.	Ongoing	PBCE, ESD, PW, RDA
	2. Update guidance material regarding maintenance responsibilities for any HMP measures.	Pending	PBCE, ESD, PW, RDA, Program

NRD 3 - CEQA Requirements

The City will ensure that environmental documents required for those projects that fall under CEQA and NEPA review address both significant and cumulative stormwater quality impacts during the life of the project, and relevant permit requirements. These documents included EIRs, negative declarations and initial study checklists (C.3.m).

#	Activities	Compliance Date	Responsible Party
A.	Review and evaluate the City's Environmental Review procedures to improve the review for water quality impacts and identification of mitigation measures. (Provision C.3.m.)	Ongoing	PBCE, ESD, PW, RDA
	1. Identify areas where new or additional water quality review processes and related documents or checklist questions are needed and propose schedule for revision.	Done FY 02-03 and Ongoing	PBCE, ESD, PW, RDA
	2. Refine and update areas where new or additional water quality related mitigation measures may be needed.	FY 05-06	
B.	Report on revisions made to environmental review processes.	Annually	PBCE, ESD, PW, RDA

NRD 4 - Project Mitigation Measures and Design Requirements

The City will encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measure that minimize stormwater pollutant discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Revise current Policy on Post-Construction Urban Runoff Management as necessary to incorporate minimum BMP requirements for all projects.	Done FY 04-05	PBCE, ESD, PW, RDA
B.	Review and modify development permit approval procedures for adopted revisions as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA
C.	Review the design standards and guidance for opportunities to make revisions that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures.	Done FY 03-04	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
D.	Review the existing source control measures contained in site design standards, guidance documents and conditions of approval for opportunities to limit stormwater pollution. (Provision C.3.k.)	Done FY 03-04	PBCE, ESD, PW, RDA
E.	Review General Plan and revise as necessary to incorporate water quality and watershed protection principles and policies, and summarize revisions made.	Ongoing as necessary	PBCE
F.	Review the design standards and guidance for opportunities to make revisions as necessary that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures. Such revisions are listed in Provision C.3.j.	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Identify and document existing site design standards and guidance documents and policies.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise Site Design Measures and Standards, as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA

NRD 5 - Group 1, 2 and HMP Project Requirements

The City will require developers of Group 1 projects deemed complete on or after October 15, 2003, to design and implement the following measures to reduce stormwater pollution to the maximum extent practicable in conformance with Policy 6-29:

- Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality) and provide detention or retention as part of landscaping where feasible (C3.b.i and C.3.j);
- Source controls shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k), including measures to discourage pesticide use (C.9.d.ii);
- Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Provision C.3.d;
- Increases in peak runoff flow and volume shall be managed for appropriate projects by implementing the guidance in the Program's Hydromodification Plan (HMP) for the specific stream receiving the discharge, following approval of the HMP by the Water Board (C.3.f).

#	Activities	Compliance Date	Responsible Party
A.	1. Propose revisions to current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 04-05	PBCE, ESD, PW, RDA
	3. Revise policy as needed for Group 2 implementation.	FY 05-06	PBCE, ESD, PW, RDA
	4. Revise policy as needed for HMP implementation	Pending	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
B.	Develop list of Annual Reporting requirements from Provision C.3. Design data tracking needs and protocols.	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Compile a list of new development and redevelopment projects by name, type of project, site acreage or square footage, square footage of new impervious surface, treatment BMPs and numeric sizing criteria used for applicable projects. Also, the source control measures required and pesticide reduction measures.	Annually	PBCE, ESD, PW, RDA
C.	Revise and update permitted alternatives to numeric sizing through Alternative Measures Program in Policy 6-29.	Done FY 04-05	PBCE, ESD, PW, RDA
	1. Report to City Council on Alternative Measures Program revisions in Policy 6-29. (Provision C.3.g.)	Done FY 04-05	PBCE, ESD, PW, RDA
	2. Track name and location of projects in the Alternative Measures Program, project type and size, percent impervious surface, reason for granting waiver, terms of waiver, equivalent benefit provided, alternative treatment project or regional project receiving the benefit and date of completion of the alternative treatment project or regional project (Provision C.3.g).	Annually	PBCE, ESD, PW, RDA
	3. Report to City Council on projects approved with numeric sizing alternatives through Alternative Measures Program. (Provision C.3.g.)	Annually	PBCE, ESD, PW, RDA
D.	Draft post-construction treatment BMP certification procedures. (Provision C.3.h)	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Track name and location of projects subject to certification. (Provision C.3.h.)	Annually	PBCE, ESD, PW, RDA
E.	Participate on SCVURPPP's Hydromodification Management Plan work group and develop procedures for limiting peak stormwater runoff discharge rates from development projects. (Provision C.3.f.)	Ongoing	PBCE, ESD, PW, RDA
F.	1. Review and modify development permit approval procedures and standard operating procedures as necessary to incorporate requirements for:		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	FY 05-06	
	c. HMP	Pending	
	2. Update and refine criteria & checklist to aid Department of Planning, Building & Code Enforcement & Department of Public Works planners & engineers in determining whether a development project should be required to incorporate post-construction treatment control measures & their related operation and maintenance requirements as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	FY 05-06	
	c. HMP	Pending	
	3. Update and refine standard conditions of approval as necessary to ensure proper selection, design of and installation of structural stormwater treatment measures per Provision C.3.b.,c.,d as necessary.		PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	a. Group 1 b. Group 2 c. HMP	Done FY 03-04 FY 05-06 Pending	
G.	Develop & propose enhanced reporting format for documenting use of pesticide reduction measures at development sites. (Provision C.3.n. & C.9.ii.)	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Based on City's Pesticide Management Plan, establish criteria for tracking percentage of new development projects for which pesticide reduction measures were required & begin tracking. (Provision C.3.n. & C.9.d.ii)	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA
H.	Implement any new adopted development conditions of approval, and procedures to developments with significant stormwater pollution potential. (Provision C.3.b.)	Ongoing	PBCE, ESD, PW, RDA

NRD 6 - Developer Conformance with State Requirements

The City will require developers of projects that disturb a land area of one acre or more to demonstrate conformance with the State General Construction Activity Storm Water Permit including filing of NOI, development of a SWPPP, et al.

#	Activities	Compliance Date	Responsible Party
A.	Include as condition of approval for projects that disturb a land area of one acre or more, a requirement to demonstrate coverage under the State General Construction Activity Storm Water Permit.	Ongoing	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Annually. See CON Program Element in Annual Report.	PBCE, PW, RDA

NRD 7 - Developer Erosion Control Plans

The City will required developers of projects with potential for significant erosion and planned construction activity during the wet season to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

#	Activities	Compliance Date	Responsible Party
A.	Include as a condition of approval for applicable projects a requirement to prepare and implement an erosion and sediment control plan.	Ongoing	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Annually. See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 8 - Operation and Maintenance for Structural Stormwater Controls

The City will implement an operation and maintenance (O&M) verification program that includes (C.3.e):

- Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;
- Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;
- Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

#	Activities	Compliance Date	Responsible Party
A.	Work with SCVURPPP to develop guidance for implementing O&M Program.	Done FY 02-03	PBCE, ESD, PW, RDA
B.	1. Draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities. (Provision C.3.e)	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise and update draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities as necessary. (Provision C.3.e.)	FY 05-06	PBCE, ESD, PW, RDA
C.	1. Include as a condition of approval a requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such controls.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise and update condition of approval requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such structural controls as necessary.	FY 05-06	PBCE, ESD, PW, RDA
	3. Develop model permit conditions with BMP fact sheets to include in use permits where appropriate.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Compile a list of projects & responsible operators subject to C.3.e. provision.	Annually	PBCE, ESD, PW, RDA
D.	Track and compile a list of priority properties inspected and inspection results. (Provision C.3.e.iii.)	Ongoing	PBCE, ESD, PW, RDA
	1. Determine criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update and revise criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency as necessary.	FY 05-06	PBCE, ESD, PW, RDA
	3. Develop local inspection program for verification of proper O&M.	Done FY 02-03	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	4. Update and revise local inspection program for verification of proper O & M as necessary.	FY 05-06	PBCE, ESD, PW, RDA

NRD 9 - Applicability to Public Projects

The City will ensure municipal capital improvement projects include stormwater quality control measures during and after construction, appropriate for each project, and that that contractors comply with stormwater quality control requirements during construction activities and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a process to ensure that municipal capital improvement projects install structural stormwater quality control measures as necessary.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Participate on SCVURPPP work group tasked with developing a technical guidance document for use by municipal staff to ensure that the document includes standard specifications and details, sizing methodologies, & model conditions of approval acceptable for use in City projects as necessary. (Provision C.3.b. & d.)	Ongoing	PBCE, ESD, PW, RDA
	2. Review and revise Redevelopment Agency Project Request for Proposal procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 03-04	ESD, PBCE, RDA
	3. Review and Revise Public Works Capital Improvement Project approval procedures and Road Improvement Project approval procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 02-03	PBCE, ESD, PW, RDA
B.	Review, evaluate, and modify the procedures, as necessary.	As needed	PBCE, ESD, PW, RDA
C.	Begin tracking required data on the public projects subject to Provision C.3. hydraulic sizing criteria requirements for Annual Report.	Done FY 03-04 Ongoing	PBCE, PW, RDA
D.	Monitor development of City's Green Building program for opportunities to discourage architectural use of copper in development projects (Provision C.9.a.) and to incorporate urban runoff considerations.	Ongoing	PBCE, ESD, PW, RDA

NRD 10 - City Staff Training

The City will provide training at least annually to its planning, building, and public works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention (C.3.a.vi).

#	Activities	Compliance Date	Responsible Party
A.	Provide training to Planning and Public Works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA
B.	Provide training to Redevelopment Agency and Department of Transportation staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA, DOT
C.	Revise the training protocol to incorporate any newly adopted Provision C.3. permit requirements and related revised procedures.	As Needed	PBCE, ESD, PW, RDA
D.	Train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval and the importance of minimizing pesticide use in runoff from development sites. (Provision C.3.n. and Provision C.9.d.ii)	Ongoing	PBCE, ESD, PW, RDA

NRD 11 - Development Plan Review and Approval Procedures Effectiveness Evaluation

The City of San José will review and evaluate the effectiveness of its development plan review and approval procedures.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in review and approval process.	Annually	PBCE, ESD, PW, RDA
B.	Document and evaluate what worked well and what needs improvement.	Annually	PBCE, ESD, PW, RDA

Construction Inspection

CON Work Plan

This program element is implemented pursuant to permit provision C.2. The control measures discussed in this work plan apply to both private development projects and municipal public works construction projects. These control measures are implemented at construction project sites as part of the City's construction inspection and enforcement program.

FY 05-06 will be the third full year of implementation for the Standard Operating Procedure (SOP) for Construction Inspections that was developed for the 03-04 season. This SOP includes the method by which PBCE Building Division Inspectors address housekeeping measures at construction sites, in addition to the established roles of Environmental Services and Public Works inspectors. Inspection staff from the three departments work together to monitor compliance at construction sites.

CON 1 - Site Housekeeping

The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites, and prevent illicit discharges to storm drains and watercourses.

#	Activities	Compliance Date	Responsible Party
A.	Track and document incidents of housekeeping issues at construction sites.	Ongoing	PBCE-Bldg, PW, ESD-WE

CON 2 - Local Ordinance

For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.

#	Activities	Compliance Date	Responsible Party
A.	Maintain a program for identifying and conditioning projects with significant erosion potential and planned wet season activity.	Ongoing	PW PBCE-Bldg
B.	Identify ordinance changes needed to conduct inspections.	As Needed	PW, ESD-WE, PBCE-Bldg

CON 3 - Construction Inspection Frequency

The City inspects construction sites for adequacy of stormwater quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on size of project, site conditions, precipitation, and project's potential impact on stormwater quality.

#	Activities	Compliance Date	Responsible Party
A.	Maintain and update SOPs for construction inspection program.	As Needed	PW, ESD-WE, PBCE-Bldg
B.	Document inspections of active construction sites.	Ongoing	PW, ESD-WE, PBCE-Bldg
C.	Evaluate the effectiveness of the construction inspection program and make improvements as necessary.	Annually	PW, ESD-WE, PBCE-Bldg

CON 4 - Wet Season Preparation

Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.

#	Activities	Compliance Date	Responsible Party
A.	Review and revise procedures for construction inspection staff regarding wet season construction requirements.	As Needed	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD
B.	Document pre-season inspection of construction sites to ensure adequate implementation of winterizing BMPs prior to the wet season.	Ongoing	PW-AE, ECS, PRF, TDS

CON 5 - Inspection and Site Evaluation Follow-up

Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Water Board.

#	Activities	Compliance Date	Responsible Party
A.	Implement SOPs for follow-up actions and graduated levels of enforcement for construction sites.	Ongoing	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD

B.	Track and summarize notices and follow-up actions for annual reports.	Annually	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD

CON 6 - Municipal Training

The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention. All inspectors receive training on the latest construction-related stormwater pollution prevention techniques and appropriate follow up actions at least once every two years. The City keeps documentation that inspectors have received training.

#	Activities	Compliance Date	Responsible Party
A.	Develop an annual training plan for construction inspection program.	Annually, Q1	ESD, PW, PBCE-Bldg
B.	Conduct annual training.	Ongoing	ESD, PW, PBCE-Bldg
C.	Track and document that inspectors have received training.	Annually	ESD-UR
D.	Evaluate the training curriculum and frequency, and make improvements as necessary.	Annually	ESD, PW, PBCE-Bldg

CON 7 - Outreach

The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.

#	Activities	Compliance Date	Responsible Party
A.	Review outreach and technology transfer materials and make improvements, as necessary	Annually, Q4	ESD, PW, PBCE-Bldg
B.	Conduct outreach sessions for development community.	Annually	ESD, PW, PBCE-Bldg Program & Water Board
C.	Document outreach to development community.	Annually	ESD-UR
D.	Evaluate outreach program and make improvements, as necessary.	Annually	ESD, PW, PBCE-Bldg

CON 8 - Public Works Projects

The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.

#	Activities	Compliance Date	Responsible Party
A.	Conduct training for Public Works capital improvement project staff (Architectural Engineering Design & Construction and Streets, Bridges and Sewers Design and Construction) on contract language, standard specifications, and enforcement.	Annually	PW-AE, ECS, PRF, TDS ESD
B.	Track the number of Public Work projects with these requirements.	Annually	PW-AE, ECS, PRF, TDS

CON 9 - Construction Inspection Effectiveness Evaluation

The City of San José will review and evaluate effectiveness of its construction inspection SOPs and BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in construction inspection SOPs and BMPs.	Annually	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD-WE ESD-UR
B.	Document and evaluate what worked well and what needs improvement.	Annually	PW-AE, ECS, PRF, TDS PBCE-Bldg ESD-WE ESD-UR
	1. Expand the number of sites with an inspector of record to capture more of the Type 1 and Type 2 sites (per Public Work's designation).	Annually	PBCE-Bldg
	2. Hold coordination meetings for Building, ESD, and Public Works inspectors to provide a forum for questions, and to discuss consistency and training needs.	Ongoing	ESD, PW, PBCE-Bldg

Public Streets, Roads, & Highways

PSR Work Plan

This program element is implemented pursuant to permit provision C.2.

Training will continue to cover the SOPs and appropriate BMPs for Department of Transportation activities with the highest potential for stormwater pollution. These activities include spill response, resurfacing, sealing and patching, saw-cutting, street sweeping, landscape chemical application, concrete installation, pavement stripping, legend removal, and catch basin inspection after irrigation repair. BMP effectiveness evaluation from crew members is obtained during the training sessions.

Staff training continues in FY 05-06 on Rural Public Works SOPs related to stormwater pollutant reduction during operations and maintenance activities in the City's regional and neighborhood parks and other "rural areas."

PSR 1 - Implementation of BMPs

The City of San José will implement Best Management Practices (BMPs) for street, road, and highway operation and maintenance (O&M) activities to reduce pollutants in stormwater and eliminate illicit discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted.	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	6/30/05 Annually	DOT, ESD

PSR 2 - Contractor Use of BMPs

The City of San José will develop and implement a process to ensure that contractors employed to perform street, road, and highway O&M activities use appropriate BMPs per URMP.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for public street, road, and highway O&M contracts on related stormwater BMPs annually.	Annually	DOT, ESD
B.	Develop standard contract language for PSR maintenance activities.	6/30/05	DOT, ESD

PSR 3 - City Staff Annual Training

The City of San José will provide annual training to its municipal staff in the use of appropriate BMPs. The City will also provide a mechanism for obtaining feedback from staff on the implementation and effectiveness of the BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Identify training goals, such as improving the focus of the training on the specific BMPs used by a section; integrating new BMPs, if any; etc.	Annually, Q4	DOT, ESD
B.	Identify training opportunities (which could include tailgate meetings and other existing training).	Annually	DOT, ESD
C.	Create or revise training modules for affected City staff and contractors.	As Needed	DOT, ESD
D.	Create or revise collateral material based on training modules.	As Needed	DOT, ESD
E.	Schedule training with affected supervisors. 1. Develop and implement a new training module specifically for DOT electrician staff.	Annually 6/30/05	DOT, ESD DOT, ESD

PSR 4 - Notification of Public Agencies

The City of San José will inform other parties (e.g., CalTrans, the County of Santa Clara, and public utilities) conducting street, road, and highway O&M activities within its jurisdiction of the requirements to implement pollutant reduction BMPs and Control Measures in stormwater to the maximum extent practicable and eliminate illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Identify conditions under which another agency will be notified regarding relevant stormwater requirements.	Done FY 02-03	

PSR 5 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges. The review and evaluation will include input from the municipal maintenance staff that implement the BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual effectiveness reporting, including sub-procedures for gathering feedback from affected supervisors and for modifications to BMPs and SOPs as necessary.	Done FY 01-02	
	1. Review procedures for annual effectiveness evaluation. Consider obtaining feedback from supervisors on how to assess BMP effectiveness and the use of training sessions with staff as an opportunity to evaluate BMPs and SOPs.	FY 04-05	DOT, ESD
B.	Conduct evaluation of BMPs and SOPs.	Annually	DOT, ESD

PSR 6 - Rural Public Works Maintenance and Support Activities

The City will extend its control measure strategy for PSR to address water quality impacts resulting from public works maintenance and support activities in rural areas.

#	Activities	Compliance Date	Responsible Party
A.	Identify City-owned properties that are applicable (under the RPW performance standard).	Ongoing	
	1. Re-evaluate the feasibility of using GIS information to identify additional applicable properties, if any.	6/30/06	PRNS, GS, DOT, ESD
B.	Develop or adapt Standard Operating Procedures (SOPs) and Best Management Practices (BMPs) for rural public works activities.	Done FY 03-04	
C.	Provide annual training on appropriate SOPs/BMPs to City staff that perform rural public works operations and maintenance activities. Incorporate SOPs/BMPs evaluation into annual training.	Annually	PRNS, DOT, GS, ESD
D.	Through contract specifications, require contractors hired by the City to use appropriate SOPs/BMPs when performing rural public works construction or maintenance.	6/30/05	PRNS, DOT, GS, ESD
E.	Annually conduct an evaluation of the effectiveness of the rural public works program, report the results in the Urban Runoff Annual Report. Identify items for continuous improvement.	Annually	PRNS, DOT, GS, ESD

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Storm Drain System Operation & Maintenance

SDO Work Plan

The Department of Transportation Standard Operating Procedures for catch basin cleaning and Problem Area Reporting continue to be the focus of crew training. A GIS map overlay has been created that assigns serial numbers to each of the City's more than 28,500 storm drain inlets. This map overlay is currently in use as a means to facilitate problem area reporting in the storm drain system.

SDO 2A indicates that the City is performing Tier II inspection and cleaning for catch basins. Severe budget constraints in the coming year may require that the City perform inspection and cleaning to a modified version of Tier II in FY 05-06 that accomplishes the same objective over a longer time frame in the fiscal year.

SDO 1 - O&M BMP Implementation

The City of San José will implement best management practices (BMPs) for the storm drain system operation and maintenance (O&M) to reduce pollutants in stormwater to the maximum extent practicable. Specific BMPs for each type of O&M activity are those listed in the City's Urban Runoff Management Plan (URMP).

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted (including structural controls if necessary).	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	6/30/05 Annually	DOT, ESD

SDO 2 - Problem Tracking and Process Improvement

The City of San José will develop and implement processes for tracking problem areas and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Implement an annual inspection and cleaning work plan to achieve a Tier II level review.	Ongoing	DOT
B.	Evaluate criteria for collecting data from City field personnel for the purposes of determining Problem Areas.	As Needed	DOT, ESD

#	Activities	Compliance Date	Responsible Party
C.	Revise documentation and problem area reporting procedure, if necessary, to improve reporting performance. Documentation to include frequency, nature, and type of recurring problem. Include coordination of data from ICID and Storm Drain Management System data sources. Include analysis of data to identify trends for targeting solutions.	As Needed	DOT, ESD
D.	Produce Problem Area report.	Annually	DOT
E.	Address Problem Areas through ICID enforcement/ education activities, additional BMP development, program development or retrofit.	As Needed	DOT, ESD

SDO 3 - Contractor Use of BMPs

The City will develop and implement, as needed, a process to ensure that contractors employed to perform storm drain O&M activities use the appropriate BMPs. NOTE: All City SDO O&M is conducted in-house, and City staff receives BMP/SOP training annually. The only time storm drain maintenance might be contracted out would be for a rare flood emergency situation. The City has standard specifications that cover storm drain BMPs for construction activities.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for SDO O&M contracts on related stormwater BMPs.	Annually	DOT, ESD

SDO 4 - Staff Training and BMP Feedback

The City of San José will provide annual training to its municipal staff in use of appropriate BMPs and/or Control Measures. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Provide training prior to the rainy season.	Annually, Q4	DOT, ESD
B.	Create or revise training modules for affected City staff.	As Needed	DOT, ESD
	1. Improve the focus of the training on the specific BMPs used by a section.	As Needed	DOT, ESD
	2. Provide specific training to inlet cleaning crews on IMSPAR data collection in advance of inlet cleaning program implementation.	Annually	
C.	Produce schedule for training.	Annually	DOT, ESD

SDO 5 - Data Analysis

As part of the annual review process, the City of San José will evaluate data regarding cleaning activities and unusual flows observed during inspection. The review and evaluation will include consideration of storm drain structural retrofit.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual review and evaluation of data. 1. Investigate the feasibility of collecting data on the amount of materials removed during inlet cleaning.	Done FY 01-02 6/30/05	DOT, ESD
B.	Implement annual data review and identify follow-up actions as appropriate.	Annually	

SDO 6 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Review with supervisors to get feedback and information on how to assess BMP effectiveness.	As Needed	DOT, ESD
B.	Use annual training sessions with staff as an opportunity to evaluate the effectiveness of BMPs & SOPs.	Annually	DOT, ESD

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Water Utilities Operations & Maintenance

WUO&M Work Plan

The City's Water Utility program is ongoing and is implemented pursuant to permit provision C.2.

WUO&M 1 - Inventory of O&M Activities

The City of San José's Municipal Water System will conduct an inventory of all-key operations and maintenance activities, and identify routine and unplanned non-storm water discharges from these activities. This inventory will be conducted every three years and evaluated at least once a year.

#	Activities	Compliance Date	Responsible Party
A.	Review current procedures for operations and maintenance.	Annually	ESD-Muni
B.	Three-year update of list.	3/31/06 Every 3 years	ESD-Muni

WUO&M 2 - Implementation of WUPPP

The City of San José's Municipal Water System will implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.

#	Activities	Compliance Date	Responsible Party
A.	Implement WUPPP/Report on activities	Ongoing	ESD-Muni

WUO&M 3 - Staff Training and Contractor WUPPP Compliance

The City of San José's Municipal Water System will conduct annual training for municipal staff and coordinate WUPPP elements with water utility project planning, including WUPPP elements (BMPs, conditions, specifications, etc., in contract and services agreements).

#	Activities	Compliance Date	Responsible Party
A.	Implement training program.	Annually, Q2	ESD-Muni

WUO&M 4 - WUPPP Effectiveness Evaluation

The City of San José's Municipal Water System will evaluate the effectiveness of the WUPPP annually. Maintain accurate documentation and revise the WUPPP as necessary.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate effectiveness of program.	Annually, Q4	ESD-Muni

Pesticide Management

PM Work Plan

This program element is implemented pursuant to permit provision C.9.d. Progress continues with implementing pest control BMPs and training staff on Integrated Pest Management (IPM) techniques.

PM 1 - Integrated Pest Management

The City will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring use of IPM techniques in the agency's operations; and, minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors.

#	Activity	Compliance Date	Responsible Party
A.	Develop a City IPM policy for inclusion in Pesticide Management Plan.	Done FY 02-03	

PM 2 - Pesticide Management Plan

The City will develop and implement a Pesticide Management Plan with the goals of minimizing pesticide use and reducing the amount of pesticides in stormwater and landscape runoff to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Draft a City of San José Pesticide Management Plan.	Done FY 01-02	
B.	Publish City Pesticide Management Plan in URMP.	Done FY 01-02	

PM 3 - IPM SOPs and BMPs

The City will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy.

#	Activities	Compliance Date	Responsible Party
A.	Develop SOPs and BMPs for implementing IPM policy with provisions that will reduce water quality impacts from pesticide use.	Done FY 01-02	
B.	For each type of pest problem identified, seek model SOPs and BMPs from published literature.	Done FY 01-02	
C.	Incorporate or develop appropriate IPM measures into City SOPs and BMPs.	Done FY 02-03	
D.	Update City URMP to incorporate model Pest Management Performance Standard, including description of legal authority (IPM	Done FY 02-03	

#	Activities	Compliance Date	Responsible Party
	policy and contract language), work plan elements, BMPs, and SOPs needed for implementation.		
E.	Review and update City SOPs and BMPs, as appropriate.	As Needed	GS, DOT, ESD, PRNS

PM 4 - City Employee Training

The City will ensure that employees receive pest management training by implementing the following:

1. Employees who apply pesticides for the City will obtain the appropriate training as required by the County Agricultural Commissioner and State Department of Pesticide Regulation (DPR);
2. Employees within departments responsible for pesticide application will receive annual training on appropriate portions of City IPM Policy, SOPs, and BMPs, and latest IPM techniques;
3. Employees who are not authorized to apply pesticides will be annually trained not to use over-the-counter pesticides at workplace, consistent with IPM Policy.
4. Annual internal outreach will be conducted to employees, who do not necessarily purchase or apply pesticides during their course of work, on less toxic pest control and to encourage employees to use IPM techniques away from work.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that employees who apply pesticides for the agency obtain appropriate training required by County Agricultural Commissioner and State Department of Pesticide Regulation.	Annually	GS, DOT, PRNS
B.	Provide annual training on IPM Policy, SOPs, and BMPs, and latest IPM techniques to employees within departments responsible for pesticide application.	Annually	GS, DOT, ESD, PRNS
C.	Annually inform employees who are not authorized / trained to apply pesticides not to use over-the-counter pesticides at workplace, consistent with IPM Policy.	Ongoing	GS, DOT, ESD, PRNS
D.	**Monitoring Mechanism I.B.1.** Document and evaluate effectiveness of staff training conducted each year in annual report. 1. Update class evaluation/survey for IPM training classes conducted by City staff.	Annually As Needed	GS, DOT, ESD, PRNS GS, DOT, ESD, PRNS
E.	Public Education and Outreach Task II.A.14 Conduct internal outreach on less toxic pest control to employees who do not necessarily purchase or apply pesticides during the course of their work (to encourage employees to use IPM techniques away from work).	Annually	ESD

PM 5 - Contractor Pesticide Management Requirements

The City will develop and implement a process to ensure that contractors employed to conduct pest control and pesticide application on municipal property engage in pest control methods consistent with City IPM Policy. Specifically, the City will require contractors to:

- follow City IPM policy, BMPs, and SOPs;
- provide evidence of current IPM training, when feasible; and
- provide documentation of pesticide use on City property to the City in a timely manner.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that contractors employed to conduct pest control/pesticide application on municipal property engage in methods consistent with City IPM policy.	Ongoing	GS, DOT, ESD, PRNS, PW, RDA
B.	Review and update a list of all contractors employed by the City who perform pest application work.	Annually	GS, DOT, ESD, PRNS, PW, RDA
C.	Implement a procedure to provide to each contractor a copy of the City's IPM policy.	Done FY 02-03	
D.	City will supply copies of pest specific BMPs and SOPs to contractors. If contractors want to use their own BMPs and SOPs, they must submit them in writing to the contract manager. The contract manager must then review and approve the contractor's BMPs and SOPs for conformance with the City's IPM policy, BMPs and SOPs.	Ongoing	GS, DOT, ESD
E.	Require through contract specifications that PCOs contracted for municipal applications use pest control methods consistent with City's IPM Policy. Specifically, require contractors to: a) follow City IPM policy, BMPs and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on City property to the City in a timely manner. 1. City will develop standard content for PCO contracts.	Ongoing FY 04-05	GS GS, DOT, ESD
F.	**Monitoring Mechanism III.A.1.** Document number of PCOs receiving presentations and/or training on pesticide use by PCOs on municipal property.	Annually	GS, ESD

PM 6 - Pesticide Management Outreach

The City will identify in annual work plan outreach activities it will conduct consistent with Program Pesticide Management Plan. Work plan elements will address outreach to residential and commercial pesticide users, pesticide retailers, and special districts. Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the City's own IPM practices, as applicable.

#	Activities	Compliance Date	Responsible Party
A.	Increase awareness of target audiences regarding proper pesticide use, disposal methods, water quality impacts, and less toxic pest management messages. Target audiences include commercial and residential pesticide users, pesticide retailers, municipal employees, and special districts.	Ongoing	ESD
B.	Prepare IPM stories and press releases to local media.	As Needed	ESD
C.	In conjunction with Program, City will provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., VTA, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	As Needed	ESD
D.	Create and provide fact sheets and materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program.	Ongoing	ESD
E	**Monitoring Mechanism:** Document or estimate numbers of residents reached by outreach efforts, including events, web promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts by documenting calls to the Program's general and watershed campaign hotlines.	Annually	ESD
F	**Monitoring Mechanism IV.A.1.** Document outreach efforts targeting businesses, recommended in the work plan, to be developed by the Program. Implement evaluation component of the work plan.	Annually	ESD

PM 7 - HHW Pesticide Disposal

The City will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.

#	Activities	Compliance Date	Responsible Party
A.	Work with HHW collection agencies to support, enhance, and publicize programs for pesticide disposal.	Ongoing	ESD
B.	Ensure that adequate pesticide disposal services exist for residents and conditionally exempt small quantity commercial generators.	Annually	ESD
C.	Provide hazardous waste disposal information to residents, through distribution of materials (e.g., utility bill insert, city newsletter, community events, etc.) or advertising in local media.	Ongoing	ESD

#	Activities	Compliance Date	Responsible Party
D.	**Monitoring Mechanism V.A.1.** Document that HHW collection programs adequately serve residents and businesses and that exchange programs do not exchange organophosphate or banned pesticides.	Annually	ESD

PM 8 - City Pesticide Use Tracking

The City will develop and implement a process for tracking pesticide use on municipally-owned property.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a pilot pesticide tracking process for Diazinon and Chlorpyriphos products.	Done FY 01-02	
B	Track pesticide use on municipally owned property. Include reporting and justification for use of OP pesticides and BMPs employed during OP pesticide use.	Ongoing	GS, DOT,ESD
	1. Evaluate feasibility of implementing electronic data management system for pesticide use.	Done FY 04-05	
	2. Implement electronic data management system for tracking pesticide use on City property.	FY 05-06	GS, DOT, ESD
C.	**Monitoring Mechanism I.A.1.** Document completion of tasks in annual reports. Use pesticide tracking process to document pesticide use.	Annually	GS, DOT, ESD, PRNS, PW, RDA

PM 9 - City Pesticide Inventory Search

The City will conduct periodic Citywide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. These pesticides, if found, will be properly disposed pursuant to appropriate waste disposal regulations.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Citywide search of chemical storage areas for pesticides no longer legal for application per EPA, State, and/or local requirements. Properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.	Annually	GS, DOT, PRNS

PM 10 - Pesticide Management Plan / IPM Policy Review

As part of annual reporting process, the City will review and evaluate, with input from municipal staff, the effectiveness of its Pest Management Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Review and continuously improve goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings, if any.	Annually	GS, DOT, ESD, PRNS, PW, RDA
B.	**Monitoring Mechanism IX.A.1.** Complete revised work plan that incorporates continuous improvement items, and report on completion of work plan tasks.	Annually	GS, DOT, ESD, PRNS, PW, RDA
C.	**Monitoring Mechanism VII.A.1.** Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development and significant redevelopment projects, and percentage of new development/ significant redevelopment projects for which pesticide reduction measures were required. (Draft Permit Provision C.3.n.)	Annually	PW, RDA, ESD

Mercury

M Work Plan

This program element is implemented pursuant to permit provision C.9.c. In 2003, the Program approved a Guidelines document on the management of mercury-containing products by a municipal agency. The City will continue to implement management practices consistent with the guidelines.

M 1 - Municipal Use of Mercury-Containing Products

The City will eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

#	Activities	Compliance Date	Responsible Party
A	Implement SCVURPPP guidelines for mercury-containing products reduction and management. These guidelines include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	Ongoing	ESD, GS
	1. Collect and dispose of mercury-containing lamps generated in City-owned facilities	Ongoing	GS, ESD
	2. Identify other mercury-containing products for virtual elimination, phase-out and/or proper disposal.	Annually, As Needed	ESD, GS
B.	Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines.	Annually	ESD

M 2 - Household Hazardous Waste Collection

The City will provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

#	Activities	Compliance Date	Responsible Party
A.	Provide mercury-containing products disposal services for residents and small businesses.	Ongoing	ESD-IWM
B.	Work with Program and HHW collection agencies to develop and help publicize fluorescent light recycling program.	Ongoing	ESD, Program

M 3 - Monitoring and Science

The City will participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

#	Activities	Compliance Date	Responsible Party
A.	Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee.	Ongoing	ESD
B.	The City of San José will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San José through calendar year 2005.	12/31/2005	ESD

M 4 - Regional, State, and Federal Coordination

Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

#	Activities	Compliance Date	Responsible Party
A.	Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup, RMP, and the CEP.	Ongoing	ESD
B.	Support and participate in WMI Watershed Action Plan implementation	Ongoing	ESD

M 5 - Public Education and Outreach

Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees.

#	Activities	Compliance Date	Responsible Party
A.	Coordinate with Program and HHW collection agencies to develop and implement a mercury-containing product outreach program to educate selected target audience and encourage proper use and disposal of mercury-containing products.	Ongoing	ESD, Program, County HHW
B.	Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	Ongoing	ESD
C.	Attend community events and distribute outreach materials. (See Attachment A: Outreach Activities Summary)	Ongoing	ESD
D.	**Monitoring Mechanism V.B.** Document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	Annually	ESD, Program

Copper / Nickel Action Plans

CNAP Work Plan

This element is implemented pursuant to provisions C.9.a and b of the stormwater permit. Activities in the copper and nickel action plans are attributed largely to the South Bay POTWs and to SCVURPPP as the responsible entities. Some activities, however, require specific actions by the SCVURPPP co-permittees or specified municipalities. Summarized here are activities pursuant to implementation of the baseline actions included in the Copper and Nickel Action Plans. These are in addition to those undertaken by SCVURPPP as a program. A complete update on implementation of the Action Plans can be found in the SCVURPPP Annual Report.

CB-1 - Vehicle Washing Operations

#	Activities	Target Date	Responsible Party
A.	Have member of San José team trained and available to lead mobile cleaners certification seminar.	As needed	
B.	Support Program in hosting mobile cleaners certification seminar. 1. Promote list of recognized mobile cleaning service providers.	FY 06-07 Ongoing	ESD ESD
C.	Distribute coupons in support of Program partnership with Western Car Wash Association.	As needed, dependant on Program activities	Program, ESD

CB-3 - Industrial Discharges

#	Activities	Target Date	Responsible Party
A.	Continue Distribution of information regarding copper from roof vents.	Ongoing	ESD

CB-8 - Watershed Assessments and New Development

#	Activities	Target Date	Responsible Party
A.	See NRD section for details on San José implementation of C.3 permit provisions.		

CB-11 - Street Sweeping and Storm System O&M

#	Activities	Target Date	Responsible Party
A.	Track quantitative data on the tons of material removed and disposed	Annually	ESD-IWM

#	Activities	Target Date	Responsible Party
	of and other relevant street sweeping program data.		DOT

CB-12 - Pools and Spas

#	Activities	Target Date	Responsible Party
A.	Distribute outreach materials at events, public counters, and post on City website.	Ongoing	ESD
B.	Provide guidance to residents on disposal alternatives for pool and spa water.	Ongoing	ESD

CB-21 - Architectural Use of Copper

#	Activities	Target Date	Responsible Party
A.	Continue to discourage architectural use of copper during Planning application review.	Ongoing	PBCE-Planning
B.	Continue to monitor progress of San José Green Building program to identify opportunities for dis couraging architectural use of copper.	Ongoing	PBCE-Planning ESD-UR

NB-1 - Discharges from Construction sites

#	Activities	Target Date	Responsible Party
A.	See NRD and CON program elements for activities that address erosion control.		

Trash

TRA Work Plan

This program element was added in FY 04-05 and is being implemented in accordance with the Program's Trash Work Plan dated March 1, 2003. The City's strategy is to inventory and evaluate current trash management practices and to maximize or tailor the most effective ones for ongoing implementation. The City's activities focus on assistance with the development of an evaluation strategy, implementation of trash evaluations, and the implementation or refinement of trash management practices.

TRA 1 - Inventory, Document and Evaluate Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Complete Program survey of existing trash management practices.	Done FY 03-04	

TRA 2 - Document and Map Known Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/ incidents and eradication efforts).	Done FY 03-04	
B.	Compile trash problem location data/information and submit to Program for conversion to coordinates for GIS mapping.	Done FY 03-04	
C.	Revise and update documentation (list of locations, maps, etc.) of known trash problem areas.	As Needed	ESD

TRA 3 - Conduct Trash Evaluations

#	Activities	Target Date	Responsible Party
A.	Work with Program to select trash evaluation methodology.	Done FY 03-04	
B.	Assist Program with planning and organizing of training workshop for municipal staff.	Done FY 03-04	
C.	Participate in the trash evaluation methodology training workshop.	Done FY 03-04	
D.	Conduct trash evaluations and submit to Program staff. 1. Coyote Watershed 2. Remaining San José locations	 Done FY 04-05 FY 05-06	 ESD

TRA 4 - Develop Standardized Documentation and Reporting Format

#	Activities	Target Date	Responsible Party
A.	Work with Program to develop a reporting format to document trash management activities in Annual Reports.	Done FY 04-05	

TRA 5 - Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Assist Program staff with the documentation and analysis of trash evaluation results.	12/31/04	ESD
B.	Identify high priority trash areas using trash evaluation results.		
	1. Coyote Watershed	12/31/04	ESD
	2. Remaining San José locations	FY 05-06	ESD

TRA 6 - Identify and Implement Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Identify reasonable trash management practices to address high priority areas (in TRA 5B).	Ongoing	ESD, PRNS, GS, DOT
B.	Implement or refine trash management practices at high priority areas to the maximum extent practicable.	Ongoing	ESD, PRNS, GS, DOT
C.	Document and report implementation of trash management actions.	7/31/05	ESD
D.	Provide Program with information on trash management practices implemented standardized reporting format.	Annually	ESD

TRA 7 - Review and Update Performance Standards and Develop Long-Term Strategy for Trash Management

#	Activities	Target Date	Responsible Party
A.	Assist with the review and update of existing standards that address BMPs or control measures relevant to trash management.	TBD by Program	ESD
B.	Assist Program staff in developing a long-term strategy for trash conditions in urban streams and waterways.	FY05-06	ESD

Monitoring

MON Work Plan

The City, in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) has submitted, to the RWQCB, a Multi-Year Receiving Waters Monitoring Plan required per permit provision C.7.b. The final version of the plan was submitted August 5, 2002 and revised March 1, 2004. The Multi-Year Plan covers a number of pollutant control programs required by C.7 and C.9 provisions of the permit. The City continues to support Program staff in the implementation of the plan by commenting on annual plans, providing guidance for sampling within the City, and participating in the Watershed Analysis Ad Hoc Task Group.

The 2001 C.9 permit provisions require implementation of control programs for Copper, Nickel, Mercury, Pesticides, PCBs, and Dioxin-like compounds. The City continues to support and assist the Program efforts to address these control and monitoring efforts. Additionally, the City is actively involved as stakeholder and workgroup member for the Guadalupe Mercury TMDL effort, and will continue to contribute and comment on products and reports generated by Baywide TMDLs for copper, nickel, mercury and PCBs. City Staff also actively participate in Clean Estuary Project activities through the PCB workgroup and Diazinon and Pesticide Related Toxicity workgroup.

PCB Control Program

Analytical characterization work to support the PCB Control Program, required under provision C.9.e, has been completed. The Program is currently working on next steps with BASMAA and CEP.

Initial PCB analysis was performed on sediments found in selected urban storm drain systems. At this point, no known controllable sources of PCBs have been identified. Results of the follow-up analytical work have been reviewed and further sampling work to identify controllable sources was undertaken in October and November of 2002. The SCVURPPP Program submitted the final PCB Control Plan March 1, 2002, and Control Program Work Plan July 1, 2002. In addition, the City continues to implement activities described in "Next Steps" from the Year Two PCB Case Study Report submitted to the Water Board in July 2003.

#	Activities	Compliance Date	Responsible Party
A.	Sample, analyze, and report on PCBs in storm drain sediments to characterize potential sources and implement controls.	Done, 6/00 through FY 01-02	Program, ESD
B.	Begin implementation of final PCB Control Plan upon approval.	Done FY 02-03 & Ongoing	ESD

Dioxin-like Compound Control Program

Characterization of dioxins based on existing data has begun Program-wide. The Program is now collaborating with BASMAA and CEP to develop a conceptual model/impairment assessment document. City Staff provide comments to the Program and directly to CEP in support of this process.

This Dioxin-like Compound Control Program will develop procedures to identify, assess, and manage controllable sources of Dioxin-like compounds found in urban runoff.

#	Activities	Compliance Date	Responsible Party
A.	Characterize distribution of Dioxin-like compounds in the urban runoff system based on existing data.	Done FY 01-02	Program
B.	Begin implementation of SCVURPPP plan to characterize distribution of Dioxins.	In Progress at Program Level	Program
C.	Submit plan that identifies control measures / management practices to eliminate or reduce discharges of Dioxins, if needed.	TBD	Program

Sediment Control Program

The City's sediment control program falls predominantly within the Construction Inspection (CON) section of this work plan. Sediment monitoring activities also continue in conjunction with the SCVURPPP Five-Year Receiving Waters Monitoring Plan.

Pilot Monitoring Programs

In addition to the above listed control programs, the City concluded activities performed in support for the two Monitoring Pilot Programs that were begun in 1997. These pilot programs generated data that helped develop the follow-on programs of IND (outreach to industrial and commercial dischargers) and the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

MON 1 - Industrial Stormwater Monitoring Pilot Program

This program sampled key industrial sites to determine the significance of metal-contaminated stormwater discharges associated with industrial activities. The ultimate objective from this project of educating industrial and commercial dischargers about developing and implementing SWPPPs and BMPs has now been turned over to the Industrial and Commercial Dischargers section of this workplan under IND.

#	Activities	Compliance Date	Responsible Party
A.	Design and execute a sampling program to meet the project objectives, analyze results, develop guidance for industry to improve SWPPP implementation, and provide technology transfer information to industry and inspectors.	Done, FY 96-97 through 01-02 Ongoing as part of IND	ESD

MON 3 - First Flush Monitoring Program

First flush discharge areas along The Coyote Creek and Guadalupe River were monitored for three wet seasons. The City provided data to the Program for analysis and comparison to other data in June of 2002. The Program submitted a final report to the Water Board in 2003; it was included as appendix C-2 in the Program's 02-03 Annual Report.

#	Activities	Compliance Date	Responsible Party
A.	Conduct multi-year First Flush study sampling, analyze data and provide data to Program as part of Multi-year Monitoring Program	Done, FY 96-97 through 02-03	ESD, Program

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Municipal Compliance

Municipal training continues to be a key element for most program elements. Specific program elements that include municipal training activities include ICID 3, IND 5, NRD 10, CON 6, CON 8, PSR 2, PSR 3, PSR 6, SDO 3, SDO 4, PM 4, and WUO&M 3. For a list of planned training activities, see Attachment B: Municipal Training Schedule.

Municipal Training

Municipal Training is a critical function of the City's NPDES Permit. Municipal compliance is dependent on the level and quality of the training provided.

#	Activities	Compliance Date	Responsible Party
A.	Identify training needs.	Annually	ESD-UR
B.	Develop curricula.	As Needed	ESD-UR
C.	Conduct training.	Ongoing	ESD-UR
D.	Evaluate municipal training program and make improvements as needed.	Annually	ESD-UR

Municipal Facilities Assessment and Compliance

Municipal facilities are required to comply with stormwater regulations. Efforts to reduce contaminated discharges from City facilities must be similar to those required of private businesses. While many elements for permit compliance are in place, the City requires a systematic approach to City facilities compliance at the level of effort required in the URMP.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Corp Yard assessments and inspections.	Annually	ESD-UR, GS, DOT
	1. Conduct Citywide meeting to discuss Hazardous Material, Safety, and Stormwater issues for City corporation yards (up to two times per year).	Annually	GS, ESD, DOT, Fire, Police
B.	Review Municipal Facilities SWPPPs.	Annually	ESD-UR, GS, DOT

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Public Information / Participation

PIP Work Plan

For FY 05-06, the City's PIP work plan will focus on the following objectives:

1. Support and coordinate efforts with the Santa Clara Basin Watershed Management Initiative's (WMI) and Santa Clara Valley Urban Runoff Pollution Prevention Program's (Program) outreach activities. This will be done primarily through participation in the Watershed Education and Outreach (WE&O) Ad Hoc Task Group, and participation in the WMI Communications and Outreach Subgroup (COS).
2. Support watershed awareness through classroom education programs by participating in the WE&O Schools and Youth Work Group, the Alviso Environmental Education Center (EEC) Work Group, the City's Youth Watershed Education Team (YWET), and to the general public by promoting community-based involvement, such as the biannual creek cleanups conducted through the Creek Connections Action Group.

Outreach in Other Elements

Other sections of this work plan contain elements related to outreach to specific target audiences. They can be found in ICID 4, IND 6, CON 7, NRD 2, PM 6, M 5, CB-1 and CB-12. For a list of outreach activities, see Attachment A: Outreach Activities Summary.

PIP 1 - General Outreach

The City of San José will promote general citizen awareness of what a watershed is, the functions of the storm drain system, pathways and sources of urban runoff pollution to the South Bay watershed, and behaviors that adversely affect water quality.

#	Activities	Compliance Date	Responsible Party
A.	Participate in WMI Outreach, and coordinate WMI outreach with Watershed Watch and Program efforts.	Ongoing	ESD, WMI, Program
	1. Participate in Watershed Watch campaign.	Ongoing	ESD, Program
B.	Identify, support and participate in appropriate community events to further general public awareness.	Ongoing	ESD
	1. Work with Watershed Watch Events work group.	Ongoing	ESD, Program
C.	Give presentations upon request that focus on stormwater messages to elementary through college grade levels, neighborhood groups, etc.	As Needed	ESD

PIP 2 - Targeted Outreach

The City of San José will develop and implement targeted residential outreach and education campaigns, based on high priority pollutants, to effectively reduce pollutant-causing behaviors and promote Best Management Practices.

#	Activities	Compliance Date	Responsible Party
A.	Identify General Residential practices contributing to stormwater pollution. Identify reasonable alternatives to pollutant causing behavior.		ESD, Program
	1. Review surveys and applicable reports.	Ongoing	ESD
	2. Meet with inspectors to discuss and document residential outreach needs.	Ongoing	ESD
	3. Prepare report identifying residential outreach needs and tasks.	Annually	ESD
B.	Identify ICID practices and target audience(s) contributing to pollution.		ESD
	1. Review ICID reports.	Ongoing	ESD
	2. Meet with ICID inspectors to discuss and document outreach needs.	Ongoing	ESD
	3. Prepare report identifying ICID outreach needs and tasks.	Annually	ESD
C.	Promote selected residential and ICID messages through local and regional activity (e.g. Program PIP, BASMAA PIP, BAPPG, Media Relations, etc.)		
	1. Report on targeted residential and ICID outreach activity.	Annually	ESD
	2. Participate in the Program's Pesticide and Mercury ad hoc task groups.	Ongoing	ESD, Program

PIP 3 - Educational Programs

The City of San José will support and/or develop and implement educational programs designed to increase youth understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support, and/or develop and implement school and youth education programs.		
	1. Participate in WE&O Schools and Youth work group.	Ongoing	ESD, Program
	2. Participate in the Alviso Education Center work group.	Ongoing	ESD, Program
	3. Participate in City Education programs such as the Youth Watershed Education Team, Rangers in Schools, etc.	Ongoing	ESD

PIP 4 - Citizen Participation

The City of San José will support and/or develop and implement citizen involvement programs designed to increase citizen understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support and/or develop involvement opportunities for San José residents		
	1. Participate in creek clean-ups on a biannual basis through in-kind staff support for the Creek Connections Action Group.		
	a. Fall creek cleanup (Coastal Cleanup Day)	Annually, Q1	ESD, PRNS
	b. Spring creek Cleanup (National Rivers Day)	Annually, Q2	ESD, PRNS

PIP 5 - Outreach Evaluation

The City of San José will evaluate its Outreach efforts for effectiveness.

#	Activities	Compliance Date	Responsible Party
A.	Implement selected evaluation tools.		ESD
	1. Work with Program, WMI, and Watershed Watch AHTG to Plan for Program's Watershed Watch Campaign Survey.	Triennially-FY 06-07	ESD, Program
	2. Report on survey and evaluation activity during the report period.	Annually	ESD
B.	Annually review, modify and report on outreach plans based on effectiveness results.		ESD
	1. Document in Annual Report effectiveness of outreach activities conducted in prior fiscal year.	Annually	ESD

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Permit Reapplication

Provision C.14 of the permit stipulates that the current permit expires on February 21, 2006 and that the Dischargers must file for reapplication not later than 360 prior to that, or by February 26, 2005.

Permit Reapplication Preparation

#	Activities	Target Date	Responsible Party
A.	Compile all changes to URMP as part of reapplication for next permit. (C.2.b)	Done FY 04-05	ESD
B.	Participate in permit development and negotiation processes.	Beginning 02/01/05	ESD

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Attachment A: Outreach Activities Summary

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	❍ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
1.	**Storm Drain Stenciling** San José Conservation Corps to stencil approximately 4,500 storm drain inlets throughout the City with the appropriate neighborhood creek name and 945-3000 hotline number.	❍		FY 05-06	
2.	**Regional partnerships** Participate in BAPPG, BASMAA/BACWA Media Relations campaign, Clean Estuary Partnership, etc.	❍	PIP 2.C	FY 05-06	
3.	**Event Support** As needed, staff Booth and/or provide outreach materials to select events.	❍	PIP 1.B	As needed	♦ Materials distributed
4.	**BMP Reprints** Reprint selected Outreach materials as needed.	❍	PIP 1	FY 05-06	♦ n/a
5.	**Watershed Enforcement Program Brochure** Develop and print piece describing WE services and requirements.	◎	ICID 4, IND 6	FY 05-06	♦ Materials distributed
6.	**Home and Garden Show(s)** Attend and distribute information.	◎: Residential	PIP 1.B PM 6.A.	Spring 06	♦ # People talked to ♦ Materials distributed
7.	**Industrial Users Academy** Give stormwater, pollution prevention and GIASP compliance information to industries permitted to the Water Pollution Control Plant	◎: Plant-permitted Industries	IND 6.A PIP 2.B PM 6.A, M 5.B	FY 05-06	♦ Participant surveys
8.	**Outreach to Development Community** PW & ESD staffs to conduct training on erosion and sediment control for private developers of type 2 projects. PBCE Planning and PW also conduct roundtable meetings with developers where information regarding stormwater requirements is shared.	◎: Developers	CON 7 NRD 2	FY 05-06	♦ Participant surveys
9.	**IPM Store Partnership** (PROGRAM) Create & provide fact sheets & materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program. There are currently nine stores in San José participating in the IPM store partnership.	◎	PM 6.D.	FY 05-06 dates TBD	

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	○ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
10.	**Partner with Strong Neighborhoods Initiative** Investigate partnering with City's SNI for delivering selected messages.	◎	PIP 1	FY 04-05	
11.	**Mercury Outreach** Investigate opportunities to include mercury messages through participation in the Home Show events, residential newsletters or other mailings, and support the County's Universal Waste Take-back Pilot Program.	◎	M 5 PIP 2.C.	FY 05-06	
12.	**E-Mail newsletter to General Services Building/Facilities Managers** Distribute information on selected messages.	◎: City Employees	PM 6.A. M 1.A.	FY 05-06	
13.	**IPM Outreach** Prepare IPM stories and press releases for local media. Investigate opportunities to include IPM messages in the City's outreach to businesses.	◎	PM 6.A PM 6.B	FY 04-05	
14.	**Coastal Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Fall 05	♦ Participant surveys ♦ Amount picked up
15.	**National Rivers Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Spring 06	♦ Participant surveys ♦ Amount picked up
16.	**Requests for Brochures** Distribute outreach materials upon request.	✎	PIP 1.C	FY 05-06	♦ Materials distributed
17.	**Wacky Watersheds Workshops** Present South Bay Water Connections curriculum to middle school educators within San Jose/Santa Clara Water Pollution Control Plant service area. The educators will also receive a tour of the Don Edwards San Francisco Bay National Wildlife Refuge.	✎	PIP 3.A	TBD	♦ Participant surveys ♦ Follow-up call of attendees
18.	**Water Awareness Program** Also called Rangers in Schools. Presentations focusing on Pollution Prevention. *It's Wet It's Wild It's Water!* Curriculum distributed to teachers.	✎	PIP 3.A	FY 05-06	♦ Survey of teachers ♦ Survey of students
19.	**Slow the Flow** Grant to Don Edwards Alviso Environmental Education Center to host 9 different types of events: special events, interpretive programs, teacher orientation, field trips, in-class presentations, outreach presentations, workshops, special visits and interpretive displays.	✎	PIP 3.A	FY 05-06	♦ Done by Grantee
20.	**Youth Watershed Education Grants** Grant program for educators.	✎	PIP 3.A	FY 05-06	♦ Audit of projects

Attachment B: Municipal Training Schedule

PS ID #	Topic	Sponsored or Held By	Dept/Division/Section Attending	# Sessions	Tentative FY 05/06 Schedule
ICID 3	Construction Inspection Training	ESD Watershed Enforcement	ESD Watershed Enforcement	1	07/05
ICID 3	Annual Training for IC/ID Inspectors	ESD Watershed Enforcement	ESD Watershed Enforcement	1	07/05
IND 5	Training for IND Inspectors	ESD Watershed Enforcement	ESD Watershed Enforcement	1	07/05
CON 6	Wet Weather Construction Site Preparation & Inspection	DPW, ESD	PW	2	9/05
CON 6	Construction Site Planning and Management For Water Quality Protection	SCVURPPP & Water Board	PW, ESD, PBCE, PRNS		9/05
CON 6	SOPs for inspections during wet and dry season to include procedures for erosion control plan review inspection process	DPW, ESD	PW Inspections, PBCE Building Inspectors (All to attend at least once every two years)		10/05
CON 7	Erosion & Sediment Control Training for Type 2 Private Development Projects	DPW & ESD	Private Developers, PW, ESD		10/05
CON 8	Erosion Control Information To Be Included In Contract Language For Capital Improvement Projects Training For PW Construction Project Management	PW & ESD	PW		11/05
NDC 10	NPDES C.3 Training	Various	PBCE, PW, RDA, ESD		
PSR 2	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/06
PSR 3	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/06
PSR 6C	Stormwater Pollution Prevention Training – Rural Public Works	PRNS, ESD	PRNS	2	10/05

PS ID #	TOPIC	SPONSORED OR HELD BY	DEPT/DIVISION/SECTION ATTENDING	# SESSIONS	TENTATIVE FY 05/06 SCHEDULE
SDO 3A	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/06
SDO 4	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/06
PM 4A	Worker Safety training per DPR requirements	GS, ESD, Target Specialty Products	DOT, GS, PRNS, ESD	1	12/05
PM 4B	Training on IPM Policy & Techniques.	GS, ESD	DOT, GS, PRNS, ESD	1	12/05
WUO&M 3	Water Utility Operation & Maintenance Discharge Training	ESD (Muni Water)	Muni Water Operations & Maintenance Crews		12/05

Glossary

AHTG	Ad Hoc Task Group
AOC	Area of Concern
BAPPG	Bay Area Pollution Prevention Group
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practices
CAO	City Attorney's Office
CEP	Clean Estuary Partnership
DOT	Department of Transportation
EIR	Environmental Impact Report
ESD	Environmental Services Department
ESD-MarComm	Marketing & Communication Section
ESD-Muni	City of San José Municipal Water System
ESD-UR	Urban Runoff Section
ESD-WE	Watershed Enforcement Section
GS	General Services Department
HHW	Household Hazardous Waste
HMP	Hydromodification Management Plan
IPM	Integrated Pest Management
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PBCE	Department of Planning, Building and Code Enforcement
PBCE-Bldg	Building Division of PBCE
PBCE-Planning	Planning Division of PBCE
POTW	Publicly Owned Treatment Works
PRNS	Department of Parks, Recreation and Neighborhood Services
PW	Public Works Department
PW-AE	Architectural Engineering Division of PW
PW-ECS	Engineering and Construction Services Division of PW
PW-PRF	Parks and Recreational Facilities Division of PW
PW-TDS	Transportation & Development Services of PW
RDA	Redevelopment Agency
RWQCB or Water Board	Regional Water Quality Control Board
SCVURPPP or Program	Santa Clara Valley Urban Runoff Pollution Prevention Program
SOP	Standard Operating Procedure
SWPPP	Storm Water Pollution Prevention Program
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
WMI	Watershed Management Initiative
WUPPP	Water Utility Pollution Prevention Program

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Environmental Services
DIRECTOR'S OFFICE

February 28, 2006

Dr. Adam W. Olivieri
Program Manager
Santa Clara Valley Urban Runoff Pollution Prevention Program
699 Town & Country Village
Sunnyvale, CA 94086

Subject: Submittal of FY 2006-2007 Work Plan for the Urban Runoff Management Plan

Dear Dr. Olivieri:

Attached is the annual work plan for the City of San José Urban Runoff Management Plan (URMP) for FY 2006-2007 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. This submittal should be included as part of the Santa Clara Valley Urban Runoff Pollution Prevention Program's March 1, 2006 Work Plan submittal to the California Regional Water Quality Control Board, San Francisco Bay Region.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment of knowing violations.

If you have any questions regarding these work plans, please contact Melody Tovar of my staff at (408) 277-3892.

Sincerely,

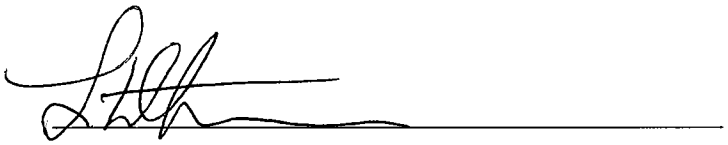
John Stufflebean
Director

Encl: FY 2006-2007 Work Plan

City of San José
FY 2006-2007 WORK PLAN
FOR CITY'S URBAN RUNOFF MANAGEMENT PLAN

Certification Statement

"I certify, under penalty of law, that this work plan and related URMP revisions were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



LES WHITE
City Manager

Submitted on March 1, 2006

City of San José

Urban Runoff Management Plan

Chapter 11:

Santa Clara Valley Urban

Runoff Pollution Prevention Program

Attachment 1: Work Plans, FY 06-07

Prepared by the Environmental Services Department

March 1, 2006

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Introduction

This compilation of annual work plans for the City of San José Urban Runoff Management Plan (URMP) has been developed for FY 2006-2007 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. The work plans include tasks, responsibilities, and schedules needed to implement the program elements in the URMP. The Environmental Services Department coordinates development and review of the work plans in cooperation with staff from all affected City departments.

The Permit requires that annual work plans be submitted to the Water Board by March 1 of each year. This submission precedes completion of the City's annual budget development and approval process. While the work plans are developed using the best available information regarding budget forecasts, all activities in the work plans are subject to the approval of funding by the City Council in June of each year.

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Illicit Connection / Illegal Dumping

ICID Work Plan

This program element is implemented pursuant to permit provision C.2 and C.6.a.ii. The City's Environmental Inspectors located within the Environmental Services Department, Watershed Protection Division continue to conduct ICID investigations.

ICID 1 - Response to Complaints

The City of San José will respond to complaints regarding ICID dumping activities into the storm drain system and will ensure that the activity has ceased or is on a time schedule to cease.

#	Activities	Compliance Date	Responsible Party
A.	Update database system to track ICID complaint information.	Done FY 02-03	ESD-WE
B.	Document complaint activity, the number of ICID complaints that the City received, and that the activity has ceased or is an allowable discharge.	Annually	ESD-WE
C.	Document to the Water Board annually follow-up activities from each ICID complaint response.	Annually	ESD-WE
D.	1. Review effectiveness of standard operating procedures for responding to ICID complaints. 2. Refine and implement standard operating procedures for responding to ICID complaints/referrals.	Ongoing ~~Ongoing~~ **As Needed**	ESD-WE ESD-WE
E.	Work with SCVURPPP to refine administrative procedure for providing referrals to the Water Board.	Pending Implementation by Program	ESD-WE, Program
F.	Refine and implement standard operating procedures to incorporate results of ICID 1E.	Pending Implementation by Program	ESD-WE, Program

ICID 2 - Investigations of High Priority Areas

The City of San José will conduct investigations of high priority areas. High Priority is defined as areas with a high potential for non-storm water discharges to the City's collection system.

#	Activities	Compliance Date	Responsible Party
A.	Target areas for monitoring by identifying high priority areas, primary types and sources of ICID pollution based on complaints, historical inspection records, inspector knowledge, and monitoring information. 1. Perform GIS analysis on frequently occurring ICID sources and/or types.	Annually Done FY 03-04	ESD-WE ESD-UR

#	Activities	Compliance Date	Responsible Party
B.	Conduct investigations of high priority areas based on ICID 2A.	Ongoing	ESD-WE
C.	Document to the Water Board that investigations of high priority areas have been conducted.	Annually	ESD-WE

ICID 3 - Inspector Training

The City of San José will ensure that ICID inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for ICID inspectors.	Annually, Q1	ESD-WE
B.	Provide and document on-the-job training and other training opportunities, such as inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

ICID 4 - Outreach and Technology Transfer

The City of San José will distribute outreach and technology transfer material containing applicable control measures and/or BMPs to target parties responsible for ICID activities.

#	Activities	Compliance Date	Responsible Party
A.	Determine need for new and/or revised outreach and technology transfer material by getting feedback from inspectors regarding 1) continuing problem activities; 2) discharge types; 3) monitoring and complaint data; and 4) usefulness of existing outreach and technology transfer material.	Ongoing	ESD-MarComm ESD-UR
B.	Develop, audit and/or modify existing outreach material, as needed, based on report developed under ICID 4A.	Ongoing, as needed	ESD ~~-WE~~
C.	Document to Water Board that outreach **and** technology transfer material and/or BMPs have been distributed.	Annually	ESD-UR
D.	Develop and implement standard operating procedures to gather customer feedback on ICID services.	Development Done FY 02-03 Implementation Ongoing	ESD-WE

ICID 5 - SOPs Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its SOPs in responding to complaints regarding illicit connections and illegal discharge dumping activities into the storm drain system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate effectiveness of SOPs.	Annually	ESD-WE
B.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

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Industrial & Commercial Dischargers

IND Work Plan

Pursuant to permit provision C.2, the City continues to conduct Industrial and Commercial facility inspections based on an inspection frequency schedule and collect the information needed to meet enhanced reporting requirements. The City's Environmental Inspectors located within the Environmental Services Department, Watershed Protection Division continue to conduct IND investigations.

IND 1 - Notice of Intent (NOI) Filers

The City of San José will conduct inspections of those facilities that have filed an NOI with the State and appear on a list provided by the State.

#	Activities	Compliance Date	Responsible Party
A.	Annually, obtain NOI filer database from State with annual information, review information and identify new NOI facilities for inspection the following year.	Annually	ESD-WE
B.	Conduct and document initial inspections of NOI Filers within one year using the inspector checklist form to determine exposure and assign a future inspection frequency to each facility accordingly. Document whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site.	Ongoing	ESD-WE
C.	Conduct and document annual inspections of facilities determined to have exposure in accordance with inspection frequency schedule.	Ongoing	ESD-WE
D.	Conduct and document inspections of facilities that need to file an NOI at least once every five years and in accordance with the inspection frequency schedule identified in IND 3.	Ongoing	ESD-WE
E.	Maintain the database to track the inspection information from the inspector checklist and to include all NOI filer SIC codes required by the Industrial Activities Stormwater General Permit.	Ongoing	ESD-WE

IND 2 - Non-Filer Investigations

The City of San José will inspect industrial facilities that may be subject to general permit requirements but are not found on the NOI filer list provided by the State and that conduct activities identified by the following SIC codes:

5015: Automobile Dismantlers

5093: Other Recycling Industries

3200 series: Stone, Clay and Concrete Products Industry

4100 & 4200 series: Trucking Facilities that perform on-site vehicle repair, maintenance or washing.

#	Activities	Compliance Date	Responsible Party
A.	Identify industrial facilities that conduct activities with the SIC codes listed in the IND SOPs.	Annually	ESD-WE
B.	Develop a list of facilities targeted for inspection during upcoming year that may be subject to general permit requirements for NOI based on business licenses, etc.	Annually	ESD-WE
C.	Conduct and document initial inspections of industrial facilities with the SIC codes listed referenced in IND 2A, using the inspector checklist form to document whether the facility constituted a potential threat to discharge pollutants to the storm drain collection system, whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site. Maintain database.	Ongoing	ESD-WE
D.	Conduct & document annual inspections of facilities determined to have exposure in accordance with implementation schedule. Add the facility to appropriate database(s) and assign an inspection frequency. If the facility inspected is determined to need to file an NOI and is not able to provide an NOI, SWPPP or SWMP, refer to the RWQCB.	Ongoing	ESD-WE
E.	Work with the Program's Industrial Inspection Ad Hoc TG on an Administrative procedure for providing referrals to the Water Board and document providing referrals to the Water Board for facilities with significant problems.	Pending Implementation by Program	ESD-WE, ESD-UR

IND 3 - City Regulated Facilities

The City of San José will conduct inspections of City Regulated commercial facilities as identified below:

Type	Frequency
Food service facilities	2 or more AOCs* over a rolling three year time period - Every year 1 AOC over a rolling three year time period – Every two (2) years 0 AOCs over a rolling three year time period - Every three (3)years
All Other City Regulated facilities	2 or more AOCs* over a rolling five year time period – Every year 1 AOC over a rolling five year time period – Every two (2) years 0 AOCs over a rolling five year time period but have exposure – Every five (5) years 0 AOCs over a rolling five year time period with no exposure or potential for exposure – No further inspections
Facilities for which a referral or ICID complaint is received	As soon as practicable for violations and every year until they meet the above criteria.

*Area of Concern (AOC) = A violation based on the San José Municipal Code 15.14.530 issued to a facility during a stormwater inspection.

#	Activities	Compliance Date	Responsible Party
A.	Determine industrial/commercial facilities identified in the IND SOPs for inspection in each FY.	Annually, Q1	ESD-WE
B.	Conduct and document inspections of City Regulated facilities, other than food service facilities, at least once every five (5) years in	Ongoing	ESD-WE

#	Activities	Compliance Date	Responsible Party
	accordance with the inspection frequency schedule. If determined to have no impact or no potential for pollution, will not be scheduled for future inspection.		
C.	Conduct and document inspections of City Regulated food service facilities at least once every three (3) years. Initial approved performance standards require inspections every three years.	Ongoing	ESD-WE
D.	Conduct and document inspections for which a referral or complaint was received within five days of complaint received and second inspection within one year.	Ongoing	ESD-WE
E.	Develop a database to track the inspection information from the inspector facility inspection report. 1. Implement new Environmental Enforcement Data Management System	Done FY 02-03 Done FY 03-04	ESD-WE ESD-WE
F.	Maintain database to track inspection information from inspector facility inspection report and to include new industrial program categories.	Ongoing	ESD-WE
G.	For B, C, D, and E, collect information during inspections on the potential for stormwater pollution at City Regulated facilities in order to determine the appropriate inspection frequency for the various facilities.	Ongoing	ESD-WE
H.	Develop an inspection frequency plan to track frequency of inspections. Implement & update, as needed, the inspection frequency plan.	Development: Done FY 01-02 Implementation Ongoing Updated as needed	ESD-WE

IND 4 - Compliance

The City of San José will conduct industrial/commercial inspections to determine the existence of discharges or potential discharges which are illegal under local ordinances. The facility operator will be notified of observed areas of concern to be corrected and/or if official action on violations is necessary, it will take place under local enforcement procedures.

#	Activities	Compliance Date	Responsible Party
A.	Document facilities that have enforcement actions and the type of enforcement actions conducted for the existence of discharges or threatened discharges that are illegal under local ordinances.	Ongoing	ESD-WE

IND 5 - Training

The City of San José will ensure that industrial/commercial inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for IND inspectors.	Annually, Q1	ESD-WE
B.	Maintain a training plan and provide and document on-the-job training and other training opportunities such as industrial/commercial inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

IND 6 - Outreach

The City of San José will help develop and distribute outreach and technology transfer material containing applicable control measures and/or BMPs to industrial/commercial facility operators responsible for IND activities.

#	Activities	Compliance Date	Responsible Party
A.	Identify and list existing outreach and technology transfer material.	Annually	ESD-UR
B.	Distribute applicable outreach and technology transfer material to industrial/commercial facility operators. Document to the RWQCB that outreach and technology transfer material and/or BMPs have been distributed, as needed, to industrial/commercial facility operators.	Distribution: Ongoing See PIP Program Element in Annual Report	ESD-UR
C.	Determine usefulness of outreach and technology transfer materials by obtaining feedback from industrial/commercial facilities. Obtain feedback from inspectors about the effectiveness of existing outreach and technology transfer material and develop and/or modify existing outreach material.	As Needed	ESD-UR

IND 7 - NOI Filers Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its inspections procedures and database tracking system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate the effectiveness of NOI Filers inspections procedures.	Annually	ESD-WE
B.	Document and evaluate the effectiveness of the NOI Filers database tracking system.	Annually	ESD-WE
C.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

New and Redevelopment

NRD Work Plan

The New and Redevelopment C.3 provision in the NPDES permit of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) requires all dischargers covered by the permit, including the City, to modify their project review processes as needed to incorporate conditions of approval in permits for applicable projects, as defined in the provision, to ensure that pollutant discharges are reduced by incorporation of treatment measures and other appropriate source control and site design measures, and increases in runoff flow are managed in accordance with the provision to the maximum extent practicable.

The City began implementation of hydraulic (also referred to as numeric) sizing requirements for stormwater treatment BMPs in conformance with the City Council approved Post-Construction Urban Runoff Management Policy 6-29 on October 15, 2003. Effective August 15, 2006, hydraulic sizing will be required for all projects that create or replace 10,000 square feet of impervious surface.

On October 18, 2005, Council approved Post-Construction Hydromodification Management Policy 8-14 and the City began implementation of hydromodification management requirements, as required in the permit.

NRD 1 - Legal Authority

The City of San José will have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Provision C.3.a.i).

#	Activities	Compliance Date	Responsible Party
A.	Revise Municipal Code to ensure adequate legal authority to implement new development control measures (C.3.a.i).	As Needed.	PBCE, ESD, PW

NRD 2 - Guidance to Developers

The City will provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for stormwater pollution prevention, as appropriate for the type of project and location.

#	Activities	Compliance Date	Responsible Party
A.	1. Draft necessary revisions to Guidance Manual on Selection of Stormwater Quality Control Measures to allow incorporation of hydraulic sizing design criteria and provide to developers.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Refine Guidance Manual on Selection of Stormwater Quality Control Measures to incorporate HMP measures, as necessary.	FY 05-06	PBCE, ESD, PW, RDA, **Program**

#	Activities	Compliance Date	Responsible Party
B.	Provide development community with revised information and guidance materials concerning any adopted on site design, building permit requirements, hydraulic sizing design criteria and HMP criteria, and maintenance requirements for BMPs for stormwater treatment measures.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Coordinate w/development community on proposed hydraulic sizing criteria for structural stormwater treatment measures, HMP criteria and any proposed revisions to Guidance Manual and policy through workshops and regular meetings.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update guidance material regarding maintenance responsibilities for any HMP measures.	FY 05-06	PBCE, ESD, PW, RDA, Program

NRD 3 - CEQA Requirements

The City will ensure that environmental documents required for those projects that fall under CEQA and NEPA review address both significant and cumulative stormwater quality impacts during the life of the project, and relevant permit requirements. These documents include EIRs, negative declarations and initial study checklists (C.3.m).

#	Activities	Compliance Date	Responsible Party
A.	Review and evaluate the City's Environmental Review procedures to improve the review for water quality impacts and identification of mitigation measures. (Provision C.3.m.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Identify areas where new or additional water quality review processes and related documents or checklist questions are needed and propose schedule for revision.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Refine and update areas where new or additional water quality related mitigation measures may be needed.	Done FY 05-06	PBCE, ESD, PW, RDA
B.	Report on revisions made to environmental review processes.	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 4 - Project Mitigation Measures and Design Requirements

The City will encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measure that minimize stormwater pollutant discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Revise current Policy on Post-Construction Urban Runoff Management as necessary to incorporate minimum BMP requirements for all projects.	Done FY 03-04	PBCE, ESD, PW, RDA
B.	Review and modify development permit approval procedures for adopted revisions as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
C.	Review the design standards and guidance for opportunities to make revisions that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures.	Done FY 03-04	PBCE, ESD, PW, RDA
D.	Review the existing source control measures contained in site design standards, guidance documents and conditions of approval for opportunities to limit stormwater pollution. (Provision C.3.k.)	Done FY 03-04	PBCE, ESD, PW, RDA
E.	Review General Plan and revise as necessary to incorporate water quality and watershed protection principles and policies, and summarize revisions made.	Done FY 02-03	PBCE
F.	Review the design standards and guidance for opportunities to make revisions as necessary that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures. Such revisions are listed in Provision C.3.j.	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Identify and document existing site design standards and guidance documents and policies.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise Site Design Measures and Standards, as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA

NRD 5 - Group 1, 2 and HMP Project Requirements

On October 15, 2003, the City began phased implementation of hydraulically sized stormwater treatment measures in conformance with Policy 6-29 beginning with projects that create or replace one acre or more of impervious surface area and are considered Land Uses of Concern. On February 15, 2005, all projects that created or replaced one acre or more of impervious surface were required to hydraulically size stormwater treatment measures. On May 17, 2005, the threshold changed to include all projects that created or replaced 10,000 square feet of impervious surface and are a Land Use of Concern. Effective August 15, 2006, all projects that create or replace 10,000 square feet or more of impervious surface will be required to include hydraulically sized stormwater treatment measures in each project.

On October 18, 2005, all projects that meet the criteria described in Policy 8-14 are required to manage increases in runoff flow, volume and duration.

The following is a brief summary of the Best Management Practices that are required in all development projects:

- Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality) and provide detention or retention as part of landscaping where feasible (C3.b.i and C.3.j);
- Source controls shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k), including measures to discourage pesticide use (C.9.d.ii);
- Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Policy 6-29 (Provision C.3.d);
- Increases in runoff flow, volume and duration shall be managed in accordance with Policy 8-14 (Provision C.3.f).

#	Activities	Compliance Date	Responsible Party
A.	1. Propose revisions to current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04	PBCE, ESD, PW, RDA
	3. Revise policy as needed for Group 2 implementation.	Done FY 04-05	PBCE, ESD, PW, RDA
	4. Revise policy as needed for HMP implementation	**Done FY 05-06**	PBCE, ESD, PW, RDA
B.	Develop list of Annual Reporting requirements from Provision C.3. Design data tracking needs and protocols.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Compile a list of new development and redevelopment projects by name, type of project, site acreage or square footage, square footage of new impervious surface, treatment BMPs and numeric sizing criteria used for applicable projects. Also, the source control measures required and pesticide reduction measures.	Annually	PBCE, ESD, PW, RDA
C.	Revise and update permitted alternatives to numeric sizing through Alternative Measures Program in Policy 6-29.	Done FY 04-05	PBCE, ESD, PW, RDA
	1. Report to City Council on Alternative Measures Program revisions in Policy 6-29. (Provision C.3.g.)	Done FY 04-05	PBCE, ESD, PW, RDA
	2. Track name and location of projects in the Alternative Measures Program, project type and size, percent impervious surface, reason for granting waiver, terms of waiver, equivalent benefit provided, alternative treatment project or regional project receiving the benefit and date of completion of the alternative treatment project or regional project (Provision C.3.g).	Annually	PBCE, ESD, PW, RDA
	3. Report to City Council on projects approved with numeric sizing alternatives through Alternative Measures Program. (Provision C.3.g.)	Annually	PBCE, ESD, PW, RDA
D.	Draft post-construction treatment BMP certification procedures. (Provision C.3.h)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Track name and location of projects subject to certification. (Provision C.3.h.)	Annually	PBCE, ESD, PW, RDA
E.	Participate on SCVURPPP's Hydromodification Management Plan work group and develop procedures for limiting peak stormwater runoff discharge rates from development projects. (Provision C.3.f.)	Done FY 04-05	PBCE, ESD, PW, RDA
F.	1. Review and modify development permit approval procedures and standard operating procedures as necessary to incorporate requirements for:		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	FY 05-06	

#	Activities	Compliance Date	Responsible Party
	2. Update and refine criteria & checklist to aid Department of Planning, Building & Code Enforcement & Department of Public Works planners & engineers in determining whether a development project should be required to incorporate post-construction treatment control measures & their related operation and maintenance requirements as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	FY 05-06	
	3. Update and refine standard conditions of approval as necessary to ensure proper selection, design of and installation of structural stormwater treatment measures per Provision C.3.b.,c.,d as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	FY 05-06	
G.	Develop & propose enhanced reporting format for documenting use of pesticide reduction measures at development sites. (Provision C.3.n. & C.9.ii.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Based on City's Pesticide Management Plan, establish criteria for tracking percentage of new development projects for which pesticide reduction measures were required & begin tracking. (Provision C.3.n. & C.9.d.ii)	Done FY 03-04	PBCE, ESD, PW, RDA
H.	Implement any new adopted development conditions of approval, and procedures to developments with significant stormwater pollution potential. (Provision C.3.b.)	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 6 - Developer Conformance with State Requirements

The City will require developers of projects that disturb a land area of one acre or more to demonstrate conformance with the State General Construction Activity Storm Water Permit including filing of NOI, development of a SWPPP, et al.

#	Activities	Compliance Date	Responsible Party
A.	Include as condition of approval for projects that disturb a land area of one acre or more, a requirement to demonstrate coverage under the State General Construction Activity Storm Water Permit.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03. See CON Program Element in Annual Report.	PBCE, PW, RDA

NRD 7 - Developer Erosion Control Plans

The City will require developers of projects with potential for significant erosion and planned construction activity during the wet season to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

#	Activities	Compliance Date	Responsible Party
A.	Include as a condition of approval for applicable projects a requirement to prepare and implement an erosion and sediment control plan.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03. See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 8 - Operation and Maintenance for Structural Stormwater Controls

The City will implement an operation and maintenance (O&M) verification program that includes (C.3.e):

- Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;
- Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;
- Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

#	Activities	Compliance Date	Responsible Party
A.	Work with SCVURPPP to develop guidance for implementing O&M Program.	Done FY 02-03	PBCE, ESD, PW, RDA
B.	1. Draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities. (Provision C.3.e)	Done FY 03-04	PBCE, ESD, PW, RDA
	1.b Conduct pilot inspection program to inspect treatment BMPs that were constructed prior to numeric sizing requirements. The intention of the pilot program is to assess workload impacts, data tracking and collection methods, and funding for O&M programs and to use this information to revise the O&M program.	FY 05-06	ESD
	2. Revise and update draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities as necessary. (Provision C.3.e.)	FY 05-06	PBCE, ESD, PW, RDA
C.	1. Include as a condition of approval a requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of	Done FY 03-04	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	operation and maintenance of such controls.		
	2. Revise and update condition of approval requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such structural controls as necessary.	FY 05-06	PBCE, ESD, PW, RDA
	3. Develop model permit conditions with BMP fact sheets to include in use permits where appropriate.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Compile a list of projects & responsible operators subject to C.3.e. provision.	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
D.	Track and compile a list of priority properties inspected and inspection results. (Provision C.3.e.iii.)	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
	1. Determine criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update and revise criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency as necessary.	FY 05-06	PBCE, ESD, PW, RDA
	3. Develop local inspection program for verification of proper O&M.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Update and revise local inspection program for verification of proper O & M as necessary.	FY 05-06	PBCE, ESD, PW, RDA

NRD 9 - Applicability to Public Projects

The City will ensure municipal capital improvement projects include stormwater quality control measures during and after construction, appropriate for each project, and that contractors comply with stormwater quality control requirements during construction activities and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a process to ensure that municipal capital improvement projects install structural stormwater quality control measures as necessary.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Participate on SCVURPPP work group tasked with developing a technical guidance document for use by municipal staff to ensure that the document includes standard specifications and details, sizing methodologies, & model conditions of approval acceptable for use in City projects as necessary. (Provision C.3.b. & d.)	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Review and revise Redevelopment Agency Project Request for Proposal procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 03-04	ESD, PBCE, RDA
	3. Review and Revise Public Works Capital Improvement Project approval procedures and Road Improvement Project approval procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 02-03	PBCE, ESD, PW, RDA
B.	Review, evaluate, and modify the procedures, as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA
C.	Begin tracking required data on the public projects subject to Provision C.3. hydraulic sizing criteria requirements for Annual Report.	Done FY 03-04 Ongoing	PBCE, PW, RDA
D.	Monitor development of City's Green Building program for opportunities to discourage architectural use of copper in development projects (Provision C.9.a.) and to incorporate urban runoff considerations.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

NRD 10 - City Staff Training

The City will provide training at least annually to its planning, building, and public works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention (C.3.a.vi).

#	Activities	Compliance Date	Responsible Party
A.	Provide training to Planning and Public Works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA
B.	Provide training to Redevelopment Agency and Department of Transportation staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA, DOT
C.	Revise the training protocol to incorporate any newly adopted Provision C.3. permit requirements and related revised procedures.	As Needed	PBCE, ESD, PW, RDA
D.	Train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval and the importance of minimizing pesticide use in runoff from development sites. (Provision C.3.n. and Provision C.9.d.ii)	Ongoing	PBCE, ESD, PW, RDA

NRD 11 - Development Plan Review and Approval Procedures Effectiveness Evaluation

The City of San José will review and evaluate the effectiveness of its development plan review and approval procedures.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in review and approval process.	Annually	PBCE, ESD, PW, RDA
B.	Document and evaluate what worked well and what needs improvement.	Annually	PBCE, ESD, PW, RDA

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Construction Inspection

CON Work Plan

This program element is implemented pursuant to permit provision C.2. The control measures discussed in this work plan apply to both private development projects and municipal public works construction projects. These control measures are implemented at construction project sites as part of the City's construction inspection and enforcement program, which is implemented as a collaborative effort between inspectors from Public Works, Building, and Environmental Services.

CON 1 - Site Housekeeping

The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites, and prevent illicit discharges to storm drains and watercourses.

#	Activities	Compliance Date	Responsible Party
A.	Track and document incidents of housekeeping issues at construction sites.	Ongoing	PBCE-Bldg, PW, ESD-WE

CON 2 - Local Ordinance

For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.

#	Activities	Compliance Date	Responsible Party
A.	Maintain a program for identifying and conditioning projects with significant erosion potential and planned wet season activity.	Ongoing	PW PBCE-Bldg
B.	Identify ordinance changes needed to conduct inspections.	As Needed	PW, ESD-WE, PBCE-Bldg

CON 3 - Construction Inspection Frequency

The City inspects construction sites for adequacy of stormwater quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on size of project, site conditions, precipitation, and project's potential impact on stormwater quality.

#	Activities	Compliance Date	Responsible Party
A.	Maintain and update SOPs for construction inspection program.	As Needed	PW, ESD-WE,

#	Activities	Compliance Date	Responsible Party
			PBCE-Bldg
B.	Document inspections of active construction sites.	Ongoing	PW, ESD-WE, PBCE-Bldg
C.	Evaluate the effectiveness of the construction inspection program and make improvements as necessary.	Annually	PW, ESD-WE, PBCE-Bldg

CON 4 - Wet Season Preparation

Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.

#	Activities	Compliance Date	Responsible Party
A.	Review and revise procedures for construction inspection staff regarding wet season construction requirements.	As Needed	PW-CFAS, ECS, TDS PBCE-Bldg ESD
B.	Document pre-season inspection of construction sites to ensure adequate implementation of winterizing BMPs prior to the wet season.	Ongoing	PW-CFAS, ECS, TDS

CON 5 - Inspection and Site Evaluation Follow-up

Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Water Board.

#	Activities	Compliance Date	Responsible Party
A.	Implement SOPs for follow-up actions and graduated levels of enforcement for construction sites.	Ongoing	PW-CFAS, ECS, TDS PBCE-Bldg ESD
B.	Track and summarize notices and follow-up actions for annual reports.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD

CON 6 - Municipal Training

The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention. All inspectors receive training on the latest construction-related stormwater pollution prevention techniques and

appropriate follow up actions at least once every two years. The City keeps documentation that inspectors have received training.

#	Activities	Compliance Date	Responsible Party
A.	Develop an annual training plan for construction inspection program.	Annually, Q1	ESD, PW, PBCE-Bldg
B.	Conduct annual training.	Ongoing	ESD, PW, PBCE-Bldg
C.	Track and document that inspectors have received training.	Annually	ESD-UR
D.	Evaluate the training curriculum and frequency, and make improvements as necessary.	Annually	ESD, PW, PBCE-Bldg
E.	Hold coordination meetings for Building, ESD, and Public Works inspectors.	Ongoing	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD UR

CON 7 - Outreach

The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.

#	Activities	Compliance Date	Responsible Party
A.	Review outreach and technology transfer materials and make improvements, as necessary.	Annually, Q4	ESD, PW, PBCE-Bldg
B.	Conduct outreach sessions for development community.	Annually	ESD, PW, PBCE-Bldg Program & Water Board
C.	Document outreach to development community.	Annually	ESD-UR
D.	Evaluate outreach program and make improvements, as necessary.	Annually	ESD, PW, PBCE-Bldg
	1. Print and distribute revised "Clean Bay Blueprint" to developers and City inspectors.	FY 05-06	ESD, PW, PBCE-Bldg
	2. Evaluate the use of construction site signs to alert site employees and the public of stormwater pollution prevention message and 945-3000 hotline information.	FY 05-06	ESD, PW, PBCE-Bldg

CON 8 - Public Works Projects

The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.

#	Activities	Compliance Date	Responsible Party
A.	Conduct training for Public Works capital improvement project staff (City Facilities Architectural Services; Roads and Bridges; and Engineering and Construction Services) on contract language, standard specifications, and enforcement.	Annually	PW-CFAS, ECS, TDS ESD
B.	Track the number of Public Work projects with these requirements.	Annually	PW-CFAS, ECS, TDS

CON 9 - Construction Inspection Effectiveness Evaluation

The City of San José will review and evaluate effectiveness of its construction inspection SOPs and BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in construction inspection SOPs and BMPs.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
B.	Document and evaluate what worked well and what needs improvement.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
	1. Expand the number of sites with an inspector of record to capture more of the Type 1 and Type 2 sites (per Public Work's designation).	Ongoing	PBCE-Bldg

Public Streets, Roads, & Highways

PSR Work Plan

This program element is implemented pursuant to permit provision C.2.

Training will continue to cover the SOPs and appropriate BMPs for Department of Transportation activities with the highest potential for stormwater pollution. These activities include spill response, resurfacing, sealing and patching, saw-cutting, street sweeping, landscape chemical application, concrete installation, pavement striping, legend removal, and catch basin inspection after irrigation repair. BMP effectiveness evaluation from crew members is obtained during the training sessions.

Staff training continues in FY 06-07 on Rural Public Works SOPs related to stormwater pollutant prevention during operations and maintenance activities in the City's regional and neighborhood parks and other "rural areas."

PSR 1 - Implementation of BMPs

The City of San José will implement Best Management Practices (BMPs) for street, road, and highway operation and maintenance (O&M) activities to reduce pollutants in stormwater and eliminate illicit discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted.	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	Done FY 04-05 Annually	DOT, ESD
	1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • **Storm Drain Inlet Cleaning;** • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning.	6/30/06	DOT, ESD, **PRNS**

PSR 2 - Contractor Use of BMPs

The City of San José will develop and implement a process to ensure that contractors employed to perform street, road, and highway O&M activities use appropriate BMPs per URMP.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for public street, road, and highway O&M contracts on related stormwater BMPs annually.	Annually	DOT, ESD
B.	Develop standard contract language for PSR maintenance activities.	**Done FY 05-06**	DOT, ESD

PSR 3 - City Staff Annual Training

The City of San José will provide annual training to its municipal staff in the use of appropriate BMPs. The City will also provide a mechanism for obtaining feedback from staff on the implementation and effectiveness of the BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Identify training goals, such as improving the focus of the training on the specific BMPs used by a section; integrating new BMPs, if any; etc.	Annually, Q4	DOT, ESD
B.	Identify training opportunities (which could include tailgate meetings and other existing training).	Annually	DOT, ESD
C.	Create or revise training modules for affected City staff and contractors.	As Needed	DOT, ESD
	1. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	6/30/06	ESD
D.	Create or revise collateral material based on training modules.	As Needed	DOT, ESD
E.	Schedule training with affected supervisors. 1. Develop and implement a new training module specifically for DOT electrician staff.	Annually Done FY 04-05	DOT, ESD DOT, ESD

PSR 4 - Notification of Public Agencies

The City of San José will inform other parties (e.g., CalTrans, the County of Santa Clara, and public utilities) conducting street, road, and highway O&M activities within its jurisdiction of the requirements to implement pollutant reduction BMPs and Control Measures in stormwater to the maximum extent practicable and eliminate illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Identify conditions under which another agency will be notified regarding relevant stormwater requirements.	Done FY 02-03	

PSR 5 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges. The review and evaluation will include input from the municipal maintenance staff that implement the BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual effectiveness reporting, including sub-procedures for gathering feedback from affected supervisors and for modifications to BMPs and SOPs as necessary.	Done FY 01-02	
	1. Review procedures for annual effectiveness evaluation. Consider obtaining feedback from supervisors on how to assess BMP effectiveness and the use of training sessions with staff as an opportunity to evaluate BMPs and SOPs.	Annually	DOT, ESD
B.	Conduct evaluation of BMPs and SOPs.	Annually	DOT, ESD

PSR 6 - Rural Public Works Maintenance and Support Activities

The City will extend its control measure strategy for PSR to address water quality impacts resulting from public works maintenance and support activities in rural areas.

#	Activities	Compliance Date	Responsible Party
A.	Identify City-owned properties that are applicable (under the RPW performance standard).	Ongoing	
	1. Re-evaluate the feasibility of using GIS information to identify additional applicable properties, if any.	6/30/06	PRNS, GS, DOT, ESD
B.	Develop or adapt Standard Operating Procedures (SOPs) and Best Management Practices (BMPs) for rural public works activities.	Done FY 03-04	
C.	Provide annual training on appropriate SOPs/BMPs to City staff that perform rural public works operations and maintenance activities. Incorporate SOPs/BMPs evaluation into annual training.	Annually	PRNS, DOT, GS, ESD
D.	Through contract specifications, require contractors hired by the City to use appropriate SOPs/BMPs when performing rural public works construction or maintenance.	**Done FY 05-06**	PRNS, DOT, GS, ESD
E.	Annually conduct an evaluation of the effectiveness of the rural public works program, report the results in the Urban Runoff Annual Report. Identify items for continuous improvement.	Annually	PRNS, DOT, GS, ESD

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Storm Drain System Operation & Maintenance

SDO Work Plan

The Department of Transportation Standard Operating Procedures for catch basin cleaning and Problem Area Reporting continue to be the focus of crew training. A GIS map overlay has been created that assigns serial numbers to each of the City's more than 28,500 storm drain inlets. This map overlay is currently in use as a means to facilitate problem area reporting in the storm drain system.

SDO 2A indicates that the City is performing Tier II inspection and cleaning for catch basins. Continued budget constraints in the coming year may require that the City perform inspection and cleaning to a modified version of Tier II in FY 06-07 that accomplishes the same objective over a longer time frame in the fiscal year.

SDO 1 - O&M BMP Implementation

The City of San José will implement best management practices (BMPs) for the storm drain system operation and maintenance (O&M) to reduce pollutants in stormwater to the maximum extent practicable. Specific BMPs for each type of O&M activity are those listed in the City's Urban Runoff Management Plan (URMP).

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted (including structural controls if necessary).	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review. 1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • **Storm Drain Inlet Cleaning;** • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning. See PSR 1.D.1	Done FY 04-05 Annually 6/30/06	DOT, ESD DOT, ESD, **PRNS**

SDO 2 - Problem Tracking and Process Improvement

The City of San José will develop and implement processes for tracking problem areas and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Implement an annual inspection and cleaning work plan to achieve a Tier II level review.	Ongoing	DOT
B.	Evaluate criteria for collecting data from City field personnel for the purposes of determining Problem Areas.	As Needed	DOT, ESD
C.	Revise documentation and problem area reporting procedure, if necessary, to improve reporting performance. Documentation to include frequency, nature, and type of recurring problem. Include coordination of data from ICID and Storm Drain Management System data sources. Include analysis of data to identify trends for targeting solutions.	As Needed	DOT, ESD
D.	Produce Problem Area report.	Annually	DOT
E.	Address Problem Areas through ICID enforcement/ education activities, additional BMP development, program development or retrofit.	As Needed	DOT, ESD

SDO 3 - Contractor Use of BMPs

The City will develop and implement, as needed, a process to ensure that contractors employed to perform storm drain O&M activities use the appropriate BMPs. ~~NOTE: All City SDO O&M is conducted in-house, and City staff receives BMP/SOP training annually. The only time storm drain maintenance might be contracted out would be for a rare flood emergency situation. The City has standard specifications that cover storm drain BMPs for construction activities.~~

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for SDO O&M contracts on related stormwater BMPs.	Annually	DOT, ESD

SDO 4 - Staff Training and BMP Feedback

The City of San José will provide annual training to its municipal staff in use of appropriate BMPs and/or Control Measures. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Provide training prior to the rainy season.	Annually, Q4	DOT, ESD
B.	Create or revise training modules for affected City staff.	As Needed	DOT, ESD
	1. Improve the focus of the training on the specific BMPs used by a section.	As Needed	DOT, ESD

#	Activities	Compliance Date	Responsible Party
	2. Provide specific training to inlet cleaning crews on IMSPAR data collection in advance of inlet cleaning program implementation.	Annually	
	3. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	6/30/06	ESD
C.	Produce schedule for training.	Annually	DOT, ESD

SDO 5 - Data Analysis

As part of the annual review process, the City of San José will evaluate data regarding cleaning activities and unusual flows observed during inspection. The review and evaluation will include consideration of storm drain structural retrofit.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual review and evaluation of data.	Done FY 01-02	
	1. Collect data on the amount of materials removed during inlet cleaning.	Done FY 04-05 Annually	DOT, ESD
B.	Implement annual data review and identify follow-up actions as appropriate.	Annually	
	1. Evaluate how follow up is conducted by crews when "cars on catch basins" is identified on the IMSPAR report, in order to better understand to what extent parked cars are a barrier to cleaning.	6/30/06	DOT, ESD
	2. Evaluate how to integrate the results of the IMSPAR report, regarding garbage and high debris, into scheduling additional cleaning into FY 05-06 and subsequent years.	6/30/06	DOT, ESD
	3. Evaluate use of hand held devices to collect data during storm drain inlet cleaning and potentially other maintenance activities.	6/30/06	DOT, ESD

SDO 6 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Review with supervisors to get feedback and information on how to assess BMP effectiveness.	As Needed	DOT, ESD
B.	Use annual training sessions with staff as an opportunity to evaluate the effectiveness of BMPs & SOPs.	Annually	DOT, ESD

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Water Utilities Operations & Maintenance

WUO&M Work Plan

The City's Water Utility program is ongoing and is implemented pursuant to permit provision C.2.

WUO&M 1 - Inventory of O&M Activities

The City of San José's Municipal Water System will conduct an inventory of all-key operations and maintenance activities, and identify routine and unplanned non-storm water discharges from these activities. This inventory will be conducted every three years and evaluated at least once a year.

#	Activities	Compliance Date	Responsible Party
A.	Review current procedures for operations and maintenance.	Annually	ESD-Muni
B.	Three-year update of list.	3/31/06 Every 3 years	ESD-Muni

WUO&M 2 - Implementation of WUPPP

The City of San José's Municipal Water System will implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.

#	Activities	Compliance Date	Responsible Party
A.	Implement WUPPP/Report on activities	Ongoing	ESD-Muni

WUO&M 3 - Staff Training and Contractor WUPPP Compliance

The City of San José's Municipal Water System will conduct annual training for municipal staff and coordinate WUPPP elements with water utility project planning, including WUPPP elements (BMPs, conditions, specifications, etc., in contract and services agreements).

#	Activities	Compliance Date	Responsible Party
A.	Implement training program.	Annually, Q2	ESD-Muni

WUO&M 4 - WUPPP Effectiveness Evaluation

The City of San José's Municipal Water System will evaluate the effectiveness of the WUPPP annually. Maintain accurate documentation and revise the WUPPP as necessary.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate effectiveness of program.	Annually, Q4	ESD-Muni

Pesticide Management

PM Work Plan

This program element is implemented pursuant to permit provision C.9.d. The City continues to implement pest control BMPs and train staff on Integrated Pest Management (IPM) techniques.

PM 1 - Integrated Pest Management

The City will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring use of IPM techniques in the agency's operations; and, minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors.

#	Activity	Compliance Date	Responsible Party
A.	Develop a City IPM policy for inclusion in Pesticide Management Plan.	Done FY 02-03	

PM 2 - Pesticide Management Plan

The City will develop and implement a Pesticide Management Plan with the goals of minimizing pesticide use and reducing the amount of pesticides in stormwater and landscape runoff to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Draft a City of San José Pesticide Management Plan.	Done FY 01-02	
B.	Publish City Pesticide Management Plan in URMP.	Done FY 01-02	

PM 3 - IPM SOPs and BMPs

The City will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy.

#	Activities	Compliance Date	Responsible Party
A.	Develop SOPs and BMPs for implementing IPM policy with provisions that will reduce water quality impacts from pesticide use.	Done FY 01-02	
B.	For each type of pest problem identified, seek model SOPs and BMPs from published literature.	Done FY 01-02	
C.	Incorporate or develop appropriate IPM measures into City SOPs and BMPs.	Done FY 02-03	
	1. Pilot the use of additional IPM techniques, e.g., for weed control.	**FY 06-07**	**PRNS, DOT, GS, ESD**

#	Activities	Compliance Date	Responsible Party
D.	Update City URMP to incorporate model Pest Management Performance Standard, including description of legal authority (IPM policy and contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done FY 02-03	
E.	Review and update City SOPs and BMPs, as appropriate.	As Needed	GS, DOT, ESD, PRNS
F.	**Develop Approved Pesticide List for applications on City property**	**FY 06-07**	**PRNS, DOT, GS, ESD**
	1. Revise SOPs and BMPs to reflect use of Approved Pesticide List.	**FY 06-07**	**PRNS, DOT, GS, ESD**

PM 4 - City Employee Training

The City will ensure that employees receive pest management training by implementing the following:

1. Employees who apply pesticides for the City will obtain the appropriate training as required by the County Agricultural Commissioner and State Department of Pesticide Regulation (DPR);
2. Employees within departments responsible for pesticide application will receive annual training on appropriate portions of City IPM Policy, SOPs, and BMPs, and latest IPM techniques;
3. Employees who are not authorized to apply pesticides will be annually trained not to use over-the-counter pesticides at workplace, consistent with IPM Policy.
4. Annual internal outreach will be conducted to employees, who do not necessarily purchase or apply pesticides during their course of work, on less toxic pest control and to encourage employees to use IPM techniques away from work.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that employees who apply pesticides for the agency obtain appropriate training required by County Agricultural Commissioner and State Department of Pesticide Regulation.	Annually	GS, DOT, PRNS
B.	Provide annual training on IPM Policy, SOPs, and BMPs, and latest IPM techniques to employees within departments responsible for pesticide application.	Annually	GS, DOT, ESD, PRNS
C.	Annually inform employees who are not authorized / trained to apply pesticides not to use over-the-counter pesticides at workplace, consistent with IPM Policy.	Ongoing	GS, DOT, ESD, PRNS
D.	Monitoring Mechanism I.B.1. Document and evaluate effectiveness of staff training conducted each year in annual report.	Annually	GS, DOT, ESD, PRNS
	1. Update class evaluation/survey for IPM training classes conducted by City staff.	As Needed	GS, DOT, ESD, PRNS

#	Activities	Compliance Date	Responsible Party
E.	Public Education and Outreach Task II.A.14 Conduct internal outreach on less toxic pest control to employees who do not necessarily purchase or apply pesticides during the course of their work (to encourage employees to use IPM techniques away from work).	Annually	ESD

PM 5 - Contractor Pesticide Management Requirements

The City will develop and implement a process to ensure that contractors employed to conduct pest control and pesticide application on municipal property engage in pest control methods consistent with City IPM Policy. Specifically, the City will require contractors to:

- follow City IPM policy, BMPs, and SOPs;
- provide evidence of current IPM training, when feasible; and
- provide documentation of pesticide use on City property to the City in a timely manner.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that contractors employed to conduct pest control/pesticide application on municipal property engage in methods consistent with City IPM policy.	Ongoing	GS, DOT, ESD, PRNS, PW, RDA
B.	Review and update a list of all contractors employed by the City who perform pesticide application work.	Annually	GS, DOT, ESD, PRNS, PW, RDA
C.	Implement a procedure to provide to each contractor a copy of the City's IPM policy.	Done FY 02-03	
D.	City will supply copies of pest specific BMPs and SOPs to contractors. Contractors will self-certify their compliance with the City SOPs and BMPs.	Ongoing	GS, DOT, ESD
E.	Require through contract specifications that PCOs contracted for municipal applications use pest control methods consistent with City's IPM Policy. Specifically, require contractors to: a) follow City IPM policy, BMPs and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on City property to the City in a timely manner.	Ongoing	GS
	2. City will develop standard content for PCO contracts.	Done FY 04-05	
	3. City will implement standard content for PCO contracts.	FY 05-06	GS, DOT, ESD, PRNS
F.	Invite contractors to participate in City training sessions on pesticide management.	**Done FY 05-06** **Ongoing**	GS, DOT, PRNS
G.	Monitoring Mechanism III.A.1. Document number of PCOs receiving presentations and/or training on pesticide use by PCOs on municipal property.	Annually	GS, ESD

PM 6 - Pesticide Management Outreach

The City will identify in the annual work plan the outreach activities it will conduct consistent with Program Pesticide Management Plan. Work plan elements will address outreach to residential and commercial pesticide users, pesticide retailers, and special districts. Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the City's own IPM practices, as applicable.

#	Activities	Compliance Date	Responsible Party
A.	Increase awareness of target audiences regarding proper pesticide use, disposal methods, water quality impacts, and less toxic pest management messages. Target audiences include commercial and residential pesticide users, pesticide retailers, municipal employees, and special districts.	Ongoing	ESD
B.	Prepare IPM stories and press releases to local media.	As Needed	ESD
C.	In conjunction with Program, City will provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., VTA, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	As Needed	ESD
D.	Create and provide fact sheets and materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program.	Ongoing	ESD
E	Monitoring Mechanism: Document or estimate numbers of residents reached by outreach efforts, including events, web promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts by documenting calls to the Program's general and watershed campaign hotlines.	Annually	ESD
F	Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, recommended in the work plan, to be developed by the Program. Implement evaluation component of the work plan.	Annually	ESD

PM 7 - HHW Pesticide Disposal

The City will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.

#	Activities	Compliance Date	Responsible Party
A.	Work with HHW collection agencies to support, enhance, and publicize programs for pesticide disposal.	Ongoing	ESD
B.	Ensure that adequate pesticide disposal services exist for residents and conditionally exempt small quantity commercial generators.	Annually	ESD
C.	Provide hazardous waste disposal information to residents, through distribution of materials (e.g., utility bill insert, city newsletter, community events, etc.) or advertising in local media.	Ongoing	ESD
D.	Monitoring Mechanism V.A.1. Document that HHW collection programs adequately serve residents and businesses and that	Annually	ESD

#	Activities	Compliance Date	Responsible Party
	exchange programs do not exchange organophosphate or banned pesticides.		

PM 8 - City Pesticide Use Tracking

The City will develop and implement a process for tracking pesticide use on municipally-owned property.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a pilot pesticide tracking process for Diazinon and Chlorpyriphos products.	Done FY 01-02	
B	Track pesticide use on municipally owned property. Include reporting and justification for use of OP pesticides and BMPs employed during OP pesticide use.	Ongoing	GS, DOT,ESD
	1. Evaluate feasibility of implementing electronic data management system for pesticide use.	Done FY 04-05	
	2. Implement electronic data management system for tracking pesticide use on City property.	Done FY 05-06 Ongoing	GS, DOT, ESD
C.	Monitoring Mechanism I.A.1. Document completion of tasks in annual reports. Use pesticide tracking process to document pesticide use.	Annually	GS, DOT, ESD, PRNS, PW, RDA

PM 9 - City Pesticide Inventory Search

The City will conduct periodic Citywide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. These pesticides, if found, will be properly disposed pursuant to appropriate waste disposal regulations.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Citywide search of chemical storage areas for pesticides no longer legal for application per EPA, State, and/or local requirements. Properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.	Annually	GS, DOT, PRNS

PM 10 - Pesticide Management Plan / IPM Policy Review

As part of annual reporting process, the City will review and evaluate, with input from municipal staff, the effectiveness of its Pest Management Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Review and continuously improve goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings, if any.	Annually	GS, DOT, ESD, PRNS, PW, RDA
B.	Monitoring Mechanism IX.A.1. Complete revised work plan that incorporates continuous improvement items, and report on completion of work plan tasks.	Annually	GS, DOT, ESD, PRNS, PW, RDA
C.	Monitoring Mechanism VII.A.1. Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development and significant redevelopment projects, and percentage of new development/ significant redevelopment projects for which pesticide reduction measures were required. (Draft Permit Provision C.3.n.)	Annually	PW, RDA, ESD

Mercury

M Work Plan

This program element is implemented pursuant to permit provision C.9.c. In 2003, the Program approved a Guidelines document on the management of mercury-containing products by a municipal agency. The City will continue to implement management practices consistent with the guidelines.

M 1 - Municipal Use of Mercury-Containing Products

The City will eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

#	Activities	Compliance Date	Responsible Party
A	Implement SCVURPPP guidelines for mercury-containing products reduction and management. These guidelines include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	Ongoing	ESD, GS
	1. Collect and dispose of mercury-containing lamps generated in City-owned facilities	Ongoing	GS, ESD
	2. Identify other mercury-containing products for virtual elimination, phase-out and/or proper disposal.	Annually, As Needed	ESD, GS
B.	Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines.	Annually	ESD

M 2 - Household Hazardous Waste Collection

The City will ~~provide~~ **support** mercury-containing product disposal services through **universal waste and** household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

#	Activities	Compliance Date	Responsible Party
A.	Provide mercury-containing products disposal services for residents and small businesses.	Ongoing	ESD-IWM
B.	Work with Program and HHW collection agencies to develop and help publicize fluorescent light recycling program.	Ongoing	ESD, Program

M 3 - Monitoring and Science

The City will participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

#	Activities	Compliance Date	Responsible Party
A.	Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee.	Ongoing	ESD
B.	The City of San José will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San José through calendar year ~~2005~~ **2006**.	~~12/31/05~~ **12/31/06**	ESD

M 4 - Regional, State, and Federal Coordination

Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

#	Activities	Compliance Date	Responsible Party
A.	Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup, RMP, and the CEP.	Ongoing	ESD
B.	Support and participate in WMI Watershed Action Plan implementation	Ongoing	ESD

M 5 - Public Education and Outreach

Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees.

#	Activities	Compliance Date	Responsible Party
A.	Coordinate with Program and HHW collection agencies to develop and implement a mercury-containing product outreach program to educate selected target audience and encourage proper use and disposal of mercury-containing products.	Ongoing	ESD, Program, County HHW
B.	Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	Ongoing	ESD
C.	Attend community events and distribute outreach materials. (See Attachment A: Outreach Activities Summary)	Ongoing	ESD
D.	Monitoring Mechanism V.B. Document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	Annually	ESD, Program

Copper / Nickel Action Plans

CNAP Work Plan

This element is implemented pursuant to provisions C.9.a and b of the stormwater permit. Activities in the copper and nickel action plans are attributed largely to the South Bay POTWs and to SCVURPPP as the responsible entities. Some activities, however, require specific actions by the SCVURPPP co-permittees or specified municipalities. Summarized here are activities pursuant to implementation of the baseline actions included in the Copper and Nickel Action Plans. These are in addition to those undertaken by SCVURPPP as a program. A complete update on implementation of the Action Plans can be found in the SCVURPPP Annual Report.

CB-1 - Vehicle Washing Operations

#	Activities	Target Date	Responsible Party
A.	Have member of San José team trained and available to lead mobile cleaners certification seminar.	As needed	
B.	Support Program in hosting mobile cleaners certification seminar. 1. Promote list of recognized mobile cleaning service providers.	FY 06-07 Ongoing	ESD ESD
C.	Distribute coupons in support of Program partnership with Western Car Wash Association.	As needed, dependant on Program activities	Program, ESD

CB-3 - Industrial Discharges

#	Activities	Target Date	Responsible Party
A.	Continue Distribution of information regarding copper from roof vents. 1. Continue rooftop inspections. Evaluate efforts and need for any additional effort.	Ongoing **Done FY 05-06**	ESD ESD
B.	Mail NOI Package: information on the GIASP and how to comply, to targeted industrial facilities.	6/30/06	ESD

CB-8 - Watershed Assessments and New Development

#	Activities	Target Date	Responsible Party
A.	See NRD section for details on San José implementation of C.3 permit provisions.		

CB-11 - Street Sweeping and Storm System O&M

#	Activities	Target Date	Responsible Party
A.	Track quantitative data on the tons of material removed and disposed of and other relevant street sweeping program data.	Annually	ESD-IWM DOT

CB-12 - Pools and Spas

#	Activities	Target Date	Responsible Party
A.	Distribute outreach materials at events, public counters, and post on City website.	Ongoing	ESD
B.	Provide guidance to residents on disposal alternatives for pool and spa water.	Ongoing	ESD

CB-21 - Architectural Use of Copper

#	Activities	Target Date	Responsible Party
A.	Continue to discourage architectural use of copper during Planning application review.	Ongoing	PBCE-Planning
B.	Continue to monitor progress of San José Green Building program to identify opportunities for discouraging architectural use of copper.	Ongoing	PBCE-Planning ESD-UR

NB-1 - Discharges from Construction sites

#	Activities	Target Date	Responsible Party
A.	See NRD and CON program elements for activities that address erosion control.		

Trash

TRA Work Plan

This program element was added in FY 04-05 and is being implemented in accordance with the Program's Trash Work Plan dated March 1, 2003. The City's strategy is to inventory and evaluate current trash management practices and to maximize or tailor the most effective ones for ongoing implementation. The City's activities focus on assistance with the development of an effective trash strategy, ongoing trash evaluations, implementation or refinement of trash management practices, and piloting the use of structural controls for trash.

TRA 1 - Inventory, Document and Evaluate Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Complete Program survey of existing trash management practices.	Done FY 03-04	

TRA 2 - Document and Map Known Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/ incidents and eradication efforts).	Done FY 03-04	
B.	Compile trash problem location data/information and submit to Program for conversion to coordinates for GIS mapping.	Done FY 03-04	
C.	Revise and update documentation (list of locations, maps, etc.) of known trash problem areas.	As Needed	ESD
D.	**Continue identifying and prioritizing trash problem areas in urban streams and waterways and other potential sources that may contribute trash to those areas.**	**Annually**	**ESD, PRNS, DOT, PD**

TRA 3 - Conduct Trash Evaluations

#	Activities	Target Date	Responsible Party
A.	Work with Program to select trash evaluation methodology.	Done FY 03-04	
B.	Assist Program with planning and organizing of training workshop for municipal staff.	Done FY 03-04	
C.	Participate in the trash evaluation methodology training workshop.	Done FY 03-04	
D.	Conduct trash evaluations and submit to Program staff. 1. Coyote Watershed 2. Remaining San José locations	 Done FY 04-05 FY 05-06	

#	Activities	Target Date	Responsible Party
E.	**Continue trash evaluations in high priority areas using the Program's Urban Rapid Trash Assessment protocol (version 1.0) and/or the KAB litter index in a subset of trash problem areas to track changes over time.**	**Ongoing**	**ESD**

TRA 4 - Develop Standardized Documentation and Reporting Format

#	Activities	Target Date	Responsible Party
A.	Work with Program to develop a reporting format to document trash management activities in Annual Reports.	Done FY 03-04	

TRA 5 - Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Assist Program staff with the documentation and analysis of trash evaluation results.	~~12/31/04~~ Ongoing	ESD
B.	Identify high priority trash areas using trash evaluation results. 1. Coyote Watershed 2. Remaining San José locations	**Ongoing** Done FY 04-05 FY 05-06	ESD ESD ESD

TRA 6 - Identify and Implement Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Identify reasonable trash management practices to address high priority areas (in TRA 5B).	Ongoing	ESD, PRNS, GS, DOT
B.	Implement or refine trash management practices at high priority areas to the maximum extent practicable.	Ongoing	ESD, PRNS, GS, DOT
C.	Document and report implementation of trash management actions.	~~7/31/05~~ **Ongoing**	ESD
D.	Provide Program with information on **assessments and** trash management practices implemented **using** standardized reporting format.	Annually	ESD
E.	**Provide Program with trash assessment data forms.**	**Annually**	**ESD**

TRA 7 - Review and Update Performance Standards and Develop Long-Term Strategy for Trash Management

#	Activities	Target Date	Responsible Party
A.	Assist with the review and update of existing standards that address BMPs or control measures relevant to trash management.	TBD by Program	ESD
B.	Assist Program staff in developing an effective long-term strategy for trash conditions in urban streams and waterways.	FY 05-06	ESD

TRA 8 - Implement a Pilot Demonstration Project

#	Activities	Target Date	Responsible Party
A.	**Assist Program in implementing a pilot project to address trash conveyed through the storm drain system.**	**FY 06-07**	**ESD, DOT, PW**
B.	**Begin piloting the use of structural controls to prevent trash from entering the storm sewer system.**	**FY 06-07**	**ESD, DOT, PW**
C.	**Pursue grant funding to support installation of structural controls for trash management.**	**FY 05-06**	**ESD, DOT, PW**

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Monitoring

MON Work Plan

The City, in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) has submitted, to the RWQCB, a Multi-Year Receiving Waters Monitoring Plan required per permit provision C.7.b. The final version of the plan was submitted August 5, 2002 and revised March 1, 2004. The Multi-Year Plan covers a number of pollutant control programs required by C.7 and C.9 provisions of the permit. The City continues to support Program staff in the implementation of the plan by commenting on annual plans, providing guidance for sampling within the City, and participating in the Watershed Analysis Ad Hoc Task Group.

The 2001 C.9 permit provisions require implementation of control programs for Copper, Nickel, Mercury, Pesticides, PCBs, and Dioxin-like compounds. The City continues to support and assist the Program efforts to address these control and monitoring efforts. Additionally, the City is actively involved as stakeholder and workgroup member for the Guadalupe Mercury TMDL effort, and will continue to contribute and comment on products and reports generated by Baywide TMDLs for copper, nickel, mercury and PCBs. City Staff also actively participate in Clean Estuary Project activities through the PCB workgroup and Diazinon and Pesticide Related Toxicity workgroup.

PCB Control Program

Analytical characterization work to support the PCB Control Program, required under provision C.9.e, has been completed. The Program is currently working on next steps with BASMAA and CEP.

Initial PCB analysis was performed on sediments found in selected urban storm drain systems. At this point, no known controllable sources of PCBs have been identified. Results of the follow-up analytical work have been reviewed and further sampling work to identify controllable sources was undertaken in October and November of 2002. The SCVURPPP Program submitted the final PCB Control Plan March 1, 2002, and Control Program Work Plan July 1, 2002. In addition, the City continues to implement activities described in "Next Steps" from the Year Two PCB Case Study Report submitted to the Water Board in July 2003.

#	Activities	Compliance Date	Responsible Party
A.	Sample, analyze, and report on PCBs in storm drain sediments to characterize potential sources and implement controls.	Done, 6/00 through FY 01-02	Program, ESD
B.	Begin implementation of final PCB Control Plan upon approval.	Done FY 02-03 & Ongoing	ESD

Dioxin-like Compound Control Program

Characterization of dioxins based on existing data has begun Program-wide. The Program is now collaborating with BASMAA and CEP to develop a conceptual model/impairment assessment document. City Staff provide comments to the Program and directly to CEP in support of this process.

This Dioxin-like Compound Control Program will develop procedures to identify, assess, and manage controllable sources of Dioxin-like compounds found in urban runoff.

#	Activities	Compliance Date	Responsible Party
A.	Characterize distribution of Dioxin-like compounds in the urban runoff system based on existing data.	Done FY 01-02	Program
B.	Begin implementation of SCVURPPP plan to characterize distribution of Dioxins.	In Progress at Program Level	Program
C.	Submit plan that identifies control measures / management practices to eliminate or reduce discharges of Dioxins, if needed.	TBD	Program

Sediment Control Program

The City's sediment control program falls predominantly within the Construction Inspection (CON) section of this work plan. Sediment monitoring activities also continue in conjunction with the SCVURPPP Five-Year Receiving Waters Monitoring Plan.

Pilot Monitoring Programs

In addition to the above listed control programs, the City concluded activities performed in support for the two Monitoring Pilot Programs that were begun in 1997. These pilot programs generated data that helped develop the follow-on programs of IND (outreach to industrial and commercial dischargers) and the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

MON 1 - Industrial Stormwater Monitoring Pilot Program

This program sampled key industrial sites to determine the significance of metal-contaminated stormwater discharges associated with industrial activities. The ultimate objective from this project of educating industrial and commercial dischargers about developing and implementing SWPPPs and BMPs has now been turned over to the Industrial and Commercial Dischargers section of this workplan under IND.

#	Activities	Compliance Date	Responsible Party
A.	Design and execute a sampling program to meet the project objectives, analyze results, develop guidance for industry to improve SWPPP implementation, and provide technology transfer information to industry and inspectors.	Done, FY 96-97 through 01-02 Ongoing as part of IND	ESD

MON 3 - First Flush Monitoring Program

First flush discharge areas along The Coyote Creek and Guadalupe River were monitored for three wet seasons. The City provided data to the Program for analysis and comparison to other data in June of 2002. The Program submitted a final report to the Water Board in 2003; it was included as appendix C-2 in the Program's 02-03 Annual Report.

#	Activities	Compliance Date	Responsible Party
A.	Conduct multi-year First Flush study sampling, analyze data and provide data to Program as part of Multi-year Monitoring Program	Done, FY 96-97 through 02-03	ESD, Program

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Municipal Compliance

Municipal training continues to be a key element for most program elements. Specific program elements that include municipal training activities include ICID 3, IND 5, NRD 10, CON 6, CON 8, PSR 2, PSR 3, PSR 6, SDO 3, SDO 4, PM 4, and WUO&M 3. For a list of planned training activities, see Attachment B: Municipal Training Schedule.

Municipal Training

Municipal Training is a critical function of the City's NPDES Permit. Municipal compliance is dependent on the level and quality of the training provided.

#	Activities	Compliance Date	Responsible Party
A.	Identify training needs.	Annually	ESD-UR
B.	Develop curricula.	As Needed	ESD-UR
C.	Conduct training.	Ongoing	ESD-UR
D.	Evaluate municipal training program and make improvements as needed.	Annually	ESD-UR

Municipal Facilities Assessment and Compliance

Municipal facilities are required to comply with stormwater regulations. Efforts to reduce contaminated discharges from City facilities must be similar to those required of private businesses. While many elements for permit compliance are in place, the City requires a systematic approach to City facilities compliance at the level of effort required in the URMP.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Corp Yard assessments and inspections.	Annually	ESD-UR, GS, DOT
	1. Conduct Citywide meeting to discuss Hazardous Material, Safety, and Stormwater issues for City corporation yards (up to two times per year).	Annually	GS, ESD, DOT, Fire, Police
	2. Revise Corporation Yard inspection form.	~~9/30/05~~ **Done FY 05-06** **As Needed**	ESD-UR
B.	Review Municipal Facilities SWPPPs.	Annually	ESD-UR, GS, DOT
	1. Fully revise the five (5) remaining Corporation Yard SWPPPs (using the Main Yard revised SWPPP pilot process as a template).	6/30/07	ESD-UR, GS, DOT
C.	Conduct SWPPP training at City corporation yards.	Annually	ESD-UR, GS, DOT

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Public Information / Participation

PIP Work Plan

For FY 06-07, the City's PIP work plan will focus on the following objectives:

1. Support and coordinate efforts with the Santa Clara Basin Watershed Management Initiative's (WMI) and Santa Clara Valley Urban Runoff Pollution Prevention Program's (Program) outreach activities. This will be done primarily through participation in the Watershed Education and Outreach (WE&O) Ad Hoc Task Group, and participation in the WMI Communications and Outreach Subgroup (COS).
2. Support watershed awareness through classroom education programs by participating in the WE&O Schools and Youth Work Group, the Alviso Environmental Education Center (EEC) Work Group, the City's Youth Watershed Education Team (YWET), and to the general public by promoting community-based involvement, such as the biannual creek cleanups conducted through the Creek Connections Action Group.

Outreach in Other Elements

Other sections of this work plan contain elements related to outreach to specific target audiences. They can be found in ICID 4, IND 6, NRD 2, CON 7, PM 6, M 5, CB-1, CB-3, and CB-12. For a list of outreach activities, see Attachment A: Outreach Activities Summary.

PIP 1 - General Outreach

The City of San José will promote general citizen awareness of what a watershed is, the functions of the storm drain system, pathways and sources of urban runoff pollution to the South Bay watershed, and behaviors that adversely affect water quality.

#	Activities	Compliance Date	Responsible Party
A.	Participate in WMI Outreach, and coordinate WMI outreach with Watershed Watch and Program efforts.	Ongoing	ESD, WMI, Program
	1. Participate in Watershed Watch campaign.	Ongoing	ESD, Program
B.	Identify, support and participate in appropriate community events to further general public awareness.	Ongoing	ESD
	1. Work with Watershed Watch Events work group.	Ongoing	ESD, Program
C.	Give presentations upon request that focus on stormwater messages to elementary through college grade levels, neighborhood groups, etc.	As Needed	ESD

PIP 2 - Targeted Outreach

The City of San José will develop and implement targeted residential outreach and education campaigns, based on high priority pollutants, to effectively reduce pollutant-causing behaviors and promote Best Management Practices.

#	Activities	Compliance Date	Responsible Party
A.	Identify General Residential practices contributing to stormwater pollution. Identify reasonable alternatives to pollutant causing behavior.		ESD, Program
	1. Review surveys and applicable reports.	Ongoing	ESD
	2. Meet with inspectors to discuss and document residential outreach needs.	Ongoing	ESD
	3. Prepare report identifying residential outreach needs and tasks.	Annually	ESD
B.	Identify ICID practices and target audience(s) contributing to pollution.		ESD
	1. Review ICID reports.	Ongoing	ESD
	2. Meet with ICID inspectors to discuss and document outreach needs.	Ongoing	ESD
	3. Prepare report identifying ICID outreach needs and tasks.	Annually	ESD
C.	Promote selected residential and ICID messages through local and regional activity (e.g. Program PIP, BASMAA PIP, BAPPG, Media Relations, etc.)		
	1. Report on targeted residential and ICID outreach activity.	Annually	ESD
	2. Participate in the Program's Pesticide and Mercury ad hoc task groups.	Ongoing	ESD, Program

PIP 3 - Educational Programs

The City of San José will support and/or develop and implement educational programs designed to increase youth understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support, and/or develop and implement school and youth education programs.		
	1. Participate in WE&O Schools and Youth work group.	Ongoing	ESD, Program
	2. Participate in the Alviso Education Center work group.	Ongoing	ESD, Program
	3. Participate in City Education programs such as the Youth Watershed Education Team, Rangers in Schools, etc.	Ongoing	ESD

PIP 4 - Citizen Participation

The City of San José will support and/or develop and implement citizen involvement programs designed to increase citizen understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support and/or develop involvement opportunities for San José residents		
	1. Participate in creek clean-ups on a biannual basis through in-kind staff support for the Creek Connections Action Group.		
	a. Fall creek cleanup (Coastal Cleanup Day)	Annually, Q1	ESD, PRNS
	b. Spring creek Cleanup (National Rivers Day)	Annually, Q4	ESD, PRNS

PIP 5 - Outreach Evaluation

The City of San José will evaluate its Outreach efforts for effectiveness.

#	Activities	Compliance Date	Responsible Party
A.	Implement selected evaluation tools.		ESD
	1. Work with Program, WMI, and Watershed Watch AHTG to Plan for Program's Watershed Watch Campaign Survey.	Triennially-FY 06-07	ESD, Program
	2. Report on survey and evaluation activity during the report period.	Annually	ESD
B.	Annually review, modify and report on outreach plans based on effectiveness results.		ESD
	1. Document in Annual Report effectiveness of outreach activities conducted in prior fiscal year.	Annually	ESD

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Permit Reapplication

Provision C.14 of the permit stipulates that the current permit expires on February 21, 2006 and that the Dischargers must file for reapplication not later than 360 prior to that, or by February 26, 2005. Reapplication has been completed as part of the Program submittal. It is anticipated that the current permit will be administratively extended pending adoption of a Municipal Regional Permit for stormwater.

Permit Reapplication Preparation

#	Activities	Target Date	Responsible Party
A.	Compile all changes to URMP as part of reapplication for next permit. (C.2.b)	Done FY 04-05	ESD
B.	Participate in permit development and negotiation processes.	~~Beginning 02/01/05~~ **Ongoing**	ESD

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Attachment A: Outreach Activities Summary

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	❍ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
1.	**Storm Drain Stenciling** San José Conservation Corps to stencil approximately 4,500 storm drain inlets throughout the City with the appropriate neighborhood creek name and 945-3000 hotline number.	❍		FY 06-07	
2.	**Regional partnerships** Participate in BAPPG, BASMAA/BACWA Media Relations campaign, Clean Estuary Partnership, etc.	❍	PIP 2.C	FY 06-07	
3.	**Event Support** As needed, staff Booth and/or provide outreach materials to select events. Evaluate the overall benefit and effectiveness of attending events and make changes as needed.	❍	PIP 1.B	As needed	♦ Materials distributed
4.	**BMP Reprints** Reprint selected Outreach materials as needed.	❍	PIP 1	FY 06-07	♦ n/a
5.	**Industrial Users Academy** Give stormwater, pollution prevention and GIASP compliance information to industries permitted to the Water Pollution Control Plant.	◎: Plant-permitted Industries	IND 6.A PIP 2.B PM 6.A, M 5.B	FY 06-07	♦ Participant surveys
6.	**Outreach to Development Community** PW & ESD staffs to conduct training on erosion and sediment control for private developers of type 2 projects. PBCE Planning and PW also conduct roundtable meetings with developers where information regarding stormwater requirements is shared.	◎: Developers	CON 7 NRD 2	FY 06-07	♦ Participant surveys
7.	**IPM Store Partnership** (PROGRAM) Create & provide fact sheets & materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program. There are currently nine stores in San José participating in the IPM store partnership.	◎	PM 6.D.	FY 06-07 dates TBD	

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
8.	**Partner with other City programs, such as the Strong Neighborhoods Initiative** Investigate partnering with City's SNI for delivering selected messages. Other programs to investigate are the Anti-Litter Program, After School Program, etc.		PIP 1	FY 06-07	
9.	**Mercury Outreach** Investigate opportunities to include mercury messages through participation in the Home Show events, residential newsletters or other mailings, and support the County's Universal Waste Take-back Pilot Program.		M 5 PIP 2.C.	FY 06-07	
10.	**IPM Outreach** Prepare IPM stories and press releases for local media. Investigate opportunities to include IPM messages in the City's outreach to businesses.		PM 6.A PM 6.B	FY 06-07	
11.	**Facility/Building Manager Outreach** Distribute e-mail newsletter to General Services Building/Facilities Managers with information on selected messages.		PM 6.A M 1.A	FY 06-07	
12.	**Coastal Clean-up Day** Creek Clean-up event coordinated with Countywide effort.		PIP 4.A	Fall 06	♦ Participant surveys ♦ Amount picked up
13.	**National Rivers Clean-up Day** Creek Clean-up event coordinated with Countywide effort.		PIP 4.A	Spring 07	♦ Participant surveys ♦ Amount picked up
14.	**Requests for Brochures** Distribute outreach materials upon request.		PIP 1.C	FY 06-07	♦ Materials distributed
15.	**Wacky Watersheds Workshops** Present South Bay Water Connections curriculum to middle school educators within San Jose/Santa Clara Water Pollution Control Plant service area. The educators will also receive a tour of the Don Edwards San Francisco Bay National Wildlife Refuge.		PIP 3.A	FY 06-07	♦ Participant surveys ♦ Follow-up call of attendees
16.	**Water Awareness Program** Also called Rangers in Schools. Presentations focusing on Pollution Prevention. *It's Wet It's Wild It's Water!* Curriculum distributed to teachers.		PIP 3.A	FY 06-07	♦ Survey of teachers ♦ Survey of students
17.	**Slow the Flow** Grant to Don Edwards Alviso Environmental Education Center to host 9 different types of events: special events, interpretive programs, teacher orientation, field trips, in-class presentations, outreach presentations, workshops, special visits and interpretive displays.		PIP 3.A	FY 06-07	♦ Done by Grantee
18.	**Youth Watershed Education Grants**		PIP 3.A	FY 06-07	♦ Audit of projects

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	Grant program for educators.				
19.	**Revise South Bay Water Connections Curriculum** Update the South Bay Water Connections to expand watershed and pollution prevention lessons.		PIP 3.A	Fall 2006	♦ Wacky Watersheds Participant surveys ♦ Follow-up call of attendees

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Attachment B: Municipal Training Schedule

PS ID #	Topic	Sponsored or Held By	Dept/Division/Section Attending	# Sessions	Tentative FY 06/07 Schedule
ICID 3	Construction Inspection Training	ESD Watershed Enforcement	ESD Watershed Enforcement	1	07/06
ICID 3	Annual Training for ICID Inspectors	ESD Watershed Enforcement	ESD Watershed Enforcement	1	07/06
IND 5	Training for IND Inspectors	ESD Watershed Enforcement	ESD Watershed Enforcement	1	07/06
CON 6	Wet Weather Construction Site Preparation & Inspection	DPW, ESD	PW	2	9/06
CON 6	Construction Site Planning and Management For Water Quality Protection	SCVURPPP & Water Board	PW, ESD, PBCE, PRNS		9/06
CON 6	SOPs for inspections during wet and dry season to include procedures for erosion control plan review inspection process	DPW, ESD	PW Inspections, PBCE Building Inspectors (All to attend at least once every two years)		10/06
CON 7	Erosion & Sediment Control Training for Type 2 Private Development Projects	DPW & ESD	Private Developers, PW, ESD		10/06
CON 8	Erosion Control Information To Be Included In Contract Language For Capital Improvement Projects Training For PW Construction Project Management	PW & ESD	PW		11/06
NRD 10	NPDES C.3 Training	Various	PBCE, PW, RDA, ESD		
PSR 2	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/07
PSR 3	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/07
PSR 6C	Stormwater Pollution Prevention Training – Rural Public Works	PRNS, ESD	PRNS	2	10/06

PS ID #	TOPIC	SPONSORED OR HELD BY	DEPT/DIVISION/SECTION ATTENDING	# SESSIONS	TENTATIVE FY 06/07 SCHEDULE
SDO 3A	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/07
SDO 4	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/07
PM 4A	Worker Safety training per DPR requirements	GS, ESD, Target Specialty Products	DOT, GS, PRNS, ESD	1	12/06
PM 4B	Training on IPM Policy & Techniques	GS, ESD	DOT, GS, PRNS, ESD	1	12/06
WUO&M 3	Water Utility Operation & Maintenance Discharge Training	ESD (Muni Water)	Muni Water Operations & Maintenance Crews		12/06

Glossary

AHTG	Ad Hoc Task Group
AOC	Area of Concern
BACWA	Bay Area Clean Water Agencies
BAPPG	Bay Area Pollution Prevention Group
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practices
CAO	City Attorney's Office
CEP	Clean Estuary Partnership
COS	Communications and Outreach Subgroup of WMI
DOT	Department of Transportation
EEC	Environmental Education Center
EIR	Environmental Impact Report
ESD	Environmental Services Department
ESD-MarComm	Marketing & Communication Section
ESD-Muni	City of San José Municipal Water System
ESD-UR	Urban Runoff Section
ESD-WE	Watershed Enforcement Section
GIASP	General Industrial Activities Storm Water Permit
GS	General Services Department
HHW	Household Hazardous Waste
HMP	Hydromodification Management Plan
IPM	Integrated Pest Management
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PBCE	Department of Planning, Building and Code Enforcement
PBCE-Bldg	Building Division of PBCE
PBCE-Planning	Planning Division of PBCE
PD	Police Department
POTW	Publicly Owned Treatment Works
PRNS	Department of Parks, Recreation and Neighborhood Services
PW	Public Works Department
PW-CFAS	City Facilities Architectural Services Division of PW
PW-ECS	Engineering and Construction Services Division of PW
PW-TDS	Transportation & Development Services of PW
RDA	Redevelopment Agency
RWQCB or Water Board	Regional Water Quality Control Board
SCVURPPP or Program	Santa Clara Valley Urban Runoff Pollution Prevention Program
SOP	Standard Operating Procedure
SWPPP	Storm Water Pollution Prevention Program
TBD	To Be Determined
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
WE&O	Watershed Education and Outreach

WMI	Watershed Management Initiative
WUPPP	Water Utility Pollution Prevention Program
YWET	Youth Watershed Education Team

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Environmental Services Department

February 28, 2007

Dr. Adam W. Olivieri
Program Manager
Santa Clara Valley Urban Runoff Pollution Prevention Program
699 Town & Country Village
Sunnyvale, CA 94086

Subject: Submittal of FY 2007-2008 Work Plan for the Urban Runoff Management Plan

Dear Dr. Olivieri:

Attached is the annual work plan for the City of San José Urban Runoff Management Plan (URMP) for FY 2007-2008 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. This submittal should be included as part of the Santa Clara Valley Urban Runoff Pollution Prevention Program's March 1, 2007 Work Plan submittal to the California Regional Water Quality Control Board, San Francisco Bay Region.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment of knowing violations.

If you have any questions regarding these work plans, please contact Melody Tovar, Deputy Director, at (408) 277-3892.

Sincerely,

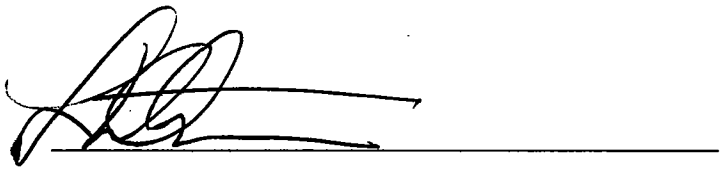
John Stufflebean
Director

Encl: FY 2007-2008 Work Plan

City of San José
FY 2007-2008 WORK PLAN
FOR CITY'S URBAN RUNOFF MANAGEMENT PLAN

Certification Statement

"I certify, under penalty of law, that this work plan and related URMP revisions were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



Les White
Interim City Manager

Submitted on March 1, 2007

City of San José

Urban Runoff Management Plan

Chapter 11:

Santa Clara Valley Urban

Runoff Pollution Prevention Program

Attachment 1: FY 07-08 Work Plans

Prepared by the Environmental Services Department

March 1, 2007

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Key to revisions in the Work Plans

Bold text ..... Bold text indicates elements that have been added to the Work Plans since the URMP FY 06-07 Work Plans approved in March 2006

~~Strikethrough text~~ ..... Strikethrough text indicates elements that have been deleted from the Work Plans since the URMP FY 06-07 Work Plans approved in March 2006

Introduction

This compilation of annual work plans for the City of San José Urban Runoff Management Plan (URMP) has been developed for FY 2007-2008 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. The work plans include tasks, responsibilities, and schedules needed to implement the program elements in the URMP with the overall intent to reduce stormwater pollution in the City's storm drains, creeks and rivers. The Environmental Services Department coordinates development and review of the work plans in cooperation with staff from all affected City departments.

The Permit requires that annual work plans be submitted to the Water Board by March 1 of each year. This submission precedes completion of the City's annual budget development and approval process. While the work plans are developed using the best available information regarding budget forecasts, all activities in the work plans are subject to the approval of funding by the City Council in June of each year.

The City of San José is committed to managing and protecting stormwater quality and dedicates significant resources to a variety of activities designed to address stormwater quality issues. The City actively participates in many local and regional efforts designed to leverage the most value for its resources and citizens and strives to be a leader in watershed protection.

Alum Rock Library detention pond, a stormwater treatment measure

Illicit Connection / Illegal Dumping

ICID Work Plan

The City's Environmental Inspectors located within the Environmental Services Department (ESD) Watershed Protection Division respond to complaints regarding illegal discharges or threats of discharge to the storm sewer system. Residential incidents are typically the most frequent type of complaint, with vehicle-related sources being most common. Dumping of various materials is also a prevailing source of incidents. ESD responds to all complaints with education and enforcement in partnership to achieve compliance and prevent future incidents. This program element is implemented pursuant to permit provision C.2 and C.6.a.ii.

Storm drain inlet stenciled with hotline number and local creek name

ICID 1 - Response to Complaints

The City of San José will respond to complaints regarding ICID dumping activities into the storm drain system and will ensure that the activity has ceased or is on a time schedule to cease.

#	Activities	Compliance Date	Responsible Party
A.	Update database system to track ICID complaint information.	Done FY 02-03	ESD-WE
B.	1. Document complaint activity, the number of ICID complaints that the City received, and that the activity has ceased or is an allowable discharge.	Annually	ESD-WE
	2. Prepare draft complaint activity data tables to review trends and to facilitate timely evaluation of the data.	**Annually, Q3**	**ESD-WE**
C.	Document to the Water Board annually follow-up activities from each ICID complaint response.	Annually	ESD-WE
D.	1. Review effectiveness of standard operating procedures for responding to ICID complaints.	Ongoing	ESD-WE
	2. Refine and implement standard operating procedures for responding to ICID complaints/referrals.	As Needed	ESD-WE
E.	Work with SCVURPPP to refine administrative procedure for providing referrals to the Water Board.	Pending Implementation by Program	ESD-WE, Program
F.	Refine and implement standard operating procedures to incorporate results of ICID 1E.	Pending Implementation by Program	ESD-WE, Program

ICID 2 - Investigations of High Priority Areas

The City of San José will conduct investigations of high priority areas. High Priority is defined as areas with a high potential for non-storm water discharges to the City's collection system.

#	Activities	Compliance Date	Responsible Party
A.	Target areas for monitoring by identifying high priority areas, primary types and sources of ICID pollution based on complaints, historical inspection records, inspector knowledge, and monitoring information.	Annually	ESD-WE
	1. Perform GIS analysis on frequently occurring ICID sources and/or types.	Done FY 03-04	ESD-UR
	2. Perform outreach in targeted areas based on GIS analysis and other analyses as available. See PIP 2 for details.	**Annually**	**ESD-UR & WE**
B.	Conduct investigations of high priority areas based on ICID 2A.	Ongoing	ESD-WE
C.	Document to the Water Board that investigations of high priority areas have been conducted.	Annually	ESD-WE

ICID 3 - Inspector Training

The City of San José will ensure that ICID inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for ICID inspectors.	Annually, Q1	ESD-WE
B.	Provide and document on-the-job training and other training opportunities, such as inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

ICID 4 - Outreach and Technology Transfer

The City of San José will distribute outreach and technology transfer material containing applicable control measures and/or BMPs to target parties responsible for ICID activities.

#	Activities	Compliance Date	Responsible Party
A.	Determine need for new and/or revised outreach and technology transfer material by getting feedback from inspectors regarding 1) continuing problem activities; 2) discharge types; 3) monitoring and complaint data; and 4) usefulness of existing outreach and technology transfer material.	Ongoing	ESD-MarComm ESD-UR
B.	Develop, audit and/or modify existing outreach material, as needed, based on report developed under ICID 4A.	As Needed	ESD
C.	Document to Water Board that outreach and technology transfer material and/or BMPs have been distributed.	Annually	ESD-UR

#	Activities	Compliance Date	Responsible Party
D.	Develop and implement standard operating procedures to gather customer feedback on ICID services.	Development Done FY 02-03 Implementation Ongoing	ESD-WE

ICID 5 - SOPs Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its SOPs in responding to complaints regarding illicit connections and illegal dumping activities into the storm drain system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate effectiveness of SOPs.	Annually	ESD-WE
B.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

Industrial & Commercial Dischargers

IND Work Plan

The City's Environmental Inspectors, located within the Watershed Protection Division of the Environmental Services Department, inspect more than 4,000 businesses per year to ensure that proper practices are employed to prevent stormwater pollution. How frequently a business is inspected depends on their potential for contributing pollutants as determined by previous inspection results. This method of assigning inspection frequencies has been effective in focusing limited inspection resources on high priority cases to best protect water quality. Generally, over 70% of the businesses inspected are found to have no significant stormwater issues and thus do not warrant near-term re-inspection. When issues are identified, education and enforcement are used together to achieve compliance. This Program element is implemented pursuant to permit provision C.2.

A City inspector explains stormwater Best Management Practices to a downtown restaurateur

IND 1 - Notice of Intent (NOI) Filers

The City of San José will conduct inspections of those facilities that have filed an NOI with the State and appear on a list provided by the State. An NOI is required to be filed with the State by companies that are considered to have a high potential to contaminate stormwater and are classified under certain standard industrial classification (SIC) codes.

#	Activities	Compliance Date	Responsible Party
A.	Annually, obtain NOI filer database from State with annual information, review information and identify new NOI facilities for inspection the following year.	Annually	ESD-WE
B.	Conduct and document initial inspections of NOI Filers within one year using the inspector checklist form to determine exposure and assign a future inspection frequency to each facility accordingly. Document whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site.	Ongoing	ESD-WE
C.	Conduct and document annual inspections of facilities determined to have exposure in accordance with inspection frequency schedule.	Ongoing	ESD-WE
D.	Conduct and document inspections of facilities that need to file an NOI at least once every five years and in accordance with the inspection frequency schedule identified in IND 3.	Ongoing	ESD-WE

#	Activities	Compliance Date	Responsible Party
E.	Maintain the database to track the inspection information from the inspector checklist and to include all NOI filer SIC codes required by the Industrial Activities Stormwater General Permit.	Ongoing	ESD-WE

IND 2 - Non-Filer Investigations

The City of San José will inspect industrial facilities that may be subject to general permit requirements but are not found on the NOI filer list provided by the State and that conduct activities identified by the following SIC codes:

5015: Automobile Dismantlers

5093: Other Recycling Industries

3200 series: Stone, Clay and Concrete Products Industry

4100 & 4200 series: Trucking Facilities that perform on-site vehicle repair, maintenance or washing.

#	Activities	Compliance Date	Responsible Party
A.	Identify industrial facilities that conduct activities with the SIC codes listed in the IND SOPs.	Annually	ESD-WE
B.	Develop a list of facilities targeted for inspection during upcoming year that may be subject to general permit requirements for NOI based on business licenses, etc.	Annually	ESD-WE
C.	Conduct and document initial inspections of industrial facilities with the SIC codes listed referenced in IND 2A, using the inspector checklist form to document whether the facility constituted a potential threat to discharge pollutants to the storm drain collection system, whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site. Maintain database.	Ongoing	ESD-WE
D.	Conduct ~~&~~ **and** document annual inspections of facilities determined to have exposure in accordance with implementation schedule. Add the facility to appropriate database(s) and assign an inspection frequency. If the facility inspected is determined to need to file an NOI and is not able to provide an NOI, SWPPP or SWMP, refer to the ~~RWQCB~~ **Water Board**.	Ongoing	ESD-WE
E.	Work with the Program's Industrial Inspection Ad Hoc TG on an Administrative procedure for providing referrals to the Water Board and document providing referrals to the Water Board for facilities with significant problems.	Pending Implementation by Program	ESD-WE, ESD-UR

IND 3 - City Regulated Facilities

The City of San José will conduct inspections of City Regulated commercial facilities as identified below:

Type	Frequency
Food service facilities	2 or more AOCs* over a rolling three year time period - Every year 1 AOC over a rolling three year time period - Every two (2) years 0 AOCs over a rolling three year time period - Every three (3)years
All Other City Regulated facilities	2 or more AOCs* over a rolling five year time period - Every year 1 AOC over a rolling five year time period - Every two (2) years 0 AOCs over a rolling five year time period but have exposure - Every five (5) years 0 AOCs over a rolling five year time period with no exposure or potential for exposure - No further inspections
Facilities for which a referral or ICID complaint is received	As soon as practicable for violations and every year until they meet the above criteria.

*Area of Concern (AOC) = A violation based on the San José Municipal Code 15.14.530 issued to a facility during a stormwater inspection.

#	Activities	Compliance Date	Responsible Party
A.	Determine industrial/commercial facilities identified in the IND SOPs for inspection in each FY.	Annually, Q1	ESD-WE
B.	Conduct and document inspections of City Regulated facilities, other than food service facilities, at least once every five (5) years in accordance with the inspection frequency schedule. If determined to have no impact or no potential for pollution, will not be scheduled for future inspection.	Ongoing	ESD-WE
C.	Conduct and document inspections of City Regulated food service facilities at least once every three (3) years. Initial approved performance standards require inspections every three years.	Ongoing	ESD-WE
D.	Conduct and document inspections for which a referral or complaint was received within five days of complaint received and second inspection within one year.	Ongoing	ESD-WE
E.	Develop a database to track the inspection information from the inspector facility inspection report.	Done FY 02-03	ESD-WE
	1. Implement new Environmental Enforcement Data Management System.	Done FY 03-04	ESD-WE
	2. Prepare draft data inspection tables to review data trends and to facilitate timely evaluation of the data.	**Annually, Q3**	**ESD-WE**
F.	Maintain database to track inspection information from inspector facility inspection report and to include new industrial program categories.	Ongoing	ESD-WE
G.	For B, C, D, and E, collect information during inspections on the potential for stormwater pollution at City Regulated facilities in order to determine the appropriate inspection frequency for the various facilities.	Ongoing	ESD-WE
H.	Develop an inspection frequency plan to track frequency of inspections. Implement & update, as needed, the inspection frequency plan.	Development: Done FY 01-02 Ongoing Updated As Needed	ESD-WE

IND 4 - Compliance

The City of San José will conduct industrial/commercial inspections to determine the existence of discharges or potential discharges which are illegal under local ordinances. The facility operator will be notified of observed areas of concern to be corrected and/or if official action on violations is necessary, it will take place under local enforcement procedures.

#	Activities	Compliance Date	Responsible Party
A.	Document facilities that have enforcement actions and the type of enforcement actions conducted for the existence of discharges or threatened discharges that are illegal under local ordinances.	Ongoing	ESD-WE

IND 5 - Training

The City of San José will ensure that industrial/commercial inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for IND inspectors.	Annually, Q1	ESD-WE
B.	Maintain a training plan and provide and document on-the-job training and other training opportunities such as industrial/ commercial inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

IND 6 - Outreach

The City of San José will help develop and distribute outreach and technology transfer material containing applicable control measures and/or BMPs to industrial/commercial facility operators responsible for IND activities.

#	Activities	Compliance Date	Responsible Party
A.	Identify and list existing outreach and technology transfer material.	Annually	ESD-UR
B.	Distribute applicable outreach and technology transfer material to industrial/commercial facility operators. Document to the ~~RWQCB~~ **Water Board** that outreach and technology transfer material and/or BMPs have been distributed, as needed, to industrial/commercial facility operators.	Distribution: Ongoing See PIP Program Element in Annual Report	ESD-UR
C.	Determine usefulness of outreach and technology transfer materials by obtaining feedback from industrial/commercial facilities. Obtain feedback from inspectors about the effectiveness of existing outreach and technology transfer material and develop and/or modify existing outreach material.	As Needed	ESD-UR

IND 7 - NOI Filers Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its inspections procedures and database tracking system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate the effectiveness of NOI Filers inspections procedures.	Annually	ESD-WE
B.	Document and evaluate the effectiveness of the NOI Filers database tracking system.	Annually	ESD-WE
C.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

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New and Redevelopment

NRD Work Plan

The New and Redevelopment provision (also referred to as C.3) requires that development projects implement controls to address pollutant discharges and increased stormwater runoff flows for the life of a project by incorporation of treatment and hydromodification measures and other appropriate source control and site design measures.

Porous-paved parking lot: a stormwater site design and treatment control measure

The City began phased implementation of hydraulic (also referred to as numeric) sizing requirements for stormwater treatment control measures in conformance with City Council approved Post-Construction Urban Runoff Management Policy 6-29 on October 15, 2003. Effective August 15, 2006, hydraulic sizing was required for all projects that create or replace 10,000 square feet of impervious surface. On October 18, 2005, Council approved Post-Construction Hydromodification Management Policy 8-14 and the City began implementation of hydromodification management requirements. This Program element is implemented pursuant to permit provision C.3.

NRD 1 - Legal Authority

The City of San José will have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Provision C.3.a.i).

#	Activities	Compliance Date	Responsible Party
A.	Revise Municipal Code to ensure adequate legal authority to implement new development control measures (C.3.a.i).	As Needed	PBCE, ESD, PW

NRD 2 - Guidance to Developers

The City will provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for stormwater pollution prevention, as appropriate for the type of project and location.

#	Activities	Compliance Date	Responsible Party
A. 1.	Draft necessary revisions to Guidance Manual on Selection of Stormwater Quality Control Measures to allow incorporation of hydraulic sizing design criteria and provide to developers.	Done FY 02-03	PBCE, ESD, PW, RDA
2.	Refine Guidance Manual on Selection of Stormwater Quality Control Measures to incorporate HMP measures, as necessary.	**Done** FY 05-06	PBCE, ESD, PW, RDA, Program

#	Activities	Compliance Date	Responsible Party
B.	Provide development community with revised information and guidance materials concerning any adopted on site design, building permit requirements, hydraulic sizing design criteria and HMP criteria, and maintenance requirements for BMPs for stormwater treatment measures.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Coordinate w/development community on proposed hydraulic sizing criteria for structural stormwater treatment measures, HMP criteria and any proposed revisions to Guidance Manual and policy through workshops and regular meetings.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update guidance material regarding maintenance responsibilities for any HMP measures.	**Done** FY 05-06	PBCE, ESD, PW, RDA, Program

NRD 3 - CEQA Requirements

The City will ensure that environmental documents required for those projects that fall under CEQA and NEPA review address both significant and cumulative stormwater quality impacts during the life of the project, and relevant permit requirements. These documents include EIRs, negative declarations and initial study checklists (C.3.m).

#	Activities	Compliance Date	Responsible Party
A.	Review and evaluate the City's Environmental Review procedures to improve the review for water quality impacts and identification of mitigation measures. (Provision C.3.m.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Identify areas where new or additional water quality review processes and related documents or checklist questions are needed and propose schedule for revision.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Refine and update areas where new or additional water quality related mitigation measures may be needed.	Done FY 05-06	PBCE, ESD, PW, RDA
B.	Report on revisions made to environmental review processes.	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 4 - Project Mitigation Measures and Design Requirements

The City will encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measure that minimize stormwater pollutant discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Revise current Policy on Post-Construction Urban Runoff Management as necessary to incorporate minimum BMP requirements for all projects.	Done FY 03-04	PBCE, ESD, PW, RDA
B.	Review and modify development permit approval procedures for adopted revisions as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
C.	Review the design standards and guidance for opportunities to make revisions that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures.	Done FY 03-04	PBCE, ESD, PW, RDA
D.	Review the existing source control measures contained in site design standards, guidance documents and conditions of approval for opportunities to limit stormwater pollution. (Provision C.3.k.)	Done FY 03-04	PBCE, ESD, PW, RDA
E.	Review General Plan and revise as necessary to incorporate water quality and watershed protection principles and policies, and summarize revisions made.	Done FY 02-03 **Ongoing**	PBCE
F.	Review the design standards and guidance for opportunities to make revisions as necessary that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures. Such revisions are listed in Provision C.3.j.	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Identify and document existing site design standards and guidance documents and policies.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise Site Design Measures and Standards, as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA

NRD 5 - Group 1, 2 and HMP Project Requirements

On October 15, 2003, the City began phased implementation of hydraulically sized stormwater treatment measures in conformance with Policy 6-29 beginning with projects that create or replace one acre or more of impervious surface area and are considered Land Uses of Concern. On February 15, 2005, all projects that created or replaced one acre or more of impervious surface were required to hydraulically size stormwater treatment measures. On May 17, 2005, the threshold changed to include all projects that created or replaced 10,000 square feet of impervious surface and are a Land Use of Concern. Effective August 15, 2006, all projects that create or replace 10,000 square feet or more of impervious surface were required to include hydraulically sized stormwater treatment measures in each project.

On October 18, 2005, all projects that meet the criteria described in Policy 8-14 are required to manage increases in runoff flow, volume and duration.

The following is a brief summary of the Best Management Practices that are required in all development projects:

- Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality) and provide detention or retention as part of landscaping where feasible (C3.b.i and C.3.j);
- Source controls shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k), including measures to discourage pesticide use (C.9.d.ii);
- Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Policy 6-29 (Provision C.3.d); and
- Increases in runoff flow, volume and duration shall be managed in accordance with Policy 8-14 (Provision C.3.f).

#	Activities	Compliance Date	Responsible Party
A.	1. Propose revisions to current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04	PBCE, ESD, PW, RDA
	3. Revise policy as needed for Group 2 implementation.	Done FY 04-05 **& FY 06-07**	PBCE, ESD, PW, RDA
	4. Revise policy as needed for HMP implementation.	Done FY 05-06	PBCE, ESD, PW, RDA
B.	Develop a list of Annual Reporting requirements from Provision C.3. design data tracking needs and protocols.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Compile a list of new development and redevelopment projects by name, type of project, site acreage or square footage, square footage of new impervious surface, treatment BMPs and numeric sizing criteria used for applicable projects. Also, the source control measures required and pesticide reduction measures.	Annually	PBCE, ESD, PW, RDA
	2. Update existing data collection software for private projects to enable tracking of all projects with treatment or HMP measures.	**FY 07-08**	**PBCE, ESD, PW, RDA**
C.	Revise and update permitted alternatives to numeric sizing through Alternative Measures Program in Policy 6-29.	Done FY 04-05	PBCE, ESD, PW, RDA
	1. Report to City Council on Alternative Measures Program revisions in Policy 6-29. (Provision C.3.g.)	Done FY 04-05	PBCE, ESD, PW, RDA
	2. Track name and location of projects in the Alternative Measures Program, project type and size, percent impervious surface, reason for granting waiver, terms of waiver, equivalent benefit provided, alternative treatment project or regional project receiving the benefit and date of completion of the alternative treatment project or regional project (Provision C.3.g).	Annually	PBCE, ESD, PW, RDA
	3. Report to City Council on projects approved with numeric sizing alternatives through Alternative Measures Program. (Provision C.3.g.)	Annually	PBCE, ESD, PW, RDA
D.	Draft post-construction treatment BMP certification procedures. (Provision C.3.h)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Track name and location of projects subject to certification. (Provision C.3.h.)	Annually	PBCE, ESD, PW, RDA
E.	Participate on SCVURPPP's Hydromodification Management Plan work group and develop procedures for limiting peak stormwater runoff discharge rates from development projects. (Provision C.3.f.)	Done FY 04-05	PBCE, ESD, PW, RDA
F.	1. Review and modify development permit approval procedures and standard operating procedures as necessary to incorporate requirements for:		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	

#	Activities	Compliance Date	Responsible Party
	c. HMP	**Done** FY 05-06	
	2. Update and refine criteria and checklist to aid Department of Planning, Building & Code Enforcement & Department of Public Works planners and engineers in determining whether a development project should be required to incorporate post-construction treatment control measures and their related operation and maintenance requirements as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	**Done** FY 05-06	
	3. Update and refine standard conditions of approval as necessary to ensure proper selection, design of and installation of structural stormwater treatment measures per Provision C.3.b.,c.,d as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	**Done** FY 05-06	
G.	Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites. (Provision C.3.n. & C.9.ii.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Based on City's Pesticide Management Plan, establish criteria for tracking percentage of new development projects for which pesticide reduction measures were required and begin tracking. (Provision C.3.n. & C.9.d.ii)	Done FY 03-04	PBCE, ESD, PW, RDA
H.	Implement any new adopted development conditions of approval, and procedures to developments with significant stormwater pollution potential. (Provision C.3.b.)	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 6 - Developer Conformance with State Requirements

The City will require developers of projects that disturb a land area of one acre or more to demonstrate conformance with the State General Construction Activity Storm Water Permit including filing of NOI, development of a SWPPP, et al.

#	Activities	Compliance Date	Responsible Party
A.	Include as condition of approval for projects that disturb a land area of one acre or more, a requirement to demonstrate coverage under the State General Construction Activity Storm Water Permit.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03 See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 7 - Developer Erosion Control Plans

The City will require developers of projects with potential for significant erosion and planned construction activity during the wet season to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

#	Activities	Compliance Date	Responsible Party
A.	Include as a condition of approval for applicable projects a requirement to prepare and implement an erosion and sediment control plan.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03 See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 8 - Operation and Maintenance for Structural Stormwater Controls

The City will implement an operation and maintenance (O&M) verification program that includes (C.3.e):

- Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;
- Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;
- Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

#	Activities	Compliance Date	Responsible Party
A.	Work with SCVURPPP to develop guidance for implementing O&M Program.	Done FY 02-03	PBCE, ESD, PW, RDA
B.	1. Draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities. (Provision C.3.e)	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Conduct pilot inspection program to inspect treatment BMPs that were constructed prior to numeric sizing requirements. The intention of the pilot program is to assess workload impacts, data tracking and collection methods, and funding for O&M programs and to use this information to revise the O&M program.	**Done** FY 05-06	ESD
	3. Revise and update draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities as necessary. (Provision C.3.e.)	**Done** FY 05-06	PBCE, ESD, PW, RDA
C.	1. Include as a condition of approval a requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such controls.	Done FY 03-04	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	2. Revise and update condition of approval requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such structural controls as necessary.	**Done** FY 05-06 **Ongoing**	PBCE, ESD, PW, RDA
	3. Develop model permit conditions with BMP fact sheets to include in use permits where appropriate.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Compile a list of projects & responsible operators subject to C.3.e. provision.	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
D.	Track and compile a list of priority properties inspected and inspection results. (Provision C.3.e.iii.)	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
	1. Determine criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update and revise criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency as necessary.	**Done** FY 05-06	PBCE, ESD, PW, RDA
	3. Develop local inspection program for verification of proper O&M.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Update and revise local inspection program for verification of proper O&M as necessary.	**Done** FY 05-06	PBCE, ESD, PW, RDA
E.	**Update inspection software to track and schedule inspections for the number of sites that installed treatment and/or HMP measures.**	**FY 07-08**	**ESD-WE**

NRD 9 - Applicability to Public Projects

The City will ensure municipal capital improvement projects include stormwater quality control measures during and after construction, appropriate for each project, and that contractors comply with stormwater quality control requirements during construction activities and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a process to ensure that municipal capital improvement projects install structural stormwater quality control measures as necessary.	Done FY 02-03	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	1. Participate on SCVURPPP work group tasked with developing a technical guidance document for use by municipal staff to ensure that the document includes standard specifications and details, sizing methodologies, and model conditions of approval acceptable for use in City projects as necessary. (Provision C.3.b. & d.)	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Review and revise Redevelopment Agency Project Request for Proposal procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 03-04	ESD, PBCE, RDA
	3. Review and Revise Public Works Capital Improvement Project approval procedures and Road Improvement Project approval procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 02-03	PBCE, ESD, PW, RDA
B.	Review, evaluate, and modify the procedures, as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA
C.	Begin tracking required data on the public projects subject to Provision C.3. hydraulic sizing criteria requirements for Annual Report.	Done FY 03-04 Ongoing	PBCE, PW, RDA
	1. Modify the existing data collection software for public projects to track new capitol improvement projects with stormwater treatment and/or HMP measures.	**FY 07-08**	**PW**
D.	Monitor development of City's Green Building program for opportunities to discourage architectural use of copper in development projects (Provision C.9.a.) and to incorporate urban runoff considerations.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

NRD 10 - City Staff Training

The City will provide training at least annually to its planning, building, and public works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention (C.3.a.vi).

#	Activities	Compliance Date	Responsible Party
A.	Provide training to Planning and Public Works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA
B.	Provide training to Redevelopment Agency and Department of Transportation staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA, DOT
C.	Revise the training protocol to incorporate any newly adopted Provision C.3. permit requirements and related revised procedures.	As Needed	PBCE, ESD, PW, RDA
D.	Train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval and the importance of minimizing pesticide use in runoff from development sites. (Provision C.3.n. and Provision C.9.d.ii)	Ongoing	PBCE, ESD, PW, RDA, DOT

NRD 11 - Development Plan Review and Approval Procedures Effectiveness Evaluation

The City of San José will review and evaluate the effectiveness of its development plan review and approval procedures.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in review and approval process.	Annually	PBCE, ESD, PW, RDA
B.	Document and evaluate what worked well and what needs improvement.	Annually	PBCE, ESD, PW, RDA

Construction Inspection

CON Work Plan

The City inspects activities at construction sites to prevent sediment and other pollutants from entering the storm sewer system. The measures and activities discussed in this work plan apply to both private development projects and municipal public works construction projects. These measures and activities are implemented at construction project sites as part of the City's construction inspection and enforcement program, which is implemented as a collaborative effort between inspectors from Public Works, Building, and Environmental Services. These departments also collaborate in providing outreach materials and training to the development community on appropriate best management practices. This program element is implemented pursuant to permit provision C.2.

Proper storm drain protection during construction prevents construction debris and sediment from entering the storm drain

CON 1 - Site Housekeeping

The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites, and prevent illicit discharges to storm drains and watercourses.

#	Activities	Compliance Date	Responsible Party
A.	Track and document incidents of housekeeping issues at construction sites.	Ongoing	PBCE-Bldg, PW, ESD-WE

CON 2 - Local Ordinance

For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.

#	Activities	Compliance Date	Responsible Party
A.	Maintain a program for identifying and conditioning projects with significant erosion potential and planned wet season activity.	Ongoing	PW, PBCE-Bldg
B.	Identify ordinance changes needed to conduct inspections.	As Needed	PW, ESD-WE, PBCE-Bldg

CON 3 - Construction Inspection Frequency

The City inspects construction sites for adequacy of stormwater quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on size of project, site conditions, precipitation, and project's potential impact on stormwater quality.

#	Activities	Compliance Date	Responsible Party
A.	Maintain and update SOPs for construction inspection program.	As Needed	PW, ESD-WE, PBCE-Bldg
B.	Document inspections of active construction sites.	Ongoing	PW, ESD-WE, PBCE-Bldg
C.	Evaluate the effectiveness of the construction inspection program and make improvements as necessary.	Annually	PW, ESD-WE, PBCE-Bldg

CON 4 - Wet Season Preparation

Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.

#	Activities	Compliance Date	Responsible Party
A.	Review and revise procedures for construction inspection staff regarding wet season construction requirements.	As Needed	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
B.	Document pre-season inspection of construction sites to ensure adequate implementation of winterizing BMPs prior to the wet season.	Ongoing	PW-CFAS, ECS, TDS

CON 5 - Inspection and Site Evaluation Follow-up

Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Water Board.

#	Activities	Compliance Date	Responsible Party
A.	Implement SOPs for follow-up actions and graduated levels of enforcement for construction sites.	Ongoing	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
B.	Track and summarize notices and follow-up actions for annual reports.	Annually	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
	1. Use revised erosion and sediment control checklist to better track warnings and required corrections given to construction site managers.	**Done FY 06-07**	**PW-TDS**

CON 6 - Municipal Training

The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention. All inspectors receive training on the latest construction-related stormwater pollution prevention techniques and appropriate follow up actions at least once every two years. The City keeps documentation that inspectors have received training.

#	Activities	Compliance Date	Responsible Party
A.	Develop an annual training plan for construction inspection program.	Annually, Q1	ESD, PW, PBCE-Bldg
B.	Conduct annual training.	Ongoing	ESD, PW, PBCE-Bldg
C.	Track and document that inspectors have received training.	Annually	ESD-UR
D.	Evaluate the training curriculum and frequency, and make improvements as necessary.	Annually	ESD, PW, PBCE-Bldg
	1. Conduct additional stormwater BMP training for all inspection groups during section meetings throughout the year to supplement the main autumn annual training.	**Done FY 06-07** **Ongoing**	**ESD-UR, ESD-WE**
E.	Hold coordination meetings for Building, ESD, and Public Works inspectors.	Ongoing	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD-WE, ESD-UR

CON 7 - Outreach

The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.

#	Activities	Compliance Date	Responsible Party
A.	Review outreach and technology transfer materials and make improvements, as necessary.	Annually, Q4	ESD, PW, PBCE-Bldg
	1. Reprint revised Dewatering from Construction Sites and In-Ground Utilities Maintenance Projects brochure.	**FY 07-08**	**ESD-UR**
B.	Conduct outreach sessions for development community.	Annually	ESD, PW, PBCE-Bldg, Program
C.	Document outreach to development community.	Annually	ESD-UR
D.	Evaluate outreach program and make improvements, as necessary.	Annually	ESD, PW, PBCE-Bldg
	1. Print and distribute revised "Clean Bay Blueprint" to developers and City inspectors.	Done FY 05-06	ESD, PW, PBCE-Bldg
	2. Explore the use of construction site signs to alert site employees and the public of stormwater pollution prevention message and 945-3000 hotline information.	FY 06-07	ESD, PW, PBCE-Bldg

#	Activities	Compliance Date	Responsible Party
	3. Implement, if feasible, the use of construction site signs to alert site employees and the public of stormwater pollution prevention message and 945-3000 hotline information, if feasible.	**FY 07-08**	**ESD, PW, PBCE-Bldg**

CON 8 - Public Works Projects

The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.

#	Activities	Compliance Date	Responsible Party
A.	Conduct training for Public Works capital improvement project staff (City Facilities Architectural Services; Roads and Bridges; and Engineering and Construction Services) on contract language, standard specifications, and enforcement.	Annually	PW-CFAS, ECS, TDS ESD
B.	Track the number of Public Work projects with these requirements.	Annually	PW-CFAS, ECS, TDS

CON 9 - Construction Inspection Effectiveness Evaluation

The City of San José will review and evaluate effectiveness of its construction inspection SOPs and BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in construction inspection SOPs and BMPs.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
B.	Document and evaluate what worked well and what needs improvement.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
	1. Expand the number of sites with an inspector of record to capture more of the Type 1 and Type 2 sites (per Public Work's designation).	Ongoing	PBCE-Bldg

Public Streets, Roads, & Highways

PSR Work Plan

This program element is one of several that address municipal activities. The PSR program element consists of incorporating best management practices (BMPs) into City operations such as street repair. Training plays a key role in ensuring that staff uses the proper techniques during the course of their duties to protect water quality. Training topics and activities include spill response, resurfacing, sealing and patching, saw-cutting, street sweeping, landscape chemical application, concrete installation, pavement striping, legend removal, and catch basin inspection after irrigation repair. BMP effectiveness evaluation from crew members is obtained during the training sessions. This program element is implemented pursuant to permit provision C.2.

Department of Transportation paving crew applying their training along with the pavement

PSR 1 - Implementation of BMPs

The City of San José will implement Best Management Practices (BMPs) for street, road, and highway operation and maintenance (O&M) activities to reduce pollutants in stormwater and eliminate illicit discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted.	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
	1. Include SOPs listed in PSR 1.D.1 and developed in FY 05-06 into the FY 06-07 training program.	**FY 06-07**	**ESD**
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
	1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • Storm Drain Inlet Cleaning; • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning.	~~6/30/06~~ **Done FY 05-06**	DOT, ESD, PRNS
	2. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City employee.	**FY 06-07** **Ongoing**	**ESD**
	3. In response to stormwater complaints involving a City employee conducting PSR and SDO O&M activities, the supervisor for the City employee involved in the complaint will be notified.	**FY 06-07** **Ongoing**	**DOT, GS, PRNS, ESD**

PSR 2 - Contractor Use of BMPs

The City of San José will develop and implement a process to ensure that contractors employed to perform street, road, and highway O&M activities use appropriate BMPs per URMP.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for public street, road, and highway O&M contracts on related stormwater BMPs annually.	Annually	DOT, ESD
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City contractor.	**FY 06-07** **Ongoing**	**ESD**
	2. In response to stormwater complaints involving City contractors conducting PSR and SDO O&M activities, the contract manager for the City contract involved in the complaint will be notified.	**FY 06-07** **Ongoing**	**DOT, GS, PRNS, ESD**
B.	Develop standard contract language for PSR maintenance activities.	Done FY 05-06	DOT, ESD
	1. Send letters to City contractors conducting PSR and SDO O&M activities with a reminder to use appropriate BMPs while conducting their work.	**FY 06-07**	**DOT, GS, PRNS, ESD**

PSR 3 - City Staff Annual Training

The City of San José will provide annual training to its municipal staff in the use of appropriate BMPs. The City will also provide a mechanism for obtaining feedback from staff on the implementation and effectiveness of the BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Identify training goals, such as improving the focus of the training on the specific BMPs used by a section; integrating new BMPs, if any; etc.	Annually, Q4	DOT, ESD
B.	Identify training opportunities (which could include tailgate meetings and other existing training).	Annually	DOT, ESD
C.	Create or revise training modules for affected City staff and contractors.	As Needed	DOT, ESD
	1. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	~~6/30/06~~ **Done FY 05-06**	ESD
D.	Create or revise collateral material based on training modules.	As Needed	DOT, ESD
E.	Schedule training with affected supervisors.	Annually	DOT, ESD
	1. Develop and implement a new training module specifically for DOT electrician staff.	Done FY 04-05	DOT, ESD

PSR 4 - Notification of Public Agencies

The City of San José will inform other parties (e.g., CalTrans, the County of Santa Clara, and public utilities) conducting street, road, and highway O&M activities within its jurisdiction of the requirements to implement pollutant reduction BMPs and Control Measures in stormwater to the maximum extent practicable and eliminate illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Identify conditions under which another agency will be notified regarding relevant stormwater requirements.	Done FY 02-03	
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is another agency.	**FY 06-07**	**ESD**
	2. The City will send letters to other agencies that conduct PSR O&M activities within its jurisdiction informing them of the requirement to implement appropriate BMPs and control measures while conducting their work.	**FY 06-07**	**ESD-WE**

PSR 5 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges. The review and evaluation will include input from the municipal maintenance staff that implement the BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual effectiveness reporting, including sub-procedures for gathering feedback from affected supervisors and for modifications to BMPs and SOPs as necessary.	Done FY 01-02	
	1. Review procedures for annual effectiveness evaluation. Consider obtaining feedback from supervisors on how to assess BMP effectiveness and the use of training sessions with staff as an opportunity to evaluate BMPs and SOPs.	Annually	DOT, ESD
B.	Conduct evaluation of BMPs and SOPs.	Annually	DOT, ESD
C.	**Expand parking restriction signage and enforcement for street sweeping by 40 curb miles each fiscal year.**	**FY 06-07 Ongoing**	**DOT**
D.	**Collect street sweeping data: volume and/or weight of debris collected, curb miles swept, and estimated percentage of leaves in yard trimmings collection program.**	**Ongoing [See CNAP CB-11]**	**DOT, ESD**

PSR 6 - Rural Public Works Maintenance and Support Activities

The City will extend its control measure strategy for PSR to address water quality impacts resulting from public works maintenance and support activities in rural areas.

#	Activities	Compliance Date	Responsible Party
A.	Identify City-owned properties that are applicable (under the RPW performance standard).	Ongoing	
	1. Re-evaluate the feasibility of using GIS information to identify additional applicable properties, if any.	~~6/30/06~~ **Done FY 05-06**	PRNS, GS, DOT, ESD
B.	Develop or adapt Standard Operating Procedures (SOPs) and Best Management Practices (BMPs) for rural public works activities.	Done FY 03-04	
C.	Provide annual training on appropriate SOPs/BMPs to City staff that perform rural public works operations and maintenance activities. Incorporate SOPs/BMPs evaluation into annual training.	Annually	PRNS, DOT, GS, ESD
	1. Evaluate the RPW training schedule in order to coordinate more efficiently with PRNS staff schedules.	**FY 06-07**	**PRNS, ESD**
D.	Through contract specifications, require contractors hired by the City to use appropriate SOPs/BMPs when performing rural public works construction or maintenance.	Done FY 05-06	PRNS, DOT, GS, ESD
E.	Annually conduct an evaluation of the effectiveness of the rural public works program, report the results in the Urban Runoff Annual Report. Identify items for continuous improvement.	Annually	PRNS, DOT, GS, ESD

Storm Drain System Operation & Maintenance

SDO Work Plan

Department of Transportation Vactor crew cleaning out a storm drain inlet

Storm Drain System Operation and Maintenance is another municipal activity program element implemented in accordance with provision C.2.a of the permit. This program includes key maintenance activities that are conducted to ensure the proper function of the storm sewer system to collect and convey storm runoff. The Department of Transportation Standard Operating Procedures for catch basin cleaning and Problem Area Reporting are a focus of crew training. A GIS map overlay has been created that assigns serial numbers to each of the City's more than 28,500 storm drain inlets. This map overlay is currently in use as a means to facilitate problem area reporting in the storm drain system.

SDO 1 - O&M BMP Implementation

The City of San José will implement best management practices (BMPs) for the storm drain system operation and maintenance (O&M) to reduce pollutants in stormwater to the maximum extent practicable. Specific BMPs for each type of O&M activity are those listed in the City's Urban Runoff Management Plan (URMP).

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted (including structural controls if necessary).	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
	1. Include SOPs listed in SDO 1.D.1 and developed in FY 05-06 into the FY 06-07 training program.	**FY 06-07**	**ESD**
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
	1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • Storm Drain Inlet Cleaning; • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning. See PSR 1.D.1	~~6/30/06~~ **Done FY 05-06**	DOT, ESD, PRNS
	2. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City employee.	**FY 06-07** **Ongoing**	**ESD**
	3. In response to stormwater complaints involving a City employee conducting PSR and SDO O&M activities, the supervisor for the City employee involved in the complaint will be notified.	**FY 06-07** **Ongoing**	**DOT, GS, PRNS, ESD**

SDO 2 - Problem Tracking and Process Improvement

The City of San José will develop and implement processes for tracking problem areas and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Implement an annual inspection and cleaning work plan to achieve a Tier II level review.	Ongoing	DOT
B.	Evaluate criteria for collecting data from City field personnel for the purposes of determining Problem Areas.	As Needed	DOT, ESD
C.	Revise documentation and problem area reporting procedure, if necessary, to improve reporting performance. Documentation to include frequency, nature, and type of recurring problem. Include coordination of data from ICID and Storm Drain Management System data sources. Include analysis of data to identify trends for targeting solutions.	As Needed	DOT, ESD
D.	Produce Problem Area report.	Annually	DOT
E.	Address Problem Areas through ICID enforcement/ education activities, additional BMP development, program development or retrofit.	As Needed	DOT, ESD
	1. Explore purchasing additional vactor trucks.	**FY 06-07**	**DOT**

SDO 3 - Contractor Use of BMPs

The City will develop and implement, as needed, a process to ensure that contractors employed to perform storm drain O&M activities use the appropriate BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for SDO O&M contracts on related stormwater BMPs.	Annually	DOT, ESD
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City contractor.	**FY 06-07** **Ongoing**	**ESD**
	2. In response to stormwater complaints involving City contractors conducting PSR and SDO O&M activities, the contract manager for the City contract involved in the complaint will be notified.	**FY 06-07** **Ongoing**	**DOT, GS, PRNS, ESD**

SDO 4 – Staff Training and BMP Feedback

The City of San José will provide annual training to its municipal staff in use of appropriate BMPs and/or Control Measures. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Provide training prior to the rainy season.	Annually, Q4	DOT, ESD
B.	Create or revise training modules for affected City staff.	As Needed	DOT, ESD
	1. Improve the focus of the training on the specific BMPs used by a section.	As Needed	DOT, ESD
	2. Provide specific training to inlet cleaning crews on IMSPAR data collection in advance of inlet cleaning program implementation.	Annually	
	3. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	~~6/30/06~~ **Done FY 05-06**	ESD
C.	Produce schedule for training.	Annually	DOT, ESD

SDO 5 – Data Analysis

As part of the annual review process, the City of San José will evaluate data regarding cleaning activities and unusual flows observed during inspection. The review and evaluation will include consideration of storm drain structural retrofit.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual review and evaluation of data.	Done FY 01-02	
	1. Collect data on the amount of materials removed during inlet cleaning.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
B.	Implement annual data review and identify follow-up actions as appropriate.	Annually	
	1. ~~Evaluate~~ **Re-evaluate** how follow up is conducted by crews when "cars on catch basins" is identified on the IMSPAR report, in order to better understand to what extent parked cars are barriers to cleaning.	~~6/30/06~~ **FY 06-07**	DOT, ESD
	2. **Evaluate "cars on catch basins" data to see if it can be used as one of the factors in determining where future posted signage for street sweeping restrictions will be installed.**	**FY 06-07**	**DOT, ESD**
	3. ~~2.~~ Evaluate how to integrate the results of the IMSPAR report, regarding garbage and high debris, into scheduling additional cleaning.	~~6/30/06~~ **Annually**	DOT, ESD
	4. ~~3. Evaluate~~ **Re-evaluate** use of hand held devices to collect data during storm drain inlet cleaning and potentially other maintenance activities.	~~6/30/06~~ **FY 07-08**	DOT, ESD

SDO 6 – BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Review with supervisors to get feedback and information on how to assess BMP effectiveness.	As Needed	DOT, ESD
B.	Use annual training sessions with staff as an opportunity to evaluate the effectiveness of BMPs & SOPs.	Annually	DOT, ESD

Water Utilities Operations & Maintenance

WUO&M Work Plan

This program element addresses a municipal activity and is implemented in accordance with provision C.2.a. The program addresses operation and maintenance activities at the City's Municipal Water system. The key tools for implementing this program are the Water Utility Pollution Prevention Plan and staff training to ensure that proper techniques are employed during maintenance activities. The City's training program includes the annual development of a video demonstrating the implementation of BMPs for a specific work function.

Pumps at the Rincon II Pump Station

WUO&M 1 – Inventory of O&M Activities

The City of San José's Municipal Water System will conduct an inventory of all-key operations and maintenance activities, and identify routine and unplanned non-storm water discharges from these activities. This inventory will be conducted every three years and evaluated at least once a year.

#	Activities	Compliance Date	Responsible Party
A.	Review current procedures for operations and maintenance.	Annually	ESD-Muni
B.	Three-year update of list.	**Done 03/31/06 03/31/09**	ESD-Muni

WUO&M 2 – Implementation of WUPPP

The City of San José's Municipal Water System will implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.

#	Activities	Compliance Date	Responsible Party
A.	Implement WUPPP/Report on activities.	Ongoing	ESD-Muni

WUO&M 3 – Staff Training and Contractor WUPPP Compliance

The City of San José's Municipal Water System will conduct annual training for municipal staff and coordinate WUPPP elements with water utility project planning, including WUPPP elements (BMPs, conditions, specifications, etc., in contract and services agreements).

#	Activities	Compliance Date	Responsible Party
A.	Implement training program.	Annually, Q2	ESD-Muni

WUO&M 4 – WUPPP Effectiveness Evaluation

The City of San José's Municipal Water System will evaluate the effectiveness of the WUPPP annually. Maintain accurate documentation and revise the WUPPP as necessary.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate effectiveness of program.	Annually, Q4	ESD-Muni

Pesticide Management

PM Work Plan

Tussock Moth infestation on an oak tree at Williams Street Park

The purpose of the Pesticide Management program is to reduce the amount of pesticides in stormwater and landscape runoff. Activities include setting municipal policy, implementing proper techniques when selecting and applying pesticides on City property, staff training, public education, and City participation in regional efforts to influence regulations that affect pesticide management. In 2003, the Council adopted an Integrated Pest Management (IPM) Policy, which calls for municipal operations to incorporate IPM techniques and to reduce, phase-out, and ultimately eliminate the use of pesticides that cause impairment of surface waters. The City continues to implement pest control BMPs and train staff on Integrated Pest Management (IPM) techniques. This program element is implemented pursuant to permit provision C.9.d.

PM 1 – Integrated Pest Management

The City will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring use of IPM techniques in the agency's operations and minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors.

#	Activity	Compliance Date	Responsible Party
A.	Develop a City IPM policy for inclusion in Pesticide Management Plan.	Done FY 02-03	**GS, DOT, ESD, PRNS**

PM 2 – Pesticide Management Plan

The City will develop and implement a Pesticide Management Plan with the goals of minimizing pesticide use and reducing the amount of pesticides in stormwater and landscape runoff to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Draft a City of San José Pesticide Management Plan.	Done FY 01-02	**GS, DOT, ESD, PRNS**
B.	Publish City Pesticide Management Plan in URMP.	Done FY 01-02	**ESD**

PM 3 – IPM SOPs and BMPs

The City will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy.

#	Activities	Compliance Date	Responsible Party
A.	Develop SOPs and BMPs for implementing IPM policy with provisions that will reduce water quality impacts from pesticide use.	Done FY 01-02	**GS, DOT, ESD, PRNS**
B.	For each type of pest problem identified, seek model SOPs and BMPs from published literature.	Done FY 01-02	**GS, DOT, ESD, PRNS**
C.	Incorporate or develop appropriate IPM measures into City SOPs and BMPs.	Done FY 02-03	**GS, DOT, ESD, PRNS**
	1. Pilot the use of additional IPM techniques, e.g., for weed control.	Done FY 06-07 Ongoing	GS, DOT, ESD, PRNS
D.	Update City URMP to incorporate model Pest Management Performance Standard, including description of legal authority (IPM policy and contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done FY 02-03	**GS, DOT, ESD, PRNS**
E.	Review and update City SOPs and BMPs, as appropriate.	As Needed	GS, DOT, ESD, PRNS
F.	Develop Approved Pesticide List for applications on City property.	FY 06-07 **Ongoing**	GS, DOT, ESD, PRNS
	1. Revise SOPs and BMPs to reflect use of Approved Pesticide List.	FY 06-07 **Ongoing**	GS, DOT, ESD, PRNS

PM 4 – City Employee Training

The City will ensure that employees receive pest management training by implementing the following:

1. Employees who apply pesticides for the City will obtain the appropriate training as required by the County Agricultural Commissioner and State Department of Pesticide Regulation (DPR);
2. Employees within departments responsible for pesticide application will receive annual training on appropriate portions of City IPM Policy, SOPs, and BMPs, and latest IPM techniques;
3. Employees who are not authorized to apply pesticides will be annually trained not to use over-the-counter pesticides at workplace, consistent with IPM Policy; and
4. Annual internal outreach will be conducted to employees, who do not necessarily purchase or apply pesticides during their course of work, on less toxic pest control and to encourage employees to use IPM techniques away from work.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that employees who apply pesticides for the agency obtain appropriate training required by County Agricultural Commissioner and State Department of Pesticide Regulation.	Annually	GS, DOT, PRNS

#	Activities	Compliance Date	Responsible Party
B.	Provide annual training on IPM Policy, SOPs, and BMPs, and latest IPM techniques to employees within departments responsible for pesticide application.	Annually	GS, DOT, ESD, PRNS
C.	Annually inform employees who are not authorized / trained to apply pesticides not to use over-the-counter pesticides at workplace, consistent with IPM Policy.	Ongoing	GS, DOT, ESD, PRNS
D.	Monitoring Mechanism I.B.1. Document and evaluate effectiveness of staff training conducted each year in annual report.	Annually	GS, DOT, ESD, PRNS
	1. Update class evaluation/survey for IPM training classes conducted by City staff.	As Needed	GS, DOT, ESD, PRNS
E.	Public Education and Outreach Task II.A.14 Conduct internal outreach on less toxic pest control to employees who do not necessarily purchase or apply pesticides during the course of their work (to encourage employees to use IPM techniques away from work).	Annually	ESD

PM 5 – Contractor Pesticide Management Requirements

The City will develop and implement a process to ensure that contractors employed to conduct pest control and pesticide application on municipal property engage in pest control methods consistent with City IPM Policy. Specifically, the City will require contractors to:

- follow City IPM policy, BMPs, and SOPs;
- provide evidence of current IPM training, when feasible; and
- provide documentation of pesticide use on City property to the City in a timely manner.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that contractors employed to conduct pest control/pesticide application on municipal property engage in methods consistent with City IPM policy.	Ongoing	GS, DOT, ESD, PRNS, PW, ~~RDA~~
B.	Review and update a list of all contractors employed by the City who perform pesticide application work.	Annually	GS, DOT, ESD, PRNS, PW, ~~RDA~~
C.	Implement a procedure to provide to each contractor a copy of the City's IPM policy.	Done FY 02-03	**GS, DOT, ESD, PRNS**
D.	City will supply copies of pest specific BMPs and SOPs to contractors. Contractors will self-certify their compliance with the City SOPs and BMPs.	Ongoing	GS, DOT, ESD, **PRNS**
E.	Require through contract specifications that PCOs contracted for municipal applications use pest control methods consistent with City's IPM Policy. Specifically, require contractors to: a) follow City IPM policy, BMPs and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on City property to the City in a timely manner.	Ongoing	GS, **DOT, ESD, PRNS**
	1. City will develop standard content for PCO contracts.	Done FY 04-05	**GS, DOT, ESD, PRNS**

#	Activities	Compliance Date	Responsible Party
	2. City will implement standard content for PCO contracts.	**Done** FY 05-06 **Ongoing**	GS, DOT, ESD, PRNS
F.	Invite contractors to participate in City training sessions on pesticide management.	Done FY 05-06 Ongoing	GS, DOT, **ESD**, PRNS
G.	Monitoring Mechanism III.A.1. Document number of PCOs receiving presentations and/or training on pesticide use on municipal property.	Annually	GS, **DOT**, ESD, **PRNS**

PM 6 – Pesticide Management Outreach

The City will identify in the annual work plan the outreach activities it will conduct consistent with Program Pesticide Management Plan. Work plan elements will address outreach to residential and commercial pesticide users, pesticide retailers, and special districts. Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the City's own IPM practices, as applicable.

#	Activities	Compliance Date	Responsible Party
A.	Increase awareness of target audiences regarding proper pesticide use, disposal methods, water quality impacts, and less toxic pest management messages. Target audiences include commercial and residential pesticide users, pesticide retailers, municipal employees, and special districts.	Ongoing	ESD
B.	Prepare IPM stories and press releases to local media.	As Needed	ESD
C.	In conjunction with Program, City will provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., VTA, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	As Needed	ESD
D.	Create and provide fact sheets and materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program.	Ongoing	ESD
E.	Monitoring Mechanism: Document or estimate numbers of residents reached by outreach efforts, including events, web promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts by documenting calls to the Program's general and watershed campaign hotlines.	Annually	ESD
F.	**Co-host regional IPM conference to promote implementation of IPM practices in municipal operations in the City and Bay Area region.**	**Done FY 06-07**	**GS, DOT, ESD, PRNS**
G.	Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, recommended in the work plan, to be developed by the Program. Implement evaluation component of the work plan.	Annually	ESD

PM 7 – HHW Pesticide Disposal

The City will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.

#	Activities	Compliance Date	Responsible Party
A.	Work with HHW collection agencies to support, enhance, and publicize programs for pesticide disposal.	Ongoing	ESD
B.	Ensure that adequate pesticide disposal services exist for residents and conditionally exempt small quantity commercial generators.	Annually	ESD
C.	Provide hazardous waste disposal information to residents, through distribution of materials (e.g., utility bill insert, city newsletter, community events, etc.) or advertising in local media.	Ongoing	ESD
D.	Monitoring Mechanism V.A.1. Document that HHW collection programs adequately serve residents and businesses and that exchange programs do not exchange organophosphate or banned pesticides.	Annually	ESD

PM 8 – City Pesticide Use Tracking

The City will develop and implement a process for tracking pesticide use on municipally-owned property.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a pilot pesticide tracking process for Diazinon and Chlorpyriphos products.	Done FY 01-02	**GS, DOT, ESD, PRNS**
B.	Track pesticide use on municipally owned property. Include reporting and justification for use of OP pesticides and BMPs employed during OP pesticide use.	Ongoing	GS, DOT, ESD, **PRNS**
	1. Evaluate feasibility of implementing electronic data management system for pesticide use.	Done FY 04-05	**GS, DOT, ESD, PRNS**
	2. Implement electronic data management system for tracking pesticide use on City property.	Done FY 05-06 Ongoing	GS, DOT, ESD, **PRNS**
C.	Monitoring Mechanism I.A.1. Document completion of tasks in annual reports. Use pesticide tracking process to document pesticide use.	Annually	GS, DOT, ESD, PRNS, PW, ~~RDA~~

PM 9 – City Pesticide Inventory Search

The City will conduct periodic City-wide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. If found, these pesticides will be properly disposed of pursuant to appropriate waste disposal regulations.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Citywide search of chemical storage areas for pesticides no longer legal for application per EPA, State, and/or local requirements. Properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.	Annually	GS, DOT, PRNS

PM 10 – Pesticide Management Plan / IPM Policy Review

As part of annual reporting process and with input from municipal staff, the City will review and evaluate the effectiveness of its Pest Management Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Review and continuously improve goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings, if any.	Annually	GS, DOT, ESD, PRNS, PW, ~~RDA~~
B.	Monitoring Mechanism IX.A.1. Complete revised work plan that incorporates continuous improvement items, and report on completion of work plan tasks.	Annually	GS, DOT, ESD, PRNS, PW, ~~RDA~~
C.	Monitoring Mechanism VII.A.1. Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development and significant redevelopment projects, and percentage of new development/ significant redevelopment projects for which pesticide reduction measures were required. (Draft Permit Provision C.3.n.)	Annually	PW, ESD, ~~RDA~~

Mercury

M Work Plan

The City continues its efforts to reduce or eliminate mercury discharges during municipal operations. Virtual elimination practices employed by the City include: purchasing low mercury-containing fluorescent lamps, recycling spent lamps, recycling spent batteries, and switching to non-mercury-containing apparatus in the Water Pollution Control Plant Laboratory. In 2003, the Program approved a Guidelines document on the management of mercury-containing products by a municipal agency. The City will continue to implement management practices consistent with the guidelines such as collecting and recycling spent fluorescent lamps, batteries, and other electronic wastes. This program element is implemented pursuant to permit provision C.9.c.

Fluorescent lamps for recycling at the Central Service Yard

M 1 – Municipal Use of Mercury-Containing Products

The City will eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

#	Activities	Compliance Date	Responsible Party
A.	Implement SCVURPPP guidelines for mercury-containing products reduction and management. These guidelines include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	Ongoing	ESD, GS
	1. Collect and dispose of mercury-containing lamps generated in City-owned facilities.	Ongoing	GS, ESD
	2. Identify other mercury-containing products for virtual elimination, phase-out and/or proper disposal.	Annually, As Needed	ESD, GS
B.	Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines.	Annually	ESD

M 2 – Household Hazardous Waste Collection

The City will support mercury-containing product disposal services through universal waste and household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

#	Activities	Compliance Date	Responsible Party
A.	Provide mercury-containing products disposal services for residents and small businesses.	Ongoing	ESD-IWM, **County**
B.	Work with Program and HHW collection agencies to develop and help publicize fluorescent light recycling program.	Ongoing	ESD, Program

M 3 – Monitoring and Science

The City will participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

#	Activities	Compliance Date	Responsible Party
A.	Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP steering committee and technical review committee.	Ongoing	ESD
B.	~~The City of San José will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San José through calendar year 2006.~~ **Examine feasibility of enhancing stormwater pollution prevention and control activities on a watershed or sub watershed basis to focus activities in those parts of the Guadalupe River Watershed enriched in mercury from natural or mining-related causes.**	~~12/31/05~~ ~~12/31/06~~ **FY 07-08**	ESD

M 4 – Regional, State, and Federal Coordination

Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

#	Activities	Compliance Date	Responsible Party
A.	Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup, RMP, and the CEP.	Ongoing	ESD
B.	Support and participate in WMI Watershed Action Plan implementation.	Ongoing	ESD

M 5 – Public Education and Outreach

Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees.

#	Activities	Compliance Date	Responsible Party
A.	Coordinate with Program and HHW collection agencies ~~to develop and~~ implement a mercury-containing product outreach program to educate selected target audience and encourage proper use and disposal of mercury-containing products.	Ongoing	ESD, Program, County HHW
B.	Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	Ongoing	ESD
C.	Attend community events and distribute outreach materials. (See Attachment A: Outreach Activities Summary)	Ongoing	ESD
D.	Monitoring Mechanism V.B. Document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	Annually	ESD, Program

Copper / Nickel Action Plans

CNAP Work Plan

This element is implemented pursuant to provisions C.9.a and b of the stormwater permit. Activities in the copper and nickel action plans are attributed largely to the South Bay POTWs and to SCVURPPP as the responsible entities. Some activities, however, require specific actions by SCVURPPP Co-Permittees or specified municipalities, such as increasing awareness of copper and nickel with businesses that are also NOI filers (please see IND 1 for a description of NOI filers). Summarized here are activities pursuant to implementation of the baseline actions included in the Copper and Nickel Action Plans. These are in addition to those undertaken by SCVURPPP as a program. A complete update on implementation of the Action Plans can be found in the SCVURPPP Annual Report.

CB-1 – Vehicle Washing Operations

#	Activities	Target Date	Responsible Party
A.	Have member of San José team trained and available to lead mobile cleaners' certification seminar.	As Needed	
B.	Support Program in hosting mobile cleaners' certification seminar.	**Done** FY 06-07	ESD
	1. Promote list of recognized mobile cleaning service providers.	Ongoing	ESD
C.	Distribute coupons in support of Program partnership with Western Car Wash Association.	As needed, dependant on Program activities	Program, ESD

CB-3 – Industrial Discharges

#	Activities	Target Date	Responsible Party
A.	Continue Distribution of information regarding copper from roof vents.	Ongoing	ESD
	1. Continue rooftop inspections. Evaluate efforts and need for any additional effort.	Done FY 05-06	ESD
B.	Mail NOI Package, with information on the GIASP and how to comply, to targeted industrial facilities.	6/30/06 **Done FY 05-06**	ESD

CB-8 – Watershed Assessments and New Development

#	Activities	Target Date	Responsible Party
A.	**Review new and redevelopment project review procedures and update or refine procedures to minimize copper pollution.** See NRD sections **3, 4, and 9** for details on San José's implementation of C.3 permit provisions.	**Done FY 02-03**	**ESD, PBCE, PW, RDA**

CB-11 – Street Sweeping and Storm System O&M

#	Activities	Target Date	Responsible Party
A.	Track quantitative data on the tons of material removed and disposed of and other relevant street sweeping program data.	Annually	ESD-IWM DOT

CB-12 – Pools and Spas

#	Activities	Target Date	Responsible Party
A.	Distribute outreach materials at events, public counters, and post on City website.	Ongoing	ESD
B.	Provide guidance to residents on disposal alternatives for pool and spa water.	Ongoing	ESD

CB -21 – Architectural Use of Copper

#	Activities	Target Date	Responsible Party
A.	Continue to discourage architectural use of copper during Planning application review.	Ongoing	PBCE-Planning
B.	Continue to monitor progress of San José Green Building program to identify opportunities for discouraging architectural use of copper.	Ongoing	PBCE-Planning ESD-P&P

NB-1 – Discharges from Construction sites

#	Activities	Target Date	Responsible Party
A.	~~See NRD and CON program elements for activities that address erosion control.~~ **Implement performance standards for construction inspection.**	**See NRD 6 and CON program element for activities that address erosion control.**	**ESD, PBCE, PW**
B	**Participate in the Water Board's regional training of construction site inspectors.**	**See NRD 6 and CON program element for activities that address erosion control.**	**ESD, PBCE, PW**

Trash

TRA Work Plan

Volunteers removing trash from Coyote Creek behind San Jose High Academy

The purpose of the Trash program is to address litter and illegal dumping that threatens to pollute urban waterways. The impetus for this program was the 2001 Water Board Staff Report recommending that all urban creeks, lakes, and shorelines be placed on a monitoring list due to the threat of trash impairment to water quality. The City's activities focus on assistance with the development and implementation of an effective trash strategy, ongoing trash evaluations in high priority areas, implementation or refinement of trash management practices, and piloting the use of structural controls for trash. This program element is implemented pursuant to the Program's Trash Work Plan and provision C.1 of the permit.

TRA 1 – Inventory, Document and Evaluate Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Complete Program survey of existing trash management practices.	Done FY 03-04	ESD

TRA 2 – Document and Map Known Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/ incidents and eradication efforts).	Done FY 03-04	ESD
B.	Compile trash problem location data/information and submit to Program for conversion to coordinates for GIS mapping.	Done FY 03-04	ESD
C.	Revise and update documentation (list of locations, maps, etc.) of known trash problem areas.	As Needed	ESD
D.	Continue identifying and prioritizing trash problem areas in urban streams and waterways and other potential sources that may contribute trash to those areas.	Annually	ESD, PRNS, DOT, PD

TRA 3 – Conduct Trash Evaluations

#	Activities	Target Date	Responsible Party
A.	Work with Program to select trash evaluation methodology.	Done FY 03-04	ESD

#	Activities	Target Date	Responsible Party
B.	Assist Program with planning and organizing of training workshop for municipal staff.	Done FY 03-04	ESD
C.	Participate in the trash evaluation methodology training workshop.	Done FY 03-04	ESD
D.	Conduct trash evaluations and submit to Program staff.		ESD
	1. Coyote Watershed	Done FY 04-05	ESD
	2. Remaining San José locations	**Done** FY 05-06	ESD
E.	Continue trash evaluations in high priority areas using the Program's Urban Rapid Trash Assessment protocol (version 1.0) and/or the KAB litter index in a subset of trash problem areas to track changes over time.	Ongoing	ESD

TRA 4 – Develop Standardized Documentation and Reporting Format

#	Activities	Target Date	Responsible Party
A.	Work with Program to develop a reporting format to document trash management activities in Annual Reports.	Done FY 03-04	ESD

TRA 5 – Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Assist Program staff with the documentation and analysis of trash evaluation results.	Ongoing	ESD
B.	Identify high priority trash areas using trash evaluation results.	Ongoing	ESD
	1. Coyote Watershed	Done FY 04-05	ESD
	2. Remaining San José locations	**Done** FY 05-06	ESD

TRA 6 – Identify and Implement Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Identify reasonable trash management practices to address high priority areas (in TRA 5B).	Ongoing	ESD, PRNS, GS, DOT
B.	Implement or refine trash management practices at high priority areas to the maximum extent practicable.	Ongoing	ESD, PRNS, GS, DOT
C.	Document and ~~report~~ **evaluate** implementation of trash management actions.	Ongoing	ESD
D.	Provide Program with information on assessments and trash management practices implemented using standardized reporting format.	Annually	ESD
E.	Provide Program with trash assessment data forms.	Annually	ESD

#	Activities	Target Date	Responsible Party
F.	**Assist Program in developing Trash Fact Sheets.**	**TBD by Program**	**ESD**

TRA 7 – Review and Update Performance Standards and Develop Long-Term Strategy for Trash Management

#	Activities	Target Date	Responsible Party
A.	Assist with the review and update of existing standards that address BMPs or control measures relevant to trash management.	TBD by Program	ESD
B.	Assist Program staff in developing **and implementing** an effective long-term strategy for trash conditions in urban streams and waterways.	~~Done FY 05-06~~ Ongoing	ESD

TRA 8 – Implement a Pilot Demonstration Project

#	Activities	Target Date	Responsible Party
A.	Assist Program in implementing a pilot project to address trash conveyed through the storm drain system.	~~FY 06-07~~ **Ongoing as necessary**	ESD, DOT, PW
B.	Begin piloting the use of structural controls to prevent trash from entering the storm sewer system.	~~FY 06-07~~ **Ongoing as necessary**	ESD, DOT, PW
C.	Pursue grant funding to support installation of structural controls for trash management.	~~Done FY 05-06~~ **As Needed**	ESD, DOT, PW
D.	**Evaluate the effectiveness of the pilot structural controls.**	**Ongoing as necessary**	**Program, ESD, DOT, PW**

Monitoring

MON Work Plan

Monitoring activities required in the stormwater permit are generally implemented in collaboration with other agencies. The City continues to participate in monitoring activities area-wide, including Regional and Program-focused investigation of pollutants and sources of pollutants to the storm drain system. The City also provides input and support to the Program's multi-year monitoring program, and reviews work products as various Program-level projects are designed and completed.

The City, in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) has submitted, to the Water Board, a Multi-Year Receiving Waters Monitoring Plan required per permit provision C.7.b. The final version of the plan was submitted August 5, 2002 and revised March 1, 2004. The Multi-Year Plan covers a number of pollutant control programs required by C.7 and C.9 provisions of the permit. The City continues to support Program staff in the implementation of the plan by commenting on annual plans, providing guidance for sampling within the City, and participating in the Watershed Analysis Ad Hoc Task Group.

The 2001 C.9 permit provisions require implementation of control programs for Copper, Nickel, Mercury, Pesticides, PCBs, and Dioxin-like compounds. The City continues to support and assist the Program efforts to address these control and monitoring efforts. Additionally, the City is actively involved as stakeholder and workgroup member for the Guadalupe Mercury TMDL effort, and will continue to contribute and comment on products and reports generated by Baywide TMDLs for copper, nickel, mercury and PCBs. City Staff also actively participate in Clean Estuary Project activities through the PCB workgroup and Diazinon and Pesticide Related Toxicity workgroup.

ESD Biologist collecting field data from Coyote Creek

PCB Control Program

Analytical characterization work to support the PCB Control Program, required under provision C.9.e, has been completed. The Program is currently working on next steps with BASMAA and CEP.

Initial PCB analysis was performed on sediments found in selected urban storm drain systems. At this point, no known controllable sources of PCBs have been identified. Results of the follow-up analytical work have been reviewed and further sampling work to identify controllable

sources was undertaken in October and November of 2002. The SCVURPPP Program submitted the final PCB Control Plan March 1, 2002, and the Control Program Work Plan July 1, 2002. In addition, the City continues to implement activities described in "Next Steps" from the Year Two PCB Case Study Report submitted to the Water Board in July 2003.

#	Activities	Compliance Date	Responsible Party
A.	Sample, analyze, and report on PCBs in storm drain sediments to characterize potential sources and implement controls.	Done, 6/00 through FY 01-02	Program, ESD
B.	Begin implementation of final PCB Control Plan upon approval.	Done FY 02-03 & Ongoing	ESD

Dioxin-like Compound Control Program

Characterization of dioxins based on existing data has begun Program-wide. The Program is now collaborating with BASMAA and CEP to develop a conceptual model/impairment assessment document. City Staff provide comments to the Program and directly to CEP in support of this process.

This Dioxin-like Compound Control Program will develop procedures to identify, assess, and manage controllable sources of Dioxin-like compounds found in urban runoff.

#	Activities	Compliance Date	Responsible Party
A.	Characterize distribution of Dioxin-like compounds in the urban runoff system based on existing data.	Done FY 01-02	Program
B.	Begin implementation of SCVURPPP plan to characterize distribution of Dioxins.	In Progress at Program Level	Program
C.	Submit plan that identifies control measures / management practices to eliminate or reduce discharges of Dioxins, if needed.	TBD	Program
D.	**Explore, and implement if feasible, efforts to move toward alternative fuels for diesel vehicles in City fleet.**	**FY 06-07 Ongoing**	**ESD, DOT, GS**

Sediment Control Program

The City's sediment control program falls predominantly within the Construction Inspection (CON) section of this work plan. Sediment monitoring activities also continue in conjunction with the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

Pilot Monitoring Programs

In addition to the above listed control programs, the City concluded activities performed in support for the two Monitoring Pilot Programs that were begun in 1997. These pilot programs generated data that helped develop the follow-on programs of IND (outreach to industrial and commercial dischargers) and the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

MON 1 – Industrial Stormwater Monitoring Pilot Program

This program sampled key industrial sites to determine the significance of metal-contaminated stormwater discharges associated with industrial activities. The ultimate objective from this project of educating industrial and commercial dischargers about developing and implementing SWPPPs and BMPs has now been turned over to the Industrial and Commercial Dischargers section of this work plan under IND.

#	Activities	Compliance Date	Responsible Party
A.	Design and execute a sampling program to meet the project objectives, analyze results, develop guidance for industry to improve SWPPP implementation, and provide technology transfer information to industry and inspectors.	Done, FY 96-97 through 01-02 Ongoing as part of IND	ESD

MON 3 – First Flush Monitoring Program

First flush discharge areas along The Coyote Creek and Guadalupe River were monitored for three wet seasons. The City provided data to the Program for analysis and comparison to other data in June of 2002. The Program submitted a final report to the Water Board in 2003; it was included as appendix C-2 in the Program's 02-03 Annual Report.

#	Activities	Compliance Date	Responsible Party
A.	Conduct multi-year First Flush study sampling, analyze data and provide data to Program as part of Multi-year Monitoring Program.	Done, FY 96-97 through 02-03	ESD, Program

Municipal Compliance

Fuelling island at Mabury Corporation Yard

This program element summarizes the City's efforts to train City staff on pollution prevention practices and to ensure that City facilities comply with stormwater requirements. Municipal training continues to be a key element for most program elements. Specific program elements that include municipal training activities include ICID 3, IND 5, NRD 11, CON 6, CON 8, PSR 2, PSR 3, PSR 6, SDO 3, SDO 4, PM 4, and WUO&M 3. In order to ensure that City facilities comply with stormwater requirements, Corporation Yards are routinely inspected by ESD staff and the results and improvements discussed with Yard staff. Additionally, Stormwater Pollution Prevention Plans (SWPPPs) that govern the operation of Corporation Yards are also used to ensure that Yards are using current stormwater BMPs. For a list of planned training activities, see Attachment B: Municipal Training Schedule.

Municipal Training

Municipal Training is a critical function of the City's NPDES Permit. Municipal compliance is dependent on the level and quality of the training provided.

#	Activities	Compliance Date	Responsible Party
A.	Identify training needs.	Annually	ESD-UR
	1. Conduct training for City staff and City contractors that perform surface cleaning at City facilities.	**FY 06-07 Annually**	**DOT, GS, ESD**
B.	Develop curricula.	As Needed	ESD-UR
C.	Conduct training.	Ongoing	ESD-UR
D.	Evaluate municipal training program and make improvements as needed.	Annually	ESD-UR

Municipal Facilities Assessment and Compliance

Municipal facilities are required to comply with stormwater regulations. Efforts to reduce contaminated discharges from City facilities must be similar to those required of private businesses. While many elements for permit compliance are in place, the City requires a systematic approach to City facilities compliance at the level of effort required in the URMP.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Corp Yard assessments and inspections.	Annually	ESD-UR, GS, DOT

#	Activities	Compliance Date	Responsible Party
	1. Conduct Citywide meeting to discuss Hazardous Material, Safety, and Stormwater issues for City corporation yards (up to two times per year).	Annually	GS, ESD, DOT, Fire, Police
	2. Revise Corporation Yard inspection form.	Done FY 05-06 As Needed	ESD-UR
B.	Review Municipal Facilities SWPPPs.	Annually	ESD-UR, GS, DOT
	1. Fully revise the five (5) remaining Corporation Yard SWPPPs (using the Main Yard revised SWPPP pilot process as a template).	6/30/07	ESD-UR, GS, DOT
C.	Conduct SWPPP training at City corporation yards.	Annually	ESD-UR, GS, DOT

Public Information / Participation

PIP Work Plan

This program is implemented in accordance with provision C.4 and includes general outreach, targeted outreach, educational programs, and public participation activities. The City has a robust and broad-based public information and public participation program, utilizing many different outreach methods to best deliver stormwater pollution prevention and watershed protection messages. Conducting outreach to the community and providing opportunities for participation in water quality protection activities are critical to evoking the behavior changes needed to manage stormwater quality. They are also important for garnering the support needed to continue and expand services and programs. Examples of outreach activities include: stenciling of storm drain inlets throughout the City, training sessions for staff and developers about stormwater runoff construction requirements, and conducting Wacky Watershed teacher training workshops.

Watershed Protection Engineer educating 3rd graders at the Water Wizards Festival

Outreach in Other Elements

Other sections of this work plan contain elements related to outreach to specific target audiences. They can be found in ICID 4, IND 6, NRD 2, CON 7, PM 6, M 5, CB-1, CB-3, and CB-12. For a list of planned outreach activities, see Attachment A: Outreach Activities Summary.

PIP 1 – General Outreach

The City of San José will promote general citizen awareness of what a watershed is, the functions of the storm drain system, pathways and sources of urban runoff pollution to the South Bay watershed, and behaviors that adversely affect water quality.

#	Activities	Compliance Date	Responsible Party
A.	Participate in WMI Outreach, and coordinate WMI outreach with Watershed Watch and Program efforts.	Ongoing	ESD, WMI, Program
	1. Participate in Watershed Watch campaign.	Ongoing	ESD, Program
B.	Identify, support and participate in appropriate community events to further general public awareness.	Ongoing	ESD
	2. Work with Watershed Watch Events work group.	Ongoing	ESD, Program
C.	Give presentations upon request that focus on stormwater messages to elementary through college grade levels, neighborhood groups, etc.	As Needed	ESD

PIP 2 – Targeted Outreach

The City of San José will develop and implement targeted residential outreach and education campaigns, based on high priority pollutants, to effectively reduce pollutant-causing behaviors and promote Best Management Practices.

#	Activities	Compliance Date	Responsible Party
A.	Identify general residential practices contributing to stormwater pollution. Identify reasonable alternatives to pollutant causing behavior.		ESD, Program
	1. Review surveys and applicable reports.	Ongoing	ESD
	2. Meet with inspectors to discuss and document residential outreach needs.	Ongoing	ESD
	3. Prepare report identifying residential outreach needs and tasks and conduct outreach as necessary.	Annually	ESD
B.	Identify ICID practices and target audience(s) contributing to pollution.		ESD
	1. Review ICID reports.	Ongoing	ESD
	2. Meet with ICID inspectors to discuss and document outreach needs.	Ongoing	ESD
	3. Prepare report identifying ICID outreach needs and tasks and conduct outreach as necessary.	Annually	ESD
C.	Promote selected residential and ICID messages through local and regional activity (e.g. Program PIP, BASMAA PIP, BAPPG, Media Relations, etc.).		
	1. Report on targeted residential and ICID outreach activity.	Annually	ESD
	2. Participate in the Program's Pesticide and Mercury ad hoc task groups.	Ongoing	ESD, Program

PIP 3 – Educational Programs

The City of San José will support and/or develop and implement educational programs designed to increase youth understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support, and/or develop and implement school and youth education programs.		
	1. Participate in WE&O Schools and Youth work group.	Ongoing	ESD, Program
	2. Participate in the Alviso Education Center work group.	Ongoing	ESD, Program
	3. Participate in City Education programs such as the Youth Watershed Education Team, Rangers in Schools, **Go Green Initiative**, etc.	Ongoing	ESD

PIP 4 – Citizen Participation

The City of San José will support and/or develop and implement citizen involvement programs designed to increase citizen understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support and/or develop involvement opportunities for San José residents.		
	1. Participate in creek clean-ups on a biannual basis through in-kind staff support for the Creek Connections Action Group.		
	a. Fall creek cleanup (Coastal Cleanup Day).	Annually~~, Q1~~	ESD, PRNS
	b. Spring creek cleanup (National Rivers Day).	Annually~~, Q4~~	ESD, PRNS

PIP 5 – Outreach Evaluation

The City of San José will evaluate its Outreach efforts for effectiveness.

#	Activities	Compliance Date	Responsible Party
A.	Implement selected evaluation tools.		ESD
	1. Work with Program, WMI, and Watershed Watch AHTG to Plan for Program's Watershed Watch Campaign Survey.	As Needed	ESD, Program
	2. Report on survey and evaluation activity during the report period.	Annually	ESD
B.	Annually review, modify and report on outreach plans based on effectiveness results.		ESD
	1. Document in Annual Report effectiveness of outreach activities conducted in prior fiscal year.	Annually	ESD

Permit Reapplication

ESD staff evaluating draft Municipal Regional Permit.

The City's current NPDES permit was adopted in February 2001 for a five-year period. The permit was amended in October 2001 and July 2005, with both amendments relating to the New and Redevelopment stormwater treatment and hydromodification provision, also known as Provision C.3. The permit has been administratively extended since February 2006, pending the adoption of the Bay Area-wide Municipal Regional Permit.

In late 2005, the Water Board embarked on a multi-stakeholder process to craft an NPDES permit, called the Municipal Regional Permit (MRP) that would apply to all municipal stormwater dischargers in the Bay Area and be in effect for a five year period. The Water Board is expected to adopt the MRP during the 07-08 fiscal year. The adoption of the MRP would necessitate the development of a new City work plan which will identify activities with associated timelines that are required in order to achieve compliance with the stormwater requirements set forth in the MRP.

Permit Reapplication Preparation

#	Activities	Target Date	Responsible Party
A.	Compile all changes to URMP as part of reapplication for next permit. (C.2.b)	Done FY 04-05	ESD
B.	Participate in permit development and negotiation processes.	Ongoing	ESD
C.	**As required, develop new five-year work plan that starts the following fiscal year upon adoption of MRP.**	**FY 07-08**	**ESD**

Attachment A: Outreach Activities Summary

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	❍ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
1.	**Storm Drain Stenciling Evaluation** Evaluate current methods of inlet marking and make recommendations for future FY efforts.	❍		FY 07-08	
2.	**Requests for Brochures** Distribute outreach materials upon request.	❍	PIP 1.C	FY 07-08	♦ Materials distributed
3.	**Regional partnerships** Participate in BAPPG, BASMAA/BACWA Media Relations campaign, CEP, etc.	❍	PIP 2.C	FY 07-08	
4.	**Event Support** As needed, staff Booth and/or provide outreach materials to select events. Evaluate the overall benefit and effectiveness of attending events and make changes as needed.	❍	PIP 1.B	As needed	♦ Materials distributed
5.	**BMP Reprints** Reprint selected Outreach materials as needed.	❍	PIP 1	FY 07-08	♦ n/a
6.	**Industrial Users Academy** Give stormwater, pollution prevention and GIASP compliance information to industries permitted to the Water Pollution Control Plant.	◎: Plant-permitted Industries	IND 6.A, PIP 2.B, PM 6.A, M 5.B	FY 07-08	♦ Participant surveys
7.	**Outreach to Development Community** PW & ESD staffs to conduct training on erosion and sediment control for private developers of type 2 projects. PBCE Planning and PW also conduct roundtable meetings with developers where information regarding stormwater requirements is shared.	◎: Developers	CON 7 NRD 2	FY 07-08	♦ Participant surveys
8.	**IPM Store Partnership** (PROGRAM) Create & provide fact sheets & materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program. There are currently nine stores in San José participating in the IPM store partnership.	◎	PM 6.D.	FY 07-08 dates TBD	
9.	**Partner with other City programs, such as the Strong Neighborhoods Initiative** Continue partnering with City's SNI for delivering selected messages. Other programs to investigate partnerships are the Anti-Litter Program, After School Program, etc.	◎	PIP 1	FY 07-08	
10.	**Mercury Outreach** Investigate opportunities to include mercury messages through participation in the Home Show	◎	M 5 PIP 2.C.	FY 07-08	

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	○ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
	events, residential newsletters or other mailings, and support the County's Universal Waste Take-back Pilot Program.				
11.	**IPM Outreach** Prepare IPM stories and press releases for local media. Investigate opportunities to include IPM messages in the City's outreach to businesses.	◎	PM 6.A PM 6.B	FY 07-08	
12.	**Facility/Building Manager Outreach** Distribute e-mail newsletter to General Services Building/Facilities Managers with information on selected messages.	◎	PM 6.A M 1.A	FY 07-08	
13.	**Coastal Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Fall 07	♦ Participant surveys ♦ Amount picked up
14.	**National Rivers Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Spring 08	♦ Participant surveys ♦ Amount picked up
15.	**Wacky Watersheds Workshops** Present South Bay Water Connections curriculum to middle school educators within San Jose/Santa Clara Water Pollution Control Plant service area.	✎	PIP 3.A	FY 07-08	♦ Participant surveys ♦ Follow-up call of attendees
16.	**Water Awareness Program** Also called Rangers in Schools. Presentations focusing on Pollution Prevention. *It's Wet It's Wild It's Water!* Curriculum distributed to teachers.	✎	PIP 3.A	FY 07-08	♦ Survey of teachers ♦ Survey of students
17.	**Slow the Flow** Grant to Don Edwards Alviso Environmental Education Center to host 9 different types of events: special events, interpretive programs, teacher orientation, field trips, in-class presentations, outreach presentations, workshops, special visits and interpretive displays.	✎	PIP 3.A	FY 07-08	♦ Done by Grantee
18.	**Youth Watershed Education Grants** Grant program for educators.	✎	PIP 3.A	FY 07-08	♦ Audit of projects
19.	**Website** Maintain and update website with pertinent information as needed.	○	PIP 1	FY 07-08	♦ Website traffic data
20.	**ICID Targeted Outreach** Targeted outreach to areas that exhibited a high number of residential ICID Complaints in FY 06-07.	◎	PIP 2.C	FY 07-08	♦ TBD
21.	**Charity Car Wash Kit** Explore the option of providing targeted outreach and supplies to community groups engaging in fundraising car wash events.	◎		FY 07-08	♦ TBD

Attachment B: Municipal Training Schedule

PS ID #	Topic	Sponsored or Held By	Dept/Division/Section Attending	# Sessions	Tentative Schedule
ICID 3	Construction Inspection Training	ESD - WE	ESD - WE	1	07/07
ICID 3	Annual Training for ICID Inspectors	ESD - WE	ESD - WE	1	07/07
IND 5	Training for IND Inspectors	ESD - WE	ESD - WE	1	07/07
CON 6	Wet Weather Construction Site Preparation & Inspection	DPW, ESD	PW	2	9/07
CON 6	Construction Site Planning and Management For Water Quality Protection	SCVURPPP & Water Board	PW, ESD, PBCE, PRNS		9/07
CON 6	SOPs for inspections during wet and dry season to include procedures for erosion control plan review inspection process	DPW, ESD	PW Inspections, PBCE Building Inspectors (All to attend at least once every two years)		10/07
CON 7	Erosion & Sediment Control Training for Type 2 Private Development Projects	DPW & ESD	Private Developers, PW, ESD		10/07
CON 8	Erosion Control Information To Be Included In Contract Language For Capital Improvement Projects Training For PW Construction Project Management	PW & ESD	PW		11/07
NRD 10	NPDES C.3 Training	Various	PBCE, PW, RDA, ESD		
PSR 2	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/08
PSR 3	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/08
PSR 6C	Stormwater Pollution Prevention Training – Rural Public Works	PRNS, ESD	PRNS	2	10/07
SDO 3A	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/08
SDO 4	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/08
PM 4A	Worker Safety training per DPR requirements	GS, DOT, PRNS, ESD	GS, DOT, PRNS, ESD	1	2/08
PM 4B	Training on IPM Policy & Techniques	GS, DOT, PRNS, ESD	GS, DOT, PRNS, ESD	1	2/08
WUOM 3	Water Utility Operation & Maintenance Discharge Training	ESD (Muni Water)	Muni Water Operations & Maintenance Crews		12/07

Glossary

AHTG	Ad Hoc Task Group
AOC	Area of Concern
BACWA	Bay Area Clean Water Agencies
BAPPG	Bay Area Pollution Prevention Group
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practices
CAO	City Attorney's Office
CEP	Clean Estuary Partnership
COS	Communications and Outreach Subgroup of WMI
DOT	Department of Transportation
EEC	Environmental Education Center
EIR	Environmental Impact Report
ESD	Environmental Services Department
ESD-P&P	Policy and Planning
ESD-MarComm	Marketing & Communication Section
ESD-Muni	City of San José Municipal Water System
ESD-R&R	Regulations and Research Section
ESD-UR	Urban Runoff Section
ESD-WE	Watershed Enforcement Section
GIASP	General Industrial Activities Storm Water Permit
GS	General Services Department
HHW	Household Hazardous Waste
HMP	Hydromodification Management Plan
IPM	Integrated Pest Management
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PBCE	Department of Planning, Building and Code Enforcement
PBCE-Bldg	Building Division of PBCE
PBCE-Planning	Planning Division of PBCE
PD	Police Department
POTW	Publicly Owned Treatment Works
PRNS	Department of Parks, Recreation and Neighborhood Services
PW	Public Works Department
PW-CFAS	City Facilities Architectural Services Division of PW
PW-ECS	Engineering and Construction Services Division of PW
PW-TDS	Transportation & Development Services of PW
RDA	Redevelopment Agency
RWQCB or Water Board	Regional Water Quality Control Board
SCVURPPP or Program	Santa Clara Valley Urban Runoff Pollution Prevention Program
SNI	Strong Neighborhoods Initiative
SOP	Standard Operating Procedure

SWPPP	Storm Water Pollution Prevention Plan
TBD	To Be Determined
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
WE&O, or WEO	Watershed Education and Outreach
WMI	Watershed Management Initiative
WUPPP	Water Utility Pollution Prevention Program
YWET	Youth Watershed Education Team

City of San José
Urban Runoff Management Plan
FY 08-09 Work Plans

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Cover Pictures

First Row:

1) The wetlands of South San Francisco Bay, with the Diablo Mountain Range to the east.

Second Row:

1) Volunteers collecting trash from Coyote Creek behind San José High Academy.

2) Thompson Creek as it flows through Aborn Park.

Third Row

1) Vegetated swale at The Ranch Golf Club in the City's Evergreen district.

2) Department of Transportation crew cleaning a storm drain catch basin in a neighborhood near Almaden Lake Park.

3) A storm drain inlet stenciled with the name of the nearest creek and the City's stormwater dumping complaint phone number.

City of San José

Urban Runoff Management Plan

Chapter 11:

Santa Clara Valley Urban

Runoff Pollution Prevention Program

Attachment 1: FY 08-09 Work Plans

Prepared by the Environmental Services Department

March 1, 2008

009662

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Key to revisions in the Work Plans

Bold text ..... Bold text indicates elements that have been added to the Work Plans since the URMP FY 07-08 Work Plans approved in March 2007

~~Strikethrough text~~ ..... Strikethrough text indicates elements that have been deleted from the Work Plans since the URMP FY 07-08 Work Plans approved in March 2007

Introduction

This compilation of annual work plans for the City of San José Urban Runoff Management Plan (URMP) has been developed for FY 2008-2009 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. The work plans include tasks, responsibilities, and schedules needed to implement the program elements in the URMP with the overall intent to reduce stormwater pollution in the City's storm drains, creeks and rivers. The Environmental Services Department coordinates development and review of the work plans in cooperation with staff from all affected City departments.

The Permit requires that annual work plans be submitted to the Water Board by March 1 of each year. This submission precedes completion of the City's annual budget development and approval process. While the work plans are developed using the best available information regarding budget forecasts, all activities in the work plans are subject to the approval of funding by the City Council in June of each year.

Additionally, the work plans address program needs as defined by the current permit and do not include new, expanded, or redirected efforts contemplated in the Tentative Order for the Municipal Regional Permit currently released for comment. Until the MRP is adopted, it is not practical to specify additional tasks at this time given the scope and pervasiveness of the proposed requirements across the City's programs. Rather, the City is prepared to revise work plans as needed to reflect the MRP after adoption.

Alum Rock Library detention pond, a stormwater treatment measure.

The City of San José is committed to managing and protecting stormwater quality and dedicates significant resources to a variety of activities designed to address stormwater quality issues. The City actively participates in many local and regional efforts designed to leverage the most value for its resources and citizens and strives to be a leader in watershed protection.

Illicit Connection / Illegal Dumping

ICID Work Plan

The City's Environmental Inspectors assigned within the Environmental Services Department (ESD) Watershed Protection Division respond to complaints regarding illegal discharges or threats of discharge to the storm sewer system. Residential incidents are typically the most frequent type of complaint, with vehicle-related sources being most common. Dumping of various materials is also a prevailing source of incidents. ESD responds to all complaints with education and enforcement in partnership to achieve compliance and prevent future incidents. This program element is implemented pursuant to permit provision C.2 and C.6.a.ii.

Storm drain inlet stenciled with hotline number and local creek name.

ICID 1 - Response to Complaints

The City of San José will respond to complaints regarding ICID dumping activities into the storm drain system and will ensure that the activity has ceased or is on a time schedule to cease.

#	Activities	Compliance Date	Responsible Party
A.	Update database system to track ICID complaint information.	Done FY 02-03	ESD-WE
B.	1. Document complaint activity, the number of ICID complaints that the City received, and that the activity has ceased or is an allowable discharge.	Annually	ESD-WE
	2. Prepare draft complaint activity data tables to review trends and to facilitate timely evaluation of the data.	Annually, Q3	ESD-WE
C.	Document to the Water Board annually follow-up activities from each ICID complaint response.	Annually	ESD-WE
D.	1. Review effectiveness of standard operating procedures for responding to ICID complaints.	Ongoing	ESD-WE
	2. Refine and implement standard operating procedures for responding to ICID complaints/referrals.	As Needed	ESD-WE
E.	Work with SCVURPPP to refine administrative procedure for providing referrals to the Water Board.	Pending Implementation by Program	ESD-WE, Program
F.	Refine and implement standard operating procedures to incorporate results of ICID 1E.	Pending Implementation by Program	ESD-WE, Program

ICID 2 - Investigations of High Priority Areas

The City of San José will conduct investigations of high priority areas. High Priority is defined as areas with a high potential for non-storm water discharges to the City's collection system.

#	Activities	Compliance Date	Responsible Party
A.	Target areas for monitoring by identifying high priority areas, primary types and sources of ICID pollution based on complaints, historical inspection records, inspector knowledge, and monitoring information.	Annually	ESD-WE
	1. Perform GIS analysis on frequently occurring ICID sources and/or types.	Done FY 03-04	ESD-UR
	2. Perform outreach in targeted areas based on GIS analysis and other analyses as available. See PIP 2 for details.	Annually	ESD-UR & WE
B.	Conduct investigations of high priority areas based on ICID 2A.	Ongoing	ESD-WE
C.	Document to the Water Board that investigations of high priority areas have been conducted.	Annually	ESD-WE

ICID 3 - Inspector Training

The City of San José will ensure that ICID inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for ICID inspectors.	Annually, Q1	ESD-WE
B.	Provide and document on-the-job training and other training opportunities, such as inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

ICID 4 - Outreach and Technology Transfer

The City of San José will distribute outreach and technology transfer material containing applicable control measures and/or BMPs to target parties responsible for ICID activities.

#	Activities	Compliance Date	Responsible Party
A.	Determine need for new and/or revised outreach and technology transfer material by getting feedback from inspectors regarding 1) continuing problem activities; 2) discharge types; 3) monitoring and complaint data; and 4) usefulness of existing outreach and technology transfer material.	Ongoing	ESD-MarComm ESD-UR
B.	Develop, audit and/or modify existing outreach material, as needed, based on report developed under ICID 4A.	As Needed	ESD
C.	Document to Water Board that outreach and technology transfer material and/or BMPs have been distributed.	Annually	ESD-UR

#	Activities	Compliance Date	Responsible Party
D.	Develop and implement standard operating procedures to gather customer feedback on ICID services.	Development Done FY 02-03 Implementation Ongoing	ESD-WE

ICID 5 - SOPs Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its SOPs in responding to complaints regarding illicit connections and illegal dumping activities into the storm drain system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate effectiveness of SOPs.	Annually	ESD-WE
B.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

Industrial & Commercial Dischargers

IND Work Plan

The City's Environmental Inspectors, located within the Watershed Protection Division of the Environmental Services Department, inspect more than 4,000 businesses per year to ensure that proper practices are employed to prevent stormwater pollution. How frequently a business is inspected depends on their potential for contributing pollutants as determined by previous inspection results. This method of assigning inspection frequencies has been effective in focusing limited inspection resources on high priority cases to best protect water quality. Generally, over 70% of the businesses inspected are found to have no significant stormwater issues and thus do not warrant near-term re-inspection. When issues are identified, education and enforcement are used together to achieve compliance. This Program element is implemented pursuant to permit provision C.2.

A City inspector explains stormwater Best Management Practices to a downtown restaurateur.

IND 1 - Notice of Intent (NOI) Filers

The City of San José will conduct inspections of those facilities that have filed an NOI with the State and appear on a list provided by the State. An NOI is required to be filed with the State by companies that are considered to have a high potential to contaminate stormwater and are classified under certain standard industrial classification (SIC) codes.

#	Activities	Compliance Date	Responsible Party
A.	Annually, obtain NOI filer database from State with annual information, review information and identify new NOI facilities for inspection the following year.	Annually	ESD-WE
B.	Conduct and document initial inspections of NOI Filers within one year using the inspector checklist form to determine exposure and assign a future inspection frequency to each facility accordingly. Document whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site.	Ongoing	ESD-WE
C.	Conduct and document annual inspections of facilities determined to have exposure in accordance with inspection frequency schedule.	Ongoing	ESD-WE
D.	Conduct and document inspections of facilities that need to file an NOI at least once every five years and in accordance with the inspection frequency schedule identified in IND 3.	Ongoing	ESD-WE

#	Activities	Compliance Date	Responsible Party
E.	Maintain the database to track the inspection information from the inspector checklist and to include all NOI filer SIC codes required by the Industrial Activities Stormwater General Permit.	Ongoing	ESD-WE

IND 2 - Non-Filer Investigations

The City of San José will inspect industrial facilities that may be subject to general permit requirements but are not found on the NOI filer list provided by the State and that conduct activities identified by the following SIC codes:

5015: Automobile Dismantlers

5093: Other Recycling Industries

3200 series: Stone, Clay and Concrete Products Industry

4100 & 4200 series: Trucking Facilities that perform on-site vehicle repair, maintenance or washing.

#	Activities	Compliance Date	Responsible Party
A.	Identify industrial facilities that conduct activities with the SIC codes listed in the IND SOPs.	Annually	ESD-WE
B.	Develop a list of facilities targeted for inspection during upcoming year that may be subject to general permit requirements for NOI based on business licenses, etc.	Annually	ESD-WE
C.	Conduct and document initial inspections of industrial facilities with the SIC codes listed referenced in IND 2A, using the inspector checklist form to document whether the facility constituted a potential threat to discharge pollutants to the storm drain collection system, whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site. Maintain database.	Ongoing	ESD-WE
D.	Conduct and document annual inspections of facilities determined to have exposure in accordance with implementation schedule. Add the facility to appropriate database(s) and assign an inspection frequency. If the facility inspected is determined to need to file an NOI and is not able to provide an NOI, SWPPP or SWMP, refer to the Water Board.	Ongoing	ESD-WE
E.	Work with the Program's Industrial Inspection Ad Hoc TG on an Administrative procedure for providing referrals to the Water Board and document providing referrals to the Water Board for facilities with significant problems.	Pending Implementation by Program	ESD-WE, ESD-UR

IND 3 - City Regulated Facilities

The City of San José will conduct inspections of City Regulated commercial facilities as identified below:

Type	Frequency

Type	Frequency
Food service facilities	2 or more AOCs* over a rolling three year time period - Every year 1 AOC over a rolling three year time period - Every two (2) years 0 AOCs over a rolling three year time period - Every three (3)years
All Other City Regulated facilities	2 or more AOCs* over a rolling five year time period - Every year 1 AOC over a rolling five year time period - Every two (2) years 0 AOCs over a rolling five year time period but have exposure - Every five (5) years 0 AOCs over a rolling five year time period with no exposure or potential for exposure - No further inspections
Facilities for which a referral or ICID complaint is received	As soon as practicable for violations and every year until they meet the above criteria.

*Area of Concern (AOC) = A violation based on the San José Municipal Code 15.14.530 issued to a facility during a stormwater inspection.

#	Activities	Compliance Date	Responsible Party
A.	Determine industrial/commercial facilities identified in the IND SOPs for inspection in each FY.	Annually, Q1	ESD-WE
B.	Conduct and document inspections of City Regulated facilities, other than food service facilities, at least once every five (5) years in accordance with the inspection frequency schedule. If determined to have no impact or no potential for pollution, will not be scheduled for future inspection.	Ongoing	ESD-WE
C.	Conduct and document inspections of City Regulated food service facilities at least once every three (3) years. Initial approved performance standards require inspections every three years.	Ongoing	ESD-WE
D.	Conduct and document inspections for which a referral or complaint was received within five days of complaint received and second inspection within one year.	Ongoing	ESD-WE
E.	Develop a database to track the inspection information from the inspector facility inspection report.	Done FY 02-03	ESD-WE
	1. Implement new Environmental Enforcement Data Management System.	Done FY 03-04	ESD-WE
	2. Prepare draft data inspection tables to review data trends and to facilitate timely evaluation of the data.	Annually, Q3	ESD-WE
F.	Maintain database to track inspection information from inspector facility inspection report and to include new industrial program categories.	Ongoing	ESD-WE
G.	For B, C, D, and E, collect information during inspections on the potential for stormwater pollution at City Regulated facilities in order to determine the appropriate inspection frequency for the various facilities.	Ongoing	ESD-WE
H.	Develop an inspection frequency plan to track frequency of inspections. Implement & update, as needed, the inspection frequency plan.	Development: Done FY 01-02 Ongoing Updated As Needed	ESD-WE

IND 4 - Compliance

The City of San José will conduct industrial/commercial inspections to determine the existence of discharges or potential discharges which are illegal under local ordinances. The facility operator will be notified of observed areas of concern to be corrected and/or if official action on violations is necessary, it will take place under local enforcement procedures.

#	Activities	Compliance Date	Responsible Party
A.	Document facilities that have enforcement actions and the type of enforcement actions conducted for the existence of discharges or threatened discharges that are illegal under local ordinances.	Ongoing	ESD-WE

IND 5 - Training

The City of San José will ensure that industrial/commercial inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for IND inspectors.	Annually, Q1	ESD-WE
B.	Maintain a training plan and provide and document on-the-job training and other training opportunities such as industrial/ commercial inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

IND 6 - Outreach

The City of San José will help develop and distribute outreach and technology transfer material containing applicable control measures and/or BMPs to industrial/commercial facility operators responsible for IND activities.

#	Activities	Compliance Date	Responsible Party
A.	Identify and list existing outreach and technology transfer material.	Annually	ESD-UR
B.	Distribute applicable outreach and technology transfer material to industrial/commercial facility operators. Document to the Water Board that outreach and technology transfer material and/or BMPs have been distributed, as needed, to industrial/commercial facility operators.	Distribution: Ongoing See PIP Program Element in Annual Report	ESD-UR
C.	Determine usefulness of outreach and technology transfer materials by obtaining feedback from industrial/commercial facilities. Obtain feedback from inspectors about the effectiveness of existing outreach and technology transfer material and develop and/or modify existing outreach material.	As Needed	ESD-UR

IND 7 - NOI Filers Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its inspections procedures and database tracking system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate the effectiveness of NOI Filers inspections procedures.	Annually	ESD-WE
B.	Document and evaluate the effectiveness of the NOI Filers database tracking system.	Annually	ESD-WE
C.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

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New and Redevelopment

NRD Work Plan

The New and Redevelopment provision (also referred to as C.3) requires that development projects implement controls to address pollutant discharges and increased stormwater runoff flows for the life of a project by incorporation of treatment and hydromodification measures and other appropriate source control and site design measures.

Porous-paved parking lot: a stormwater site design and treatment control measure.

The City began phased implementation of hydraulic (also referred to as numeric) sizing requirements for stormwater treatment control measures in conformance with City Council approved Post-Construction Urban Runoff Management Policy 6-29 on October 15, 2003. Effective August 15, 2006, hydraulic sizing was required for all projects that create or replace 10,000 square feet of impervious surface. On October 18, 2005, Council approved Post-Construction Hydromodification Management Policy 8-14 and the City began implementation of hydromodification management requirements. This Program element is implemented pursuant to permit provision C.3.

NRD 1 - Legal Authority

The City of San José will have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Provision C.3.a.i).

#	Activities	Compliance Date	Responsible Party
A.	Revise Municipal Code to ensure adequate legal authority to implement new development control measures (C.3.a.i).	As Needed	PBCE, ESD, PW

NRD 2 - Guidance to Developers

The City will provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for stormwater pollution prevention, as appropriate for the type of project and location.

#	Activities	Compliance Date	Responsible Party
A.	1. Draft necessary revisions to Guidance Manual on Selection of Stormwater Quality Control Measures to allow incorporation of hydraulic sizing design criteria and provide to developers.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	2. Refine Guidance Manual on Selection of Stormwater Quality Control Measures to incorporate HMP measures, as necessary.	Done FY 05-06	PBCE, ESD, PW, RDA, Program
B.	Provide development community with revised information and guidance materials concerning any adopted on site design, building permit requirements, hydraulic sizing design criteria and HMP criteria, and maintenance requirements for BMPs for stormwater treatment measures.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA
	1. Coordinate w/development community on proposed hydraulic sizing criteria for structural stormwater treatment measures, HMP criteria and any proposed revisions to Guidance Manual and policy through workshops and regular meetings.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update guidance material regarding maintenance responsibilities for any HMP measures.	Done FY 05-06	PBCE, ESD, PW, RDA, Program

NRD 3 - CEQA Requirements

The City will ensure that environmental documents required for those projects that fall under CEQA and NEPA review address both significant and cumulative stormwater quality impacts during the life of the project, and relevant permit requirements. These documents include EIRs, negative declarations and initial study checklists (C.3.m).

#	Activities	Compliance Date	Responsible Party
A.	Review and evaluate the City's Environmental Review procedures to improve the review for water quality impacts and identification of mitigation measures. (Provision C.3.m.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Identify areas where new or additional water quality review processes and related documents or checklist questions are needed and propose schedule for revision.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Refine and update areas where new or additional water quality related mitigation measures may be needed.	Done FY 05-06	PBCE, ESD, PW, RDA
B.	Report on revisions made to environmental review processes.	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 4 - Project Mitigation Measures and Design Requirements

The City will encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measure that minimize stormwater pollutant discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Revise current Policy on Post-Construction Urban Runoff Management as necessary to incorporate minimum BMP requirements for all projects.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
B.	Review and modify development permit approval procedures for adopted revisions as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA
C.	Review the design standards and guidance for opportunities to make revisions that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures.	Done FY 03-04	PBCE, ESD, PW, RDA
D.	Review the existing source control measures contained in site design standards, guidance documents and conditions of approval for opportunities to limit stormwater pollution. (Provision C.3.k.)	Done FY 03-04	PBCE, ESD, PW, RDA
E.	Review General Plan and revise as necessary to incorporate water quality and watershed protection principles and policies, and summarize revisions made.	Done FY 02-03 Ongoing	PBCE
F.	Review the design standards and guidance for opportunities to make revisions as necessary that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures. Such revisions are listed in Provision C.3.j.	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Identify and document existing site design standards and guidance documents and policies.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise Site Design Measures and Standards, as necessary.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA

NRD 5 - Group 1, 2 and HMP Project Requirements

On October 15, 2003, the City began phased implementation of hydraulically sized stormwater treatment measures in conformance with Policy 6-29 beginning with projects that create or replace one acre or more of impervious surface area and are considered Land Uses of Concern. On February 15, 2005, all projects that created or replaced one acre or more of impervious surface were required to hydraulically size stormwater treatment measures. On May 17, 2005, the threshold changed to include all projects that created or replaced 10,000 square feet of impervious surface and are a Land Use of Concern. Effective August 15, 2006, all projects that create or replace 10,000 square feet or more of impervious surface were required to include hydraulically sized stormwater treatment measures in each project.

On October 18, 2005, all projects that meet the criteria described in Policy 8-14 are required to manage increases in runoff flow, volume and duration.

The following is a brief summary of the Best Management Practices that are required in all development projects:

- Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality) and provide detention or retention as part of landscaping where feasible (C3.b.i and C.3.j);
- Source controls shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k), including measures to discourage pesticide use (C.9.d.ii);
- Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Policy 6-29 (Provision C.3.d); and

- Increases in runoff flow, volume and duration shall be managed in accordance with Policy 8-14 (Provision C.3.f).

#	Activities	Compliance Date	Responsible Party
A.	1. Propose revisions to current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA
	2. Revise current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA
	3. Revise policy as needed for Group 2 implementation.	Done FY 04-05 & FY 06-07	PBCE, ESD, PW, RDA
	4. Revise policy as needed for HMP implementation.	Done FY 05-06	PBCE, ESD, PW, RDA
B.	Develop a list of Annual Reporting requirements from Provision C.3. Design data tracking needs and protocols.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Compile a list of new development and redevelopment projects by name, type of project, site acreage or square footage, square footage of new impervious surface, treatment BMPs and numeric sizing criteria used for applicable projects. Also, the source control measures required and pesticide reduction measures.	Annually	PBCE, ESD, PW, RDA
	2. Update existing data collection software for private projects to enable tracking of all projects with treatment or HMP measures.	**Done** FY 07-08	PBCE, ESD, PW, RDA
C.	Revise and update permitted alternatives to numeric sizing through Alternative Measures Program in Policy 6-29.	Done FY 04-05	PBCE, ESD, PW, RDA
	1. Report to City Council on Alternative Measures Program revisions in Policy 6-29. (Provision C.3.g.)	Done FY 04-05	PBCE, ESD, PW, RDA
	2. Track name and location of projects in the Alternative Measures Program, project type and size, percent impervious surface, reason for granting waiver, terms of waiver, equivalent benefit provided, alternative treatment project or regional project receiving the benefit and date of completion of the alternative treatment project or regional project (Provision C.3.g).	Annually	PBCE, ESD, PW, RDA
	3. Report to City Council on projects approved with numeric sizing alternatives through Alternative Measures Program. (Provision C.3.g.)	Annually	PBCE, ESD, PW, RDA
D.	Draft post-construction treatment BMP certification procedures. (Provision C.3.h)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Track name and location of projects subject to certification. (Provision C.3.h.)	Annually	PBCE, ESD, PW, RDA
E.	Participate on SCVURPPP's Hydromodification Management Plan work group and develop procedures for limiting peak stormwater runoff discharge rates from development projects. (Provision C.3.f.)	Done FY 04-05 Ongoing	PBCE, ESD, PW, RDA
F.	1. Review and modify development permit approval procedures and standard operating procedures as necessary to incorporate requirements for:		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	

#	Activities	Compliance Date	Responsible Party
	b. Group 2	Done FY 04-05	
	c. HMP	Done FY 05-06	
	2. Update and refine criteria and checklist to aid Department of Planning, Building & Code Enforcement & Department of Public Works planners and engineers in determining whether a development project should be required to incorporate post-construction treatment control measures and their related operation and maintenance requirements as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	Done FY 05-06	
	3. Update and refine standard conditions of approval as necessary to ensure proper selection, design of and installation of structural stormwater treatment measures per Provision C.3.b.,c.,d as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	Done FY 05-06	
G.	Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites. (Provision C.3.n. & C.9.ii.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Based on City's Pesticide Management Plan, establish criteria for tracking percentage of new development projects for which pesticide reduction measures were required and begin tracking. (Provision C.3.n. & C.9.d.ii)	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA
H.	Implement any new adopted development conditions of approval, and procedures to developments with significant stormwater pollution potential. (Provision C.3.b.)	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 6 - Developer Conformance with State Requirements

The City will require developers of projects that disturb a land area of one acre or more to demonstrate conformance with the State General Construction Activity Storm Water Permit including filing of NOI, development of a SWPPP, et al.

#	Activities	Compliance Date	Responsible Party
A.	Include as condition of approval for projects that disturb a land area of one acre or more, a requirement to demonstrate coverage under the State General Construction Activity Storm Water Permit.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03 See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 7 - Developer Erosion Control Plans

The City will require developers of projects with potential for significant erosion and planned construction activity during the wet season to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

#	Activities	Compliance Date	Responsible Party
A.	Include as a condition of approval for applicable projects a requirement to prepare and implement an erosion and sediment control plan.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03 See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 8 - Operation and Maintenance for Structural Stormwater Controls

The City will implement an operation and maintenance (O&M) verification program that includes (C.3.e):

- Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;
- Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;
- Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

#	Activities	Compliance Date	Responsible Party
A.	Work with SCVURPPP to develop guidance for implementing O&M Program.	Done FY 02-03	PBCE, ESD, PW, RDA
B.	1a. Draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities. (Provision C.3.e)	Done FY 03-04	PBCE, ESD, PW, RDA
	1b. Conduct pilot inspection program to inspect treatment BMPs that were constructed prior to numeric sizing requirements. The intention of the pilot program is to assess workload impacts, data tracking and collection methods, and funding for O&M programs and to use this information to revise the O&M program.	Done FY 05-06 Ongoing	ESD
	2. Revise and update draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities as necessary. (Provision C.3.e.)	Done FY 05-06	PBCE, ESD, PW, RDA
C.	1. Include as a condition of approval a requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such controls.	Done FY 03-04	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	2. Revise and update condition of approval requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such structural controls as necessary.	Done FY 05-06 Ongoing	PBCE, ESD, PW, RDA
	3. Develop model permit conditions with BMP fact sheets to include in use permits where appropriate.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Compile a list of projects & responsible operators subject to C.3.e. provision.	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
D.	Track and compile a list of priority properties inspected and inspection results. (Provision C.3.e.iii.)	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
	1. Determine criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update and revise criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency as necessary.	Done FY 05-06	PBCE, ESD, PW, RDA
	3. Develop local inspection program for verification of proper O&M.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Update and revise local inspection program for verification of proper O&M as necessary.	Done FY 05-06	PBCE, ESD, PW, RDA
E.	Update inspection software to track and schedule inspections for the number of sites that installed treatment and/or HMP measures.	FY 07-08 Ongoing	ESD-WE

NRD 9 - Applicability to Public Projects

The City will ensure municipal capital improvement projects include stormwater quality control measures during and after construction, appropriate for each project, and that contractors comply with stormwater quality control requirements during construction activities and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a process to ensure that municipal capital improvement projects install structural stormwater quality control measures as necessary.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	1. Participate on SCVURPPP work group tasked with developing a technical guidance document for use by municipal staff to ensure that the document includes standard specifications and details, sizing methodologies, and model conditions of approval acceptable for use in City projects as necessary. (Provision C.3.b. & d.)	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Review and revise Redevelopment Agency Project Request for Proposal procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 03-04	ESD, PBCE, RDA
	3. Review and Revise Public Works Capital Improvement Project approval procedures and Road Improvement Project approval procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 02-03	PBCE, ESD, PW, RDA
B.	Review, evaluate, and modify the procedures, as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA
C.	Begin tracking required data on the public projects subject to Provision C.3. hydraulic sizing criteria requirements for Annual Report.	Done FY 03-04 Ongoing	PBCE, PW, RDA
	1. Modify the existing data collection software for public projects to track new capitol improvement projects with stormwater treatment and/or HMP measures.	**Done** FY 07-08	PW
D.	Monitor development of City's Green Building program for opportunities to discourage architectural use of copper in development projects (Provision C.9.a.) and to incorporate urban runoff considerations.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

NRD 10 - City Staff Training

The City will provide training at least annually to its planning, building, and public works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention (C.3.a.vi).

#	Activities	Compliance Date	Responsible Party
A.	Provide training to Planning and Public Works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA
B.	Provide training to Redevelopment Agency and Department of Transportation staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA, DOT
C.	Revise the training protocol to incorporate any newly adopted Provision C.3. permit requirements and related revised procedures.	As Needed	PBCE, ESD, PW, RDA
D.	Train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval and the importance of minimizing pesticide use in runoff from development sites. (Provision C.3.n. and Provision C.9.d.ii)	Ongoing	PBCE, ESD, PW, RDA, DOT

NRD 11 - Development Plan Review and Approval Procedures Effectiveness Evaluation

The City of San José will review and evaluate the effectiveness of its development plan review and approval procedures.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in review and approval process.	Annually	PBCE, ESD, PW, RDA
B.	Document and evaluate what worked well and what needs improvement.	Annually	PBCE, ESD, PW, RDA

Construction Inspection

CON Work Plan

The City inspects activities at construction sites to prevent sediment and other pollutants from entering the storm sewer system. The measures and activities discussed in this work plan apply to both private development projects and municipal public works construction projects. These measures and activities are implemented at construction project sites as part of the City's construction inspection and enforcement program, which is implemented as a collaborative effort between inspectors from Public Works, Building, and Environmental Services. These departments also collaborate in providing outreach materials and training to the development community on appropriate best management practices. This program element is implemented pursuant to permit provision C.2.

Proper storm drain protection during construction prevents construction debris and sediment from entering the storm drain.

CON 1 - Site Housekeeping

The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites, and prevent illicit discharges to storm drains and watercourses.

#	Activities	Compliance Date	Responsible Party
A.	Track and document incidents of housekeeping issues at construction sites.	Ongoing	PBCE-Bldg, PW, ESD-WE

CON 2 - Local Ordinance

For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.

#	Activities	Compliance Date	Responsible Party
A.	Maintain a program for identifying and conditioning projects with significant erosion potential and planned wet season activity.	Ongoing	PW, PBCE-Bldg
B.	Identify ordinance changes needed to conduct inspections.	As Needed	PW, ESD-WE, PBCE-Bldg

CON 3 - Construction Inspection Frequency

The City inspects construction sites for adequacy of stormwater quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on size of project, site conditions, precipitation, and project's potential impact on stormwater quality.

#	Activities	Compliance Date	Responsible Party
A.	Maintain and update SOPs for construction inspection program.	As Needed	PW, ESD-WE, PBCE-Bldg
B.	Document inspections of active construction sites.	Ongoing	PW, ESD-WE, PBCE-Bldg
C.	Evaluate the effectiveness of the construction inspection program and make improvements as necessary.	Annually	PW, ESD-WE, PBCE-Bldg

CON 4 - Wet Season Preparation

Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.

#	Activities	Compliance Date	Responsible Party
A.	Review and revise procedures for construction inspection staff regarding wet season construction requirements.	As Needed	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
B.	Document pre-season inspection of construction sites to ensure adequate implementation of winterizing BMPs prior to the wet season.	Ongoing	PW-CFAS, ECS, TDS

CON 5 - Inspection and Site Evaluation Follow-up

Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Water Board.

#	Activities	Compliance Date	Responsible Party
A.	Implement SOPs for follow-up actions and graduated levels of enforcement for construction sites.	Ongoing	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
B.	Track and summarize notices and follow-up actions for annual reports.	Annually	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
	1. Use revised erosion and sediment control checklist to better track warnings and required corrections given to construction site managers.	Done FY 06-07	PW-TDS

CON 6 - Municipal Training

The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention. All inspectors receive training on the latest construction-related stormwater pollution prevention techniques and appropriate follow up actions at least once every two years. The City keeps documentation that inspectors have received training.

#	Activities	Compliance Date	Responsible Party
A.	Develop an annual training plan for construction inspection program.	Annually, Q1	ESD, PW, PBCE-Bldg
B.	Conduct annual training.	Ongoing	ESD, PW, PBCE-Bldg
C.	Track and document that inspectors have received training.	Annually	ESD-UR
D.	Evaluate the training curriculum and frequency, and make improvements as necessary.	Annually	ESD, PW, PBCE-Bldg
	1. Conduct additional stormwater BMP training for all inspection groups during section meetings throughout the year to supplement the main autumn annual training.	Done FY 06-07 Ongoing	ESD-UR, ESD-WE
E.	Hold coordination meetings for Building, ESD, and Public Works inspectors.	Ongoing	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD-WE, ESD-UR
F.	City has allocated funds in FY 07-08 for contractual support for two Construction Stormwater BMP Training Workshops for City staff. Ensure City staff attends two funded Construction Stormwater BMP Training Workshops.	Done FY 07-08	ESD-UR, ESD-WE

CON 7 - Outreach

The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.

#	Activities	Compliance Date	Responsible Party
A.	Review outreach and technology transfer materials and make improvements, as necessary.	Annually, Q4	ESD, PW, PBCE-Bldg
	1. Reprint revised Dewatering from Construction Sites and In-Ground Utilities Maintenance Projects brochure.	~~FY 07-08~~ **FY 08-09**	ESD-UR
B.	Conduct outreach sessions for development community.	Annually	ESD, PW, PBCE-Bldg, Program
C.	Document outreach to development community.	Annually	ESD-UR
D.	Evaluate outreach program and make improvements, as necessary.	Annually	ESD, PW, PBCE-Bldg
	1. Print and distribute revised "Clean Bay Blueprint" to developers	Done FY 05-06	ESD, PW,

#	Activities	Compliance Date	Responsible Party
	and City inspectors.		PBCE-Bldg
	2. Explore the use of construction site signs to alert site employees and the public of stormwater pollution prevention message and 945-3000 hotline information.	FY 06-07	ESD, PW, PBCE-Bldg
	3. Implement, if feasible, the use of construction site signs to alert site employees and the public of stormwater pollution prevention message and 945-3000 hotline information, if feasible.	**Done** FY 07-08	ESD, PW, PBCE-Bldg
	4. Evaluate use of construction site signs program and possibly expand it to other municipal construction project sites during FY 07-08.	**Done** FY 07-08	ESD, PW, PBCE-Bldg

CON 8 - Public Works Projects

The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.

#	Activities	Compliance Date	Responsible Party
A.	Conduct training for Public Works capital improvement project staff (City Facilities Architectural Services; Roads and Bridges; and Engineering and Construction Services) on contract language, standard specifications, and enforcement.	Annually	PW-CFAS, ECS, TDS ESD
B.	Track the number of Public Work projects with these requirements.	Annually	PW-CFAS, ECS, TDS

CON 9 - Construction Inspection Effectiveness Evaluation

The City of San José will review and evaluate effectiveness of its construction inspection SOPs and BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in construction inspection SOPs and BMPs.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
B.	Document and evaluate what worked well and what needs improvement.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
	1. Expand the number of sites with an inspector of record to capture more of the Type 1 and Type 2 sites (per Public Work's designation).	Ongoing	PBCE-Bldg

Public Streets, Roads, & Highways

PSR Work Plan

Department of Transportation paving crew applying their training along with the pavement.

This program element is one of several that address municipal activities. The PSR program element consists of incorporating best management practices (BMPs) into City operations such as street repair. Training plays a key role in ensuring that staff uses the proper techniques during the course of their duties to protect water quality. Training topics and activities include spill response, resurfacing, sealing and patching, saw-cutting, street sweeping, landscape chemical application, concrete installation, pavement striping, legend removal, and catch basin inspection after irrigation repair. BMP effectiveness evaluation from crew members is obtained during the training sessions. This program element is implemented pursuant to permit provision C.2.

PSR 1 - Implementation of BMPs

The City of San José will implement Best Management Practices (BMPs) for street, road, and highway operation and maintenance (O&M) activities to reduce pollutants in stormwater and eliminate illicit discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted.	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
	1. Include SOPs listed in PSR 1.D.1 and developed in FY 05-06 into the FY 06-07 training program.	Done FY 06-07	ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
	1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • Storm Drain Inlet Cleaning; • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning.	Done FY 05-06	DOT, ESD, PRNS
	2. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City employee.	FY 07-08 Ongoing	ESD
	3. In response to stormwater complaints involving a City employee conducting PSR and SDO O&M activities, the supervisor for the City employee involved in the complaint will be notified.	**Done** FY 07-08 Ongoing	DOT, GS, PRNS, ESD

PSR 2 - Contractor Use of BMPs

The City of San José will develop and implement a process to ensure that contractors employed to perform street, road, and highway O&M activities use appropriate BMPs per URMP.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for public street, road, and highway O&M contracts on related stormwater BMPs annually.	Annually	DOT, ESD
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City contractor.	FY 07-08 Ongoing	ESD
	2. In response to stormwater complaints involving City contractors conducting PSR and SDO O&M activities, the contract manager for the City contract involved in the complaint will be notified.	**Done** FY 07-08 Ongoing	DOT, GS, PRNS, ESD
B.	Develop standard contract language for PSR maintenance activities.	Done FY 05-06	DOT, ESD
	1. Send letters to City contractors conducting PSR and SDO O&M activities with a reminder to use appropriate BMPs while conducting their work.	**Done** FY 07-08	DOT, GS, PRNS, ESD

PSR 3 - City Staff Annual Training

The City of San José will provide annual training to its municipal staff in the use of appropriate BMPs. The City will also provide a mechanism for obtaining feedback from staff on the implementation and effectiveness of the BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party

#	Activities	Compliance Date	Responsible Party
A.	Identify training goals, such as improving the focus of the training on the specific BMPs used by a section; integrating new BMPs, if any; etc.	Annually, Q4	DOT, ESD
B.	Identify training opportunities (which could include tailgate meetings and other existing training).	Annually	DOT, ESD
C.	Create or revise training modules for affected City staff and contractors.	As Needed	DOT, ESD
	1. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	Done FY 05-06	ESD
D.	Create or revise collateral material based on training modules.	As Needed	DOT, ESD
E.	Schedule training with affected supervisors.	Annually	DOT, ESD
	1. Develop and implement a new training module specifically for DOT electrician staff.	Done FY 04-05	DOT, ESD

PSR 4 - Notification of Public Agencies

The City of San José will inform other parties (e.g., CalTrans, the County of Santa Clara, and public utilities) conducting street, road, and highway O&M activities within its jurisdiction of the requirements to implement pollutant reduction BMPs and Control Measures in stormwater to the maximum extent practicable and eliminate illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Identify conditions under which another agency will be notified regarding relevant stormwater requirements.	Done FY 02-03	
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is another agency.	FY 07-08 Ongoing	ESD
	2. The City will send letters to other agencies that conduct PSR O&M activities within its jurisdiction informing them of the requirement to implement appropriate BMPs and control measures while conducting their work.	**Done** FY 06-07	ESD-WE

PSR 5 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges. The review and evaluation will include input from the municipal maintenance staff that implement the BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual effectiveness reporting, including sub-procedures for gathering feedback from affected supervisors and for modifications to BMPs and SOPs as necessary.	Done FY 01-02	
	1. Review procedures for annual effectiveness evaluation. Consider obtaining feedback from supervisors on how to assess BMP effectiveness and the use of training sessions with staff as an opportunity to evaluate BMPs and SOPs.	Annually	DOT, ESD
B.	Conduct evaluation of BMPs and SOPs.	Annually	DOT, ESD
	1. Revise the eight SOPs reviewed in FY 06-07 according to comments received during the review process.	**Done** FY 07-08	ESD
C.	Expand parking restriction signage and enforcement for street sweeping by 20 curb miles.	**Done** FY 07-08	DOT
D.	Collect street sweeping data: volume and/or weight of debris collected, curb miles swept, and estimated percentage of leaves in yard trimmings collection program.	Ongoing [See CNAP CB-11]	DOT, ESD

PSR 6 - Rural Public Works Maintenance and Support Activities

The City will extend its control measure strategy for PSR to address water quality impacts resulting from public works maintenance and support activities in rural areas.

#	Activities	Compliance Date	Responsible Party
A.	Identify City-owned properties that are applicable (under the RPW performance standard).	Ongoing	
	1. Re-evaluate the feasibility of using GIS information to identify additional applicable properties, if any.	Done FY 05-06	PRNS, GS, DOT, ESD
	2. Some of the roads on the rural roads list compiled in FY 06-07 have portions that are within City limits and portions that are within Unincorporated Areas. Determine exactly which portions of these roads fall within the City's limits.	**Done** FY 07-08	DOT, ESD
B.	Develop or adapt Standard Operating Procedures (SOPs) and Best Management Practices (BMPs) for rural public works activities.	Done FY 03-04	
C.	Provide annual training on appropriate SOPs/BMPs to City staff that perform rural public works operations and maintenance activities. Incorporate SOPs/BMPs evaluation into annual training.	Annually	PRNS, DOT, GS, ESD
	1. Evaluate the RPW training schedule in order to coordinate more efficiently with PRNS staff schedules.	Done FY 06-07	PRNS, ESD
D.	Through contract specifications, require contractors hired by the City to use appropriate SOPs/BMPs when performing rural public works construction or maintenance.	Done FY 05-06	PRNS, DOT, GS, ESD
E.	Annually conduct an evaluation of the effectiveness of the rural public works program, report the results in the Urban Runoff Annual Report. Identify items for continuous improvement.	Annually	PRNS, DOT, GS, ESD

Storm Drain System Operation & Maintenance

SDO Work Plan

Department of Transportation Vactor crew cleaning out a storm drain inlet.

Storm Drain System Operation and Maintenance is another municipal activity program element implemented in accordance with provision C.2.a of the permit. This program includes key maintenance activities that are conducted to ensure the proper function of the storm sewer system to collect and convey storm runoff. The Department of Transportation Standard Operating Procedures for catch basin cleaning and Problem Area Reporting are a focus of crew training. A GIS map overlay has been created that assigns serial numbers to each of the City's more than 30,000 storm drain inlets. This map overlay is currently in use as a means to facilitate problem area reporting in the storm drain system.

SDO 1 - O&M BMP Implementation

The City of San José will implement best management practices (BMPs) for the storm drain system operation and maintenance (O&M) to reduce pollutants in stormwater to the maximum extent practicable. Specific BMPs for each type of O&M activity are those listed in the City's Urban Runoff Management Plan (URMP).

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted (including structural controls if necessary).	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
	1. Include SOPs listed in SDO 1.D.1 and developed in FY 05-06 into the FY 06-07 training program.	Done FY 06-07	ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
	1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • Storm Drain Inlet Cleaning; • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning. See PSR 1.D.1	Done FY 05-06	DOT, ESD, PRNS
	2. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City employee.	FY 07-08 Ongoing	ESD
	3. In response to stormwater complaints involving a City employee conducting PSR and SDO O&M activities, the supervisor for the City employee involved in the complaint will be notified.	**Done** FY 07-08 Ongoing	DOT, GS, PRNS, ESD

SDO 2 - Problem Tracking and Process Improvement

The City of San José will develop and implement processes for tracking problem areas and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Implement an annual inspection and cleaning work plan to achieve a Tier II level review.	Ongoing	DOT
B.	Evaluate criteria for collecting data from City field personnel for the purposes of determining Problem Areas.	As Needed	DOT, ESD
C.	Revise documentation and problem area reporting procedure, if necessary, to improve reporting performance. Documentation to include frequency, nature, and type of recurring problem. Include coordination of data from ICID and Storm Drain Management System data sources. Include analysis of data to identify trends for targeting solutions.	As Needed	DOT, ESD
D.	Produce Problem Area report.	Annually	DOT
E.	Address Problem Areas through ICID enforcement/ education activities, additional BMP development, program development or retrofit.	As Needed	DOT, ESD
	1. Explore purchasing additional vactor trucks.	Done FY 06-07	DOT

SDO 3 - Contractor Use of BMPs

The City will develop and implement, as needed, a process to ensure that contractors employed to perform storm drain O&M activities use the appropriate BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for SDO O&M contracts on related stormwater BMPs.	Annually	DOT, ESD
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City contractor.	FY 07-08 Ongoing	ESD
	2. In response to stormwater complaints involving City contractors conducting PSR and SDO O&M activities, the contract manager for the City contract involved in the complaint will be notified.	**Done** FY 07-08 Ongoing	DOT, GS, PRNS, ESD

SDO 4 – Staff Training and BMP Feedback

The City of San José will provide annual training to its municipal staff in use of appropriate BMPs and/or Control Measures. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Provide training prior to the rainy season.	Annually, Q4	DOT, ESD
B.	Create or revise training modules for affected City staff.	As Needed	DOT, ESD
	1. Improve the focus of the training on the specific BMPs used by a section.	As Needed	DOT, ESD
	2. Provide specific training to inlet cleaning crews on IMSPAR data collection in advance of inlet cleaning program implementation.	Annually	
	3. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	Done FY 05-06	ESD
C.	Produce schedule for training.	Annually	DOT, ESD

SDO 5 – Data Analysis

As part of the annual review process, the City of San José will evaluate data regarding cleaning activities and unusual flows observed during inspection. The review and evaluation will include consideration of storm drain structural retrofit.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual review and evaluation of data.	Done FY 01-02	
	1. Collect data on the amount of materials removed during inlet cleaning.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
B.	Implement annual data review and identify follow-up actions as appropriate.	Annually	
	1. Re-evaluate how follow up is conducted by crews when "cars on catch basins" is identified on the IMSPAR report, in order to better understand to what extent parked cars are barriers to cleaning.	Done FY 06-07	DOT, ESD
	2. Evaluate "cars on catch basins" data to see if it can be used as one of the factors in determining where future posted signage for street sweeping restrictions will be installed.	Done FY 06-07	DOT, ESD
	3. Evaluate how to integrate the results of the IMSPAR report, regarding garbage and high debris, into scheduling additional cleaning.	Annually	DOT, ESD
	4. Re-evaluate use of hand held devices to collect data during storm drain inlet cleaning and potentially other maintenance activities.	**Done** FY 07-08	DOT, ESD

SDO 6 – BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Review with supervisors to get feedback and information on how to assess BMP effectiveness.	As Needed	DOT, ESD
B.	Use annual training sessions with staff as an opportunity to evaluate the effectiveness of BMPs & SOPs.	Annually	DOT, ESD

Water Utilities Operations & Maintenance

WUO&M Work Plan

This program element addresses a municipal activity and is implemented in accordance with provision C.2.a. The program addresses operation and maintenance activities at the City's Municipal Water system. The key tools for implementing this program are the Water Utility Pollution Prevention Plan and staff training to ensure that proper techniques are employed during maintenance activities. The City's training program includes the annual development of a video demonstrating the implementation of BMPs for a specific work function.

Pumps at the Rincon II Pump Station.

WUO&M 1 – Inventory of O&M Activities

The City of San José's Municipal Water System will conduct an inventory of all-key operations and maintenance activities, and identify routine and unplanned non-storm water discharges from these activities. This inventory will be conducted every three years and evaluated at least once a year.

#	Activities	Compliance Date	Responsible Party
A.	Review current procedures for operations and maintenance.	Annually	ESD-Muni
B.	Three-year update of list.	Done 03/31/06 03/31/09	ESD-Muni

WUO&M 2 – Implementation of WUPPP

The City of San José's Municipal Water System will implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.

#	Activities	Compliance Date	Responsible Party
A.	Implement WUPPP/Report on activities.	Ongoing	ESD-Muni

WUO&M 3 – Staff Training and Contractor WUPPP Compliance

The City of San José's Municipal Water System will conduct annual training for municipal staff and coordinate WUPPP elements with water utility project planning, including WUPPP elements (BMPs, conditions, specifications, etc., in contract and services agreements).

#	Activities	Compliance Date	Responsible Party
A.	Implement training program.	Annually, Q2	ESD-Muni

WUO&M 4 – WUPPP Effectiveness Evaluation

The City of San José's Municipal Water System will evaluate the effectiveness of the WUPPP annually. Maintain accurate documentation and revise the WUPPP as necessary.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate effectiveness of program.	Annually, Q4	ESD-Muni

Pesticide Management

PM Work Plan

Tussock Moth infestation on an oak tree at Williams Street Park.

The purpose of the Pesticide Management program is to reduce the amount of pesticides in stormwater and landscape runoff. Activities include setting municipal policy, implementing proper techniques when selecting and applying pesticides on City property, staff training, public education, and City participation in regional efforts to influence regulations that affect pesticide management. In 2003, the Council adopted an Integrated Pest Management (IPM) Policy, which calls for municipal operations to incorporate IPM techniques and to reduce, phase-out, and ultimately eliminate the use of pesticides that cause impairment of surface waters. The City continues to implement pest control BMPs and train staff on Integrated Pest Management (IPM) techniques. This program element is implemented pursuant to permit provision C.9.d.

PM 1 – Integrated Pest Management

The City will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring use of IPM techniques in the agency's operations and minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors.

#	Activity	Compliance Date	Responsible Party
A.	Develop a City IPM policy for inclusion in Pesticide Management Plan.	Done FY 02-03	GS, DOT, ESD, PRNS

PM 2 – Pesticide Management Plan

The City will develop and implement a Pesticide Management Plan with the goals of minimizing pesticide use and reducing the amount of pesticides in stormwater and landscape runoff to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Draft a City of San José Pesticide Management Plan.	Done FY 01-02	GS, DOT, ESD, PRNS
B.	Publish City Pesticide Management Plan in URMP.	Done FY 01-02	ESD

PM 3 – IPM SOPs and BMPs

The City will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy.

#	Activities	Compliance Date	Responsible Party
A.	Develop SOPs and BMPs for implementing IPM policy with provisions that will reduce water quality impacts from pesticide use.	Done FY 01-02	GS, DOT, ESD, PRNS
B.	For each type of pest problem identified, seek model SOPs and BMPs from published literature.	Done FY 01-02	GS, DOT, ESD, PRNS
C.	Incorporate or develop appropriate IPM measures into City SOPs and BMPs.	Done FY 02-03	GS, DOT, ESD, PRNS
	1. Pilot the use of additional IPM techniques, e.g., for weed control.	Done FY 06-07 Ongoing	GS, DOT, ESD, PRNS
D.	Update City URMP to incorporate model Pest Management Performance Standard, including description of legal authority (IPM policy and contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done FY 02-03	GS, DOT, ESD, PRNS
E.	Review and update City SOPs and BMPs, as appropriate.	As Needed	GS, DOT, ESD, PRNS
F.	Develop Approved Pesticide List for applications on City property.	FY 06-07 Ongoing	GS, DOT, ESD, PRNS
	1. Revise SOPs and BMPs to reflect use of Approved Pesticide List.	FY 06-07 Ongoing	GS, DOT, ESD, PRNS

PM 4 – City Employee Training

The City will ensure that employees receive pest management training by implementing the following:

1. Employees who apply pesticides for the City will obtain the appropriate training as required by the County Agricultural Commissioner and State Department of Pesticide Regulation (DPR);
2. Employees within departments responsible for pesticide application will receive annual training on appropriate portions of City IPM Policy, SOPs, and BMPs, and latest IPM techniques;
3. Employees who are not authorized to apply pesticides will be annually trained not to use over-the-counter pesticides at workplace, consistent with IPM Policy; and
4. Annual internal outreach will be conducted to employees, who do not necessarily purchase or apply pesticides during their course of work, on less toxic pest control and to encourage employees to use IPM techniques away from work.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that employees who apply pesticides for the agency obtain appropriate training required by County Agricultural Commissioner and State Department of Pesticide Regulation.	Annually	GS, DOT, PRNS

#	Activities	Compliance Date	Responsible Party
B.	Provide annual training on IPM Policy, SOPs, and BMPs, and latest IPM techniques to employees within departments responsible for pesticide application.	Annually	GS, DOT, ESD, PRNS
C.	Annually inform employees who are not authorized / trained to apply pesticides not to use over-the-counter pesticides at workplace, consistent with IPM Policy.	Ongoing	GS, DOT, ESD, PRNS
D.	Monitoring Mechanism I.B.1. Document and evaluate effectiveness of staff training conducted each year in annual report.	Annually	GS, DOT, ESD, PRNS
	1. Update class evaluation/survey for IPM training classes conducted by City staff.	As Needed	GS, DOT, ESD, PRNS
E.	Public Education and Outreach Task II.A.14 Conduct internal outreach on less toxic pest control to employees who do not necessarily purchase or apply pesticides during the course of their work (to encourage employees to use IPM techniques away from work).	Annually	ESD

PM 5 – Contractor Pesticide Management Requirements

The City will develop and implement a process to ensure that contractors employed to conduct pest control and pesticide application on municipal property engage in pest control methods consistent with City IPM Policy. Specifically, the City will require contractors to:

- follow City IPM policy, BMPs, and SOPs;
- provide evidence of current IPM training, when feasible; and
- provide documentation of pesticide use on City property to the City in a timely manner.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that contractors employed to conduct pest control/pesticide application on municipal property engage in methods consistent with City IPM policy.	Ongoing	GS, DOT, ESD, PRNS, PW
B.	Review and update a list of all contractors employed by the City who perform pesticide application work.	Annually	GS, DOT, ESD, PRNS, PW
C.	Implement a procedure to provide to each contractor a copy of the City's IPM policy.	Done FY 02-03	GS, DOT, ESD, PRNS
D.	City will supply copies of pest specific BMPs and SOPs to contractors. Contractors will self-certify their compliance with the City SOPs and BMPs.	Ongoing	GS, DOT, ESD, PRNS
E.	Require through contract specifications that PCOs contracted for municipal applications use pest control methods consistent with City's IPM Policy. Specifically, require contractors to: a) follow City IPM policy, BMPs and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on City property to the City in a timely manner.	Ongoing	GS, DOT, ESD, PRNS
	1. City will develop standard content for PCO contracts.	Done FY 04-05	GS, DOT, ESD, PRNS

#	Activities	Compliance Date	Responsible Party
	2. City will implement standard content for PCO contracts.	Done FY 05-06 Ongoing	GS, DOT, ESD, PRNS
F.	Invite contractors to participate in City training sessions on pesticide management.	Done FY 05-06 Ongoing	GS, DOT, ESD, PRNS
G.	Monitoring Mechanism III.A.1. Document number of PCOs receiving presentations and/or training on pesticide use on municipal property.	Annually	GS, DOT, ESD, PRNS

PM 6 – Pesticide Management Outreach

The City will identify in the annual work plan the outreach activities it will conduct consistent with Program Pesticide Management Plan. Work plan elements will address outreach to residential and commercial pesticide users, pesticide retailers, and special districts. Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the City's own IPM practices, as applicable.

#	Activities	Compliance Date	Responsible Party
A.	Increase awareness of target audiences regarding proper pesticide use, disposal methods, water quality impacts, and less toxic pest management messages. Target audiences include commercial and residential pesticide users, pesticide retailers, municipal employees, and special districts.	Ongoing	ESD
B.	Prepare IPM stories and press releases to local media.	As Needed	ESD
C.	In conjunction with Program, City will provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., VTA, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	As Needed	ESD
D.	Create and provide fact sheets and materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program.	Ongoing	ESD
E.	Monitoring Mechanism: Document or estimate numbers of residents reached by outreach efforts, including events, web promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts by documenting calls to the Program's general and watershed campaign hotlines.	Annually	ESD
F.	Co-host regional IPM conference to promote implementation of IPM practices in municipal operations in the City and Bay Area region.	Done FY 06-07	GS, DOT, ESD, PRNS
G.	Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, recommended in the work plan, to be developed by the Program. Implement evaluation component of the work plan.	Annually	ESD

PM 7 – HHW Pesticide Disposal

The City will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.

#	Activities	Compliance Date	Responsible Party
A.	Work with HHW collection agencies to support, enhance, and publicize programs for pesticide disposal.	Ongoing	ESD
B.	Ensure that adequate pesticide disposal services exist for residents and conditionally exempt small quantity commercial generators.	Annually	ESD
C.	Provide hazardous waste disposal information to residents, through distribution of materials (e.g., utility bill insert, city newsletter, community events, etc.) or advertising in local media.	Ongoing	ESD
D.	Monitoring Mechanism V.A.1. Document that HHW collection programs adequately serve residents and businesses and that exchange programs do not exchange organophosphate or banned pesticides.	Annually	ESD

PM 8 – City Pesticide Use Tracking

The City will develop and implement a process for tracking pesticide use on municipally-owned property.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a pilot pesticide tracking process for Diazinon and Chlorpyriphos products.	Done FY 01-02	GS, DOT, ESD, PRNS
B.	Track pesticide use on municipally owned property. Include reporting and justification for use of OP pesticides and BMPs employed during OP pesticide use.	Ongoing	GS, DOT, ESD, PRNS
	1. Evaluate feasibility of implementing electronic data management system for pesticide use.	Done FY 04-05	GS, DOT, ESD, PRNS
	2. Implement electronic data management system for tracking pesticide use on City property.	Done FY 05-06 Ongoing	GS, DOT, ESD, PRNS
C.	Monitoring Mechanism I.A.1. Document completion of tasks in annual reports. Use pesticide tracking process to document pesticide use.	Annually	GS, DOT, ESD, PRNS, PW

PM 9 – City Pesticide Inventory Search

The City will conduct periodic City-wide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. If found, these pesticides will be properly disposed of pursuant to appropriate waste disposal regulations.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Citywide search of chemical storage areas for pesticides no longer legal for application per EPA, State, and/or local requirements. Properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.	Annually	GS, DOT, PRNS

PM 10 – Pesticide Management Plan / IPM Policy Review

As part of annual reporting process and with input from municipal staff, the City will review and evaluate the effectiveness of its Pest Management Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Review and continuously improve goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings, if any.	Annually	GS, DOT, ESD, PRNS, PW
B.	Monitoring Mechanism IX.A.1. Complete revised work plan that incorporates continuous improvement items, and report on completion of work plan tasks.	Annually	GS, DOT, ESD, PRNS, PW
C.	Monitoring Mechanism VII.A.1. Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development and significant redevelopment projects, and percentage of new development/ significant redevelopment projects for which pesticide reduction measures were required. (Draft Permit Provision C.3.n.)	Annually	PW, ESD

Mercury

M Work Plan

The City continues its efforts to reduce or eliminate mercury discharges during municipal operations. Virtual elimination practices employed by the City include: purchasing low mercury-containing fluorescent lamps, recycling spent lamps, recycling spent batteries, and switching to non-mercury-containing apparatus in the Water Pollution Control Plant Laboratory. In 2003, the Program approved a Guidelines document on the management of mercury-containing products by a municipal agency. The City will continue to implement management practices consistent with the guidelines such as collecting and recycling spent fluorescent lamps, batteries, and other electronic wastes. This program element is implemented pursuant to permit provision C.9.c.

Fluorescent lamps for recycling at the Central Service Yard.

M 1 – Municipal Use of Mercury-Containing Products

The City will eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

#	Activities	Compliance Date	Responsible Party
A.	Implement SCVURPPP guidelines for mercury-containing products reduction and management. These guidelines include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	Ongoing	ESD, GS
	1. Collect and dispose of mercury-containing lamps generated in City-owned facilities.	Ongoing	GS, ESD
	2. Identify other mercury-containing products for virtual elimination, phase-out and/or proper disposal.	Annually, As Needed	ESD, GS
B.	Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines.	Annually	ESD

M 2 – Household Hazardous Waste Collection

The City will support mercury-containing product disposal services through universal waste and household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

#	Activities	Compliance Date	Responsible Party
A.	Provide mercury-containing products disposal services for residents and small businesses.	Ongoing	ESD-IWM, County
B.	Work with Program and HHW collection agencies to develop and help publicize fluorescent light recycling program.	Ongoing	ESD, Program
C.	Host a mercury fever thermometer exchange event for residents in San José and the Water Pollution Control Plant service area.	**Done** 6/30/08	ESD-P2

M 3 – Monitoring and Science

The City will participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

#	Activities	Compliance Date	Responsible Party
A.	Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP steering committee and technical review committee.	Ongoing	ESD
B.	Examine feasibility of enhancing stormwater pollution prevention and control activities on a watershed or sub watershed basis to focus activities in those parts of the Guadalupe River Watershed enriched in mercury from natural or mining-related causes.	**Done** FY 07-08	ESD

M 4 – Regional, State, and Federal Coordination

Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

#	Activities	Compliance Date	Responsible Party
A.	Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup, RMP, and the CEP.	Ongoing	ESD
B.	Support and participate in WMI Watershed Action Plan implementation.	Ongoing	ESD

M 5 – Public Education and Outreach

Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees.

#	Activities	Compliance Date	Responsible Party
A.	Coordinate with Program and HHW collection agencies ~~to develop and~~ implement a mercury-containing product outreach program to educate selected target audience and encourage proper use and disposal of mercury-containing products.	Ongoing	ESD, Program, County HHW
B.	Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	Ongoing	ESD
C.	Attend community events and distribute outreach materials. (See Attachment A: Outreach Activities Summary)	Ongoing	ESD
D.	Monitoring Mechanism V.B. Document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	Annually	ESD, Program

Copper / Nickel Action Plans

CNAP Work Plan

This element is implemented pursuant to provisions C.9.a and b of the stormwater permit. Activities in the copper and nickel action plans are attributed largely to the South Bay POTWs and to SCVURPPP as the responsible entities. Some activities, however, require specific actions by SCVURPPP Co-Permittees or specified municipalities, such as increasing awareness of copper and nickel with businesses that are also NOI filers (please see IND 1 for a description of NOI filers). Summarized here are activities pursuant to implementation of the baseline actions included in the Copper and Nickel Action Plans. These are in addition to those undertaken by SCVURPPP as a program. A complete update on implementation of the Action Plans can be found in the SCVURPPP Annual Report.

CB-1 – Vehicle Washing Operations

#	Activities	Target Date	Responsible Party
A.	Have member of San José team trained and available to lead mobile cleaners' certification seminar.	As Needed	
B.	Support Program in hosting mobile cleaners' certification seminar.	Done FY 06-07	ESD
	1. Promote list of recognized mobile cleaning service providers.	Ongoing	ESD
C.	Offer discount car washes through the Watershed Watch Campaign.	**Done FY 07-08** ~~12/31/2007~~	Program

CB-3 – Industrial Discharges

#	Activities	Target Date	Responsible Party
A.	Continue Distribution of information regarding copper from roof vents.	Ongoing	ESD
	1. Continue rooftop inspections. Evaluate efforts and need for any additional effort.	Done FY 05-06	ESD
B.	Mail NOI Package, with information on the GIASP and how to comply, to targeted industrial facilities.	Done FY 05-06 **annually as needed**	ESD

CB-8 – Watershed Assessments and New Development

#	Activities	Target Date	Responsible Party
A.	Review new and redevelopment project review procedures and update or refine procedures to minimize copper pollution. See NRD sections 3, 4, and 9 for details on San José's implementation of C.3 permit provisions.	Done FY 02-03	ESD, PBCE, PW, RDA

CB-11 – Street Sweeping and Storm System O&M

#	Activities	Target Date	Responsible Party
A.	Track quantitative data on the tons of material removed and disposed of and other relevant street sweeping program data.	Annually	ESD-IWM DOT

CB-12 – Pools and Spas

#	Activities	Target Date	Responsible Party
A.	Distribute outreach materials at events, public counters, and post on City website.	Ongoing	ESD
B.	Provide guidance to residents on disposal alternatives for pool and spa water.	Ongoing	ESD

CB -21 – Architectural Use of Copper

#	Activities	Target Date	Responsible Party
A.	Continue to discourage architectural use of copper during Planning application review.	Ongoing	PBCE-Planning
B.	Continue to monitor progress of San José Green Building program to identify opportunities for discouraging architectural use of copper.	Ongoing	PBCE-Planning ESD-P&P

NB-1 – Discharges from Construction sites

#	Activities	Target Date	Responsible Party
A.	Implement performance standards for construction inspection.	See NRD 6 and CON program element for activities that address erosion control.	ESD, PBCE, PW
B	Participate in the Water Board's regional training of construction site inspectors.	See NRD 6 and CON program element for activities that address erosion control.	ESD, PBCE, PW

Trash

TRA Work Plan

Volunteers remove trash from Coyote Creek behind San Jose High Academy.

The purpose of the Trash program is to address litter and illegal dumping that threatens to pollute urban waterways. The impetus for this program was the 2001 Water Board Staff Report recommending that all urban creeks, lakes, and shorelines be placed on a monitoring list due to the threat of trash impairment to water quality. The City's activities focus on assistance with the development and implementation of an effective trash strategy, ongoing trash evaluations in high priority areas, implementation or refinement of trash management practices, and piloting the use of structural controls for trash. This program element is implemented pursuant to the Program's Trash Work Plan and provision C.1 of the permit.

TRA 1 – Inventory, Document and Evaluate Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Complete Program survey of existing trash management practices.	Done FY 03-04	ESD

TRA 2 – Document and Map Known Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/ incidents and eradication efforts).	Done FY 03-04	ESD
B.	Compile trash problem location data/information and submit to Program for conversion to coordinates for GIS mapping.	Done FY 03-04	ESD
C.	Revise and update documentation (list of locations, maps, etc.) of known trash problem areas.	As Needed	ESD
D.	Continue identifying and prioritizing trash problem areas in urban streams and waterways and other potential sources that may contribute trash to those areas.	Annually	ESD, PRNS, DOT, PD

TRA 3 – Conduct Trash Evaluations

#	Activities	Target Date	Responsible Party
A.	Work with Program to select trash evaluation methodology.	Done FY 03-04	ESD
B.	Assist Program with planning and organizing of training workshop for municipal staff.	Done FY 03-04	ESD
C.	Participate in the trash evaluation methodology training workshop.	Done FY 03-04	ESD
D.	Conduct trash evaluations and submit to Program staff.		ESD
	1. Coyote Watershed	Done FY 04-05	ESD
	2. Remaining San José locations	Done FY 05-06	ESD
E.	Continue trash evaluations in high priority areas using the Program's Urban Rapid Trash Assessment protocol (version 1.0) and/or the KAB litter index in a subset of trash problem areas to track changes over time.	Ongoing	ESD

TRA 4 – Develop Standardized Documentation and Reporting Format

#	Activities	Target Date	Responsible Party
A.	Work with Program to develop a reporting format to document trash management activities in Annual Reports.	Done FY 03-04	ESD

TRA 5 – Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Assist Program staff with the documentation and analysis of trash evaluation results.	Ongoing	ESD
B.	Identify high priority trash areas using trash evaluation results.	Ongoing	ESD
	1. Coyote Watershed	Done FY 04-05	ESD
	2. Remaining San José locations	Done FY 05-06	ESD

TRA 6 – Identify and Implement Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Identify reasonable trash management practices to address high priority areas (in TRA 5B).	Ongoing	ESD, PRNS, GS, DOT
B.	Implement or refine trash management practices at high priority areas to the maximum extent practicable.	Ongoing	ESD, PRNS, GS, DOT
C.	Document and evaluate implementation of trash management actions.	Ongoing	ESD
D.	Provide Program with information on assessments and trash management practices implemented using standardized reporting format.	Annually	ESD

#	Activities	Target Date	Responsible Party
E.	Provide Program with trash assessment data forms.	Annually	ESD
F.	Assist Program in developing Trash Fact Sheets.	**Done FY07-08**	ESD

TRA 7 – Review and Update Performance Standards and Develop Long-Term Strategy for Trash Management

#	Activities	Target Date	Responsible Party
A.	Assist with the review and update of existing standards that address BMPs or control measures relevant to trash management.	**Done FY 07-08** ~~TBD by Program~~	ESD
B.	Assist Program staff in developing and implementing an effective long-term strategy for trash conditions in urban streams and waterways.	Ongoing	ESD

TRA 8 – Implement a Pilot Demonstration Project

#	Activities	Target Date	Responsible Party
A.	Assist Program in implementing a pilot project to address trash conveyed through the storm drain system.	**Done FY 07-08** Ongoing as necessary	ESD, DOT, PW
B.	Begin piloting the use of structural controls to prevent trash from entering the storm sewer system.	**Done FY 07-08** ~~Ongoing as necessary~~	ESD, DOT, PW
C.	Pursue grant funding to support installation of structural controls for trash management.	As Needed	ESD, DOT, PW
D.	Evaluate the effectiveness of the pilot structural controls.	Ongoing as necessary	Program, ESD, DOT, PW

Monitoring

MON Work Plan

Monitoring activities required in the stormwater permit are generally implemented in collaboration with other agencies. The City continues to participate in monitoring activities area-wide, including Regional and Program-focused investigation of pollutants and sources of pollutants to the storm drain system. The City also provides input and support to the Program's multi-year monitoring program, and reviews work products as various Program-level projects are designed and completed.

The City, in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) has submitted, to the Water Board, a Multi-Year Receiving Waters Monitoring Plan required per permit provision C.7.b. The final version of the plan was submitted August 5, 2002 and revised March 1, 2004. The Multi-Year Plan covers a number of pollutant control programs required by C.7 and C.9 provisions of the permit. The City continues to support Program staff in the implementation of the plan by commenting on annual plans, providing guidance for sampling within the City, and participating in the Watershed Analysis Ad Hoc Task Group.

The 2001 C.9 permit provisions require implementation of control programs for Copper, Nickel, Mercury, Pesticides, PCBs, and Dioxin-like compounds. The City continues to support and assist the Program efforts to address these control and monitoring efforts. Additionally, the City is actively involved as stakeholder and workgroup member for the Guadalupe Mercury TMDL effort, and will continue to contribute and comment on products and reports generated by Baywide TMDLs for copper, nickel, mercury and PCBs. City Staff also actively participate in Clean Estuary Project activities through the PCB workgroup and Diazinon and Pesticide Related Toxicity workgroup.

ESD Biologist collecting field data from Coyote Creek.

PCB Control Program

Analytical characterization work to support the PCB Control Program, required under provision C.9.e, has been completed. The Program is currently working on next steps with BASMAA and CEP.

Initial PCB analysis was performed on sediments found in selected urban storm drain systems. At this point, no known controllable sources of PCBs have been identified. Results of the follow-up analytical work have been reviewed and further sampling work to identify controllable sources was undertaken in October and November of 2002. The SCVURPPP Program submitted

the final PCB Control Plan March 1, 2002, and the Control Program Work Plan July 1, 2002. In addition, the City continues to implement activities described in "Next Steps" from the Year Two PCB Case Study Report submitted to the Water Board in July 2003.

#	Activities	Compliance Date	Responsible Party
A.	Sample, analyze, and report on PCBs in storm drain sediments to characterize potential sources and implement controls.	Done, 6/00 through FY 01-02	Program, ESD
B.	Begin implementation of final PCB Control Plan upon approval.	Done FY 02-03 & Ongoing	ESD

Dioxin-like Compound Control Program

Characterization of dioxins based on existing data has begun Program-wide. The Program is now collaborating with BASMAA and CEP to develop a conceptual model/impairment assessment document. City Staff provide comments to the Program and directly to CEP in support of this process.

This Dioxin-like Compound Control Program will develop procedures to identify, assess, and manage controllable sources of Dioxin-like compounds found in urban runoff.

#	Activities	Compliance Date	Responsible Party
A.	Characterize distribution of Dioxin-like compounds in the urban runoff system based on existing data.	Done FY 01-02	Program
B.	Begin implementation of SCVURPPP plan to characterize distribution of Dioxins.	In Progress at Program Level	Program
C.	Submit plan that identifies control measures / management practices to eliminate or reduce discharges of Dioxins, if needed.	TBD	Program
D.	Explore, and implement if feasible, efforts to move toward alternative fuels for diesel vehicles in City fleet.	**Done** FY 06-07 Ongoing	ESD, DOT, GS

Sediment Control Program

The City's sediment control program falls predominantly within the Construction Inspection (CON) section of this work plan. Sediment monitoring activities also continue in conjunction with the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

Pilot Monitoring Programs

In addition to the above listed control programs, the City concluded activities performed in support for the two Monitoring Pilot Programs that were begun in 1997. These pilot programs generated data that helped develop the follow-on programs of IND (outreach to industrial and commercial dischargers) and the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

MON 1 – Industrial Stormwater Monitoring Pilot Program

This program sampled key industrial sites to determine the significance of metal-contaminated stormwater discharges associated with industrial activities. The ultimate objective from this project of educating industrial and commercial dischargers about developing and implementing SWPPPs and BMPs has now been turned over to the Industrial and Commercial Dischargers section of this work plan under IND.

#	Activities	Compliance Date	Responsible Party
A.	Design and execute a sampling program to meet the project objectives, analyze results, develop guidance for industry to improve SWPPP implementation, and provide technology transfer information to industry and inspectors.	Done, FY 96-97 through 01-02 Ongoing as part of IND	ESD

MON 3 – First Flush Monitoring Program

First flush discharge areas along The Coyote Creek and Guadalupe River were monitored for three wet seasons. The City provided data to the Program for analysis and comparison to other data in June of 2002. The Program submitted a final report to the Water Board in 2003; it was included as appendix C-2 in the Program's 02-03 Annual Report.

#	Activities	Compliance Date	Responsible Party
A.	Conduct multi-year First Flush study sampling, analyze data and provide data to Program as part of Multi-year Monitoring Program.	Done, FY 96-97 through 02-03	ESD, Program

Municipal Compliance

Fuelling island at Mabury Corporation Yard.

This program element summarizes the City's efforts to train City staff on pollution prevention practices and to ensure that City facilities comply with stormwater requirements. Municipal training continues to be a key element for most program elements. Specific program elements that include municipal training activities include ICID 3, IND 5, NRD 11, CON 6, CON 8, PSR 2, PSR 3, PSR 6, SDO 3, SDO 4, PM 4, and WUO&M 3. In order to ensure that City facilities comply with stormwater requirements, Corporation Yards are routinely inspected by ESD staff and the results and improvements discussed with Yard staff. Additionally, Stormwater Pollution Prevention Plans (SWPPPs) that govern the operation of Corporation Yards are also used to ensure that Yards are using current stormwater BMPs. For a list of planned training activities, see Attachment B: Municipal Training Schedule.

Municipal Training

Municipal Training is a critical function of the City's NPDES Permit. Municipal compliance is dependent on the level and quality of the training provided.

#	Activities	Compliance Date	Responsible Party
A.	Identify training needs.	Annually	ESD-UR
	1. Conduct training for City staff and City contractors that perform surface cleaning at City facilities.	Done FY 06-07 As Needed	DOT, GS, ESD
B.	Develop curricula.	As Needed	ESD-UR
C.	Conduct training.	Ongoing	ESD-UR
D.	Evaluate municipal training program and make improvements as needed.	Annually	ESD-UR

Municipal Facilities Assessment and Compliance

Municipal facilities are required to comply with stormwater regulations. Efforts to reduce contaminated discharges from City facilities must be similar to those required of private businesses. While many elements for permit compliance are in place, the City requires a systematic approach to City facilities compliance at the level of effort required in the URMP.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Corp Yard assessments and inspections.	Annually	ESD-UR, GS, DOT

#	Activities	Compliance Date	Responsible Party
	1. Conduct Citywide meeting to discuss Hazardous Material, Safety, and Stormwater issues for City corporation yards (up to two times per year).	Annually	GS, ESD, DOT, Fire, Police, PRNS
	2. Revise Corporation Yard inspection form.	Done FY 05-06 As Needed	ESD-UR
B.	Review Municipal Facilities SWPPPs.	Annually	ESD-UR, GS, DOT
	1. Fully revise the five (5) remaining Corporation Yard SWPPPs (using the Main Yard revised SWPPP pilot process as a template).	Done FY 06-07	ESD-UR, GS, DOT
C.	Conduct SWPPP training at City corporation yards.	Annually	ESD-UR, GS, DOT

Public Information / Participation

PIP Work Plan

This program is implemented in accordance with provision C.4 and includes general outreach, targeted outreach, educational programs, and public participation activities. The City has a robust and broad-based public information and public participation program, utilizing many different outreach methods to best deliver stormwater pollution prevention and watershed protection messages. Conducting outreach to the community and providing opportunities for participation in water quality protection activities are critical to evoking the behavior changes needed to manage stormwater quality. They are also important for garnering the support needed to continue and expand services and programs. Examples of outreach activities include: stenciling of storm drain inlets throughout the City, training sessions for staff and developers about stormwater runoff construction requirements, and conducting Wacky Watershed teacher training workshops.

Watershed Protection Engineer educating 3rd graders at the Water Wizards Festival.

Outreach in Other Elements

Other sections of this work plan contain elements related to outreach to specific target audiences. They can be found in ICID 4, IND 6, NRD 2, CON 7, PM 6, M 5, CB-1, CB-3, and CB-12. For a list of planned outreach activities, see Attachment A: Outreach Activities Summary.

PIP 1 – General Outreach

The City of San José will promote general citizen awareness of what a watershed is, the functions of the storm drain system, pathways and sources of urban runoff pollution to the South Bay watershed, and behaviors that adversely affect water quality.

#	Activities	Compliance Date	Responsible Party
A.	Participate in WMI Outreach, and coordinate WMI outreach with Watershed Watch and Program efforts.	Ongoing	ESD, WMI, Program
	1. Participate in Watershed Watch campaign.	Ongoing	ESD, Program
B.	Identify, support and participate in appropriate community events to further general public awareness.	Ongoing	ESD
	2. Work with Watershed Watch Events work group.	Ongoing	ESD, Program
C.	Give presentations upon request that focus on stormwater messages to elementary through college grade levels, neighborhood groups, etc.	As Needed	ESD

PIP 2 – Targeted Outreach

The City of San José will develop and implement targeted residential outreach and education campaigns, based on high priority pollutants, to effectively reduce pollutant-causing behaviors and promote Best Management Practices.

#	Activities	Compliance Date	Responsible Party
A.	Identify general residential practices contributing to stormwater pollution. Identify reasonable alternatives to pollutant causing behavior.		ESD, Program
	1. Review surveys and applicable reports.	Ongoing	ESD
	2. Meet with inspectors to discuss and document residential outreach needs.	Ongoing	ESD
	3. Prepare report identifying residential outreach needs and tasks and conduct outreach as necessary.	Annually	ESD
B.	Identify ICID practices and target audience(s) contributing to pollution.		ESD
	1. Review ICID reports.	Ongoing	ESD
	2. Meet with ICID inspectors to discuss and document outreach needs.	Ongoing	ESD
	3. Prepare report identifying ICID outreach needs and tasks and conduct outreach as necessary.	Annually	ESD
C.	Promote selected residential and ICID messages through local and regional activity (e.g. Program PIP, BASMAA PIP, BAPPG, Media Relations, etc.).		
	1. Report on targeted residential and ICID outreach activity.	Annually	ESD
	2. Participate in the Program's Pesticide and Mercury ad hoc task groups.	Ongoing	ESD, Program

PIP 3 – Educational Programs

The City of San José will support and/or develop and implement educational programs designed to increase youth understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support, and/or develop and implement school and youth education programs.		
	1. Participate in WE&O Schools and Youth work group.	Ongoing	ESD, Program
	2. Participate in the Alviso Education Center work group.	Ongoing	ESD, Program
	3. Participate in City Education programs such as the Youth Watershed Education Team, Rangers in Schools, Go Green Initiative, etc.	Ongoing	ESD

PIP 4 – Citizen Participation

The City of San José will support and/or develop and implement citizen involvement programs designed to increase citizen understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support and/or develop involvement opportunities for San José residents.		
	1. Participate in creek clean-ups on a biannual basis through in-kind staff support for the Creek Connections Action Group.		
	a. Fall creek cleanup (Coastal Cleanup Day).	Annually	ESD, PRNS
	b. Spring creek cleanup (National Rivers Day).	Annually	ESD, PRNS

PIP 5 – Outreach Evaluation

The City of San José will evaluate its Outreach efforts for effectiveness.

#	Activities	Compliance Date	Responsible Party
A.	Implement selected evaluation tools.		ESD
	1. Work with Program, WMI, and Watershed Watch AHTG to Plan for Program's Watershed Watch Campaign Survey.	As Needed	ESD, Program
	2. Report on survey and evaluation activity during the report period.	Annually	ESD
B.	Annually review, modify and report on outreach plans based on effectiveness results.		ESD
	1. Document in Annual Report effectiveness of outreach activities conducted in prior fiscal year.	Annually	ESD

Permit Reapplication

ESD staff evaluating Municipal Regional Permit Tentative Order.

The City's current NPDES permit was adopted in February 2001 for a five-year period. The permit was amended in October 2001 and July 2005, with both amendments relating to the New and Redevelopment stormwater treatment and hydromodification provision, also known as Provision C.3. The permit has been administratively extended since February 2006, pending the adoption of the Bay Area-wide Municipal Regional Permit.

In late 2005, the Water Board embarked on a multi-stakeholder process to craft an NPDES permit, called the Municipal Regional Permit (MRP) that would apply to all municipal stormwater dischargers in the Bay Area and be in effect for a five year period. The Water Board released the MRP Tentative Order on December 4, 2007 for public review and comment. Comments and public hearings will be held during Spring 2007. The Water Board is expected to adopt the MRP Summer/Fall 2008. The adoption of the MRP would necessitate the development of a new City Work Plan which will identify activities with associated timelines that are required in order to achieve compliance with the stormwater requirements set forth in the MRP.

Permit Reapplication Preparation

#	Activities	Target Date	Responsible Party
A.	Compile all changes to URMP as part of reapplication for next permit. (C.2.b)	Done FY 04-05	ESD
B.	Participate in permit development and negotiation processes.	Ongoing	ESD
C.	As required, develop new five-year Work Plan that starts the following fiscal year upon adoption of MRP.	~~FY 07-08~~ **FY 08-09**	ESD

Attachment A: Outreach Activities Summary

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	❍ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
1.	**Storm Drain Stenciling Evaluation** Evaluate current methods of inlet marking and make recommendations for future FY efforts.	❍		FY 08-09	
2.	**Requests for Brochures** Distribute outreach materials upon request.	❍	PIP 1.C	FY 08-09	♦ Materials distributed
3.	**Regional partnerships** Participate in BAPPG, BASMAA/BACWA Media Relations campaign, CEP, etc.	❍	PIP 2.C	FY 08-09	
4.	**Event Support** As needed, staff Booth and/or provide outreach materials to select events. Evaluate the overall benefit and effectiveness of attending events and make changes as needed.	❍	PIP 1.B	As needed	♦ Materials distributed
5.	**BMP Reprints** Reprint selected Outreach materials as needed.	❍	PIP 1	FY 08-09	♦ n/a
6.	**Industrial Users Academy** Give stormwater, pollution prevention and GIASP compliance information to industries permitted to the Water Pollution Control Plant.	◎: Plant-permitted Industries	IND 6.A, PIP 2.B, PM 6.A, M 5.B	FY 08-09	♦ Participant surveys
7.	**Outreach to Development Community** PW & ESD staffs to conduct training on erosion and sediment control for private developers of type 2 projects. PBCE Planning and PW also conduct roundtable meetings with developers where information regarding stormwater requirements is shared.	◎: Developers	CON 7 NRD 2	FY 08-09	♦ Participant surveys
8.	**IPM Store Partnership** (PROGRAM) Create & provide fact sheets & materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program. There are currently nine stores in San José participating in the IPM store partnership.	◎	PM 6.D.	FY 08-09 dates TBD	
9.	**Partner with other City programs, such as the Strong Neighborhoods Initiative** Continue partnering with City's SNI for delivering selected messages. Other programs to investigate partnerships are the Anti-Litter Program, After School Program, etc.	◎	PIP 1	FY 08-09	
10.	**Mercury Outreach** Investigate opportunities to include mercury messages through participation in the Home Show	◎	M 5 PIP 2.C.	FY 08-09	

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	○ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
	events, residential newsletters or other mailings, and support the County's Universal Waste Take-back Pilot Program.				
11.	**IPM Outreach** Prepare IPM stories and press releases for local media. Investigate opportunities to include IPM messages in the City's outreach to businesses.	◎	PM 6.A PM 6.B	FY 08-09	
12.	**Coastal Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Fall 08	♦ Participant surveys ♦ Amount picked up
13.	**National Rivers Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Spring 09	♦ Participant surveys ♦ Amount picked up
14.	**Wacky Watersheds Workshops** Present South Bay Water Connections curriculum to middle school educators within San Jose/Santa Clara Water Pollution Control Plant service area.	✎	PIP 3.A	FY 08-09	♦ Participant surveys ♦ Follow-up call of attendees
15.	**Creeks Come to Class** Formerly called Water Awareness Program. Also called Rangers in Schools. Presentations focusing on Pollution Prevention. *It's Wet It's Wild It's Water!* Curriculum distributed to teachers.	✎	PIP 3.A	FY 08-09	♦ Survey of teachers ♦ Survey of students
16.	**Slow the Flow** Grant to Don Edwards Alviso Environmental Education Center to host 9 different types of events: special events, interpretive programs, teacher orientation, field trips, in-class presentations, outreach presentations, workshops, special visits and interpretive displays.	✎	PIP 3.A	FY 08-09	♦ Done by Grantee
17.	**Youth Watershed Education Grants** Grant program for educators.	✎	PIP 3.A	FY 08-09	♦ Audit of projects
18.	**Website** Maintain and update website with pertinent information as needed.	○	PIP 1	FY 08-09	♦ Website traffic data
19.	**ICID Targeted Outreach** Targeted outreach to areas that exhibited a high number of residential ICID Complaints in FY 06-07.	◎	PIP 2.C	FY 08-09	♦ TBD
20.	**Charity Car Wash Kit** Explore the option of providing targeted outreach and supplies to community groups engaging in fundraising car wash events.	◎		FY 08-09	♦ TBD

Attachment B: Municipal Training Schedule

PS ID #	Topic	Sponsored or Held By	Dept/Division/Section Attending	# Sessions	Tentative Schedule
ICID 3	Construction Inspection Training	ESD - WE	ESD - WE	1	07/08
ICID 3	Annual Training for ICID Inspectors	ESD - WE	ESD - WE	1	07/08
IND 5	Training for IND Inspectors	ESD - WE	ESD - WE	1	07/08
CON 6	Wet Weather Construction Site Preparation & Inspection	DPW, ESD	PW	2	09/08
CON 6	Construction Site Planning and Management For Water Quality Protection	SCVURPPP & Water Board	PW, ESD, PBCE, PRNS		09/08
CON 6	SOPs for inspections during wet and dry season to include procedures for erosion control plan review inspection process	DPW, ESD	PW Inspections, PBCE Building Inspectors (All to attend at least once every two years)		10/08
CON 7	Erosion & Sediment Control Training for Type 2 Private Development Projects	DPW & ESD	Private Developers, PW, ESD		10/08
CON 8	Erosion Control Information To Be Included In Contract Language For Capital Improvement Projects Training For PW Construction Project Management	PW & ESD	PW		11/08
NRD 10	NPDES C.3 Training	Various	PBCE, PW, RDA, ESD		
PSR 2	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/09
PSR 3	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/09
PSR 6C	Stormwater Pollution Prevention Training – Rural Public Works	PRNS, ESD	PRNS	2	10/08
SDO 3A	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/09
SDO 4	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/09
PM 4A	Worker Safety training per DPR requirements	GS, DOT, PRNS, ESD	GS, DOT, PRNS, ESD	1	02/09
PM 4B	Training on IPM Policy & Techniques	GS, DOT, PRNS, ESD	GS, DOT, PRNS, ESD	1	02/09
WUOM 3	Water Utility Operation & Maintenance Discharge Training	ESD (Muni Water)	Muni Water Operations & Maintenance Crews		12/08

Glossary

AHTG	Ad Hoc Task Group
AOC	Area of Concern
BACWA	Bay Area Clean Water Agencies
BAPPG	Bay Area Pollution Prevention Group
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practices
CAO	City Attorney's Office
CEP	Clean Estuary Partnership
COS	Communications and Outreach Subgroup of WMI
DOT	Department of Transportation
EEC	Environmental Education Center
EIR	Environmental Impact Report
ESD	Environmental Services Department
ESD-P&P	Policy and Planning
ESD-MarComm	Marketing & Communication Section
ESD-Muni	City of San José Municipal Water System
ESD-R&R	Regulations and Research Section
ESD-UR	Urban Runoff Section
ESD-WE	Watershed Enforcement Section
GIASP	General Industrial Activities Storm Water Permit
GS	General Services Department
HHW	Household Hazardous Waste
HMP	Hydromodification Management Plan
IPM	Integrated Pest Management
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PBCE	Department of Planning, Building and Code Enforcement
PBCE-Bldg	Building Division of PBCE
PBCE-Planning	Planning Division of PBCE
PD	Police Department
POTW	Publicly Owned Treatment Works
PRNS	Department of Parks, Recreation and Neighborhood Services
PW	Public Works Department
PW-CFAS	City Facilities Architectural Services Division of PW
PW-ECS	Engineering and Construction Services Division of PW
PW-TDS	Transportation & Development Services of PW
RDA	Redevelopment Agency
RWQCB or Water Board	Regional Water Quality Control Board
SCVURPPP or Program	Santa Clara Valley Urban Runoff Pollution Prevention Program
SNI	Strong Neighborhoods Initiative
SOP	Standard Operating Procedure

SWPPP	Storm Water Pollution Prevention Plan
TBD	To Be Determined
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
WE&O, or WEO	Watershed Education and Outreach
WMI	Watershed Management Initiative
WUPPP	Water Utility Pollution Prevention Program
YWET	Youth Watershed Education Team

City of San José
Urban Runoff Management Plan
FY 09-10 Work Plans

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Cover Pictures

First Row:

1) The wetlands of South San Francisco Bay, with the Diablo Mountain Range to the east.

Second Row:

1) Third graders learning about pollution prevention at Water Wizards Festival.

2) Stormwater treatment integrated with public art at Roosevelt Community Center.

Third Row

1) Bio-swale stormwater treatment control measure at Roosevelt Community Center.

2) A storm drain inlet stenciled with the name of the nearest creek and the City's stormwater dumping complaint phone number.

3) Thompson Creek as it flows through Aborn Park.

City of San José

Urban Runoff Management Plan

Chapter 11:

Santa Clara Valley Urban

Runoff Pollution Prevention Program

Attachment 1: FY 09-10 Work Plans

Prepared by the Environmental Services Department

February 24, 2009

009728

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Key to revisions in the Work Plans

Bold text ..... Bold text indicates elements that have been added to the Work Plans since the URMP FY 08-09 Work Plans approved in March 2008

~~Strikethrough text~~ ..... Strikethrough text indicates elements that have been deleted from the Work Plans since the URMP FY 08-09 Work Plans approved in March 2008

Introduction

This compilation of annual work plans for the City of San José Urban Runoff Management Plan (URMP) has been developed for FY 2009-2010 pursuant to Section C.6.b of the City's Municipal Separate Storm Sewer System NPDES permit (No. CAS029718), Order 01-024. The work plans include tasks, responsibilities, and schedules needed to implement the program elements in the URMP with the overall intent to reduce stormwater pollution in the City's storm drains, creeks and rivers. The Environmental Services Department coordinates development and review of the work plans in cooperation with staff from all affected City departments.

Stormwater treatment integrated with public art at Roosevelt Community Center

The Permit requires that annual work plans be submitted to the Water Board by March 1 of each year. This submission precedes completion of the City's annual budget development and approval process. While the work plans are developed using the best available information regarding budget forecasts, all activities in the work plans are subject to the approval of funding by the City Council in June of each year.

Additionally, the work plans address program needs as defined by the current permit and do not include new, expanded, or redirected efforts anticipated in the Municipal Regional Permit (MRP). Until the MRP is adopted, it is not practical to specify additional tasks at this time given the scope and pervasiveness of the proposed requirements across the City's programs. Rather, the City is prepared to revise work plans as needed to reflect the MRP after adoption.

The City of San José is committed to managing and protecting stormwater quality and dedicates significant resources to a variety of activities designed to address stormwater quality issues. The City actively participates in many local and regional efforts designed to leverage the most value for its resources and citizens and strives to be a leader in watershed protection.

Illicit Connection / Illegal Dumping

ICID Work Plan

The City's Environmental Inspectors assigned within the Environmental Services Department (ESD) Watershed Protection Division respond to complaints regarding illegal discharges or threats of discharge to the storm sewer system. Residential incidents are typically the most frequent type of complaint, with vehicle-related sources being most common. Dumping of various materials is also a prevailing source of incidents. ESD responds to all complaints with education and enforcement in partnership to achieve compliance and prevent future incidents. This program element is implemented pursuant to permit provision C.2 and C.6.a.ii.

Storm drain inlet stenciled with hotline number and name of local creek

ICID 1 - Response to Complaints

The City of San José will respond to complaints regarding ICID dumping activities into the storm drain system and will ensure that the activity has ceased or is on a time schedule to cease.

#	Activities	Compliance Date	Responsible Party
A.	Update database system to track ICID complaint information.	Done FY 02-03	ESD-WE
B.	1. Document complaint activity, the number of ICID complaints that the City received, and that the activity has ceased or is an allowable discharge.	Annually	ESD-WE
	2. Prepare draft complaint activity data tables to review trends and to facilitate timely evaluation of the data.	Annually, Q3	ESD-WE
C.	Document to the Water Board annually follow-up activities from each ICID complaint response.	Annually	ESD-WE
D.	1. Review effectiveness of standard operating procedures for responding to ICID complaints.	Ongoing	ESD-WE
	2. Refine and implement standard operating procedures for responding to ICID complaints/referrals.	As Needed	ESD-WE
E.	Work with SCVURPPP to refine administrative procedure for providing referrals to the Water Board.	Pending Implementation by Program	ESD-WE, Program
F.	Refine and implement standard operating procedures to incorporate results of ICID 1E.	Pending Implementation by Program	ESD-WE, Program

ICID 2 - Investigations of High Priority Areas

The City of San José will conduct investigations of high priority areas. High Priority is defined as areas with a high potential for non-storm water discharges to the City's collection system.

#	Activities	Compliance Date	Responsible Party
A.	Target areas for monitoring by identifying high priority areas, primary types and sources of ICID pollution based on complaints, historical inspection records, inspector knowledge, and monitoring information.	Annually	ESD-WE
	1. Perform GIS analysis on frequently occurring ICID sources and/or types.	Done FY 03-04	ESD-UR
	2. Perform outreach in targeted areas based on GIS analysis and other analyses as available. See PIP 2 for details.	Annually	ESD-UR & WE
B.	Conduct investigations of high priority areas based on ICID 2A.	Ongoing	ESD-WE
C.	Document to the Water Board that investigations of high priority areas have been conducted.	Annually	ESD-WE

ICID 3 - Inspector Training

The City of San José will ensure that ICID inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for ICID inspectors.	Annually, Q1	ESD-WE
B.	Provide and document on-the-job training and other training opportunities, such as inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

ICID 4 - Outreach and Technology Transfer

The City of San José will distribute outreach and technology transfer material containing applicable control measures and/or BMPs to target parties responsible for ICID activities.

#	Activities	Compliance Date	Responsible Party
A.	Determine need for new and/or revised outreach and technology transfer material by getting feedback from inspectors regarding 1) continuing problem activities; 2) discharge types; 3) monitoring and complaint data; and 4) usefulness of existing outreach and technology transfer material.	Ongoing	ESD-MarComm ESD-UR
B.	Develop, audit and/or modify existing outreach material, as needed, based on report developed under ICID 4A.	As Needed	ESD
C.	Document to Water Board that outreach and technology transfer material and/or BMPs have been distributed.	Annually	ESD-UR

#	Activities	Compliance Date	Responsible Party
D.	Develop and implement standard operating procedures to gather customer feedback on ICID services.	Development Done FY 02-03 Implementation Ongoing	ESD-WE

ICID 5 - SOPs Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its SOPs in responding to complaints regarding illicit connections and illegal dumping activities into the storm drain system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate effectiveness of SOPs.	Annually	ESD-WE
B.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

Industrial & Commercial Dischargers

IND Work Plan

The City's Environmental Inspectors, located within the Watershed Protection Division of the Environmental Services Department, inspect more than 4,500 businesses per year to ensure that proper practices are employed to prevent stormwater pollution. How frequently a business is inspected depends on their potential for contributing pollutants as determined by previous inspection results. This method of assigning inspection frequencies has been effective in focusing limited inspection resources on high priority cases to best protect water quality. Generally, over 70% of the businesses inspected are found to have no significant stormwater issues and thus do not warrant near-term re-inspection. When issues are identified, education and enforcement are used together to achieve compliance. This Program element is implemented pursuant to permit provision C.2.

Watershed Enforcement Inspector reviewing an inspection report with a facility manager

IND 1 - Notice of Intent (NOI) Filers

The City of San José will conduct inspections of those facilities that have filed an NOI with the State and appear on a list provided by the State. An NOI is required to be filed with the State by companies that are considered to have a high potential to contaminate stormwater and are classified under certain standard industrial classification (SIC) codes.

#	Activities	Compliance Date	Responsible Party
A.	Annually, obtain NOI filer database from State with annual information, review information and identify new NOI facilities for inspection the following year.	Annually	ESD-WE
B.	Conduct and document initial inspections of NOI Filers within one year using the inspector checklist form to determine exposure and assign a future inspection frequency to each facility accordingly. Document whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site.	Ongoing	ESD-WE
C.	Conduct and document annual inspections of facilities determined to have exposure in accordance with inspection frequency schedule.	Ongoing	ESD-WE
D.	Conduct and document inspections of facilities that need to file an NOI at least once every five years and in accordance with the inspection frequency schedule identified in IND 3.	Ongoing	ESD-WE
E.	Maintain the database to track the inspection information from the	Ongoing	ESD-WE

#	Activities	Compliance Date	Responsible Party
	inspector checklist and to include all NOI filer SIC codes required by the Industrial Activities Stormwater General Permit.		

IND 2 - Non-Filer Investigations

The City of San José will inspect industrial facilities that may be subject to general permit requirements but are not found on the NOI filer list provided by the State and that conduct activities identified by the following SIC codes:

5015: Automobile Dismantlers

5093: Other Recycling Industries

3200 series: Stone, Clay and Concrete Products Industry

4100 & 4200 series: Trucking Facilities that perform on-site vehicle repair, maintenance or washing.

#	Activities	Compliance Date	Responsible Party
A.	Identify industrial facilities that conduct activities with the SIC codes listed in the IND SOPs.	Annually	ESD-WE
B.	Develop a list of facilities targeted for inspection during upcoming year that may be subject to general permit requirements for NOI based on business licenses, etc.	Annually	ESD-WE
C.	Conduct and document initial inspections of industrial facilities with the SIC codes listed referenced in IND 2A, using the inspector checklist form to document whether the facility constituted a potential threat to discharge pollutants to the storm drain collection system, whether the facility had submitted an NOI, and whether a SWPPP and a SWMP were on site. Maintain database.	Ongoing	ESD-WE
D.	Conduct and document annual inspections of facilities determined to have exposure in accordance with implementation schedule. Add the facility to appropriate database(s) and assign an inspection frequency. If the facility inspected is determined to need to file an NOI and is not able to provide an NOI, SWPPP or SWMP, refer to the Water Board.	Ongoing	ESD-WE
E.	Work with the Program's Industrial Inspection Ad Hoc TG on an Administrative procedure for providing referrals to the Water Board and document providing referrals to the Water Board for facilities with significant problems.	Pending Implementation by Program	ESD-WE, ESD-UR

IND 3 - City Regulated Facilities

The City of San José will conduct inspections of City Regulated commercial facilities as identified below:

Type	Frequency
Food service facilities	2 or more AOCs* over a rolling three year time period - Every year 1 AOC over a rolling three year time period - Every two (2) years 0 AOCs over a rolling three year time period - Every three (3)years
All Other City Regulated facilities	2 or more AOCs* over a rolling five year time period - Every year 1 AOC over a rolling five year time period - Every two (2) years 0 AOCs over a rolling five year time period but have exposure - Every five (5) years 0 AOCs over a rolling five year time period with no exposure or potential for exposure - No further inspections
Facilities for which a referral or ICID complaint is received	As soon as practicable for violations and every year until they meet the above criteria.

*Area of Concern (AOC) = A violation based on the San José Municipal Code 15.14.530 issued to a facility during a stormwater inspection.

#	Activities	Compliance Date	Responsible Party
A.	Determine industrial/commercial facilities identified in the IND SOPs for inspection in each FY.	Annually, Q1	ESD-WE
B.	Conduct and document inspections of City Regulated facilities, other than food service facilities, at least once every five (5) years in accordance with the inspection frequency schedule. If determined to have no impact or no potential for pollution, will not be scheduled for future inspection.	Ongoing	ESD-WE
C.	Conduct and document inspections of City Regulated food service facilities at least once every three (3) years. Initial approved performance standards require inspections every three years.	Ongoing	ESD-WE
D.	Conduct and document inspections for which a referral or complaint was received within five days of complaint received and second inspection within one year.	Ongoing	ESD-WE
E.	Develop a database to track the inspection information from the inspector facility inspection report.	Done FY 02-03	ESD-WE
	1. Implement new Environmental Enforcement Data Management System.	Done FY 03-04	ESD-WE
	2. Prepare draft data inspection tables to review data trends and to facilitate timely evaluation of the data.	Annually, Q3	ESD-WE
F.	Maintain database to track inspection information from inspector facility inspection report and to include new industrial program categories.	Ongoing	ESD-WE
G.	For B, C, D, and E, collect information during inspections on the potential for stormwater pollution at City Regulated facilities in order to determine the appropriate inspection frequency for the various facilities.	Ongoing	ESD-WE

#	Activities	Compliance Date	Responsible Party
H.	Develop an inspection frequency plan to track frequency of inspections. Implement & update, as needed, the inspection frequency plan.	Development: Done FY 01-02 Ongoing Updated As Needed	ESD-WE

IND 4 - Compliance

The City of San José will conduct industrial/commercial inspections to determine the existence of discharges or potential discharges which are illegal under local ordinances. The facility operator will be notified of observed areas of concern to be corrected and/or if official action on violations is necessary, it will take place under local enforcement procedures.

#	Activities	Compliance Date	Responsible Party
A.	Document facilities that have enforcement actions and the type of enforcement actions conducted for the existence of discharges or threatened discharges that are illegal under local ordinances.	Ongoing	ESD-WE

IND 5 - Training

The City of San José will ensure that industrial/commercial inspectors are adequately trained in inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

#	Activities	Compliance Date	Responsible Party
A.	Conduct annual training for IND inspectors.	Annually, Q1	ESD-WE
B.	Maintain a training plan and provide and document on-the-job training and other training opportunities such as industrial/ commercial inspection workshops.	Ongoing	ESD-WE
C.	Review inspection training protocols to identify new training opportunities, approaches, and materials.	Annually	ESD-WE

IND 6 - Outreach

The City of San José will help develop and distribute outreach and technology transfer material containing applicable control measures and/or BMPs to industrial/commercial facility operators responsible for IND activities.

#	Activities	Compliance Date	Responsible Party
A.	Identify and list existing outreach and technology transfer material.	Annually	ESD-UR
B.	Distribute applicable outreach and technology transfer material to industrial/commercial facility operators. Document to the Water Board that outreach and technology transfer material and/or BMPs	Distribution: Ongoing	ESD-UR

#	Activities	Compliance Date	Responsible Party
	have been distributed, as needed, to industrial/commercial facility operators.	See PIP Program Element in Annual Report	
C.	Determine usefulness of outreach and technology transfer materials by obtaining feedback from industrial/commercial facilities. Obtain feedback from inspectors about the effectiveness of existing outreach and technology transfer material and develop and/or modify existing outreach material.	As Needed	ESD-UR

IND 7 - NOI Filers Effectiveness Evaluation

The City of San Jose's Watershed Enforcement staff will review and evaluate the effectiveness of its inspections procedures and database tracking system.

#	Activities	Compliance Date	Responsible Party
A.	Document and evaluate the effectiveness of NOI Filers inspections procedures.	Annually	ESD-WE
B.	Document and evaluate the effectiveness of the NOI Filers database tracking system.	Annually	ESD-WE
C.	Document and evaluate what worked well and what needs improvement.	Annually	ESD-WE

New and Redevelopment

NRD Work Plan

The New and Redevelopment provision (also referred to as C.3) requires that development projects implement controls to address pollutant discharges and increased stormwater runoff flows for the life of a project by incorporation of treatment and hydromodification measures and other appropriate source control and site design measures.

The City began phased implementation of hydraulic (also referred to as numeric) sizing requirements for stormwater treatment control measures in conformance with City Council approved Post-Construction Urban Runoff Management Policy 6-29 on October 15, 2003. Effective August 15, 2006, hydraulic sizing was required for all projects that create or replace 10,000 square feet of impervious surface. On October 18, 2005, Council approved Post-Construction Hydromodification Management Policy 8-14 and the City began implementation of hydromodification management requirements. This Program element is implemented pursuant to permit provision C.3.

Bio-swale stormwater treatment control measure at Roosevelt Community Center

NRD 1 - Legal Authority

The City of San José will have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Provision C.3.a.i).

#	Activities	Compliance Date	Responsible Party
A.	Revise Municipal Code to ensure adequate legal authority to implement new development control measures (C.3.a.i).	As Needed	PBCE, ESD, PW

NRD 2 - Guidance to Developers

The City will provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for stormwater pollution prevention, as appropriate for the type of project and location.

#	Activities	Compliance Date	Responsible Party
A.	1. Draft necessary revisions to Guidance Manual on Selection of Stormwater Quality Control Measures to allow incorporation of hydraulic sizing design criteria and provide to developers.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	2. Refine Guidance Manual on Selection of Stormwater Quality Control Measures to incorporate HMP measures, as necessary.	Done FY 05-06	PBCE, ESD, PW, RDA, Program
B.	Provide development community with revised information and guidance materials concerning any adopted on site design, building permit requirements, hydraulic sizing design criteria and HMP criteria, and maintenance requirements for BMPs for stormwater treatment measures.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA
	1. Coordinate w/development community on proposed hydraulic sizing criteria for structural stormwater treatment measures, HMP criteria and any proposed revisions to Guidance Manual and policy through workshops and regular meetings.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update guidance material regarding maintenance responsibilities for any HMP measures.	Done FY 05-06	PBCE, ESD, PW, RDA, Program

NRD 3 - CEQA Requirements

The City will ensure that environmental documents required for those projects that fall under CEQA and NEPA review address both significant and cumulative stormwater quality impacts during the life of the project, and relevant permit requirements. These documents include EIRs, negative declarations and initial study checklists (C.3.m).

#	Activities	Compliance Date	Responsible Party
A.	Review and evaluate the City's Environmental Review procedures to improve the review for water quality impacts and identification of mitigation measures. (Provision C.3.m.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Identify areas where new or additional water quality review processes and related documents or checklist questions are needed and propose schedule for revision.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Refine and update areas where new or additional water quality related mitigation measures may be needed.	Done FY 05-06	PBCE, ESD, PW, RDA
B.	Report on revisions made to environmental review processes.	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 4 - Project Mitigation Measures and Design Requirements

The City will encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measure that minimize stormwater pollutant discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Revise current Policy on Post-Construction Urban Runoff Management as necessary to incorporate minimum BMP requirements for all projects.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
B.	Review and modify development permit approval procedures for adopted revisions as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA
C.	Review the design standards and guidance for opportunities to make revisions that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures.	Done FY 03-04	PBCE, ESD, PW, RDA
D.	Review the existing source control measures contained in site design standards, guidance documents and conditions of approval for opportunities to limit stormwater pollution. (Provision C.3.k.)	Done FY 03-04	PBCE, ESD, PW, RDA
E.	Review General Plan and revise as necessary to incorporate water quality and watershed protection principles and policies, and summarize revisions made.	Done FY 02-03 Ongoing	PBCE
F.	Review the design standards and guidance for opportunities to make revisions as necessary that would result in reduced impacts to water quality and summarize how they were incorporated into approval procedures. Such revisions are listed in Provision C.3.j.	Done FY 03-04	PBCE, ESD, PW, RDA
	1. Identify and document existing site design standards and guidance documents and policies.	Done FY 03-04	PBCE, ESD, PW, RDA
	2. Revise Site Design Measures and Standards, as necessary.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA

NRD 5 - Group 1, 2 and HMP Project Requirements

On October 15, 2003, the City began phased implementation of hydraulically sized stormwater treatment measures in conformance with Policy 6-29 beginning with projects that create or replace one acre or more of impervious surface area and are considered Land Uses of Concern. On February 15, 2005, all projects that created or replaced one acre or more of impervious surface were required to hydraulically size stormwater treatment measures. On May 17, 2005, the threshold changed to include all projects that created or replaced 10,000 square feet of impervious surface and are a Land Use of Concern. Effective August 15, 2006, all projects that create or replace 10,000 square feet or more of impervious surface were required to include hydraulically sized stormwater treatment measures in each project.

On October 18, 2005, all projects that meet the criteria described in Policy 8-14 are required to manage increases in runoff flow, volume and duration.

The following is a brief summary of the Best Management Practices that are required in all development projects:

- Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality) and provide detention or retention as part of landscaping where feasible (C3.b.i and C.3.j);
- Source controls shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k), including measures to discourage pesticide use (C.9.d.ii);
- Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Policy 6-29 (Provision C.3.d); and

- Increases in runoff flow, volume and duration shall be managed in accordance with Policy 8-14 (Provision C.3.f).

#	Activities	Compliance Date	Responsible Party
A.	1. Propose revisions to current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA
	2. Revise current Policy 6-29 on Post-Construction Urban Runoff Management as necessary to incorporate hydraulic sizing design criteria.	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA
	3. Revise policy as needed for Group 2 implementation.	Done FY 04-05 & FY 06-07	PBCE, ESD, PW, RDA
	4. Revise policy as needed for HMP implementation.	Done FY 05-06	PBCE, ESD, PW, RDA
B.	Develop a list of Annual Reporting requirements from Provision C.3. Design data tracking needs and protocols.	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Compile a list of new development and redevelopment projects by name, type of project, site acreage or square footage, square footage of new impervious surface, treatment BMPs and numeric sizing criteria used for applicable projects. Also, the source control measures required and pesticide reduction measures.	Annually	PBCE, ESD, PW, RDA
	2. Update existing data collection software for private projects to enable tracking of all projects with treatment or HMP measures.	Done FY 07-08	PBCE, ESD, PW, RDA
C.	Revise and update permitted alternatives to numeric sizing through Alternative Measures Program in Policy 6-29.	Done FY 04-05	PBCE, ESD, PW, RDA
	1. Report to City Council on Alternative Measures Program revisions in Policy 6-29. (Provision C.3.g.)	Done FY 04-05	PBCE, ESD, PW, RDA
	2. Track name and location of projects in the Alternative Measures Program, project type and size, percent impervious surface, reason for granting waiver, terms of waiver, equivalent benefit provided, alternative treatment project or regional project receiving the benefit and date of completion of the alternative treatment project or regional project (Provision C.3.g).	Annually	PBCE, ESD, PW, RDA
	3. Report to City Council on projects approved with numeric sizing alternatives through Alternative Measures Program. (Provision C.3.g.)	Annually	PBCE, ESD, PW, RDA
D.	Draft post-construction treatment BMP certification procedures. (Provision C.3.h)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Track name and location of projects subject to certification. (Provision C.3.h.)	Annually	PBCE, ESD, PW, RDA
E.	Participate on SCVURPPP's Hydromodification Management Plan work group and develop procedures for limiting peak stormwater runoff discharge rates from development projects. (Provision C.3.f.)	Done FY 04-05 Ongoing	PBCE, ESD, PW, RDA
F.	1. Review and modify development permit approval procedures and standard operating procedures as necessary to incorporate requirements for:		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	

#	Activities	Compliance Date	Responsible Party
	b. Group 2	Done FY 04-05	
	c. HMP	Done FY 05-06	
	2. Update and refine criteria and checklist to aid Department of Planning, Building & Code Enforcement & Department of Public Works planners and engineers in determining whether a development project should be required to incorporate post-construction treatment control measures and their related operation and maintenance requirements as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	Done FY 05-06	
	3. Update and refine standard conditions of approval as necessary to ensure proper selection, design of and installation of structural stormwater treatment measures per Provision C.3.b.,c.,d as necessary.		PBCE, ESD, PW, RDA
	a. Group 1	Done FY 03-04	
	b. Group 2	Done FY 04-05	
	c. HMP	Done FY 05-06	
G.	Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites. (Provision C.3.n. & C.9.ii.)	Done FY 02-03	PBCE, ESD, PW, RDA
	1. Based on City's Pesticide Management Plan, establish criteria for tracking percentage of new development projects for which pesticide reduction measures were required and begin tracking. (Provision C.3.n. & C.9.d.ii)	Done FY 03-04 Ongoing	PBCE, ESD, PW, RDA
H.	Implement any new adopted development conditions of approval, and procedures to developments with significant stormwater pollution potential. (Provision C.3.b.)	Done FY 02-03	PBCE, ESD, PW, RDA

NRD 6 - Developer Conformance with State Requirements

The City will require developers of projects that disturb a land area of one acre or more to demonstrate conformance with the State General Construction Activity Storm Water Permit including filing of NOI, development of a SWPPP, et al.

#	Activities	Compliance Date	Responsible Party
A.	Include as condition of approval for projects that disturb a land area of one acre or more, a requirement to demonstrate coverage under the State General Construction Activity Storm Water Permit.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03 See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 7 - Developer Erosion Control Plans

The City will require developers of projects with potential for significant erosion and planned construction activity during the wet season to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

#	Activities	Compliance Date	Responsible Party
A.	Include as a condition of approval for applicable projects a requirement to prepare and implement an erosion and sediment control plan.	Done FY 02-03	PBCE, PW, RDA
B.	Track the projects that contained above condition of approval.	Done FY 02-03 See CON Program Element in Annual Report	PBCE, PW, RDA

NRD 8 - Operation and Maintenance for Structural Stormwater Controls

The City will implement an operation and maintenance (O&M) verification program that includes (C.3.e):

- Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;
- Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;
- Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

#	Activities	Compliance Date	Responsible Party
A.	Work with SCVURPPP to develop guidance for implementing O&M Program.	Done FY 02-03	PBCE, ESD, PW, RDA
B.	1a. Draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities. (Provision C.3.e)	Done FY 03-04	PBCE, ESD, PW, RDA
	1b. Conduct pilot inspection program to inspect treatment BMPs that were constructed prior to numeric sizing requirements. The intention of the pilot program is to assess workload impacts, data tracking and collection methods, and funding for O&M programs and to use this information to revise the O&M program.	Done FY 05-06 Ongoing	ESD
	2. Revise and update draft summary of details of operation and maintenance verification program: organizational structure, evaluation, proposed improvements, inspections and follow-up, including criteria for setting priorities as necessary. (Provision C.3.e.)	Done FY 05-06	PBCE, ESD, PW, RDA
C.	1. Include as a condition of approval a requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such controls.	Done FY 03-04	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	2. Revise and update condition of approval requirement that developers of projects that include installation of permanent structural stormwater controls are required to establish and provide proof of operation and maintenance of such structural controls as necessary.	Done FY 05-06 Ongoing	PBCE, ESD, PW, RDA
	3. Develop model permit conditions with BMP fact sheets to include in use permits where appropriate.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Compile a list of projects & responsible operators subject to C.3.e. provision.	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
D.	Track and compile a list of priority properties inspected and inspection results. (Provision C.3.e.iii.)	Done FY 03-04 Annually	PBCE, ESD, PW, RDA
	1. Determine criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency.	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Update and revise criteria for setting priorities for inspection of structural stormwater treatment measures & inspection frequency as necessary.	Done FY 05-06	PBCE, ESD, PW, RDA
	3. Develop local inspection program for verification of proper O&M.	Done FY 02-03	PBCE, ESD, PW, RDA
	4. Update and revise local inspection program for verification of proper O&M as necessary.	Done FY 05-06	PBCE, ESD, PW, RDA
E.	Update inspection software to track and schedule inspections for the number of sites that installed treatment and/or HMP measures. *This activity is one of multiple inspection software updates planned upon adoption of MRP.	~~FY 06-07~~ **FY 09-10***	ESD-WE

NRD 9 - Applicability to Public Projects

The City will ensure municipal capital improvement projects include stormwater quality control measures during and after construction, appropriate for each project, and that contractors comply with stormwater quality control requirements during construction activities and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a process to ensure that municipal capital improvement projects install structural stormwater quality control measures as necessary.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

#	Activities	Compliance Date	Responsible Party
	1. Participate on SCVURPPP work group tasked with developing a technical guidance document for use by municipal staff to ensure that the document includes standard specifications and details, sizing methodologies, and model conditions of approval acceptable for use in City projects as necessary. (Provision C.3.b. & d.)	Done FY 02-03	PBCE, ESD, PW, RDA
	2. Review and revise Redevelopment Agency Project Request for Proposal procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 03-04	ESD, PBCE, RDA
	3. Review and Revise Public Works Capital Improvement Project approval procedures and Road Improvement Project approval procedures as necessary to comply with revised Provision C.3. requirements. (Provision C.3.c.)	Done FY 02-03	PBCE, ESD, PW, RDA
B.	Review, evaluate, and modify the procedures, as necessary.	Done FY 03-04	PBCE, ESD, PW, RDA
C.	Begin tracking required data on the public projects subject to Provision C.3. hydraulic sizing criteria requirements for Annual Report.	Done FY 03-04 Ongoing	PBCE, PW, RDA
	1. Modify the existing data collection software for public projects to track new capitol improvement projects with stormwater treatment and/or HMP measures.	**Done** FY 07-08	PW
D.	Monitor development of City's Green Building program for opportunities to discourage architectural use of copper in development projects (Provision C.9.a.) and to incorporate urban runoff considerations.	Done FY 02-03 Ongoing	PBCE, ESD, PW, RDA

NRD 10 - City Staff Training

The City will provide training at least annually to its planning, building, and public works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention (C.3.a.vi).

#	Activities	Compliance Date	Responsible Party
A.	Provide training to Planning and Public Works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA
B.	Provide training to Redevelopment Agency and Department of Transportation staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention. (Provision C.3.a.vi.)	Ongoing	PBCE, ESD, PW, RDA, DOT
C.	Revise the training protocol to incorporate any newly adopted Provision C.3. permit requirements and related revised procedures.	As Needed	PBCE, ESD, PW, RDA
D.	Train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval and the importance of minimizing pesticide use in runoff from development sites. (Provision C.3.n. and Provision C.9.d.ii)	Ongoing	PBCE, ESD, PW, RDA, DOT

NRD 11 - Development Plan Review and Approval Procedures Effectiveness Evaluation

The City of San José will review and evaluate the effectiveness of its development plan review and approval procedures.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in review and approval process.	Annually	PBCE, ESD, PW, RDA
B.	Document and evaluate what worked well and what needs improvement.	Annually	PBCE, ESD, PW, RDA

Construction Inspection

CON Work Plan

The City inspects activities at construction sites to prevent sediment and other pollutants from entering the storm sewer system. The measures and activities discussed in this work plan apply to both private development projects and municipal public works construction projects. These measures and activities are implemented at construction project sites as part of the City's construction inspection and enforcement program, which is implemented as a collaborative effort between inspectors from Public Works, Building, and Environmental Services. These departments also collaborate in providing outreach materials and training to the development community on appropriate best management practices. This program element is implemented pursuant to permit provision C.2.

Proper stormwater management during construction, including drain protection, prevents sediment and other pollutants from entering the storm system

CON 1 - Site Housekeeping

The City ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites, and prevent illicit discharges to storm drains and watercourses.

#	Activities	Compliance Date	Responsible Party
A.	Track and document incidents of housekeeping issues at construction sites.	Ongoing	PBCE-Bldg, PW, ESD-WE

CON 2 - Local Ordinance

For development projects with significant erosion potential and planned construction activity during the wet season, the City ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.

#	Activities	Compliance Date	Responsible Party
A.	Maintain a program for identifying and conditioning projects with significant erosion potential and planned wet season activity.	Ongoing	PW, PBCE-Bldg
B.	Identify ordinance changes needed to conduct inspections.	As Needed	PW, ESD-WE, PBCE-Bldg

CON 3 - Construction Inspection Frequency

The City inspects construction sites for adequacy of stormwater quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on size of project, site conditions, precipitation, and project's potential impact on stormwater quality.

#	Activities	Compliance Date	Responsible Party
A.	Maintain and update SOPs for construction inspection program.	As Needed	PW, ESD-WE, PBCE-Bldg
B.	Document inspections of active construction sites.	Ongoing	PW, ESD-WE, PBCE-Bldg
C.	Evaluate the effectiveness of the construction inspection program and make improvements as necessary.	Annually	PW, ESD-WE, PBCE-Bldg

CON 4 - Wet Season Preparation

Prior to the beginning of the wet season each year, the City inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.

#	Activities	Compliance Date	Responsible Party
A.	Review and revise procedures for construction inspection staff regarding wet season construction requirements.	As Needed	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
B.	Document pre-season inspection of construction sites to ensure adequate implementation of winterizing BMPs prior to the wet season.	Annually	PW-CFAS, ECS, TDS

CON 5 - Inspection and Site Evaluation Follow-up

Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the City's enforcement procedures, and followed up with action(s) commensurate with risk of pollutants entering City storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the City's Annual Report to the Water Board.

#	Activities	Compliance Date	Responsible Party
A.	Implement SOPs for follow-up actions and graduated levels of enforcement for construction sites.	Ongoing	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
B.	Track and summarize notices and follow-up actions for annual reports.	Annually	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD
	1. Use revised erosion and sediment control checklist to better track warnings and required corrections given to construction site managers.	Done FY 06-07 Annually	PW-THS

CON 6 - Municipal Training

The City provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention. All inspectors receive training on the latest construction-related stormwater pollution prevention techniques and appropriate follow up actions at least once every two years. The City keeps documentation that inspectors have received training.

#	Activities	Compliance Date	Responsible Party
A.	Develop an annual training plan for construction inspection program.	Annually, Q1	ESD, PW, PBCE-Bldg
B.	Conduct annual training.	Annually	ESD, PW, PBCE-Bldg
C.	Track and document that inspectors have received training.	Annually	ESD-UR
D.	Evaluate the training curriculum and frequency, and make improvements as necessary.	Annually	ESD, PW, PBCE-Bldg
	1. Conduct additional stormwater BMP training for all inspection groups during section meetings throughout the year to supplement the main autumn annual training.	Done FY 06-07 Ongoing	ESD-UR, ESD-WE
E.	Hold coordination meetings for Building, ESD, and Public Works inspectors.	Ongoing	PW-CFAS, ECS, TDS, PBCE-Bldg, ESD-WE, ESD-UR
F.	City has allocated funds in FY 08-09 for contractual support for two Construction Stormwater BMP Training Workshops for City staff. Ensure City staff attends two funded Construction Stormwater BMP Training Workshops.	Done FY 08-09	ESD-UR, ESD-WE

CON 7 - Outreach

The City provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.

#	Activities	Compliance Date	Responsible Party
A.	Review outreach and technology transfer materials and make improvements, as necessary.	Annually, Q4	ESD, PW, PBCE-Bldg
	1. Reprint revised Dewatering from Construction Sites and In-Ground Utilities Maintenance Projects brochure.	Pending MRP	ESD-UR
B.	Conduct outreach sessions for development community.	Annually	ESD, PW, PBCE-Bldg, Program
C.	Document outreach to development community.	Annually	ESD-UR
D.	Evaluate outreach program and make improvements, as necessary.	Annually	ESD, PW, PBCE-Bldg
	1. Print and distribute revised "Clean Bay Blueprint" to developers and City inspectors.	Done FY 05-06 As needed	ESD, PW, PBCE-Bldg

#	Activities	Compliance Date	Responsible Party
	2. Explore the use of construction site signs to alert site employees and the public of stormwater pollution prevention message and 945-3000 hotline information.	Done FY 06-07	ESD, PW, PBCE-Bldg
	3. Implement, if feasible, the use of construction site signs to alert site employees and the public of stormwater pollution prevention message and 945-3000 hotline information, if feasible.	Done FY 07-08 As needed	ESD, PW, PBCE-Bldg
	4. Evaluate use of construction site signs program and possibly expand it to other municipal construction project sites during FY 07-08.	Done FY 07-08	ESD, PW, PBCE-Bldg

CON 8 - Public Works Projects

The City will develop and implement a process to ensure that contractors hired to construct public works projects have adequate erosion control plans and use appropriate Best Management Practices (BMPs) adopted by the Department of Public Works.

#	Activities	Compliance Date	Responsible Party
A.	Conduct training for Public Works capital improvement project staff (City Facilities Architectural Services; Roads and Bridges; and Engineering and Construction Services) on contract language, standard specifications, and enforcement.	Annually	PW-CFAS, ECS, TDS ESD
B.	Track the number of Public Work projects with these requirements.	Annually	PW-CFAS, ECS, TDS

CON 9 - Construction Inspection Effectiveness Evaluation

The City of San José will review and evaluate effectiveness of its construction inspection SOPs and BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate and incorporate any needed improvements in construction inspection SOPs and BMPs.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
B.	Document and evaluate what worked well and what needs improvement.	Annually	PW-CFAS, ECS, TDS PBCE-Bldg ESD-WE ESD-UR
	1. Expand the number of sites with an inspector of record to capture more of the Type 1 and Type 2 sites (per Public Work's designation).	Ongoing	PBCE-Bldg

Public Streets, Roads, & Highways

PSR Work Plan

DOT paving crew receives a hand from the governor

This program element is one of several that address municipal activities. The PSR program element consists of incorporating best management practices (BMPs) into City operations such as street repair. Training plays a key role in ensuring that staff uses the proper techniques during the course of their duties to protect water quality. Training topics and activities include spill response, resurfacing, sealing and patching, saw-cutting, street sweeping, landscape chemical application, concrete installation, pavement striping, legend removal, and catch basin inspection after irrigation repair. BMP effectiveness evaluation from crew members is obtained during the training sessions. This program element is implemented pursuant to permit provision C.2.

PSR 1 - Implementation of BMPs

The City of San José will implement Best Management Practices (BMPs) for street, road, and highway operation and maintenance (O&M) activities to reduce pollutants in stormwater and eliminate illicit discharges to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted.	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
	1. Include SOPs listed in PSR 1.D.1 and developed in FY 05-06 into the FY 06-07 training program.	Done FY 06-07	ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
	1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • Storm Drain Inlet Cleaning; • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning.	Done FY 05-06	DOT, ESD, PRNS
	2. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City employee.	FY 08-09 Ongoing	ESD
	3. In response to stormwater complaints involving a City employee conducting PSR and SDO O&M activities, the supervisor for the City employee involved in the complaint will be notified.	Done FY 07-08 Ongoing	DOT, GS, PRNS, ESD
	4. Review the existing Street Sweeping SOP.	FY 08-09	DOT, ESD

PSR 2 - Contractor Use of BMPs

The City of San José will develop and implement a process to ensure that contractors employed to perform street, road, and highway O&M activities use appropriate BMPs per URMP.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for public street, road, and highway O&M contracts on related stormwater BMPs annually.	Annually	DOT, ESD
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City contractor.	FY 08-09 Ongoing	ESD
	2. In response to stormwater complaints involving City contractors conducting PSR and SDO O&M activities, the contract manager for the City contract involved in the complaint will be notified.	Done FY 07-08 Ongoing	DOT, GS, PRNS, ESD
B.	Develop standard contract language for PSR maintenance activities.	Done FY 05-06	DOT, ESD
	1. Send letters to City contractors conducting PSR and SDO O&M activities with a reminder to use appropriate BMPs while conducting their work.	Done FY 07-08	DOT, GS, PRNS, ESD

PSR 3 - City Staff Annual Training

The City of San José will provide annual training to its municipal staff in the use of appropriate BMPs. The City will also provide a mechanism for obtaining feedback from staff on the implementation and effectiveness of the BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Identify training goals, such as improving the focus of the training on the specific BMPs used by a section; integrating new BMPs, if any; etc.	Annually	DOT, ESD
B.	Identify training opportunities (which could include tailgate meetings and other existing training).	Annually	DOT, ESD
C.	Create or revise training modules for affected City staff and contractors.	As Needed	DOT, ESD
	1. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	Done FY 05-06	ESD
D.	Create or revise collateral material based on training modules.	As Needed	DOT, ESD
E.	Schedule training with affected supervisors.	Annually	DOT, ESD
	1. Develop and implement a new training module specifically for DOT electrician staff.	Done FY 04-05	DOT, ESD

PSR 4 - Notification of Public Agencies

The City of San José will inform other parties (e.g., CalTrans, the County of Santa Clara, and public utilities) conducting street, road, and highway O&M activities within its jurisdiction of the requirements to implement pollutant reduction BMPs and Control Measures in stormwater to the maximum extent practicable and eliminate illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Identify conditions under which another agency will be notified regarding relevant stormwater requirements.	Done FY 02-03	
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is another agency.	FY 08-09 Ongoing	ESD
	2. The City will send letters to other agencies that conduct PSR O&M activities within its jurisdiction informing them of the requirement to implement appropriate BMPs and control measures while conducting their work.	Done FY 06-07	ESD-WE

PSR 5 - BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges. The review and evaluation will include input from the municipal maintenance staff that implement the BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual effectiveness reporting, including sub-procedures for gathering feedback from affected supervisors and for modifications to BMPs and SOPs as necessary.	Done FY 01-02	
	1. Review procedures for annual effectiveness evaluation. Consider obtaining feedback from supervisors on how to assess BMP effectiveness and the use of training sessions with staff as an opportunity to evaluate BMPs and SOPs.	Annually	DOT, ESD
B.	Conduct evaluation of BMPs and SOPs.	Annually	DOT, ESD
	1. Revise the eight SOPs reviewed in FY 06-07 according to comments received during the review process.	Done FY 07-08	ESD
C.	Expand parking restriction signage and enforcement for street sweeping by 20 curb miles.	FY 08-09	DOT
D.	Collect street sweeping data: volume and/or weight of debris collected, curb miles swept, and estimated percentage of leaves in yard trimmings collection program.	Ongoing [See CNAP CB-11]	DOT, ESD

PSR 6 - Rural Public Works Maintenance and Support Activities

The City will extend its control measure strategy for PSR to address water quality impacts resulting from public works maintenance and support activities in rural areas.

#	Activities	Compliance Date	Responsible Party
A.	Identify City-owned properties that are applicable (under the RPW performance standard).	Ongoing	
	1. Re-evaluate the feasibility of using GIS information to identify additional applicable properties, if any.	Done FY 05-06	PRNS, GS, DOT, ESD
	2. Some of the roads on the rural roads list compiled in FY 06-07 have portions that are within City limits and portions that are within Unincorporated Areas. Determine exactly which portions of these roads fall within the City's limits.	Done FY 07-08	DOT, ESD
B.	Develop or adapt Standard Operating Procedures (SOPs) and Best Management Practices (BMPs) for rural public works activities.	Done FY 03-04	
C.	Provide annual training on appropriate SOPs/BMPs to City staff that perform rural public works operations and maintenance activities. Incorporate SOPs/BMPs evaluation into annual training.	Annually	PRNS, DOT, GS, ESD
	1. Evaluate the RPW training schedule in order to coordinate more efficiently with PRNS staff schedules.	Done FY 06-07	PRNS, ESD
D.	Through contract specifications, require contractors hired by the City to use appropriate SOPs/BMPs when performing rural public works construction or maintenance.	Done FY 05-06	PRNS, DOT, GS, ESD
E.	Annually conduct an evaluation of the effectiveness of the rural public works program, report the results in the Urban Runoff Annual Report. Identify items for continuous improvement.	Annually	PRNS, DOT, GS, ESD

Storm Drain System Operation & Maintenance

SDO Work Plan

Storm Drain System Operation and Maintenance is another municipal activity program element implemented in accordance with provision C.2.a of the permit. This program includes key maintenance activities that are conducted to ensure the proper function of the storm sewer system to collect and convey storm runoff. The Department of Transportation Standard Operating Procedures for catch basin cleaning and Problem Area Reporting are a focus of crew training. A GIS map overlay has been created that assigns serial numbers to each of the City's more than 30,000 storm drain inlets. This map overlay is currently in use as a means to facilitate problem area reporting in the storm drain system.

DOT Vactor crew cleaning out a storm drain inlet while Urban Runoff staff collects GIS data

SDO 1 - O&M BMP Implementation

The City of San José will implement best management practices (BMPs) for the storm drain system operation and maintenance (O&M) to reduce pollutants in stormwater to the maximum extent practicable. Specific BMPs for each type of O&M activity are those listed in the City's Urban Runoff Management Plan (URMP).

#	Activities	Compliance Date	Responsible Party
A.	Develop additional BMPs, as needed, when new O&M tasks are instituted (including structural controls if necessary).	As Needed	DOT, ESD
B.	Develop SOPs based on BMPs.	As Needed	DOT, ESD
C.	When new BMPs and SOPs are developed, integrate BMPs and SOPs into training program.	As Needed	DOT, ESD
	1. Include SOPs listed in SDO 1.D.1 and developed in FY 05-06 into the FY 06-07 training program.	Done FY 06-07	ESD
D.	Staff will review current PSR and SDO BMPs and SOPs. The annual training sessions with staff will be used as an opportunity to evaluate the effectiveness of BMPs and SOPs. BMPs and SOPs will be updated as indicated by the review.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
	1. Revise or write the following SOPs: • Sidewalk/Plaza Maintenance: Cleaning, concrete installation and replacement, surface removal and repair; • Bridge and Structure Maintenance: Painting and paint removal, repair work, and graffiti removal; • Median and Road Embankment Maintenance; • Storm Drain Inlet Cleaning; • Storm Drain Line Cleaning; • Management of Storm Drain System Solid Waste; • Pump Station Inspection and Cleaning; • Drainage Ditch Cleaning. See PSR 1.D.1	Done FY 05-06	DOT, ESD, PRNS
	2. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City employee. *This activity is one of multiple inspection software updates planned upon adoption of MRP.	~~FY 07-08~~ **FY 09-10***	ESD
	3. In response to stormwater complaints involving a City employee conducting PSR and SDO O&M activities, the supervisor for the City employee involved in the complaint will be notified.	Done FY 07-08 Ongoing	DOT, GS, PRNS, ESD

SDO 2 - Problem Tracking and Process Improvement

The City of San José will develop and implement processes for tracking problem areas and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.

#	Activities	Compliance Date	Responsible Party
A.	Implement an annual inspection and cleaning work plan to achieve a Tier II level review.	Ongoing	DOT
B.	Evaluate criteria for collecting data from City field personnel for the purposes of determining Problem Areas.	As Needed	DOT, ESD
C.	Revise documentation and problem area reporting procedure, if necessary, to improve reporting performance. Documentation to include frequency, nature, and type of recurring problem. Include coordination of data from ICID and Storm Drain Management System data sources. Include analysis of data to identify trends for targeting solutions.	As Needed	DOT, ESD
D.	Produce Problem Area report.	Annually	DOT
E.	Address Problem Areas through ICID enforcement/ education activities, additional BMP development, program development or retrofit.	As Needed	DOT, ESD
	1. Explore purchasing additional vactor trucks.	Done FY 06-07	DOT

SDO 3 - Contractor Use of BMPs

The City will develop and implement, as needed, a process to ensure that contractors employed to perform storm drain O&M activities use the appropriate BMPs.

#	Activities	Compliance Date	Responsible Party
A.	Train contract managers for SDO O&M contracts on related stormwater BMPs.	Annually	DOT, ESD
	1. Include a check box on the WE ICID inspection report form to indicate whether the responsible party in a stormwater complaint is a City contractor.	FY 08-09 Ongoing	ESD
	2. In response to stormwater complaints involving City contractors conducting PSR and SDO O&M activities, the contract manager for the City contract involved in the complaint will be notified.	Done FY 07-08 Ongoing	DOT, GS, PRNS, ESD

SDO 4 – Staff Training and BMP Feedback

The City of San José will provide annual training to its municipal staff in use of appropriate BMPs and/or Control Measures. The City will also provide a mechanism for obtaining feedback from staff on implementation and effectiveness of BMPs and Control Measures.

#	Activities	Compliance Date	Responsible Party
A.	Provide training prior to the rainy season.	Annually	DOT, ESD
B.	Create or revise training modules for affected City staff.	As Needed	DOT, ESD
	1. Improve the focus of the training on the specific BMPs used by a section.	As Needed	DOT, ESD
	2. Provide specific training to inlet cleaning crews on IMSPAR data collection in advance of inlet cleaning program implementation.	Annually	
	3. Add specific components from DOT Electrical Crew training module to the general DOT Street Crew training module. These components include: asphalt/concrete removal, concrete installation and repair, and mercury lamp recycling and/or disposal.	Done FY 05-06	ESD
C.	Produce schedule for training.	Annually	DOT, ESD

SDO 5 – Data Analysis

As part of the annual review process, the City of San José will evaluate data regarding cleaning activities and unusual flows observed during inspection. The review and evaluation will include consideration of storm drain structural retrofit.

#	Activities	Compliance Date	Responsible Party
A.	Draft procedure for annual review and evaluation of data.	Done FY 01-02	
	1. Collect data on the amount of materials removed during inlet cleaning.	Done FY 04-05 Annually	DOT, ESD

#	Activities	Compliance Date	Responsible Party
B.	Implement annual data review and identify follow-up actions as appropriate.	Annually	
	1. Re-evaluate how follow up is conducted by crews when "cars on catch basins" is identified on the IMSPAR report, in order to better understand to what extent parked cars are barriers to cleaning.	Done FY 06-07	DOT, ESD
	2. Evaluate "cars on catch basins" data to see if it can be used as one of the factors in determining where future posted signage for street sweeping restrictions will be installed.	Done FY 06-07	DOT, ESD
	3. Evaluate how to integrate the results of the IMSPAR report, regarding garbage and high debris, into scheduling additional cleaning.	Annually	DOT, ESD
	4. Re-evaluate use of hand held devices to collect data during storm drain inlet cleaning and potentially other maintenance activities.	Done FY 07-08	DOT, ESD

SDO 6 – BMP Effectiveness Reviews

As part of the annual review process, the City of San José will review and evaluate the effectiveness of its BMPs in reducing pollutants in stormwater and eliminating illicit discharges.

#	Activities	Compliance Date	Responsible Party
A.	Review with supervisors to get feedback and information on how to assess BMP effectiveness.	As Needed	DOT, ESD
B.	Use annual training sessions with staff as an opportunity to evaluate the effectiveness of BMPs & SOPs.	Annually	DOT, ESD

Water Utilities Operations & Maintenance

WUO&M Work Plan

This program element addresses a municipal activity and is implemented in accordance with provision C.2.a. The program addresses operation and maintenance activities at the City's Municipal Water system. The key tools for implementing this program are the Water Utility Pollution Prevention Plan and staff training to ensure that proper techniques are employed during maintenance activities. The City's training program includes the annual development of a video demonstrating the implementation of BMPs for a specific work function.

Water System Technicians diverting flow to landscape area during maintenance

WUO&M 1 – Inventory of O&M Activities

The City of San José's Municipal Water System will conduct an inventory of all-key operations and maintenance activities, and identify routine and unplanned non-storm water discharges from these activities. This inventory will be conducted every three years and evaluated at least once a year.

#	Activities	Compliance Date	Responsible Party
A.	Review current procedures for operations and maintenance.	Annually	ESD-Muni
B.	Three-year update of list.	Done 03/31/06 03/31/09	ESD-Muni

WUO&M 2 – Implementation of WUPPP

The City of San José's Municipal Water System will implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.

#	Activities	Compliance Date	Responsible Party
A.	Implement WUPPP/Report on activities.	Ongoing	ESD-Muni

WUO&M 3 – Staff Training and Contractor WUPPP Compliance

The City of San José's Municipal Water System will conduct annual training for municipal staff and coordinate WUPPP elements with water utility project planning, including WUPPP elements (BMPs, conditions, specifications, etc., in contract and services agreements).

#	Activities	Compliance Date	Responsible Party
A.	Implement training program.	Annually, Q2	ESD-Muni

WUO&M 4 – WUPPP Effectiveness Evaluation

The City of San José's Municipal Water System will evaluate the effectiveness of the WUPPP annually. Maintain accurate documentation and revise the WUPPP as necessary.

#	Activities	Compliance Date	Responsible Party
A.	Evaluate effectiveness of program.	Annually, Q4	ESD-Muni

Pesticide Management

PM Work Plan

Sheep grazing on weeds at the Airport, a pesticide-free management strategy

The purpose of the Pesticide Management program is to reduce the amount of pesticides in stormwater and landscape runoff. Activities include setting municipal policy, implementing proper techniques when selecting and applying pesticides on City property, staff training, public education, and City participation in regional efforts to influence regulations that affect pesticide management. In 2003, the Council adopted an Integrated Pest Management (IPM) Policy, which calls for municipal operations to incorporate IPM techniques and to reduce, phase-out, and ultimately eliminate the use of pesticides that cause impairment of surface waters. The City continues to implement pest control BMPs and train staff on Integrated Pest Management (IPM) techniques. This program element is implemented pursuant to permit provision C.9.d.

PM 1 – Integrated Pest Management

The City will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring use of IPM techniques in the agency's operations and minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors.

#	Activity	Compliance Date	Responsible Party
A.	Develop a City IPM policy for inclusion in Pesticide Management Plan.	Done FY 02-03	GS, DOT, ESD, PRNS

PM 2 – Pesticide Management Plan

The City will develop and implement a Pesticide Management Plan with the goals of minimizing pesticide use and reducing the amount of pesticides in stormwater and landscape runoff to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Draft a City of San José Pesticide Management Plan.	Done FY 01-02	GS, DOT, ESD, PRNS
B.	Publish City Pesticide Management Plan in URMP.	Done FY 01-02	ESD

PM 3 – IPM SOPs and BMPs

The City will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy.

#	Activities	Compliance Date	Responsible Party
A.	Develop SOPs and BMPs for implementing IPM policy with provisions that will reduce water quality impacts from pesticide use.	Done FY 01-02	GS, DOT, ESD, PRNS
B.	For each type of pest problem identified, seek model SOPs and BMPs from published literature.	Done FY 01-02	GS, DOT, ESD, PRNS
C.	Incorporate or develop appropriate IPM measures into City SOPs and BMPs.	Done FY 02-03	GS, DOT, ESD, PRNS
	1. Pilot the use of additional IPM techniques, e.g., for weed control.	Done FY 06-07 Ongoing	GS, DOT, ESD, PRNS
D.	Update City URMP to incorporate model Pest Management Performance Standard, including description of legal authority (IPM policy and contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done FY 02-03	GS, DOT, ESD, PRNS
E.	Review and update City SOPs and BMPs, as appropriate.	As Needed	GS, DOT, ESD, PRNS
F.	Develop Approved Pesticide List for applications on City property.	FY 06-07 Ongoing	GS, DOT, ESD, PRNS
	1. Revise SOPs and BMPs to reflect use of Approved Pesticide List.	FY 06-07 Ongoing	GS, DOT, ESD, PRNS

PM 4 – City Employee Training

The City will ensure that employees receive pest management training by implementing the following:

1. Employees who apply pesticides for the City will obtain the appropriate training as required by the County Agricultural Commissioner and State Department of Pesticide Regulation (DPR);
2. Employees within departments responsible for pesticide application will receive annual training on appropriate portions of City IPM Policy, SOPs, and BMPs, and latest IPM techniques;
3. Employees who are not authorized to apply pesticides will be annually trained not to use over-the-counter pesticides at workplace, consistent with IPM Policy; and
4. Annual internal outreach will be conducted to employees, who do not necessarily purchase or apply pesticides during their course of work, on less toxic pest control and to encourage employees to use IPM techniques away from work.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that employees who apply pesticides for the agency obtain appropriate training required by County Agricultural Commissioner and State Department of Pesticide Regulation.	Annually	GS, DOT, PRNS

#	Activities	Compliance Date	Responsible Party
B.	Provide annual training on IPM Policy, SOPs, and BMPs, and latest IPM techniques to employees within departments responsible for pesticide application.	Annually	GS, DOT, ESD, PRNS
C.	Annually inform employees who are not authorized / trained to apply pesticides not to use over-the-counter pesticides at workplace, consistent with IPM Policy.	Ongoing	GS, DOT, ESD, PRNS
D.	Monitoring Mechanism I.B.1. Document and evaluate effectiveness of staff training conducted each year in annual report.	Annually	GS, DOT, ESD, PRNS
	1. Update class evaluation/survey for IPM training classes conducted by City staff.	As Needed	GS, DOT, ESD, PRNS
E.	Public Education and Outreach Task II.A.14 Conduct internal outreach on less toxic pest control to employees who do not necessarily purchase or apply pesticides during the course of their work (to encourage employees to use IPM techniques away from work).	Annually	ESD

PM 5 – Contractor Pesticide Management Requirements

The City will develop and implement a process to ensure that contractors employed to conduct pest control and pesticide application on municipal property engage in pest control methods consistent with City IPM Policy. Specifically, the City will require contractors to:

- follow City IPM policy, BMPs, and SOPs;
- provide evidence of current IPM training, when feasible; and
- provide documentation of pesticide use on City property to the City in a timely manner.

#	Activities	Compliance Date	Responsible Party
A.	Ensure that contractors employed to conduct pest control/pesticide application on municipal property engage in methods consistent with City IPM policy.	Ongoing	GS, DOT, ESD, PRNS, PW
B.	Review and update a list of all contractors employed by the City who perform pesticide application work.	Annually	GS, DOT, ESD, PRNS, PW
C.	Implement a procedure to provide to each contractor a copy of the City's IPM policy.	Done FY 02-03	GS, DOT, ESD, PRNS
D.	City will supply copies of pest specific BMPs and SOPs to contractors. Contractors will self-certify their compliance with the City SOPs and BMPs.	Ongoing	GS, DOT, ESD, PRNS
E.	Require through contract specifications that PCOs contracted for municipal applications use pest control methods consistent with City's IPM Policy. Specifically, require contractors to: a) follow City IPM policy, BMPs and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on City property to the City in a timely manner.	Ongoing	GS, DOT, ESD, PRNS
	1. City will develop standard content for PCO contracts.	Done FY 04-05	GS, DOT, ESD, PRNS

#	Activities	Compliance Date	Responsible Party
	2. City will implement standard content for PCO contracts.	Done FY 05-06 Ongoing	GS, DOT, ESD, PRNS
F.	Invite contractors to participate in City training sessions on pesticide management.	Done FY 05-06 Ongoing	GS, DOT, ESD, PRNS
G.	Monitoring Mechanism III.A.1. Document number of PCOs receiving presentations and/or training on pesticide use on municipal property.	Annually	GS, DOT, ESD, PRNS

PM 6 – Pesticide Management Outreach

The City will identify in the annual work plan the outreach activities it will conduct consistent with Program Pesticide Management Plan. Work plan elements will address outreach to residential and commercial pesticide users, pesticide retailers, and special districts. Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the City's own IPM practices, as applicable.

#	Activities	Compliance Date	Responsible Party
A.	Increase awareness of target audiences regarding proper pesticide use, disposal methods, water quality impacts, and less toxic pest management messages. Target audiences include commercial and residential pesticide users, pesticide retailers, municipal employees, and special districts.	Ongoing	ESD
B.	Prepare IPM stories and press releases to local media.	As Needed	ESD
C.	In conjunction with Program, City will provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., VTA, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	As Needed	ESD
D.	Create and provide fact sheets and materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program.	Ongoing	ESD
E.	Monitoring Mechanism: Document or estimate numbers of residents reached by outreach efforts, including events, web promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts by documenting calls to the Program's general and watershed campaign hotlines.	Annually	ESD
F.	Co-host regional IPM conference to promote implementation of IPM practices in municipal operations in the City and Bay Area region.	Done FY 06-07	GS, DOT, ESD, PRNS
G.	Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, recommended in the work plan, to be developed by the Program. Implement evaluation component of the work plan.	Annually	ESD

PM 7 – HHW Pesticide Disposal

The City will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.

#	Activities	Compliance Date	Responsible Party
A.	Work with HHW collection agencies to support, enhance, and publicize programs for pesticide disposal.	Ongoing	ESD
B.	Ensure that adequate pesticide disposal services exist for residents and conditionally exempt small quantity commercial generators.	Annually	ESD
C.	Provide hazardous waste disposal information to residents, through distribution of materials (e.g., utility bill insert, city newsletter, community events, etc.) or advertising in local media.	Ongoing	ESD
D.	Monitoring Mechanism V.A.1. Document that HHW collection programs adequately serve residents and businesses and that exchange programs do not exchange organophosphate or banned pesticides.	Annually	ESD

PM 8 – City Pesticide Use Tracking

The City will develop and implement a process for tracking pesticide use on municipally-owned property.

#	Activities	Compliance Date	Responsible Party
A.	Develop and implement a pilot pesticide tracking process for Diazinon and Chlorpyriphos products.	Done FY 01-02	GS, DOT, ESD, PRNS
B.	Track pesticide use on municipally owned property. Include reporting and justification for use of OP pesticides and BMPs employed during OP pesticide use.	Ongoing	GS, DOT, ESD, PRNS
	1. Evaluate feasibility of implementing electronic data management system for pesticide use.	Done FY 04-05	GS, DOT, ESD, PRNS
	2. Implement electronic data management system for tracking pesticide use on City property.	Done FY 05-06 Ongoing	GS, DOT, ESD, PRNS
C.	Monitoring Mechanism I.A.1. Document completion of tasks in annual reports. Use pesticide tracking process to document pesticide use.	Annually	GS, DOT, ESD, PRNS, PW

PM 9 – City Pesticide Inventory Search

The City will conduct periodic City-wide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. If found, these pesticides will be properly disposed of pursuant to appropriate waste disposal regulations.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Citywide search of chemical storage areas for pesticides no longer legal for application per EPA, State, and/or local requirements. Properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.	Annually	GS, DOT, PRNS

PM 10 – Pesticide Management Plan / IPM Policy Review

As part of annual reporting process and with input from municipal staff, the City will review and evaluate the effectiveness of its Pest Management Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.

#	Activities	Compliance Date	Responsible Party
A.	Review and continuously improve goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings, if any.	Annually	GS, DOT, ESD, PRNS, PW
B.	Monitoring Mechanism IX.A.1. Complete revised work plan that incorporates continuous improvement items, and report on completion of work plan tasks.	Annually	GS, DOT, ESD, PRNS, PW
C.	Monitoring Mechanism VII.A.1. Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development and significant redevelopment projects, and percentage of new development/ significant redevelopment projects for which pesticide reduction measures were required. (Draft Permit Provision C.3.n.)	Annually	PW, ESD

Mercury

Hg Work Plan

The City continues its efforts to reduce or eliminate mercury discharges during municipal operations. Virtual elimination practices employed by the City include: purchasing low mercury-containing fluorescent lamps, recycling spent lamps, recycling spent batteries, and switching to non-mercury-containing apparatus in the Water Pollution Control Plant Laboratory. In 2003, the Program approved a Guidelines document on the management of mercury-containing products by a municipal agency. The City will continue to implement management practices consistent with the guidelines such as collecting and recycling spent fluorescent lamps, batteries, and other electronic wastes. This program element is implemented pursuant to permit provision C.9.c.

Fluorescent lamps for recycling at the Central Service Yard.

Hg 1 – Municipal Use of Mercury-Containing Products

The City will eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

#	Activities	Compliance Date	Responsible Party
A.	Implement SCVURPPP guidelines for mercury-containing products reduction and management. These guidelines include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	Ongoing	ESD, GS
	1. Collect and dispose of mercury-containing lamps generated in City-owned facilities.	Ongoing	GS, ESD
	2. Identify other mercury-containing products for virtual elimination, phase-out and/or proper disposal.	Annually, As Needed	ESD, GS
B.	Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines.	Annually	ESD

Hg 2 – Household Hazardous Waste Collection

The City will support mercury-containing product disposal services through universal waste and household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

#	Activities	Compliance Date	Responsible Party
A.	Provide mercury-containing products disposal services for residents and small businesses.	Ongoing	ESD-IWM, County
B.	Work with Program and HHW collection agencies to develop and help publicize fluorescent light recycling program.	Ongoing	ESD, Program
C.	Host a mercury fever thermometer exchange event for residents in San José and the Water Pollution Control Plant service area.	Done FY 07-08 Ongoing	ESD-P2

Hg 3 – Monitoring and Science

The City will participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

#	Activities	Compliance Date	Responsible Party
A.	Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP steering committee and technical review committee.	Ongoing	ESD
B.	Examine feasibility of enhancing stormwater pollution prevention and control activities on a watershed or sub watershed basis to focus activities in those parts of the Guadalupe River Watershed enriched in mercury from natural or mining-related causes.	Done FY 07-08	ESD

Hg 4 – Regional, State, and Federal Coordination

Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

#	Activities	Compliance Date	Responsible Party
A.	Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup, and the RMP.	Ongoing	ESD
B.	Support and participate in WMI Watershed Action Plan implementation.	Ongoing	ESD

Hg 5 – Public Education and Outreach

Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees.

#	Activities	Compliance Date	Responsible Party
A.	Coordinate with Program and HHW collection agencies implement a mercury-containing product outreach program to educate selected target audience and encourage proper use and disposal of mercury-containing products.	Ongoing	ESD, Program, County HHW
B.	Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	Ongoing	ESD
C.	Attend community events and distribute outreach materials. (See Attachment A: Outreach Activities Summary)	Ongoing	ESD
D.	Monitoring Mechanism V.B. Document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	Annually	ESD, Program

Copper / Nickel Action Plans

CuNiAP Work Plan

This element is implemented pursuant to provisions C.9.a and b of the stormwater permit. Activities in the copper and nickel action plans are attributed largely to the South Bay POTWs and to SCVURPPP as the responsible entities. Some activities, however, require specific actions by SCVURPPP Co-Permittees or specified municipalities, such as increasing awareness of copper and nickel with businesses that are also NOI filers (please see IND 1 for a description of NOI filers). Summarized here are activities pursuant to implementation of the baseline actions included in the Copper and Nickel Action Plans. These are in addition to those undertaken by SCVURPPP as a program. A complete update on implementation of the Action Plans can be found in the SCVURPPP Annual Report.

CuB-1 – Vehicle Washing Operations

#	Activities	Target Date	Responsible Party
A.	Have member of San José team trained and available to lead mobile cleaners' certification seminar.	As Needed	
B.	Support Program in hosting mobile cleaners' certification seminar.	Done FY 06-07	ESD
	1. Promote list of recognized mobile cleaning service providers.	Ongoing	ESD
C.	Offer discount car washes through the Watershed Watch Campaign.	Done FY 07-08 Annually as needed	Program

CuB-3 – Industrial Discharges

#	Activities	Target Date	Responsible Party
A.	Continue Distribution of information regarding copper from roof vents.	Ongoing	ESD
	1. Continue rooftop inspections. Evaluate efforts and need for any additional effort.	Done FY 05-06	ESD
B.	Mail NOI Package, with information on the GIASP and how to comply, to targeted industrial facilities.	Done FY 05-06 annually as needed	ESD

CuB-8 – Watershed Assessments and New Development

#	Activities	Target Date	Responsible Party
A.	Review new and redevelopment project review procedures and update or refine procedures to minimize copper pollution. See NRD sections 3, 4, and 9 for details on San José's implementation of C.3 permit provisions.	Done FY 02-03	ESD, PBCE, PW, RDA

CuB-11 – Street Sweeping and Storm System O&M

#	Activities	Target Date	Responsible Party
A.	Track quantitative data on the tons of material removed and disposed of and other relevant street sweeping program data.	Annually	ESD-IWM DOT

CuB-12 – Pools and Spas

#	Activities	Target Date	Responsible Party
A.	Distribute outreach materials at events, public counters, and post on City website.	Ongoing	ESD
B.	Provide guidance to residents on disposal alternatives for pool and spa water.	Ongoing	ESD

CuB -21 – Architectural Use of Copper

#	Activities	Target Date	Responsible Party
A.	Continue to discourage architectural use of copper during Planning application review.	Ongoing	PBCE-Planning
B.	Continue to monitor progress of San José Green Building program to identify opportunities for discouraging architectural use of copper.	Ongoing	PBCE-Planning ESD-P&P

NiB-1 – Discharges from Construction sites

#	Activities	Target Date	Responsible Party
A.	Implement performance standards for construction inspection.	See NRD 6 and CON program element for activities that address erosion control.	ESD, PBCE, PW
B	Participate in the Water Board's regional training of construction site inspectors.	See NRD 6 and CON program element for activities that address erosion control.	ESD, PBCE, PW

Trash

TRA Work Plan

Installation of a catch basin screen on Mt. Vista Drive for the structural trash pilot

The purpose of the Trash program is to address litter and illegal dumping that threatens to pollute urban waterways. The impetus for this program was the 2001 Water Board Staff Report recommending that all urban creeks, lakes, and shorelines be placed on a monitoring list due to the threat of trash impairment to water quality. The City's activities focus on assistance with the development and implementation of an effective trash strategy, ongoing trash evaluations in high priority areas, implementation or refinement of trash management practices, and piloting the use of structural controls for trash. This program element is implemented pursuant to the Program's Trash Work Plan and provision C.1 of the permit.

TRA 1 – Inventory, Document and Evaluate Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Complete Program survey of existing trash management practices.	Done FY 03-04	ESD

TRA 2 – Document and Map Known Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/ incidents and eradication efforts).	Done FY 03-04	ESD
B.	Compile trash problem location data/information and submit to Program for conversion to coordinates for GIS mapping.	Done FY 03-04	ESD
C.	Revise and update documentation (list of locations, maps, etc.) of known trash problem areas.	As Needed	ESD
D.	Continue identifying and prioritizing trash problem areas in urban streams and waterways and other potential sources that may contribute trash to those areas.	Annually	ESD, PRNS, DOT, PD

TRA 3 – Conduct Trash Evaluations

#	Activities	Target Date	Responsible Party
A.	Work with Program to select trash evaluation methodology.	Done FY 03-04	ESD
B.	Assist Program with planning and organizing of training workshop for municipal staff.	Done FY 03-04	ESD
C.	Participate in the trash evaluation methodology training workshop.	Done FY 03-04	ESD
D.	Conduct trash evaluations and submit to Program staff.		ESD
	1. Coyote Watershed	Done FY 04-05	ESD
	2. Remaining San José locations	Done FY 05-06	ESD
E.	Continue trash evaluations in high priority areas using the Program's Urban Rapid Trash Assessment protocol (version 1.0) and/or the KAB litter index in a subset of trash problem areas to track changes over time.	Ongoing	ESD

TRA 4 – Develop Standardized Documentation and Reporting Format

#	Activities	Target Date	Responsible Party
A.	Work with Program to develop a reporting format to document trash management activities in Annual Reports.	Done FY 03-04	ESD

TRA 5 – Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

#	Activities	Target Date	Responsible Party
A.	Assist Program staff with the documentation and analysis of trash evaluation results.	Ongoing	ESD
B.	Identify high priority trash areas using trash evaluation results.	Ongoing	ESD
	1. Coyote Watershed	Done FY 04-05	ESD
	2. Remaining San José locations	Done FY 05-06	ESD

TRA 6 – Identify and Implement Trash Management Practices

#	Activities	Target Date	Responsible Party
A.	Identify reasonable trash management practices to address high priority areas (in TRA 5B).	Ongoing	ESD, PRNS, GS, DOT
B.	Implement or refine trash management practices at high priority areas to the maximum extent practicable.	Ongoing	ESD, PRNS, GS, DOT
C.	Document and evaluate implementation of trash management actions.	Ongoing	ESD
D.	Provide Program with information on assessments and trash management practices implemented using standardized reporting format.	Annually	ESD

#	Activities	Target Date	Responsible Party
E.	Provide Program with trash assessment data forms.	Annually	ESD
F.	Assist Program in developing Trash Fact Sheets.	Done FY 07-08	ESD

TRA 7 – Review and Update Performance Standards and Develop Long-Term Strategy for Trash Management

#	Activities	Target Date	Responsible Party
A.	Assist with the review and update of existing standards that address BMPs or control measures relevant to trash management.	Done FY 07-08	ESD
B.	Assist Program staff in developing and implementing an effective long-term strategy for trash conditions in urban streams and waterways.	Ongoing	ESD

TRA 8 – Implement a Pilot Demonstration Project

#	Activities	Target Date	Responsible Party
A.	Assist Program in implementing a pilot project to address trash conveyed through the storm drain system.	Done FY 07-08 Ongoing as necessary	ESD, DOT, PW
B.	Begin piloting the use of structural controls to prevent trash from entering the storm sewer system.	Done FY 07-08 Ongoing as necessary	ESD, DOT, PW
C.	Pursue grant funding to support installation of structural controls for trash management.	As Needed	ESD, DOT, PW
D.	Evaluate the effectiveness of the pilot structural controls.	Ongoing as necessary	Program, ESD, DOT, PW

Monitoring

MON Work Plan

Monitoring activities required in the stormwater permit are generally implemented in collaboration with other agencies. The City continues to participate in monitoring activities area-wide, including Regional and Program-focused investigation of pollutants and sources of pollutants to the storm drain system. The City also provides input and support to the Program's multi-year monitoring program, and reviews work products as various Program-level projects are designed and completed.

ESD Biologist collecting field data from Coyote Creek

The City, in conjunction with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) has submitted, to the Water Board, a Multi-Year Receiving Waters Monitoring Plan required per permit provision C.7.b. The final version of the plan was submitted August 5, 2002 and revised March 1, 2004. The Multi-Year Plan covers a number of pollutant control programs required by C.7 and C.9 provisions of the permit. The City continues to support Program staff in the implementation of the plan by commenting on annual plans, providing guidance for sampling within the City, and participating in the Watershed Analysis Ad Hoc Task Group.

The 2001 C.9 permit provisions require implementation of control programs for Copper, Nickel, Mercury, Pesticides, PCBs, and Dioxin-like compounds. The City continues to support and assist the Program efforts to address these control and monitoring efforts. Additionally, the City is actively involved as stakeholder and workgroup member for the Guadalupe Mercury TMDL effort, and will continue to contribute and comment on products and reports generated by Baywide TMDLs for copper, nickel, mercury and PCBs. City Staff also actively participate in Clean Estuary Project activities through the PCB workgroup and Diazinon and Pesticide Related Toxicity workgroup.

PCB Control Program

Analytical characterization work to support the PCB Control Program, required under provision C.9.e, has been completed. The Program is currently working on next steps with BASMAA..

Initial PCB analysis was performed on sediments found in selected urban storm drain systems. At this point, no known controllable sources of PCBs have been identified. Results of the follow-up analytical work have been reviewed and further sampling work to identify controllable sources was undertaken in October and November of 2002. The SCVURPPP Program submitted the final PCB Control Plan March 1, 2002, and the Control Program Work Plan July 1, 2002. In

addition, the City continues to implement activities described in "Next Steps" from the Year Two PCB Case Study Report submitted to the Water Board in July 2003.

#	Activities	Compliance Date	Responsible Party
A.	Sample, analyze, and report on PCBs in storm drain sediments to characterize potential sources and implement controls.	Done, 6/00 through FY 01-02	Program, ESD
B.	Begin implementation of final PCB Control Plan upon approval.	Done FY 02-03 & Ongoing	ESD

Dioxin-like Compound Control Program

Characterization of dioxins based on existing data has begun Program-wide. The Program is now collaborating with BASMAA to develop a conceptual model/impairment assessment document. City Staff provide comments to the Program in support of this process.

This Dioxin-like Compound Control Program will develop procedures to identify, assess, and manage controllable sources of Dioxin-like compounds found in urban runoff.

#	Activities	Compliance Date	Responsible Party
A.	Characterize distribution of Dioxin-like compounds in the urban runoff system based on existing data.	Done FY 01-02	Program
B.	Begin implementation of SCVURPPP plan to characterize distribution of Dioxins.	In Progress at Program Level	Program
C.	Submit plan that identifies control measures / management practices to eliminate or reduce discharges of Dioxins, if needed.	TBD	Program
D.	Explore, and implement if feasible, efforts to move toward alternative fuels for diesel vehicles in City fleet.	Done FY 06-07 Ongoing	ESD, DOT, GS

Sediment Control Program

The City's sediment control program falls predominantly within the Construction Inspection (CON) section of this work plan. Sediment monitoring activities also continue in conjunction with the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

Pilot Monitoring Programs

In addition to the above listed control programs, the City concluded activities performed in support for the two Monitoring Pilot Programs that were begun in 1997. These pilot programs generated data that helped develop the follow-on programs of IND (outreach to industrial and commercial dischargers) and the SCVURPPP Multi-Year Receiving Waters Monitoring Plan.

MON 1 – Industrial Stormwater Monitoring Pilot Program

This program sampled key industrial sites to determine the significance of metal-contaminated stormwater discharges associated with industrial activities. The ultimate objective from this

project of educating industrial and commercial dischargers about developing and implementing SWPPPs and BMPs has now been turned over to the Industrial and Commercial Dischargers section of this work plan under IND.

#	Activities	Compliance Date	Responsible Party
A.	Design and execute a sampling program to meet the project objectives, analyze results, develop guidance for industry to improve SWPPP implementation, and provide technology transfer information to industry and inspectors.	Done, FY 96-97 through 01-02 Ongoing as part of IND	ESD

MON 3 – First Flush Monitoring Program

First flush discharge areas along The Coyote Creek and Guadalupe River were monitored for three wet seasons. The City provided data to the Program for analysis and comparison to other data in June of 2002. The Program submitted a final report to the Water Board in 2003; it was included as appendix C-2 in the Program's 02-03 Annual Report.

#	Activities	Compliance Date	Responsible Party
A.	Conduct multi-year First Flush study sampling, analyze data and provide data to Program as part of Multi-year Monitoring Program.	Done, FY 96-97 through 02-03	ESD, Program

Municipal Compliance

Annual training of City inspectors on construction site stormwater management

This program element summarizes the City's efforts to train City staff on pollution prevention practices and to ensure that City facilities comply with stormwater requirements. Municipal training continues to be a key element for most program elements. Specific program elements that include municipal training activities include ICID 3, IND 5, NRD 11, CON 6, CON 8, PSR 2, PSR 3, PSR 6, SDO 3, SDO 4, PM 4, and WUO&M 3. In order to ensure that City facilities comply with stormwater requirements, Corporation Yards are routinely inspected by ESD staff and the results and improvements discussed with Yard staff. Additionally, Stormwater Pollution Prevention Plans (SWPPPs) that govern the operation of Corporation Yards are also used to ensure that Yards are using current stormwater BMPs. For a list of planned training activities, see Attachment B: Municipal Training Schedule.

Municipal Training

Municipal Training is a critical function of the City's NPDES Permit. Municipal compliance is dependent on the level and quality of the training provided.

#	Activities	Compliance Date	Responsible Party
A.	Identify training needs.	Annually	ESD-UR
	1. Conduct training for City staff and City contractors that perform surface cleaning at City facilities.	Done FY 06-07 As Needed	DOT, GS, ESD, PRNS
B.	Develop curricula.	As Needed	ESD-UR
C.	Conduct training.	Ongoing	ESD-UR
D.	Evaluate municipal training program and make improvements as needed.	Annually	ESD-UR

Municipal Facilities Assessment and Compliance

Municipal facilities are required to comply with stormwater regulations. Efforts to reduce contaminated discharges from City facilities must be similar to those required of private businesses. While many elements for permit compliance are in place, the City requires a systematic approach to City facilities compliance at the level of effort required in the URMP.

#	Activities	Compliance Date	Responsible Party
A.	Conduct Corp Yard assessments and inspections.	Annually	ESD-UR, GS, DOT

#	Activities	Compliance Date	Responsible Party
	1. Conduct Citywide meeting to discuss Hazardous Material, Safety, and Stormwater issues for City corporation yards (up to two times per year).	Annually	GS, ESD, DOT, Fire, Police, PRNS
	2. Revise Corporation Yard inspection form.	Done FY 05-06 As Needed	ESD-UR
B.	Review Municipal Facilities SWPPPs.	Annually	ESD-UR, GS, DOT
	1. Fully revise the five (5) remaining Corporation Yard SWPPPs (using the Main Yard revised SWPPP pilot process as a template).	Done FY 06-07	ESD-UR, GS, DOT
C.	Conduct SWPPP training at City corporation yards.	Annually	ESD-UR, GS, DOT

Public Information / Participation

PIP Work Plan

This program is implemented in accordance with provision C.4 and includes general outreach, targeted outreach, educational programs, and public participation activities. The City has a robust and broad-based public information and public participation program, utilizing many different outreach methods to best deliver stormwater pollution prevention and watershed protection messages. Conducting outreach to the community and providing opportunities for participation in water quality protection activities are critical to evoking the behavior changes needed to manage stormwater quality. They are also important for garnering the support needed to continue and expand services and programs. Examples of outreach activities include: stenciling of storm drain inlets throughout the City, training sessions for staff and developers about stormwater runoff construction requirements, and conducting Wacky Watershed teacher training workshops.

Watershed Protection Engineer educating 3rd graders at the Water Wizards Festival

Outreach in Other Elements

Other sections of this work plan contain elements related to outreach to specific target audiences. They can be found in ICID 4, IND 6, NRD 2, CON 7, PM 6, M 5, CB-1, CB-3, and CB-12. For a list of planned outreach activities, see Attachment A: Outreach Activities Summary.

PIP 1 – General Outreach

The City of San José will promote general citizen awareness of what a watershed is, the functions of the storm drain system, pathways and sources of urban runoff pollution to the South Bay watershed, and behaviors that adversely affect water quality.

#	Activities	Compliance Date	Responsible Party
A.	Participate in WMI Outreach, and coordinate WMI outreach with Watershed Watch and Program efforts.	Ongoing	ESD, WMI, Program
	1. Participate in Watershed Watch campaign.	Ongoing	ESD, Program
B.	Identify, support and participate in appropriate community events to further general public awareness.	Ongoing	ESD
	2. Work with Watershed Watch Events work group.	Ongoing	ESD, Program
C.	Give presentations upon request that focus on stormwater messages to elementary through college grade levels, neighborhood groups, etc.	As Needed	ESD

PIP 2 – Targeted Outreach

The City of San José will develop and implement targeted residential outreach and education campaigns, based on high priority pollutants, to effectively reduce pollutant-causing behaviors and promote Best Management Practices.

#	Activities	Compliance Date	Responsible Party
A.	Identify general residential practices contributing to stormwater pollution. Identify reasonable alternatives to pollutant causing behavior.		ESD, Program
	1. Review surveys and applicable reports.	Ongoing	ESD
	2. Meet with inspectors to discuss and document residential outreach needs.	Ongoing	ESD
	3. Prepare report identifying residential outreach needs and tasks and conduct outreach as necessary.	Annually	ESD
B.	Identify ICID practices and target audience(s) contributing to pollution.		ESD
	1. Review ICID reports.	Ongoing	ESD
	2. Meet with ICID inspectors to discuss and document outreach needs.	Ongoing	ESD
	3. Prepare report identifying ICID outreach needs and tasks and conduct outreach as necessary.	Annually	ESD
C.	Promote selected residential and ICID messages through local and regional activity (e.g. Program PIP, BASMAA PIP, BAPPG, Media Relations, etc.).		
	1. Report on targeted residential and ICID outreach activity.	Annually	ESD
	2. Participate in the Program's Pesticide and Mercury ad hoc task groups.	Ongoing	ESD, Program

PIP 3 – Educational Programs

The City of San José will support and/or develop and implement educational programs designed to increase youth understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support, and/or develop and implement school and youth education programs.		
	1. Participate in WE&O Schools and Youth work group.	Ongoing	ESD, Program
	2. Participate in the Alviso Education Center work group.	Ongoing	ESD, Program
	3. Participate in City Education programs such as the Youth Watershed Education Team, Rangers in Schools, Go Green Initiative, etc.	Ongoing	ESD

PIP 4 – Citizen Participation

The City of San José will support and/or develop and implement citizen involvement programs designed to increase citizen understanding and appreciation of the South Bay watershed.

#	Activities	Compliance Date	Responsible Party
A.	Support and/or develop involvement opportunities for San José residents.		
	1. Participate in creek clean-ups on a biannual basis through in-kind staff support for the Creek Connections Action Group.		
	a. Fall creek cleanup (Coastal Cleanup Day).	Annually	ESD, PRNS
	b. Spring creek cleanup (National Rivers Day).	Annually	ESD, PRNS

PIP 5 – Outreach Evaluation

The City of San José will evaluate its Outreach efforts for effectiveness.

#	Activities	Compliance Date	Responsible Party
A.	Implement selected evaluation tools.		ESD
	1. Work with Program, WMI, and Watershed Watch AHTG to Plan for Program's Watershed Watch Campaign Survey.	As Needed	ESD, Program
	2. Report on survey and evaluation activity during the report period.	Annually	ESD
B.	Annually review, modify and report on outreach plans based on effectiveness results.		ESD
	1. Document in Annual Report effectiveness of outreach activities conducted in prior fiscal year.	Annually	ESD

Permit Reapplication

Urban Runoff staff evaluating the Municipal Regional Permit Tentative Order.

The City's current NPDES permit was adopted in February 2001 for a five-year period. The permit was amended in October 2001 and July 2005, with both amendments relating to the New and Redevelopment stormwater treatment and hydromodification provision, also known as Provision C.3. The permit has been administratively extended since February 2006, pending the adoption of the Bay Area-wide Municipal Regional Permit.

In late 2005, the Water Board embarked on a multi-stakeholder process to craft an NPDES permit, called the Municipal Regional Permit (MRP) that would apply to all municipal stormwater dischargers in the Bay Area and be in effect for a five year period. The Water Board released the MRP Tentative Order on December 4, 2007 for public review and comment. The City submitted both legal and technical comments on the Tentative Order on February 29, 2008, and City staff and elected officials provided testimony at the Water board public hearing held on March 11, 2008. Water Board staff are continuing to review the comments received on the Tentative Order and discussing potential changes with various stakeholders. A revised Tentative Order is expected to be released in early 2009 and the Water Board is expected to adopt the MRP Summer 2009. The adoption of the MRP would prompt the development of a new City Work Plan which will identify activities with associated timelines that are required in order to achieve compliance with the stormwater requirements set forth in the MRP.

Permit Reapplication Preparation

#	Activities	Target Date	Responsible Party
A.	Compile all changes to URMP as part of reapplication for next permit. (C.2.b)	Done FY 04-05	ESD
B.	Participate in permit development and negotiation processes.	Ongoing	ESD
C.	As required, develop new five-year Work Plan that starts the following fiscal year upon adoption of MRP.	FY 08-09 **FY 09-10**	ESD

Attachment A: Outreach Activities Summary

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	❍ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
1.	**Storm Drain Stenciling Evaluation** ~~Evaluate current methods of~~ **Implement preferred inlet marking method.** ~~and make recommendations for future FY efforts.~~	❍		~~FY 08-09~~ **FY 09-10** Ongoing	♦ Materials distributed
2.	**Requests for Brochures** Distribute outreach materials upon request.	❍	PIP 1.C	FY 09-10	♦ Materials distributed
3.	**Regional partnerships** Participate in BAPPG, BASMAA/BACWA Media Relations campaign, etc.	❍	PIP 2.C	FY 09-10	
4.	**Event Support** As needed, staff Booth and/or provide outreach materials to select events. Evaluate the overall benefit and effectiveness of attending events and make changes as needed.	❍	PIP 1.B	As needed	♦ Materials distributed
5.	**BMP Reprints** Reprint selected Outreach materials as needed.	❍	PIP 1	FY 09-10	♦ n/a
6.	**Industrial Users Academy** Give stormwater, pollution prevention and GIASP compliance information to industries permitted to the Water Pollution Control Plant.	◎: Plant-permitted Industries	IND 6.A, PIP 2.B, PM 6.A, M 5.B	FY 09-10	♦ Participant surveys
7.	**Outreach to Development Community** PW & ESD staffs to conduct training on erosion and sediment control for private developers of type 2 projects. PBCE Planning and PW also conduct roundtable meetings with developers where information regarding stormwater requirements is shared.	◎: Developers	CON 7 NRD 2	FY 09-10	♦ Participant surveys
8.	**IPM Store Partnership** (PROGRAM) Create & provide fact sheets & materials to pesticide retailers to facilitate point-of-purchase outreach to support IPM Store Partnership Program. There are currently nine stores in San José participating in the IPM store partnership.	◎	PM 6.D.	FY 09-10 dates TBD	
9.	**Partner with other City programs, such as the Strong Neighborhoods Initiative** Continue partnering with City's SNI for delivering selected messages. Other programs to investigate partnerships are the Anti-Litter Program, After School Program, etc.	◎	PIP 1	FY 09-10	
10.	**Mercury Outreach**	◎	M 5	FY 09-10	

#	Activity	Outreach Type	Work Plan Reference	Implementation Date	Evaluation Mechanism
	○ = General Outreach, ◎ = Targeted Outreach, ✋ = Citizen Involvement, ✎ = Education				
	Investigate opportunities to include mercury messages through participation in the Home Show events, residential newsletters or other mailings, and support the County's Universal Waste Take-back Pilot Program.		PIP 2.C.		
11.	**IPM Outreach** Prepare IPM stories and press releases for local media. Investigate opportunities to include IPM messages in the City's outreach to businesses.	◎	PM 6.A PM 6.B	FY 09-10	
12.	**Coastal Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Fall 09	♦ Participant surveys ♦ Amount picked up
13.	**National Rivers Clean-up Day** Creek Clean-up event coordinated with Countywide effort.	✋	PIP 4.A	Spring 10	♦ Participant surveys ♦ Amount picked up
14.	**Wacky Watersheds Workshops** Present South Bay Water Connections curriculum to middle school educators within San Jose/Santa Clara Water Pollution Control Plant service area.	✎	PIP 3.A	FY 09-10	♦ Participant surveys ♦ Follow-up call of attendees
15.	**Creeks Come to Class** Formerly called Water Awareness Program. Also called Rangers in Schools. Presentations focusing on Pollution Prevention. *It's Wet It's Wild It's Water!* Curriculum distributed to teachers.	✎	PIP 3.A	FY 09-10	♦ Survey of teachers ♦ Survey of students
16.	**Slow the Flow** Grant to Don Edwards Alviso Environmental Education Center to host 9 different types of events: special events, interpretive programs, teacher orientation, field trips, in-class presentations, outreach presentations, workshops, special visits and interpretive displays.	✎	PIP 3.A	FY 09-10	♦ Done by Grantee
17.	**Youth Watershed Education Grants** Grant program for educators.	✎	PIP 3.A	FY 09-10	♦ Audit of projects
18.	**Website** Maintain and update website with pertinent information as needed.	○	PIP 1	FY 09-10	♦ Website traffic data
19.	**ICID Targeted Outreach** Targeted outreach to areas that exhibited a high number of residential ICID Complaints in FY 08-09.	◎	PIP 2.C	FY 09-10	♦ TBD
20.	**Charity Car Wash Kit** Explore the option of providing targeted outreach and supplies to community groups engaging in fundraising car wash events.	◎		~~FY 08-09~~ **FY 09-10**	♦ TBD

Attachment B: Municipal Training Schedule

PS ID #	Topic	Sponsored or Held By	Dept/Division/Section Attending	# Sessions	Tentative Schedule
ICID 3	Construction Inspection Training	ESD - WE	ESD - WE	1	07/09
ICID 3	Annual Training for ICID Inspectors	ESD - WE	ESD - WE	1	07/09
IND 5	Training for IND Inspectors	ESD - WE	ESD - WE	1	07/09
CON 6	Wet Weather Construction Site Preparation & Inspection	DPW, ESD	PW	2	09/09
CON 6	Construction Site Planning and Management For Water Quality Protection	SCVURPPP & Water Board	PW, ESD, PBCE, PRNS		09/09
CON 6	SOPs for inspections during wet and dry season to include procedures for erosion control plan review inspection process	DPW, ESD	PW Inspections, PBCE Building Inspectors (All to attend at least once every two years)		10/09
CON 7	Erosion & Sediment Control Training for Type 2 Private Development Projects	DPW & ESD	Private Developers, PW, ESD		10/09
CON 8	Erosion Control Information To Be Included In Contract Language For Capital Improvement Projects Training For PW Construction Project Management	PW & ESD	PW		11/09
NRD 10	NPDES C.3 Training	Various	PBCE, PW, RDA, ESD	1	11/09
PSR 2	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/10
PSR 3	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/10
PSR 6C	Stormwater Pollution Prevention Training – Rural Public Works	PRNS, ESD	PRNS	2	10/09
SDO 3A	DOT Contract Manager Training	DOT, ESD	DOT Managers from: Transportation, Planning, Traffic Signals, Traffic Ops, Sanitary & Sewers	2	03/10
SDO 4	Stormwater Pollution Prevention Training	DOT, ESD	DOT Crews	12	05/10
PM 4A	Worker Safety training per DPR requirements	GS, DOT, PRNS, ESD	GS, DOT, PRNS, ESD	1	02/10
PM 4B	Training on IPM Policy & Techniques	GS, DOT, PRNS, ESD	GS, DOT, PRNS, ESD	1	02/10
WUOM 3	Water Utility Operation & Maintenance Discharge Training	ESD (Muni Water)	Muni Water Operations & Maintenance Crews		12/09

Glossary

AHTG	Ad Hoc Task Group
AOC	Area of Concern
BACWA	Bay Area Clean Water Agencies
BAPPG	Bay Area Pollution Prevention Group
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practices
CAO	City Attorney's Office
CEP	Clean Estuary Partnership
COS	Communications and Outreach Subgroup of WMI
DOT	Department of Transportation
EEC	Environmental Education Center
EIR	Environmental Impact Report
ESD	Environmental Services Department
ESD-P&P	Policy and Planning
ESD-MarComm	Marketing & Communication Section
ESD-Muni	City of San José Municipal Water System
ESD-R&R	Regulations and Research Section
ESD-UR	Urban Runoff Section
ESD-WE	Watershed Enforcement Section
GIASP	General Industrial Activities Storm Water Permit
GS	General Services Department
HHW	Household Hazardous Waste
HMP	Hydromodification Management Plan
IPM	Integrated Pest Management
MRP	Municipal Regional Permit
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PBCE	Department of Planning, Building and Code Enforcement
PBCE-Bldg	Building Division of PBCE
PBCE-Planning	Planning Division of PBCE
PD	Police Department
POTW	Publicly Owned Treatment Works
PRNS	Department of Parks, Recreation and Neighborhood Services
PW	Public Works Department
PW-CFAS	City Facilities Architectural Services Division of PW
PW-DS	Development Services Division of PW
PW-ESS	Engineering and Support Services Division of PW
PW-THS	Transportation & Hydraulic Services of PW
RDA	Redevelopment Agency
RWQCB or Water Board	Regional Water Quality Control Board
SCVURPPP or Program	Santa Clara Valley Urban Runoff Pollution Prevention Program

SNI	Strong Neighborhoods Initiative
SOP	Standard Operating Procedure
SWPPP	Storm Water Pollution Prevention Plan
TBD	To Be Determined
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
WE&O, or WEO	Watershed Education and Outreach
WMI	Watershed Management Initiative
WUPPP	Water Utility Pollution Prevention Program
YWET	Youth Watershed Education Team

County of Santa Clara
Clean Water Program

Phone: (408) 299-5737
Fax: (408) 279-8537

Santa Clara Valley Urban Runoff
Pollution Prevention Program
(SCVURPPP)
Work Plan

Co-permittee:

County of Santa Clara

FY 07 Work Plan

Submittal Date 3/1/2006

Development Services Office
DEPARTMENT OF PLANNING AND DEVELOPMENT
70 West Hedding St., 7th Floor East Wing
San Jose, CA 95110

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County of Santa Clara
Clean Water Program

FY 07 WORK PLAN

Certification Statement

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature by Duly Authorized Representative:

Thomas P. Whisler, P.E.

Manager
Development Services Office
DEPT. OF PLANNING AND DEVELOPMENT

Submittal Date: 3/1/2006

County of Santa Clara

Department of Planning and Development
Office of Development Services

County Government Center, East Wing
70 West Hedding Street, 7th Floor
San Jose, California 95110
Bldg. Inspec. (408) 299-5700 Land Devel. 299-5730 FAX 279-8537
www.sccbuilding.org

March 1, 2006

Bruce H. Wolfe
Chief Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

RE: FY 07 Clean Water Program Work Plan, for the County of Santa Clara

Dear Mr. Wolfe:

Attached is the Work Plan for FY 07 for the County of Santa Clara, for compliance activities associated with the 2001 NPDES Storm Water Discharge Permit, as amended, and the County's Urban Runoff Management Plan.

The Work Plan contains sections for General Clean Water Program tasks, IPM related tasks, Mercury reduction related tasks, New Development and Redevelopment related tasks, and Copper Action Plan related tasks.

Please feel free for you or your staff to contact me at (408) 299-5737, should there be any questions regarding this Work Plan.

Very truly,

Steve Homan

Steve Homan, REHS, REA, B.S.
Coordinator,
Clean Water Program

cc: Sue Ma, SFB-RWQCB Staff
Adam Olivieri, Ph.D., SCVURPPP Program Mgr.
Jill Bicknell, P.E., SCVURPPP Asst. Program Manager

Board of Supervisors: Donald F. Gage, Blanca Alvarado, Pete McHugh, James T. Beall, Jr., Liz Kniss
County Executive: Peter Kutras, Jr.

Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)

Co-permittee:

County of Santa Clara

FY 07 Work Plan

LEGEND

AR: Annual Report

CWP Program: County of Santa Clara Clean Water Program

SCVURPPP: Santa Clara Valley Urban Runoff Pollution Prevention Program

DEH: Department of Environmental Health of the County of Santa Clara

SW-LEA: Solid Waste Section, Local Enforcement Agency of DEH

HMCD: Hazardous Materials Control Division of DEH

HHW: Household Hazardous Waste Section of DEH-HMCD

CPD: Consumer Protection Division of DEH

PS: Performance Standard

SFCr: San Francisquito Creek

NPDES: National Pollutant Discharge Elimination System

WP: Work Plan

DSO: Development Services Office of the Planning and Development Dept.

LDE: Land Development Engineering Section of ODS

PLN: Planning Office of the Planning and Development Dept.

AERM: New department, Agriculture and Environmental Resources Management, combining Agriculture and Resource Management with the Department of Environmental Health

FAF: Fleet and Facilities, now includes Capital Programs Section

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CLEAN WATER PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

P.S. Id.	*Activity*	*FY 07 Tasks*	*Status / Comments*	*Due Date*	*Responsible Party*
Illicit Connection & Illegal Dumping Elimination Activities					
ICID PS-2	Staff training	Document annual training for DEH inspectors		6/30/07	DEH
ICID PS-4	Field Investigations	DEH will continue to respond to ICID Complaints		Ongoing	DEH
ICID PS-6	Enhanced reporting requirements	Provide quarterly reports to SCVURPPP.		Quarterly Ongoing	DEH
ICID PS-7	Effectiveness Evaluation	Review and evaluate the effectiveness of County efforts.	For Annual Report	7/15/07	DEH
Industrial/Commercial Discharger Control Programs					
IND PS-3	Check for new industrial businesses.	Automatic, as part of regulatory permit process.	(1) Unincorporated area has few industrial facilities. (2) New facilities apply for County Hazmat Storage Permits, and Hazmat Generator Permits. In that way they are automatically included in the inspection inventory. (3) SWRCB NOI List does not differentiate between unincorporated or incorporated areas, only by the city mailing address of the location. Therefore, the SWRCB NOI List of little use in uninc. area.	N/A	DEH

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

P.S. Id.	*Activity*	*FY 07 Tasks*	*Status / Comments*	*Due Date*	*Responsible Party*
IND PS-3	Commercial Inspections	Inspect 1/3 automotive and service stations in FY 06 • Inspect all facilities determined to be potentially significant contributors to stormwater pollution annually ("Category A" and "NOI Filers" List). • Inspect one-third of all non-significant facilities annually. • Review the lists of significant and non-significant facilities, and revise as necessary (NOI List not helpful in uninc. area). • Inspect (non-NOI filers) with SICs 5015 (auto dismantlers); 5093 (other recycling industries); 3200 (trucking facilities that repair, wash, or maintain vehicles), and state the frequency of these inspections in the Annual Report (1/3 annually). • Inspect (1/3) of all vehicle service facilities annually (URMP-1997) • Inspect one-third or more of all food service facilities annually. • Inspect all facilities promptly for which a complaint is received. • Evaluate the effectiveness of the County's storm water inspection efforts and of its enforcement actions in correcting any problems found (see below).	(URMP Goal)	During FY 07	DEH

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

P.S. Id.	*Activity*	*FY 07 Tasks*	*Status / Comments*	*Due Date*	*Responsible Party*
IND PS-4	Staff training	Document annual training for Hazmat and Food Facilities Inspectors		6/30/07	DEH
IND PS-4	Enhanced reporting requirements	Continue to track all non-compliance, follow-up enforcement actions and final resolutions resulting from inspections. Submit data to the Program quarterly.		Ongoing	DEH
IND PS-4	Effectiveness Evaluation	Review and evaluate the effectiveness of County efforts.	For CWP Annual Report	7/15/07	DEH
Public Streets, Roads, and Highways Operation and Maintenance and Rural Public Works PS					
PSR H PS-3	Staff training	Arrange annual training for Roads and Airports Staff and Maint. Yard Supervisors.	For CWP Annual Report	6/30/07	Roads and Airports Dept., CWP Prgm. Coord.
PSR H PS-5	Effectiveness Evaluation	Review and evaluate the effectiveness of R&A efforts.	For CWP Annual Report	7/15/07	Roads and Airports Dept.
RPW -PS	Rural PW PS	Continue using the Rural Public Works-PS at Parks and Roads, and evaluate effectiveness		Ongoing	Parks, Roads and Airports
Storm Drain System Operation and Maintenance					
SD PS-1	Storm Drain Maintenance	All tasks are routine and on-going (URMP)		Ongoing	Roads and Airports Dept.
SD-4	Annual training	Arrange for annual training for staff responsible for the maintenance of the storm drain system.		6/30/07	Roads and Airports Dept., CWP Prgm. Coord.,

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

P.S. Id.	*Activity*	*FY 07 Tasks*	*Status / Comments*	*Due Date*	*Responsible Party*
					Roads Sr. Env. Compliance Spec.
SD PS-5	Effectiveness Evaluation	Review and evaluate the effectiveness of R&A efforts.	For CWP Annual Report	7/15/07	Roads and Airports Dept.
Maintenance Yards					
PSR H PS-3	Staff training	Arrange annual training for R&A maintenance yard staff and supervisors.		6/30/07	Roads and Airports Dept, CWP Prgm. Coord.
PSR H PS-5	Effectiveness Evaluation	Review and evaluate the effectiveness of R&A efforts.	For CWP Annual Report	7/15/07	Roads and Airports Dept.

Program Work Plan Task	Activity	CI Item Source[1]	*FY 07 Tasks*	Status / Comments	Due Date (mo/yr)	Responsible Party
Water Quality-Based Requirements						
New	PCBs/Dioxin Compounds	C.9.e	Support SCVURPPP staff to perform follow-up work on identifying and evaluating controllable sources.		Ongoing	CWP Prgm. Coord
New	Sediment	C.9.f.iii	Support SCVURPPP staff to conduct a watershed analysis and management practices assessment		Ongoing	CWP Prgm. Coord.

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	CI Item Source[1]	*FY 07 Tasks*	Status / Comments	Due Date (mo/yr)	Responsible Party
			for uninc. area creeks to determine if creeks are impaired by sediment production from anthropogenic activities.			
New	Sediment	C.9.f.III	Monitor activities of the SFCrJPA, including the SFCr Sediment Study	($8000 assessment was paid as County share of sediment study)	Ongoing	CWP Prgm. Coord.
Concerns Regarding Trash in Creeks						
		Use SCVURPPP guidance for trash evaluations. Conduct trash evaluations where appropriate. Identify trash control measures needed in high priority areas. Provide SCVURPPP staff with data and information as requested Please see separate Trash Work Plan			During FY 07	CWP Prgm. Coord., DEH, GALA Coord., IWM Coord.

Program Work Plan Task	Activity	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
Watershed Management					

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
	ID trash hot spots	Continue to work with the SCVURPPP and DEH as requested to identify trash "hot spots" or trash problem areas within the uninc. area.	(SCVURPPP trash assessment is currently in development.)	FY 07	DEH, GALA, IWM, CWP Prgm. Coord.
	Trash mgmt. practices	Continue to support SCVURPPP staff as requested in identifying existing trash management practices.	(SCVURPPP trash assessment is currently in development.)	FY 07	DEH, GALA Coord., IWM Coord., CWP Prgm. Coord.
	Trash documen-tation	Provide SCVURPPP staff with documentation regarding trash complaints/incidents as requested.	(SCVURPPP trash assessment is currently in development.)	FY 07	DEH
	Trash eval. workshop	Participate in trash workshops and training, when scheduled.		FY 07	CWP Prgm. Coord., Roads, Parks, DEH, GALA Coord., IWM Coord, P2 Coord.
	Street sweeping data	Collect street sweeping data and provide data to Program for a street sweeping effectiveness evaluation as requested.	Annual spread sheet from Roads since mid 1990s.	Ongoing	Roads and Airports Dept., CWP Prgm. Coord.
	WE&O Outreach	Support WEO in SCVURPPP budget		Ongoing	CWP Prgm. Coord.
	WMI Core Group, LUSG	Monitor WMI meeting minutes and materials: Core Group, Land Use Sub-Group		Ongoing	CWP Prgm. Coord.; Planning Office

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
Public Information / Participation					
PI/P	On-going public Information program	Staff will continue to use a variety of outreach avenues to educate the variety of audiences in the County. See following PI/P table for detail of activities.	Green business program is ongoing. IWM and P2 and GALA have been included with DEH within the Dept. of Agriculture and Environmental Resource Management	Ongoing	IWM Coord., P2 Coord., GALA Coord., DEH, CWP Prgm. Coord.

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

General Outreach

Activity	Communication Vehicle	Goal
CWP literature distribution to the general public at County facilities: • Govt. Center • Planning / Building Dept. counter • Events	**CWP Prgm. literature:** Pests Bugging You?, Home Maintenance Tips, eight construction tri-folds, Blueprint For a Clean Bay booklet, IPM pest-specific fact sheets, Grow-It!, pool water brochure. **HHW Prgm literature:** HHW brochures, small business hazardous waste brochure, (and any new Mercury-products literature as it becomes available)	Keep stocked in view of public
HHW Collection Events	Handouts	Ongoing throughout the year
Website: Include new information in County CWP Prgm. website. Include CWP Ordinance C3. changes when adopted.	County web site	On-going When HMP approved and if Group 2 date extended
Watershed Education & Outreach Campaign: Conduct or participate in local activities that are coordinated with the Watershed Education & Outreach campaign. Evaluate the effectiveness of PI/P projects by direct or indirect means as appropriate.	Any ed. materials developed by the WE&O campaign. Continue handing out Watershed Watch.	TBA

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

Targeted Outreach

Activity	Communication Vehicle	Goal
County staff: • Building inspectors • Construction Inspectors and Engineer/Plan Checkers • Planning Office: Planners • Maint. Yard& Roads Maint. staff • Roads staff and GSA staff managing facilities pesticide spraying contract • County employees for general info on less-toxic alternatives for their own home use, and info on not using pesticides on the job, if unauthorized (detail in the Pesticide Workplan)	CWP literature, as appropriate In-house and Program trainings E-mails	Internal training at least once/yr, for each listed group of employees (except the general County employee info on IPM) In addition, building inspectors, construction inspectors, planners, and engineers are encouraged to attend SCVURPPP-sponsored training events.
County Contractors: Require PCOs, contracted for work on County facilities, to use pest control methods consistent with our IPM policy and demonstrate adequate training (IPM Coord.) (See Pesticide workplan for details.)	Contract specifications. IPM Ordinance. SCVURPPP sponsored IPM workshops as they occur.	Adequate contract specifications. Appropriate contractor & GSA staff attendance at Program workshops. (IPM Coord., Parks, Roads, GSA)

Auto Repair Shops	Education of shop mgrs. during tri-annual inspections by DEH; use SCVURPPP lit.,	Ongoing

COUNTY OF SANTA CLARA

	when necessary	
Restaurant education	Restaurant poster distr. at inspections by County health inspectors as needed, when not present in facility, when wall space allows.	Posters left at restaurants at routine inspections by DEH as appropriate.
Development community	Literature distr. at Planning/Bldg Lobby *Blueprint for a Clean Bay* manual; eight construction tri-folds; storm drain stencils are available.	Restock as needed, check regularly
Problem contractors in the field	2nd Outreach letter to problem contractors (40 on database—warning letters sent in the past to all). Illegal dumping of soil: targeted letters to swimming pool contractors. Verbal and Written notices and follow up. Improve written notices for erosion problems.	Summer 2005 Constr Insp. Perf. Std.
Residents living near creeks	Water District's Stream Care Guide	Display, restock as needed
Gardening community—IWM Coord. contacts and coordinates with local gardening clubs to provide them with IPM info. through composting program	IPM fact sheets from SCVURPPP and others	As opportunities arise. (IWM Coord.)
Outreach to local restaurants (working with DEH inspectors) to encourage less-toxic control (Program Pesticide Workplan for details.)		Arrange for distribution as the new materials become available. (DEH--CPD)

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: GENERAL CWP PROGRAM RELATED TASKS

COUNTY OF SANTA CLARA

Public Participation

Activity	Communication Vehicle	Goal
Encourage participation in regional creek cleanup event. Help publicize cleanup.	Email, hang posters in Govt. Center	Involve public and county work force

School/Education Outreach

Activity	Communication Vehicle	Goal
Public Schools N/A [Students primarily attend schools within the incorporated cities; therefore this is not a priority for the County]	Cities' existing and planned outreach	Present storm water pollution prevention message to youth

COUNTY OF SANTA CLARA

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
I. Municipal Pesticide Use ***Goal I.A.*** *Eliminate all unnecessary municipal pesticide use (particularly organophosphate (OP) pesticide use) and implement Integrated Pest Management (IPM) techniques.*				
I.A.1	Track pesticide use on County owned property. (PS #9). The results are reported in the AR.		Ongoing	County IPM Program Coordinator in County Exec's Office, FAF
I.A.3	Continue to refine and implement SOPs and BMPs for implementing the IPM policy. (PS #3).		Ongoing	County IPM Coord., FAF
I.A.4	Update URMP with Pest Mgmt. changes.		IPM Ord.	CWP Prgm Coord., IPM Mgr.
I.A.5	Continue to ensure that any contractor employed to conduct pest control and pesticide application on County property engages in pest control methods consistent with the IPM policy adopted by the agency (PS #6).		Ongoing	County IPM Coordinator, FAF
I.A.6	Arrange annual, County facility search of chemical storage areas for pesticides no longer legal for application, and properly dispose of them. (PS #10)		Conducted once. Now ALL pesticide purchase goes through IPM	County IPM Coord.

COUNTY OF SANTA CLARA

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
			Coord.	
MM I.A.1.	Document completion of tasks in annual reports. Use pesticide-tracking process to document pesticide use.		Ongoing	County IPM Coord.

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
Goal I.B. *Raise awareness of all municipal employees and train employees who apply pesticides for the jurisdictiony about the IPM Policy and/or IPM techniques as appropriate.*				
I.B.1	Ensure that employees who apply pesticides for the agency continue to obtain the appropriate County Ag and DPR- required training (PS #5a).		Annually	County IPM Coord. FAF, Parks, Roads
I.B.2	Provide for annual training on the IPM Policy, SOPs, and BMPs, and the latest IPM techniques to employees within departments responsible for pesticide application (PS #5b).		Annually	County IPM Coordinator
I.B.3	Annually inform employees who are not authorized to apply pesticides, that they cannot use over-the-counter pesticides in the workplace (PS #5c)		Annually, by e-mail or county newsletter	County IPM Coordinator
MM I.B.1.	Document and evaluate effectiveness of annual staff training.	Quarterly HLUET Committee reports also.	Annually for AR	County IPM Coordinator

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
II. Public Education and Outreach *Goal II.A. Increase awareness of IPM so target audiences recall less toxic pest management messages and adopt IPM behaviors. Target audiences include residential pesticide users, professional pest control businesses, customers of professional pest control businesses, & pesticide retailers, school districts(PS # 7).*				
II.A.1	Support local implementation of the Watershed Education & Outreach (WE&O) Campaign[1], which will target the general public and include messages about less-toxic pest control and proper disposal. Support SCVURPPP as requested		During FY 07	CWP Prgm. Coord.
II.A.2	Assist SCVURPPP in developing targeted messages regarding proper pesticide use and disposal, effects on water quality, and IPM.		Review of new pieces as developed by SCVURPPP	CWP Prgm. Coord.
II.A.4	Identify and attend local community events and distribute outreach material. Distribute literature at Backyard Compost or Master Composter workshops.			IWM Prgm. Coord., P2 Coord.
II.A.5	Maintain contact with local gardening groups and offer them literature.			IWM Prgm Coord., P2
II.A.9	Continue to support BASMAA Regional Media Relations Campaign featuring pitches to Bay Area media and responses to	SCVURPPP funds BASMAA baseline projects, including Regional Media Relations Campaign.	Ongoing	CWP Prgm. Coord.

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
	breaking news on pesticide-related topics.			
II.A.10	IPM coord. to provide IPM-related press releases to local media as appropriate—using SCVURPPP generated materials when appropriate		Intermittently, as needed	IPM Coord.
II.A.12	Continue to assist with implementation of local components of a "Pesticide User Outreach" project targeting residential and commercial users	Will assist as needed.	As requested by SCVURPPP	CWP Prgm. Coor., IPM Coord.
II.A.14	Internal outreach on IPM to encourage employees to use IPM techniques away from work: Distribute IPM fact sheets electronically to involved County employees through e-mail or web site or newsletter.		Intermittently	IPM Prgm. Coord., IWM Coord.
MM II.A.1.	Document or estimate numbers of residents reached by outreach efforts and media advertising		Annually, for AR	IPM Prgm. Coord., IWM Coord.
Goal II.B. *Educate pesticide retailers and consumers about less toxic pest control products and promote the sale of such products.*				
II.B.1	Continue to fund and participate in the BASMAA Regional IPM Partnership	SCVURPPP funds BASMAA baseline projects, including Regional IPM Partnership.	Ongoing	CWP Prgm. Coord.
II.B.2	Continue to support the IPM Store	Support through SCVURPPP	Ongoing	CWP Prgm.

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
	Partnership Program. (Nurseries)			Coord.
MM II.B.1.	Assist Program when requested in documenting number of participating stores, materials distributed, employees trained, and cost-effectiveness of the IPM Store Partnership Program.		As requested. Few stores in uninc. area.	SCVURPPP

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
III. Pest Control Operators (PCOs) ***Goal III.A.*** *Minimize pesticide use by PCOs contracted for structural pest control and landscape maintenance.*				
III.A.4	Require PCOs contracted for municipal applications to use pest control methods consistent with the County's IPM policy (through contract specifications). Specifically, require contractors to: a) follow the agency's IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on agency property to the agency in a timely manner	IPM-specific specifications are included in the contracts.	Ongoing	Maint. Yard Supervisor & Parks FAF IPM Prgm. Coord.

COUNTY OF SANTA CLARA

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
	(PS#6).			
MM III.A.1.	Document pesticide use by PCOs on County property.		Avail. on request	IPM Prgm. Coord., FAF
	Goal III.B. *Require all PCOs to implement Best Management Practices (BMPs).*			
III.B.2	Require PCOs contracted by County to implement BMPs through contract specifications.		Ongoing	Roads and Airports Fleet and Ops Mgr. Parks Sr. Env. Compliance Specialist Park & Rec IPM Prgm. Coord.
MM III.B.1.	Document efforts to complete the above actions.		In the Annual Report	Roads and Airports Fleet and Ops Mgr. Parks Sr. Env. Compliance Specialist Park & Rec IPM Prgm. Coord.

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
IV. Commercial Businesses ***Goal IV.A.*** *Determine the extent of commercial business employees' use of pesticides (i.e., pesticide applications not performed by a licensed PCO) and conduct appropriate outreach regarding less toxic pest management.*				
IV.A.2	Support implementation of education programs that target commercial businesses, per recommendations developed in SCVURPPP work plan. IPM Mgr. assists in area-wide IPM conference, when scheduled		Ongoing through SCVURPPP Few commercial businesses in uninc. area.	SCVURPPP, DEH--CPD
MM IV.A.1.	Document outreach efforts targeting businesses.	Rely on SCVURPPP	Annually in AR	SCVURPPP , IPM Coord., DEH
V. Household Hazardous Waste Collection ***Goal V.A.*** *Provide pesticide disposal services through household hazardous waste (HHW) collection programs for all residents and small businesses, and encourage use of these programs.*				
V.A.1	Ensure that adequate pesticide disposal services exist for residents and conditionally exempt small quantity commercial generators.		Ongoing	DEH--HHW, Ag. Commis-sioner's Office
V.A.3	Support, enhance, and help publicize programs for proper pesticide disposal (PS #7).		Ongoing	DEH, Ag. Commis-sioner's Office

COUNTY OF SANTA CLARA

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
V.A.5	Provide hazardous waste disposal information to residents through DEH website and handouts at collection centers.		Ongoing	DEH— HMCD, DEH--HHW

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
MM V.A.1.	Document that household hazardous waste collection programs adequately serve residents and businesses and that any exchange programs do not exchange organophosphate or banned pesticides.		Annually	DEH--HHW
VII. New Development ***Goal VII.A*** *Minimize pesticide use at new and redevelopment sites.*				
VII.A.2	Consider pest-resistant landscaping and design features in the design, landscaping, and environmental reviews of proposed development projects. (C.9.d.ii.)	Certification will required for Grp. 1 Projects	Ongoing	CWP Prgm. Coord., Planning Office, Development Services Office
VII.A.4	Collect information and report a summary of types of pesticide reduction measures required for development projects and the	County to require LLA certification for Grp. 1 projects.	Ongoing	CWP Prgm. Coord., Planning

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
	percentage of projects for which pesticide reduction measures were required. (C.3.n.5)			Office, Development Services Office
MM VII.A.1.	Summarize types of pesticide reduction measures required (such as by conditions of approval) for new development and significant redevelopment projects, and the percentage of new development and significant redevelopment projects for which pesticide reduction measures were required. (C.3.n.)		Annually, in AR	CWP Prgm. Coord., Planning Office, Development Services Office

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
VIII. Monitoring and Science ***Goal VII.A.*** *Participate in coordinated monitoring efforts to support pesticide TMDL development and implementation.*				
VIII.A.1	Continue financial support of the Regional Monitoring Program (RMP) through County contribution to SCVURPPP budget.		Annually	CWP Prgm. Coord.
X. Review and Revision of Work Plan ***Goal X.A.*** *Implement a work plan that includes appropriate goals, actions, and monitoring mechanisms to reduce pesticide-related toxicity in urban runoff.*				
X.A.1.	Review and continuously improve the goals,		Annually	CWP Prgm.

COUNTY OF SANTA CLARA

Program Work Plan Task	Task Description	Status / Comments	Due Date (mo/yr)	Responsible Party
	actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Regional Board staff and other interested parties, and results of local performance review meetings, if any.			Coord., IPM Prgm. Coord.
MM X.A.1.	Revise work plan to include any continuous improvement items. Report on completion of work plan tasks in Annual Report.		Annually; submit work plan updates in March. AR submitted in Sept.	CWP Prgm. Coord.

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	Contin-uous Improve-ment Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
Mercury Control Program						
I. Municipal Use of Mercury-Containing Products Goal I. Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.						
I.B	Mercury control program	C.9.c	Continue to handle mercury-containing products in accordance with Universal Waste Regulations. Participate in the Program ad hoc Task Group.			FAF, DEH—HHW CWP Prgm. Coord.
I.D	Mercury Policy	C.9.c	Propose a mercury policy or ordinance requiring the virtual elimination of mercury from controllable sources in urban runoff from county operations.	SCVURPPP to provide guidelines for a policy. FAF conducts mercury recycling, for lights, batteries, thermostats, etc.	6/04 Ongoing	CWP Prgm. Coord., FAF, DEH, IWM, DEH-HHW, HMCD
I.F	Implement guidelines for mercury reduction	C.9.c	Implement guidelines for mercury-containing products reduction and mgmt	Program provided guidelines 3/03.	Ongoing	FAF
MMI	Mercury control program	C.9.c	Document completion of tasks in annual reports. Use mercury-containing product reporting		Annually, In AR	FAF

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	Contin-uous Improve-ment Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
			guidelines.			
II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.						
II.B	Mercury control program	C.9.c	Provide mercury-containing products disposal services for residents and small businesses.	DEH--HHW	Ongoing	DEH—HMCD, HHW

Program Work Plan Task	Activity	CI Item Source[1]	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
II.D	Document products disposed	C.9.c	Implement guidelines for documenting and reporting quantities of mercury-containing products recycled.	Reported in AR annually	Ongoing	FAF DEH--HHW
III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.						
III.A	Mercury control program	C.9.c	Assist SCVURPPP as requested, County to continue to provide financial support for the		Ongoing	CWP Prgm. Coord., County

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: MERCURY CONTROL PROGRAM

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	CI Item Source[1]	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
			Regional Monitoring Program (RMP) through annual SCVURPPP assessment. Support SCVURPPP's continued participation in the RMP steering committee and technical review committee.			Budget
III.B	Mercury control program	C.9.c	Assist SCVURPPP as requested by supporting a coordinated regional plan to collect data for the mercury TMDL.		Available	CWP Prgm. Coord.
III.C	Mercury control program	C.9.c	Assist SCVURPPP as requested in providing support for the Joint Storm Water Agency Project to Study Urban Sources of Mercury to assess sediment mercury concentrations and percentage of fine material.		Available	CWP Prgm. Coord.
III.C.2	Mercury control program	C.9.c	Assist SCVURPPP as requested in preparing the Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides		Available	CWP Prgm. Coord.

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	CI Item Source[1]	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees.						
V.A.	Mercury control program	C.9.c	Assist SCVURPPP when requested to develop various outreach programs to educate target audiences about proper disposal of mercury-containing products and alternative non-mercury containing products.	E-waste program starting, DEH-HHW working with SCVURPPP and others on mercury policy and /or ordinance.	See below. DEH-HHW-HMCD coordinates with SCVURPPP	DEH—HHW, IWM Coord., CWP Prgm. Coord.
V.A.1	Fluorescent light recycling outreach—residential	C.9.c	Continue fluorescent light recycling program. Educate residential users and encourage proper disposal of fluorescent lights.		Ongoing	DEH--HHW
V.A.2	Fluorescent light recycling outreach—small businesses	C.9.c	Assist SCVURPPP when requested to develop and begin to implement a fluorescent light recycling outreach program for small businesses and encourage proper disposal of fluorescent lights.		Grant funding depen-dant	DEH—HHW, P2, IWM
V.A 3	Outreach to auto shops	C.9.c	Coordinate with DEH--HMCD inspectors to integrate future mercury outreach into the routine	As material becomes available.	Grant funding depen-	DEH--HMCD

COUNTY OF SANTA CLARA

Program Work Plan Task	Activity	CI Item Source[1]	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
			auto repair shops inspections		dent, also depend-ing on material availa-bility	
V.A.4	Mercury control program	C.9.c	Assist SCVURPPP as requested to develop "tailgate safety meeting cards" about mercury.		Unknown, depends on SCV-URPPP priorities	CWP Prgm. Coord.
V.B	Mercury control program	C.9.c	Assist SCVURPPP as requested to develop or adapt existing mercury outreach materials, as needed, for outreach programs.		Ongoing	
V.C	Mercury control program	C.9.c	Attend community events and distribute outreach materials, when available.		Ongoing	P2, IWM, DEH--HHW
MM V.B	Mercury control program	C.9.c	**Monitoring Mechanism V.B.** In the Annual Report, document and evaluate each County outreach activity, including the target audience and estimated number of residents and/or businesses reached.		Annually	DEH-HHW, HMCD, IWM, P2
MM V.C	Mercury control program	C.9.c	**Monitoring Mechanism V.C.** Assist SCVURPPP as requested to survey public attitudes and behavior.		Available	CWP Prgm. Coord.

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: NEW DEVELOPMENT AND REDEVELOPMENT REQUIREMENTS

COUNTY OF SANTA CLARA

Activity	Permit Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
C.3.b Development Project Approval Process -- Planning Procedures					
Ordinance Revision	C.3.b.2	Develop new ordinance incorporate C3. requirements	Amend existing CWP ordinance to include Numeric Sizing Criteria requirements for Group 1,2 projects. & HMP.	Ordinanc e is complete ,under review by County Counsel	CWP Prgm. Coord., Planning Office, County Counsel, Land Development Engineering.
Staff Training	C.3.b.3	Provide training opportunities for County staff in the planning office, building inspection office, and land development engineering with training on the C.3. provisions including SCVURPPP sponsored and RWQCB sponsored workshops	Written guidance, staff meetings and SCVURPPP workshops.	6/30/07	CWP Prgm. Coord., Planning, Building, FAF, LDE
C.3.c. Requirements for Group 1 and Group 2 Projects					
Guidance Manual	C.3.c.4	Review Guidance Manual developed by Program and, if needed, customize for Group 1 projects.	Guidance Manual is general enough to be used locally with only minor changes.	Done	CWP Coord., Planning, Building, LDE
Group 2 Alternative Project Size	C.3.c.8	Conduct analysis of alternative project size and prepare proposal for submittal to Regional Board. (Initial submittal to be handled by SCVURPPP/EOA Inc.	Continue to assist Program with data collection and analysis, as requested. No Alt Proj Size is proposed by County.	Ongoing	Building Inspection, Planning Office, CWP Prgm. Coord.
Guidance Manual Update	C.3.c.9	Update Guidance Manual and Performance Standard for Group 2 projects as needed.	Assist Program with development and review, as requested.	As request-ed	

COUNTY OF SANTA CLARA

Activity	Permit Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
C.3.e Operation and Maintenance of Treatment BMPs					
Data Form and Staff Training	C.3.e.1	Log information about treatment BMPs installed at approved Group 1 projects and maintain a list or database of properties, treatment BMPs, and responsible operators.	Review data collected and evaluate need to modify data collection method and need for additional staff training on tracking information.	Ongoing	CWP Prgm. Coord., Planning, Building, LDE
BMP O&M Agreement Mechanism	C.3.e.2	Adapt model O&M agreement language to meet agency-specific needs and requirements and incorporate into the project review and approval process.	Will incorporate recorded maint. agreement into CWP Ord. C3. Revision.	Ordi-nance, Spring 06	CWP Program Coord., Planning, County Counsel
BMP Inspection Program	C.3.e.5	Develop local programs for inspection of a subset of prioritized treatment BMPs to verify that proper O&M is being performed by the responsible party (Program to assist in defining which BMPs are priority for inspection.)	For Group 1 projects, County will develop written BMP inspection priority criteria and inspection and enforcement forms and procedures. (County will require private PE or LLA inspection)	Ordi-nance Spring 06	LDE, CWP Prgm. Coord.
Reporting	C.3.e.6	Report on the County's treatment BMPs O&M verification program in each annual report, including organizational structure, evaluation of effectiveness, and planned improvement to the program. Include a list or summary of treatment BMPs inspected during the year, inspection results, and any required follow-up and correction.	Written Agreement	FY 06 AR and ongoing.	CWP Prgm. Coord., Planning, Building, LDE

COUNTY OF SANTA CLARA

Activity	Permit Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
C.3.f Hydromodification Management Plan					
Staff training	C.3.f.3	Upon adoption by the Regional Board, begin implementation of HMP as part of requirements for Group 1 projects that may cause increased erosion or other related impacts.	Where applicable, HMP to be integrated into existing programs for development, review, construction inspection and BMP operations and maintenance. County staff to receive incremental training in HMP requirements.	Ongoing	LDE, Building, Planning, FAF, Roads, Parks, CWP Prgm. Coord.
C.3.g (Waiver) Compensatory Mitigation Program					
Model Waiver Program	C.3.g.1	Develop a model waiver program.	Assist SCVURPPP by reviewing documents.	Ongoing No County Waiver Program is pro-posed	CWP Coord., Planning Dir., Building Official, County Counsel, FAF, Parks Dir., Roads, Dir.,
Local Waiver Program (Compensatory Mitigation)	C.3.g.2	Consider developing local waiver program, perform legal review, and incorporate waiver provisions in project review process. (If model program has not been adopted by Regional Board, consider developing interim waiver program per C.3.g.vi.). Provide info on waivers granted, if any.	No County waiver program is proposed.	N/A	CWP Coord., Planning Dir., Building Official, County Counsel, FAF, Parks Dir., Roads, Dir.
Staff training and reporting	C.3.g.3	Begin tracking information for reporting on waivers granted, including project name, location,	Not applicable	N/A	CWP Coord., Planning Dir., Building

COUNTY OF SANTA CLARA

Activity	Permit Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
		type, percent impervious surface, reasons for and terms of waiver, and the alternative benefit project and completion date.			Official, County Counsel, FAF, Parks Dir., Roads, Dir.,
C.3.j Site Design Measures Guidance and Standards Development					
Policy and standards review	C.3.j.2	Review existing local design standards and guidance, and compare them to the list of areas to address in provision C.3.j. and other references such as "Start at the Source" and the "Development Policies Comparison" work sheet. Prepare and submit an analysis of local standards, identified opportunities for revision, and proposed revisions. (Program to prepare guidance for Co-permittees on this work product.)	County will focus on making sure BMP list is updated to be consistent with revised General Plan, any new ordinance requirements, C3. Numeric Sizing Criteria and the latest technical guidance documents such as the upcoming HMP, SCVURPPP "Guidance Manual," the "Using Start at the Source" manual. and the revised California BMP Handbooks.	Ongoing	CWP Prgm. Coord., LDE, Planning, Roads, Fire Marshall, Parks, FAF
Standards Revisions	C.3.j.4	Incorporate any revised standards and guidance into local project approval process and "fully implement" the revised standards and guidance.	Any modification to required design standards will be done with input from Planning, Fire Marshall's Office, and other affected local agencies. (Reduced road width and other design standards (pervious paving, etc) are not the highest priority on large parcel single site SFD development with ample existing infiltration area and BMP installation areas available.	Ongoing	LDE, Fire Marshall, FAF, Roads, Parks

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan: New and Redevelopment Requirements

COUNTY OF SANTA CLARA

Activity	Permit Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
C.3.k Source Control Measures					
Reporting	C.3.k.3	Implement source control measures requirements by including appropriate conditions of approval. Report status and provide examples of application of conditions in annual reports.	Report on source control BMPs required for particular projects. (The NPDES Permit seems to indicate that C3. items apply only to Group 1 and Group 2 projects; however, use of source control BMPs is recommended for other projects.	Ongoing	Planning, Building, CWP Coord., Roads, FAF, Parks, DEH
C.3.l Update General Plans					
General Plan Review	C.3.l.1	Review current General Plan policies related to water quality and watershed protection and incorporate additional policies as needed to implement C.3.	Depending on the content of the HMP, the County may need to modify the General Plan to incorporate new goals and policies. (Planning Office is continuing to consider a Riparian Protection Ordinance)	[Next sche-duled revision]	Planning Office, CWP Prgm. Coord.
C.3.m Water Quality Review Processes					
CEQA Review	C.3.m.1	Review CEQA initial study checklists and other environmental review documents and modify documents as needed to include questions that sufficiently address water quality impacts of projects.	With guidance from the Reg. Board & Program, once additional guidance is obtained, provide staff training on completing the revised Initial Study checklist.	Ongoing Ques-tions revised 11/02, Parks CEQA review also	Planning Office, Parks, FAF, Roads

COUNTY OF SANTA CLARA

Activity	Permit Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
				modified FAF uses Planning Office for CEQA review. Roads has provided new ques-tions for its CEQA consul-tants to use	
C.3.n Reporting Requirements					
Reporting	C.3.n.1	Provide information described in Table 1 of Provision C.3. in annual reports (SCVURPPP to provide guidance for each annual report).		Ongoing	CWP Prgm. Coord.
Reporting	C.3.n.3	Collect and report the following for all Gr 1,2 new and redevelopment projects: --project name, location, type (per C.3.c.), size (ac. or sq.ft.), and impervious surface area. For redevelopment projects, include area of land disturbance.		Ongoing	LDE, Planning, Building, CWP Prgm. Coord.

COUNTY OF SANTA CLARA

Activity	Permit Item Source	FY 07 Tasks	Status / Comments	Due Date (mo/yr)	Responsible Party
Reporting	C.3.n.4	Collect and report the following for all projects that must implement treatment measures: BMPs, site design, and source control measures used, sizing criteria, O&M responsibility mechanism and responsible party.		Ongoing	LDE, Planning, Building, CWP Prgm. Coord.
Pesticide Control Measures	C.3.n.5	Collect information and report a summary of types of pesticide reduction measures required for development projects and the percentage of projects for which pesticide reduction measures were required.	Lic. Landscape Architect Certification for Grp. 1,2 Projects.	Ongoing information collection	Planning, Building, LDE, CWP Prgm. Coord.

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan : COPPER/NICKEL ACTION PLAN

COUNTY OF SANTA CLARA

Id.	*Activity*	*CI Item Source*	*FY 07 Tasks*	*Status / Comments*	*Due Date (mo/yr)*	*Responsible Party*
Copper Action Plan Tasks						
CB-1	Vehicle Washing Operations	CAP	• Continue to distribute outreach materials on proper vehicle/equipment washing at building department counters and public events.		Ongoing	CWP Coord.
			• Submit data regarding vehicle washing outreach activities as requested.		Ongoing	CWP Coord., R&A
			• Require source control measures for Group 1 & 2 new development and redevelopment projects that will conduct vehicle/equipment washing and maintenance activities (consistent with Permit Provision C.3.k).		Ongoing	PLN & DEV.
			• Continue to inspect industrial/ commercial facilities that conduct vehicle/equipment washing activities on-site (this includes auto-related businesses). Ensure that BMPs for vehicle/equipment washing are implemented. Provide an effectiveness evaluation of inspection/compliance with BMPs (consistent with enhanced reporting requirements).		Ongoing	DEH
			• Continue to maintain and inspect car wash systems for County vehicles at the corporation yards .		Ongoing	Roads & Airports
			• Encourage municipal staff to use certified mobile cleaners when			CWP Coord.

COUNTY OF SANTA CLARA

Id.	*Activity*	*CI Item Source*	*FY 07 Tasks*	*Status / Comments*	*Due Date (mo/yr)*	*Responsible Party*
			contracting cleaning services. • Refer mobile surface cleaners who desire BASMAA surface cleaning certification and recertification to the BASMAA website (www.basmaa.org).		Ongoing Ongoing	CWP Coord.
CB-3	Industrial Copper Control	CAP	• Continue Industrial Inspection program, including NOI sites and other identified industrial facilities. These may include plating and metal finishing facilities, vehicle service facilities and other permitted sites (consistent with enhanced reporting requirements).		Ongoing	DEH
CB-6/7	Reducing Traffic Congestion/ Promoting Alternative Transportation	CAP	• Collaborate with the agencies and organizations (e.g., VTA) that are better poised to take the lead on transportation-related tasks.	CB-6&7 issues appear to have been adequately addressed for SCVURPPP CAP purposes. This issue is now in the hands of municipal transportation planners and congestion management and transportation agencies (i.e., VTA) and is not a high priority. The unincorporated area is primarily low density suburban and rural with minimal public transit available.		VTA--not County jurisdiction
CB-8	Watershed assessment and protection	CAP	• Continue to implement guidance from SCVURPPP on addressing water quality in the CEQA review process, as part of C.3.m. implementation. • Participate in the Water Resources		Ongoing	PLN & DEV, Roads, Parks, FAF

COUNTY OF SANTA CLARA

Id.	*Activity*	*CI Item Source*	*FY 07 Tasks*	*Status / Comments*	*Due Date (mo/yr)*	*Responsible Party*
			Protection Collaborative and implement any agreed upon guidelines and standards for watershed protection.		Ongoing	PLN
CB-11	Street sweeping and storm drain O&M		• Continue following Program guidance regarding the collection and reporting of street sweeping data. Provide data for Annual Report. • Implement (as appropriate) identified improvements to current street sweeping and storm drain system O&M programs (within available budgets). Provide effectiveness evaluation in FY 07 Annual Report.		Ongoing As scheduled	Roads Roads
CB-12	Outreach on pool, spa maintenance	CAP	• Continue to distribute outreach materials at local public events; brochures at building department counters and public places.	Rotating distribution	Ongoing	CWP Coord.
CB-21	Use of architectural copper	CAP	• Continue to discourage use of copper on roofs, in roof shingles, and for gutters.	Low priority: Very few copper roofs and gutters have been proposed.	Ongoing	PLN & DEV CWP Coord.
Nickel Action Plan Tasks						
NB-1	Measures to control nickel discharges from construction sites		• Continue to implement Construction Inspection Performance Standards (see Construction Inspection work plan section).		Ongoing	PLN & DEV

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 07 Work Plan : COPPER/NICKEL ACTION PLAN

COUNTY OF SANTA CLARA

Id.	*Activity*	*CI Item Source*	*FY 07 Tasks*	*Status / Comments*	*Due Date (mo/yr)*	*Responsible Party*
			• Continue to have inspectors attend Regional Board/Program workshops on construction site management and learn latest erosion/sediment control techniques		As scheduled	CWP Coord.
			• Continue to attend Program-sponsored or other workshops on post-development stormwater BMPs (C.3.)		As Scheduled	CWP, PLN & DEV, Roads, Parks, FAF

COUNTY OF SANTA CLARA

- As requested, assist SCVURPPP in implementing a Pilot Demonstration Project which focuses on documenting type and volume of trash that can potentially be conveyed through the storm drain system. (CWP Coordinator, DEH)

- Identify and begin implementing trash control measures, where practical and feasible, to reduce trash; this includes the ongoing and long-time enforcement activity by DEH-CPD, DEH-HMCD and DEH-SWLEA in investigating every solid waste dumping and hazmat dumping complaint in the unincorporated area, and following it to resolution. (The County has ordinances prohibiting dumping of trash, garbage, and hazardous materials. The County also has a Nonpoint Source ordinance that prohibits illegal discharges to the storm water system.)(DEH)

- The Dept. of Roads and Airports will continue to investigate and resolve cases of illegal dumping in County Rights of Way. (DEH investigates all other cases on private property.) (Dept. of Roads and Airports, DEH)

- As requested, the County will provide Co-permittee specific information on trash management practices implemented in their jurisdictions, using standardized reporting format (to be used for Program-wide reporting). (CWP Coordinator, DEH, IWM Program)

- As requested, the County will assist SCVURPPP staff in developing effective strategies for reducing trash in urban streams and waterways. (CWP Coordinator, DEH)

- As requested, assist SCVURPPP in developing Trash Fact Sheets, as appropriate. (CWP Coordinator, DEH, IWM Program)

009834

STORMWATER MANAGEMENT PLAN

July 1998 - June 2003

San Mateo Countywide
Stormwater Pollution
Prevention Program

March 1998

Revised Version - June 1999

A Program of the City/County Association of Governments

009835

STORMWATER MANAGEMENT PLAN

July 1998 - June 2003

San Mateo Countywide
Stormwater Pollution
Prevention Program
(STOPPP)

March 1998

A Program of the City/County Association of Governments (C/CAG)

009836

Credits

This report is being submitted by the participating agencies in the

San Mateo Countywide
Stormwater Pollution
Prevention Program

Town of Atherton
City of Belmont
City of Brisbane
City of Burlingame
Town of Colma
City of Daly City
City of East Palo Alto
City of Foster City
City of Half Moon Bay
Town of Hillsborough
City of Menlo Park
City of Millbrae
City of Pacifica
Town of Portola Valley
City of Redwood City
City of San Bruno
City of San Carlos
City of San Mateo
County of San Mateo
City of South San Francisco
Town of Woodside

Implementation of the Program Coordinated by:

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A program of the City/County Association of Governments
(C/CAG)

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Acronyms

ABAG	Association of Bay Area Governments
BASMAA	Bay Area Stormwater Management Agencies Association
BART	Bay Area Rapid Transit
BMPs	Best Management Practices
C/CAG	City/County Association of Governments
CCMP	Comprehensive Conservation and Management Plan
CEQA	California Environmental Quality Act
CII	Commercial/Industrial/Illicit Discharge (Subcommittee)
COGs	Community Outreach Grants
CRMP	Coordinated Resources Management and Planning
CZARA	Coastal Zone Act Reauthorization Amendments
EPA	Environmental Protection Agency
KMEL	(call letters for a radio station)
LUDA	Land Use Data
MEP	Maximum Extent Practicable
MOU	Memorandum of Understanding
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PIP	Public Information and Participation
POP	Point of Purchase (Campaign)
POTW	Publicly - Owned Treatment Works (sewage treatment plants)
RMP	Regional Monitoring Program
RNA	ribonucleic acid

SFEI	San Francisco Estuary Institute
STOPPP	San Mateo Countywide Stormwater Pollution Prevention Program
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
USGS	U.S. Geological Survey
WERF	Water Environment Research Foundation

Definitions

BMPs	Practices which prevent or reduce stormwater pollution.
General Program	Activities implemented for the joint benefit of the member agencies of the San Mateo County STOPPP.
Member Agencies	San Mateo County and the 20 cities/towns in San Mateo County that participate in the San Mateo Countywide Stormwater Pollution Prevention Program.
Performance Standards	Pollution prevention practices the member agencies have made a commitment to implement.

E Executive Summary

INTRODUCTION

This Stormwater Management Plan describes what the San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) will be doing during the five-year period from July 1998 through June 2003 to prevent and control stormwater pollution in San Mateo County. STOPPP's initial Stormwater Management Plan covered the previous five-year period. The Stormwater Management Plan is the most important element of STOPPP's application for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge stormwater from the municipalities' storm drain systems.

This Stormwater Management Plan describes stormwater pollution prevention and control goals, tasks, and completion schedules. STOPPP's activities are divided into two categories, based on whether the General Program or member agencies are responsible for implementation. General Program tasks are conducted for the mutual benefit of all of the STOPPP member agencies, and member agency-specific tasks are conducted by and for the individual member agency.

The Stormwater Management Plan (SWMP) contains two-year work plans with budgets that describe in more detail how the General Program portion of the five-year SWMP will be completed. The two-year work plans and budgets will be updated annually to include the subsequent fiscal year and submitted to the San Francisco Bay Regional Water Quality Control Board (Regional Board) each March. The General Program's work plans and budgets for the first two-year period are included in Appendix A; subsequent work plans and budgets will be added to Appendix A as they are developed and approved.

The SWMP also contains detailed performance standards (Appendix B) that identify what each of the member agencies is committed to do to control stormwater pollutants from the storm drains and conveyance systems that it owns and/or operates. STOPPP will review these performance standards every two years and revise them as needed. New and modified performance standards will be incorporated into Appendix B following the approval process described in the reissued NPDES permit.

BACKGROUND

Regulatory requirements for developing a stormwater pollution prevention and control program in San Mateo County originated from the following two sources:

- amendments to the federal Clean Water Act; and
- Regional Board's 1986 amendments to its Water Quality Control Plan.

The federal Clean Water Act's 1987 amendments require municipalities to effectively prohibit non-stormwater discharges to municipal storm drain systems and to implement controls to reduce pollutants to the maximum extent

practicable. These federal Clean Water Act requirements are implemented through NPDES permits.

In 1992 and 1993 STOPPP developed its comprehensive, area-wide, stormwater pollution prevention and control program under the auspices of the City/County Association of Governments and each of the 21 municipalities (20 cities and the county unincorporated area) within San Mateo County. The initial Stormwater Management Plan included tasks, schedules, and parties responsible for implementation of tasks during the initial five-year NPDES permit period (i.e., 1993-1998).

The Regional Board adopted Order No. 93-106 and STOPPP's municipal stormwater NPDES Permit No. CA0029921 in September 1993 for the following municipalities: Town of Atherton, City of Belmont, City of Brisbane, City of Burlingame, Town of Colma, City of Daly City, City of East Palo Alto, City of Foster City, City of Half Moon Bay, Town of Hillsborough, City of Menlo Park, City of Millbrae, City of Pacifica, Town of Portola Valley, City of Redwood City, City of San Bruno, City of San Carlos, City of San Mateo, County of San Mateo, City of South San Francisco and Town of Woodside.

ORGANIZATION OF THE STORMWATER MANAGEMENT PLAN

The SWMP is organized around the following five major stormwater pollution prevention and control sections:

- Municipal Maintenance Activities
- Industrial and Illicit Discharge Controls
- Public Information/Participation
- New Development and Construction Controls
- Watershed and Monitoring

Each of the SWMP's five major sections describe goals, existing conditions, and tasks that will be accomplished over the five year period.

In addition to Appendices A and B described above, the SWMP also includes a list of municipal stormwater pollution control ordinances and General Program agreements (Appendix C).

COMPONENT GOALS AND MAJOR TASKS

The following reviews the goals and major tasks of each of these components as well as highlights of the applicable performance standards (Appendix B).

2.0 Municipal Government Maintenance Activities

Municipal maintenance activities include street sweeping, storm drain cleaning, and other maintenance-related activities that may have an impact on stormwater quality. The purpose of this component is to continue to work with municipal public works and other maintenance staff to identify ways to optimize the removal of pollutants and minimize discharges during routine maintenance activities.

The two primary tasks include implementing and developing the performance standards (Task 3.1) and conducting outreach and training (Task 3.2) for maintenance staff and the public. The other tasks in this component include the following: coordinating with other STOPPP subcommittees, other public agencies, and private industries with similar interests or who are potentially affected by municipal maintenance

activities (Task 3.3); and assisting with regulatory compliance and planning (Task 3.4).

3.0 Industrial and Illicit Discharge Controls

The two primary goals of this component are to minimize or eliminate potential stormwater pollution sources at commercial and industrial facilities through inspection and educational outreach activities; and to effectively prohibit illicit discharges (such as oil, paint, or soapy washwater) to the municipalities' storm drain systems.

The primary role of the General Program is to help municipalities implement a consistent countywide approach to implementing the performance standards (Task 3.1), complying with regulations (Task 3.2), providing training and outreach materials to municipal staff and industries (Task 3.3), providing incentives for businesses to comply (Task 3.4), and evaluating the effectiveness of the stormwater pollution prevention and control activities as part of a process of continuous improvement (Task 3.5).

4.0 Public Information and Participation (PIP)

The primary purpose of this component is to educate the public about the differences between the sanitary sewer and storm drain systems and the causes of stormwater pollution in order to encourage residents to adopt less polluting and more environmentally beneficial practices.

The most important task under this component is to achieve public involvement through outreach and education (Task 4.3). Specifically, PIP will conduct targeted campaigns, general informational outreach activities, and effectiveness evaluations. During FY 1998/99, PIP will be completing its second year of an ongoing Paint Point of Purchase Campaign. The purpose of this campaign is to educate residents about the problems caused by disposing of paint improperly, such as by washing paint into the storm drain. The campaign is coordinated with the County's Household Hazardous Waste Program to encourage paint recycling. During FY 1999/00, the Subcommittee will select the next targeted campaign subject area and will implement that campaign during the following two years. The other tasks in this component include the following: implementing the performance standards (Task 4.1); complying with regulations (Task 4.2); training PIP staff (Task 4.4); and building partnerships with agencies and companies and working with volunteer groups and other STOPPP subcommittees (Task 4.5).

5.0 New Development and Construction Controls

The primary goal of this component is to minimize the water quality and beneficial use impacts of land development, both during and after construction. This will be achieved through objectives such as prohibiting non-stormwater discharges from construction sites, reducing stormwater pollutant discharges from development and construction activities to the maximum extent practicable, and requiring compliance with stormwater best management practices and erosion/sedimentation control at construction sites.

The Subcommittee and the General Program will be conducting the following activities: implementing and improving performance standards (Task 5.1); conducting watershed resource inventory and planning (Task 5.2); implementing stormwater quality controls (Task 5.3); assessing the effectiveness of

implemented controls (Task 5.4); and assisting with regulatory compliance and planning (Task 5.5)

6.0 Watershed and Monitoring

This component evaluates the effectiveness of BMPs and helps to identify how to use a watershed management approach to prevent and control stormwater pollution. The primary goals of the component include identifying effective BMPs and developing tools and analyzing information needed to identify and help solve creek drainage basin-specific water quality and beneficial use impairment problems.

The General Program will be participating in the BASMAA Monitoring Strategy (Task 6.1), evaluating the effectiveness of BMPs (Task 6.2), assessing the state of significantly urbanized watersheds and creeks (Task 6.3), assisting with regulatory compliance and planning (Task 6.4), and evaluating the effectiveness of watershed and monitoring studies (Task 6.5).

Work Plans and Budgets (Appendix A)

The General Program work plans and budgets for the first two years of the SWMP are contained in Appendix A. The General Program costs for FY 1998/99 will be $886,000 and for FY 1999/00 will be $856,000. These costs are similar to the costs of the General Program during the previous two years. These costs are about 18 percent lower than the peak year of FY 1994/95 when the General Program budget was approximately $1,056,000. Cost savings have been possible as STOPPP has completed its start up phase.

The budgets for agency-specific implementation should be similar to previous budgets. The primary agency-specific activity is to implement the performance standards.

Performance Standards (Appendix B)

Performance standards to be implemented by member agencies have been developed for the following five areas of the SWMP:

- Municipal Maintenance Activities
- Industrial and Commercial Discharge Controls
- Illicit Discharge Controls
- Public Information/Participation
- New Development and Construction Controls

STOPPP developed performance standards as a tool to help STOPPP member agencies comply with their NPDES permit. The Clean Water Act and STOPPP's stormwater NPDES discharge permit require STOPPP member agencies to control discharges of pollutants to the maximum extent practicable (MEP) and to effectively prohibit illicit discharges. STOPPP developed the performance standards to define the MEP level of effort that each member municipality will attain to control pollutants in stormwater.

In addition, the performance standards define the level of effort that each member municipality will attain to effectively prohibit illicit discharges[1] from entering its municipal storm drain conveyance system[2].

[1] Illicit discharges include non-stormwater discharges disallowed by the STOPPP NPDES permit.
[2] Municipal storm drain conveyance system includes roads with drainage systems, municipal streets, curbs, gutters, catch basins, storm drain inlets, ditches, man-made channels, or storm drains.

The performance standards provide an effective, consistent, and predictable countywide approach to minimizing water quality impacts. Having consistent countywide standards assures similar treatment to businesses, developers, contractors, and property owners. In addition, such standards will assist STOPPP member agencies with training and educational outreach. Furthermore, the performance standards will be used as the basis for measuring the effectiveness of each municipalities planning and permitting procedures, and inspection and enforcement activities.

These performance standards define the major portion of what each member agency will need to do to implement the SWMP and comply with the NPDES permit. The implementation of these performance standards by member agencies is required by the SWMP.

These performance standards describe *what* each municipality is responsible for achieving. Each municipality will decide *how* it will achieve these performance standards, whether it be by using its own staff, a contracted agency, or other arrangements.

Most of the municipalities are currently meeting these standards, and all of the member agencies are committed to be achieving these performance standards by July 1, 1998, unless otherwise noted.

GUIDING PRINCIPLES BEHIND THE SWMP

This SWMP has evolved since the first five-year plan. The guiding principles that have shaped this plan include:

- Rely on local, hands-on experience for guidance on what to include in the SWMP;
- Achieve compliance with the NPDES permit as simply and cost-effectively as possible;
- Incorporate stormwater pollution prevention and control baselines established by older Bay Area stormwater programs;
- Use EPA's stormwater regulations in developing performance standards;
- Incorporate a flexible, but focused, pragmatic approach;
- Build partnerships with other organizations and groups who may help STOPPP be more effective; and
- Track progress and incorporate a process of continuous improvement.

2 Municipal Maintenance

GOALS

This component of the SWMP describes municipal maintenance activities designed to maximize the remove of pollutants during routine maintenance. The STOPPP developed BMPs for conducting maintenance activities and these BMPs were subsequently used to develop performance standards.

The goals of this component include:

- Optimize pollutant removal during routine maintenance activities such as street sweeping and maintenance of storm drainage facilities;
- Identify maintenance methods to prevent or minimize discharges to storm drains and watercourses; and,
- Track and measure the effectiveness of performance standards.

EXISTING CONDITIONS

This section of the SWMP summarizes the accomplishments of municipal maintenance component during the initial NPDES permit period. Table 2-1 presents background information on selected maintenance activities conducted by each municipality.

Street Sweeping and Storm Drain System Maintenance

Municipalities spend significant resources on routine maintenance activities such as street sweeping and storm drain system maintenance for aesthetic purposes and flood control. These maintenance activities also remove pollutants that could potentially enter the storm drain system, creeks, lagoons and ultimately San Francisco Bay and the Pacific ocean. Using standardized maintenance forms, municipalities have been keeping records of routine maintenance activities since October 1993.

Municipalities compile street sweeping and storm drain system maintenance data on a monthly basis and submit it to the General Program. The street sweeping data include the volume of material removed and miles swept by each municipality. Table 2-2 summarizes the street sweeping data collected since 1993. As shown in the Table, material removed and miles swept has increased since 1993 for the majority of municipalities. This increase may be attributed to the implementation of BMPs and performance standards and the increased awareness among maintenance staff about the importance of preventing stormwater pollution.

The storm drain system maintenance data include the number of inlets and other storm drainage facilities (e.g., creeks, channels, culverts and pump stations) inspected and cleaned and the total volume of material removed. Table 2-3 summarizes the inlet cleaning data collected since 1993. Municipalities are targeting high volume inlets for cleaning to provide a more efficient method of removing material.

Outreach Activities

A major achievement of this component during the initial NPDES permit period was

to provide information about the STOPPP to public works employees. This was primarily accomplished through monthly or bimonthly meetings and annual workshops. A Public Works Supervisor Subcommittee (Subcommittee) was formed in 1993. Performance standards were developed and information on storm drain inlet retrofits for treating stormwater was provided at Subcommittee meetings. In addition, the Subcommittee researched methods for marking storm drain inlets. Thermoplastics, drain plagues and paint stenciling were evaluated for cost effectiveness and longevity. Several municipalities were interested in using thermoplastic markers. Therefore, a bulk order for thermoplastic products was established to reduce the unit cost. The annual workshops focused on educating maintenance field staff on the goals of the STOPPP and on obtaining input from field staff on practices that may improve stormwater quality. Workshop topics have included the following:

- General program Requirements and Goals for the Municipal Maintenance Component
- Presentations from Equipment Vendors - Latest Technologies for Storm Drain Protection
- Review of BMPs and Performance Standards
- Proper Spill Response Procedures
- Review of Corporation Yard Practices Potentially Impacting the Storm Drain

The General Program worked with the Subcommittee to develop several educational materials. The materials were used to assist municipalities in educating maintenance staff about performance standards, BMPs, and stormwater violations. The following items were produced:

- A BMP booklet developed to assist municipalities with BMPs;
- Bumper and side panel stickers containing the message "No Dumping! Street Runoff Flows to Bay/Ocean"; and,
- An informational clipboard with removable insert containing a summary of pertinent stormwater regulations and local telephone numbers of various emergency and governmental agencies.

The bumper and side panel stickers were placed on the sides of maintenance vehicles to increase the awareness of the municipal staff and the general public of the STOPPP. In addition, 2000 bumper stickers were distributed to the public at the San Mateo County Fair. The informational clipboard was distributed to maintenance staff for use in the field.

Municipal Maintenance Performance Standards

The Subcommittee has developed performance standards for street sweeping, maintenance of storm drainage facilities and watercourses, litter control, corporation yards, road repair and maintenance and operation of stormwater pump stations.

The majority of municipalities have incorporated stormwater quality controls into municipal contract specifications. Specific BMPs include the following:

- maintaining a clean construction site by sweeping up soil and debris rather than washing it into the storm drainage system;
- using a vacuum attachment for concrete and asphalt saw cutting operations; and,
- containing and properly disposing of construction generated pollutants.

Municipal Corporation Yard Inspections

During the second year of the Program, STOPPP representatives visited municipal corporation yards to assist municipalities in implementing BMPs. Using results of the visit, recommendations for changing current practices and for implementing capital improvements to prevent stormwater pollution were provided. Although most cities did not discharge wash water to the storm drain system, a significant number of cities needed retrofitted wash pads. Other recommendations identified during the visits included improving outdoor storage of materials or waste and providing spill kits in fueling areas. The status of implementing these recommendations was tracked the following year (FY 1995/96).

Results of information collected indicated that several municipalities have installed or modified wash racks. In addition, the majority of the municipalities have improved outdoor storage areas and have provided spill kits in the fueling areas of their corporation yards. As shown on Table 2-1, nine municipalities have wash racks discharging to the sanitary sewer. Municipalities not discharging wash water to the sanitary sewer are either monitoring waste water to ensure it does not discharge to the storm drain or are not washing vehicles on-site.

Pilot Studies

The initial Stormwater Management Plan required the General Program to work with municipalities to assess the feasibility of potential pilot studies for devices that may improve water quality. This task was re-directed in 1995 until better product information was available on the effectiveness of treatment methods (e.g. sediment traps, maintaining vegetation in water courses). The General Program instead focused its efforts on working with municipalities to incorporate construction BMPs into contract specifications for municipal projects. The majority of the municipalities have incorporated BMPs into their specifications.

During FY 1996/97, a nutrient removal pilot study was proposed by the Subcommittee. This pilot study will evaluate nutrient removal from lagoons, creeks and channels and study the effects of nutrient removal on algae and plant growth. A specific scope of work for the pilot study will be developed in FY 1997/98.

MAJOR TASKS

The following tasks will be conducted during the next five years.

Task 2.1 Develop and Implement Performance Standards

Each of the municipalities will implement the existing performance standards for municipal maintenance specified in Appendix B, as part of its compliance with the Countywide Stormwater NPDES permit. The Municipal Maintenance Subcommittee will also develop a minimum of one new performance standard or BMP every two years. ~~-~~

~~Topics for new performance standards may include, but are not limited to, the following:~~

~~Pesticide and fertilizer usage~~
~~Parking lots and sidewalks~~
~~Swimming pools, ponds and lagoons~~
- ~~Drinking water supply maintenance~~

The General Program will contact municipal Park and Recreation departments and, if appropriate, convene a work group to develop performance standards for integrated pest management. Generally the majority of municipal pesticide applicators are comprised of

Park and Recreation personnel. These personnel are not under the direct control of traditional municipal maintenance personnel and therefore should be addressed separately.

The General Program will work with municipal Park and Recreation personnel to develop performance standards for integrated pest management by municipal personnel by June 30, 2000. The first training of Park and Recreation personnel on the new integrated pest management performance standards will be conducted before July, 2001.

Other topics for new performance standards that may be considered include, but are not limited to, the following:

- Parking lots and sidewalks
- Drinking water supply maintenance
- Swimming pools and ponds management

The Municipal Maintenance Subcommittee will review the existing performance standards at least once every two years and revise them as appropriate. Improvements to the performance standards will be based on implementation experience, the measured effectiveness of controls, and guidance developed by the Bay Area Stormwater Management Agencies and other groups as available.

The General Program will continue to work with the municipalities to identify and assess the feasibility of pilot studies that could improve pollutant removal. Pilot studies may include modifications to operation and maintenance practices of detention basins, sediment traps, or stormwater pump stations to maximize pollutant removal; or maintaining vegetation in watercourses to detain runoff and trap sediments. The Watershed and Collaborative Monitoring Subcommittees will be responsible for selecting and implementing any pilot study recommended by the Municipal Maintenance Subcommittee.

Task 2.2 Conduct Outreach and Training

Outreach to both maintenance staff and the public is an important aspect of this component. The General Program will provide administrative support and guidance for the Municipal Maintenance Subcommittee and will help coordinate annual workshops. In addition, materials designed to increase awareness of performance standards will be developed and distributed to maintenance field staff.

The General Program will assist municipalities to develop public outreach materials. Particular emphasis will be placed on educational materials directed at private communities where streets and storm drainage facilities may not be routinely maintained. In addition, educational materials may include a performance standards implementation handbook designed for public works supervisors. The design of public outreach materials will be coordinated with the Public Information/Participation Subcommittee. One public outreach piece will be developed every two years.

Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries

This task includes developing work groups with appropriate staff from other subcommittees of the STOPPP, other agencies, and private industries whose activities are similar to or potentially affected by municipal maintenance activities. The work groups will identify activities of concern and possible BMPs. In addition, representatives from these groups may be included in outreach workshops. Examples of other agencies and businesses include:

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- Schools
- Utilities
- Private Communities
- Golf Courses
- BART / Transportation Agencies
- Cemeteries

Task 2.4 Assist with Regulatory Compliance and Planning

The General Program will conduct four activities under this task:

1. Assist the STOPPP agencies with the reporting and other regulatory requirements of the NPDES permit, including developing quarterly and/or semiannual deliverable reporting forms for tracking implementation of the performance standards and other program activities and preparing the municipal maintenance section of the STOPPP Annual Report;

2. Develop the General Program's two-year work plans and budgets;

3. Assist with any additional planning needed to improve this section of the SWMP (the goal of the STOPPP is to modify the SWMP as needed at least every two years so that the plan may continue to be used for more than five years); and,

4. Continue assisting the Municipal Maintenance Subcommittee in conducting routine meetings and other activities. The Municipal Maintenance Subcommittee will conduct a minimum of six meetings each year.

Municipalities will be responsible for participating in the Municipal Maintenance Subcommittee as appropriate (see the performance standards) and for providing sufficient information on the local programs for the Annual Report.

Table 2-1 Municipal Maintenance Background Information

Municipality	Corporation Yards			Street and Inlet Summary		Maintain Municipal Water Distribution System	Maintain Stormwater Pump Stations (a)
	Operate Corporation Yard	Operate Wash Pad	Wash Pad Drainage	Miles of Street In Municipality	Number of Inlets In Municipality		
Atherton	Yes	Yes	Monitors wash water to ensure no discharge to the storm drain. No sanitary sewer connection.	50	198	No	No
Belmont	Yes	Yes	Two wash racks with sanitary sewer connection installed.	81	515	No	No / None
Brisbane	Yes	No	N/A	19	410	Yes	Yes
Burlingame	Yes	Yes	Wash rack with sanitary sewer connection scheduled for installation. Currently monitor wash water to minimize discharge to the storm drain.	70	1,100	Yes	Yes
Colma	No	N/A	N/A	7	185	No	No
Daly City	Yes	Yes	Wash rack with sanitary sewer connection scheduled for installation. Currently monitor wash water to minimize discharge to the storm drain.	130	1,442	Yes	No / None
East Palo Alto	Yes		Wash area drains to storm drain. Vehicles are washed off-site.	38	437	No	No
Foster City	Yes	Yes	Wash area drains to storm drain. Signs posted indicating no vehicle washing.	46	1,275	Yes	Yes
Half Moon Bay	Yes	Yes	Infiltrates	30	70	No	No
Hillsborough	Yes	Yes	Re-routed wash rack drain to the sanitary sewer.	81	846	Yes	No / None
Menlo Park	Yes	Yes	Wash rack with sanitary sewer connection installed.	96	1,555	Yes	Yes (1)
Millbrae	Yes	Yes	Wash rack with sanitary sewer connection installed.	55	623	Yes	Yes (2)
Pacifica	Yes	Yes	Re-routed wash rack drain to the sanitary sewer.	89	986	No	Yes
Portola Valley	No	N/A	N/A	27	220	No	No
Redwood City	Yes	Yes	Wash rack with sanitary sewer connection scheduled for 12/97 installation.	175	2,400	Yes	Yes (13)
San Bruno	Yes	Yes	Wash rack with sanitary sewer connection installed.	88	950	Yes	Yes
San Carlos	Yes	Yes	Wash area with holding cells that discharge to the sanitary	83	701	No	Yes (2)
San Mateo, City of	Yes	Yes	Re-routed wash rack drain to the sanitary sewer.	285	5,000	No	Yes
San Mateo County	Yes	Yes	Recycle wash water.	320	1,136	No	Yes
South San Francisco	Yes	Yes	Wash rack with sanitary sewer connection installed.	121	1,500	No	Yes (5)
Woodside	Yes	No	N/A	43	350	No	No

NOTE:

a: (13) Indicates the number of pump stations.

Table 2-2 Summary of Street Sweeping Activities for Fiscal Years 1996/97,1995/96, 1994/95 and 1993/94 [1]

Municipality	Miles of Street in Municipality	FY 1996/97		FY 1995/96		FY 1994/95		FY 1993/94	
		Material Removed (yd^3)	Curb Miles Swept	Material Removed (yd^3)	Curb Miles Swept	Material Removed (yd^3)	Curb Miles Swept	Material Removed (yd^3)	Curb Miles Swept
Atherton	50	3.0	1.1	1.9	3.9	0	0	0.5	0.5
Belmont	81	690	1,403	937	2,074	816	2,942	1,061	4,720
Brisbane	19	224	176	224	122	150	102	216	122
Burlingame	70	2,759	13,998	648	3,987	3,507	15,636	1,416	9,216
Colma	7	369	420	375	398	294	384	226	308
Daly City	130	4,042	18,656	2,086	19,456	1,928	18,554	1,967	17,837
East Palo Alto	38	ND [2]	ND	1,736	1,915	340	585	260	333
Foster City	46	747	3,913	221	1,921	499	3,521	399	3,102
Half Moon Bay	30	66	181	0	0	0	0	ND	ND
Hillsborough	81	0	0	0	0	80	35	2	NA [4]
Menlo Park	96	4,346	5,213	4,361	5,202	3,859	5,168	3,226	4,745
Millbrae	55	579	8,409	506	6,000	709	7,001	682	5,861
Pacifica	89	1,549	9,916	2,546	9,592	1,874	8,835	*23,611*	10,701
Portola Valley	27	0	0	48	29	6	18	30	12
Redwood City	175	5,324	16,643	4,995	13,764	4,532	12,444	3,768	13,617
San Bruno	88	923	3,717	986	3,429	1,008	4,012	996	3,731
San Carlos	83	1,271	6,416	640	5,074	608	4,561	568	2,133
San Mateo, City of	285	4,316	20,455	2,604	12,453	4,001	17,127	1,442	17,910
San Mateo County	320	4,180	7,196	2,348	5,064	3,918	11,023	1,923	3,782
So. San Francisco	121	2,609	18,893	2,739	25,093	3,111	25,176	2,551	25,731
Woodside	43	82.5	404.9	155	346	98	132	42	39
TOTAL	**1,934**	**34,077**	**136,011**	**28,157**	**115,923**	**31,338**	**137,256**	**20,776**	**123,901**

Notes: (1) Based on data from the Fiscal Year Annual Report.

(2) ND - No Data reported.

(3) Pacifica data indicates 23,611 yd3 of material removed for FY 1993/94. This value does not appear to be correct and therefore has not been included in the total.

(4) Do not use sweeper - collect by hand.

Table 2-3 Summary of Inspection/Cleaning Activities for Municipal Storm Drainage Facilities for Fiscal Years 1996/97, 1995/96, 1994/95, 1993/94 [1]

Municipality	No. of Inlets In Municipality	FY 1996/97				FY 1995/96			FY 1994/95			FY 1993/94		
		No. of Inlets Inspected	No. of Inlets Cleaned	Other Facilities Inspected (miles)	Total Volume of Material Removed	No. of Inlets Inspected/ Cleaned [3]	Other Facilities Inspected (miles)	Total Volume of Material Removed	No. of Inlets Inspected/ Cleaned [3]	Other Facilities Inspected (miles)	Total Volume of Material Removed	No. of Inlets Inspected/ Cleaned [3]	Other [2] Facilities Inspected (miles)	Total Volume of Material Removed
Atherton	198	653	653	141.0	175 yd^3 39 tons	400	67.5	6 yd^3	130	3.5	3 yd^3	343	29.8	33 yd^3
Belmont	515	408	379	1.5	212 yd^3	687	13.0	438 yd^3	478	4.0	370 yd^3	247	0.0	172 yd^3 196 tons
Brisbane	410	163	159	0.0	40 yd^3	301	0.0	123 yd^3	410	14.0	4 yd^3	410	14.0	3 tons
Burlingame	1,100	1,025	1,025	2.1	434 yd^3	58	0.0	9 yd^3	2,736	4.4	296 yd^3	1,777	2.9	91 yd^3
Colma	185	397	300	17.1	140 yd^3	281	17.9	145 yd^3	546	21.1	105 yd^3	635	25.5	78 yd^3
Daly City	1,442	1,533	169	0.7	124 yd^3	1,465	0.7	59 yd^3	580	0.8	154 yd^3	1,112	0.7	127 yd^3
East Palo Alto	437	ND [4]	ND	0.0	ND	155	55.6	68 yd^3	170	3.3	18 yd^3 15 tons	178	2.3	43 yd^3
Foster City	1,275	357	339	0.0	287 yd^3	248	0.0	70 yd^3	105	0.0	7 yd^3	349	0.0	28 yd^3
Half Moon Bay [2]	70	38	25	4.3	114 yd^3	0	0.0	0 yd^3	141	4.0	7 yd^3	ND	0.0	ND
Hillsborough	846	1,691	1,469	8.6	388 yd^3	803	24.8	371 yd^3	1,060	41.1	361 yd^3	483	33.1	1,099 yd^3 6 tons
Menlo Park	1,555	1,102	1,102	1.0	689 yd^3	1,277	1.0	396 yd^3	1,176	1.0	225 yd^3	921	1.0	98 yd^3
Millbrae	623	2,435	2,435	2.3	361 yd^3	1,197	1.1	239 yd^3	2,453	1.8	786 yd^3	686	3.9	222 yd^3
Pacifica	986	1,136	1,136	10.0	414 yd^3	184	3.5	224 yd^3	260	5.6	102 yd^3	166	13.7	82 yd^3 9 tons
Portola Valley	220	138	45	7.5	124 yd^3	21	3.0	31 yd^3	88	5.6	53 yd^3	428	9.1	32 yd^3
Redwood City	1,910	862	791	12.3	979 yd^3	1,053	14.5	833 yd^3	824	12.9	1,898 yd^3	481	1.8	1,366 yd^3
San Bruno	950	912	604	0.0	65 yd^3	2,418	0.4	196 yd^3	2,184	0.5	231 yd^3	1,845	2.6	158 yd^3
San Carlos	701	137	52	0.0	140 yd^3	67	0.1	174 yd^3	997	0.2	229 yd^3	683	3.0	134 yd^3
San Mateo, City of	5,000	2,914	2,914	20.5	198 yd^3	1,541	12.5	345 yd^3	2,941	14.1	1,232 yd^3	2,704	9.3	918 yd^3
San Mateo County	1,136	6,005	3,210	22.2	227 yd^3	4,023	20.6	278 yd^3	4,799	75.8	250 yd^3	8,093	64.3	96 yd^3
So. San Francisco	1,500	4,401	660	0.0	127 yd^3	14,806	0.5	62 yd^3	11,148	1.8	97 yd^3	7,587	15.6	97 yd^3 2 tons
Woodside	350	ND	ND	ND	ND	363	121.5	109 yd^3	379	288.0	436 yd^3	1,458	294.7	27 tons
TOTAL	21,409	26,307	17,467	251	5,238 yd^3 39 tons	31,348	358	4,176 yd^3	33,605	503	6,864 yd^3 15 tons	30,586	527	4,874 yd^3 243 tons

Notes: 1. Based on data from the Fiscal Year Annual Report.

2. Other facilities include V-ditches, drain lines, channels, creeks and culverts. Junction boxes and pump stations are excluded.

3. Assumed the number of inlets cleaned are also inspected.

4. ND - No Data reported.

General Program Lead

Member Agency Lead

Figure 2-1 Task Lead and Schedule for Municipal Maintenance

Task	Description	Year	FY 1998/99				FY 1999/00				FY 2000/01				FY 2001/02				FY 2002/03			
			Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr
	2.0 Municipal Maintenance																					
2.1	Implement Performance Standards																					
	Develop and Assist with Performance Standards																					
2.2	Conduct Training and Outreach Materials																					
2.3	Coordinate with Other Agencies and Private Industries																					
2.4	Assist with Regulatory Compliance and Planning		▲				▲				▲				▲				▲			

▲ Annual Report

3 Industrial and Illicit Discharge Controls

GOALS

This component of the SWMP contains two distinct, but related types of stormwater pollution prevention and control activities. One is a set of business-based controls on stormwater pollution and the other is a storm drain system-based set of controls to identify and effectively eliminate illicit discharges. Each of these types of controls is described further below.

The control of pollutants from industrial and commercial facilities emphasizes educating businesses about stormwater pollution prevention and control methods. Educational outreach to businesses occurs during facility inspections, through meetings with trade and business organizations, and as a result of STOPPP's public information and involvement activities. During facility inspections, STOPPP inspectors identify any needed improvements in businesses' stormwater pollution prevention and control practices and establish schedules for accomplishing these improvements. As needed, STOPPP inspectors enforce local ordinances and/or hazardous waste management and other statutes to control stormwater pollution.

The control of illicit discharges is intended to effectively eliminate non-stormwater discharges (i.e., those that are disallowed by the NPDES permit) to the municipal storm drain system. Citizens and municipal staff identify illicit discharges, and municipalities attempt to locate the sources. Municipalities then require the responsible parties to eliminate the illicit discharge. Where a responsible party has not been identified, additional field screening and educational outreach to the residents and businesses in the area may be conducted.

The four primary goals of this component are as follows:

- Minimize or eliminate potential stormwater pollution sources at commercial and industrial facilities through inspection and educational outreach activities;
- Effectively prohibit illicit discharges to the municipalities' storm drain systems;
- Identify and use consistent countywide stormwater pollutant control methods which are based on guidance and practices that have been proven effective; and
- Track, measure, and distribute information about the progress of inspection and educational outreach activities as part of instituting a process of continuous improvement.

EXISTING CONDITIONS

This section summarizes what has been accomplished during the initial NPDES permit period that began in July 1993.

Inspections of Commercial and Industrial Businesses

During the initial NPDES permit period, STOPPP inspected a wide variety and number of businesses. This expansive push to visit businesses helped provide

educational outreach to these businesses, led to needed stormwater pollution prevention improvements, and helped to develop baseline information about businesses' stormwater impacts for prioritizing future re-inspections. This major effort resulted in the inspection of approximately 5,400 businesses from July 1994 through June 1997.

The County Environmental Health Department (County Health) reports that it has inspected all of the facilities with Hazardous Materials Management Plans and/or which are hazardous waste generators within the cities where it conducts stormwater inspections and in the San Mateo County unincorporated area. The number of businesses inspected in future years will decline significantly as the inspection effort focuses more on priority businesses identified during the initial broad round of inspections.

Most of the inspections and educational outreach are conducted by County Health which has inspection agreements with 15 municipalities (Atherton, Belmont, Burlingame, Colma, East Palo Alto, Half Moon Bay, Hillsborough, Menlo Park, Millbrae, Pacifica, Portola Valley, Redwood City, San Bruno, San Carlos, and the unincorporated county area for San Mateo County). Most of the other cities (Daly City, Foster City, San Mateo, and South San Francisco) use their pretreatment, source control, or industrial waste inspectors from their wastewater treatment plants to conduct the stormwater inspections. Brisbane uses its public works staff to conduct inspections. In addition, Burlingame and Millbrae supplement County Health's inspections with ones conducted by their pretreatment or industrial waste inspectors. Conducting stormwater inspections as part of existing inspection programs has proven to be a very cost-effective approach.

The Standard Industrial Stormwater Inspection forms completed for the inspections conducted in FY 1995/96 were entered into a database and the results evaluated. The following conclusions are based on this evaluation and on experience implementing the stormwater program:

- Outdoor waste storage/disposal areas and outdoor wash areas are, in general, important sources of stormwater pollutants;
- Outdoor parking areas, access roads, and rooftop equipment areas are, in general, minor sources of stormwater pollutants; and
- Businesses that have the most potential to cause stormwater pollution should be targeted for annual inspections by using the information generated during the first round of inspections.

Elimination of Illicit Discharges

One of the primary requirements of the STOPPP agencies' first NPDES permit is to identify and eliminate illicit discharges. Listed below are the four primary ways that municipalities are working to accomplish this:

1. Educate the public and businesses about illicit discharges and alternatives available for their elimination.
2. Respond to complaints from the public and other agencies about illicit discharges. The key to the success of this activity is having a response process in place to efficiently route and respond to complaints.
3. Combine reconnaissance for illicit discharges with each municipality's routine maintenance and cleaning of

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storm drain inlets and culverts and creeks.

4. Eliminate illicit discharges as part of business inspections.

Between July 1994 and June 1997, STOPPP's member municipalities reported inspecting approximately 180 channel miles of creeks and storm drainage systems. In response to calls from residents and the inspection of the storm drain system, about 840 illicit discharges were identified. In most cases the source of the illicit discharge was found and abated. The number of illicit discharges found each year increased due to municipal staff's heightened awareness of illicit discharges and the increased amount of the storm drain system screened each year for illicit discharges.

The most common categories of illicit discharges have been sewage, construction material, automotive fluids, washwaters, and food waste. These five categories account for over 85 percent of the illicit discharges, and the number of illicit discharges is fairly evenly distributed among these five categories.

Partnership with Used Oil and Household Hazardous Waste Programs, and Business Groups

Businesses and residents need alternatives to dumping and discharging wastes into the storm drainage system if illicit discharges are going to be effectively prohibited. As described further under the Public Information and Participation section of the SWMP, the County Household Hazardous Waste Program and the County's Used Oil Program have seen a large increase in the amount of materials recycled. STOPPP has partnered with the County's programs and with businesses to improve awareness about alternatives for disposal of oil, paint, and other chemicals.

STOPPP member agencies also recognized the need to work with business groups. In 1997 STOPPP representatives conducted a presentation on stormwater requirements and BMPs during a chapter meeting of the California Autobody Association, Golden Gate Chapter.

Staff Training

Training has been one of the keys to making the STOPPP program more routine, consistent, and cost-effective for all of the municipalities. The Subcommittee conducted two training workshops for business inspectors and two for illicit discharge inspectors during the initial NPDES permit period. The topics covered included information on BMPs, enforcement options, and case studies. Approximately 190 people attended the two business inspection workshops and approximately 160 people attended the two illicit discharge control workshops. The Commercial/Industrial/ Illicit Discharge Subcommittee has also conducted additional informal stormwater pollution prevention and control training as part of its monthly meetings; and County Health has conducted additional informal training of its staff.

Performance Standards

Based on four years of experience identifying and eliminating illicit discharges and helping businesses to implement stormwater controls, the Subcommittee developed a set of performance standards. All of the STOPPP municipalities have agreed to the performance standards as the minimum set of controls that each agency is committed to implement. Copies of the performance standards are included in Appendix B.

MAJOR TASKS

The following tasks will be conducted during the next five years.

Task 3.1 Implement and Assist with the Performance Standards

Each of the municipalities will implement the performance standards specified in Appendix B for industrial/commercial controls of pollutants in stormwater and to effectively control and eliminate illicit discharge as part of its compliance with the countywide stormwater NPDES permit. The Commercial/Industrial/Illicit Discharge (C/I/I) Subcommittee will review the performance standards at least every two years and make any needed improvements. The General Program will assist the municipalities to understand and implement the performance standards.

Task 3.2 Assist with Regulatory Compliance and Planning

The General Program will conduct four activities under this task:

1. Assist the STOPPP municipalities to comply with the reporting and other requirements of the NPDES permit, including development of deliverable quarterly/semi-annual reporting forms for tracking local program progress, and preparation of the industrial and commercial discharge/illicit discharge controls section of the STOPPP Annual Report;

2. Develop two-year General Program work plans and budgets;

3. Assist with any additional planning needed to improve this section of the SWMP (the goal of STOPPP is to modify the SWMP as needed every two years so that the plan may continue to be used for more than five years); and

4. Continue to assist the C/I/I Subcommittee to conduct meetings and other activities.

As part of this task the General Program will also conduct individual performance reviews and one-on-one meetings with STOPPP's member agencies every two years on average. Regional Water Quality Control Board staff may choose to attend these meetings.

Municipalities will be responsible for participating in the Subcommittee as appropriate (see the performance standards) and providing sufficient information on their local programs for the Annual Report.

Task 3.3 Provide Training and Outreach Materials

This task targets training for two groups. One group is the municipal staff implementing the business inspections and illicit discharge controls and the other group is the business and trade organizations whose members need to comply with the stormwater pollution prevention and control requirements. Upon request, the STOPPP General Program will assist any of its member agencies to provide training of its inspection staff. It is anticipated that more emphasis will be placed on continuing to train illicit discharge inspectors than business inspectors over the next five years because most of the business inspectors work for County Health and receive stormwater training as part of their Certified Unified Program Agency duties. Training of illicit discharge inspections will occur approximately every other year. Part of assisting with the training will be to develop an inspector's handbook that will

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be in a binder so that it can be updated regularly.

The educational outreach and training with business and trade organizations is an excellent way for STOPPP to gain a better understanding of the business community's perspective. This will allow STOPPP inspectors to offer better alternatives for preventing and controlling stormwater pollution. The C/I/I Subcommittee has identified the following groups as priorities for possible future collaboration on joint stormwater training activities: 1) restaurants; 2) automotive repair facilities; and 3) business organizations that base their membership on a particular geographic area.

This task also includes the adaptation, update, and preparation of educational outreach materials (e.g., flyers and brochures) to provide to businesses. During the development of new materials, input from business groups will be solicited so that the materials are accurate and useful to them. The last group is included in the list of priorities because it includes some active, local organizations that can assist STOPPP.

Task 3.4 Provide Incentives for Businesses to Comply

The General Program will continue to identify incentives for businesses to comply with stormwater pollution prevention and control requirements. The types of incentives that will be evaluated include publicly recognizing businesses' stormwater pollution prevention efforts, providing certificates for businesses that attend STOPPP's training, and working with business organizations to develop their own recognition programs. The General Program will implement or assist with the implementation of any incentives approved by the Subcommittee, Technical Advisory Committee, and C/CAG (if its approval is needed).

Task 3.5 Evaluate the Effectiveness of the Implemented Controls

The effectiveness of the stormwater pollution prevention and control activities will be evaluated in several ways. One method will be to track trends in the number and type of stormwater pollution problems found at businesses over time. It is uncertain whether a trend toward fewer problems will be evident as the program continues to increase its effectiveness. One possibility is that the program will continue to uncover new problems in sufficient numbers to offset the number of old problems being corrected. In order to evaluate trends, information collected on the Standard Industrial Reporting Form will be entered into a database and evaluated at least every two years. Other methods that will be used to evaluate effectiveness will include tracking the number of illicit discharges found and eliminated, the amount of liquid materials being recycled by the County's Household Hazardous Waste and Used Oil Programs, and by conducting at least one countywide survey of businesses to find out how well STOPPP's educational outreach and inspections are working. The countywide survey of businesses will be conducted in FY 1999/00 to correspond with the Public Information and Participation's public awareness survey of residents. The results of these evaluations will be included in the annual NPDES permit report and in reports to C/CAG.

General Program Lead

Member Agency Lead

Figure 3-1 Task Lead and Schedule for Industrial and Illicit Discharge Controls

Task	Description	Year	FY 1998/99				FY 1999/00				FY 2000/01				FY 2001/02				FY 2002/03			
			Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr
	3.0 Industrial and Commercial/ Illicit Discharge Controls																					
3.1	Implement Performance Standards																					
	Assist with Performance Standards																					
3.2	Assist with Regulatory Compliance, Planning and Performance Reviews		▲				▲				▲				▲				▲			
3.3	Provide Training and Outreach Materials																					
3.4	Provide Incentives for Businesses to Comply																					
3.5	Evaluate Effectiveness of Controls																					

▲ Annual Report

4 Public Information and Participation

GOALS

Stormwater pollution results from the small, incremental, and collective activities of everyone within San Mateo County and its watersheds. The diffuse origins of the problem are often the result of the unintended and unrecognized consequences of thousands of routine, seemingly inconsequential, decisions made daily. Public Information and Participation (PIP) is one of the keys to preventing stormwater pollution. The better everyone understands what causes stormwater pollution and the simple things that we can do about it, the cleaner our creeks and shorelines will be.

The primary goals of this component are:

- Educate the public about the causes of stormwater pollution and its serious effects on the quality of local creeks, lagoons, shorelines, and neighborhoods;
- Encourage residents to adopt less polluting and more environmentally beneficial practices; and
- Increase residents' hands-on involvement in STOPPP activities.

EXISTING CONDITIONS

This section of the SWMP summarizes what PIP accomplished during the initial NPDES permit period that began in July 1993.

General Outreach

The PIP Subcommittee conducted educational outreach activities to convey general information about stormwater pollution problems and solutions. These activities included developing informational flyers and promotional materials, working with schools, stenciling storm drain inlets, and participating in the San Mateo County Fair. More information about these four activities is provided below.

The PIP Subcommittee developed or adapted six informational brochures and several promotional items. The six brochures PIP developed were: "The Bay and Ocean Begin at Your Front Door (English and Spanish versions)," "STOPPP," "Stormwater Pollution Prevention Guidelines for Food Handling Facilities," the Motor Oil Point of Purchase brochure, and the Private Property Stenciling brochure. PIP also developed various promotional items, such as: crayons, coloring books, magnets, key chains, T-shirts, hats, pens, and auto fender skirts. In FY 1996/97 the STOPPP municipalities distributed approximately 21,000 of these promotional items.

The PIP Subcommittee worked with schools and community organizations to educate students and residents about stormwater pollution. This educational outreach included presenting "Canopy"—an interactive theatrical performance that dramatizes ways that everyone can help prevent stormwater pollution—to approximately 7,800 students at 24 elementary schools during FY1996/97.

The PIP Subcommittee also initiated the Community Action Grant Awards Program (later named Community Outreach Grant Program), which funds community-based environmental education/pollution prevention programs or activities. Lastly, STOPPP developed an award for stormwater related projects as part of the annual San Mateo County Science Fair.

STOPPP municipalities have also stenciled storm drain inlets. Most of the municipalities (16 of 21) have stenciled all their storm drain inlets. The Town of Portola Valley has no storm drain inlets, and the other four municipalities are in the process of completing their inlet stenciling. In addition, the STOPPP municipalities encourage businesses and apartment owners to stencil their privately-owned inlets.

Through the PIP Subcommittee, STOPPP municipalities have participated in the San Mateo County Fair since 1993. For this annual event, the PIP Subcommittee developed and featured an interactive, educational booth on stormwater pollution prevention. Thousands of residents have visited this booth.

Partnerships with Agencies, Organizations, and Industries

The PIP Subcommittee's partnerships with other agencies and organizations have provided a cost-effective way to reach a large audience. The PIP Subcommittee forged partnerships during the past four years with BASMAA, organizations and industries involved in the Motor Oil Point of Purchase (POP) Campaign, and the County Used Oil Program.

STOPPP's participation in BASMAA's Regional Advertising Campaign has provided an opportunity to expose more residents to stormwater pollution prevention messages by sharing the costs of radio and television advertising with other municipal stormwater programs. PIP participated in BASMAA's campaigns during FYs 1995/96, 1996/97, and 1997/98. BASMAA's 1995/96 campaign encouraged residents not to dump materials in the storm drains by explaining that discharges to the storm drains are not treated, unlike discharges to the sanitary sewer system. The 1996/97 campaign encouraged the use of environmentally friendly yard and garden practices and the 1997/98 campaign focused on minimizing leaks from cars. The advertising promoted the 1-888-BAYWISE number, which when called, provided phone numbers to call and receive a free copy of the "Grow It" or "Keeping It All in Tune" guides or to obtain further information on stormwater pollution prevention.

To promote the Used Motor Oil Point of Purchase Campaign, the PIP Subcommittee formed partnerships with the County Used Oil Program, Pennzoil Products Company, KMEL (106.1 FM) radio station, the California Integrated Waste Management Board, and local garbage companies. The purpose of the campaign was to encourage the proper use and disposal of motor oil. Because of the partnership with Pennzoil Products Company, STOPPP was able to elicit retail store participation through Pennzoil's existing relationships with store managers. As a result, 22 stores participated in the 1995/96 campaign and 23 stores participated in the 1996/97 campaign. Pennzoil provided further assistance by setting up and maintaining the POP displays. KMEL aired the campaign's paid advertisement and promoted the campaign during KMEL's street fairs. Finally, the local garbage companies (the Seacoast/Coastside Disposal Company, the South San Francisco Disposal Scavenger Company, and the Los Altos Garbage Company)

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included stormwater pollution prevention information in their bills.

The County Used Oil Program also promoted STOPPP's general messages in its outreach materials. The County Used Oil Program promoted stormwater messages through its 1-800 recycling hotlines, promotional items, media campaigns, "Boogie Down Jugglers"—a pollution prevention stage show that was performed at middle schools—and an urban pollution exhibit at the Coyote Point Museum in San Mateo.

The Regional Board adopted Resolution No. 97-117 in September 1997 commending STOPPP and its pollution prevention partners as part of Pollution Prevention Week. This resolution also recognized other major pollution prevention projects in the Bay Area.

Public Education Outreach Survey

In November 1996, the PIP Subcommittee's consultant conducted STOPPP's first countywide telephone survey to assess the effectiveness of its outreach efforts and the public's awareness of stormwater pollution. The survey also provided information needed to improve future outreach activities. The survey revealed the following:

- While about one-half the residents know that stormwater runs directly to the creeks/Bay/ocean, the other half do not know what happens to stormwater (35% were undecided or did not know and 13% thought water in storm drains was treated at a wastewater treatment plant).

- Most residents considered dumping pollutants into storm drains a fairly serious threat, but considered runoff from streets and parking lots, construction activity, and household trash as relatively low threats.

- Most residents (74%) have seen the "No Dumping" stencil on storm drain inlets.

- Survey participants listed the garbage company, city and county departments, and the phone book as the most frequently used sources for finding out how to properly dispose of household hazardous waste.

- Most residents (72%) have been exposed to at least one message on the proper use and disposal of hazardous chemicals; residents with higher income levels reported a greater level of exposure to this message than lower income residents.

- About 10% of residents have called either the 1-800-CLEANUP or 1-800-94-REUSE numbers. They learned about these numbers through the Used Oil Regional advertising campaign efforts and STOPPP's advertising in the San Mateo County Times.

- 60% of residents mentioned that recycling and disposing of materials properly are activities people can do to reduce pollutants from entering the Bay.

- 7% of residents no longer dump oil in the storm drain as a result of messages about proper disposal of household chemicals and used motor oil.

- As a result of messages encouraging citizens to dispose properly their household chemicals and used motor oil, 18% of residents have either decreased their use of hazardous products or have increased the amount that they properly dispose.

MAJOR TASKS

The following tasks will be conducted during the next five years:

Task 4.1 Implement and Assist with the Performance Standards

Each of the municipalities will implement the performance standards for Public Information/Participation specified in Appendix B. The Public Information/Participation Subcommittee will review the performance standards at least once every two years and make any needed improvements. The General Program will assist the municipalities to understand and implement the performance standards.

Task 4.2 Assist with Regulatory Compliance and Planning

The General Program will conduct four activities under this task:

1. Assist the STOPPP municipalities to comply with the reporting and other requirements of the NPDES permit, including development of deliverable quarterly/semi-annual reporting forms for tracking local program progress, and preparation of the public information/participation section of the STOPPP Annual Report;

2. Develop two-year General Program work plans and budgets;

3. Assist with any additional planning needed to improve this section of the SWMP (the goal of STOPPP is to modify the SWMP as needed every two years so that the plan may continue to be used for more than five years); and

4. Continue to assist the Public Information/Participation Subcommittee to conduct meetings and other activities.

Municipalities will be responsible for participating in the Subcommittee as appropriate (see the performance standards) and providing sufficient information on their local programs for the Annual Report.

Task 4.3 Encourage Public Involvement, Outreach, and Education

STOPPP will continue to encourage the public to adopt stormwater pollution prevention habits in their daily activities. This will be accomplished by educating the public about stormwater pollution and by encouraging the public to take an active role in keeping stormwater and creeks clean. The following activities comprise this task: Develop and Implement Targeted Outreach, Continue to Implement General Outreach, and Evaluate Effectiveness.

Develop and Implement Targeted Outreach

Targeted Outreach has five basic steps:

1. Identify a subject area to work on;

2. Conduct market research to identify effective target message and audiences;

3. Develop a focused campaign;

4. Implement the focused campaign; and

5. Conduct a public awareness survey as one way to measure progress.

The following criteria may be used to select areas to target for public education activities: focus on stormwater pollutant generating behavior by residents; select a behavior where change is possible; and choose a target that offers opportunities

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to create partnerships with others to leverage limited resources.

PIP completed its Motor Oil Point of Purchase targeted campaign in FY 1996/97, and is currently conducting its Paint Point of Purchase campaign. The Paint Point of Purchase campaign will continue into FY 1998/99. The General Program will select the next targeted campaign subject area and conduct market research in FY 1999/00. This subsequent campaign is tentatively planned to be implemented during the two years beginning in FY 2001/02.

Continue to Implement General Outreach

In addition to targeted outreach, the General Program will also conduct activities related to the general message of the stormwater program. This may include activities such as: continuing to provide, improve, and create promotional materials and informational brochures; encouraging schools and organizations to educate students and citizens about stormwater through the Community Outreach Grant Program, the "Canopy" Assembly Program, participation with the County Science Fair, and through the distribution of materials to schools, such as computer programs and activity books; encouraging participation in creek clean-up and creek-specific water quality improvements; creating interactive displays and materials for distribution at events such as the San Mateo County Fair; and creating a website that provides information on stormwater pollution and watersheds.

Evaluate Effectiveness

The PIP Subcommittee will develop methods to evaluate the effectiveness of each outreach activity conducted under its targeted and general outreach activities. Evaluations will help improve future outreach, identify which types of outreach are most cost effective at educating and changing behavior, and identify what topics and populations to target next. Effectiveness can be measured by how many people were reached and how many residents adopted less polluting behavior. Where cost-effective, the PIP Subcommittee may use focus groups or conduct public opinion surveys, such as the one conducted in 1996. At least one public awareness survey will be conducted in 1999/00 to measure progress since the 1996 survey. The PIP Subcommittee will also use incentives for encouraging the public to give feedback and participate in evaluations of individual General Program events.

Task 4.4 Assist with Focused Staff Training

The PIP coordinators for each municipality will be provided information on how to stay informed on the basic stormwater pollution prevention information being developed both outside and within STOPPP. Every two years, the PIP Subcommittee will help identify and prioritize the PIP training needs of staff, and the optimum ways to meet these needs. One of the training needs already identified is to learn how to better involve the public in stormwater pollution prevention activities. The PIP Subcommittee will implement agreed-upon training activities every two years beginning in FY 1999/00.

One of the specific activities under this task will be to develop a model municipal employee guidance document about STOPPP. The guidance will explain STOPPP and how to answer and route telephone calls about stormwater pollution. Portions of the guidance will be designed for adaptation and use by each municipality. The guidance will help each municipality to implement the agreed

upon internal communication and training described in the performance standards.

Task 4.5 Collaborate with Other Groups

This task addresses the PIP Subcommittee's continued commitment to build partnerships with outside agencies and companies, to collaborate with volunteer groups, and to work with other STOPPP subcommittees. In the past, working with outside agencies and volunteer groups through activities such as the Community Outreach Grant Program to promote a common environmental message has proven to be cost-effective. In addition, working with other subcommittees helps STOPPP to achieve its goals most effectively.

Build Partnerships with Agencies and Companies

PIP will continue to build partnerships with outside agencies where appropriate and cost-effective. The past partnerships with BASMAA and the County Used Oil Program have been successful, and PIP may continue to take part in them.

Collaborate with Volunteer Groups

Working with volunteer groups with similar goals will be beneficial to both STOPPP and the volunteer group. This task will complement the performance standard that states that municipalities may coordinate with a volunteer group that would assist STOPPP with community outreach activities (Performance Standard V.g.).

Under this task, STOPPP will conduct the Community Outreach Grant Program. This program funds community-based environmental education or pollution prevention programs and activities.

Work with Other Subcommittees

The last activity covered as part of this task will be coordinating and integrating PIP activities with other General Program components. Some ways this might be accomplished include participating in joint work groups with other subcommittees, inviting other subcommittee chairs annually to participate in the PIP Subcommittee meetings, and holding workshops or other events with other components of the General Program. One specific activity PIP will implement under this task is to help develop education materials, such as BMP guidance and employee training, for other subcommittees. This will help STOPPP to produce materials with a consistent, user-friendly message.

General Program Lead

Member Agency Lead

Figure 4-1 Task Lead and Schedule for Public Information and Participation

Task	Description	Year	FY 1998/99				FY 1999/00				FY 2000/01				FY 2001/02				FY 2002/03			
			Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr
	4.0 Public Information/Participation																					
4.1	Implement Performance Standards Assist with Performance Standards																					
4.2	Assist with Regulatory Compliance and Planning																					
4.3	Encourage Public Involvement, Outreach and Education																					
4.4	Assist with Focused Staff Training																					
4.5	Collaborate with Other Groups																					

Annual Report

5 New Development and Construction Controls

GOALS

Changes to natural drainage systems due to land development have led to increases in the volume and rate of stormwater runoff as well as the amount of pollutants discharged to local waters. These changes include modifying drainages to quickly convey runoff, filling wetlands, removing natural vegetation, and increasing the amount of impervious surface area through the construction of buildings, roads, and parking lots. A large portion of the developable land in San Mateo County is already urbanized and, with current growth rates and strong economic conditions, there is continuing pressure for more development. Efforts are needed to control the impacts of development and construction projects on environmentally sensitive areas and local waters.

The primary goal of the New Development and Construction Controls component of the SWMP is to minimize the water quality and beneficial use impacts of land development, both during and after construction. Specific objectives to meet this goal include the following:

- Prohibit non-stormwater discharges from construction sites, and reduce stormwater pollutant discharges from development and construction activities to the maximum extent practicable;
- Provide guidance to municipalities on cost-effective stormwater quality controls for new and re-development projects, and communicate the information to developers, owner/builders, and contractors;
- Incorporate stormwater quality controls-- including good planning practices to minimize increases in impervious cover-- into development plan review and permitting, and gain internal acceptance and support for these policies;
- Coordinate stormwater quality efforts with the efforts of other agencies with similar but separate regulations (e.g. habitat protection/sensitive species);
- Require compliance with stormwater best management practices (BMPs) and erosion controls at construction sites;
- Promote implementation of performance standards for new development and construction controls; and
- Continually track, evaluate and improve efforts to control stormwater quality and beneficial use[1] impacts of

[1] "Beneficial use" is defined as those uses allowing the highest water quality consistent with maximum benefit to the people of California, including uses for recreation, preservation and enhancement of fish and wildlife use, agricultural supply, industrial service and process supply, municipal and domestic supply,

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development. Evaluate local agency policies and practices, changes in public awareness, and effectiveness of specific control measures; and use the results of these evaluations to improve related future activities.

EXISTING CONDITIONS

Current Land Use

Land use data from the Association of Bay Area Governments (ABAG) indicate that about 74,300 acres (26 percent) of the 285,000 total acres in San Mateo County are considered urbanized as of 1995[1]. However, a large proportion of the un-urbanized land is in unincorporated County areas, and a majority of the cities in the County are more than 75 percent urbanized. These data are based on Land Use Data (LUDA)-compatible maps created in the 1970's through a joint USGS/San Mateo County project and digitized by ABAG. ABAG updated the maps in 1985, 1990, and 1995 mainly using aerial photographs and population data. Based on the latest updated maps, Table 5-1 displays the land use by type for each municipality in 1995. A description of the categories used in Table 5-1 is provided in Attachment 5-1(at the end of this section).

Estimated Development Potential and Impacts

In 1994, ABAG estimated the area in San Mateo County available to future urban development to be 20,200 acres. Of this amount, ABAG estimated 10,700 acres would be available for development through 2010. The remaining 9,500 acres may be available after 2010. Of the 20,200 developable acres, ABAG predicts that 4,250 of the 20,200 developed acres would be second growth or redevelopment[2].

The total population in the County is expected to increase from 696,450 in 1995 to 727,300 in 2000 and 754,750 in 2005[3], which is an average growth rate of about 0.8 percent per year. However, projected growth rates for individual cities vary from 4 percent in Portola Valley and Menlo Park to 37 percent in Half Moon Bay over the period from 1995 to 2005. The rise in employment and the high cost of housing in many bayside communities will cause disproportionate increases in population in coastside communities.

STOPPP conducted a survey in 1997 that asked planning departments in San Mateo County to identify the type and amount of land use development they expected between January 1998 and January 2003. The survey also asked for parcel sizes and whether these parcels had been previously developed. Fifteen of the 21 municipalities responded to the survey.[4] Of those who did respond, municipal planning staffs identified 2,141 acres that are currently being considered for development approval. Of this area, 1,672 acres, or 78%, is vacant. Table 5-2 summarizes the 1997 survey responses by land use type. Attachment 5-2, located at the end of this section, provides detailed results of survey

groundwater recharge, navigation, and ocean commercial and sport fishing. For a more detailed description, see: San Francisco Bay Regional Water Quality Control Board's *Water Quality Control Plan (1995 Basin Plan)*, 1995 (Chapter II).

[1] Association of Bay Area Governments. *Existing Land Use in 1995: Data for Bay Area Counties and Cities.* 1996.

[2] Association of Bay Area Governments. *Local Policy Survey Report.* 1994.

[3] Association of Bay Area Governments. *Projections96.* 1995.

[4] Municipalities that responded to the survey include: Brisbane, Burlingame, Colma, Foster City, Half Moon Bay, Hillsborough, Menlo Park, Millbrae, Pacifica, Portola Valley, San Bruno, San Carlos, San Mateo County, South San Francisco, and Woodside.

responses.

STOPPP conducted a similar survey in 1993 that was used in a subsequent study to establish priorities for implementing stormwater controls, based on the potential of certain types of development to impact water quality. The study recommended that municipalities require stormwater controls for (in priority order): 1) commercial, industrial, and residential developments that include new open parking lots; 2) low density (lot sizes greater than 10,000 square feet) single-family residential developments; 3) medium density (lot sizes less than 10,000 square feet) single-family residential developments; and 4) other types of multi-family residential, industrial and commercial developments[1]. The potential impacts of the highest priority development types are summarized in Table 5-3.

Current Regulations and Policies

Control of the water quality impacts of construction and new development is described in U.S.E.P.A.'s stormwater regulations[2], CZARA[3], and the San Francisco Bay Basin Plan[4]. The Basin Plan also requires municipalities to use their powers under CEQA to reduce the long-term impacts of development on stormwater quality. In addition, the *Comprehensive Conservation and Management Plan* (CCMP) for the San Francisco Estuary[5] includes recommendations that local governments: 1) incorporate watershed management and stormwater management plans into local General Plans; 2) adopt policies to promote compact, contiguous development; 3) develop and implement guidelines for site planning and BMPs; and 4) create market-based incentives to protect water quality.

In 1994, Regional Board staff issued *Staff Recommendations for New and Redevelopment Controls for Stormwater Programs (Recommendations),* to assist municipalities in implementing planning procedures and selecting construction and post-construction BMPs consistent with the regulations and policies described above. The *Recommendations* state that municipalities that put forth good-faith efforts to implement local programs based on the *Recommendations* will be complying with EPA regulations, CZARA, and the CCMP. STOPPP municipalities have worked toward implementing the *Recommendations* during the past three years, and used the *Recommendations* as the basis for developing performance standards for control of stormwater pollutants from development and construction activities. (See Appendix B).

Current Guidance Documents

Several useful guidance documents are available to STOPPP municipalities to assist implementation of the Stormwater Management Plan. These include the following:

- *Erosion and Sediment Control Field Manual* (Regional Board, 1998);
- *Manual of Standards for Erosion and Sediment Control Measures (ABAG, 1995);*

[1] EOA, Inc. *Toward Policies for Long Term Control of Stormwater Pollutants from New Development.* Prepared for the STOPPP New Development Subcommittee. August, 1995.
[2] Environmental Protection Agency. *National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Final Rule.* Federal Register, 40 CFR Parts 122, 123, and 124. November 16, 1990.
[3] *Coastal Zone Act Reauthorization Amendments,* Section 6217.
[4] State of California. *Water Quality Control Plan for the San Francisco Bay Region.* 1995.
[5] San Francisco Estuary Project. *Comprehensive Conservation and Management Plan.* 1993.

- *Compilation of New Development Stormwater Treatment Controls in the San Francisco Bay Area* (BASMAA, 1997);
- *Start at the Source* (BASMAA, 1999);
- *Recommendations for New and Redevelopment Controls for Stormwater Programs (Recommendations)* (Regional Board, 1994);
- *Guidance for Implementation of Performance Standards for Control of Stormwater Pollutants from Development and Construction Activities* (STOPPP,1998);
- *Guidance on Permanent Stormwater Controls for New and Redevelopment in San Mateo County* (STOPPP, 1996);
- *Toward Policies for Long-Term Control of Stormwater Pollution from New Development* (STOPPP, 1995);
- *California Storm Water Best Management Practices Handbook—Construction Activity* (SWQTF, 1993).

STOPPP Accomplishments

New Development Subcommittee

STOPPP's strategy has been to integrate procedures for stormwater pollution prevention and control into existing municipal review and inspection programs and to coordinate with new development programs being implemented as part of other Bay Area stormwater programs. STOPPP provides guidance to the local municipal programs through its New Development Subcommittee. The Subcommittee meets monthly and has been a valuable means of communication and information sharing between STOPPP and the member agencies as well as among the agencies.

Outreach

Since 1995, the Subcommittee has conducted annual educational workshops for municipal planners, engineers, and inspectors. Recent workshops covered such topics as: consideration of stormwater issues during the plan review and permitting process; local examples of plan review processes; construction and erosion control issues, and an overview of permanent stormwater controls (both site design and treatment controls). The Subcommittee has also assisted Regional Board staff in conducting erosion control and site inspection workshops.

The Subcommittee also assists municipalities in conducting outreach to developers and contractors. The Subcommittee adapted a series of seven brochures on BMPs for construction activities for municipalities to hand out at planning and building department counters and to attach to various permits. In addition, representatives of the Subcommittee worked with BASMAA to develop a guidance document entitled *Start at the Source: Residential Site Planning and Design Guidance Manual for Stormwater Quality Protection*. This document is being used by the municipalities to educate developers (and their own staffs) about ways to mitigate stormwater impacts of development through proper site design.

Guidance for Local Policies

In 1995, the Subcommittee and its consultant prepared a guidance document entitled *Toward Policies for Long-Term Control of Stormwater Pollutants from*

New Development. The purpose of this document was to assist municipalities to adopt and implement consistent, practical development policies that would accomplish the maximum feasible reduction in stormwater pollution from new development over the long term. As described earlier, the document took the results of the 1993 future development survey and identified types of development that were considered high priority for implementing stormwater controls, based on their potential to impact water quality.

Guidance for Selection of Stormwater Quality Controls

In 1996, the Subcommittee and its consultant prepared a report entitled *Guidance on Permanent Stormwater Controls for New and Redevelopment in San Mateo County*. The report provides design guidelines and criteria for recommended BMPs for priority development sites in the County (new parking lots, low-density residential development, medium-density residential development, and industrial/commercial development). The BMPs evaluated include grass swales, vegetated filter strips, infiltration controls, porous pavement, sand filters, oil/sediment separators, detention basins and wet ponds, as well as erosion controls, landscaping, public education, and street and storm drain maintenance.

Development Review Checklists

STOPPP was one of the first stormwater programs in the Bay Area to promote the use of standardized checklists to help municipal plan checkers consider stormwater quality impacts, mitigations, and BMPs during the plan review process. STOPPP's *Interim Checklist for Development Approvals and Building Permits*, developed in 1994, was revised into a set of two checklists, one for construction activity requirements and BMPs and one for permanent stormwater quality controls. The revised checklists were designed for use by planners, engineers, and inspectors to track a project's compliance with stormwater requirements from the initial application stage through the construction stage. Copies of the revised checklists are provided in Attachment 5-3.

Local Efforts

In general, STOPPP municipalities have made substantial progress incorporating stormwater pollution prevention requirements into their development plan review and construction inspection procedures, and are continuing to review and improve their programs. During the term of the first NPDES permit, STOPPP municipalities' new development activities focused on:

- Adoption of stormwater discharge and erosion control ordinances;
- Development and implementation of construction activity BMPs;
- Incorporation of stormwater pollution prevention into development plan reviews and construction inspections;
- Implementation of the Regional Board staff's *Recommendations;* and
- Development and initial implementation of performance standards for new development and construction activities.

Almost all municipalities have reported that they are: 1) using the STOPPP checklists for some or all development projects; 2) requiring construction BMPs as permit conditions for some or all projects; and 3) requiring copies of Notices of Intent (NOIs) and Stormwater Pollution Prevention Plans (SWPPPs) for

projects with greater than five acres of disturbed area.

The Role of the County Flood Control District

The San Mateo County Flood Control District is part of the County Public Works Department and has a very small staff. Historically, the District has constructed and maintained flood control improvements in selected zones of the County. The zones were assessed for the cost of improvements via the property tax bill (until Proposition 13 was enacted). The District is still a legal entity today, but funds projects on a "pay as you go" basis. It is currently involved in three main activities:

- *Colma Creek Improvements* – raising bridges, improving channels, adding box culverts at Mission Road and El Camino Real, working with BART and SamTrans to construct box channel and bridge improvements;
- *San Francisquito Creek Maintenance* – working with the Santa Clara Valley Water District to develop guidelines for voluntary creek maintenance by private property owners; and
- *Ongoing maintenance activities* – minor dredging and maintenance in San Bruno Creek, Colma Creek, and other "engineered" channels.

The District has coordinated with the New Development Subcommittee on implementation of appropriate BMPs for its activities.

MAJOR TASKS

The following tasks will be conducted during the next five years.

Task 5.1 Implement and Improve Performance Standards

Each of the municipalities will implement the performance standards for control of stormwater pollutants from development and construction activities, specified in Appendix B, as part of its compliance with the countywide stormwater NPDES permit. The New Development Subcommittee will review the performance standards at least once every two years and make any needed improvements. These improvements will be based on implementation experience, the measured effectiveness of the controls, and future guidance from Regional Board staff, BASMAA, and other groups as available.

Task 5.2 Conduct Watershed Resource Inventory and Planning

STOPPP will assist municipalities to begin to develop inventories and maps of the natural resources within their watersheds. The purpose of the inventories is to identify areas to be protected and/or restored through the use of development controls, as determined necessary by the local municipalities. The municipalities will perform identification and mapping of "sensitive areas" (as defined in the performance standards). STOPPP assistance will include guidance on assessment of creek and habitat conditions by field observation, estimates of impervious cover in the watersheds and other indicators. These efforts will be coordinated with the STOPPP Watershed and ~~Collaborative~~ Monitoring Subcommittee's development of impervious surface cover measurements as a tool for watershed management in San Mateo County.

Task 5.3 Assist with Implementing Stormwater Quality Controls

Increase Knowledge and Use of Appropriate Controls

The General Program will track the implementation of stormwater controls in municipal and private projects. Tracking will primarily be conducted through discussion of municipal "case studies" at New Development Subcommittee meetings and quarterly/biannual reports from municipalities. The Subcommittee will also continue to investigate and inform municipalities about the effectiveness of individual structural controls (e.g., grass swales, inlet filters, etc.) by: 1) doing literature reviews and periodically updating the *Guidance on Permanent Stormwater Controls for New and Redevelopment in San Mateo County*; and 2) identifying opportunities for and recommending BMP monitoring studies to the Watershed and ~~Collaborative~~ Monitoring Subcommittee.

Control Discharges from Construction-Related Activities

The General Program will support municipalities' efforts to control pollutant discharges (including sediment) from construction sites, as described in the performance standards.

Activities may include:

- Assistance with education of municipal inspectors on what to look for during inspections, BMPs and erosion/sedimentation controls, and reporting;
- Development of a model certification letter for municipalities to demonstrate completion of pre-wet season inspections;
- Guidance to municipalities on reviewing local erosion control or grading ordinances for adequacy and effectiveness;
- Outreach to developers and contractors (see the *Promote Outreach* section below), including review and update (if needed) of the *Construction Activity BMPs* brochures; and
- Consideration of positive incentive programs to encourage contractors to implement BMPs.

The Subcommittee will also track and inform municipalities about changes to the State Board's General Construction Activity Stormwater NPDES Permit, which is scheduled for reissuance in 1998.

Promote Outreach

The objectives of this subtask are to continue and expand existing outreach programs and to prepare and distribute appropriate educational materials. Initial outreach efforts have focused on education of municipal planners and engineers through monthly New Development Subcommittee meetings and annual workshops. These efforts will continue to ensure that stormwater quality controls are addressed during the planning and design phase for both private and municipal projects. The General Program will conduct at least one workshop (or equivalent) for municipal staff each year. In the initial years of this SWMP, the outreach will focus on helping municipal planners and engineers understand their responsibilities for

implementing the performance standards and coordinating their efforts among internal departments.

Additional outreach is needed for educating contractors, developers and owner/builders, and elected officials such as Planning Commissions and City Councils. The New Development Subcommittee will discuss methods for reaching these target audiences, and conduct at least one outreach effort or event each year for one or more of these groups. The Subcommittee may coordinate its outreach to developers and contractors with efforts by BASMAA (e.g., the proposed regional construction education program) and Regional Board staff (e.g., erosion control certification).

This task also includes preparation and distribution of educational materials to promote awareness of appropriate stormwater controls and other issues of importance to the Subcommittee. Outreach pieces will be designed based on the target audience and intended use, with assistance and review by the Public Information/Participation Subcommittee to ensure that materials are consistent and user-friendly.

Ensure Adequate Implementation Measures

The objective of this subtask is to encourage each municipality to adopt and implement policies and implementation measures that help preserve and enhance water quality and protect sensitive areas, as indicated in the performance standards (Appendix B).

Because many cities throughout San Mateo County are approaching built-out capacities, municipalities are not finding pressing needs to update their general plans. Nonetheless, it is more efficient for municipalities to consider all proposed changes to their general plans during their regular general plan update period, rather than piecemeal amendments throughout the general plan period. The next general plan update period varies from municipality to municipality. The General Program will encourage implementation by each municipality of appropriate general plan policies during the next update period.

In the meantime, the General Program will encourage the adoption of policies and implementation measures by either council resolution or planning department policy to help preserve and enhance water quality and protect sensitive areas for each municipality, as indicated in the Performance Standards. Specifically, by July 2001, the General Program will update an existing or provide a new technical guidance document that provides examples and/or model language for council resolutions and planning department policies. As indicated in the performance standards, municipalities will be encouraged to tailor, adopt, and fully implement council resolutions or planning department policies by July 2002.

This schedule allows the necessary time for creation, review, adoption and implementation of more practical and effective policies and resolutions. This time frame also allows for greater input from and coordination with the STOPPP Watershed and Monitoring Subcommittee and the incorporation of results from its impervious surface cover measurement studies.

Task 5.4 Assess the Effectiveness of Implemented Controls

There are three main areas in which the effectiveness of municipal programs will be assessed:

1. Implementation of the performance

standards;

2. Enforcement of construction site BMPs, as documented in inspection reports (for sites inspected per the Performance Standards), notices of violation, and other documents; and

3. Requirements for appropriate stormwater controls for both private and municipal development projects, as demonstrated in checklists, conditions of approval, project plans and specifications, or other documents.

The New Development Subcommittee will develop methods for measuring effectiveness in these areas. This may include methods for tracking new development case studies, use of special reporting or inspection forms, or other means. In addition, as described in Task 5.3, the Subcommittee will continue to investigate the effectiveness of individual structural controls and recommend BMP monitoring studies to the Collaborative Monitoring Subcommittee.

Task 5.5 Assist with Regulatory Compliance and Planning

The General Program will conduct five activities under this task:

1. Assist the STOPPP municipalities to comply with the reporting and other requirements of the NPDES permit, including development of deliverable quarterly/semi-annual reporting forms for tracking local program progress and preparation of the new development section of the STOPPP Annual Report;

2. Develop two-year General Program work plans and budgets;

3. Assist with any additional planning needed to improve this section of the SWMP;

4. Continue to assist the New Development Subcommittee to conduct meetings and other activities; and,

5. Develop a detailed work plan and schedule for Subcommittee activities each fiscal year.

Municipalities will be responsible for participating in the Subcommittee as appropriate (see the performance standards) and providing sufficient information on their local programs for the Annual Report.

Table 5-1 Existing Land Use in San Mateo County Municipalities in 1995 [1]

	Total County		Atherton		Belmont		Brisbane		Burlingame		Colma		Daly City		East Palo Alto	
	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent
TOTAL LAND [3]	285,339	100%	3,111	100%	2,904	100%	1,927	100%	3,002	100%	1,315	100%	4,757	100%	1,601	100%
Total Urban Land (1995) [3]	74,333	26%	3,091	99%	2,108	73%	981	51%	2,763	92%	1,110	84%	4,070	86%	1,369	86%
Non-Urban Land [3]	211,006	74%	20	1%	796	27%	946	49%	240	8%	205	16%	687	14%	232	14%
URBAN																
Residential (gross)	48,449	65%	2,856	92%	1,656	79%	213	22%	1,626	59%	42	4%	2,464	61%	892	65%
Mixed Residential/ Commercial	534	1%	0	0%	0	0%	0	0%	3	0%	7	1%	3	0%	22	2%
Commercial/ Services	9,264	12%	230	7%	304	14%	35	4%	494	18%	141	13%	872	21%	193	14%
Mixed Commercial/ Industrial	766	1%	0	0%	0	0%	0	0%	57	2%	0	0%	0	0%	5	0%
Industrial	3,598	5%	0	0%	0	0%	388	40%	383	14%	22	2%	27	1%	77	6%
Major Infrastructure	6,447	9%	3	0%	47	2%	334	34%	126	5%	15	1%	361	9%	94	7%
Military	148	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total Urban Open:	5,127	7%	3	0%	101	5%	12	1%	74	3%	882	79%	343	8%	86	6%
Vacant--Cleared for Redevelopment [4]	462	9%	0	0%	35	35%	0	0%	32	43%	7	1%	3	1%	22	26%
Vacant--Undeveloped [4]	405	8%	0	0%	45	45%	0	0%	0	0%	0	0%	0	0%	7	8%
NON-URBAN																
Agriculture	18,441	9%	7	35%	0	0%	0	0%	0	0%	96	47%	0	0%	0	0%
Rangeland	96,253	46%	12	60%	336	42%	568	60%	47	20%	67	33%	603	88%	35	15%
Wetlands [5]	8,211	4%	0	0%	27	3%	0	0%	17	7%	0	0%	0	0%	178	77%
Forest Land	85,225	40%	0	0%	423	53%	0	0%	12	5%	15	7%	0	0%	0	0%
Sparsely Vegetated	2,876	1%	0	0%	10	1%	378	40%	163	68%	27	13%	84	12%	20	9%

Source: Association of Bay Area Governments. *Existing Land Use in 1995: Data for Bay Area Counties and Cities.* Oakland, CA. 1996.

[1] Not including Water category (ie. specific acreages for streams, canals, lakes, reservoirs, bays, estuaries, or sedimentation ponds).

[2] Numbers are estimates for Unincorporated San Mateo County; Census Designated Places are included as parts of Unincorporated San Mateo County.

[3] Subcategories may not sum to totals, due to rounding errors.

[4] "Vacant--Cleared for Redevelopment" and "Vacant--Undeveloped" are two of several subcategories of "Total Urban Open."

[5] Based on U.S.G.S. Survey Mapping.

Table 5-1 Existing Land Use in San Mateo County Municipalities in 1995 [1]

	Foster City		Half Moon Bay		Hillsborough		Menlo Park		Millbrae		Pacificia		Portola Valley		Redwood City	
	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent
TOTAL LAND [3]	2,293	100%	3,838	100%	4,008	100%	6,543	100%	2,076	100%	7,821	100%	5,814	100%	12,125	100%
Total Urban Land (1995) [3]	2,017	88%	1,253	33%	3,010	75%	4,458	68%	1,913	92%	2,782	36%	2,056	35%	5,908	49%
Non-Urban Land [3]	277	12%	2,585	67%	998	25%	2,086	32%	163	8%	5,038	64%	3,759	65%	6,217	51%
URBAN																
Residential (gross)	1,347	67%	754	60%	2,763	92%	2,716	61%	1,428	75%	1,992	72%	1,972	96%	3,674	62%
Mixed Residential/ Commercial	0	0%	12	1%	0	0%	59	1%	0	0%	22	1%	5	0%	89	2%
Commercial/ Services	158	8%	223	18%	69	2%	623	14%	272	14%	373	13%	49	2%	1,226	21%
Mixed Commercial/ Industrial	262	13%	0	0%	0	0%	232	5%	0	0%	0	0%	0	0%	163	3%
Industrial	0	0%	0	0%	0	0%	284	6%	32	2%	0	0%	0	0%	240	4%
Major Infrastructure	64	3%	77	6%	30	1%	198	4%	116	6%	129	5%	0	0%	351	6%
Military	0	0%	0	0%	0	0%	101	2%	0	0%	15	1%	0	0%	0	0%
Total Urban Open:	185	9%	188	15%	148	5%	245	5%	64	3%	252	9%	30	1%	165	3%
Vacant--Cleared for Redevelopment [4]	59	32%	10	5%	12	8%	0	0%	12	19%	45	18%	0	0%	10	6%
Vacant--Undeveloped [4]	0	0%	0	0%	0	0%	7	3%	5	8%	0	0%	27	90%	57	35%
NON-URBAN																
Agriculture	0	0%	1,525	59%	0	0%	0	0%	0	0%	25	0%	111	3%	0	0%
Rangeland	64	23%	932	36%	171	17%	106	5%	89	55%	4,500	89%	899	24%	141	2%
Wetlands [5]	59	21%	0	0%	0	0%	1,883	90%	0	0%	0	0%	15	0%	5,577	90%
Forest Land	0	0%	32	1%	759	76%	3	0%	37	23%	363	7%	2,701	72%	193	3%
Sparsely Vegetated	153	55%	96	4%	69	7%	94	5%	37	23%	151	3%	32	1%	306	5%

Source: Association of Bay Area Governments. *Existing Land Use in 1995: Data for Bay Area Counties and Cities.* Oakland, CA. 1996.

[1] Not including Water category (ie. specific acreages for streams, canals, lakes, reservoirs, bays, estuaries, or sedimentation ponds).

[2] Numbers are estimates for Unincorporated San Mateo County; Census Designated Places are included as parts of Unincorporated San Mateo County.

[3] Subcategories may not sum to totals, due to rounding errors.

[4] "Vacant--Cleared for Redevelopment" and "Vacant--Undeveloped" are two of several subcategories of "Total Urban Open."

[5] Based on U.S.G.S. Survey Mapping.

Table 5-1 Existing Land Use in San Mateo County Municipalities in 1995 [1]

	San Bruno		San Carlos		San Mateo		San Mateo County [2]		South San Francisco		Woodside	
	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent	acres	percent
TOTAL LAND [3]	4,045	100%	3,581	100%	7,821	100%	193,886	100%	5,678	100%	7,193	100%
Total Urban Land (1995) [3]	3,252	80%	2,936	82%	7,211	92%	12,183	6%	5,310	94%	4,552	63%
Non-Urban Land [3]	793	20%	645	18%	610	8%	181,699	94%	368	6%	2,642	37%
URBAN												
Residential (gross)	1,782	55%	2,078	71%	4,856	67%	6,814	56%	2,387	45%	4,137	91%
Mixed Residential/ Commercial	0	0%	42	1%	126	2%	144	1%	0	0%	0	0%
Commercial/ Services	702	22%	319	11%	1,312	18%	896	7%	667	13%	106	2%
Mixed Commercial/ Industrial	0	0%	0	0%	35	0%	0	0%	12	0%	0	0%
Industrial	45	1%	309	11%	40	1%	286	2%	1,465	28%	0	0%
Major Infrastructure	395	12%	156	5%	351	5%	3,039	25%	408	8%	153	3%
Military	12	0%	0	0%	0	0%	15	0%	5	0%	0	0%
Total Urban Open:	316	10%	32	1%	492	7%	987	8%	366	7%	156	3%
Vacant--Cleared for Redevelopment [4]	30	9%	7	22%	20	4%	89	9%	27	7%	42	27%
Vacant--Undeveloped [4]	0	0%	0	0%	0	0%	225	23%	32	9%	0	0%
NON-URBAN												
Agriculture	87	11%	0	0%	0	0%	16,392	9%	30	8%	168	6%
Rangeland	361	46%	284	44%	267	44%	85,973	47%	225	61%	573	22%
Wetlands [5]	0	0%	47	7%	5	1%	371	0%	0	0%	32	1%
Forest Land	161	20%	255	40%	208	34%	78,190	43%	12	3%	1,861	70%
Sparsely Vegetated	185	23%	59	9%	131	21%	773	0%	101	27%	7	0%

Source: Association of Bay Area Governments. *Existing Land Use in 1995: Data for Bay Area Counties and Cities.* Oakland, CA. 1996.

[1] Not including Water category (ie. specific acreages for streams, canals, lakes, reservoirs, bays, estuaries, or sedimentation ponds).

[2] Numbers are estimates for Unincorporated San Mateo County; Census Designated Places are included as parts of Unincorporated San Mate

[3] Subcategories may not sum to totals, due to rounding errors.

[4] "Vacant--Cleared for Redevelopment" and "Vacant--Undeveloped" are two of several subcategories of "Total Urban Open."

[5] Based on U.S.G.S. Survey Mapping.

Table 5-2 Summary of Anticipated Development (1998-2003)

Residential Development	Current Status of Parcels	Total Units To Be Built	Total Acres
Single-family residential	Vacant	1,170	979
	Developed	1,229	109
Multi-family development	Vacant	950	214
	Developed	190	20
		3,539	**1,322**
Commercial & Industrial Development	**Current Status of Parcels**	**Parcel Size Range (acres)**	**Total Acres**
	Vacant/ undeveloped	0.11-100	479
	Developed	0.03-124	314
		0.03-124	**793**

Table 5-3 Priority Development Types and Potential Stormwater Impacts[1]

Development Type	Potential Impacts
Priority 1: Commercial, industrial, and residential projects with large, open parking lots.	Large increase in impervious area (increased runoff, accumulation of pollutants, stream degradation); increased traffic.
Priority 2: Low-density single-family residential (parcels of 10,000 square feet or more).	Disturbs previously undeveloped land, often in sensitive areas; roads to development increase pollutants; increase in auto-related pollutants due to long drives and increased auto-trip frequency for residents.
Priority 3: Medium-density single-family residential (parcels less than 10,000 square feet).	Density usually requires significant changes in topography; drainage goes directly to storm drains; increased impervious surface; can contribute to urban sprawl and traffic impacts.

[1] EOA, Inc. *Guidance on Permanent Stormwater Controls for New and Redevelopment in San Mateo County.* Prepared for STOPPP New Development Subcommittee. December 1996.

General Program Lead

Member Agency Lead

Figure 5-1 Task Lead and Schedule for New Development and Construction Controls

Task	Description	Year	FY 1998/99				FY 1999/00				FY 2000/01				FY 2001/02				FY 2002/03			
			Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr
	5.0 New Development and Construction Controls																					
5.1	Implement Performance Standards																					
	Assist with Performance Standards																					
5.2	Conduct Watershed Resource Inventory and Planning																					
5.3	Assist with implementing Stormwater Quality Controls																					
5.4	Evaluate the Effectiveness of Implemented Controls																					
5.5	Assist with Regulatory Compliance and Planning																					

Annual Report

ATTACHMENT 5-1

Definition of Categories in Table 5-1

Definition of Categories in Table 5-1

URBAN	
Residential:	Gross residential acreage of houses, apartments, mobile home parks, garages, sheds, lawn, and streets. Excludes mixed use.
Mixed Residential/ Commercial:	Areas combining both residential and commercial/services aspects.
Commerical/ Services:	Retail and wholesale commercial, outdoor recreation, education, hospitals, rehabilitiation centers, other public facilities/ institutions (fire, police, city hall, jail) research centers, offices, hotels. Excludes mixed use.
Mixed Commercial/ Industrial:	Areas combining both commercial/services and industrial aspects.
Industrial:	Includes heavy and light industrial, recycling, and metal salvage. Excludes mixed use.
Major Infrastructure:	Major roads, rail, carports, marine transportation, municipal wastewater and water supply facilities, communications facilities, and power facilities.
Military:	Areas used by the armed forces including residential, commercial, hospitals, communications, airports and ports, and open lands.
Total Urban Open:	Affected by urban development but with minimal paving and buildings. Extensive recreation (golf, racetracks), cemetaries, parks, open space, open land that has been developed as an urban use, but is currently vacant.
Vacant--Cleared For Redevelopment:	Subcategory of Total Urban Open. Selected land that has been developed as an urban use but is currently vacant.
Vacant--Undeveloped:	Subcategory of Total Urban Open. Undeveloped open areas and vacant lots slated for urban development and open areas on urban/rural boundary.
NON-URBAN	
Agriculture:	Harvested, idle, cultivated cropland or pasture, includes orchards, groves, vineyards, nurseries, ornamental horticulture, confined feeding lots, and farmsteads.
Rangeland:	Where natural vegetation is grasses, grass-like plants, shrubs, bushy, chaparral.
Wetlands:	Includes forested (seasonally flooded bottomlands, swamps, wooded swamps), non-forested wetlands (marshes, meadows, prairies, open bogs), and salt evaporators. Identifies general land use patterns consistent with USGS, not US Fish and Wildlife Service.
Forest Land:	Trees, including deciduous.
Sparsely Vegetated:	Having limited ability to support life; general absence of vegetation such as salt flats, beaches, sand, bare and exposed rock, strip mines, quarries, gravel

ATTACHMENT 5-2

Land Use Survey Results (For Period 1998-2003)

Land Use Survey Results (For Period 1998-2003)

	Atherton	Belmont	Brisbane	Burlingame	Colma	Daly City	East Palo Alto	Foster City (f)	Half Moon Bay	Hillsborough	Menlo Park	Millbrae	Pacifica (l)	Portola Valley	Redwood City	San Bruno	San Carlos (r)	San Mateo	San Mateo County	South San Francisco	Woodside (aa)	TOTALS
Single-Family Detached to be Constructed On:																						
Presently Vacant/ Undeveloped Land																						
Acres	NP	NP	16.5	0	0	NP	NP	0	67	20	34.3	2.74	334	300 (n)	NP	0	7.8	NP	110	86.3	NP	978.6
Units	NP	NP	97	0	0	NP	NP	0	450	8	140	7	140	46	NP	0	19	NP	69	194	NP	1170
Typical Parcel size (ac.)	NP	NP	0.11	NA	NA	NP	NP	NA	0.15	2.5	0.2	0.36	0.115	2.3	NP	NA	0.46	NP	NP	0.1	4.06	1.035
Parcel size range low (ac.)	NP	NP	0.14	NA	NA	NP	NP	NA	0.11	2	0.1	0.19	0.069	1	NP	NA	0.23	NP	NP	0.1	0.46	0.07
Parcel size range high (ac.)	NP	NP	0.95	NA	NA	NP	NP	NA	0.23	3	0.25	0.861	5	3 (o)	NP	NA	0.5	NP	NP	0.13	10	10
Presently Developed Land (Redevelopment/Infill Sites)																						
Acres	NP	NP	12	NP	0.45	NP	NP	NP	7.5	NP	NP	0.19	0	1.39	NP	0	1.2	NP	35	51.5	NP	109.2
Units	NP	NP	85	1 (b)	6	NP	NP	NP	50	10 (g)	NP	1	0	5	NP	0	3	NP	750	318	NP	1229
Typical Parcel size (ac.)	NP	NP	0.11	0.14	0.075	NP	NP	NP	1.5	0.5	NP	0.19	NA	0.18	NP	NA	0.15	NP	0.23	0.12	4.06	0.659
Parcel size range low (ac.)	NP	NP	0.06	0.11	0.075	NP	NP	NP	0.15	0.5	NP	0.19	NA	0.13	NP	NA	0.15	NP	0.11	0.1	0.46	0.06
Parcel size range high (ac.)	NP	NP	0.5	0.14	0.075	NP	NP	NP	3	2	NP	0.19	NA	0.2	NP	NA	0.23	NP	40	0.27	10	40
Single-Family Attached or Multi-family Development to Be Constructed On:																						
Presently Vacant/ Undeveloped Land																						
Acres	NP	NP	38.8	0	0	NP	NP	5.2	4.3	NA	NP	0	18	NP	NP	0	0	NP	120	27.8	NP	214.1
Units	NP	NP	352	0	0	NP	NP	129	60	NA	NP	0	7	NP	NP	0	0	NP	234 (p)	168	NP	950
Typical Parcel size (ac.)	NP	NP	0.63	NA	NA	NP	NP	0	1	NA	NP	NA	0.115	NP	NP	NA	NA	NP	NP	0.06	4.06	0.984
Parcel size range low (ac.)	NP	NP	0.38	NA	NA	NP	NP	NP	0.4	NA	NP	NA	0.115	NP	NP	NA	NA	NP	NP	0.06	0.46	0.06
Parcel size range high (ac.)	NP	NP	0.88	NA	NA	NP	NP	NP	2	NA	NP	NA	5	NP	NP	NA	NA	NP	NP	0.09	10	10
Presently Developed Land (Redevelopment/Infill Sites)																						
Acres	NP	NP	1.5	0.92	0.38	NP	NP	NP	0.67	NA	0.34	2	0	NP	NP	0.5	1.4	NP	10	2.58	NP	20.29
Units	NP	NP	2.5	40	7.5 (e)	NP	NP	NP	8	NA	6	1	0	NP	NP	3	50 (s)	NP	37.5 (u)	34	NP	189.5
Typical Parcel size (ac.)	NP	NP	0.11	0.14	0.075	NP	NP	NP	0.2	NA	0.34	2	NA	NP	NP	0.15	0.14	NP	0.46	2.58	4.06	0.932
Parcel size range low (ac.)	NP	NP	NP	0.14	0.075	NP	NP	NP	0.2	NA	0.34	2	NA	NP	NP	0.12	0.14	NP	0.23	NP	0.46	0.08
Parcel size range high (ac.)	NP	NP	NP	0.46	0.75	NP	NP	NP	0.4	NA	0.34	2	NA	NP	NP	0.18	0.41	NP	1	NP	10	10
Commercial or Industrial Development to Be Constructed On:																						
Presently Vacant/ Undeveloped Land																						
Acres	NP	NP	42	7	20	NP	NP	93 (g)	0.001	NA	14.15	15.6	52.7	1	NP	0	7.2	NP	7.5 (v)	219	NP	479.4
Units	NP	NP	3 (a)	2 (c)	4	NP	NP	NP	12.63 (h)	NA	5.83	4	450 (m)	1 (p)	NP	0	NA	NP	7.5 (w)	(x)	NP	490
Typical Parcel size (ac.)	NP	NP	10	2.5 (d)	5	NP	NP	10 (z)	10	NA	3	3.9	0.115	1	NP	NA	0.5	NP	NP	NA	NA	4.635
Parcel size range low (ac.)	NP	NP	10	2	2	NP	NP	1.4	1	NA	1	1.6	0.115	1	NP	NA	0.2	NP	NP	1.1	NA	0.11
Parcel size range high (ac.)	NP	NP	22	5	10	NP	NP	27 (g)	20	NA	10.72	7.3	5	1	NP	NA	4	NP	NP	100	NA	100
Presently Developed Land (Redevelopment/Infill Sites)																						
Acres	NP	NP	72	10	10	NP	NP	NP	124	NA	11.1	21.9 (k)	8	NP	NP	7.5 (q)	22	NP	7.5 (v)	19.9	NP	313.9
Units	NP	NP	9 (a)	2 (c)	4	NP	NP	NP	1 (i)	NA	4.11	20 (k)	100	NP	NP	NA	NA	NP	5	(y)	NP	145.1
Typical Parcel size (ac.)	NP	NP	8	3	2	NP	NP	NP	124	NA	1.6	1	0.115	NP	NP	0.5	0.75	NP	NP	NA	0.93	14.19
Parcel size range low (ac.)	NP	NP	5.6	2	1	NP	NP	NP	124	NA	0.25	0.2	0.115	NP	NP	0.5	0.25	NP	NP	0.34	0.03	0.03
Parcel size range high (ac.)	NP	NP	11.3	5	5	NP	NP	NP	124	NA	3	17.2	2	NP	NP	6	6	NP	NP	9.5	8.27	124

Land Use Survey Results (For Period 1998-2003)

Notes:

Values are approximate; were gathered merely to determine trends in future development, but not actual acreages projected.
NP: Not Provided.
NA: Not Applicable.
ac.: Acres.
(a): Sites; units not provided.
(b): 1 SFD/ Remodels/ Additions.
(c): 1 office development/ 1 hotel expansion.
(d): Took mean of range: 2-3 acres.
(e): Took mean of range: 5 to 10.
(f): Took areas with high potential for development within next 5 years only.
(g): Includes Public developments.
(h): Took mean of 450,000-650,000 sf.
(i): Golf course.
(j): Tear downs.
(k): Does not include 17.2 acres, 20 parcels associated with new BART station, for which improvements being made are within BART's jurisdiction and appear not to be a part of the SM STOPPP.
(l): Single-family data from vacant land survey (3/92); Commercial/industrial data from survey summary (2/86). Last General Plan update: 1980. Defined "redevelopment/infill" as redevelopment projects only.
(m): Tenant units or buildings.
(n): Includes PUD cluster projects with significant open space. Does not include development of individual existing 1 ac. & vacant parcels which have been developing at rate of roughly 9 per year).
(o): 3.0+
(p): One 7,000-8,000 sf (0.16-0.18 ac.) office/ commercial building.
(q): Potential closure of Navy base in 1998 will open 17+ acres of commercial property not included herein.
(r): San Carlos recently annexed a developed (with some vacant land) industrial area; future plans for this area are unclear. Future trends indicate mostly redevelopment. For industrial/ commercial sites, parcel size is grouped at extremes, not average.
(s): 40 net, 50 gross.
(t): In large projects, pending.
(u): Took mean of range (5-10 units/year over 5 years).
(v): Took mean of range (1-2 acres/year over 5 years).
(w): Took mean of range (1-2 buildings/year).
(x): Number of units not provided. Includes 948,670 sq ft (21.8 ac.) OFC/R&D; 1,000-1,900 hotel rooms; 150,000 sf (3.4 ac.) retail.
(y): Number of units not provided. Includes 147,000 sf (3.4 ac) R&D; 1,991 Parking spaces; 124 hotel rooms.
(z): Comprised of average of high probability cases.
(aa): Woodside provided information for existing development. Thus only parcel size responses, which are expected to remain constant through the end of the planning period (i.e., Jan. 2003), were used.

ATTACHMENT 5-3

NPDES Permit Compliance for Construction and New Development

- Checklist for Permanent Stormwater Quality Controls
- Chart for Identifying Required Permanent Stormwater Controls
- Checklist for Construction Requirements

SAN MATEO COUNTYWIDE STORMWATER POLLUTION PREVENTION PROGRAM
NPDES Permit Compliance for Construction and New Development
Checklist for Permanent Stormwater Quality Controls

Req'd	Incl.	Done	Key: Req'd = required conditions for project; Incl. = included in submittal; Done = implemented on site.

I. REQUIREMENTS FOR ALL PROJECTS

The selection of and requirements for permanent stormwater quality controls ("post-construction" BMPs) will depend on the type of development, the amount of impervious area proposed, and location of the project relative to water quality resources. Use the following checklist and the "Regional Board Staff Recommendations" to select appropriate BMPs and provide additional information to applicant.

Req'd	Incl.	Done	
☐	☐	☐	Evaluate type, size, and location of development: • Type of development: ☐ Residential ☐ Industrial ☐ Commercial • Directly connected impervious area[1]: ☐ < 1 acre ☐ 1-5 acres ☐ > 5 acres • Is any part of the project located in a sensitive area[2]? ☐ no ☐ yes
☐	☐	☐	Provide plans for and implement the following post-construction BMPs: *(Check those that apply, using the matrix on the back of this page; for description, see Regional Board Staff Recommendations)* Pollutant Source Controls ☐ Education/training ☐ Landscape controls ☐ Litter controls ☐ Labeling storm drain inlets ☐ Site planning ☐ Street sweeping ☐ Storm drain maintenance ☐ Common car wash area ☐ Grease controls ☐ Trash controls ☐ Cleaning, maintenance and processing controls ☐ Fuel dispensing controls ☐ Outdoor storage controls ☐ Loading dock controls ☐ Public agency project controls Stormwater Volume/Treatment Controls ☐ Runoff control ☐ Roof downspout system ☐ Vegetated swale ☐ Vegetated filter strip ☐ Sand filter ☐ Other treatment control designed to meet a performance goal Other Measures ☐ Stream erosion control ☐ Water quality monitoring ☐ Coverage by and compliance with an Industrial NPDES Stormwater Discharge Permit
☐	☐	☐	Develop an agreement of responsibility and funding for ongoing implementation and maintenance of BMPs, as appropriate for the BMPs required.

NOTES:

1. *Directly connected impervious area* is defined as the area covered by pavement, building roofs, and other impervious surfaces which drain directly into the storm drain, excluding impervious areas which drain directly onto infiltration devices.

2. A project is located in a *sensitive area* if the limit of impervious area will be located less than 200 feet away from a water quality resource, including a wetland, stream, pond, lake, river, or bay.

From: San Francisco Bay Regional Water Quality Control Board, April 1994. *Staff Recommendations for New and Redevelopment Controls for Storm Water Programs.*

NPDES PERMIT COMPLIANCE FOR CONSTRUCTION AND NEW DEVELOPMENT
CHART FOR IDENTIFYING REQUIRED PERMANENT STORMWATER CONTROLS

Best Management Practice (BMP) Required	Res. less than 1 acre DCIA	Res. between 1-5 acres DCIA	Res. greater than five acres DCIA	Res. Sensitive Areas DCIA	Ind. less than 1 acre DCIA	Ind. between 1-5 acres DCIA	Ind. greater than five acres DCIA	Ind. Sensitive Areas* DCIA	Comm. less than 1 acre DCIA	Comm. between 1-5 acres DCIA	Comm. greater than five acres DCIA	Comm. Sensitive Areas
Education/Training	✓	✓	✓	✓								
Landscape Control	✓	✓	✓	✓								
Litter Control	✓	✓	✓	✓								
Labeling Storm Drain Facilities	✓	✓	✓	✓								
Runoff Control	✓	✓	✓	✓	✓	✓	✓	✓				
Site Planning		✓	✓	✓*		✓	✓	✓*		✓	✓	✓*
Swales or Sand Filters		✓	✓	✓*		✓	✓	✓*		✓	✓	✓*
Street Sweeping		✓	✓	✓*		✓	✓	✓*		✓	✓	✓*
Labeling/Maintenance of Storm Drain Facilities		✓	✓	✓*		✓	✓	✓*		✓	✓	✓*
Common Car Wash Area		✓	✓	✓*								
Treatment Control Designed to Meet Performance Goal			✓	✓**			✓	✓**			✓	✓**
Roof Downspout System				✓				✓				✓
Swales				✓				✓				✓
Vegetated Filter Strip				✓				✓				✓
Stream Erosion Control				✓				✓				✓
Water Quality Monitoring				✓**				✓**				✓**
Grease Controls					✓	✓	✓	✓	✓	✓	✓	✓
Trash Controls					✓	✓	✓	✓	✓	✓	✓	✓
Cleaning, Maintenance and Processing Controls					✓	✓	✓	✓	✓	✓	✓	✓
Fuel Dispensing Controls					✓	✓	✓	✓	✓	✓	✓	✓
Outdoor Storage Controls					✓	✓	✓	✓	✓	✓	✓	✓
Loading Dock Controls					✓	✓	✓	✓	✓	✓	✓	✓
Landscape Controls					✓	✓	✓	✓	✓	✓	✓	✓
Public Agency Project Controls					✓	✓	✓	✓	✓	✓	✓	✓
Coverage by and Compliance with an Industrial NPDES Storm Water Discharge Permit					✓	✓	✓	✓				

* For projects between 1-5 acres only.
** For projects greater than five acres only.

The above chart applies to numeric thresholds of directly connected impervious area (DCIA) proposed for residential (Res.), Industrial (Ind.), and Commercial (Comm.) projects. In addition to the above requirements, all projects must meet minimum construction BMPs required for all development projects which are listed on the STOPPP "Checklist for Construction Requirements." These requirements are based on the RWQCB Recommendations and are indicated on the STOPPP Construction Requirements checklist. Additional BMPs may be obtained from your local Planning Department or through the "California Storm Water Construction Activity BMP Handbook".

SAN MATEO COUNTYWIDE STORMWATER POLLUTION PREVENTION PROGRAM
NPDES Permit Compliance for Construction and New Development
Checklist for Construction Requirements

Req'd	Incl.	Done	Key: Req'd = required conditions for project; Incl. = included in submittal; Done = implemented on site.
I. REQUIREMENTS FOR ALL PROJECTS *Provide applicable brochures on construction best management practices (BMPs).*			
☐	☐	☐	1. Store, handle, and dispose of construction materials and wastes properly, so as to prevent their contact with stormwater.
☐	☐	☐	2. Control and prevent the discharge of all potential pollutants, including solid wastes, paints, concrete, petroleum products, chemicals, washwater or sediment, and non-stormwater discharges to storm drains and watercourses.
☐	☐	☐	3. Use sediment controls or filtration to remove sediment from dewatering effluent.
☐	☐	☐	4. Avoid cleaning, fueling, or maintaining vehicles on-site, except in a designated area in which runoff is contained and treated.
☐	☐	☐	5. Delineate clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses with field markers.
☐	☐	☐	6. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
☐	☐	☐	7. Perform clearing and earth moving activities only during dry weather.
☐	☐	☐	8. Limit and time applications of pesticides and fertilizers to prevent polluted runoff.
☐	☐	☐	9. Limit construction access routes and stabilize designated access points.
☐	☐	☐	10. Avoid tracking dirt or other materials off-site; clean off-site paved areas and sidewalks using dry sweeping methods.
II. EROSION AND SEDIMENT CONTROLS *The following requirements apply if: 1) any part of the project disturbs land with a slope exceeding ___ %; 2) the project disturbs ____ SF or more total area; 3) the project involves grading of more than ___ cubic yards of earth; or 4) an erosion and sediment control plan is required by local ordinance.*			
☐	☐	☐	1. Stabilize all denuded areas and install and maintain all temporary erosion and sediment controls continuously between October 1 and May 1 of each year, until permanent erosion controls have been established.
☐	☐	☐	2. Provide a site plan showing the following site characteristics and improvements: ☐ property lines, existing and proposed topography, and slopes; ☐ areas to be disturbed, locations of cut/fill, and soil storage/disposal areas; ☐ areas with existing vegetation to be protected; ☐ existing and proposed drainage patterns and structures; ☐ watercourses or sensitive areas on-site or immediately downstream of project; ☐ designated construction access routes and staging areas.
☐	☐	☐	3. Provide a site plan showing erosion and sediment controls to be used during construction, selected as appropriate from the *California Construction BMP Handbook* (1993) or ABAG *Manual of Standards for Erosion and Sediment Control Measures* (1995): *<continued on page 2>*

SAN MATEO COUNTYWIDE STORMWATER POLLUTION PREVENTION PROGRAM
NPDES Permit Compliance for Construction and New Development
Checklist for Construction Requirements

Req'd	Incl.	Done	Key: Req'd = required conditions for project; Incl. = included in submittal; Done = implemented on site.
			II. EROSION AND SEDIMENT CONTROLS, CONTINUED
			Requirements for an erosion and sediment control site plan: ☐ Provisions for preventing erosion and trapping sediment on-site, such as sediment basins or traps, earthen dikes or berms, silt fences, straw bale dikes, check dams, storm drain inlet protection, soil blankets or mats, covers for soil stock piles, and/or other measures. ☐ Provisions for vegetative cover in disturbed areas, including areas to be seeded, planted, and/or mulched, and types of vegetation proposed. ☐ Provisions for diverting on-site runoff around exposed areas and diverting off-site runoff around the site (e.g., swales and dikes).
☐	☐	☐	4. Provide notes, specifications, or attachments describing the following: ☐ Construction, operation and maintenance of erosion and sediment control measures, including inspection frequency; ☐ Methods and schedule for grading, excavation, filling, clearing of vegetation, and storage and disposal of excavated or cleared material; ☐ Specifications for vegetative cover and mulch, including methods and schedules for planting and fertilization; ☐ Provisions for temporary and/or permanent irrigation.
			III. PROJECTS WITH ≥ 5 ACRES DISTURBED AREA -- *The following requirements apply to all projects with 5 acres or more of disturbed area, which must file a Notice of Intent (NOI) with the State Water Resources Control Board to obtain coverage under the State General Construction Activity NPDES Permit, and must prepare and implement a Storm Water Pollution Prevention Plan (SWPPP).* ***Note: Completion of this checklist does not imply certification of the adequacy of the SWPPP by the local agency.***
☐	☐	☐	A copy of the project's NOI and SWPPP shall be submitted to the planning, building, or engineering department prior to issuance of a grading or building permit.
☐	☐	☐	A copy of the project's NOI and SWPPP shall be kept on-site and made available for review by the inspector upon request.
☐	☐	☐	In addition to erosion control measures in Section II, the SWPPP shall include: ☐ A plan showing designated areas for 1) storage of soils, wastes, and other construction materials, and 2) vehicle and equipment storage and service. ☐ Descriptions of construction BMPs (to be implemented <u>year round</u>) for: ☐ Minimizing pollutant contact with storm water; ☐ Storage, handling and disposal of construction materials and wastes; ☐ Management of non-storm water discharges; and ☐ Spill prevention, control, and cleanup. ☐ Descriptions of and plans showing permanent stormwater control measures, and plans for their inspection and maintenance; ☐ A stormwater monitoring program including site inspections prior to and immediately after storm events.

6 Watershed and Monitoring

GOALS

This component supports the SWMP's implementation and assessment of effectiveness. This support is achieved, in part, by conducting collaborative monitoring to test the effectiveness of BMPs. Information about how well BMPs work is essential to assist the various subcommittees know which BMPs to recommend under different conditions. The testing of BMPs has been and continues to be conducted in collaboration with the other Bay Area municipal stormwater programs through BASMAA and other informal arrangements with these other programs.

This component also supports the SWMP by using aspects of a watershed management approach to prevent and control stormwater pollution. STOPPP's interest is in targeting the use of the public's limited resources in ways that best solve stormwater problems. A watershed management approach will help to improve the likelihood of achieving tangible improvements.

The watershed management approach is defined as the process of identifying and prioritizing a watershed's problems and developing a rational, cost-effective system for their solution. The Regional Board's *Work Plan for the Watershed Management Initiative* (revised July 17, 1997) has identified three different geographic levels of watershed management: 1) San Francisco Bay watershed; 2) sub-regional watersheds which are areas generally defined by county boundaries; and 3) drainage basins from particular creeks. This SWMP encompasses aspects of each of these geographic levels of watershed management.

This component's San Francisco Bay watershed activities include testing to evaluate and improve BMPs for Bay Area-wide use. The entire SWMP addresses, in general, the San Mateo County sub-regional watershed as defined by the Regional Board. Some watershed studies conducted under this component are intended to identify particular water quality and beneficial use impairment problems in creek-specific drainage basins that local stakeholders are in the best position to solve.

The implementation of this component will continue to be conducted in collaboration with other BASMAA member agencies. BASMAA's regional monitoring strategy provides a blueprint of ideas for improving our understanding of stormwater pollution prevention and watershed management. STOPPP actively participated in creating this evolving strategy.

The primary goals of this component include the following:

- Identify effective BMPs;
- Develop tools and compile information needed to identify and help solve creek drainage basin-specific water quality and beneficial use impairment problems; and
- Identify stormwater environmental assessment methods applicable for

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evaluating stormwater impacts and management programs.

EXISTING CONDITIONS

During the initial NPDES permit period, the Watershed and Monitoring Subcommittee undertook special studies to help implement various STOPPP activities. These studies included developing the tools and information needed to better implement illicit discharge detection and elimination, new development site planning, and municipal maintenance. These studies are briefly summarized below.

Microbial Indicator Study

The purpose of this two-year study was to identify whether there was a cost-effective and practicable microbial indicator for use in determining whether the sources of microbial contamination sometimes found in storm drains, creeks, lagoons, and shorelines originate from human or animal sources. Having this type of indicator would help municipal staff to more easily locate and, in some cases to eliminate the sources of the contamination.

The study found that the presence of F+RNA coliphage is a good indicator of human sewage. However, when the F+ RNA coliphage is not present, the source of the contamination may or may not be from human sewage because only a small fraction of people are infected with this microbe. For example, the F+RNA coliphage would probably not be found if a septic tank failed that served one family, but it would most likely be found if sewage leaked from a collection pipe serving a few dozen homes.

Street Sweeping Material Study

The purpose of this study was to quantify the variability in copper concentrations found in street sweeping material so that the amount of copper being removed by street sweeping in San Mateo County could be better estimated. The Regional Board staff has identified copper as one of the pollutants of concern in San Francisco Bay. The variability in the concentration of copper in material from both regenerative air and broom sweepers was significant and appears to be unavoidable. The estimated 2,100 pounds of copper collected annually countywide by street sweeping appears to be consistent with the results of other similar studies nationwide.

Parking Lot BMPs Studies

The New Development Subcommittee concluded that municipalities can have the greatest effect on stormwater quality by targeting new open parking lots for on-site stormwater controls. This was based on the anticipated amount of development of parking lots and the ability municipalities have to control development as described in the *Toward Policies for Long-Term Control of Stormwater Pollutants from New Development*. This interest in better controlling the quality of stormwater runoff from parking lots generated two studies.

The first study evaluated the treatment effectiveness of a stormwater settling and oil and grease removal device called the "Jensen Precast" High Velocity Stormwater Interceptor. One of the STOPPP municipalities required the installation of this treatment device as a condition for development. Testing during six storms in FY 1995/96 showed that the interceptor was effective in removing some pollutants (total copper, total lead, and suspended solids). Most of the pollutants being removed were associated with sand particles since smaller silt and clay particles did not usually have sufficient time to settle out in the

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interceptor. The high levels of total suspended solids found in stormwater runoff from this particular new parking lot resulted from the erosion onto the parking lot of soils that had been disturbed during construction.

STOPPP's second parking lot study focused on obtaining information to better characterize parking lot stormwater runoff. Obtaining information on pollutant concentrations, whether the pollutants are predominantly dissolved or associated with particulates, and the settleability of particulate pollutants, is an essential prerequisite for identifying effective pollutant controls. Based on the results of FY 1996/97 stormwater sampling, the concentrations of copper, lead, and zinc in three San Mateo County parking lots were approximately 50 percent lower than the median values for stormwater runoff from the Santa Clara Valley residential/commercial land use sites. The Santa Clara Valley Urban Runoff Pollution Prevention Program collected stormwater information from residential/commercial land use sites in the late 1980's and early 1990's. The concentrations of these pollutants were lower in San Mateo County parking lots even though the total suspended solids concentrations were higher, but comparable, to the median concentrations in the Santa Clara Valley residential/commercial land use stormwater runoff. About 70 percent of the copper, lead, zinc, and cadmium found in the San Mateo County parking lot study were in the particulate form, which is similar to data found in the Santa Clara Valley's residential/commercial land use stormwater runoff. More testing is being conducted to verify these results in order to identify effective BMPs for new open parking lots. This testing should be completed during FY 1997/98.

Watershed Inventory Survey and Impervious Surface Cover Estimates

The watershed inventory survey was conducted to identify the types of data that exist for watersheds in San Mateo County. This study summarized the sources of existing information on physical/hydrologic/hydraulic conditions, water quality, biological resources, land use, and pollutant sources/controls. The study identified a lack of information about impervious surface cover in specific creek drainages.

The amount of impervious surface cover is believed to be an important indicator of creek condition. Having information on the amount of impervious surface cover should help municipalities to set priorities for which creek drainage basins or parts of drainage basins to focus protection efforts on and what types of measures to use. The stormwater management goals that might be appropriate for creek drainage basins or portions of drainage basins with low amounts of impervious cover include minimizing further increases in impervious cover and the total volume and peak rates of runoff. Creek drainage basins or portions of drainage basins with high existing amounts of impervious cover might be targeted for limiting pollutant loading that affects downstream uses.

As part of a separate study, the San Mateo Creek drainage basin was used to evaluate methods for measuring percent impervious cover. The methods evaluation study identified a cost-effective way to estimate impervious surface cover. The impervious surface cover estimates generated indicate that within the San Mateo Creek drainage basin (below Crystal Springs Reservoir) there appears to be enough impervious surface to impact the creek. The least impact would be expected in the upper watershed, which has approximately 25 percent impervious cover. The lower

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portion of the creek's watershed is more than 55 percent covered with impervious material and would be expected to support few natural uses. Estimates of the percent impervious cover and creek channel condition for several other representative drainages are in the process of being obtained.

The Regional Board placed the numerous small watersheds in San Mateo County in its lowest priority for assistance with grant funds and staffing. The Regional Board staff plans to target these watersheds in FYs 2002/03 to 2004/05 after all of the other watersheds in the Bay Area, except San Francisco and Solano Counties, have been provided assistance.

MAJOR TASKS

The following tasks will be conducted during the next five years as part of the General Program.

Task 6.1 Participate in the BASMAA Monitoring Strategy

STOPPP will continue to participate in updating, revising, and developing the details for implementation of the BASMAA monitoring strategy. Many of the details for implementing the strategy will need to be developed and the overall strategy will need to continue evolving to meet BASMAA member agencies' needs. STOPPP is committed to helping to implement a BASMAA monitoring strategy that achieves STOPPP's goals. STOPPP's continued participation is expected to occur as part of BASMAA's regular meetings. The input of STOPPP's Watershed and Monitoring Subcommittee is essential to assure that the views of STOPPP's member agencies are expressed in the strategy.

Task 6.2 Evaluate BMP Effectiveness

STOPPP will continue to evaluate the effectiveness of BMPs as part of the assistance it provides to other STOPPP subcommittees This evaluation may take the form of testing BMPs or reviewing the testing conducted by others. The type of BMP assistance that the other STOPPP subcommittees need will be determined at least every two years, and this information will be used to update and revise the BASMAA Monitoring Strategy, if needed, as part of Task 6.1.

Task 6.3 Conduct Watershed Assessment

STOPPP will collect information on the percent of impervious surface cover and channel condition of creek drainage basins that have not previously been evaluated. This information will be obtained for all of the significant urbanized, creek-specific drainage basins flowing into San Francisco Bay. These drainage basins may include the main portions of the Cañada de Guadalupe, San Bruno, Mills, Sanchez, Pulgas, Belmont, and Redwood Creeks. On the coast side the four drainage basins that include significant urbanized areas may be assessed. These may include the drainage basins for San Vincente/Montara, Calera, Frenchmans, and Pilarcitos Creeks. The exact ten additional drainage basins that will be assessed will be determined by the Watershed and Monitoring Subcommittee. This work will be completed by June 2000.

By June 2001, STOPPP will prepare a report that summarizes existing information about the state of San Mateo County's creek-specific drainage basins that have significant urbanized areas. The report will cover the drainage basins about which STOPPP developed information about impervious surface cover. This report is intended to assist

STOPPP and the Regional Board staff as they initiate "targeted watershed activities" in San Mateo County in FY 2002/2003.

Task 6.4 Assist with Regulatory Compliance and Planning

STOPPP will prepare the NPDES permit required reports to document this component's progress. This will include developing the biennial General Program work plans and budget and assisting with any additional planning and modifications needed to improve this section of the SWMP. The goal of STOPPP is to review the SWMP at least every two years so that the plan may be modified, if needed, for use for more than five years.

STOPPP will also assist the Watershed and Monitoring Subcommittee to conduct its meetings as part of this task.

Task 6.5 Evaluate the Effectiveness of the Watershed and Monitoring Studies Conducted

The purpose of this task is to critically evaluate the effectiveness of the work being conducted as part of this component of the SWMP. In addition, STOPPP will review stormwater environmental indicator assessment methods applicable for use in evaluating stormwater impacts and management programs. Useful assessment methods will be tracked to measure progress.

General Program Lead

Member Agency Lead

Figure 6-1 Task Lead and Schedule for Watershed and Monitoring

Task	Description	Year	FY 1998/99				FY 1999/00				FY 2000/01				FY 2001/02				FY 2002/03			
			Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr
	6.0 Watershed and Monitoring																					
6.1	Participate in BASMAA Monitoring Strategy																					
6.2	Evaluate BMPs Effectiveness						▲				▲				▲				▲			
6.3	Conduct Watershed Assessment						▲				▲				▲				▲			
6.4	Assist with Regulatory Compliance and Planning						▲				▲				▲				▲			
6.5	Evaluate Effectiveness of Conducted Studies																					

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APPENDIX A

FYs 1998/99 and 1999/00 General Program Work Plans and Budgets

APPENDIX A

FYs 1998/99 and 1999/00 General Program Work Plans and Budgets

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Table A1-1. FY 1998/99 General Program Budget Summary

Budget Categories		FY 1998/99 General Program Budget
Personnel Services		
Executive Director		$20,000
Program Manager		$45,000
Program Secretary		$3,000
Member Agency Support		$46,200
	Subtotal	$114,200
Fees and Dues		
Annual NPDES Permit Fee		$10,000
Bay Protection and Toxic Cleanup Program		$10,000
BASMAA Dues		$26,200
Regional Monitoring Program		$65,200
	Subtotal	$111,400
Supplies and Other Charges		
Copier and Service Agreement		$1,500
Membership/Publications		$500
Travel and Meetings		$2,500
Education and Training		$1,000
	Subtotal	$5,500
Additional Expenses		
Data Base Management		$12,500
EDP Consultant Work		$6,000
Controller's Processing Fee @ $.30/APN		$45,000
One-Time Assistance with Obtaining NPDES Permit		$40,000
	Subtotal	$103,500
Tasks in the SWMP		
2.0 Municipal Maintenance		$54,000
3.0 Industrial and Illicit Discharge Controls		$86,000
4.0 Public Information/Participation		$172,000
5.0 New Development		$46,400
6.0 Watershed and Monitoring		$193,000
	Subtotal	$551,400
	TOTAL BUDGET	$886,000

Table A1-2. FY 1999/00 General Program Budget Summary

Budget Categories		FY 1999/00 General Program Budget	
Personnel Services			
Executive Director		$20,000	
Program Manager		$36,000	~~$45,000~~
Program Secretary		$0	~~$3,000~~
Member Agency Support		$22,500	~~$46,200~~
Miscellaneous		$1,000	
	Subtotal	$79,500	~~114,200~~
Fees and Dues			
Annual NPDES Permit Fee		$10,000	
Bay Protection and Toxic Cleanup Program		$0	~~$10,000~~
BASMAA Dues		$26,200	
Regional Monitoring Program		$65,200	
	Subtotal	$101,400	~~$111,400~~
Supplies and Other Charges			
Copier and Service Agreement		$0	~~$1,500~~
Publications		$15,000	~~$500~~
Conferences and Meetings		$1,500	~~$2,500~~
Education and Training		$0	~~$1,000~~
	Subtotal	$16,500	~~5,500~~
Additional Expenses			
Data Base Management		$12,500	
EDP Consultant Work		$6,500	~~$6,000~~
Controller's Processing Fee @ $.30/APN		$45,000	
Permit Implementation Assistance		$10,000	
	Subtotal	$74,000	~~$73,500~~
Tasks in the SWMP			
2.0 Municipal Maintenance		$69,000	~~54,000~~
3.0 Industrial and Illicit Discharge Controls		$91,000	~~86,000~~
4.0 Public Information and Participation		$168,118	~~172,000~~
5.0 New Development		$46,400	
6.0 Watershed and Monitoring		$193,000	
	Subtotal	$567,518	~~551,400~~
	TOTAL BUDGET	$838,918	~~$856,000~~

Table A2-1. Municipal Maintenance General Program Work Plan and Budget - FY 1998/99

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. Identify and assess feasibility of pilot studies to compliment performance standard development.	See SWMP	$4,000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	Outreach activities will educate maintenance staff and the public about the STOPPP goals related to municipal maintenance and provide information on how the public can help the municipalities achieve these goals. A minimum of one public outreach piece will be developed every two years beginning with FY 1998/99.	$16,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$10,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance.	See SWMP	$24,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Total Budget		**$54,000**	

Table A2-2. Municipal Maintenance General Program Work Plan and Budget - FY 1999/2000

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. Identify and assess feasibility of pilot studies to compliment performance standard development. The performance standards will be reviewed and improvements will be prepared, as appropriate, for approval by the STOPPP and for submittal to the Regional Board. A new Park and Recreation Work Group will develop integrated pest management performance standards for use by the municipalities when they conduct pest control activities. This task will include establishing and assisting the Park and Recreation Work Group	Improvements identified for the performance standards will be formally considered by the Maintenance Subcommittee every two years beginning in FY 1999/00. A minimum of one performance standards will be developed every two years beginning in FY 1999/00. The development of integrated pest management performance standards is a requirement of the NPDES permit	$7,000 $15,000	Ongoing June 30, 2000
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$13,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$10,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance.	See SWMP	$24,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Total Budget		~~$54,000~~ 69,000	

Table A3-1. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 1998/99

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation of the performance standards: Assist the municipalities to understand and implement the performance standards. Materials that help inspectors implement the performance standards will be identified, copied and distributed for addition to the inspectors' binder.	See SWMP	$4,000	ongoing
3.2 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist with NPDES permit required reporting (including C/I/I section of annual reports and reports to support requests for discharge exemption for conditionally exempt non-stormwater discharges); conduct individualized performance reviews of half of the municipal programs; assist the C/I/I Subcommittee conduct its meetings; revise two year work plan and budget as needed; and provide other regulatory compliance assistance	See SWMP	$53,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
3.3 Provide Training and Outreach Materials: Provide training of municipal staff responsible for identifying and eliminating illicit discharges. Identify plan for updating, adapting and developing outreach materials.	Educational outreach and training with business and trade organizations will be conducted in years when municipal staff training is not.	$12,000	May 1999
3.4 Provide Incentives for Businesses to Comply: Work with business organizations to identify what types of incentives would be appropriate to offer.	The implementation of agreed upon incentives will be initiated in FY 1999/00.	$4,000	ongoing
3.5 Evaluate the Effectiveness of Implemented Controls: Information from the FY 1997/98 inspections will be inputted into a database and trends evaluated.	See SWMP	$13,000	April 1999
Total Budget		**$86,000**	

Table A3-2. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 1999/00

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements, if any, may be prepared for approval by STOPPP for submittal to the Regional Board.	Possible improvements in the performance standards will formally be considered by the Commercial/Industrial/Illicit Subcommittee every two years starting in FY 1999/00.	$2,000	ongoing
3.2 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist with NPDES permit required reporting (including C/I/I section of annual reports and compilation and submittal of the new Mid-Fiscal Year Report); conduct individualized performance reviews of half of the municipal programs; assist the C/I/I Subcommittee conduct its meetings; revise two year work plan and budget as needed; and provide other regulatory compliance assistance	See SWMP	~~$50,000~~ 55,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
3.3 Provide Training and Outreach Materials: Provide training and educational outreach to business or trade organization. Begin to implement the agreed upon plan for updating, adapting and developing outreach materials. Actual design, layout, and printing costs for outreach material will be funded as part of the PI/P General Program budget.	Educational outreach and training of municipal staff will be conducted in years when outreach to businesses is not.	$14,000	May 2000
3.4 Provide Incentives for Businesses to Comply: Provide incentives to businesses that participate in the training and implement other incentives as developed during FY 1998/99.	See SWMP	$4,000	ongoing
3.5 Evaluate the Effectiveness of Implemented Controls: Information from the FY 1998/99 inspections will be inputted into a database. A survey of businesses will be conducted to find out how well STOPPP's educational outreach and inspections are working.	See SWMP	$16,000	April 2000
Total Budget		~~$86,000~~ 91,000	

Table A4-1. Public Information and Participation General Program Work Plan and Budget - FY 1998/99

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
4.1 Assist implementation of the performance standards: Assist the municipalities to understand and implement the performance standards.	See SWMP	$2,000	ongoing
4.2 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist with NPDES permit required reporting (including PIP section of annual reports); assist the PIP Subcommittee conduct its meetings; revise two year work plan and budget as needed; and provide other regulatory compliance assistance.	See SWMP	$20,000 (Subcommittee - $11,000) (Reporting - $7,000) (Other - $2,000)	NPDES permit required reports will be completed by required dates. other activities will be ongoing
4.3 Encourage Public Involvement, Outreach and Education: Continue the Paint Point of Purchase (POP) campaign and assist the subcommittee select the next targeted campaign subject area. Continue to implement the general outreach by purchasing and providing $8,000 of promotional materials (unrelated to the POP campaign) for distribution by the General Program and STOPPP's member municipalities. Provide educational outreach to fourth graders using either an assembly-type program or classroom instruction type of program.	See SWMP	$87,000 (media ads 16,000) (POP campaign - 40,000) (promotional items - 8,000) (educational outreach to schools - 23,000)	ongoing
4.4 Assist with Focused Staff Training: Assist the PIP Subcommittee identify and prioritize its training needs.	See SWMP - Task will be conducted as part of Task 4.2. Agreed upon training will be conducted in FY 1999/00.	$0	Dec. 1998
4.5 Collaborate with Other Groups: Continue to provide Community Outreach Grants (COGs), participate in BASMAA's regional advertising campaigns, and assist other STOPPP subcommittees.	See SWMP	$63,000 (COGs - 10,000) (assist with COGs - 3,000) (BASMAA ads - 45,000) (other subcommittees - 5,000)	ongoing
Total Budget		**$172,000**	

Table A4-2. Public Information and Participation General Program Work Plan and Budget - FY 1999/00

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
4.1 Implement and Assist with the Performance Standards: Assist the municipalities to understand and implement the performance standards.	See SWMP	$2,000	ongoing
4.2 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist with NPDES permit required reporting (including PI/P section of annual reports); assist the PI/P Subcommittee conduct its meetings; revise two year work plan and budget as needed; and provide other regulatory compliance assistance.	See SWMP	$20,000 (Subcommittee - $11,000) (Reporting - $7,000) (Other - $2,000)	NPDES permit required reports will be completed by required dates. other activities will be ongoing
4.3 Encourage Public Involvement, Outreach, and Education: Conduct market research for the next targeted campaign. Continue to implement the general outreach by updating, adapting, designing, laying out, and printing informational materials for the PI/P and other subcommittees; purchase and provide promotional materials for distribution by the General Program and STOPPP's member municipalities; conduct stormwater public education outreach surveys of residents to identify the effectiveness of previous PI/P efforts; and conduct a similar, separate survey of businesses. Provide educational outreach to fourth graders using either an assembly-type program or classroom instruction type of program.	See SWMP	$87,000 (market research 16,000) (Informational materials- 18,000) (promotional items - 8,000) (survey of residents - 12,000) (survey of businesses - 12,000) (educational outreach to schools - 21,000)	ongoing
4.4 Assist with Focused Staff Training: Implement the public information and participation training agreed upon in FY 1998/99.	See SWMP	~~$5,000~~ 1,118	Dec. 1999
4.5 Collaborate with Other Groups: Continue to provide Community Outreach Grants (COGs), participate in BASMAA's regional advertising campaigns, and assist other STOPPP subcommittees.	See SWMP	$58,000 (COGs - 10,000) (BASMAA regional ads - 45,000) (other subcommittees - 3,000)	ongoing
Total Budget		~~$172,000~~ 168,118	

Table A5-1. New Development and Construction Controls General Program Work Plan and Budget - FY 1998/99

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: Prepare and distribute information to assist the municipalities understand and implement the performance standards.	See SWMP. Performance standards are reviewed every two years.	$4,500	ongoing
5.2 Conduct Watershed Resource Inventory and Planning: Provide guidance on assessment of creek and habitat conditions through field observations and impervious cover estimates of representative watersheds. Assist municipalities develop a framework useful for including watershed management principles in the development plan review process. Coordinate efforts with Watershed & Collaborative Monitoring Subcommittee.	See SWMP.	$3,200	ongoing
5.3 Assist with Implementing Stormwater Quality Controls: Through the New Development Subcommittee (NDS) meetings and quarterly/ biannual reports from municipalities, track implementation and effectiveness of stormwater controls in municipal and private projects; assist municipalities' efforts to control pollutant discharges from construction sites; expand existing outreach programs and prepare and distribute appropriate educational materials.	See SWMP. This task includes one workshop for municipal staff, one external outreach effort and development or revision of one outreach piece, as appropriate each year.	$15,000	ongoing
5.4 Evaluate the Effectiveness of Implemented Controls: Through the NDS, describe problems with current methods for measuring the effectiveness of performance standard implementation, enforcement of construction site BMPs, and requirements for appropriate stormwater controls, and propose solutions. Test pilot methods for measuring effectiveness. Recommend BMP effectiveness monitoring studies to the Watershed and Collaborative Monitoring Subcommittee.	See SWMP.	$7,400	June 1999
5.5 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); any improvements to the new development section of the SWMP; conducting the NDS meetings; and developing a detailed work plan and schedule for each fiscal year.	See SWMP. General Program work plan and budget are developed once every two years.	$16,300	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Total Budget		$46,400	

Table A5-2. New Development and Construction Controls General Program Work Plan and Budget - FY 1999/2000

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: With input from the New Development Subcommittee, review the performance standards and make any needed improvements.	See SWMP. Performance standards are reviewed every two years.	$5,200	ongoing
5.2 Conduct Watershed Resource Inventory and Planning: Provide guidance on assessment of creek and habitat conditions through field observations and impervious cover estimates of representative watersheds. Assist municipalities develop a framework useful for including watershed management principles in the development plan review process. Coordinate efforts with Watershed & Collaborative Monitoring Subcommittee.	See SWMP.	$2,500	ongoing
5.3 Assist with Implementing Stormwater Quality Controls: Through the New Development Subcommittee meetings and quarterly/ biannual reports from municipalities, track implementation and effectiveness of stormwater controls in municipal and private projects; assist municipalities' efforts to control pollutant discharges from construction sites; expand existing outreach programs and prepare and distribute appropriate educational materials.	See SWMP. This task includes one workshop for municipal staff, one external outreach effort and development or revision of one outreach piece, as appropriate each year.	$14,900	ongoing
5.4 Evaluate the Effectiveness of Implemented Controls: Through the New Development Subcommittee, develop and adopt consistent methods for measuring the effectiveness of performance standard implementation, enforcement of construction site BMPs, and requirements for appropriate stormwater controls. Recommend BMP effectiveness monitoring studies to the Watershed & Collaborative Monitoring Subcommittee.	See SWMP.	$7,500	June 2000
5.5 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit-required reporting (including new development section of annual reports); developing two year work plan and budget for General Program; any improvements to the new development section of the SWMP; conducting the New Development Subcommittee conduct its meetings; and developing a detailed work plan and schedule for each fiscal year.	See SWMP. General Program work plan and budget are developed once every two years.	$16,300	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Total Budget		$46,400	

Table A6-1. Watershed and Monitoring General Program Work Plan and Budget - FY 1998/99

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
6.1 Participate in the BASMAA Monitoring Strategy: Participation will occur as part of BASMAA's regular, monthly Monitoring Committee meetings.	Based on participation at up to 11 meetings	$8,000	ongoing
6.2 Evaluate BMPs Effectiveness: This task includes participating in a study to evaluate the effectiveness of one or more BMPs that have a high priority for evaluation. The exact BMP that will be studied has not been selected yet. The BMP should be one that addresses a specific, significant source of pollutants that can be defined and controlled.	See SWMP	$106,000	draft report completed by June 1999 and final by July 1999
6.3 Conduct Watershed Assessment: Information on percent impervious surface cover and channel condition will be obtained for five of the creek-specific drainage basins listed in the SWMP.	See SWMP	$57,000	draft report completed by June 1999 and final by July 1999
6.4 Assist with Regulatory Compliance and Planning: Assist with the preparation of the FY 1997/98 annual report and work plan and budget report for FY 1999/00. Assist with Watershed and Collaborative Monitoring Subcommittee meetings.	See SWMP	$17,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
6.5 Evaluate the Effectiveness of the Watershed and Collaborative Monitoring Studies Conducted: Track the progress of the Water Environment Research Federation's study to identify assessment methods appropriate for stormwater programs.	See SWMP	$5,000	ongoing
Total Budget		**$193,000**	

Table A6-2. Watershed and Monitoring General Program Work Plan and Budget - FY 1999/00

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
6.1 Participate in the BASMAA Monitoring Strategy: Participation will occur as part of BASMAA's regular, monthly Monitoring Committee meetings.	Based on participation at up to 6 meetings	$4,000	ongoing
6.2 Evaluate BMPs Effectiveness: This task includes participating in a study to evaluate the effectiveness of one or more BMPs that have a high priority for evaluation. The exact BMP that will be studied has not been selected yet. The BMP should be one that addresses a specific, significant source of pollutants that can be defined and controlled.	See SWMP	$106,000	draft report completed by June 2000 and final by July 2000
6.3 Conduct Watershed Assessment: Information on percent impervious surface cover and channel condition will be obtained for five of the creek-specific drainage basins listed in the SWMP.	See SWMP	$59,000	draft report completed by June 2000 and final by July 2000
6.4 Assist with Regulatory Compliance and Planning: Assist with the preparation of the FY 1998/99 annual report and work plan and budget report for FY 2000/01. Assist with Watershed and Collaborative Monitoring Subcommittee meetings.	See SWMP	$17,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
6.5 Evaluate the Effectiveness of the Watershed and Collaborative Monitoring Studies Conducted: Track the progress of the Water Environment Research Federation's study to identify assessment methods appropriate for stormwater programs. Identify what additional information, if any, needs to be collected to improve STOPPP's assessment methods	See SWMP	$7,000	ongoing
Total Budget		**$193,000**	

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APPENDIX B

Performance Standards

APPENDIX B

PERFORMANCE STANDARDS

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(Component 3 of the SWMP) B-ICD-1

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PUBLIC INFORMATION AND PARTICIPATION (Component 4 of the SWMP) B-PIP-1

NEW DEVELOPMENT AND CONSTRUCTION CONTROLS
(Component 5 of the SWMP) B-ND-1

ATTACHMENTS:

Standard Stormwater Facility Inspection Report Form
Definitions for New Development and Construction Controls

INTRODUCTION TO PERFORMANCE STANDARDS

Performance standards to be implemented by member agencies have been developed for the following five areas of the SWMP:

- Municipal Maintenance Activities,
- Industrial and Commercial Discharge Controls,
- Illicit Discharge Controls,
- Public Information and Participation, and
- New Development and Construction Controls.

These performance standards define a large part of what each member agency will need to do to implement the SWMP and comply with the NPDES permit. The implementation of these performance standards by member agencies is required by the SWMP.

These performance standards describe *what* each municipality is responsible for achieving. Each municipality will decide *how* it achieves these performance standards using its own staff, a contracted agency, or other arrangements.

Member agencies are required to start implementing these performance standards on July 1, 1998, unless otherwise noted. One example of a different required start date can be found in the Municipalities' Community Outreach Program of the Public Information/Participation Performance Standard Section (page B - PIP - 3), where a portion of this category is not required to begin until July 1, 2000.

The following provides a brief background on how these performance standards were developed and the process that will be used for their review and improvement.

BACKGROUND

The San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) developed performance standards as a tool to help STOPPP member agencies comply with their NPDES permit. The Clean Water Act and STOPPP's stormwater NPDES discharge permit require STOPPP member agencies to control discharges of pollutants to the maximum extent practicable (MEP) and to effectively prohibit illicit discharges. STOPPP developed the performance standards to define the MEP level of effort that each member municipality will attain to control pollutants in stormwater. In addition, the performance standards define the level of effort that each member municipality will attain to effectively prohibit illicit discharges[1] from entering its municipal storm drain conveyance system[2].

The Performance Standards provide an effective, consistent, and predictable countywide approach to minimizing water quality impacts. Having consistent countywide standards assures similar treatment to businesses, developers, contractors, and property owners. In addition, such standards will assist STOPPP member agencies with training and educational

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[1] Illicit discharges include non-stormwater discharges disallowed by the STOPPP NPDES permit.

[2] Municipal storm drain conveyance system includes roads with drainage systems, municipal streets, curbs, gutters, catch basins, storm drain inlets, ditches, man-made channels, or storm drains.

outreach. Furthermore, the performance standards will be used as the basis for measuring the effectiveness of each municipality's planning and permitting procedures, and inspection and enforcement activities.

STOPPP developed its performance standards based on three sources: Alameda Countywide Clean Water Program's Performance Standards, which were adopted by the Regional Board in February 1997 through the Board's public hearing process; Santa Clara Valley Urban Runoff Pollution Prevention Program's Performance Standards, which the Regional Board staff has agreed to; and the practical experience of staff within San Mateo County's municipalities and agencies.

The General Program has the role of advising municipalities on whether they are meeting the agreed upon performance standards and, where a lack of attainment is determined, of providing assistance. The status of each agency's implementation of the performance standards will be described in the annual reports to the Regional Board. Each subcommittee that developed a set of performance standards has been assigned responsibility for resolving general problems with interpreting and attaining the performance standards and for reviewing and updating them as needed, at least every two years.

Program Elements to Be Developed

During the planning period, certain municipalities specified in the reissued NPDES permit will be creating and adopting new performance standards in the areas of rural public works maintenance and lagoon management. For more information, see the forward to Municipal Maintenance Activities on page B-MN-i.[W1]

009923

Performance Standards for

MUNICIPAL MAINTENANCE

INTRODUCTION TO MUNICIPAL MAINTENANCE PERFORMANCE STANDARDS

During the permit planning period, the following program elements will be developed and implemented by the applicable municipalities listed. Other municipalities that contain features that are applicable to these program elements may also consider participating in developing and implementing the performance standards.

Rural Public Works Maintenance Activities

The county of San Mateo and the Cities/Towns of Half Moon Bay, Menlo Park, Pacifica, Portola Valley, and Woodside shall develop jointly by June 30, 2000, performance standards for the following rural public works maintenance and support activities:

a) management and/or removal of large woody debris and live vegetation from channels;
b) streambank stabilization projects;
c) road construction, maintenance, and repairs in rural areas to prevent and control road-related erosion; and
d) environmental permitting for rural public works activities.

Other municipalities that contain streams that drain areas of low imperviousness may also consider participating in developing and implementing the rural maintenance performance standards.

Lagoon Management

The cities of Foster City, Redwood City, and San Mateo will develop jointly by June 30, 2002, a ~~consistent and complete~~ comprehensive set of Performance Standards that address proper lagoon design, herbicide application (including the use of copper containing products as an algaecide), and management of nutrients and sediments.

STORMWATER PUMP STATIONS IN SAN MATEO COUNTY

The San Mateo County Flood Control District and approximately half of the cities in San Mateo County operate and maintain a total of 50 stormwater pump stations. Almost all stormwater pump stations ultimately discharge to San Francisco Bay. The cities of San Mateo and Redwood City each operate approximately 15 pump stations; other cities which operate pump stations include the cities of South San Francisco (5), Burlingame (3), Pacifica (2), San Bruno (2), San Carlos (2), East Palo Alto (1), Foster City (1), Menlo Park (1) and Millbrae (1). The San Mateo County Flood Control District operates 4 pump stations.

I. VISUAL INSPECTIONS

1. Inspect wet wells or forebays once per month in the dry season, and once per week in the wet season, for oil spills or other noticeable discharges.

II. MAXIMIZING REMOVAL OF POLLUTANTS PRIOR TO DISCHARGE

1. Conduct at least one comprehensive cleaning of wet wells annually to remove sediment prior to the start of the rainy season to minimize discharge of sediment. Clean wet wells with a vactor, if possible.

2. If adequate storage exists at pump stations, store oil absorbent materials on-site to clean spills if needed.

3. Contain lubricates, fuel and batteries to prevent accidental spills to wet wells.

4. If any spill is reported or observed (e.g., petroleum products, paint, antifreeze), try to remove the material at the nearest access point. If the material may reach the pump station, the station will be shut down if practical (e.g., a peak storm water event may prevent practical shut down of the pump station).

5. Track spills upstream to try to locate sources of pollution. Document spill incidents as part of the illicit discharge program, and implement appropriate enforcement actions.

6. Store oil absorbent materials in appropriate maintenance vehicles.

III. DISPOSAL

1. Dispose of screenings at a landfill, sediment at a location which will not re-enter the storm drain system or receiving waters through erosion, and oil-absorbed materials as hazardous waste.

IV. EDUCATION

1. Educate all personnel responsible for maintaining stormwater pump stations about these performance standards. At least one staff meeting will be held each year to educate pump station personnel about the performance standards and illicit discharge identification and reporting.

I. GENERAL PRACTICES

1. Schedule excavation and road maintenance activities for dry weather, if feasible.

2. Equipment repairs and refueling or maintaining vehicles and equipment will be conducted in accordance with the Corporation Yard Performance Standard.

3. Recycle used motor oil, diesel oil, concrete, broken asphalt, etc. whenever possible.

4. Train employees in using these performance standards. At least one staff meeting will be held annually to educate road repair and maintenance personnel about these performance standards.

5. Each municipality will provide educational and outreach materials provided by the Regional Board or the General Program, as appropriate, to those utility contractors (e.g., water supply, cable, phone, electrical, etc.) seeking encroachment and/or grading permits from the municipality.

II. ASPHALT/CONCRETE REMOVAL

2. Take measures to protect storm drain inlets prior to asphalt breaking or concrete-sawing operations (e.g., place sand bags or filtering barrier around inlets). Clean afterwards by sweeping up as much material as possible.

3. After breaking up old pavement, remove and recycle as much as possible to avoid contact with rainfall and storm water runoff.

4. During saw-cutting operations, block or berm around storm drain inlets using sand bags or an equivalent appropriate filter device, or absorbent materials such as pads, pillows and socks to contain slurry. If slurry enters the storm drain system, remove the material immediately.

5. Remove saw-cut slurry (e.g., with a shovel or vacuum) before leaving at the end of the day.

III. PATCHING AND RESURFACING

1. To minimize runoff from patching and resurfacing activities, materials will not be stockpiled in streets, gutter areas or near storm drain inlets or creeks unless these areas are protected (e.g. stockpiled material should be covered to minimize stormwater runoff).

2. Cover and seal manholes and storm drain inlets before applying seal coat, slurry seal, etc.

3. Never wash excess material from exposed aggregate concrete or similar treatments into a street or storm drain inlet. Designate an unpaved area for clean up and proper disposal of excess materials.

4. Use only as much water as necessary for dust control to avoid runoff.

5. Sweep up as much material as possible and dispose of properly. Wash down of streets only permitted if runoff is controlled or contained.

6. Clean up all spills and leaks from other equipment and work site areas using "dry" methods (absorbent materials and/or rags). Properly dispose of absorbent materials and rags. If spills occur on dirt areas, the contaminated soil will be removed properly and on a timely basis.

7. After the job is complete, remove stockpiles (asphalt materials, sand, etc.) within five days and other extra materials immediately.

8. If it rains unexpectedly, take appropriate action to prevent pollution of storm water runoff (e.g., divert runoff around work areas).

IV. SIGNING AND STRIPING

1. Store spill absorbent materials on trucks to be used in the event of a spill.

2. Contain and clean up waste materials and dispose of them properly according to the Material Safety Data Sheet.

V. EQUIPMENT CLEAN UP/STORAGE

1. Flush paint sprayer supply lines at the corporation yard. Use approved collection methods and dispose or recycle waste materials at an approved hazardous waste facility.

2. Clean sprayers, patch and paving equipment at the end of the day. Use approved collection methods and dispose or recycle waste materials at an approved facility.

3. Cover sprayers, patch and paving equipment to prevent rainfall from contacting pollutants; if practicable (examples of cover include but are not limited to tarps, over hangs or inside buildings).

I. STREET SWEEPING FREQUENCY

Applicable to the Cities of Atherton, Hillsborough, Portola Valley, and Woodside:

1. Inspect high traffic and other potential problem areas at least twice a year and clean as needed.

Applicable to the Cities of Belmont, Brisbane, Burlingame, Colma, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, San Mateo County, and South San Francisco:

1. Clean streets on at least a monthly average unless an alternative schedule is approved as described in number 2 below. In calculating this average, the number of curb miles swept in a fiscal year divided by the number of curb miles within a municipality will equal twelve or greater. The removal of cars should be encouraged by having a fixed sweeping schedule.

2. If streets are cleaned less than on a monthly average the rationale for the alternative standard must be described in a written action plan. The rationale should demonstrate that the alternative schedule is equivalent in terms of protecting water quality as the annual average sweeping. The action plan must be submitted to the Regional Board as part of the Annual Report. The Municipal Maintenance Subcommittee will review the alternative and provide recommendations prior to submittal to the RWQCB. The alternative standard will not be effective until approved by the Regional Board's Executive Officer, and that approval will be presumed unless it is rejected in writing within 90 days of its submittal.

II. PROBLEMS ASSOCIATED WITH EFFICIENT STREET CLEANING

A. Getting Parked/Abandoned Vehicles off Streets

1. Maintain a consistent sweeping schedule.

2. Take appropriate measures to keep curbed areas clear during street cleaning. Measures may include but are not limited to developing and distributing newsletters and other public education materials notifying residents and businesses of street sweeping schedules.

B. Removing Leaves During Leaf Season

1. Investigate alternative leaf handling methods and implement an appropriate leaf removal program. Leaf removal programs may include but are not limited to the following:

    - Operating street cleaning equipment in tandem; and/or,
    - Using a leaf removal machine prior to cleaning; and/or,

- Using a front end loader with a dump truck prior to cleaning.

2. Encourage residents to collect and compost leaves or coordinate with a local composting program. If composting is not feasible, consider scheduling removal of bagged leaves.

C. Trees Near Streets

1. Provide adequate resources to operators for conveniently reporting trees interfering with street cleaning.

III. STREET CLEANING OPERATION TO MAXIMIZE POLLUTANT REMOVAL

1. Provide a clean looking street, free of dirt tracks, trails or debris.

2. Check street cleaning equipment for proper adjustment.

3. Operate street cleaning equipment at the speed specified by the manufacturer.

IV. STREET CLEANING MAINTENANCE TO MAXIMIZE POLLUTANT REMOVAL

1. Replace worn components as required to maximize efficiency.

V. SPILL RESPONSE

1. Report spills observed on streets immediately for quick response by appropriate personnel.

2. Response to spills in accordance with response procedures described in the Storm Drainage Facility Performance Standards.

VI. RECORD KEEPING

1. Track miles swept using a broom odometer or by tracking mileage only when cleaning (Do not include mileage to an area).

2. Track volume or weight of material removed each street cleaning day.

1. Identify and target areas for: 1) more frequent cleaning throughout the year or just prior to the rainy season; 2) additional efforts to remove vehicles; 3) distribution of public education materials to discourage illegal dumping, etc.

2. Document and track areas where spills were reported and coordinate with your municipality's illicit discharge coordinator.

VII. CONTRACT SWEEPERS

1. Specify in contracts that in case of equipment failure, back up equipment must be available to ensure that the route is completed that day, and that all information necessary for record keeping is provided.

VIII. EDUCATION

1. Municipal staff and contract sweepers responsible for street sweeping shall be trained annually to identify and report illicit discharges, and to comply with the street sweeping performance standards.

I. GENERAL STANDARDS

1. Assign one person the primary responsibility for ensuring that Performance Standards are implemented. This person will also be responsible for ensuring that all persons using the facility are aware of Performance Standards. This person shall be listed as a contact in the annual report. In the annual report submittal, each municipality shall indicate what measures were undertaken during the past year to educate staff regarding the performance standards. Any performance standards that have not been implemented shall be noted in writing, and a schedule for implementation shall be presented as part of the Annual Report.

2. Prepare spill containment kits and store them in locations that have potential for spills (fueling areas, etc.).

3. Stencil inlets to the storm drainage system with a message such as "No Dumping, Drains to Bay".

4. Refer to existing plans (e.g., Hazardous Materials Business Plans and/or Spill Prevention Control and Countermeasures Plan), incorporate storm water Performance Standards in annual updates, and periodically review with persons using the facility.

5. Conduct facility surveys annually - possibly in conjunction with hazardous materials management and/or spill prevention inspections.

6. Develop educational materials and post them in appropriate areas.

II. WASHING VEHICLES/EQUIPMENT

1. Clean all vehicles/equipment on designated wash pad areas.

2. Wash vehicles and equipment off-site if needed so wash water drains to the sanitary sewer or is recycled.

3. Discharge wash water to the sanitary sewer or recycle.

4. Ensure that wash pad area and sump are large enough so that all wash water drains to the sanitary sewer or recycling system. Re-grade area if necessary or install dikes to convey washwater.

5. Monitor wash pad area to make sure it is consistently used.

6. Consider assigning schedules for use of wash pad area, if appropriate.

III. REFUSE HOLDING AREAS

1. Store material removed from storm drainage facilities on a concrete or other type of impermeable material (during the rainy season, cover with impermeable material) and drain

wastewater to the sanitary sewer or allow to evaporate to prevent discharges to the storm drain system. Dispose of the material in an appropriate facility.

IV. FUEL DISPENSING AREAS

1. Store spill containment kits nearby. If spills occur, use dry methods to clean the fueling area and follow procedures in the Hazardous Materials Business Plan (HMBP) and/or Spill Prevention Control and Countermeasure Plan.

2. Train employees in proper fueling, cleaning and spill response procedures.

3. Install signs reminding people not to "top off" tanks.

4. Discourage mobile fueling. If mobile equipment is fueled with a mobile fuel truck, establish designated areas for fueling.

5. Consider covering fuel dispensing areas. Prohibit fueling over open ground (ground should be covered by concrete or asphalt protected with a sealant).

6. Design the fueling area to prevent "runon" of storm water and runoff of spills.

7. Follow the Retail Gasoline Outlets Best Management Practices as prepared for the California Stormwater Quality Task Force (March 1997).

V. CHEMICAL STORAGE

1. Store paint and other chemicals in an approved covered containment area. Design the floor inside so that any spilled materials will be contained and easily removed. Keep all 55 gallon drums containing hazardous materials or waste closed when not filling or emptying. Label the outside according to Department of Transportation regulations. Also, protect the area from vandalism.

2. If 55 gallon drums containing hazardous materials or wastes are stored outside, keep drums in an approved containment area. Ensure that all of the drums are closed with tight-fitting lids.

3. Review the Hazardous Material Business Plan for hazardous materials storage requirements.

4. Review Material Safety Data Sheets to ensure that incompatible materials have the appropriate separation.

VI. CHEMICAL USAGE

1. Ensure that necessary safety equipment and spill containment kits are readily accessible in areas where chemicals are used. Inspect safety equipment (eye flushing stations, etc.) regularly to ensure they are operational.

2. Review Material Safety Data Sheets.

3. Minimize use of chemicals. Use water-based paints and non-toxic chemicals as much as possible.

4. Recycle or dispose of excess chemicals at an approved local Household Hazardous Waste Facility or other approved location.

5. Ensure chemical containers have secure lids and are tied down properly to vehicle during transport.

6. Properly remove any soils contaminated with spilled materials.

A. Oil-based Paints

1. Wipe paint out of brushes. Filter and reuse thinners or dispose as hazardous waste. Dispose of the excess paint as hazardous waste or recycle it.

B. Water-based Paints

1. Rinse paint out of brushes and discharge rinsewater to the sanitary sewer. Recycle, or dry excess paint in cans and dispose of the cans in the trash. If there is too much paint to dry, recycle the paint or dispose of it as hazardous waste.

C. Automotive Fluids

1. Collect used fluids and recycle or dispose of them at an appropriate facility.

D. Pesticides

1. Refer to the CAL-EPA Department of Pesticide Regulation for pesticide mixing, application, storage and disposal requirements.

2. Consider using integrated pest management methods. Given a choice, use the least toxic pesticides and herbicides that will accomplish the job; and avoid copper-based pesticides and diazinon if possible.

3. Apply pesticides at appropriate times to maximize their effectiveness and minimize their runoff potential.

4. Mix only as much pesticide as needed; do not mix or load pesticides next to storm drain inlets or watercourses.

E. Solvents/Cleaning Solutions

1. Properly recycle or dispose of used solvents/chemicals.

VII. FLEET MAINTENANCE/VEHICLE PARKING AREAS

1. Inspect equipment for leaks on a regular basis. Use drip pans under leaky vehicles. Repair vehicles with significant leaks.

2. Drain and replace motor oil and other fluids in a covered shop area. If fluids are changed outdoors, designate an area where there are no connections to storm drains, watercourses or the sanitary sewer and where spills can be easily cleaned up.

3. Periodically dry sweep the area.

4. Clean equipment regularly using proper collection and disposal methods when necessary.

5. Schedule outdoor repair activities for dry weather if possible. Prevent repair supplies or work material from entering storm drains or watercourses.

VIII. AUXILIARY STORAGE AREAS/YARDS

1. Store chemicals in appropriate areas.

IX. GENERAL HOUSEKEEPING

1. Inspect the yard at least monthly to ensure that there are no illicit discharges to the storm drain system and that during storms, pollutant discharges are controlled to the maximum extent practicable.

2. Keep chemical storage areas neat and orderly.

3. Sweep the corporation yard at least monthly. Dispose of material removed from streets and storm drainage facilities often to eliminate exposure to rainwater and runoff to the storm drain system.

4. Stockpile materials away from streets, gutters, storm drain inlets or water channels when possible.

X. ALTERNATIVE APPROACHES

Any municipality may develop and submit to the Regional Board a Corporation Yard pollution control plan that proposes an alternative, but comparably effective approach, to these performance standards for controlling to MEP stormwater pollutants from Corporation Yards

within its jurisdiction. Any such plan containing alternative performance standards would need to obtain the Regional Board's approval prior to being implemented.

I. SERVICES

1. Provide an adequate number of litter receptacles in commercial and other litter source areas. Agencies will make every effort to contain litter in receptacles.

2. Pick up litter receptacles on a frequent enough basis to minimize or prevent spillage.

3 . Document and maintain the following records monthly:

   a. Areas targeted for litter removal, and
   b. Total amount of material removed.

II. EDUCATION AND ENFORCEMENT

1. Encourage public education efforts to include an anti-littering message, specifically: 1) residents to compost yard waste; 2) residents and businesses to remove litter from their property and properly containerize waste; and 3) owners of loading docks, restaurants and other litter source areas to sweep outdoor areas daily and properly containerize waste.

2. Encourage local law enforcement personnel to post signs and enforce anti-littering laws especially for owners of vacant lots where litter accumulates.

3. Label litter receptacles with anti-littering messages when possible.

4. Encourage participation in and assist with the litter removal activities associated with the California Coastal Commission's annual Coastal Clean-Up Day.

5. Encourage maintenance crews to report any privately-owned apparently abandoned vehicles that are leaking automotive fuels.

III. ALTERNATIVE APPROACHES

Any municipality may develop and submit to the Regional Board a litter control plan that proposes an alternative, but comparably effective approach, to these performance standards for controlling to MEP stormwater pollutants from littering sources within its jurisdiction. Any such plans containing alternative performance standards would need to obtain the Regional Board's approval prior to being implemented.

Note: The following municipalities will develop and adopt performance standards for rural public works maintenance and support activities: Half Moon Bay, Menlo Park, Pacifica, Portola Valley, San Mateo County, and Woodside. Other municipalities that contain streams that drain areas of low imperviousness should also consider participating in developing and implementing the rural maintenance performance standards.

I. ROUTINE INSPECTION AND CLEANING

1. Inspect, and clean as necessary, storm drainage facilities (inlets, culverts, V-ditches, and pump stations~~, open channels, and watercourses~~[1]), at least once a year on average unless an alternative schedule is approved as described in number 2 below. The inspections and needed cleaning will preferably occur prior to the rainy season. In calculating this average, some facilities may be inspected more than once per year and others less than once per year.

2. If a municipality chooses to inspect, and clean as necessary, storm drainage facilities less than an annual average, the rationale for the alternative standard must be described in a written action plan. The rationale should demonstrate that the alternative schedule is equivalent in terms of protecting water quality as the annual average inspection. The action plan must be submitted to the Regional Board as part of the Annual Report. The alternative standard will not be effective until approved by the Regional Board's Executive Officer, and that approval will be presumed unless it is rejected in writing within 90 days of its submittal.

3. When cleaning storm drain inlets and lines, remove the maximum amount of material at the nearest access point to minimize discharges to watercourses.

II. RECORD KEEPING

1. Report the amount of material removed when cleaning storm drainage facilities in monthly record keeping forms.

2. Document and track spill incidents and response to spill incidents.

III. SPILL RESPONSE

1. If non-hazardous materials are spilled, maintenance staff will contain the spill area immediately and clean when practical to prevent additional dumping and discharge of pollutants into the storm drain system.

2. Maintenance staff will be aware of the municipality's around-the-clock immediate response/removal procedure for hazardous or unknown materials.

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[1] For open channels and other natural watercourses, other permits and approvals (e.g. 401 water quality certification, 404 permit, stream alteration agreement) may be necessary for certain activities. As appropriate, see also the rural public works maintenance activities performance standards, to be developed.

3. Establish a response/removal procedure for non-hazardous materials after work hours.

4. Maintenance staff will report spills to, and work with, the municipalities' illicit discharge coordinator to determine the most appropriate follow up response (e.g., track the source of the spill and identification product labels that have a bar code, contact Building and Planning Departments, send a clean-up bill to the responsible party, etc.).

5. Work with local Fire and Police Departments to obtain copies of spill reports to the Public Works Department.

IV. DISPOSAL OF MATERIAL

1. Store material removed from storm drainage facilities on a concrete pad or other type of impermeable material (during the rainy season, cover with impermeable material) and drain wastewater to the sanitary sewer or allow to evaporate to prevent discharges to the storm drain system. Dispose of the material at an appropriate facility.

V. ALTERNATIVE APPROACHES

Any municipality may develop and submit to the Regional Board a storm drainage facilities pollution control plan that proposes an alternative, but comparably effective approach, to these performance standards for controlling to MEP stormwater pollutants from storm drainage facilities maintenance within its jurisdiction. Any such plan containing alternative performance standards would need to obtain the Regional Board's approval prior to being implemented.

009940

Performance Standards for

INDUSTRIAL AND COMMERCIAL DISCHARGE CONTROLS

I. TARGETING INSPECTIONS TO ACHIEVE THE MOST BENEFIT

1. As a goal, each municipality will inspect and provide educational outreach to all businesses within its jurisdiction that impact stormwater quality, at least once during the five year, re-issued NPDES permit period[1].

2. Each municipality will inspect and provide educational outreach to retail gasoline outlets and vehicle service facilities and businesses that have Hazardous Materials Business Plans at least once during the five year, re-issued NPDES permit period.

3. Each municipality will inspect and provide educational outreach annually to all businesses that meet one or more of the following criteria:

    a. facilities that have filed a Notice of Intent (NOI) for coverage under the California Industrial Stormwater NPDES General Permit including facilities that the municipalities are aware of who appear to need to file, but have not[2];

    b. facilities previously inspected that show on the most recently completed *Standard Stormwater Facility Inspection Report Form* (see the attachment at the end of this section), or an equivalent form, a high potential for pollutant exposure without BMPs; and

    c. facilities previously inspected that show on the most recently completed *Standard Stormwater Facility Inspection Report Form*, or an equivalent form, a non-stormwater discharge that is not allowed by the STOPPP NPDES permit even if this discharge was reportedly corrected at the time of a follow up site visit[3].

4. Each municipality will respond to complaints or referrals from other agencies about a facility. The response may include actions such as: interviewing the caller concerning the specific nature of the problem; referring the caller to the Regional Board for facilities the Regional Board is the lead regulatory contact for or to another municipality if the facility is outside its jurisdiction; and calling the facility and providing appropriate BMP information. For substantive complaints not covered above, a facility inspection or site visit will be scheduled immediately, with a goal of completing the inspection or site visit within three working days of receiving the complaint.

II. PREPARING FOR THE INSPECTIONS

1. Each municipality will ensure that its facility inspectors are adequately trained so that

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[1] Facilities, including NOI facilities, will not be inspected if the Regional Board is the lead regulatory contact pursuant to the May 1994 MOU between C/CAG and the Regional Board staff.

[2] annual inspections will be initiated no later than the fiscal year following a facility's filing a NOI for NPDES permit coverage or no later than the fiscal year following the time the municipality became aware that the facility appears to need to file, but has not.

[3] Note that facilities in groups b and c may be removed from the annual inspection category if the most recent full-facility inspection shows that the facility no longer meets the criteria for an annual inspection.

each inspector possesses the knowledge and skills necessary to conduct effective stormwater inspections and educational outreach. Each inspector will be familiar with the following: stormwater regulations and requirements (including the municipality's ordinance, municipal stormwater NPDES permit, and the Industrial Stormwater NPDES General Permit); the impacts of non-stormwater discharges to creeks, bay, and ocean; inspection techniques and procedures; follow-up and enforcement procedures; stormwater BMPs; and how to fill out the *Standard Stormwater Facility Inspection Report Form.* Inspectors will obtain ongoing training to support inspection activities and to continue to improve program implementation.

2. At least one inspector representing each municipality will attend General Program inspector training workshops. Each municipality will designate a person responsible for implementing its industrial/commercial stormwater pollutant control activities and for acting as a liaison with the Commercial/Industrial/Illicit Discharge BMPs Subcommittee. This designated person will stay sufficiently informed by attending Subcommittee meetings or using other means to participate in the Commercial/Industrial/Illicit Discharge BMPs Subcommittee decisions and activities.

3. Inspectors will review existing information on the site and its regulatory history prior to making an inspection.

III. CONDUCTING THE INSPECTION

1. Inspectors will review the facility layout to locate the storm drain system and/or stormwater drainage path, storage areas, process areas, vehicle and heavy equipment wash and maintenance areas, and stormwater sampling locations, if any.

2. Inspectors will review/inspect the following areas, if access to the area is safe, for the potential to discharge pollutants from non-stormwater discharges, for pollutant exposure to stormwater, and for the implementation of Best Management Practices (BMPs) using the guidance in the Stormwater Inspections of Businesses Handbook:

    a. Outdoor process/manufacturing areas;
    b. Outdoor material storage areas;
    c. Outdoor waste storage/disposal areas;
    d. Outdoor vehicle and heavy equipment storage and maintenance areas;
    e. Outdoor parking areas and access roads;
    f. Outdoor wash areas;
    g. Rooftop equipment; and
    h. Outdoor drainage from indoor areas.

3. Inspectors will record the information on the most recently adopted *Standard Stormwater Facility Inspection Report Form*, or an equivalent form containing the same information. Electronic and/or hard copies of completed inspection forms will be submitted to the STOPPP General Program as part of the quarter/semiannual deliverable reports and a set of inspection forms will also be maintained by the inspection agency

and local municipality, if different than the inspection agency.

4. Inspectors will use the facility's Stormwater Pollution Prevention Plan (SWPPP), if available, as a tool in assessing the facility's stormwater pollutant sources and control activities. The inspector will, to the extent possible, evaluate the sufficiency of SWPPPs and encourage improvements to these documents as appear necessary.

5. Prior to completing an inspection, the inspector will identify and inform the facility representative of any problems and violation(s) found, such as unpermitted non-stormwater discharges and/or pollutant exposure to rainfall and runoff that does not attain MEP control. A schedule for correcting problems identified during the inspection and a means for verifying their implementation will be discussed between the inspector and the facility representative. This information will be noted on the inspection form.

6. Inspectors will provide facility representatives with appropriate BMP information, educational materials, and inter/intra-agency referrals as needed. The inspectors will ask the facility owner or operator whether his or her employees have been trained about how to prevent stormwater pollution. The inspectors will provide available BMP information in other languages, if requested by the facility owner or operator.

IV. ACHIEVING FACILITY COMPLIANCE

1. If a problem is identified during a inspection, the inspector will perform a follow up site visit or initiate a self-certification process where the facility representative certifies in writing that the problem has been remedied within the time specified by the inspector.

2. Municipalities will conduct enforcement activities and report these activities as outlined in the *Guidance on Enforcement Options for Illicit Discharges and Industrial/Commercial Business Storm Water Pollution Violations*. Enforcement authorities are set forth in the individual municipal ordinances.

3. For municipalities that are contracted with County Environmental Health to perform commercial and industrial facility inspections for stormwater pollution prevention, the following describes the roles and responsibilities of County Environmental Health and municipalities for resolving problems that are found:

   a. County Environmental Health will be responsible for resolving any stormwater quality problems that are associated with the handling of hazardous materials and wastes, the exposure of these materials to rainfall, or the discharge of wastes or washwaters from retail food facilities.

   b. Each municipality will be responsible for resolving any stormwater quality problems that are not covered under a) above.

   c. County Environmental Health will provide written inspection reports to the municipalities on a quarterly basis and will notify municipalities promptly about any stormwater pollution problems that require their assistance or lead in resolving.

Alternative Approaches

Any municipality may develop and submit to the Regional Board an industrial and commercial business inspection plan that proposes an alternative, but comparably effective approach, to these performance standards for controlling to MEP stormwater pollutants from businesses within its jurisdiction. Any such inspection plan containing alternative performance standards would need to obtain the Regional Board's approval prior to being implemented.

Attachments to Performance Standards for Industrial and Commercial Discharge Controls

Standard Stormwater Facility Inspection Report Form

San Mateo Countywide
Stormwater Pollution Prevention Program
Standard Stormwater Facility Inspection Report Form

Municipality: _____
Date: _____
Time: _____

Reason for Inspection: ☐ First Inspection ☐ Routine Inspection ☐ Response to Complaint ☐ Facility has closed or Facility Information has changed

NAME OF FACILITY	SITE ADDRESS

CONTACT NAME	PHONE	BUSINESS TYPE/ACTIVITY	SIC

Is the facility covered under any other programs or permits? (Check all that apply.)

☐ None ☐ Sanitary sewer
☐ Air quality ☐ Hazmat business plan ☐ Underground storage tanks ☐ Aboveground storage tanks
☐ Fire department(hazmat storage) ☐ Hazmat waste generator ☐ Retail food facility ☐ Other _____

Is the facility covered under a storm water permit? ☐ Does not need Coverage ☐ No, but may need to be (Refer to Regional Board)
☐ Individual ☐ General: Does the facility have a SWPPP? ☐ yes ☐ no

N/A = Not Applicable; POTENTIAL for Pollutant Exposure without BMPs: 1 = low potential, 2 = medium potential, 3 = high potential
ACTUAL Type of Discharge: BMP: 0 = BMPs are effective, 1 = BMPs are fairly/almost effective, 2 = BMPs are not effective, 3 = No BMPs are implemented
PEX = Pollutant Exposure, NSW = Non-Stormwater Discharge

AREAS OF ACTIVITY	N/A	POTENTIAL	ACTUAL			REMARKS: Describe recommendations, requirements, and time to implement. Check box if remark is a *requirement.*
			BMP	PEX	NSW	
A. Outdoor Process/Manufacturing Areas						☐
B. Outdoor Material Storage Areas						☐
C. Outdoor Waste Storage/Disposal Areas						☐
D. Outdoor Vehicle and Heavy Equipment Storage, Maintenance Areas						☐
E. Outdoor Parking Areas and Access Roads						☐
F. Outdoor Wash Areas						☐
G. Rooftop Equipment						☐
H. Outdoor Drainage from Indoor Areas						☐
I. Other (describe):						☐

Outreach material distributed: STOPPP Brochure ☐ Industrial brochure ☐ BMP Information ☐

The existing operational practices of the facility ☐ Do / ☐ Do Not reduce pollutant discharge to the storm drain system to the maximum extent practicable.

ADDITIONAL COMMENTS/REMARKS

☐ Facility map available ☐ See attached for more comments.

FIRST Follow-up Inspection (Date & Findings)	SECOND Follow-up Inspection (Date & Findings)

PRIORITY FOR RE-INSPECTION: ☐ First ☐ Second ☐ Third

ENFORCEMENT: ☐ None ☐ Verbal Notice ☐ Warning Notice ☐ Informal Violation ☐ Formal Violation ☐ Legal Action

Received by:

Facility Representative Signature: _____ Date: _____

Print Name of Facility Representative: _____ Inspector's Signature: _____

009947

Performance Standards for

ILLICIT DISCHARGE CONTROLS

These performance standards describe only part of the effort to identify and eliminate illicit discharges. Other activities to help promote and facilitate the public reporting of the presence of illicit discharges are contained in the Stormwater Management Plan and the Public Information/Participation Performance Standards. These documents also describe the educational and public information activities that are conducted to facilitate the proper management and disposal of used oil and toxic materials.

I. PREPARE FOR ILLICIT DISCHARGE SCREENING AND INVESTIGATIONS

1. Each municipality will appoint a person and/or position responsible for serving as the agency's Illicit Discharge Coordinator. The Illicit Discharge Coordinator will:

    a. Receive information about illicit discharges from municipal staff, other agencies, and the public;

    b. Assure that needed follow up, elimination, and clean up of illicit discharges is conducted;

    c. Provide municipality staff with information about the status of illicit discharge source identification and elimination. In particular, municipal staff who identify an illicit discharge will be informed about its outcome;

    d. Make sure any required NPDES permit reporting is completed;

    e. Provide information to the municipality's management staff and elected officials, as requested, about the resources needed to implement these performance standards;

    f. Facilitate the implementation of these performance standards; and

    g. Be responsible for liaison with the Commercial/Industrial/Illicit Discharge (C/I/I) Subcommittee and participate in any illicit discharge related training conducted by the STOPPP General Program or have a representative participate for the Illicit Discharge Coordinator. The Illicit Discharge Coordinator will stay sufficiently informed by attending Subcommittee meetings or using other means to participate constructively in C/I/I Subcommittee decisions and activities.

2. Municipal staff who maintain and repair the municipal storm drain conveyance system, and other municipal staff who conduct field work where illicit discharges are likely to occur, will be trained to recognize illicit discharges and the procedures for responding to these discharges. New staff who fill positions, as described above, will receive training about illicit discharge recognition and response procedures within six months of being hired.

3. Municipal staff assigned to conduct illicit discharge investigations will be trained and have the knowledge and skills necessary to be effective. They will be familiar with guidance developed by the C/I/I Subcommittee and Regional Board staff and with the illicit discharge related requirements of the STOPPP NPDES permit.

4. Each municipality will have maps of its municipal storm drain system that are sufficiently accurate to be used when tracing the sources of illicit discharges.

II. CONDUCT FIELD SCREENING

Each municipality will rely primarily on its municipal maintenance and other field staff, while conducting other routine work, to identify evidence of illicit discharges to the municipal storm drain conveyance system. This illicit discharge field screening staff may include contracted staff or consultants working for the municipality. Evidence of illicit discharges identified during these field screening activities will be reported to the municipality's Illicit Discharge Coordinator.

III. CONDUCT FIELD INVESTIGATIONS

1. Using information provided as part of field screening and complaints received from the public or other agencies, each municipality will verify whether an illicit discharge has occurred. The goal will be to initiate follow up activities within twenty- four hours of receipt by the Illicit Discharge Coordinator of a report about a possible illicit discharge.

2. When an illicit discharge has occurred, each municipality will attempt to find the source and eliminate it. The source(s) of the illicit discharge will be traced by using storm drain maps, inspecting manholes, and making surface observations. The *Field Manual: Illicit Discharge Identification and Elimination Program* will be used as guidance in conducting these investigations. Findings will be recorded and maintained by the Illicit Discharger Coordinator.

3. Inspection and follow up activities will continue until: 1) the source of the illicit discharge is found and eliminated[1]; or 2) the discharge has stopped and no source could be found.

4. If a municipality identifies three or more illicit discharges in a fiscal year within an area served by any "major outfall"[2], additional illicit discharge investigations will be conducted in the area or areas served by the major outfall(s) during the subsequent fiscal year or sooner. These additional investigations will include one or more of the following, as appropriate: 1) periodic above ground surveillance of the area for visual evidence of illicit discharges; 2) additional inspections of businesses; 3) additional

[1] Elimination means that the discharge no longer occurs, has been diverted to the sanitary sewer or continues discharging to the municipal storm drain conveyance system under an NPDES permit.

[2] Major outfalls are greater than 12-inches in diameter for outfalls serving industrial areas and 36-inches in diameter for outfalls in all other areas.

periodic investigations of outfalls, creeks, and open channels for evidence of illicit discharges; and/or 4) additional targeted educational outreach in the area which is coordinated appropriately with the municipality's PI/P activities.

IV. FOLLOW UP TO FIELD INVESTIGATIONS

1. When a party responsible for an illicit discharge is found, the party will be provided with educational information about the impacts of his or her actions, the requirements of the local stormwater ordinance, the options for proper discharge or disposal, and educational materials describing BMPs. When the source of an illicit discharge that has reached the municipal storm drain conveyance system has not been found, educational outreach material will be distributed to residents and/or businesses located in the immediate vicinity of the illicit discharge.

2. If the discharge is traced to a commercial or industrial facility, the municipality will share information about the illicit discharge with its industrial and commercial discharge control program.

3. The municipality will begin enforcement procedures, if appropriate, using the *Guidance on Enforcement Options for Illicit Discharges and Industrial/Commercial Business Storm Water Pollution Violations* (Attachment C) or comparable procedures developed by the municipality.

4. The goal of follow up investigations will be to stop the illicit discharge(s) as soon as practicable.

V. PROCEDURES FOR SPILL PREVENTION, CONTAINMENT, AND RESPONSE

Since a network of spill prevention, containment, response and clean up programs already exists, the approach of the STOPPP illicit discharge control component is to supplement these services and respond to spill incidents that are not under the purview of previously existing clean-up programs. Within this context, each municipality will assure that the following occurs.

1. The Illicit Discharge Coordinator or his/her representative will investigate spill reports and/or complaints about incidents within the municipality's jurisdiction and record his/her activities.

2. The Illicit Discharge Coordinator will become familiar with the existing spill prevention, containment, response and clean-up programs that cover the municipality's jurisdiction and coordinate illicit discharge prevention, elimination, and cleanup activities with these existing programs.

3. The Illicit Discharge Coordinator will establish a mechanism for obtaining information about spill incidents from other agencies and departments within the municipality so that source identification and follow-up activities can be coordinated.

IV. DOCUMENT AND REPORT COMPLETION

1. Each municipality will document the number and types of illicit discharge incidents reported and follow up investigations conducted within the municipality's jurisdiction. This does not need to include information from fluid spills resulting from automobile accidents. Each municipality will summarize field investigations and follow-up activities every three months using the *Illicit Discharge Inspection Quarterly Summary Report* form (Attachment B).

2. Completed reports will be submitted to the STOPPP General Program Coordinator in time for submittal to the Regional Board as part of the NPDES permit required reports.

Alternative Approaches

Although not a preferred alternative, any municipality may develop and submit to the Regional Board an illicit discharge control and elimination plan that proposes an alternative, but comparably effective approach, to these performance standards for effectively identifying and eliminating illicit discharges. Any such illicit discharge control and elimination plan containing alternative performance standards would need to be approved by the Regional Board prior to being implemented as part of NPDES permit compliance.

009952

Performance Standards for

PUBLIC INFORMATION AND PARTICIPATION

I. GENERAL PROGRAM ACTIVITIES

A. Participation in the PIP Subcommittee

1. Each municipality will designate a person responsible for implementing its Public Information and Participation (PIP) activities and for acting as a liaison with the PIP Subcommittee. This designated person will stay sufficiently informed by attending Subcommittee meetings or using other means to participate constructively in PIP Subcommittee decisions and activities.

2. The chairship of the PIP Subcommittee will rotate periodically so that the responsibility of chairing the subcommittee is shared among the municipalities.

3. Each municipality will complete its PIP quarter or semiannual deliverable reports within the approximate schedule established by the General Program.

B. Distribution of STOPPP Information Pieces

1. Public education materials developed by the General Program will be distributed to each municipality. A high priority will be placed on developing, adapting, or using existing public outreach materials that focus on creek and wetland protection. Upon receipt of public education materials, each municipality will have the goal of initiating distribution of the materials within two months and completing the distribution within two years.

2. Each municipality will be responsible for tracking the number of General Program information pieces distributed with sufficient accuracy to be able to determine the quantity to re-order, to track progress with achieving No. 1 above, and to document for NPDES permit reporting.

II. INTERNAL MUNICIPALITY COMMUNICATION AND TRAINING

A. City Staff and Officials

1. Each municipality is responsible for identifying, developing, and communicating information about STOPPP to its stormwater staff and elected officials so that they are well informed about the requirements of STOPPP, their role in implementing STOPPP, and the progress of STOPPP. Annually, each municipality will communicate Program information to elected officials and all municipal staff involved with STOPPP activities.

2. New employees involved with STOPPP activities will be provided with information about STOPPP and a description of their role in STOPPP.

B. Procedures and Training for Handling Telephone Calls from the Public about Stormwater Pollution Prevention

1. Each municipality will establish procedures for answering, tracking, and efficiently routing stormwater related telephone calls to the appropriate municipal staff for handling.

2. Municipality staff assigned to answering or responding to telephone calls will be trained and familiar with the established procedures.

3. Each municipality will promote the use of one of its telephone numbers to facilitate public reporting of the presence of illicit discharges.

III. STORM DRAIN INLET STENCILS AND SIGNS

Storm drain inlet stencils/signs are one of the most effective venues for getting the stormwater message to residents, as determined by a residential survey conducted in San Mateo County in November 1996[1]. Seventy-four percent of the residents surveyed reported seeing the "No Dumping, Flows to Bay/Ocean/Lagoon" message stenciled on storm drains.

1. By the end of Year 1 (June 1999), each municipality will have stenciled/signed its municipality-owned storm drain inlets unless an alternative is approved as described in 2 below.

2. A municipality may propose to conduct alternative education activities in lieu of stenciling/signing each municipality-owned inlet. These alternative activities should be equivalent to stenciling/signing each municipality-owned inlet and should educate the public not to dump materials into storm drain inlets. The rationale for an alternative approach must be described in a written action plan. The rationale should describe why the alternative is equivalent in terms of protecting water quality given the particular circumstances of the local municipality. The action plan must be submitted to the Regional Board by October 31, 1998. The alternative approach will not be effective until approved by the Regional Board's Executive Officer, and that approval will be presumed unless it is rejected in writing within 90 days of its submittal.

3. As a goal, all stencils and signs installed will be maintained sufficiently to be legible.

IV. COORDINATION WITH PUBLIC SCHOOLS (K-12)

Distribution of Information/Materials

[1] Meta Information Services. 1996. *San Mateo Countywide Stormwater Pollution Prevention Program Stormwater Public Education Outreach Survey. Summary of Results.* November.

1. Information provided by the General Program about activities, such as the 4th grade assembly program, County Science Fair, community stewardship grants, or other educational opportunities, will be provided to each municipality. In turn, each municipality will make materials/information available to the public schools within its jurisdiction according to schedules agreed upon by the PIP Subcommittee.

2. Each municipality will make materials available to the public schools in its area, materials such as computer programs, children's educational activity booklets, and other information the General Program develops or helps develop. This may include disseminating information on how to obtain copies of material.

V. MUNICIPALITIES' COMMUNITY OUTREACH PROGRAM

Municipalities will participate in community outreach activities from the areas listed below (a through g) for the purpose of communicating the general stormwater pollution prevention message, complementing the General Program's specific message for its targeted audiences, and facilitating the proper management and disposal of used oil and toxic materials. Each municipality will participate in a prescribed number of activities annually based on the criteria below:

Over 50,000 in population
- each municipality will participate in three activities annually

Between 5,000 and 50,000
- each municipality will participate in two activities annually

Less than 5,000
- each municipality will participate in one activity annually

Implementation: Year 3 (Beginning July 1, 2000)

Over 50,000 in population
- each municipality will participate in at least five activities annually

Between 5,000 and 50,000
- each municipality will participate in at least four activities annually

Less than 5,000
- each municipality will participate in at least three activities annually

The community outreach activities shall include any combination of the following:

a. Provide General Program Information through Other Venues

Other venues include:

- Utility inserts[2]
- Municipality newsletter
- Other municipal newsletter
- Local magazine
- Mailing to target group
- Computer bulletin board or network
- Local telephone directories

b. Participate in Existing Community Events

Distribute STOPPP information by participating in existing community events (County fair, festivals, exhibits, etc.) held within its or a nearby jurisdiction. This participation may include the setting up of a booth, kiosk display, or other creative means of communicating the general stormwater pollution prevention message, using a specific message to a target group, or making a presentation to a local community service group.

c. Initiate New Community Events

Play a major role in planning and staging a community or city-wide event, examples include the following:

- Earth Day or other festival or fair
- Business mixer
- Seminar for a target group
- Contests

d. Contact Media and Conduct Advertising

Maintain local media contacts with newspaper, radio, or television stations in order to communicate the general stormwater pollution prevention message, complement the General Program's specific targeted audience(s) and message(s), and complement any regional PIP activities. Media outreach activities may include the adaptation and/or development and distribution of stormwater related press releases or public service announcements.

e. Develop and Implement Integrated Outreach Approaches

This area includes approaches that increase the effectiveness of pollution prevention activities using one or more of the following:

- Conduct a point of purchase display and giveaway program.

[2] Thirty-seven percent of San Mateo County residents reported that they first turn to their garbage company for information on disposing of household hazardous waste (Meta 1996).

- Plan, create, and/or distribute videos.
- Create and stage a play.
- Develop special displays or kiosks for your message especially interactive ones (such as slides in movie theaters).
- Develop/implement program for school curriculum and provide materials.
- Support and partner with other municipalities to increase or improve pollution prevention capabilities.
- Make and place signs on municipality street sweeper vehicles or other municipality vehicles.
- Place stormwater messages on workers' tee-shirts.

f. Develop Watershed Awareness

This area includes one or more of the following activities:

- Identify and support a "Friends of (a watershed)" group and encourage creek (lagoon or shoreline) cleanups, or adopt-a-creek or other volunteer monitoring and resource inventorying activities.

- Conduct a creek (lagoon or shoreline) cleanup within municipality-jurisdiction on an annual basis.

- Participate in a local event, e.g., in the Coastal Commission's annual Coastal Clean-Up Day and/or Earth Day activities.

g. Coordinate with Local Volunteer Groups to Conduct Outreach

In 1995, STOPPP published the *Volunteer Resource Guide* which lists local organizations and schools which could assist STOPPP with community outreach activities. Coordinate with a volunteer group to conduct outreach. This task may be combined with other activities presented in these performance standards. For example, the volunteer group may assist with school outreach activities, stenciling activities, or creek cleanup activities.

009959

Performance Standards for

NEW DEVELOPMENT AND CONSTRUCTION CONTROLS

PERFORMANCE STANDARDS FOR NEW DEVELOPMENT AND CONSTRUCTION CONTROLS

The Performance Standards for Control of Stormwater Pollutants from Development and Construction Activities are based primarily on the San Francisco Bay Regional Water Quality Control Board's April 1994 *Staff Recommendations for New and Redevelopment Controls for Stormwater Programs* (*Recommendations*). The *Recommendations* incorporate the mandates of EPA's stormwater regulations as well as the *Coastal Zone Act Reauthorization Amendments*.

All municipalities have agreed to implement local programs that meet the following performance standards. These performance standards are intended to achieve a level of water quality protection equivalent to that achieved by the measures described in the *Recommendations*. Municipalities will continue to improve, as necessary, the performance standards within the permit period in response to any pertinent new technical information on effectiveness of control measures. Effective implementation of the performance standards and incremental program improvement will be demonstrated in annual report submittals.

I. DEVELOPMENT PLAN REVIEW AND PERMITTING

1. Each municipality will have adequate legal authority to implement stormwater quality control measures for development and construction activities as part of its development plan review and approval procedures.

2. A. Each municipality will incorporate policies and implementation measures into its General Plan to help preserve and enhance water quality and protect sensitive areas[1]. General Plan amendments~~, if necessary,~~ will be adopted ~~as soon as possible and no later than June 30, 2003~~as part of the municipality's first General Plan review cycle after reissuance of the NPDES permit in 1999.

2. B. Pending adoption of any necessary amendments to the General Plans, the Program will adopt a set of recommended model policies on or before June 30, 2001. On or before June 30, 2002, each municipality will adopt and will begin to implement policies and implementation measures by council resolution or planning department policy. As part of this process, municipalities will take steps to resolve conflicts among stormwater quality protection policies and other municipal policies. Full implementation of these measures will occur on or before June 30, 2003.

3. Each municipality will require environmental documents for projects under CEQA or NEPA review to address stormwater quality impacts during the life of the project (both significant and cumulative), and specific mitigation measures. These documents include initial study checklists, EIRs, negative declarations, and mitigation monitoring plans. Mitigation measures must address both construction stage and post-construction impacts.

4. Each municipality will require developers and owner/builders to control stormwater

[1] Definitions are provided in the attachment at the end of this section.

quality impacts of their projects by using appropriate best management practices (BMPs).[1] ~~.~~ All projects will be required to implement appropriate BMPs during construction activity. Developers of projects with significant stormwater pollution potential[2] ~~.~~[1] will also be required to mitigate impacts through site planning or design practices and/or by installing ~~stormwater treatment~~post-construction controls. For such projects, efforts will be made to avoid, minimize, and mitigate, in that order, the potential adverse impacts to water quality[3].

~~5.~~5. Each municipality will require developers and owner/builders of projects that disturb a land area of five acres or more to demonstrate coverage under the State Construction Activity Stormwater General Permit.

~~6.~~6. Each municipality will require developers and owner/builders of projects with potential for significant erosion and planned construction activity during the wet season[1] to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

7. Each municipality will require developers and owner/builders of projects that include permanent structural stormwater controls to ensure ongoing operation and maintenance of such controls, as part of project approval documents.

8. Each municipality will ensure that municipal capital improvement projects include stormwater quality control measures during and after construction, as appropriate for each project. Each municipality will also ensure that these control measures are included in project documents such as plans and contract specifications.

9. Each municipality will examine the feasibility of mapping or listing parcels containing category 2.) sensitive areas[1] to help facilitate the development plan review process.

II. EROSION AND SEDIMENT CONTROL

1. Each municipality will maintain an erosion and/or sediment control program that includes requirements for minimum BMPs, sufficient enforcement authority, training and tools for inspectors, and information for developers and contractors.

2. As a condition for issuance of a grading permit, each municipality will require developers and owner/builders to prepare, submit to the municipality for review and approval, and implement an effective erosion and/or sediment control plan or similar

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[1] Definitions are provided in the attachment at the end of this section.

[2] ~~Definitions are provided in the attachment at the end of this section.~~

[3] The ideas of "avoid, minimize, and mitigate" are consistent with the Regional Board's wetland permit policy cited in the *San Francisco Bay Basin (Region 2) Water Quality Control Plan* ("Basin Plan"), 1995. The Regional Board considers water quality impacts may include, but are not limited to, impacts to physical habitat conditions associated with the waterbody or wetland.

administrative document that contains erosion and/or sediment control provisions.

III. CONSTRUCTION INSPECTION

1. Each municipality will require through a construction inspection process that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites and prevent illicit discharges[1] to storm drains and watercourses.

2. For development projects with significant erosion potential[1] and planned construction activity during the wet season, each municipality will require, through a construction inspection process, that erosion and/or sediment control measures are implemented. Measures will be implemented in accordance with local ordinances and project conditions of approval, including the approved erosion and/or sediment control plan, and maintained as needed during construction.

3. Each municipality will oversee the inspection of construction sites for adequacy of stormwater quality control measures on a regular basis. This will include inspection of permanent structural control measures, if any. The frequency of inspections will be based on the following criteria: the project's potential impact on stormwater quality, the size of the project; the site topography and soil characteristics; the season in which the project occurs; and the nature of construction activity.

4. Prior to the beginning of the wet season, each municipality will require that each active construction site be stabilized to minimize erosion and discharges of sediment from disturbed areas and oversee the inspection of these sites to make sure these requirements are being met. Prior to November 15th of 1999, municipalities will submit to the Regional Board a letter certifying that all active sites have been inspected prior to the beginning of the wet season. Certification letters will be kept on file at the municipality in subsequent years for inclusion in the annual report and/or submittal upon request to the Regional Board.

4. During the wet season, each municipality will oversee the inspection of all construction sites with erosion and/or sediment controls within 14 calendar days following each major storm event[1]. High priority sites, as determined by each municipality, will be inspected as soon as possible after major storm events[1] and more frequently as required.

IV. EDUCATION AND OUTREACH

1. Each municipality will provide training at least annually to its planning, building, and public works staffs on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention and control.

[1] Definitions are provided in the attachment at the end of this section.

2. Each municipality will provide training at least annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention.

3. Each municipality will provide appropriate educational and training materials to municipal staff, contractors, construction site operators, developers, and owner/builders. Appropriate materials will include information on a) construction BMPs (including erosion and sediment controls) and compliance with the State Construction Activity Stormwater General Permit (if applicable), b) site planning or design measures and post-construction controls, and c) information provided by Regional Board staff regarding State and Federal permit and approval requirements for project activities in wetlands and stream channels.[1]

4. Each municipality will provide developers and owner/builders with information and guidance materials described in (3.) above ~~on-site design guidelines, building permit requirements, and BMPs for stormwater pollution prevention~~ early in the application or design review process, as appropriate for the type of project.

~~4.Each municipality will provide appropriate educational and training materials to municipal staff, contractors, construction site operators, developers, and owner/builders on construction BMPs (including erosion and sediment controls) and compliance with the State Construction Activity Stormwater General Permit (if applicable).~~

5. Each municipality will provide appropriate educational and outreach materials provided by the Regional Board to those utility contractors (water supply, cable, phone, electrical, etc.) seeking encroachment and/or grading permits from the municipality.

V. SUBCOMMITTEE MEETINGS AND WORKSHOPS

1. Each municipality will designate a person responsible for overseeing the implementation of these performance standards and for acting as a liaison with the STOPPP New Development Subcommittee. This person will stay informed sufficiently to participate in New Development Subcommittee decisions and activities.

2. At least one representative from each municipality will attend STOPPP annual training workshops.

[1] Until that time the Regional Board develops and provides appropriate materials for distribution, municipalities will provide copies of the STOPPP "Guide to Creek & Wetland Project Permitting" or update thereof.

Attachment to Performance Standards for New Development and Construction Controls

Definitions for New Development and Construction Controls

DEFINITIONS FOR NEW DEVELOPMENT AND CONSTRUCTION CONTROLS

Projects with significant stormwater pollution potential - A project which causes substantial or potentially substantial adverse change in the quantity and/or quality of stormwater runoff generated from the site. (Note: This is consistent with the CEQA definition of significance. Professional judgment will be required in evaluation of project impacts, until specific thresholds for significance have been adopted.) A project site which ~~is constructed in~~contains or is adjacent to a "sensitive area" (see definition below) and/or is ~~five acres~~of sufficient acreage ~~or greater in area~~ to require coverage under the State Water Resources Control Board (SWRCB) General Construction Activity NPDES Stormwater Permit[1] will be considered to have significant stormwater pollution potential.[2]

Sensitive Area - Any area in which plant or animal life or their habitats are rare or especially valuable, including any area in the following ~~category~~categories:

1. habitats containing or supporting "rare and endangered" species as defined by the State Fish and Game Commission;
2. perennial and intermittent streams and their tributaries that support aquatic habitat;
3. riparian corridors (see definition below);
4. lakes, ponds, and adjacent shore habitat;
5. wetlands, marshes, and coastal tide lands;
6. coastal and offshore areas containing breeding or nesting sites or used by migratory and resident water-associated birds for resting areas and feeding;
7. areas used for scientific study and research concerning fish and wildlife;
8. existing game and wildlife refuges and reserves; and
9. sand dunes and sea cliffs.[3]

Riparian Corridor - The contiguous area of vegetation adjacent to perennial and intermittent streams, lakes, and other water bodies, as determined by the association of plant species typically found in riparian areas. For streams, the riparian corridor includes any defined stream channels up to the bank full-flow line as well as adjacent upland vegetation. Riparian plant species may include: alder, jaumea, pickleweed, big leaf maple, cattail, willow, horsetail, dogwood, cottonwood, sycamore, oak, and box elder. The riparian corridor is limited to areas containing at least a 50 percent cover of some combination of the plants listed.[4]

Wet Season - October 15 to April 15 of each year, or as defined by local ordinance.

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[1] Currently five acres or more of disturbed area. U.S. EPA Phase II stormwater regulations, scheduled to be issued in 1999, may require permits for sites greater than or equal to one acre, and may affect future State General Permit requirements.

[2] STOPPP is conducting studies to better define projects with significant stormwater pollution potential by considering the percentage of impervious cover in the watershed or subwatershed where the project is located.

[3] Adapted from the San Mateo *Local Coastal Program Policies*, August, 1992.

[4] Adapted from the San Mateo County *Local Coastal Program Policies*, August 1992, and the City of San Jose *Riparian Corridor Policy Study*, May 1994.

Illicit Discharge - Any non-stormwater discharge to a storm drain or watercourse, except for those discharges allowed under STOPPP's NPDES permit.

Significant Erosion Potential - A substantial or potentially substantial adverse change in site conditions that could result in erosion and/or sedimentation of site soils. (Note: This is consistent with the CEQA definition of significance. Conditions created by land disturbance activities which require a grading permit, as defined by local ordinance, can be used as thresholds of significance.)

Major Storm Event - A storm or series of storms of such intensity or duration as to create significant quantities of runoff and potential for erosion. A series of storms will be considered as one major storm event if there is less than 72 hours of dry weather between storms.

Appropriate Best Management Practices. Appropriate BMPs are those listed in, or provide an equivalent level of protection as those provided in, the *Recommendations.* The guidance documents STOPPP "Checklist for Permanent Stormwater Quality Controls" and "Chart for Identifying Required Permanent Stormwater Controls," and STOPPP's "Checklist for Construction Requirements" were developed based on the BMPs in *Recommendations.*

APPENDIX C

Lists of Municipal Stormwater Ordinances and General Program Agreements

- Municipal Stormwater Ordinances Adopted
- Agreement to Coordinate Industrial and Commercial Stormwater Pollution Prevention and Control Activities Conducted by the San Mateo Countywide Stormwater Pollution Prevention Program and the California Regional Water Quality Control Board San Francisco Bay Region

Municipal Stormwater Ordinances Adopted

Municipality	*Stormwater Management and Discharge Control Ordinance*	
	Ordinance Number	**Date Adopted**
City of Atherton	481	March 23, 1994
City of Belmont	883	June 14, 1994
City of Brisbane	392	June 1994
City of Burlingame	1503	June 20, 1994
City of Colma	465	May 11, 1994
City of Daly City	1194	February 14, 1994
City of East Palo Alto	NR	NR
City of Foster City	NR	NR
City of Half Moon Bay	C-5-94	May 3, 1994
City of Hillsborough	530	November 8, 1993
City of Menlo Park	859	July 19, 1994
City of Millbrae	607	June 14, 1994
City of Pacifica	617 - C.S. [Chapter 12 of Title 6 of P.M.C.]	June 27, 1994
City of Portola Valley	1998 - 308	February 5, 1998
City of Redwood City	2090	June 13, 1995
City of San Bruno	1558	August 8, 1994
City of San Carlos	1149	April 25, 1994
City of San Mateo	1994-9	April 18, 1994
City of South San Francisco	1145-94	July 22, 1994
City of Woodside	52.01 - 52.37	June 22, 1994
County of San Mateo	3633	February 14, 1995

NR = Not Reported

Agreement to Coordinate Industrial and Commercial Storm Water Pollution Prevention and Control Activities Conducted by the San Mateo Countywide Stormwater Pollution Prevention Program and the California Regional Water Quality Control Board San Francisco Bay Region

I. BACKGROUND AND PURPOSE

This Memorandum of Understanding (MOU) is entered into between City/County Association of Governments (C/CAG) for the San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) and the San Francisco Bay Regional Water Quality Control Board (Regional Board) staff to define their mutual roles and responsibilities in implementing storm water pollution prevention and control activities for industrial and commercial businesses. There are parallel and overlapping responsibilities placed on both groups in regulating storm water discharges from industrial and commercial businesses. This MOU addresses the need to describe the working relationship between the STOPPP and Regional Board staff's program for the mutual benefit of each and for the benefit of the industrial and commercial businesses being regulated.

The benefits of this MOU to the STOPPP and to the Regional Board staff include sharing information, coordinating the implementation of the industrial and commercial business storm water program so that the limited resources available to both groups are used effectively, and communicating a clear and consistent message to businesses about what the expectations and requirements are of both programs.

II. UNDERSTANDINGS REACHED

Classification of a Lead Regulatory Contact

1. The Regional Board staff will be the lead regulatory contact in controlling the quality of storm water runoff from Publicly Owned Treatment Works, municipal landfills, the San Francisco International Airport and operations conducted by tenants and users of this facility, businesses covered by the Regional Board's "General Waste Discharge Requirements for: Discharges of Stormwater from Boat Repair Facilities," existing individual NPDES-permitted facilities, state and federal facilities and any other industrial discharges which is deemed necessary. For purposes of this MOU, the lead regulatory contact means the public agency which will have the primary role in inspecting, communicating, and enforcing storm water pollution prevention requirements as described either in the San Mateo County Storm Water Management Plan (Plan) for the STOPPP or as described in available permits, procedures, and guidance for the Regional Board staff. Although different agencies may serve as lead regulatory contact, this agreement is not intended to limit any agency's ability to exercise its jurisdiction or enforcement authority as provided by law.

2. The STOPPP will be the lead regulatory contact for other industrial and commercial businesses and will conduct inspections and educational outreach according to the schedule contained in the Plan.

Implementation Approach That Will Be Used

3. The Regional Board staff and the STOPPP will share information when requested as follows:

   a. The Regional Board staff will supply public information on Notifications of Intent that have been filed, storm water pollution prevention plans received, monitoring results submitted, inspections conducted, and any other public information they have that the STOPPP requests for the specific purpose of implementing its storm water program.

   b. The STOPPP will supply available public information on industrial storm water NPDES permitted facilities and other facilities for which it is acting as the lead regulatory contact that are requested by the Regional Board staff for the specific purpose of implementing its storm water program.

4. During STOPPP's current municipal NPDES permit period (until September 15, 1998), the Regional Board staff and the STOPPP intend to focus their limited resources on requiring that industries and businesses implement Best Management Practices (BMPs) to reduce pollutants to the maximum extent practicable and on effectively eliminating illicit discharges. The BMPs which will be implemented will include those developed by the California Stormwater Quality Task Force in the BMP Handbook and other lists of BMPs proposed by business and proposed by either the Regional Board staff or the STOPPP.

5. The Regional Board staff and the STOPPP agree to emphasize efforts to notify and educate the owners and operators of industrial and commercial businesses as the primary means of beginning to achieve reductions in pollutants in storm water runoff. Where information about the requirements of the storm water program has been provided and this has failed to result in the reduction of pollutant discharges or the activities being conducted require an immediate or more active response, the intent is is for the lead regulatory contact to take appropriate enforcement actions.

6. The Regional Board staff and the STOPPP agree to coordinate enforcement activities so as to maximize the use of existing resources, to minimize the chance for regulatory overlap, and to minimize possible confusion by industrial and commercial businesses.

Facilities Covered by the Industrial Storm Water General Permit

7. The STOPPP agrees to begin to assist industries for which it is the lead regulatory contact to become informed about their responsibilities for obtaining industrial storm water NPDES permit coverage. To the extent that the STOPPP has available resources, it will also evaluate the sufficiency of Stormwater Pollution Prevention Plans, Monitoring Plans, and Annual Monitoring reports for those facilities that have obtained coverage under the General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial Storm Water General Permit). In addition, as possible within available resources, STOPPP will encourage improvements in these documents as appear necessary. The results of these evaluations will be reported to the Regional Board staff as part of the Annual Report.

8. The STOPPP agrees to work with facilities it is the lead regulatory contact on that have obtained coverage under the General Industrial Activities Storm Water permit to

coordinate their pollutant monitoring of storm water runoff with the STOPPP and to explore ways to maximize the usefulness of these monitoring activities.

Effective Date

9. The Regional Board staff and the STOPPP agree that this MOU will be effective for a period of five years from the date signed by representatives from the Regional Board staff and C/CAG. The agreement may be amended, revised or terminated at any time as mutually agreed to in writing by Regional Board staff and C/CAG.

The Chairperson of C/CAG is authorized by vote of C/CAG on MAY 12, 1994 to sign this MOU on their behalf.

Raymond Miller, Chair, C/CAG

May 23, 1994
Date

APPROVED AS TO FORM:

5/17/94
C/CAG Counsel

Steven R. Ritchie, Executive Officer
San Francisco Bay Regional Water
Quality Control Board

6/7/94
Date

SAN MATEO COUNTYWIDE
STORMWATER POLLUTION PREVENTION PROGRAM

555 County Center, Redwood City, California 94063 650.599.1406 Fax 650.361.8227

June 27, 2003

Mr. Habte-Mariam T. Kifle
Regional Water Quality Control Board
1515 Clay St. Suite 1400
Oakland CA 94612

2003

Subject: STOPPP's FY 2003/04 Trash Control Work Plan

Dear Habte:

Enclosed is the San Mateo Countywide Stormwater Pollution Prevention Program's (STOPPP's) FY 2003/04 Trash Control Work Plan. STOPPP proactively prepared this plan as a first step in reducing trash in urban surface waters in San Mateo County.

If you have any questions, please contact me.

Very truly yours,

Robert Davidson
STOPPP Coordinator

Enc: STOPPP FY 2003/04 Trash Control Work Plan

FY 2003/04 Trash Control Work Plan

San Mateo Countywide
Stormwater Pollution
Prevention Program

June 2003

San Mateo Countywide
Stormwater Pollution
Prevention Program

San Mateo Countywide Stormwater Pollution Prevention Program
FY 2003/04 Trash Control Work Plan

June 2003

INTRODUCTION

A November 2001 California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board) staff report proposed changes to the 1998 Clean Water Act Section 303(d) list of impaired water bodies in the Bay area. The staff report states there "are excessive levels of trash in virtually all urbanized waterways of the San Francisco Bay Region." However, listing these waterways as impaired by trash under Section 303(d) is not proposed due to a lack of consistent assessment methodology. Instead, the staff report proposed placing all Bay area urban creeks, lakes, and shorelines on a preliminary or "monitoring" list due to the threat of trash to impair water quality (SFBRWQCB, 2001). On February 4, 2003, the State Water Resources Control Board adopted this recommendation and placed Bay area urban creeks, lakes and shorelines on the 2002 Monitoring List.

Regional Board staff expects municipalities to assess and prevent trash impairment in their jurisdictions before the next 303(d) listing cycle. The 2004 listing cycle may be skipped and, if so, the 2006 listing cycle will likely rely on information available as of spring 2005. Based on this assumption, Regional Board staff expects municipalities to demonstrate an effective program of controls to prevent trash impairments over the next two years. If progress is not sufficient, urban water bodies may move from the Monitoring List to the 2006 303(d) impaired water body list.

The San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) developed this work plan to begin developing and implementing a strategy to address trash problem areas in urban water bodies in San Mateo County.

RECENT TRASH ASSESSMENT WORK

STOPPP, in collaboration with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), recently pilot-tested a trash assessment methodology developed by Regional Board staff. Attachment A is a copy of the work plan used for the San Mateo County portion of this pilot testing (*Work Plan for Pilot Testing a Rapid Trash Assessment Procedure in San Pedro Creek)* and Attachment B is a technical memo presenting the results (*SCVURPPP and SMSTOPPP Pilot Implementation and Testing of RWQCB Rapid Trash Assessment, March 1, 2003)*. Findings of the study included:

- The Regional Board staff assessment methodology may be useful for measuring baseline levels of trash, identifying and prioritizing trash problem areas and evaluating the effectiveness of targeted BMPs in future assessments. In addition, the assessment may be useful for identifying potential sources of trash and appropriate BMPs.

- The Regional Board methodology can rapidly estimate trash quantity and quality in selected 100-foot sections of creek for a particular time period (e.g., dry season). However, the methodology does not provide an estimate for the total amount of trash entering and being transported through receiving waters.

- The Regional Board staff methodology is limited in its ability to link assessment results with potential impairment to aquatic life uses. More studies are needed to link trash with degraded water quality conditions and impacts to aquatic life. The methodology does provide a measure of aesthetic impairment of a creek section by trash, which can potentially be used to help evaluate impairment of recreational beneficial uses.

- It is not feasible to implement the methodology to assess all urban creeks in jurisdictions the size of San Mateo and Santa Clara Counties. Priority should be given to demonstrating progress at known problem areas and evaluating areas potentially having problems based on factors such as land use.

- Some modifications to the Regional Board methodology would increase its utility as a tool for use in municipal trash control programs. Goals would include facilitating the interpretation of results, identifying trash sources and developing potential management actions. Recommended modifications include the development of additional categories and parameters (within the "trash tally sheet") that enhance the distinction of trash sources (e.g., recyclables versus non-recyclables, illegal dumping versus litter) and modifying numeric ranges used in condition categories for certain trash parameters to better represent urban creek conditions.

TRASH CONTROL ACTIVITIES PLANNED FOR FY 2003/04

STOPPP's general approach during FY 2003/04 will be to document known trash problem areas and existing trash management efforts and use this information to begin to plan improvements in trash management, as possible within available resources. STOPPP will also track related efforts by other Bay stormwater management programs and coordinate the planning of future trash control strategies with these agencies. Information sharing will be facilitated through STOPPP's ongoing participation in the Bay Area Stormwater Management Agency Association's Monitoring Committee.

Table 1 summarizes FY 2003/04 activities, products, schedules and Program planning-level budgets. It should be noted that the planning-level budgets are for Program activities only. Staff time from municipalities will also be required for activities such as:

- participating in a Municipal Maintenance Subcommittee work group.

- filling out surveys identifying problem areas and current management practices.

- beginning to identify and implement improvements in trash control.

Table 1. FY 2003/04 Trash Control Tasks

FY 2003/04 Task	Product	Anticipated Completion Date	Planning-level Program Budget
1. Convene a Municipal Maintenance Subcommittee work group.	Meetings	Kick-off meeting early FY 2003/04	$5,000
2. Document known trash problem areas and existing trash management practices.	Technical Memorandum	April 2004	$15,000
3. Prepare FY 2004/05 trash control work plan.	Work Plan	June 2004	$10,000
4. Document any trash control improvements by municipalities.	Incorporate into FY 2003/04 Annual Report	September 2004	$5,000
		Total:	**$35,000**

The FY 2003/04 trash control tasks are described below.

Task 1: Municipal Maintenance Trash Control Work Group

A work group of members of STOPPP's Municipal Maintenance Subcommittee will be convened and coordinated by Program staff. This trash control work group will meet periodically to facilitate implementation of the tasks in this work plan and review and approve associated products. A kick-off meeting is anticipated early in FY 2003/04.

In future years, the work group may develop recommendations for revising STOPPP's existing performance standards related to trash control. Such recommendations would be reviewed and approved by STOPPP's Technical Advisory Committee before adoption.

Task 2: Document Known Problem Areas and Existing Trash Management Practices

Public works departments are generally aware of major trash problem areas in creeks, parks and other public land uses within their municipality. Program staff will develop and distribute a survey to STOPPP's municipalities to collect this information. Data sources available to municipalities may include personal knowledge of municipal staff, trash complaint databases, maintenance and operations records, existing lists of trash problem areas and creek clean-up locations.

The survey will also collect information on existing municipal trash management practices in San Mateo County. In addition, STOPPP's existing performance standards and programmatic efforts (e.g., Public Information/Participation outreach) will be reviewed as part of this task.

STOPPP will prepare a technical memorandum that compiles the information gathered on existing problem areas and trash management practices and documents how that information was collected. Completion of the technical memorandum is anticipated by April 2004.

Task 3: FY 2004/05 Trash Control Work Plan

Program staff will prepare a trash control work plan for implementation starting in FY 2004/05. The trash control work group will develop the scope of work based on the results of trash control-related work performed by STOPPP and other Bay area stormwater programs during FY 2003/04. As such, this task will include tracking the results of similar tasks conducted by other Bay area stormwater agencies, including the following FY 2003/04 tasks from SCVURPPP's March 1, 2003 Trash Work Plan:

- Conducting a literature review of existing trash management practices and monitoring efforts used in other areas.

- Modifying the Regional Board staff Rapid Trash Assessment Methodology in accordance with the recommendations provided by *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of RWQCB Rapid Trash Assessment, March 1, 2003* (Attachment A).

- Evaluating the utility of a litter index developed by Keep America Beautiful as an evaluation tool to measure the effectiveness of management actions over time.

- Conducting a trash assessment training workshop for municipal staff.

- Developing a standardized reporting and documentation format and procedures that detail and evaluate trash management practices.

Completion of STOPPP's FY 2004/05 Trash Control Plan is anticipated by June 2004.

Task 4: Document Municipal Trash Control Improvements

In general, potential trash management measures include three major areas: 1) cleanup of trash, 2) public outreach and participation, and 3) enforcement of litter laws. Typical measures may include:

- Anti-litter campaigns.
- Trash cleanups (e.g., creek cleanup days).
- Incentive-based programs (e.g., increasing redemption values for trash items).
- Expanding trash control ordinances and enforcement actions.
- Improving documentation and reporting.
- Enhancing interagency coordination of tracking and enforcing trash violations.
- Implementing structural controls in trash problem areas.

It is anticipated that during the process of identifying existing problem areas and management actions (Task 2), municipalities will begin to see opportunities for improvements in trash control. For example, municipalities should begin to determine why known problem areas are not

addressed by existing management practices. Municipalities should also begin to prioritize trash problem areas in urban creeks, based on factors such as aesthetics, public access, presence of aquatic life and/or recreational uses, and constraints associated with land ownership. It should be noted that each municipality's ability to implement improvements will be constrained by available resources.

In STOPPP's FY 2003/04 annual report, Program staff will document any improvements that municipalities have implemented or plan to implement as a result of the process of documenting trash problem areas and existing management practices.

REFERENCES

SFBRWQCB, 2001. *Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads (TMDLs) for the San Francisco Bay Region.* Staff Report of the California Regional Water Quality Control Board, San Francisco Bay Region. November 14, 2001.

ATTACHMENT A

WORK PLAN FOR PILOT TESTING A RAPID TRASH ASSESSMENT PROCEDURE IN SAN PEDRO CREEK

San Mateo Countywide
Stormwater Pollution
Prevention Program

September 17, 2002

WORK PLAN FOR PILOT TESTING A RAPID TRASH ASSESSMENT PROCEDURE IN SAN PEDRO CREEK

The San Mateo Countywide Pollution Prevent Program (STOPPP) prepared this work plan to pilot test a rapid trash assessment procedure developed by San Francisco Bay Regional Water Quality Control Board (Regional Board) staff. This work is the first step in developing tools to assess potential impacts to beneficial uses in urban creeks in San Mateo County, identifying sources of trash and improving management actions, if needed. STOPPP's Generalized Five-Year Monitoring Program Plan (STOPPP 2002) includes this type of work as part of STOPPP's efforts to assess representative watersheds in the county. STOPPP will initially test the rapid trash assessment procedure in the San Pedro Creek watershed.

BACKGROUND

A November 2001 Regional Board staff report proposes changes to the 1998 303(d) list of impaired water bodies in the Bay area. The staff report states there "are excessive levels of trash in virtually all urbanized waterways of the San Francisco Bay Region." However, listing these waterways as impaired by trash is not proposed due to a lack of consistent assessment methodology.

Instead, the staff report propose placing all Bay area urban creeks, lakes, and shorelines on a preliminary or "watch" list due to the threat of trash to impair water quality. It states that between now and the next 303 (d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction, as documented by stormwater agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information, and developing a program of action to address the principle sources. Regional Board staff will review this specific information in the next listing cycle and determine whether specific water bodies warrant 303(d) listing, and note the existence of relatively clean urban streams (SFBRWQCB, 2001).

RAPID TRASH ASSESSMENT PROCEDURE

Regional Board staff have developed a rapid trash assessment methodology (Appendix) and started field-testing the procedure as part of the Surface Water Ambient Monitoring Program (SWAMP). The procedure entails performing visual surveys of 100-foot sections of creeks, including creek beds and banks. The methodology employs completing a worksheet in the field that includes six parameters scored from zero – 20, with four condition categories (optimal, sub optimal, marginal and poor) that have narrative descriptions to assist in scoring. The six parameters are:

1. Level of Trash
2. Actual Number of Trash Items Found
3. Threat to Aquatic Life
4. Threat to Human Health
5. Evidence of Illegal Dumping or Littering
6. Evidence of Trash Accumulation

The worksheet also includes a separate table listing major trash items to identify and tally during the assessment.

EVALUATION OF RAPID TRASH PROCEDURE

STOPPP will test the above rapid trash assessment procedure assessment in the field. The results will be evaluated with regard to the practicability of the procedure and its utility in assessing baseline conditions, impairment of beneficial uses, sources of trash, and effectiveness of management actions.

STOPPP recently participated in a one-day orientation that included staff from the Regional Board and other Bay area stormwater programs. The purpose was to begin evaluating the procedure and work towards regionally consistent application of trash assessment methodologies.

Task 1. Test the Rapid Trash Assessment Procedure in the Field

STOPPP will evaluate the rapid trash assessment at five locations in the San Pedro Creek watershed during September 2002. Creek sections were selected at two known trash hot spot locations (based on discussions with City of Pacifica staff) and within residential, commercial and open space land uses. The goal is to evaluate the trash assessment methodology for a variety of creek conditions in an urban environment. The five sections are located:

1. Downstream of the North Fork storm drain outlet, a known trash hot spot within a commercial land use area.

2. Downstream of the Highway 1 Bridge, a known trash hot spot within a commercial land use area.

3. Downstream of the Capistrano Street Bridge, a residential area adjacent to a townhouse development.

4. Across from the Sanchez Art Center, a residential area.

5. Between San Pedro Valley County Park and the Oddstad Boulevard Bridge, a relatively undeveloped area.

The accessibility of the creek sections will be determined and necessary permissions obtained from creek side landowners and City of Pacifica Public Works Department staff. The fieldwork is expected to take one day and will be performed before the September 21, 2002 Coastal Cleanup Day sponsored by the San Pedro Creek Watershed Coalition.

Task 2. Develop a Technical Memorandum

STOPPP will prepare a technical memorandum that discusses the utility of the assessment approach and recommends any improvements deemed necessary. The memorandum will also make recommendations for the next steps in STOPPP's efforts to assess and address trash in urban water bodies in San Mateo County. All recommendations will be developed in coordination with other Bay area municipal

stormwater programs (some of which are also pilot testing the rapid trash assessment methodology) and Regional Board staff through BASMAA's Monitoring Committee.

REFERENCES

SFBRWQCB, 2001. *Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads (TMDLs) for the San Francisco Bay Region.* Staff Report of the California Regional Water Quality Control Board, San Francisco Bay Region. November 14, 2001.

STOPPP, 2002. *Generalized Five-Year Monitoring Program Plan, Fiscal Years 2002/03 through 2006/07.* San Mateo Countywide Pollution Prevent Program. June 28, 2002.

ATTACHMENT B

SCVURPPP AND SMSTOPPP PILOT IMPLEMENTATION AND TESTING OF RWQCB RAPID TRASH ASSESSMENT
March 1, 2003

INTRODUCTION

Program staff implemented and tested the Regional Water Quality Control Board's (RWQCB) *Rapid Trash Assessment Worksheet* at nine stream locations in Santa Clara and San Mateo Counties. Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and San Mateo Countywide Pollution Prevention Program (SMSTOPPP) are collaborating to determine the utility of the approach for performing the following functions:

- Document baseline levels of trash in creeks
- Identify sources of trash and appropriate control measures to reduce trash
- Evaluate effectiveness of trash management practices
- Assess all creeks in the SCVURPPP and SMSTOPPP jurisdiction for trash
- Assess impairment of beneficial uses by trash

Results of the pilot assessment were presented by Program staff at the September 25th SCVURPPP Trash Ad Hoc Task Group (AHTG) and at the October 2, 2002 BASMAA Monitoring Committee meeting. Comments from the Trash AHTG were compiled and incorporated into the discussion section of this memorandum. The current draft of the trash assessment technical memorandum was approved by the AHTG at the November 4, 2002 Trash AHTG meeting.

Development and implementation of trash assessment protocols is one component of the SCVURPPP and SMSTOPPP Trash Work Plans. SCVURPPP and SMSTOPPP will consider the recommendations included in this memorandum and comments from Regional Board staff and members of the BASMAA Monitoring Committee for future implementation of trash assessments.

BACKGROUND

A November 2001 Regional Board staff report proposes changes to the 1998 303(d) list of impaired water bodies in the Bay area. The staff report states there "are excessive levels of trash in virtually all urbanized waterways of the San Francisco Bay Region." However, listing these waterways as impaired by trash is not proposed due to a lack of consistent assessment methodology.

Instead, the staff report proposes placing all Bay area urban creeks, lakes, and shorelines on a preliminary or "monitoring" list due to the threat of trash to impair water quality. It states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by storm water agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information, and developing a program of action to address the principle sources. Regional Board staff will review this specific information in the next listing cycle and determine whether specific water bodies warrant 303(d) listing for trash, and note the existence of relatively clean urban streams.

METHODS

The RWQCB Rapid Trash Assessment Version 6.0 was released to the public on September 25, 2002. The assessment was designed for several purposes, including ambient monitoring, evaluation of management actions, and evaluation of the effects of public access to trash condition of creeks. The RWQCB began implementing the trash assessment in summer of 2002 as part of their Surface Water Ambient Monitoring Program (SWAMP).

The assessment protocol includes identification and enumeration of all trash items that occur below high water line and along stream banks within a 100-foot section of stream. The second part of the RWQCB protocol includes determination of condition for six assessment parameters (scores 0-20, higher score = less trash) using the narrative parameter descriptions provided in the assessment worksheet. Program staff attended a training session on these protocols given by RWQCB staff. In addition to implementing the assessment approach, Program staff took digital photographs at each site to determine if photo documentation could accurately depict level of trash and potential impairment.

The pilot testing of the RWQCB's approach did not include implementing the assessment during different seasons to determine temporal variation of trash condition at individual sites. The pilot assessment was conducted in the fall to capture levels of trash in the creeks prior to winter rains, and before the national trash cleanup event that occurred on September 21st 2002.

Assessments were completed over a two-day period in September 2002 at five stream locations within San Pedro Creek (Figure 1), a coastal watershed in San Mateo County, and four stream locations in Coyote Creek watershed (Figure 2), which is located in the eastern portion of the Santa Clara Valley and drains into the South Bay. The assessment locations were selected based on several factors including known problem areas, land use type (residential, commercial, open space) and stream size. Creek segments in Upper Penitencia (total =3) and San Pedro Creek (total = 5) were selected at different points in each respective watershed to represent varying degrees of urbanization, i.e., sites at the lower, middle and upper sections of the urbanized portion were surveyed within each watershed. One site on Coyote Creek was sampled to identify the feasibility of this assessment approach in larger streams.

RESULTS

Individual parameters scores, total scores and the number of major trash item types for each assessment site are provided in Tables 1 and 2. Major findings include:

1) Known problem areas had the worst scores within each watershed. The flea market site, although not previously identified as a problem area, had low trash scores (more trash) with an apparent chronic trash problem and should be considered a problem area. The two highest scores (less trash) were at the upper sites of each watershed, toward the edge of the urban boundary.

2) Total scores (parameter scores combined) decreased and total trash items increased in the downstream direction. Most of the individual assessment parameter scores also decreased in the downstream direction, with the exception of the human health parameter, which was consistently rated as sub-optimal at all but two sites.

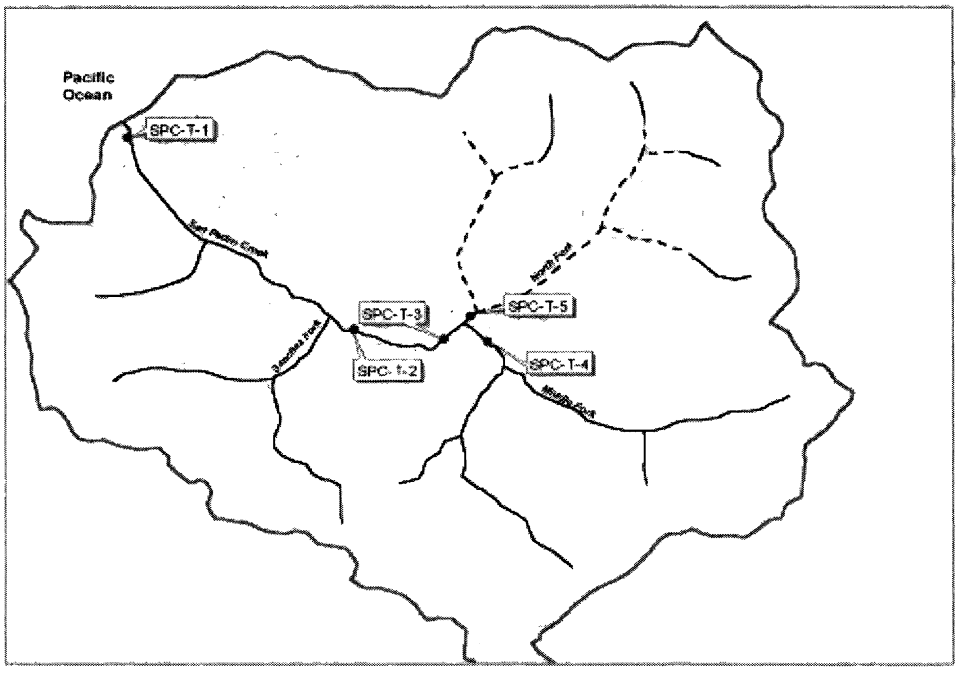


Figure 1. Location of pilot trash assessments conducted in San Pedro Creek.

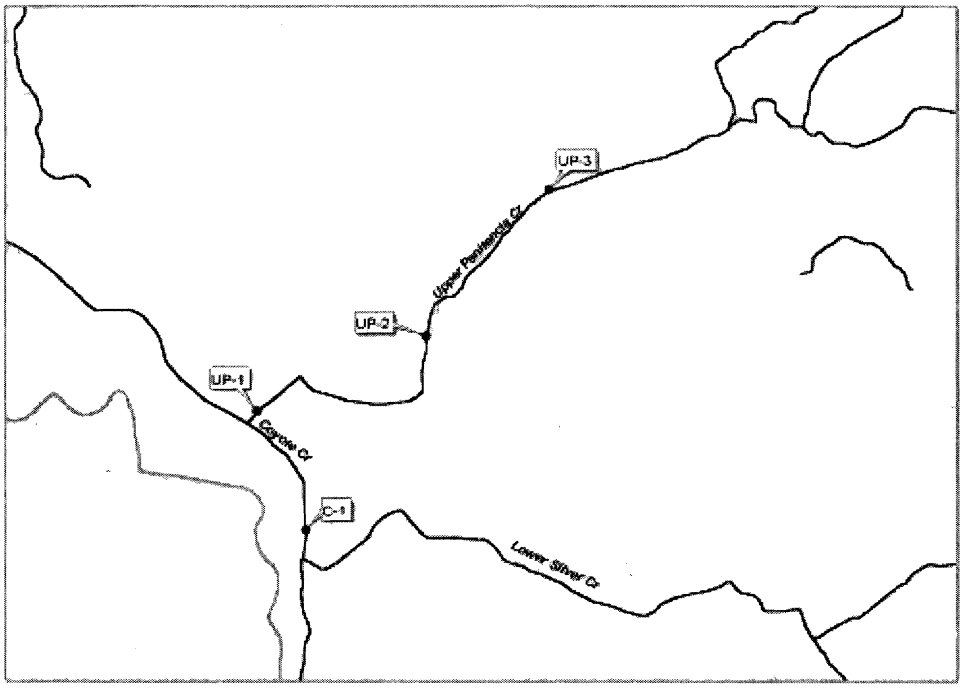


Figure 2. Location of pilot trash assessments conducted in Upper Penitencia and Coyote Creek.

3) The survey worked best in Upper Penitencia and San Pedro Creeks because all areas of the stream habitat were accessible and generally visible. The assessment at the site on Coyote Creek was less effective because the creek was too deep in some areas and the visibility too poor to accurately identify all trash items. There were generally no problems identifying trash along the stream banks, although there was difficulty in some instances of identifying the upper boundary (see # 5).

4) Digital photographs provided insufficient details to identify level of trash, estimate threats to water quality, or potential sources of trash. The relative number of trash items and types of trash are not clearly distinguishable. These results were consistent with earlier RWQCB evaluation. The photos may be useful for identifying benchmarks that define site boundaries and for documenting the general conditions of the site.

5) Using slightly different definitions for the stream bank boundary can have significant impact on the results. Incorporating trash items along the edge of upper right bank adjacent to a parking lot (at lowest site in San Pedro Creek) resulted in decreasing the total score from 74 to 30. Integrating trash for the upper section of streambank was questionable in this case because dense riparian vegetation appeared to prevent trash from entering the creek. There was minimal evidence of trash in the creek.

6) The lower site of San Pedro Creek and Upper Penitencia Creek (flea market) were cleaned up for trash shortly after the assessment. If the assessment had been repeated after the cleanup, the trash scores would have been much improved.

7) Eight of nine sites were rated poor for quantity of trash. In contrast, half of these eight sites were qualitatively rated sub-optimal (visual estimation of trash problem). As a result, conditions for qualitative and quantitative parameters were not very well correlated.

8) The most common trash items for all sites were plastic (primarily bags, bottles and wrappers), biodegradable (mostly paper), and metal (aluminum foil wrappers and cans). Trash items were more prevalent below the water line, with the exception of paper, cigarette butts and glass bottles, which were more common on the stream banks.

9) The trash items found that were considered potential threats to aquatic organism health were typically plastic (bags, bottles, wrappers) and other buoyant items (styrofoam and cigarette butts). The condition rating for aquatic health parameter was largely based on the relative number of these items found (e.g., low, medium prevalence, large amount), regardless if the plastic items were in the creek or on the bank. The scores typically decreased in the downstream direction.

10) There were few trash items found considered to be threats to human health. The most common were sharp objects, such as glass and jagged metal. There were animal feces and diapers found on the banks of two sites. The condition for this parameter was never optimal because there was always glass found on-site; five of the nine sites were rated sub-optimal due to presence of glass. There were no spatial trends observed for this parameter.

11) Dumping and littering appear to be a major problem for some sites we assessed. All four sites that were rated poor for this parameter had the lowest total scores and the highest number of trash items. Three of these sites were commercial and one was

Table 1. Rapid trash assessment results from watersheds in Santa Clara and San Mateo County. Individual trash assessment parameter scores range from 0-20, with low numbers representing poor conditions. Similarly, low total score represents poor conditions. The sites marked with (*) refer to previously known trash problem areas.

Location Description	Site Id	Land use	Date	Trash Assessment Parameter Scores						
				Qual.	Quant.	Aquatic Life	Human health	Dump/ Litter	Accum	Total Score
Santa Clara County (Upper Penitencia Creek)										
Fleamarket	UP-1	Commercial	9/12/02	6	0	5	16	5	7	**39**
Penitencia Park (lower)	UP-2	Residential/park	9/12/02	13	4	11	3	12	10	**53**
Penitencia Park (upper)	UP-3	Residential/park	9/12/02	15	5	15	15	14	13	**77**
Watson Park (Coyote)*	C-1	Undeveloped Park	9/12/02	8	2	4	12	1	6	**33**
San Mateo County (San Pedro Creek)										
Above Pacifica Beach*	SPC-T-1	Commercial	9/20/02	6	1	4	5	5	9	**30**
Behind Sanchez Art Center	SPC-T-2	Residential	9/20/02	12	3	6	15	15	4	**55**
Below Linda Mar Bridge	SPC-T-3	Residential	9/20/02	12	3	8	15	14	5	**57**
Above Oddstad Bridge	SPC-T-4	Residential/park	9/20/02	15	6	14	15	13	19	**82**
Behind Shopping Center (North Fork)*	SPC-T-5	Commercial	9/20/02	1	0	1	11	5	1	**19**

Table 2. Total number of items from each major category of trash tallied in trash assessments for nine locations in Santa Clara and San Mateo County. Stream location "A" and "B" represents above and below, respectively, high water line.

Site Id	Plastic		Biohazard		Const Debris		Misc.		Metal		Large Items		Toxic		Bio-degradable		Glass		Fabric		Total #
Location	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	
UP-1	77	85	0	0	3	0	2	13	10	4	0	0	0	0	35	36	0	0	1	4	**270**
UP-2	22	7	2	0	5	0	2	0	14	0	0	0	1	0	6	6	6	0	2	1	**74**
UP-3	17	13	0	0	0	1	2	0	1	4	0	0	0	0	7	12	2	1	1	0	**61**
C-1	35	17	0	0	4	0	1	0	10	2	20	0	0	0	18	26	3	3	2	2	**143**
SPC-T-1	32	46	0	1	2	0	1	61	4	6	0	0	0	0	4	64	0	1	0	1	**223**
SPC-T-2	66	29	0	0	11	0	4	0	14	3	1	0	0	0	3	6	1	1	14	3	**156**
SPC-T-3	80	10	0	0	8	0	14	1	11	0	0	0	0	0	4	0	2	0	1	1	**132**
SPC-T-4	5	9	0	0	4	1	1	0	9	2	0	1	0	0	0	2	2	9	1	1	**47**
SPC-T-5	205	31	0	0	11	17	14	3	29	11	4	1	0	0	19	4	0	11	2	4	**366**
Total	539	247	2	1	48	19	41	78	102	32	25	2	1	0	96	156	16	26	24	17	**1472**

undeveloped parkland, which had low scores due to dumping. A majority of the trash observed was from littering, not dumping.

12) Accumulation of trash generally increases in the downstream direction as expected, with the exception of the lower site on San Pedro Creek, which had very little accumulated trash. This may be due to yearly trash clean up events. Only two of nine sites had less than five accumulated trash items; the rest of the sites were marginal or poor.

DISCUSSION

The SCVURPPP Trash AHTG evaluated the results of the pilot assessment and the overall approach used in the RWQCB protocols. The AHTG addressed the following questions to evaluate the utility of the RWQCB's assessment protocols for assessing trash in urban streams:

- What role should the RWQCB's protocol play in assessing trash? (e.g., identify baseline levels of trash in urban creeks; document status and trends; identify trash sources; evaluate effectiveness of BMPs).
- How feasible is the approach to assess all urban creeks in SCVURPPP and SMSTOPPP jurisdictions?
- Can the results be used to assess potential impairment to beneficial uses?
- What refinements would enhance utility of the assessment approach?

Role of Trash Assessment for SCVURPPP

The Trash AHTG agreed that the RWQCB trash assessment could be used at specific reaches to establish baseline levels of trash during selected index periods. The dry season is optimal time period to use RWQCB protocols since low water levels provides maximum access to streambed and banks to measure trash condition. It is important to note the amount of trash documented in the assessment does not measure total amount of trash that enters and is transported in receiving waters, but rather more of a rapid estimate of trash condition for a snapshot in time in a limited number of locations. The trash assessments are useful to identify and prioritize trash problem areas. Future assessments could be conducted at these sites and index period using the same protocols to document status and trends or to help evaluate the effectiveness of targeted BMPs. In addition, the assessment results may assist in the identification of potential sources of trash and appropriate BMPs to implement. Overall, the protocols would be useful in prioritizing and implementing management activities and measuring the effectiveness of these actions.

One limitation identified by the AHTG is related to implementing the RWQCB protocols to characterize trash conditions for entire water bodies or subwatersheds. The level of trash within a single waterbody is assumed to be highly variable due to changes in land use, accessibility, size of the watershed, and channel characteristics (e.g., gradient, stream vegetation). Typically, many 100-foot sections would need to be assessed to measure the range of trash conditions found within an entire creek. Assessing some sections of creek and extrapolating the information to larger areas, however, could lead to misinterpretation of the results and potential listing for an entire waterbody based on data collected at a few reaches. Further discussion on the feasibility of using the RWQCB protocols to assess trash for all creeks within SCVURPPP or SMSTOPPP jurisdiction is provided below.

Another limitation of the RWQCB protocols is that it was not designed to assess lakes, shorelines or sloughs, which are types of waterbodies that are identified on the Regional Board's "monitoring" list due to the threat of trash to impair water quality.

The Trash AHTG agreed that the RWQCB protocols provide a standardized approach to assess trash, which could be used on a regional basis. Collaboration with other storm water programs and SWAMP using the same protocols would provide a larger data set for more detailed data analyses, which may include identifying relationships between trash condition and land use types. These relationships would assist managers in identifying potential trash problem areas and aid in selecting appropriate assessment locations. In addition, compilation of assessment data taken in urban streams would be useful for statistically identifying thresholds used in the condition categories for each of the assessment parameter (see recommendation section below). Program staff has started compiling trash assessment data gathered from Alameda County Cleanwater Program and Regional Board efforts.

Feasibility of Assessing all SCVURPPP and SMSTOPPP Creeks

The Trash AHTG believed it was not feasible or cost-effective to use the RWQCB protocols to assess all creeks within the SCVURPPP and SMSTOPPP jurisdiction. High variability of trash conditions would be expected within sections of urban creeks. In addition, an estimation of trash levels for a single creek would require numerous assessments. It is more cost effective to assess already known trash problem areas or in land uses that are associated with litter or illegal dumping and then monitor these sites over time to determine trends or evaluate the effectiveness of BMPs. The Trash AHTG agreed that a decision to spend resources on conducting trash assessments for all creeks in their jurisdiction needs to be weighed with efforts to resolve problems that have already been identified. For example, schools and commercial areas are land uses that are often associated with trash-impacted areas. The Trash AHTG will identify a process for prioritizing creek segments (potentially on land use) and implementing trash assessments as a task in the SCVURPPP Trash Work Plan. The proper entity (e.g., municipality/agency staff or volunteer citizen group) to conduct trash assessments will also be determined as a task in the Work Plan.

Utility of Assessment to Measure Potential Impairment

The trash AHTG identified several limitations of the protocol in linking trash assessment results with potential impairment to beneficial uses. First, there is no clear linkage between type of trash items or number of trash items in a reach to beneficial use impairment. There are no established criteria or threshold values of specific trash items that can be used to estimate the relative impairment to most beneficial uses. An exception may be using both quantitative and qualitative assessment parameters to evaluate the aesthetic quality of streams for recreational beneficial uses. Two parameters (aquatic and human health) identify specific trash items that may affect beneficial use attainment, but more than the presence of these items is needed to determine the level of impairment. For example, there is no method to determine how many small persistent trash items (e.g., styrofoam pellets) are necessary to impact aquatic biota. In addition, the link between human health and the presence of human diapers or animal feces within a 100-foot section of stream has not been clearly established. These trash items may not have direct contact with the water and in some cases, may not even contain human pathogens. Furthermore, the threat to human health ranking does not take into account the potential level of public exposure. Exposure to contaminated water or sharp objects (e.g., glass and metal) is dependent on the level of accessibility to a creek (e.g., fences limit access to creeks) and creek conditions (e.g., depth of water).

Recommendations for Modifying Protocols

The RWQCB protocols were designed to assess both rural and urban stream conditions. The threshold values used to identify conditions for some of the assessment parameters may be too conservative and not adequately represent the range of conditions typically found in urban streams. As a result, most urban creek segments are likely to fall into the poor or marginal categories. Ubiquitous low scores for all urban creeks would not provide adequate resolution to distinguish spatial or temporal variation in trash conditions.

The RWQCB protocols are intended to assist in management decisions, such as source identification. The utility for the protocols to identify trash sources could be enhanced if litter and illegal dumping were distinguished to better assist managers in the identification of appropriate BMPs to reduce the trash. In addition, new trash item categories should be added to enhance evaluation of BMP effectiveness, such as recycling programs. For example, tallying aluminum cans and plastic bottles that are labeled with California Redemption Value (CRV) symbol, along with non-CRV cans and bottles can help determine if recycling programs are effective at reducing trash in creeks.

Additional information should also be included in the assessment procedures. The assessment datasheet should include a place to indicate if an enforcement action or cleanup event is needed. Previous history of trash management activities (e.g., previous or planned cleanup events; known trash problem area) should be documented. Photo documentation should be used when at sites with large amounts of trash.

Based on the pilot evaluation, Table 3 lists some limitations of the RWQCB protocols for conducting trash assessments of urban creeks and provides recommended modifications. These modifications could be incorporated as an "urban management version" of the RWQCB protocols and not result in changes to the original protocols being used for the SWAMP program. The Trash AHTG will coordinate all recommended modification of the protocols with other stormwater programs, BASMAA Monitoring Committee and the RWQCB staff in order to develop a standardized approach for conducting trash assessments on a regional basis. The SCVURPPP and SMSTOPPP have identified tasks in their respective Work Plans to consider the recommendations to modify RWQCB assessment methodology for the purpose of developing a tool to evaluate trash problem areas. The assessment approach should also be evaluated in the future for continuous improvement as additional assessment results become available.

Table 3. Recommended Modifications to RWQCB Assessment Parameters

Trash Assessment Parameter	**Limitation**	**Recommendation**
Actual Number of Trash Items	Numerical thresholds used to rate categories too conservative and not representative for range of conditions in urban streams	Compile additional assessment results from urban streams and statistically compute ranges.
	Difficult to evaluate BMP effectiveness for existing trash item categories	Include additional categories useful for evaluating BMP effectiveness (e.g., distinction between recyclable and non-recyclable cans and bottles)
Threat to Aquatic Life	Subjective rating (little, medium, large) for number of persistent trash items may not provide consistent results.	Compile additional assessment results for specific trash items found in urban streams and statistically compute ranges.
	Equal weighing for trash above and below water line.	Place greater weight on trash below water line. Define water line mark as the bankfull channel.
Threat to Human Health	Human health threats are determined only by presence of specified trash items, not on potential for exposure.	Include additional rating for potential risk of exposure (e.g., public access: good/poor; wadable habitat: yes/no).
Illegal dumping and Littering	Doesn't provide a mechanism to distinguish two different trash sources.	Separate into two separate categories to enhance distinction of trash sources.
Illegal dumping and Littering	Litter categories do not address accumulation from adjacent land uses that result from wind.	Include narrative description to rate wind accumulated litter from adjacent land uses; expand its definition of "shoreline littering" to include "litter within creek and banks that appear to originate from adjacent land uses."
Accumulation of trash	Numerical thresholds used to rate categories not representative for range of conditions in urban streams.	Compile additional assessment results from urban streams and statistically compute ranges.

SAN MATEO COUNTYWIDE
STORMWATER POLLUTION PREVENTION PROGRAM
555 County Center, Redwood City, California 94063 650.599.1406 Fax 650.361.8227

CALIFORNIA REGIONAL WATER
OCT 20 2006
QUALITY CONTROL BOARD

January 23, 2004

Mr. Bruce Wolfe
Executive Officer
1515 Clay Street, Suite 1400
Oakland CA 94612

Subject: Submittal of San Mateo Countywide Stormwater Pollution Prevention Program's (STOPPP) NPDES Permit Reapplication Package

Dear Mr. Wolfe:

Enclosed is STOPPP's municipal stormwater NPDES permit reapplication. The reapplication consists of a new Stormwater Management Plan, which has been approved by all of the STOPPP member agencies' elected bodies, and a completed Application/General Information Form for WDRs and NPDES permits [Form 200]. The governing bodies of all of STOPPP's member agencies have authorized the City/County Association of Governments (C/CAG) of San Mateo County, and me as the C/CAG representative, to submit this NPDES permit reapplication package to you.

The new Stormwater Management Plan (Plan) is proposed to cover the period from April 2004 through June 2010. The Plan also includes the current NPDES permit's required performance standards for integrated pest management, lagoons, and rural public works. The Plan's Executive Summary describes the changes from the previous plan, which was submitted to the Regional Board in March 1998 (covering the period from July 1998 through June 2003) and had become substantially out-of-date.

The creation of the new Plan for inclusion as part of the reapplication package was discussed with STOPPP's Technical Advisory Committee and your staff in July 2003 and is consistent with the re-application packages that have been prepared recently by other municipal stormwater programs, such as the Alameda Countywide Clean Water Program and Fairfield-Suisun Urban Runoff Management Program, whose permits were reissued in 2003.

In addition, as requested in the December 11, 2003 memo from Wil Bruhns to Habte Kifle and other Regional Board staff, we have added appendices to the new Plan that include the Monitoring Program Plan (Appendix D), revised BMPs and Implementation Procedures for Conditionally Exempted Discharges (Appendix E), and revised Pollutant Prevention and Control Measures Plan (Appendix F). These documents are included in the Plan to assist the Regional Board in responding to the recent Superior Court order.

The old version of BMPs and Implementation Procedures for Conditionally Exempted Discharges was submitted previously to the Regional Board on March 15, 2001 and Attachment A to this document was updated and resubmitted to the Regional Board in May 2002. The new version was updated slightly to contain new information, such as a reference to the State Water Resources Control Board's Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality. The old version of the Pollutant Prevention and Control Measures Plan was dated June 29, 2001 and submitted to the Regional Board around that date. The current version was expanded by one year to cover FY 2004/05, in anticipation of the interim period until STOPPP's NPDES permit is reissued in 2005.

If you have any questions, or wish to arrange a meeting to discuss our reapplication package and/or the Regional Board's approach to dealing with the Superior Court order, please contact me.

Sincerely,

Robert Davidson
STOPPP Coordinator

Cc: Habte Kifle

Enc: Stormwater Management Plan April 2004 – June 2010
Application/Report of Waste Discharge General Application Form for WDRs or NPDES Permit

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

I. FACILITY INFORMATION

A. Facility:

Name: San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)			
Address: 555 County Center, Fifth Floor			
City: Redwood City	County: San Mateo	State: CA	Zip Code: 94063
Contact Person: Bob Davidson		Telephone Number: (650) 593-3820	

B. Facility Owner:

Name: San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)			Owner Type (Check One) 1. ☐ Individual 2. ☐ Corporation 3. ☐ Governmental Agency 4. ☐ Partnership 5. ☐ Other:
Address: 555 County Center, Fifth Floor			
City: Redwood City	State: CA	Zip Code: 94063	
Contact Person: Bob Davidson		Telephone Number: (650) 593-3820	Federal Tax ID:

C. Facility Operator (The agency or business, not the person):

Name: San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)			Operator Type (Check One) 1. ☐ Individual 2. ☐ Corporation 3. ☐ Governmental Agency 4. ☐ Partnership 5. ☐ Other:
Address: 555 County Center, Fifth Floor			
City: Redwood City	State: CA	Zip Code: 94063	
Contact Person: Bob Davidson		Telephone Number: (650) 593-3820	

D. Owner of the Land:

Name: San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)			Owner Type (Check One) 1. ☐ Individual 2. ☐ Corporation 3. ☐ Governmental Agency 4. ☐ Partnership 5. ☐ Other:
Address: 555 County Center, Fifth Floor			
City: Redwood City	State: CA	Zip Code: 94063	
Contact Person: Bob Davidson		Telephone Number: (650) 593-3820	

E. Address Where Legal Notice May Be Served:

Address: 555 County Center, Fifth Floor		
City: Redwood City	State: CA	Zip Code: 94063
Contact Person: Bob Davidson		Telephone Number: (650) 593-3820

F. Billing Address:

Address: 555 County Center, Fifth Floor		
City: Redwood City	State: CA	Zip Code: 94063
Contact Person: Bob Davidson		Telephone Number: (650) 593-3820

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

II. TYPE OF DISCHARGE

Check Type of Discharge(s) Described in this Application (A or B):

☐ **A. WASTE DISCHARGE TO LAND** ☒ **B. WASTE DISCHARGE TO SURFACE WATER**

Check all that apply:

- ☐ Domestic/Municipal Wastewater Treatment and Disposal
- ☐ Cooling Water
- ☐ Mining
- ☐ Waste Pile
- ☐ Wastewater Reclamation
- ☐ Other, please describe: _____
- ☐ Animal Waste Solids
- ☐ Land Treatment Unit
- ☐ Dredge Material Disposal
- ☐ Surface Impoundment
- ☐ Industrial Process Wastewater
- ☐ Animal or Aquacultural Wastewater
- ☐ Biosolids/Residual
- ☐ Hazardous Waste (see instructions)
- ☐ Landfill (see instructions)
- ☒ Storm Water

III. LOCATION OF THE FACILITY

Describe the physical location of the facility.

1. Assessor's Parcel Number(s)	2. Latitude	3. Longitude
Facility:	**Facility:**	**Facility:**
Discharge Point:	**Discharge Point:**	**Discharge Point:**

IV. REASON FOR FILING

- ☐ New Discharge or Facility
- ☐ Change in Design or Operation
- ☐ Change in Quantity/Type of Discharge
- ☐ Changes in Ownership/Operator (see instructions)
- ☒ Waste Discharge Requirements Update or NPDES Permit Reissuance
- ☐ Other: _____

V. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Name of Lead Agency: _____

Has a public agency determined that the proposed project is exempt from CEQA? ☐ **Yes** ☐ **No**

If Yes, state the basis for the exemption and the name of the agency supplying the exemption on the line below.

Basis for Exemption/Agency: _____

Has a "Notice of Determination" been filed under CEQA? ☐ **Yes** ☐ **No**

If Yes, enclose a copy of the CEQA document, Environmental Impact Report, or Negative Declaration. If no, identify the expected type of CEQA document and expected date of completion.

Expected CEQA Documents:

☐ **EIR** ☐ **Negative Declaration** **Expected CEQA Completion Date:** _____

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

VI. OTHER REQUIRED INFORMATION

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to, design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any Best Management Practices (BMPs) used, and a description of disposal methods.

Also include a site map showing the location of the facility and, if you are submitting this application for an NPDES permit, identify the surface water to which you propose to discharge. Please try to limit your maps to a scale of 1:24,000 (7.5' USGS Quadrangle) or a street map, if more appropriate.

VII. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

_____

_____

_____

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your Application/Report of Waste Discharge, pursuant to Division 7, Section 13260 of the California Water Code.

VIII. CERTIFICATION

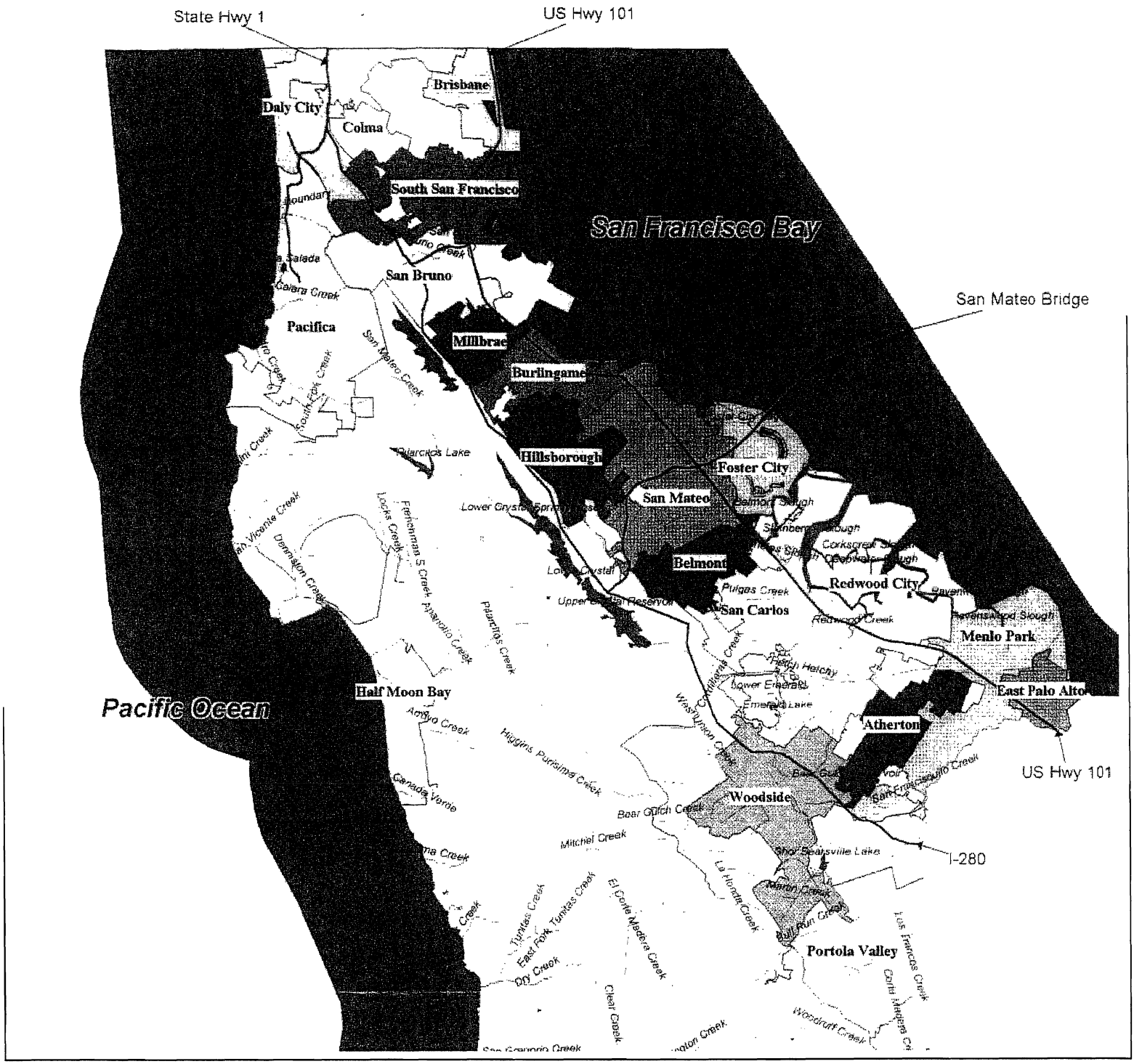
"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: Robert M. Davidson Title: Program Coordinator

Signature: Robert M. Davidson Date: Jan. 23, 2004

FOR OFFICE USE ONLY

Date Form 200 Received:	Letter to Discharger:	Fee Amount Received:	Check #:



Cities and Major Water Bodies in San Mateo County

STORMWATER MANAGEMENT PLAN

April 2004 – June 2010

San Mateo Countywide
Stormwater Pollution
Prevention Program

November 4, 2003

A Program of the City/County Association of Governments

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Acronyms

ABAG	Association of Bay Area Governments
BASMAA	Bay Area Stormwater Management Agencies Association
BART	Bay Area Rapid Transit
BMPs	Best Management Practices
C/CAG	City/County Association of Governments
CCMP	Comprehensive Conservation and Management Plan
CEQA	California Environmental Quality Act
CII	Commercial/Industrial/Illicit Discharge (Subcommittee)
COGs	Community Outreach Grants
CRMP	Coordinated Resources Management and Planning
CZARA	Coastal Zone Act Reauthorization Amendments
EPA	Environmental Protection Agency
KMEL	(call letters for a radio station)
LUDA	Land Use Data
MEP	Maximum Extent Practicable
MOU	Memorandum of Understanding
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PIP	Public Information and Participation
POP	Point of Purchase (Campaign)
POTW	Publicly - Owned Treatment Works (sewage treatment plants)
RMP	Regional Monitoring Program
RNA	ribonucleic acid
SFEI	San Francisco Estuary Institute

STOPPP	San Mateo Countywide Stormwater Pollution Prevention Program
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
USGS	U.S. Geological Survey
WERF	Water Environment Research Foundation

Definitions

BMPs	Practices which prevent or reduce stormwater pollution.
General Program	Activities implemented for the joint benefit of the member agencies of the San Mateo County STOPPP.
Member Agencies	San Mateo County and the 20 cities/towns in San Mateo County that participate in the San Mateo Countywide Stormwater Pollution Prevention Program.
Performance Standards	Pollution prevention practices the member agencies have made a commitment to implement.

E Executive Summary

INTRODUCTION

The San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) is a consortium of all 20 cities located within San Mateo County and the county. As described further below, many of STOPPP's activities are coordinated through the City/County Association of Governments of San Mateo County. This partnership also relies on each of the municipalities to implement local stormwater pollution prevention and control activities for their local storm drain systems.

This Stormwater Management Plan (Plan) describes what STOPPP will be doing during the approximately six-year period from April 2004 through June 2010 to prevent and control stormwater pollution in San Mateo County. The current Plan has evolved out of the experience developing and implementing two previous stormwater management plans that covered the preceding ten year period.

The Plan will serve as part of the basis of STOPPP's third National Pollutant Discharge Elimination System (NPDES) permit to be reissued by the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board). As required by the current NPDES permit, the Plan will be submitted to the Regional Board, at least 180 days prior to the permit's expiration on July 21, 2004. The federal Clean Water Act requires stormwater dischargers to reduce pollutants to the maximum extent practicable (MEP) and to effectively eliminate most types of non-stormwater discharges to the storm drain system. The Plan, in conjunction with the reissued permit adopted by the Regional Board, is designed to enable STOPPP to meet these requirements.

ORGANIZATION OF THE PLAN

The Plan is organized around the following five major stormwater pollution prevention and control components:

- Municipal Maintenance
- Industrial and Illicit Discharge Controls
- Public Information and Participation
- New Development and Construction Controls
- Watershed Assessment and Monitoring

Each of the Plan's five major components describes goals, recent achievements and tasks that will be completed over the five year period. The tasks are part of the General Program that will be implemented by STOPPP for the mutual benefit of the municipalities. The achievements portion of each section summarizes activities and progress during the 1999 - 2003 NPDES permit period in order to set the basis for STOPPP's future direction.

The appendices to the Plan include the General Program's work plan and budget for FYs 2003/04 and 2004/05 (Appendix A); performance standards that each of the municipalities has committed to implement

(Appendix B); and a list of municipal stormwater ordinances (Appendix C).

The General Program's two-year work plans and budgets will be updated annually to include the subsequent fiscal year and submitted as a draft to the Regional Board. Normally, STOPPP's Technical Advisory Committee approves these draft work plans and budgets around February, and C/CAG approves them around May or June of each year. Subsequent work plans and budgets will be added to Appendix A as they are developed and approved.

The performance standards are organized to correspond with each of the major components of the Plan except for the Watershed Assessment and Monitoring section. The performance standards help to define what the municipalities need to do to achieve the maximum extent practicable control of pollutants. Performance standards for monitoring are not included because it can be conducted more cost-effectively as a General Program activity rather than by having each member municipality conduct its own monitoring.

COMPONENT GOALS AND MAJOR TASKS

The following reviews the goals and major tasks of each of these components, highlights the applicable performance standards (Appendix B), and describes the most significant changes from the previous plan.

2.0 Municipal Government Maintenance Activities

Municipal maintenance activities include street sweeping, storm drain cleaning, the maintenance of parks and corporation yards and other maintenance-related activities that may have an impact on stormwater quality.

The goal of this component is to continue to work with municipal public works, parks and recreation and other maintenance staff to identify ways to optimize the removal of pollutants and minimize discharges of pollutants during routine maintenance activities.

The two primary tasks include assisting with the implementation of the performance standards (Task 2.1) and conducting outreach and training (Task 2.2) for maintenance staff. The other two tasks in this component include the following: coordinating with other STOPPP subcommittees, other public agencies, and private industries with similar interests or who are potentially affected by municipal maintenance activities (Task 2.3); and assisting with regulatory compliance and planning (Task 2.4).

3.0 Industrial and Illicit Discharge Controls

The two primary goals of this component are to minimize or eliminate potential stormwater pollution sources at commercial and industrial facilities through inspection and educational outreach activities; and to effectively prohibit illicit discharges (such as oil, paint, or soapy washwaters) to the municipalities' storm drain systems.

The primary role of the General Program is to help municipalities implement a consistent countywide approach for meeting the performance standards (Task 3.1). This will be achieved in part by developing and implementing model materials to help the municipalities develop their Five-Year Illicit Discharge Control Action Plans and their Five-Year and Annual Inspection Plans for Businesses (Task 3.2), by assisting municipalities to comply with the requirements for discharges that are conditionally exempted from the NPDES

permit's non-stormwater discharge prohibition (Task 3.3), and by conducting outreach and training (Task 3.4). Lastly, this component includes Task 3.5 to assist the municipalities with NPDES permit compliance reporting, General Program work plans and budgets, and assessing effectiveness.

4.0 Public Information and Participation (PIP)

The primary goal of this component is to educate the public about the causes of stormwater pollution and its serious effects on the quality of waterways and neighborhoods, to encourage residents to adopt less polluting and more environmentally beneficial practices, and to increase residents' hands-on involvement in STOPPP activities.

The most important task under this component is to achieve public involvement through outreach and education (Task 4.3). The PIP component will continue to implement the Bay Area Wide Integrated Pest Management Point of Purchase Campaign at 20 hardware and nurseries located in San Mateo County. In addition, the PIP Subcommittee will select future stormwater pollution prevention topics for targeted outreach, conduct targeted campaigns, and evaluate the effectiveness of these activities.

The other tasks in this component include the following: implement the performance standards (Task 4.1); assist the municipalities to prepare NPDES permit compliance reports and develop the General Program's work plans and budgets (Task 4.2); train PIP staff (Task 4.4); and build partnerships with other agencies and companies and work with volunteer groups and other STOPPP subcommittees (Task 4.5).

5.0 New Development and Construction Controls

In February 2003 the Regional Board amended STOPPP's municipal stormwater permit to include extensive new requirements that affect this component of the Plan. The primary goal of this component, to minimize the water quality and beneficial use impacts of land development during and after construction, will be achieved in part by fulfilling the requirements of the permit amendment. This includes identifying and implementing appropriate site design, source control, and stormwater treatment measures, and managing increases in peak runoff flow and volume in order to prevent increased erosion of creek beds and banks and silt pollutant generation (termed hydrograph modification management in the permit amendment). During the construction phase the goal is achieved by prohibiting non-stormwater discharges from construction sites; reducing stormwater pollutant discharges from construction activities to the maximum extent practicable; and requiring compliance with stormwater best management practices and erosion/sedimentation control at construction sites.

The Subcommittee and the General Program will be conducting the following activities: implement and improve the performance standards (Task 5.1); assist with the implementation of the Provision C.3 requirements contained in the February 2003 permit amendment (Task 5.2); assist with the implementation of controls on peak runoff rates and volumes for appropriate projects (Task 5.3); assist with improving construction site stormwater controls (Task 5.4); and promote the outreach and training for municipal staff and builders and their consultants and contractors (Task 5.5).

Lastly, this component includes Task 5.6 to assist the municipalities with NPDES permit compliance reporting, General Program work plans and budgets, and assessing effectiveness.

6.0 Watershed Assessment and Monitoring

This component supports the implementation of other program components. The primary goals of the component include assessing water quality conditions in representative San Mateo County watersheds, determining whether specific pollutants are adversely affecting local waterways, and developing plans to address any pollutants of concern. In addition, one of the goals is to identify effective BMPs and to evaluate the overall effectiveness of STOPPP's activities. In order to achieve these goals the General Program will continue to use environmental indicators to assess representative watersheds (Task 6.1); develop and implement pollutant-specific control programs for pollutants believed to be impairing local waterways (Task 6.2); participate in regional efforts to monitor and solve water quality impairment problems (Task 6.3); and prepare NPDES permit required reports, monitoring plans, budgets and reports, including annual assessments of the effectiveness of the component's activities (Task 6.4).

Work Plans and Budgets (Appendix A)

As noted previously, the General Program's work plans and budgets for FY 2003/04 and FY 2004/05, the first year of the Plan's proposed implementation, are contained in Appendix A. It is estimated that the General Program costs for FY 2004/05 will be about $1.2 million. Draft work plans and budgets for the first two years of the Plan will be prepared for submittal to the Regional Board by March 1 as required by the NPDES permit.

Performance Standards (Appendix B)

Performance standards to be implemented by member agencies have been reviewed and updated for the following five areas of the Plan:

- Municipal Maintenance Activities
- Industrial and Commercial Discharge Controls
- Illicit Discharge Controls
- Public Information/Participation
- New Development and Construction Controls

STOPPP developed performance standards as a tool to help STOPPP's municipalities comply with their NPDES permit. The Clean Water Act and STOPPP's stormwater NPDES discharge permit require STOPPP member agencies to control discharges of pollutants to the maximum extent practicable (MEP) and to effectively prohibit illicit discharges. STOPPP developed the performance standards to define the MEP level of effort that each member municipality will attain to control pollutants in stormwater.

In addition, the performance standards define the level of effort that each member municipality will attain to effectively prohibit illicit discharges[1] from entering its municipal storm drain conveyance system[2].

[1] Illicit discharges include non-stormwater discharges disallowed by the STOPPP NPDES permit.
[2] Municipal storm drain conveyance system includes roads with drainage systems, municipal streets, curbs, gutters,

The performance standards provide an effective, consistent, and predictable countywide approach to minimizing water quality impacts. Having consistent countywide standards assures similar treatment for businesses, builders, contractors, and property owners. In addition, such standards assist STOPPP's municipalities with training and educational outreach.

These performance standards define the major portion of what each member agency will need to do to implement the Plan and comply with the NPDES permit. The implementation of these performance standards by member agencies is required by the Plan.

CHANGES FROM PREVIOUS PLAN

While the majority of tasks and performance standards have been continued from the previous plan, there have been a number of changes. Some changes were made to respond to the February 2003 amendment of STOPPP's NPDES permit. This permit amendment added specific detailed requirements for stormwater pollution prevention and treatment at applicable new development and redevelopment projects

Other reasons why changes were made included: preparing for changes to the permit based on the requirements of recently reissued municipal stormwater permits in other counties; responding to constructive criticism from the regulatory agencies; incorporating new information and approaches based on experience with the previous plan; or revising outdated information.

Performance Standards

The most significant changes to the performance standards include the following.

Municipal Maintenance

- Added a new performance standard that each of the municipalities that have a corporation yard will develop and implement a Stormwater Pollution Prevention Plan that describes how the performance standards for corporation yards will be addressed locally.

- Developed new performance standards for routine maintenance of creeks and channels to help municipalities obtain necessary environmental permits for this type of work.

- Updated the performance standards for pesticide usage and integrated pest management (IPM) to support the implementation of STOPPP's Pesticide Management Plan. One example is adding a requirement to implement each municipality's new IPM policy or ordinance. Another example is a new requirement to conduct periodic searches of municipal facilities to make sure pesticides that are no longer legal to use or that no longer are allowed based on municipal policy are found and properly disposed.

- Added previously agreed to performance standards for all lagoon management activities undertaken by the cities of Foster City, Redwood City and San Mateo.

- Added previously agreed to performance standards for rural public works maintenance activities that are

catch basins, storm drain inlets, ditches, man-made channels, or storm drains.

applicable to San Mateo County. In addition, the performance standards describe a process for the cities of Half Moon Bay, Menlo Park, Pacifica, Portola Valley and Woodside to identify appropriate performance standards for the rural public works maintenance activities that they implement.

Industrial and Commercial Discharge Controls and Illicit Discharge Controls

- Added new performance standards that require that each of the municipalities will develop written, 5-year implementation plans that describe how the municipality will meet the performance standards for finding and eliminating prohibited non-stormwater discharges to its storm drain and for conducting business inspections.

- Added a new performance standard to achieve a more cost-effective business inspection compliance program by having the municipalities be responsible for inspecting facilities that have coverage under the California Industrial Stormwater NPDES General Permit, but referring most problems found to the Regional Board staff for correction.

New Development and Construction Controls

- Added new performance standards to help implement the amended NPDES permit's Provision C.3 requirements. This included: 1) a new performance standard to implement the amended NPDES permit's requirement (C.3.k) that source control measures are required for applicable projects; and 2) a new performance standard to implement the amended NPDES permit's requirement (C.3.e) to assure access permission for municipal, Regional Board, and local vector control staff for stormwater treatment measures.

- As part of implementing additional tasks to reduce the contamination of stormwater by mercury, a new performance standard was added to require that each municipality assure that when preparing for building demolition all mercury containing fluorescent tubes, thermostats and other devices are removed and disposed properly.

- Revised performance standards from the previous plan to incorporate the amended NPDES permit's Provision C.3's requirements. Examples include: 1) a performance standard that required the use of site design and stormwater treatment measures for projects with significant stormwater pollution potential was revised to also require the use of source control and hydrograph modification management measures for applicable projects; and 2) a performance standard for municipalities to require that owners/builders operate and maintain stormwater treatment measures was revised to add more specific requirements based on Provision C.3.e.

Stormwater Management Plan Tasks

The most significant changes to the Plan's tasks include the following.

A greater emphasis has been placed on evaluating the effectiveness of the General Program's tasks in order to determine where to make future improvements. This process of measuring effectiveness is modeled after U.S. EPA's requirements for small municipal stormwater programs.

The approach for conducting watershed assessments has evolved. During the previous plan the emphasis was on delineating 17 watersheds and collecting data on imperviousness and channel modifications. The new Plan specifies preparing a new multi-year monitoring plan. The new monitoring plan is anticipated to take a more comprehensive approach by focusing on fewer watersheds. This would include compiling all existing data on a watershed, collecting biological data from creeks to assess problems, and conducting focused water quality monitoring where needed to help identify how to solve problems. At some point in the process the correction of specific problems would become the responsibility of the local municipality rather than the General Program.

The Plan has a greater emphasis on assisting STOPPP's municipalities to implement improved controls on pollutants of concern, such as, PCBs, mercury, pesticides, sediment, dioxins, and copper. STOPPP will continue to assist the Regional Board to develop Total Maximum Daily Loads to reduce the loading for a number of these pollutants through its continued participation in and funding of the Clean Estuary Partnership.

The Industrial and Illicit Discharge Controls section of the Plan contains a new task to assist the municipalities to comply with the NPDES permit's requirements for conditionally exempted discharges. This assistance has increased importance because of the State Water Resources Control Board's adoption of a new permit for low threat discharges to land and as previous Regional Board waivers for minor discharges may no longer be applicable.

The New Development and Construction Controls section of the Plan has two new tasks to assist the municipalities to implement the additional new and redevelopment related requirements contained in STOPPP's NPDES permit amendment. This permit amendment represents a significant amount of additional work for both the General Program and the municipalities, and the Plan reflects this change.

Superior Court Order

On November 14, 2003 the California Superior Court for the City and County of San Francisco issued an order regarding STOPPP's NPDES permit adopted in July 1999. This court order determined that STOPPP's NPDES permit was deficient procedurally for not including a monitoring program that included the types, intervals, and frequencies of monitoring sufficient to yield data representative of the monitored activity. As requested by the Regional Board staff, on January 20, 2004 STOPPP's TAC added Appendix D, Monitoring Program Plan, to this Plan in order to remedy this deficiency.

In order to address other procedural deficiencies regarding how plans and reports are incorporated into the Plan, STOPPP's TAC, as requested by the Regional Board staff, also added to this Plan Appendix E, BMPs and Implementation Procedures for Conditionally Exempted Discharges; and Appendix F, Pollutant Prevention and Control Measures Plan.

1 Introduction and Background

INTRODUCTION

The San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) is a consortium of all 20 cities located within San Mateo County and the county. As described further below, many of STOPPP's activities are coordinated through the City/County Association of Governments of San Mateo County. This partnership also relies on each of the municipalities to implement local stormwater pollution prevention and control activities for their local storm drain systems.

This Stormwater Management Plan (Plan) describes what STOPPP will be doing during the approximately six-year period from April 2004 through June 2010 to prevent and control stormwater pollution in San Mateo County. The current Plan has evolved out of the experience developing and implementing two previous stormwater management plans that covered the preceding ten year period.

The Plan will serve as part of the basis of STOPPP's third National Pollutant Discharge Elimination System (NPDES) permit to be reissued by the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board). As required by the current NPDES permit, the Plan will be submitted to the Regional Board, at least 180 days prior to the permit's expiration on July 21, 2004. The federal Clean Water Act requires stormwater dischargers to reduce pollutants to the maximum extent practicable and to effectively eliminate prohibited discharges to the storm drain system. The Plan, in conjunction with the reissued permit adopted by the Regional Board, is designed to enable STOPPP to meet these requirements.

BACKGROUND

The following provides a brief overview about San Mateo County, STOPPP, and the Plan.

Geographic Description

San Mateo County is located on a peninsula, which is bordered on its northeast side by San Francisco Bay and on its west side by the Pacific Ocean. San Mateo County covers about 450 square miles of land area, which makes it the second smallest county in the Bay Area. The population of approximately 720,000 is concentrated primarily in the eastern part of the county, which has eighteen cities. The western part of the county has considerable amounts of agricultural and open space lands, with pockets of urbanization particularly in the northern part of the county, in Daly City and Pacifica, and in and around Half Moon Bay.

Management Structure

The City/County Association of Governments (C/CAG), established under a Joint Powers Authority Agreement, oversees the implementation of the General Program aspects of STOPPP; General Program tasks are those that can be done more cost effectively as a group. C/CAG is comprised of local elected city council representatives

from each municipality, one member of the County Board of Supervisors, and representatives from the local transit district and transportation authority.

Each of STOPPP's member agencies is responsible for preventing stormwater pollution and implementing its local stormwater pollution prevention and control activities according to the agreed upon performance standards. The STOPPP Program Coordinator is responsible for providing a liaison between C/CAG and the day-to-day implementation of STOPPP's General Program.

STOPPP's Technical Advisory Committee has provided a forum for sharing information and coordinating various aspects of the program. The Committee is comprised of municipal staff representatives in the fields of engineering, planning, environmental health, wastewater treatment, source control inspection, and public works administration. The Technical Advisory Committee has established five subcommittees to help implement the major components of the Plan.

Organization of the Plan

The Plan is organized around the following five major stormwater pollution prevention and control components:

- Municipal Maintenance
- Industrial and Illicit Discharge Controls
- Public Information and Participation
- New Development and Construction Controls
- Watershed Assessment and Monitoring

Each of the Plan's five major components describes goals, recent achievements and tasks that will be completed over the five year period. The tasks are part of the General Program that will be implemented by STOPPP for the mutual benefit of the municipalities. The achievements portion of each section summarizes activities and progress during the 1999 - 2003 NPDES permit period in order to set the basis for STOPPP's future direction. This background information is not intended to be comprehensive. More detailed information is provided in each of STOPPP's annual reports.

The appendices to the Plan include the General Program's work plan and budget for FYs 2003/04 and 2004/05 (Appendix A); performance standards that each of the municipalities has committed to implement (Appendix B); and a list of municipal stormwater ordinances (Appendix C).

The General Program's two-year work plans and budgets will be updated annually to include the subsequent fiscal year and submitted as a draft to the Regional Board by March 1 of each year. Normally, STOPPP's Technical Advisory Committee approves these draft work plans and budgets around February and C/CAG around May or June of each year. Subsequent work plans and budgets will be added to Appendix A as they are developed and approved.

The performance standards are organized to correspond with each of the major components of the Plan except for the Watershed Assessment and Monitoring section. The performance standards help to define what the municipalities need to do to achieve the maximum extent practicable control of pollutants. Performance standards for monitoring are not included because it can be conducted more cost-effectively as a General Program activity

rather than by having each member municipality conduct its own monitoring.

Legal Authority

All of the municipalities, except for the City of Foster City, have adopted the model stormwater discharge and control ordinance adapted from the Alameda Countywide Clean Water Program. The ordinance provides each municipality with the legal authority to control what is discharged into its storm drain system. The implementing ordinance numbers and dates are listed in Appendix C. The City of Foster City's attorney determined that the city's existing ordinances provide sufficient authority to regulate discharges to its storm drain system and therefore an additional ordinance was unnecessary.

Funding

During the 1992 California Legislative Session, AB 2635 (Chapter 1208, Statutes of 1992) extended the authority of the San Mateo County Flood Control District Act. As a result, the Board of Supervisors, acting in its capacity as the Flood Control District Board of Directors, upon a two-thirds vote, may adopt an ordinance to impose charges in any zone or subzone. These charges may be used for the specific purposes of funding flood control, storm drainage, water conservation or supply, or water pollution abatement projects or programs. The board's ability to impose fees provides a central revenue source for General Program activities that can also be used by local municipal programs to finance local NPDES permit program activities.

In FY 2000/01 CCAG established a Task Force to evaluate a possible fee increase for supporting the General Program. This process included notifying each property owner and it culminated in the County Board of Supervisors approving an additional fee in July 2001.

The charges appear on the property tax rolls and are imposed as a separate line item on the property tax bill. The budget expenditure to implement the General Program during FY 2002/03 was $1,295,348. Generally, fees to fund the General Program were applied according to land use area as follows:

- $3.44 residential parcel – basic fee; $2.4842 – additional fee
- $1.72 condominium, agriculture and vacant parcel – basic fee; $1.2421 – additional fee
- $3.44 all other uses for first 11,000 square feet, plus $0.3127 per 1,000 additional square feet of parcel area – basic fee; $2.4842 - additional fee.

The cities of Brisbane and Colma participate in the collection of the basic fee, but not the additional fee for supporting the General Program. In addition, the town of Woodside uses an alternative source of funding to pay its General Program cost share.

The cities of Belmont, Brisbane, Colma, Daly City, East Palo Alto, Hillsborough, Menlo Park, Millbrae, Pacifica, and South San Francisco also established local fees to fund municipality-specific activities. The cities of Redwood City, San Bruno, San Carlos and Woodside have established their own method of funding municipality-specific and General Program activities.

Bay Area-Wide Collaboration

STOPPP has continued to be an active participant in several regionwide

collaborative pollution prevention and control efforts and in planning for Total Maximum Daily Loads (TMDLs) that will reduce the loading of specific pollutants impairing the bay and local creeks. Notable among these is its continued support for Bay Area Stormwater Management Agencies Association (BASMAA) at both the Directors' level and at the committees' level.

In addition, STOPPP has provided financial support for the Clean Estuary Partnership that addresses planning for the implementation of TMDLs. STOPPP's Program Coordinator serves as BASMAA's representative on the Clean Estuary Program's Administrative Committee, and a STOPPP representative also participates in the Clean Estuary Partnership's Technical Committee. STOPPP has also participated in the Regional Board's Mercury Watershed Council since it was initiated in 1999.

Other areas of active Bay Area-wide collaboration include STOPPP's funding for the Regional Monitoring Program for Trace Substances and its active participation in the San Francisco Estuary Project's Implementation Committee.

CHANGES FROM PREVIOUS PLAN

While the majority of tasks and performance standards have been continued from the previous plan, there have been a number of changes. Some changes were made to respond to the February 19, 2003 amendment of STOPPP's NPDES permit. This permit amendment added specific detailed requirements for stormwater pollution prevention and treatment at applicable new development and redevelopment projects

Other reasons why changes were made included: preparing for changes to the permit based on the requirements of recently reissued municipal stormwater permits in other counties; responding to constructive criticism from the regulatory agencies; incorporating new information and approaches based on experience with the previous plan; or revising outdated information.

Performance Standards

The most significant changes to the performance standards include the following.

Municipal Maintenance

- Added a new performance standard that each of the municipalities that have a corporation yard will develop and implement a Stormwater Pollution Prevention Plan that describes how the performance standards for corporation yards will be addressed locally.

- Developed new performance standards for routine maintenance of creeks and channels to help municipalities obtain necessary environmental permits for this type of work.

- Updated the performance standards for pesticide usage and integrated pest management (IPM) to support the implementation of STOPPP's Pesticide Management Plan. One example is adding a requirement to implement each municipality's new IPM policy or ordinance. Another example is a new requirement to conduct periodic searches of municipal facilities to make sure pesticides that are no longer legal to use or that no longer are allowed based on municipal policy are found and properly disposed.

- Added previously agreed to performance standards for all lagoon management

activities undertaken by the cities of Foster City, Redwood City and San Mateo.

- Added previously agreed to performance standards for rural public works maintenance activities that are applicable to San Mateo County. In addition, the performance standards describe a process for the cities of Half Moon Bay, Menlo Park, Pacifica, Portola Valley and Woodside to identify appropriate performance standards for the rural public works maintenance activities that they implement.

Industrial and Commercial Discharge Controls and Illicit Discharge Controls

- Added new performance standards that require that each of the municipalities will develop written, 5-year implementation plans that describe how the municipality will meet the performance standards for finding and eliminating prohibited non-stormwater discharges to its storm drain and for conducting business inspections.

- Added a new performance standard to achieve a more cost-effective business inspection compliance program by having the municipalities be responsible for inspecting facilities that have coverage under the California Industrial Stormwater NPDES General Permit, but referring most problems found to the Regional Board staff for correction.

New Development and Construction Controls

- Added new performance standards to help implement the amended NPDES permit's Provision C.3 requirements. This included: 1) a new performance standard to implement the amended NPDES permit's requirement (C.3.k) that source control measures are required for applicable projects; and 2) a new performance standard to implement the amended NPDES permit's requirement (C.3.e) to assure access permission for municipal, Regional Board, and local vector control staff for stormwater treatment measures.

- As part of implementing additional tasks to reduce the contamination of stormwater by mercury, a new performance standard was added to require that each municipality assure that when preparing for building demolition all mercury containing fluorescent tubes, thermostats and other devices are removed and disposed properly.

- Revised performance standards from the previous plan to incorporate the amended NPDES permit's Provision C.3's requirements. Examples include: 1) a performance standard that required the use of site design and stormwater treatment measures for projects with significant stormwater pollution potential was revised to also require the use of source control and hydrograph modification management measures for applicable projects; and 2) a performance standard for municipalities to require that owners/builders operate and maintain stormwater treatment measures was revised to add more specific requirements based on Provision C.3.e.

Stormwater Management Plan Tasks

The most significant changes to the Plan's tasks include the following.

A greater emphasis has been placed on evaluating the effectiveness of the General Program's tasks in order to determine where to make future improvements. This process

of measuring effectiveness is modeled after U.S. EPA's requirements for small municipal stormwater programs.

The approach for conducting watershed assessments has evolved. During the previous plan the emphasis was on delineating 17 watersheds and collecting data on imperviousness and channel modifications. The new Plan specifies preparing a new multi-year monitoring plan. The new monitoring plan is anticipated to take a more comprehensive approach by focusing on fewer watersheds. This would include compiling all existing data on a watershed, collecting biological data from creeks to assess problems, and conducting focused water quality monitoring where needed to help identify how to solve problems. At some point in the process the correction of specific problems would become the responsibility of the local municipality rather than the General Program.

The Plan has a greater emphasis on assisting STOPPP's municipalities to implement improved controls on pollutants of concern, such as, PCBs, mercury, pesticides, sediment, dioxins, and copper. STOPPP will continue to assist the Regional Board to develop TMDLs for a number of these pollutants through its continued participation in and funding of the Clean Estuary Partnership.

The Industrial and Illicit Discharge Controls section of the Plan contains a new task to assist the municipalities to comply with the NPDES permit's requirements for conditionally exempted discharges. This assistance has increased importance because of the State Water Resources Control Board's adoption of a new permit for low threat discharges to land and as previous Regional Board waivers for minor discharges may no longer be applicable.

The New Development and Construction Controls section of the Plan has two new tasks to assist the municipalities to implement the additional new and redevelopment related requirements contained in STOPPP's NPDES permit amendment. This permit amendment represents a significant amount of additional work for both the General Program and the municipalities, and the Plan reflects this change.

2 Municipal Maintenance

INTRODUCTION

This component of the Plan describes how municipal maintenance activities will be conducted to prevent the introduction of stormwater pollutants to storm drains and to optimize the removal of pollutants that have already reached the drainage system. STOPPP has developed performance standards for conducting maintenance activities and assisted municipalities with training and implementation of these performance standards.

Municipalities spend significant resources on street sweeping and storm drain system maintenance for aesthetic purposes and flood control. These maintenance activities also remove pollutants that could potentially enter the storm drain system, creeks, lagoons and ultimately San Francisco Bay and the ocean.

During the maintenance of roads, flood control facilities, parks and other public improvements, municipalities use and generate potential stormwater pollutants, (such as automotive fluids, pesticides, asphalt saw cuttings, and sediment). STOPPP has educated municipal employees on methods to prevent these types of potential stormwater pollutants.

Maintenance personnel are involved in educating the public about stormwater pollution prevention. Maintenance personnel are valuable in educational outreach and the reporting of discharge incidents, due to their presence in the field. Also, public works and parks personnel often work directly with the public on creek clean-ups and other public participation projects.

STOPPP's permit amendment adopted in February 2003 recognized that municipalities "may utilize their Annual Reports to highlight their budget constraints and suggest reprioritization of any Program activities in order to achieve the most cost effective overall program" (Provision C.3.n). None of the municipalities attempted to use this permit provision as part of their sections of the FY 2002/03 Annual Reports, but they may choose to do so as part of future annual reports.

The three primary goals of this component are:

- Optimize pollutant removal during routine maintenance activities such as street sweeping, maintenance of storm drainage facilities and litter removal;
- Identify and implement maintenance methods to prevent or minimize discharges to storm drains and watercourses; and,
- Track and measure the effectiveness of performance standards.

ACHIEVEMENTS

The number and scope of maintenance activities subject to performance standards and the variety of municipal employees trained to implement them has increased. This section summarizes this and other accomplishments achieved since 1999, when the second permit was reissued. Table 2-1

presents background information on selected maintenance activities conducted by each municipality.

Street Sweeping and Storm Drain Maintenance

Using standardized maintenance forms, municipalities keep records of routine maintenance activities. In 2000, a STOPPP municipal maintenance web page was developed to allow for on-line entry of data. Several cities begin entering maintenance activity data via the web page in 2001.

Municipalities compile street sweeping and storm drain system maintenance data on a monthly basis and submit it to the General Program. The street sweeping data include the volume of material removed and miles swept by each municipality. Table 2-2 summarizes the street sweeping data collected between July 1999 and June 2003. As shown in the Table, miles swept appear to have increased slightly since 1999 for the majority of municipalities. In FY 1999/00, total curb miles swept equaled 135,081 and by FY 2002/03 the figure had increased to 144,321 curb miles swept. This slight increase may be attributed to improved implementation of street sweeping performance standards and the increased awareness among maintenance staff about the importance of stormwater pollution prevention. The reason for differences in amounts of material removed each year is unclear and appears to be due to other factors, besides increases in the number of miles swept.

The storm drain system maintenance data include the number of inlets and other storm drainage facilities (e.g., creeks, channels, culverts and v-ditches) inspected and cleaned and the total volume of material removed. Table 2-3 summarizes the inlet cleaning data collected between July 1999 and June 2003. Municipalities are trying to optimize the removal of storm drain inlet debris by targeting inlets that tend to accumulate this material.

Outreach Activities

A major achievement has been to provide information about STOPPP to parks and recreation employees, as well as public works employees. This was primarily accomplished through meetings and annual workshops. The Municipal Maintenance Subcommittee, which consists of Public Works Supervisors or their designees, continued bimonthly meetings. In addition, the Parks and Recreation IPM Work Group was established and has held semi-annual meetings. At the meetings, members share information about their experiences implementing performance standards. Of particular interest has been municipalities experience with new storm drain cleaning technology and inlet protection devices; and spill prevention and cleanup. Additional performance standards were developed as described below.

The annual workshops focused on educating maintenance field staff on the goals of STOPPP and on obtaining input from field staff on practices that may improve stormwater quality. Workshop topics have included the following:

- Review of BMPs and performance standards;
- Proper spill response procedures;
- Presentations from equipment vendors - latest technologies for storm drain protection;
- Stormwater pollution prevention practices for corporation yards; and
- Environmental permitting for creek and open channel maintenance activities – State/Federal requirements and experience obtaining permits.

The General Program provided or worked with the Subcommittee to develop educational materials. The materials were used to assist municipalities in educating maintenance staff about performance standards, BMPs, and stormwater violations. Other materials were targeted at educating the public. The following items were produced or adapted:

- Binder containing STOPPP outreach brochures and flyers;
- Santa Clara Valley Urban Runoff Pollution Prevention Program's draft Pest Resistant Plant List; and
- Revised Fresh Concrete and Mortar Application BMP brochure.

Beginning in 2000, the General Program began providing annual pesticide training workshops. Integrated pest management (IPM) performance standards were a focal point of the training events targeted at Parks supervisors and employees who spray pesticide in parks, landscaping near public buildings and road right-of-ways. Specific topics covered included:

- Monitoring for pest damage and for the results of various pest control methods;
- Impact of pesticides on water quality;
- Landscape design and its relationship to pesticide use;
- Implementation of IPM in San Francisco's Parks and Recreation department and in Santa Clara County; and
- Alternatives to organophosphate pesticides.

Municipal Maintenance Performance Standards

The Subcommittee and its work groups developed and submitted to Regional Board staff new performance standards for lagoon management (spring 2002), pesticide usage and integrated pest management (May 2000), and open channel and watercourse cleaning (August 2002). Also, San Mateo County developed detailed maintenance standards for rural public works maintenance activities related to creek bank stabilization, large woody debris removal, vegetation management and erosion and sediment control for projects performed near watercourses. The County and member agencies with potential rural public works maintenance involvement met once to discuss the standards. San Mateo County submitted its rural public works maintenance standards to Regional Board staff in June 2000.

Pesticide Management Activities

The General Program surveyed the municipalities about their pesticide usage and reported the findings in the FY2000/01 Annual Report. In addition, based on direction from the Regional Board staff, STOPPP developed a Pesticide Management Plan. One of the requirements of this plan is for each municipality to adopt an IPM ordinance or policy. The Parks and Recreation IPM work group developed a model Integrated Pest Management Policy for adoption and use by the municipalities.

The majority of municipalities have implemented practices that minimize impacts of pesticide use on water quality, such as:

- Use mulch and mowing to control weeds, when practicable
- Specify IPM approach in landscape maintenance bid documents and request pesticide use data and evidence of IPM training in contract specifications
- Inventory and properly dispose of excess and non-legal pesticides

Municipal Corporation Yard Inspections

During the second permit period, STOPPP representatives expanded their visits to municipal corporation yards to include eight yards operated by Parks and Recreation personnel. The purpose of the visits was to assist municipalities in identifying areas for improvement including structural and operational practices. Common problem areas included leaky dumpsters/uncovered refuse holding areas, exposed semi-permanent soil piles, vehicle washing without wash pads whose drainage either flows to sanitary sewer or is collected and recycled, and lack of spill-containment kits at fueling or chemical storage areas.

In almost all cases, agency personnel were already aware of the deficiency and had applied for grants or sought budget increases to fund proper wash racks and containment. When funding restraints were an issue, agencies were using or were advised to use temporary solutions to prevent prohibited non-stormwater discharges.

MAJOR TASKS

The following tasks will be conducted during the next five years.

Task 2.1 Develop and Implement Performance Standards

Each of the municipalities will implement the existing performance standards for municipal maintenance specified in Appendix B, as part of its compliance with its stormwater NPDES permit. The Municipal Maintenance Subcommittee will also review municipal maintenance activities, identify those without adequate stormwater pollution controls, and then develop new performance standards or BMPs to eliminate the inadequacies as needed.

The General Program will continue to work with the Parks and Recreation Work Group to assist with implementation of municipalities' IPM policies scheduled for adoption by the end of December 2003. STOPPP has also begun working on trash control activities. The General Program plans to identify problem areas, current management practices and possible improvements to existing practices.

Other possible subjects for new performance standards include the following:

- Parking lots and sidewalks
- Drinking water supply maintenance
- Swimming pools and ponds management

The Municipal Maintenance Subcommittee will review the existing performance standards at least once every two years and make any needed revisions. Improvements to the performance standards will be based on implementation experience, the measured effectiveness of controls, and guidance developed by the Bay Area Stormwater Management Agencies Association and other groups as available.

Task Evaluation: The evaluation of this task may include: 1) Analyze monthly maintenance forms and responses to Annual Report deliverable forms to determine whether performance standards are being implemented; 2) Receive input from a) subcommittee or work groups and b) Regional Board staff visits and/or comments on STOPPP's Annual Report to determine where performance standard implementation may need improvement.

Task 2.2 Conduct Outreach and Training

Outreach to both maintenance staff and the public is an important aspect of this component. The General Program will

provide administrative support and guidance for the Municipal Maintenance Subcommittee and will help coordinate annual workshops. In addition, materials designed to increase awareness of performance standards will be developed and distributed to maintenance field staff.

The General Program will assist municipalities to develop public outreach materials. STOPPP will assess the value of developing educational materials directed at private communities where streets and storm drainage facilities may not be routinely maintained. In addition, educational materials may include a performance standards implementation handbook designed for public works supervisors. The design of public outreach materials will be coordinated with the Public Information/Participation Subcommittee. Up to one public outreach piece will be developed every two years.

Task Evaluation: Each workshop will continue to include an evaluation form for workshop participants to complete. A summary of form results and level of attendance by each municipality will be used to measure training workshop success. Means of evaluating outreach materials could include 1) numbers of public outreach pieces distributed; and/or 2) collecting anecdotal information about increased BMP awareness by municipal maintenance contractors and the general public.

Task 2.3 Coordinate on Maintenance Related Activities with Other Subcommittees of the STOPPP, Other Agencies and Private Industries

This task includes developing work groups with appropriate staff from other subcommittees of the STOPPP, other agencies, and private industries whose activities are similar to or potentially affected by municipal maintenance activities. The work groups will identify activities of concern and possible BMPs. In addition, representatives from these groups may be included in outreach workshops. Examples of other agencies and businesses include:

- Schools;
- Utilities;
- Private Communities;
- Golf Courses;
- BART / Transportation Agencies;
- Cemeteries; and
- Solid Waste Management Agencies.

Task Evaluation: The success of this task may be evaluated by the 1) number of work groups established; 2) level of participation from individual municipalities in work groups and/or other joint activities; and/or 3) number and quality of jointly developed products.

Task 2.4 Assist with Regulatory Compliance and Planning

The General Program will conduct three activities under this task:

1. Assist the STOPPP agencies with the reporting and other regulatory requirements of the NPDES permit, including developing semiannual deliverable reporting forms for tracking implementation of the performance standards and other program activities and preparing the municipal maintenance section of STOPPP's Annual Report;

2. Develop the General Program's two-year work plans and budgets;

3. Continue to assist the Municipal Maintenance Subcommittee in conducting routine meetings and other

activities. The Municipal Maintenance Subcommittee and its work groups will conduct a minimum of six meetings each year.

Municipalities will be responsible for participating in the Municipal Maintenance Subcommittee as appropriate (see the performance standards) and for providing sufficient information on the local programs for the Annual Report.

Task Evaluation: Evaluation of this task may include: 1) review how well the municipalities are meeting NPDES permit requirements for municipal maintenance activities; and 2) analyze and summarize Regional Board staff's review of member agency performance in this area.

Table 2-1 Municipal Maintenance Background Information

Municipality	Corporation Yards			Street and Inlet Summary		Maintain Municipal Water Distribution System	Maintain Stormwater Pump Stations (a)
	Operate Corporation Yard	Store Pesticides	Date of Last Search for Non-Legal & Excess Pesticides	Curb Miles of Street In Municipality	Number of Inlets In Municipality		
Atherton	Yes	Yes	January 2003	10	198	No	No
Belmont	Yes	No	N/A	162	515	No	No / None
Brisbane	Yes	Yes	January 2003	48	410	Yes	Yes
Burlingame	Yes	Yes	Done annually	140	1,100	Yes	Yes
Colma	Yes	No	N/A	13	185	No	No
Daly City	Yes	Yes	Done annually	374	1,850	Yes	No / None
East Palo Alto	Yes	N/A	Contract out park maintenance.	76	437	No	No
Foster City	Yes	Yes	July 2002	98	1,275	Yes	Yes
Half Moon Bay	Yes	N/A		44	70	No	No
Hillsborough	Yes	Yes	2002	140	646	Yes	No / None
Menlo Park	Yes	Yes	Spring 2003	196	1,555	Yes	Yes (1)
Millbrae	Yes	Yes	2002	110	623	Yes	Yes (2)
Pacifica	Yes	Yes	January 2003	178	986	No	Yes
Portola Valley	No	No	N/A	53	220	No	No
Redwood City	Yes	Yes	March 2003	350	2685 [(b)]	Yes	Yes (17)
San Bruno	Yes	Yes	2003	176	950	Yes	Yes
San Carlos	Yes	Yes	January 2003	166	701	No	Yes (2)
San Mateo, City of	Yes	Yes	2003	570	5,000	No	Yes
San Mateo County	Yes	Yes	2000	640	1,136	No	Yes
South San Francisco	Yes	Yes	Done annually	252	1,500	No	Yes (5)
Woodside	Yes	No	N/A	86	350	No	No

NOTE:

a: (13) Indicates the number of pump stations.

b: Number includes both inlets and catch basins.

Table 2-2 Summary of Street Sweeping Activities for Fiscal Years 1999/00,2000/01, 2001/02 and 2002/03 (1)

Municipality	Curb Miles of Streets in Municipality	FY 1999/00		FY 2000/01		FY 2001/02		FY 2002/03	
		Material Removed (yd^3)	Curb Miles Swept	Material Removed (yd^3)	Curb Miles Swept	Material Removed (yd^3)	Curb Miles Swept	Material Removed (yd^3)	Curb Miles Swept
Atherton	10	2	2	4	2	28	6	53	61
Belmont	162	97 267 tons	5,499	 285 tons	6,171	239	5,068	245	5,817
Brisbane	48	144	122	 9 tons	874	194	1,537	202 20 tons	968
Burlingame	140	4,366	12,207	4,265	15,340	3,626	15,525	3,771	14,796
Colma	13	178	401	125	375	139	326	119	300
Daly City	374	2,215	19,533	2,186	19,952	2,077	19,444	2,157	21,035
East Palo Alto	76	172	ND	619	2,906	504	5,343	951	8,225
Foster City	98	851	3,443	676	3,169	1,316	6,341	400	4,790
Half Moon Bay	44	255	779	265	809	385	721	347	731
Hillsborough	140	0	0	0	0	0	0	1,005	0.0 (2)
Menlo Park	196	3,422	5,316	2,814	5,316	2,557	4,873	2,798	5,058
Millbrae	110	1,150	6,375	1,202	6,073	1,209	6,181	2,174	5,844
Pacifica	178	1,633	8,485	1,396	7,641	1,623	8,130	1,132	8,035
Portola Valley	53	372	587	101	172	215	195	124	194
Redwood City	350	7,090	13,493	5,820	15,116	5,500	16,320	4,689	12,328
San Bruno	176	1,351	3,713	1,478	4,300	1,395	4,388	1,473	4,450
San Carlos	166	1,158	5,283	671	5,738	765	5,891	1,342	ND
San Mateo, City of	570	4,250	18,392	3,688	17,176	2,823	16,019	1,042	20,022
San Mateo County	640	4,942	10,869	4,349	10,348	3,846	11,875	3,597	13,661
So. San Francisco	252	2,414	20,323	2,284	20,186	2,837	17,818	4,019	18,006
Woodside	86	74	259	78	259	158	215	66	ND
TOTAL	**3,882**	**36,136 267 tons**	**135,081**	**32,021 294 tons**	**141,923**	**31,436**	**146,216**	**31,706 20 tons**	**144,321**

Notes: ND - No Data reported.

(1) Based on data from the Fiscal Year Annual Report.

(2) Do not use sweeper - collect by hand.

Table 2-3 Summary of Inspection/Cleaning Activities for Municipal Storm Drainage Facilities for Fiscal Years 1999/00, 2000/01, 2001/02, 2002/03 (1)

Municipality	No. of Inlets In Municipality	FY 1999/00			FY 2000/01			FY 2001/02			FY 2002/03		
		No. of Inlets Cleaned	Other Facilities Inspected[2] (miles)	Total Volume of Material Removed	No. of Inlets Cleaned	Other Facilities Inspected (miles)	Total Volume of Material Removed	No. of Inlets Cleaned	Other Facilities Inspected (miles)	Total Volume of Material Removed	No. of Inlets Cleaned	Other [(2)] Facilities Inspected (miles)	Total Volume of Material Removed
Atherton	198	911	15.0	66 yd^3	301	9.0	104 yd^3	1,327	16.1	208 yd^3	1,051	16.6	27 yd^3
Belmont	515	365	10.2	80 tons	697	1.0	159 tons	348	0.3	83 tons	536	1.5	73 yd^3 25 tons
Brisbane	410	376	0.0	63 yd^3	ND	ND	0 yd^3	551	0.1	49 yd^3 9 tons	1,693	1.7	133 yd^3
Burlingame	1,100	716	4.0	1,756 yd^3	833	6.1	371 yd^3	1,460	4.8	852 yd^3	1,136	2.7	1,624 yd^3
Colma	185	15	28.0	28 yd^3	18	0.0	5 yd^3	40	1.4	4 yd^3	38	0.5	11 yd^3
Daly City	1,850	550	0.9	263 yd^3	324	1.0	180 yd^3	102	0.7	119 yd^3	115	0.7	192 yd^3
East Palo Alto	437	137	0.1	132 yd^3	112	8.0	4 yd^3	141	2.2	4 yd^3 7 tons	342	0.0	84 tons
Foster City	1,275	341	0.0	54 yd^3	41	0.0	32 yd^3	188	0.1	54 yd^3	1,005	0.0	218 yd^3
Half Moon Bay	70	215	51.5	148 yd^3	161	1.1	196 yd^3	247	7.3	55 yd^3	284	3.5	76 yd^3
Hillsborough	646	1,795	0.0	620 yd^3	1,696	0.1	676 yd^3	2,643	0.2	945 yd^3	2,813	2.0	810 yd^3
Menlo Park	1,555	504	0.0	393 yd^3	128	0.0	15 yd^3	359	0.5	109 yd^3	81	.0.	350 yd^3
Millbrae	623	1,810	2.2	762 yd^3	1,339	39.2	728 yd^3	1,172	38.1	309 yd^3	1,030	10.8	302 yd^3
Pacifica	986	684	1.3	204 yd^3	568	1.1	634 yd^3	1,140	0.5	424 yd^3	1,533	1.5	431 yd^3
Portola Valley	220	197	3.3	14 yd^3	35	12.0	13 yd^3	58	6.6	27 yd^3	38	5.0	17 yd^3
Redwood City	1,910	1,534	11.3	1,144 yd^3	2,106	13.2	1,242 yd^3	2,349	4.7	902 yd^3	1270 [3]	31.0	1,253 yd^3
San Bruno	950	1,181	0.0	195 yd^3	1,366	0.0	130 yd^3	703	1.0	113 yd^3	867	1.2	105 yd^3
San Carlos	701	39	0.0	156 yd^3	18	0.0	181 yd^3	789	40.3	71 yd^3	559	0.0	50 yd^3
San Mateo, City of	5,000	4,316	10.4	246 yd^3	5,592	11.0	264 yd^3	4,148	5.6	161 yd^3	5,196	13.4	358 yd^3
San Mateo County	1,136	2,839	17.8	246 yd^3	2,682	22.8	154 yd^3	2,629	19.1	198 yd^3	3,388	69.0	261 yd^3
So. San Francisco	1,500	1,858	4.5	116 yd^3	3,588	1.1	83 yd^3	2,612	2.9	290 yd^3	3,632	4.3	380 yd^3
Woodside	350	61	0.0	261 yd^3	33	0.0	264 yd^3	138	0.0	51 yd^3	182	2.0	353 yd^3
TOTAL	21,617	20,444	160	6,867 yd^3 80 tons	21,638	127	5,276 yd^3 159 tons	23,144	153	4,945 yd^3 99 tons	25,519	167	7,024 yd^3 109 tons

Notes: ND - No Data reported.

Amounts collected have been rounded to the nearest tenth.

1. Based on data from the Fiscal Year Annual Report.
2. Other facilities include V-ditches, drain lines, channels, siphons, creeks and culverts. Junction boxes and pump stations are excluded.
3. Annual Report was incorrect and actual number of inlets inspected and/or cleaned was 2,685.

3 Industrial and Illicit Discharge Controls

INTRODUCTION

This component of the Plan contains two different approaches to achieving stormwater pollution prevention and control. One approach focuses on controlling stormwater pollutants from commercial and industrial businesses and the other focuses on identifying and effectively eliminating illicit discharges from the municipal storm drain system. Each of these types of controls complements the other and is described further below.

The control of pollutants from industrial and commercial facilities relies on educating businesses about stormwater pollution prevention and control methods. Educational outreach to businesses occurs during facility inspections, through meetings with trade and business organizations, and as a result of STOPPP's public information and involvement activities. During facility inspections, STOPPP inspectors identify any needed improvements in businesses' stormwater pollution prevention and control practices and establish schedules for accomplishing these improvements.

STOPPP has spent ten years educating business owners and operators about the stormwater requirements. Where educational efforts are ineffective or if the problem is serious, STOPPP inspectors enforce local stormwater ordinances and/or hazardous waste management and other statutes to control stormwater pollution.

The control of illicit discharges is intended to effectively eliminate non-stormwater discharges (i.e., those that are disallowed by STOPPP's NPDES permit) to the municipal storm drain system. Citizens and municipal staff identify illicit discharges, and municipal staff tries to locate the sources.

When sources are found, municipalities attempt to have the responsible parties eliminate and clean up the illicit discharge promptly. When this is not possible or a responsible party cannot be found, municipalities have the responsibility for cleaning up the discharge. Where a responsible party has not been identified, additional field screening and educational outreach to the residents and businesses in the area may be conducted.

The four primary goals of this component are as follows:

- Minimize or eliminate potential stormwater pollution sources at commercial and industrial facilities through inspection and educational outreach activities;
- Effectively prohibit illicit discharges to the municipalities' storm drain systems;
- Identify and use consistent countywide stormwater pollutant control methods which are based on practices that have been proven effective; and
- Assist the Regional Board by providing it with information about businesses that possibly need to obtain Industrial Stormwater General NPDES Permit coverage.

ACHIEVEMENTS

STOPPP has shown significant progress since the last NPDES permit was reissued in July 1999. This section summarizes some of these achievements.

Business Inspections

San Mateo County Health Services Agency's Environmental Health Division (Environmental Health) conducts business inspections and educational outreach based on agreements with 16 municipalities (Atherton, Belmont, Brisbane, Burlingame, Colma, East Palo Alto, Half Moon Bay, Hillsborough, Menlo Park, Millbrae, Pacifica, Portola Valley, Redwood City, San Bruno, San Carlos, and the unincorporated county area for San Mateo County). In these cities county staff combines stormwater inspections with its inspections to check on Hazardous Materials Management Plans, hazardous waste generators, and retail food facilities.

During the four year period from July 1999 through June 2003, STOPPP municipalities inspected 6,092 businesses. About 60 percent of the inspections were conducted by Environmental Health staff, and the other inspections were conducted primarily by pretreatment, source control and industrial waste inspectors from the water quality control plants located in the cities of Daly City, San Mateo, and South San Francisco.

The number of inspections conducted during FYs 2001/02 and 2002/03 was about 65 percent higher than the number inspected during FYs 1999/00 and 2000/01. Most of the increase in the number of inspections is attributable to efforts to include stormwater inspections as part of Environmental Health's food facility inspections.

Starting in FY 2002/03 the business inspectors have more carefully tracked the number of facilities that had stormwater violations and how these violations were resolved. Based on this one year it was determined that about 10 percent of the businesses inspected had stormwater violations.[1] Approximately, 90 percent of the violations were reported as corrected and the rest were either reported as pending correction or the status was unreported.

The Commercial, Industrial and Illicit Discharge Control Subcommittee (CII Subcommittee) has also continued to emphasize staff training and educational outreach to businesses. One example of this was a CII Subcommittee-sponsored workshop held in April 2001 on stormwater pollution prevention for property managers and owners and/or operators of supermarkets, restaurants, and automotive facilities. Preparations for the workshop included developing BMP checklists for grocery stores & supermarkets, auto service facilities, and restaurants for distribution at the workshop and during business inspections. Approximately, 55 agency staff and business representatives attended the workshop, and the workshop evaluations were positive.

Illicit Discharge Controls

While the number of illicit discharges found each year varies, there appears to be an overall downward trend in the number of these discharges being found. For example, in FYs 1999/00 and 2000/01 the number of illicit discharges found each year averaged about 315 compared to the average of 260 found annually during FYs 2001/02 and

[1] For reporting purposes, the term violation was defined as either the discharge of pollutants to the storm drain system because the pollutants are exposed to stormwater runoff or there was a discharge of non-stormwater material to the storm drain system.

2002/03. This apparent downward trend occurred despite an increase in the efforts reported by municipal staff to find illicit discharges.

Another accomplishment was the CII Subcommittee's development of a set of *BMPs and Implementation Procedures for Conditionally Exempted Discharges* (Procedures) that was approved by STOPPP's Technical Advisory Committee and submitted to the Regional Board staff in March 2001. Attachment A to the Procedures addresses planned and unplanned discharges from potable water sources. The BMPs for controlling these types of discharges were modified in May 2002 based on new information[2].

The CII Subcommittee has also actively trained municipal staff to find and control illicit discharges. Most recently a work group consisting of members from the CII and Municipal Maintenance Subcommittees planned and in March 2003 held an illicit discharge identification and control workshop for municipal staff. Approximately 100 staff attended the workshop, which was judged to be highly successful based on the participants' evaluations. One tangible accomplishment of the workshop was that it allowed 74 people to become Recognized Surface Cleaners who are familiar with BASMAA's BMPs for these types of activities.

MAJOR TASKS

The following tasks will be conducted during the next five years.

1. Implement and Improve Performance Standards

Each of the municipalities will implement the performance standards for control of stormwater pollutants associated with commercial and industrial businesses and for effectively controlling illicit discharges, specified in Appendix B, as part of its compliance with STOPPP's NPDES permit. The CII Subcommittee will review the performance standards at least once every two years and make any needed improvements based on implementation experience, the estimated effectiveness of the standards, and available guidance from Regional Board staff.

Task Evaluation: The evaluation of this task may include: 1) assess the information reported by the municipalities in the annual reports; 2) obtain feedback from the Regional Board staff; and 3) obtain input from CII Subcommittee members.

2. Provide Guidance on Developing and Implementing Illicit Discharge and Business Inspection Plans

STOPPP will assist the inspectors by developing model materials to help the municipalities develop their Five-Year Illicit Discharge Control Action Plans and their Five-Year/Annual Inspection Plans for businesses.

This task will also include updating materials that are used to help implement the performance standards, such as the April 1998 *Handbook for Facility and Illicit Discharge Inspectors* and the *Guidance on Enforcement Options for Illicit Discharges and Industrial/Commercial Business Storm Water Pollution Violations.*

Task Evaluation: The evaluation of this task may include: 1) obtain feedback from staff responsible for completing

[2] From the AWWA Research Foundation. 2001. Guidance Manual for Disposal of Chlorinated Water

these plans and using the performance standards support materials; and 2) obtain feedback from Regional Board staff on the acceptability of plans submitted.

3. Assist Compliance with Requirements for Conditionally Exempted Discharges

STOPPP will continue to facilitate compliance with the requirements for handling non-stormwater discharges that are identified in the NPDES permit as conditionally exempt from discharge prohibitions to the storm drains. The General Program will work with the CII Subcommittee to review the existing Procedures document and to identify any new BMPs and/or implementation procedures for these discharges. The CII Subcommittee may also propose adding other non-stormwater discharges to the list of ones that could be conditionally exempted under the permit's requirements.

Task Evaluation: The evaluation of this task may include: 1) obtain feedback from each municipality's Illicit Discharge Coordinator; 2) evaluate Procedures document compared with what other municipal stormwater programs are doing; and 3) obtain feedback from Regional Board staff on acceptability of the Procedures document.

4. Conduct Outreach and Training

Under the direction of the CII Subcommittee STOPPP will facilitate educational outreach and training activities to prevent pollutant discharges from business activities. This may include providing incentives, such as educational materials and recognition, and disincentives, such as follow up and enforcement.

The target audience for the educational outreach and training will include both municipal staff and businesses. It is anticipated that more emphasis will be placed on continuing to train municipal staff responsible for identifying, cleaning up, and eliminating illicit discharge than the staff responsible for conducting business inspections. Most of the business inspectors are Environmental Health staff. Training of illicit discharge inspectors will occur approximately twice during the next five years.

This task also includes the adaptation, update, and preparation of educational outreach materials (e.g., flyers and brochures) to provide to businesses. During the development of new materials, input from business groups will be solicited as possible so that the materials are accurate and useful to them.

The educational outreach messages to businesses will need to increase its focus on minimizing discharges of particular pollutants of concern. Among these are pesticides, mercury, PCBs, copper, dioxin and trash, which are either on U.S. EPA's approved list of impairing pollutants and/or have been identified as a priority by the Regional Board staff.

Task Evaluation: The evaluation of this task may include: 1) the number of staff trained from each of the targeted groups; and 2) summaries of the feedback obtained from recipients of training and outreach.

5. Assist with Regulatory Compliance and Planning

The General Program will conduct the following activities under this task:

- Assist the STOPPP municipalities to comply with the reporting and other requirements of the NPDES permit, including development of deliverable reporting forms for tracking local program progress and preparation of the industrial and illicit discharge controls section of STOPPP's Annual Report;
- Develop two-year General Program work plans and budgets;
- Assist with any additional planning needed to improve the industrial and illicit discharge controls section of the Plan; and
- Continue to assist the CII Subcommittee to conduct its meetings and other activities.

Assist the STOPPP municipalities with individual performance reviews that may be conducted by the Regional Board staff or audits that may be conducted by representatives from the U.S. EPA.

Task Evaluation: The evaluation of this task may include: 1) assess information reported by the municipalities in the annual reports; 2) obtain feedback from Regional Board staff; and 3) obtain input from CII Subcommittee members.

Public Information and Participation 4

INTRODUCTION

Stormwater pollution results from the small, incremental, and collective activities of everyone within San Mateo County and its watersheds. The diffuse origins of the problem are often the result of the unintended and unrecognized consequences of thousands of routine, seemingly inconsequential, decisions made daily. Public Information and Participation (PIP) is one of the keys to preventing stormwater pollution. The more residents of San Mateo County understand about the causes of stormwater pollution and the simple things they can do to prevent them, the cleaner our creeks and shorelines will be.

The primary goals of this component are:

- To educate the public about the causes of stormwater pollution and its serious effects on the quality of local creeks, lagoons, shorelines, and neighborhoods;
- To encourage residents to adopt less polluting and more environmentally beneficial practices; and
- To increase residents' hands-on involvement in STOPPP activities.

ACHIEVEMENTS

This section of the Plan summarizes what PIP accomplished during the NPDES permit period between July 1999 and 2003.

General Outreach

The PIP Subcommittee conducted educational outreach activities to convey general information about stormwater pollution problems and solutions. These activities included developing informational flyers and promotional materials, developing a point of purchase program, developing and supporting a school assembly program, developing and running television public service announcements (PSAs) with a pollution prevention message, developing a new website, participating in the San Mateo County Fair and attending community events. The Subcommittee also partnered with other groups, such as the BASMAA media relations committee and San Mateo County Environmental Health Division, to conduct advertising campaigns and educational outreach. More information about these activities is provided below.

The PIP Subcommittee developed or adapted informational brochures and several promotional items. The brochures PIP developed were: "Mercury" and "The Streamside Planting Guide". The committee collaborated with BASMAA to develop the Integrated Pest Management (IPM) fact sheets. The PIP also developed various promotional items, such as: pencils made from recycled blue jeans, crayons, activity books, kitchen magnet clips, IPM spray bottles, fish shaped sponges and seeds.

The PIP Subcommittee collaborated with the San Mateo County Environmental Health Used Oil program to present a free assembly at schools and community venues to educate students and residents about stormwater pollution prevention. The groups contracted with Zun Zun, a husband and wife duo who present interactive, bilingual and musical education for elementary age children. The educational outreach assemblies, entitled "The Blob" and "A Journey Through our Watershed"—are interactive theatrical performances that dramatize ways that everyone can help prevent stormwater

pollution. Between 1998 and 2003, more than 40,000 San Mateo County students saw the show.

The PIP Subcommittee continued awarding the Community Action Grant Program that funds community-based environmental education/pollution prevention programs or activities. Each year STOPPP has given awards for stormwater related projects at the San Mateo County Science Fair.

Currently over 21,000 storm drain inlets have been stenciled with "no dumping flows to bay" "or no dumping flows to ocean" countywide. Public works agencies are responsible for inspecting, stenciling and cleaning inlets. In addition to stenciling on an as needed basis, some of the cities and the county work with volunteer groups to accomplish the task. Each city has stencils available to loan to private parties and businesses in the case that they want to stencil storm drains on their property.

The PIP Subcommittee organizes STOPPP municipalities' participation in the San Mateo County Fair. The PIP Subcommittee developed a stormwater display in 2002 that features a 10' x 8' black display with large vinyl photos of different stormwater chemicals of concern such as oil, household hazardous waste, paint, mercury, pesticides, swimming pool water, restaurant run off. It features pictures taken of local watersheds and wildlife that may be affected by stormwater pollution. This was on display at the 2002 and 2003 fair where an average of 1600 residents were reached one on one each year. It also has been displayed at the San Mateo County Government Center and The City of Burlingame. It was used at the 2002 San Francisco Restaurant Show where STOPPP had a booth. It is available for all STOPPP municipalities to display.

Partnerships with Agencies, Organizations, and Industries

The PIP Subcommittee's partnerships with other agencies and organizations have provided a cost-effective way to reach a large audience. The PIP Subcommittee continued partnerships with BASMAA, organizations and industries involved in the IPM Point of Purchase (POP) Campaign, and the County Used Oil and HHW Program.

STOPPP's participation in BASMAA's Regional Advertising Campaign has provided an opportunity to expose more residents to stormwater pollution prevention messages by sharing the costs of radio and television advertising with other municipal stormwater programs. PIP participated in BASMAA's campaigns during 1999-2003. BASMAA's 1999/00 campaign encouraged residents to choose less toxic products, going hand in hand with the POP IPM campaign. The 2002/03 and 2003/04 campaigns are titled "Our Watershed". The campaign, which includes print, radio and television media is designed to educate residents about what a watershed is, how it can be polluted, and solutions to keeping our watersheds clean, healthy and beautiful.

The County Used Oil Program also promoted STOPPP's general messages in its outreach materials. The County Used Oil Program promoted stormwater messages through its 1-800 CLEANUP hotline, promotional items, media campaigns, and direct mail.

In the last permit period the San Mateo County Board of Supervisors and various city councils issued a proclamation in September for National Pollution Prevention Week.

Public Education Outreach Survey

In November 1996, the PIP Subcommittee's consultant conducted STOPPP's first countywide telephone survey to assess the effectiveness of its outreach efforts and the public's awareness of stormwater pollution. A modified survey was repeated in 2001 to evaluate the effectiveness of the PIP outreach. Results were somewhat disappointing; finding that resident's knowledge about storm drains and stormwater pollution prevention had not significantly increased. Similar results were found in Santa Clara County, when their survey was repeated in 1999. The survey did provide focused information needed to target the least knowledgeable residents for future outreach activities. Following are the groups that emerge as the most optimal targets:

- Residents with no more than a high school education, or with annual household incomes of no more than $25,000

- Women under age 45 had comparatively low levels of understanding of where storm drains flow and reported receiving messages about the proper disposal of HHW and oil.

- Seniors over age 65 were far less likely than other residents to have seen storm drain stencils or to understand that storm drains flow into waterways.

- Renters are far less likely than homeowners to have received messages about proper disposal of HHW and oil.

- Latinos who chose to take the survey in Spanish were less likely to have seen stencils or received messages about proper disposal of HHW and oil.

We asked specific questions about mercury and found that 66% of county residents had purchased items containing mercury within the last 5 years, including batteries, thermometers and fluorescent lamps. Only one third of residents understood that fluorescent lamps contain mercury. When asked how they currently dispose of these products, the majority stated, "in the garbage," however once educated of their mercury content they said they would dispose of them at a HHW event. This data is helpful to target our mercury campaign outreach.

Mercury Thermometer Exchange and Outreach

The PIP purchased mercury free thermometers to conduct thermometer exchanges countywide. The first Mercury Thermometer Exchange was held Earth Day 2002 and was a successful event. Over 4270 mercury thermometers have been collected at four thermometer exchanges. The cities that participated in holding a thermometer exchange or coordinated with neighboring cities are the following:

- Atherton, Belmont, Burlingame, Colma, Daly City, East Palo Alto, Half Moon Bay, Hillsborough, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Mateo, and South San Francisco.

- A mercury brochure was developed and distributed to educate residents about the dangers of mercury and the negative health effects. The brochure was distributed to the cities and at all the exchange events. Events were advertised with press releases, in the

Environmental Health RE*News*, inserted in county newspapers and delivered to approximately 200,000 residents, and through ads in the local newspapers.

- A PSA was also developed and placed on the local cable television stations. The PSA talked about the "Dirty Word," Mercury, in both Spanish and English. It focused on the products that contain mercury, especially fluorescent lamps, based on resident's knowledge gathered from the 2001 survey. The end of the commercial urged residents to take action by recycling their fluorescents at an HHW event and directed them to the www.flowstobay.org website.

BASMAA Bay Area wide IPM POP campaign – "Our Water - Our World"

Since 1999 STOPPP has participated in the Bay Area wide IPM Campaign collaboration among water pollution prevention agencies in eight San Francisco Bay Area Counties and in nurseries and hardware stores. The program has been a successful portion of the PIP committee's presence in the community educating the public about the relationship between the use of pesticides and herbicides and water quality. The program currently has over 20 fact sheets on a variety of topics from ants to lawn care. These fact sheets are available both at retail stores and in city halls. They are also distributed at outreach fairs and events. Customers are recognizing the campaign and are interested in finding ways to protect their health and the environment by choosing less toxic products.

Website Development

In November 2002 the STOPPP program introduced a new website, www.flowstobay.org. The site is in constant flux and will continue to develop to educate residents about stormwater pollution prevention. The website is updated with upcoming events that are relevant to the program, hosts the Re*News* newsletter, which is San Mateo County Environmental Health's source for Pollution Prevention Information, and contains electronic copies of the STOPPP BMPs. This enables cities to refer clients to the website if they are in need of BMP brochures

Dirty Words PSA Campaign

In 2002-2003 seven PSAs were developed to target residents about stormwater pollutants of concern. Based on an award winning radio campaign conducted in the Monterey Bay Area the "Dirty words" included:

- Storm drain;
- First Flush (first rains of the season);
- Mercury;
- Pesticides;
- Household Hazardous Waste;
- Used Motor Oil; and
- Used Oil Filters.

The 30 second TV PSA's were directed and produced by the director who developed the Monterey Bay campaign. The PIP consultant worked closely with the director to develop the topics and scripts for each of the words, and the end product is a very effective attention getting campaign. Each of the commercials prompts residents to take action by making an appointment to dispose of their waste properly or directing them to the www.flowstobay.org website for more information. They have been run on selected cable television channels to reach the target groups shown in the survey to need more education and the groups who tend to be do-it-yourselfers.

Development of the PSAs was a collaborative effort between the County

Used Oil Program and STOPPP to maximize program effectiveness and dollars spent on advertising.

MAJOR TASKS

The following tasks will be conducted during the next five years:

Task 4.1 Implement and Assist with the Performance Standards

Each of the municipalities will implement the performance standards for Public Information/Participation specified in Appendix B. The PIP Subcommittee will review the performance standards at least once every two years and make any needed improvements. The General Program will assist the municipalities to understand and implement the performance standards.

Task 4.2 Assist with Regulatory Compliance and Planning

The General Program will conduct four activities under this task:

1. Assist the STOPPP municipalities to comply with the reporting and other requirements of the NPDES permit, including development of deliverable semi-annual reporting forms for tracking local program progress, and preparation of the public information/participation section of the STOPPP Annual Report;

2. Develop two-year General Program work plans and budgets;

3. Assist with any additional planning needed to improve this section of the Plan; and

4. Continue to assist the Public Information/Participation Subcommittee to conduct meetings and other activities.

Municipalities will be responsible for participating in the Subcommittee as appropriate (see the performance standards) and providing sufficient information on their local programs for the Annual Report.

Task 4.3 Encourage Public Involvement, Outreach, and Education

STOPPP will continue to encourage the public to adopt stormwater pollution prevention habits in their daily activities. This will be accomplished by educating the public about stormwater pollution and by encouraging the public to take an active role in keeping stormwater and creeks clean. The following activities comprise this task: Continue to Implement General Outreach, Develop and Implement Targeted Outreach and Evaluate Effectiveness.

Continue to Implement General Outreach

STOPPP will work with other municipal stormwater agencies through BASMAA to identify categories of pollutants and pollutant generating behavior to target as part of regional advertising and action campaigns. This pooling of resources has helped to generate more effective campaigns than could be achieved by working independently.

The PIP will continue to implement the Bay Area Wide IPM Point of Purchase Campaign at 20 San Mateo County Hardware and Nursery stores. This campaign includes training employees, labeling less toxic products, informing management of availability of less toxic products new to the marketplace and stocking stores with IPM fact sheets. The Subcommittee consultant will represent STOPPP at all Bay Area Wide meetings.

The website will continue to be updated and maintained with updated events, information, articles, brochures and BMPs. The website will be expanded and developed to best serve STOPPP cities and the public.

The General Program will also conduct activities related to the general message of the stormwater program. This may include activities such as: continuing to provide, improve, and create promotional materials and informational brochures; encouraging schools and organizations to educate students and citizens about stormwater through the Community Outreach Grant Program, the "ZunZun" Assembly Program, participation with the County Science Fair, and through the distribution of materials to schools, such as activity books; encouraging participation in creek clean-up and creek-specific water quality improvements; creating interactive displays and materials for distribution at events such as the San Mateo County Fair.

Develop and Implement Targeted Outreach

Targeted Outreach has five basic steps:

1. Identify a subject area to work on;

2. Conduct market research to identify effective target message and audiences;

3. Develop a focused campaign;
4. Implement the focused campaign; and

5. Conduct a public awareness survey as one way to measure progress.

The following criteria may be used to select areas to target for public education activities: focus on stormwater pollutant generating behavior by residents; select a behavior where change is possible; and choose a target that offers opportunities to create partnerships with others to leverage limited resources.

It is anticipated that future targeted campaigns will focus on helping to implement the Pollutant Reduction Plans for specific water quality impairing pollutants. The pollutants that are currently priorities on the Regional Board's list include, mercury, PCBs and dioxin compounds, pesticides, and trash. In the 2003 –2004 year research will be done for a countywide anti-littering campaign. The campaign will focus primarily on targeting residential sources and encouraging residents to prevent pollution.

The PIP Subcommittee will develop and update a list of priorities for helping to select future campaigns. Criteria for the selection of priorities are that a significant portion of the pollutant-generating behavior originates from residents. It will be important to continue to evaluate the effectiveness of each campaign and not to focus too much on the same type of pollutant or category of pollutants. The General Program will also collaborate with groups who are working on similar campaigns such as BASMAA with the IPM program.

One such program will be to provide educational support and watershed stewardship support. This task will include helping to educate students about stormwater pollution prevention and related environmental issues. In 2004 the General Program will support a school focused educational program Kids in Gardens (targeted to teachers), developed by Aquatic Outreach Institute (AOI). If this program is effective the program may support other

AOI programs including Kids in Creeks or Kids in Watersheds. The PIP Subcommittee will decide at least every two years which educational activities to support based on the known or expected effectiveness of the activity and how well it addresses the objectives of the PIP component.

Evaluate Effectiveness

The PIP Subcommittee will develop methods to evaluate the effectiveness of each outreach activity conducted under its targeted and general outreach activities. Evaluations will help improve future outreach, identify which types of outreach are most cost effective at educating and changing behavior, and identify what topics and populations to target next. Effectiveness can be measured by how many people were reached and how many residents adopted less polluting behavior. Where cost-effective, the PIP Subcommittee will evaluate the value of conducting a public awareness survey in 2007-2008 to measure progress since the 2001 survey. The PIP Subcommittee will also use incentives for encouraging the public to give feedback and participate in evaluations of individual General Program events.

Task 4.4 Assist with Focused Staff Training

The PIP coordinators for each municipality will be provided information on how to stay informed on the basic stormwater pollution prevention information being developed both outside and within STOPPP. Every two years, the PIP Subcommittee will help identify and prioritize the PIP training needs of staff, and the optimum ways to meet these needs. The PIP Subcommittee will continue to implement agreed-upon training activities every two years

A training video for stormwater compliance inspectors is scheduled for development. The purpose of this video will be to train new municipal employees and provide continuing education to current stormwater compliance inspectors. For purposes of focused PIP staff training, this video will also be used to educate city and county personnel and possibly the general public about stormwater compliance issues at commercial and industrial facilities.

If this video is determined to be successful, it has been proposed to develop training videos for all components of STOPPP's permit, i.e. Municipal Maintenance, New Development and Redevelopment, etc.

The initial video will be developed during the first year of STOPPP's reissued permit. Subsequent videos will be proposed for the remaining 4 years of the permit, depending on the outcome and cost of the initial training video.

Task 4.5 Collaborate with Other Groups

This task addresses the PIP Subcommittee's continued commitment to build partnerships with outside agencies and companies, to collaborate with volunteer groups, and to work with other STOPPP subcommittees. Working with outside agencies and volunteer groups through activities such as the Community Action Grant Program to promote a common environmental message has proven to be cost-effective. In addition, working with other subcommittees helps STOPPP to achieve its goals most effectively.

Build Partnerships with Agencies and Companies

PIP will continue to build partnerships with outside agencies where appropriate and cost-

effective. Partnerships with BASMAA and the County Used Oil Program have been successful, and PIP will continue to take part in them.

Collaborate with Volunteer Groups

Working with volunteer groups with similar goals will be beneficial to both STOPPP and the volunteer group. This task will complement the performance standard that states that municipalities may coordinate with a volunteer group that would assist STOPPP with community outreach activities.

Under this task, STOPPP will conduct the Community Outreach Grant Program. This program funds community-based environmental education or pollution prevention programs and activities.

Work with Other Subcommittees

The last activity covered as part of this task will be coordinating and integrating PIP activities with other General Program components. Some of the ways that this might be accomplished include participating in joint work groups with other subcommittees, inviting other subcommittee chairs annually to participate in the PIP Subcommittee meetings, and holding workshops or other events with other components of the General Program. PIP helps to develop educational materials and reviews all BMP, for other subcommittees. This helps STOPPP to produce materials with a consistent, user-friendly message.

In 2003 –2005 PIP will work with CII to reach County Schools to encourage the use of less toxic pest control.

New Development and Construction Controls 5

INTRODUCTION

Changes to natural drainage systems due to land development have led to increases in the volume and rate of stormwater runoff as well as the amount of pollutants discharged to local waters. These changes include modifying drainages to quickly convey runoff, filling wetlands, removing natural vegetation, and increasing the amount of impervious surface area through the construction of buildings, roads, and parking lots. A large portion of the developable land in San Mateo County has already been urbanized and there remains pressure for more intensive development.

San Mateo County is geographically the third smallest county in California with a land area of approximately 450 square miles. In addition, its population has been growing at a slower rate than the rest of California. For example, since 2000 the population in San Mateo County has been estimated by the California Department of Finance to be growing at about 0.4 percent per year contrasted with about a 1.8 percent annual growth rate for the entire state.

The City/County Association of Governments of San Mateo County (C/CAG) and it 20 member cities and the county have recently led efforts to control the impacts of development primarily to lessen traffic congestion. These efforts also have benefits in preventing stormwater pollutants associated with vehicle use.

In 2002 C/CAG won a U.S. Environmental Protection Agency Smart Growth Achievement Award for its Transit Oriented Development Incentive Program which is based on using transportation funds to help local communities build more housing near rail stations. The program supports the development of needed housing while reducing traffic congestion and the stormwater pollutants associated with urban sprawl and its attendant dependence on vehicles for commuting.

C/CAG's Transit Oriented Development Program provides financial incentives for the municipalities in San Mateo County to create housing near transit stations. C/CAG allocates up to 10 percent of its State Transportation Improvement Program Funds to the program. Municipalities will receive about $1,200 per bedroom for housing constructed within one-third mile of a rail transit station provided that the density is at least 40 units per acre.

The current cycle of projects covers the period from February 2002 through February 2004 and includes plans to provide over $2.9 million in funding to local municipalities to facilitate the creation of about 2400 bedrooms in transit oriented developments. The creation of approximately 1200 bedrooms per year in transit oriented developments when the county has been growing annually by an estimated 2700 people represents a significant commitment during this two-year period

to increasing housing adjacent to transit facilities.

The Regional Board has acknowledged the water quality benefits that transit village types of developments provide. In February 2003 the Regional Board amended STOPPP's NPDES permit to add Provision C.3, which has more specific requirements for the municipalities to control stormwater from new development and redevelopment projects. Finding No. 17 of this amendment states that transit village types of developments within ¼ to within ½ mile of transit stations are exempted from the hydrograph modification management plan requirements of this amendment. Further, Provision C.3.g sets a lower threshold for demonstrating alternative compliance with the requirement for stormwater treatment measures for transit village types of developments located within ¼ mile of transit stations.

STOPPP's amended NPDES permit Provision C.3 requires that the municipalities improve their performance standards to achieve the control of stormwater pollutants to the maximum extent practicable in accordance with the permit amendment. Where appropriate, the new development tasks and performance standards reflect Provision C.3's new requirements. It is anticipated that further improvements to the performance standards will be made once the implementation of the scheduled phase in of the Provision C.3's requirements occurs.

New Development Objectives

The primary goal of the New Development and Construction Controls section of the Plan is to minimize the water quality and beneficial use[1] impacts of land development, both during and after construction. Specific objectives to meet this goal include the following:

1. Identify and help implement source controls, site design measures, stormwater treatment measures, and, any needed, hydrograph modification management plan controls into the development plan approval process.
2. During construction promote the use of controls to reduce the discharge of pollutants to the maximum extent practicable and effectively control non-stormwater discharges.
3. Promote through training the implementation of the Provision C.3's requirements and the agreed upon performance standards for new development and construction controls in order to gain understanding and support for meeting these commitments.
4. Evaluate the effectiveness of STOPPP's efforts regulating land development to minimize adverse impacts on water quality and aquatic

[1] "Beneficial use" is defined as those uses allowing the highest water quality consistent with maximum benefit to the people of California, including uses for recreation, preservation and enhancement of fish and wildlife use, agricultural supply, industrial service and process supply, municipal and domestic supply, groundwater recharge, navigation, and ocean commercial and sport fishing. For a more detailed description, see: San Francisco Bay Regional Water Quality Control Board's *Water Quality Control Plan (1995 Basin Plan),* 1995 (Chapter II).

beneficial uses, and based on this evaluation, identify and implement improvements.

ACHIEVEMENTS

STOPPP has developed various tools to help the municipalities to implement their performance standards. These have included: recommended Model Development Policies addressing stormwater quality, construction brochures, numerous checklists, guidance for construction site inspectors, a scrapbook of post-construction controls used in new development and redevelopment projects in San Mateo County. Recent efforts have focused on planning to assist municipalities in implementing the requirements of Provision C.3.

STOPPP's new development training programs have included construction site inspection workshops, as well as new development workshops that have been attended primarily by municipal planning and public works staff. New Development Subcommittee (NDS) members have also been provided with a copy of a presentation for municipal decision makers and encouraged to give the presentation at appropriate meetings of planning commissions and city councils, or other applicable boards or committees.

Municipalities have continued to implement BASMAA's *Start at the Source* types of stormwater design measures, with more projects including landscaped swales, detention basins, and other stormwater treatment measures. With assistance from the Regional Board staff, STOPPP municipalities have also improved controls on erosion and sedimentation and the prevention of other construction related discharges. For example, according to STOPPP's FY 2002/03 Annual Report, approximately 72 municipal staff has certificates of completion from the San Francisco Estuary Project/Regional Board's workshop on Construction Site Management.

STOPPP also has developed information about the amounts of impervious surface cover in various watersheds and the condition of creek channels in STOPPP's report titled *Characterization of Watershed Imperviousness and Creek Channel Modifications for 17 Watersheds* (January 2002). The main objective of this study was to help municipal planners minimize the impacts of future development on creek resources in urban and urbanizing areas. This information will be used to help decide which watersheds or portions of watersheds require the development of a hydrograph modification management plan (Provision C.f).

MAJOR TASKS

The following tasks will be conducted during the next five years.

1. Implement and Improve Performance Standards

Each of the municipalities will implement the performance standards for control of stormwater pollutants from development and construction activities, specified in Appendix B, as part of its compliance with STOPPP's NPDES permit. The NDS will review the performance standards at least once every two years and make any

needed improvements, based on implementation experience, the estimated effectiveness of the controls, the development of strategies and materials to comply with Provision C.3's requirements, and future guidance from Regional Board staff, BASMAA, and other groups as available.

Task Evaluation: The evaluation of this task may include: 1) assess information reported by the municipalities in the annual reports, 2) obtain feedback from Regional Board staff, and 3) obtain input from NDS members.

2. Assist with the Implementation of Provision C.3

STOPPP will assist municipalities to implement source controls, site design measures, stormwater treatment measures and provisions for the continued operation and maintenance of stormwater treatment controls as part of the municipalities' new development review approval processes. This assistance will include working with the NDS to develop model examples of materials that each municipality could adapt for use within its own agency. This task includes the following activities:

- Review the Santa Clara Valley Urban Runoff Pollution Prevention Program's work on implementing its permit requirements that address these types of controls. This will also include, as appropriate, identifying and reviewing useful approaches of other municipal stormwater programs in California and elsewhere.
- Identify assistance that STOPPP's municipalities will need in order to improve implementation of source control, site design, stormwater treatment measures and verification of the operation and maintenance of these measures.
- Track and discuss at NDS meetings municipal case studies of new development/ redevelopment projects that are illustrative of successes, problems and questions about the control method.
- The NDS will continue to investigate and inform municipalities about the effectiveness of different types of stormwater treatment measures by 1) conducting literature reviews and updating the *Guidance on Permanent Stormwater Controls for New and Redevelopment in San Mateo County*; and 2) identifying opportunities for and recommending BMP monitoring studies to the Watershed and Monitoring Subcommittee, BASMAA, the Clean Estuary Program, or the San Francisco Estuary Institute.

Task Evaluation: The evaluation of this task may include: 1) assess the information submitted as part of the annual reports; 2) obtain input from the municipalities regarding improvements in implementing stormwater controls; and 3) obtain feedback from the Regional Board staff on improvements made.

3. Assist with the Implementation of the Hydrograph Modification Management Plan

Given the priority that the hydrograph modification management plan (HMP) has and the amount of resources that will be needed to address the HMP, STOPPP's support for this activity has been assigned its own task.

STOPPP will implement the HMP work plan that was submitted to the Regional Board in February 2004. STOPPP is interested in coordinating with the Santa Clara Valley Urban Runoff Pollution Prevention Program in developing the HMP for the shared San Francisquito Creek watershed. STOPPP supports identifying workable, cost-effective procedures for developing the HMP.

STOPPP expects that it will need to prioritize which individual watersheds and portions of watersheds the HMP would initially apply to because there are at least 17 watersheds with urban development or the potential for urban development that might need an HMP. STOPPP's permit amendment (Provision C.3.f.5.) allows for a phased approach based on appropriate prioritization.

Municipalities may choose to invest additional resources to build upon the base HMP that STOPPP develops or local municipalities may decide to complete a local HMP sooner than STOPPP's proposed schedule that is based on countywide priorities. STOPPP encourages local initiative in completing and improving the HMP.

Task Evaluation: The evaluation of this task will include developing a mechanism for selective pre- vs. post-project assessments to determine the effectiveness of the HMP per Provision C.3.f.6.

4. Assist with Improving Construction Site Stormwater Controls

Although progress has been made in this area, Regional Board staff has identified a need for further improvements, particularly in the reporting of results of construction site inspections. In this task, STOPPP will assist the municipalities in conducting appropriate inspections and enforcement for construction sites and project-specific stormwater management plans. The task will include assistance in improving documentation and reporting procedures to verify that construction projects are implementing stormwater controls appropriately.

Task Effectiveness: The evaluation of this task may include: 1) assess the information submitted as part of the annual reports; 2) obtain input from the municipalities regarding improvements in construction site inspections and documentation; and 3) obtain feedback from the Regional Board staff on improvements made.

5. Promote Outreach and Training

This task will include reinforcing and, as necessary, expanding educational outreach to agency planning and engineering staff, planning commissions, city councils, builders, and builders' consultants and contractors. The initial years of the Plan coincide with the phased-in implementation of numerous requirements of Provision C.3 of the permit amendment, and therefore the initial outreach and training programs will focus on educating stakeholders regarding Provision C.3 requirements. Outreach and training will generally include the following:

- Conduct one workshop (or equivalent) for municipal staff each year.
- Conduct at least one outreach effort or event each year for one or more of the following groups: contractors, developers and owner/builders, and elected officials such as planning commissions and city councils.
- Prepare or adapt and distribute for use by the municipalities educational materials to promote awareness of appropriate stormwater controls and other issues of importance to the NDS. Outreach pieces will be designed based on the target audience and intended use, with assistance and review by the Public Information/Participation Subcommittee to ensure that materials are consistent and user-friendly.

Task Evaluation: The evaluation of this task may include: 1) the number of staff trained from each of the targeted groups; and 2) summaries of the feedback obtained from recipients of training and outreach.

6. Assist with Regulatory Compliance and Planning

The General Program will conduct the following activities under this task:

- Assist the STOPPP municipalities in complying with the reporting and other requirements of the NPDES permit, including development of deliverable semi-annual reporting forms for tracking local program progress and preparation of the new development section of STOPPP's Annual Report;
- Develop two-year General Program work plans and budgets;
- Assist with any additional planning needed to improve the new development section of the Plan; and
- Continue to assist the NDS in conducting meetings and other activities.

Task Evaluation: The evaluation of this task may include: 1) review how well the municipalities are meeting the new NPDES permit requirements that affect new development and redevelopment; and 2) summarize the Regional Board staff's reviews of member agency performance in this area.

Watershed Assessment and Monitoring 6

INTRODUCTION

The Watershed Assessment and Monitoring (WAM) component of STOPPP supports the implementation of other program components. The activities under this component help STOPPP's municipalities to select stormwater pollution prevention and control BMPs by evaluating the effectiveness of existing and proposed BMPs. The current emphasis is to assess representative watersheds in San Mateo County and address pollutants of concern thought to impair water quality. The specific goals of STOPPP's WAM activities are to:

- Assess water quality conditions in representative watersheds in San Mateo County, evaluate stormwater impacts and help solve creek drainage basin-specific water quality impairment problems.
- Assess whether specific stormwater pollutants potentially have adverse impacts on water quality in San Mateo County creeks and/or San Francisco Bay, and develop plans to address these pollutants of concern as appropriate.
- Evaluate the effectiveness of existing stormwater pollution prevention and control Best Management Practices (BMPs) and recommend improvements and appropriate applications.
- Evaluate overall program effectiveness.

STOPPP's approach emphasizes undertaking focused studies to achieve specific objectives rather than conducting routine monitoring of pollutant concentrations in stormwater runoff. STOPPP will implement scientifically sound and cost-effective studies designed to meet the above goals within a reasonable time period, consistent with available budgets. STOPPP will also continue to participate in regional programs that are cost-effective and help STOPPP meet the above goals.

ACHIEVEMENTS

STOPPP's recent WAM component accomplishments provide a framework to build on during the next five years. These accomplishments include:

- Assessing the implementation of stormwater BMPs by San Mateo County municipalities.
- Delineating 17 San Mateo County watersheds and evaluating imperviousness and channel modifications.
- Performing additional watershed assessment activities including bioassessments and water quality field sampling.
- Participating in a regional study to characterize distributions of PCBs,

mercury and chlorinated pesticides in embedded stormwater conveyance sediments.

- Performing case studies to evaluate sources of PCBs to stormwater.
- Preparing pollutant-specific and five-year monitoring program plans.
- Participating in regional monitoring and TMDL-related programs.

These activities are briefly summarized below.

Stormwater Best Management Practices Implementation Study

STOPPP assessed the implementation of stormwater BMPs by San Mateo County municipalities. The study included surveying municipal staff views on the effectiveness of STOPPP's BMP programs and soliciting ideas for improvements. The surveys targeted activities related to the commercial/industrial/illicit discharge, municipal maintenance and new development components of STOPPP. The responses were anonymous and the respondents were not asked to reveal which municipality they were employed by or the department they worked in so that they would feel free to answer the survey questions candidly. For new development and commercial/industrial/illicit discharge activities, the primary goal was to help evaluate whether municipal staff in San Mateo County feel that they successfully promote and enforce the use of BMPs to prevent and control stormwater pollution. The surveys were also designed to begin to identify any reasons why these BMPs were not successfully promoted and enforced and measures that can be taken to increase BMP implementation. For municipal maintenance activities, the goals were similar, except that actual implementation of BMPs was evaluated since the municipalities generally implement these BMPs themselves rather than promoting and enforcing their use by businesses in their jurisdiction. Based on the results of the surveys, the study recommended that each of STOPPP's municipalities evaluate several ways to improve implementation of BMPs, including increasing inspections and follow-up, budgets, staff hours, training and levels of communication.

Watershed Imperviousness and Channel Modification Study

STOPPP performed an evaluation of imperviousness and channel modifications in 17 San Mateo County watersheds. The study watersheds were delineated during this study, and included most of the major urban creek drainages on the Bay side of the county and the watersheds on the coast side facing development pressure. The main objective was to help municipal planners minimize the impacts of future development on creek resources in urban and urbanizing areas. The study found the expected increase in level of channel modification and imperviousness with increased urbanization. High-density residential land use made the largest contribution to watershed imperviousness in all but two of the urbanized Bay side study watersheds. Areas with relatively low imperviousness and unmodified channels included the western portion of many of the Bay side study watersheds and most study areas on the coast side. The study recommended that municipalities protect higher quality creeks by giving priority to minimizing increases in imperviousness at new projects in areas with relatively low existing imperviousness and unmodified channels. Study maps show the locations of such areas. A STOPPP New

Development Subcommittee work group that included municipal planners assisted with development of the maps.

Watershed Assessments

STOPPP performed additional watershed assessment activities in accordance with STOPPP's *Generalized Five-Year Monitoring Program Plan*. STOPPP initially used existing information to characterize the land use, hydrologic, geomorphic, biological and water quality factors that influence the health of the San Pedro Creek watershed. STOPPP used this information to develop a stream classification to help characterize stream structure and function in terms of stream flow and sediment processes. The classification provides a framework for identifying potential impacts to watershed health, identifies and locates important aquatic resources to protect, and prioritizes future monitoring locations and parameters to further assess creek condition.

STOPPP subsequently performed two years of rapid bioassessment work in the San Pedro Creek Watershed. The assessment was conducted using protocols outlined in the California Stream Bioassessment Procedure, which uses benthic macroinvertebrate assemblages as an indicator of water and habitat quality. The San Pedro Creek Watershed Coalition and local volunteers assisted with the fieldwork. Results of the first year bioassessment suggested that variations found in macroinvertebrate assemblages were due to factors associated with the urbanized north fork branch of San Pedro Creek and the main stem. Macroinvertebrate assemblages sampled from sites receiving flow from the less urbanized middle and south forks had consistently higher richness and diversity and were less tolerant than assemblages sampled from other sites. STOPPP is currently evaluating the second year of field data. STOPPP is also collecting grab water samples and testing for aquatic toxicity and organophosphate pesticides. The objectives include better characterizing variations in the benthic macroinvertebrate assemblages and any water quality impairment problems in San Pedro Creek and, if needed, beginning to refine existing water quality management strategies or develop new strategies. The lessons learned will be applied during STOPPP's future efforts to characterize and improve water quality in other urban watersheds in San Mateo County.

Other watershed assessment-related activities performed by STOPPP include the following:

- STOPPP supplemented water quality testing performed by the statewide Surface Water Ambient Monitoring Program (SWAMP) in the San Mateo Creek watershed during FY 2002/03. STOPPP provided funding for SWAMP to collect additional samples at selected stations and analyze the samples for aquatic toxicity and organophosphate pesticides. STOPPP is performing additional follow-up assessment during FY 2003/04.

- STOPPP collaborated with the Santa Clara Valley Urban Runoff Pollution Prevention Program to pilot test a trash assessment field protocol developed by Regional Board staff. The protocol was tested in San Pedro Creek and two creeks in Santa Clara County. The pilot study concluded that the methodology may be useful for measuring baseline levels of

trash, identifying and prioritizing trash problem areas, and identifying potential sources of trash and appropriate BMPs. The study also recommended developing modifications to the protocol to increase its usefulness to municipal trash control programs.

- STOPPP provided funding to the Bay Area Macroinvertebrate Bioassessment Information Network. This regional effort is helping coordinate Bay Area benthic macroinvertebrate bioassessment efforts and develop standards for interpreting and applying the results in the context of watershed assessment and management.

Data management is an important aspect of watershed assessment. STOPPP has developed a desktop Geographic Information System (GIS) to store and compile watershed assessment data and other monitoring program data. This data management tool has many uses, including spatial visualization and analysis of data, and is especially well suited to watershed management. Current data layers in STOPPP's GIS include:

- USGS topographic base maps;
- Municipal boundaries;
- Land use;
- Aerial orthophotographs for selected areas;
- Creeks and other water bodies;
- Streets, roads and highways;
- Drainage boundaries, creek channel modifications and imperviousness of selected watersheds;
- Sediment sampling locations for the Joint Stormwater Agency Project sediment survey; and
- Geologic, riparian habitat value and stream classification data for the San Pedro Creek watershed.

Regional Sediment Survey for Pollutants of Concern

STOPPP collaborated with several other Bay Area stormwater management agencies to measure concentrations of PCBs, mercury and chlorinated pesticides in embedded sediments collected from stormwater conveyances. This two-year field study is referred to as the Joint Stormwater Agency Project. The primary goal was to characterize the distribution of pollutants among land uses in watersheds draining to the Bay. The fieldwork was conducted during the fall of 2000 and 2001. Statistical analysis of both years of data revealed higher pollutant concentrations in samples from urban sites compared to open space sites. Concentrations of pollutants were highly variable in urban samples, with relatively elevated concentrations found of one or more pollutants in some samples. Statistically significant differences were not found between industrial and residential/commercial sites. The study also developed order-of-magnitude estimates of urban runoff PCBs loads from surrounding watersheds to the Bay.

PCBs Case Studies

During the past two years, STOPPP has completed case study work in four areas where relatively elevated levels of PCBs were found during the above Joint Stormwater Agency Project regional sediment survey. The goal of the case studies was to identify sources of PCBs in urban runoff and begin to identify control measures. The areas investigated were the Bradford and Broadway pump station drainages in Redwood City, the South

Maple pump station drainage in South San Francisco and the Pulgas Creek pump station drainage in San Carlos. The case studies employed collection and analysis of embedded storm drain sediment samples and land use research. Based on the results of the field sampling and the research, a few potential source areas were identified. STOPPP has requested that Regional Board staff work with the appropriate parties to investigate the possibility that PCBs from these sites have entered storm drains.

Pollutant-specific and Five-year Monitoring Program Plans

STOPPP has completed several work plans that address pollutants of concern. STOPPP's *Pollutant Prevention and Control Measures Plan* specifies tasks related to PCBs, mercury, pesticides, sediment, dioxins, copper and nickel. The plan covers the three-year period from FY 2001/02 to FY 2003/04. STOPPP's *Sediment Management Practices Assessment Work Plan* identifies and prioritizes watersheds in San Mateo County that are most susceptible to impacts of excessive sediment production to creeks. This plan also summarizes existing and proposed sediment management efforts in San Mateo County and presents the approach that STOPPP is using during FY 2002/03 and FY 2003/04 to assess the effectiveness of existing sediment management practices and make improvements. STOPPP's *FY 2003/04 Trash Control Work Plan* specifies surveying municipal staff regarding trash problem areas and existing trash management measures as a first step towards developing strategies to reduce levels of trash in San Mateo County urban water bodies.

In addition to the above pollutant-specific plans, STOPPP completed a *Generalized Five-year Monitoring Program Plan* covering the period from FY 2002/03 to FY 2006/07. This plan presents a strategy to assess representative watersheds in San Mateo County and incorporates the pollutant-specific activities in the above plans. As described below, STOPPP anticipates preparing a new multi-year monitoring program plan during FY 2004/05 that will revise and extend the existing five-year plan.

Regional Monitoring and TMDL-related Programs

STOPPP has continued to participate in and provide funding to a variety of regional efforts to monitor water quality and solve water quality impairment problems:

- STOPPP provides funding to the San Francisco Estuary Institute for expenditures on the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP). This program monitors pollutant concentrations in water, sediments, and fish and shellfish tissue in the San Francisco Estuary. One goal of the RMP is to provide information on how pollutant concentrations in the Estuary are responding to pollution prevention and reduction measures and thus if the financial resources devoted to these efforts are improving water quality.

- STOPPP provides funding to the Clean Estuary Partnership (CEP), a joint effort of the Regional Board, the Bay Area Clean Water Agencies, and BASMAA. The three parties are collaborating to guide and assist the development of TMDLs and other

strategies to address water quality impairments by pollutants of concern in the San Francisco Estuary. STOPPP also participates in meetings of the CEP's Technical Committee, which provides oversight for the CEP's research, monitoring, and other technical endeavors.

- STOPPP coordinates its watershed assessment and monitoring activities with other Bay Area stormwater management agencies through participation in BASMAA's monthly Monitoring Committee meetings.

- STOPPP provides funding for implementation of BASMAA baseline activities such as the Brake Pad Partnership.

MAJOR TASKS

STOPPP's WAM component will conduct the following tasks during the next five years:

- Task 6.1 Conduct Watershed Assessments.
- Task 6.2 Develop Plans to Address Specific Pollutants of Concern.
- Task 6.3 Participate in Regional Monitoring and TMDL-related Efforts.
- Task 6.4 Perform Activities Related to Regulatory Compliance and Planning.

Each task is described below.

Task 6.1 Conduct Watershed Assessments

STOPPP will continue to assess urban runoff-related characteristics of representative watersheds in San Mateo County. Assessments will typically focus on using environmental indicators (e.g., benthic macroinvertebrate assemblages) to characterize the functional attributes of creeks and potential for stormwater impacts. Data on physical, biological and chemical parameters will be collected as appropriate. Special studies such as the evaluation of specific BMPs will also be incorporated into this task as appropriate. In addition, STOPPP will continue developing and implementing strategies to assess and manage trash in urban water bodies in San Mateo County. STOPPP's annual monitoring program plan, submitted by March 1 each year, will provide more details regarding activities planned for the following fiscal year. As new watershed assessment data become available, STOPPP will expand and refine its existing GIS.

The overall goal of this task is to characterize impacts to typical urban watersheds. This data will support informed selection of stormwater management measures, recognizing that individual watersheds may have unique problems that require approaches tailored to local conditions. STOPPP will develop and evaluate cost-effective methods to address water quality problems in specific watersheds. This will necessitate collaborating with other agencies and organizations (e.g., local watershed stakeholder groups) in a watershed's jurisdiction to leverage limited resources.

STOPPP's current watershed assessment strategy is outlined in STOPPP's *Generalized Five-year Monitoring Program Plan*, which covers the period from FY 2002/03 to FY 2006/07. STOPPP will prepare a new multi-year monitoring program plan by revising and extending the

existing five-year plan in accordance with the requirements of the reissued permit. Implementation of a new multi-year plan is anticipated to begin in FY 2005/06, superceding the last two years of STOPPP's existing five-year plan.

Task 6.2 Develop Plans to Address Specific Pollutants of Concern

The recent emphasis on addressing certain pollutants of concern thought to impair water quality (e.g., PCBs, mercury, pesticides, sediment, dioxins and copper) has led the Regional Board to require new assistance from Bay Area municipal stormwater programs. An overview of STOPPP's current activities related to specific pollutants of concern is presented in STOPPP's *Pollutant Prevention and Control Measures Plan*, which covers the three-year period from FY 2001/02 to FY 2003/04. STOPPP will continue to develop and implement pollutant-specific control programs in accordance with the requirements of the reissued permit. These programs will build on STOPPP's past accomplishments in controlling pollutants of concern and existing pollutant-specific control activities.

Task 6.3 Participate in Regional Monitoring and TMDL-related Programs

Participation in the previously described regional efforts to monitor water quality and solve water quality impairment problems will remain an important aspect of STOPPP's WAM component. STOPPP plans to continue participating in BASMAA's Monitoring Committee and the CEP Technical Committee. STOPPP also plans to continue providing funding to BASMAA, the RMP and the CEP, as possible within future budget constraints.

Task 6.4 Perform Activities Related to Regulatory Compliance and Planning

STOPPP will prepare the WAM component work plans and reports required by the reissued NPDES permit. This task is anticipated to include annual work plans and budgets, monitoring plans, and reports. STOPPP's WAM Subcommittee will continue to meet regularly to plan and oversee implementation of this component's activities. The annual reports will include an assessment of the effectiveness of this component's implementation. Effectiveness will be evaluated in the context of the WAM component objectives presented earlier.

APPENDIX A

General Program Work Plans and Budgets

Table 1-1. FY 2003/04 General Program Draft Budget Summary

Budget Categories	FY 2003/04 General Program Budget
Personnel Services	
Executive Director	$20,000
Program Manager	$42,180
Program Secretary	$0
Member Agency Support	$22,500
Miscellaneous	$1,000
Subtotal	$85,680
Fees and Dues*	
Annual NPDES Permit Fee	$0
BASMAA Dues	$32,014
Regional Monitoring Program	$70,045
Water Quality Attainment Strategy Contribution	$80,000
Subtotal	$182,059
Supplies and Other Charges	
Copier and Service Agreement	$0
Publications	$15,000
Conferences and Meetings	$1,500
Education and Training	$0
Subtotal	$16,500
Additional Expenses	
Data Base Management	$12,500
EDP Consultant Work	$9,000
Controller's Processing Fee @ $.30/APN	$65,000
Subtotal	$86,500
Tasks in the SWMP	
2.0 Municipal Maintenance	$69,000
3.0 Industrial and Illicit Discharge Controls	$214,000
4.0 Public Information and Participation	$218,229
5.0 New Development	$144,000
6.0 Watershed and Monitoring	$213,000
Subtotal	$858,229
TOTAL BUDGET	$1,228,968

*Assumes fees and dues remain unchanged from FY 2002/03

Table 1-2. FY 2004/05 General Program Draft Budget Summary

Budget Categories	FY 2004/05 General Program Budget
Personnel Services	
Executive Director	$20,000
Program Manager	$42,180
Program Secretary	$0
Member Agency Support	$22,500
Miscellaneous	$1,000
Subtotal	$85,680
Fees and Dues	
Annual NPDES Permit Fee	$0
BASMAA Dues	$32,014
Regional Monitoring Program	$70,045
Water Quality Attainment Strategy Contribution	$80,000
Subtotal	$182,059
Supplies and Other Charges	
Copier and Service Agreement	$0
Publications	$15,000
Conferences and Meetings	$1,500
Education and Training	$0
Subtotal	$16,500
Additional Expenses	
Data Base Management	$12,500
EDP Consultant Work	$9,000
Controller's Processing Fee @ $.30/APN	$65,000
Subtotal	$86,500
Tasks in the SWMP	
2.0 Municipal Maintenance	$69,000
3.0 Industrial and Illicit Discharge Controls	$174,000
4.0 Public Information and Participation	$216,540
5.0 New Development	$186,000
6.0 Watershed and Monitoring	$203,000
Subtotal	$848,540
TOTAL BUDGET	$1,219,279

Table 2-1 Municipal Maintenance General Program Work Plan and Budget - FY 2003/04

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. Identify and assess feasibility of pilot studies to complement performance standard development. The performance standards will be reviewed and improvements will be prepared, as appropriate, for approval by the STOPPP and for submittal to the Regional Board. Potential areas for new Performance Standard development include BMPs for mobile fuel vehicles and controlling potable water discharges.	Improvements identified for the performance standards will be formally considered by the Maintenance Subcommittee and its work groups every two years beginning in FY 1999/00. A minimum of one performance standard will be developed in FY2003/04.	$ 5,000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$15,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs. A potential project would be to work with other STOPPP subcommittees to develop a single source document for employees new to stormwater regulations featuring maintenance performance standards, brochures, videos, manuals, and so on.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$4,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance. Subtasks may include participation in the development of a new 5 Year Municipal NPDES Stormwater Permit and Stormwater Management Plan.	See SWMP	$30,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Task 2.10 Integrated Pest Management Continue to work with the Park and Recreation Work Group to implement the integrated pest management (IPM) performance standards.	See SWMP	$15,000	ongoing
Total Budget		**$ 69,000**	

Table 2-2 Municipal Maintenance General Program Work Plan and Budget - FY 2004/05

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. Identify and assess feasibility of pilot studies to complement performance standard development. The performance standards will be reviewed and improvements will be made, as appropriate, for approval by STOPPP and for submittal to the Regional Board.	Improvements to the performance standards will be formally considered by the Maintenance Subcommittee every two years.	$4000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$15,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs. Coordinate with the PI/P Subcommittee to design an outreach piece.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$5,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance. Subtasks may include participation in the development of a new 5 year Municipal NPDES Stormwater Permit.	See SWMP	$30,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Task 2.10 Integrated Pest Management Continue to work with the Park and Recreation Work Group to implement the integrated pest management (IPM) performance standards. Conduct IPM training.	See SWMP and Pesticide Management Plan.	$15,000	ongoing
	Total Budget	**$ 69,000**	

Table 3-1. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 2003/04

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements, if any, may be prepared for approval by STOPPP for submittal to the Regional Board.	Possible improvements in the performance standards will formally be considered by the Commercial/Industrial/Illicit Subcommittee every two years beginning in FY 2003/04.	$1,000	ongoing
3.2 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist with NPDES permit required reporting (including C/I/I section of annual reports and compilation and submittal of the new Mid-Fiscal Year Report); conduct individualized performance reviews of up to one-half of the municipal programs; assist with the implementation of controls for conditionally exempted discharges; assist the C/I/I Subcommittee conduct its meetings; revise two year work plan and budget as needed; and provide other regulatory compliance assistance	See SWMP	$ 61,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
3.3 Provide Training and Outreach Materials: Provide training and educational outreach to business or trade organization. Use the results of the survey of businesses to help plan any training or outreach materials needed. Actual design, layout, and printing costs for any outreach materials will be funded as part of the PI/P General Program budget.	Educational outreach and training of municipal staff will be conducted in years when outreach to businesses is not.	$15,000	June 2004
3.4 Provide Incentives for Businesses to Comply: Provide incentives to businesses to comply with stormwater pollution prevention requirements.	See SWMP	$4,000	Ongoing
3.5 Evaluate the Effectiveness of Implemented Controls: Information from the FY 2001/02 inspections will be inputted into a database.	See SWMP	$10,000	June 2004
3.6 Implement CII Led Activities from Pollutant Control Plan: This includes all of the tasks described in the *Pollutant Prevention and Control Measures Plan's* Table 4 to improve the control of the discharge of mercury and pesticides.	See STOPPP's Pollutant Prevention and Control Measures Plan dated June 29, 2001.	$36,000	See schedule in the Plan
3.7 Implement Pesticide Management Plan: This includes implementing tasks in this Plan other than those in the Public Education and Outreach and Household Hazardous Waste Collection sections.	The final version of the Plan is dated July 16, 2002, and this Plan has been approved for implementation by the Regional Board staff.	$37,000	See schedule in the Plan

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.8 Prepare Permit Reissuance Package: This task includes working with all of the STOPPP subcommittees, except PIP, and with the TAC to develop a new Stormwater Management Plan and to assist the TAC develop the documents needed to apply for STOPPP's NPDES permit reissuance.	The NPDES permit requires that an application for reissuance of the permit be submitted at least 180 days prior to the permit's expiration date of July 21, 2004.	$50,000	January 21, 2004
	Total Budget	**$ 214,000**	

Table 3-2. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 2004/05

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements, if any, may be prepared for approval by STOPPP for submittal to the Regional Board.	Possible improvements in the performance standards will formally be considered by the Commercial/Industrial/Illicit Subcommittee every two years and will be done in FY 2004/05.	$1,000	ongoing
3.2 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist with NPDES permit required reporting (including C/I/I section of annual reports and compilation and submittal of the new Mid-Fiscal Year Report); conduct individualized performance reviews of up to one-half of the municipal programs; assist with the implementation of controls for conditionally exempted discharges; assist the C/I/I Subcommittee conduct its meetings; revise two year work plan and budget as needed; and provide other regulatory compliance assistance	See SWMP	$ 61,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
3.3 Provide Training and Outreach Materials: Provide training and educational outreach to business or trade organization. Use the results of the survey of businesses to help plan any training or outreach materials needed. Actual design, layout, and printing costs for any outreach materials will be funded as part of the PI/P General Program budget.	Educational outreach and training of municipal staff will be conducted in years when outreach to businesses is not.	$15,000	June 2004
3.4 Provide Incentives for Businesses to Comply: Provide incentives to businesses to comply with stormwater pollution prevention requirements.	See SWMP	$4,000	Ongoing
3.5 Evaluate the Effectiveness of Implemented Controls: Information from the FY 2001/02 inspections will be inputted into a database.	See SWMP	$10,000	June 2004
3.6 Implement CII Led Activities from Pollutant Control Plan: This includes all of the tasks that are equivalent to those described in the *Pollutant Prevention and Control Measures Plan's* Table 4 to improve the control of the discharge of mercury and pesticides.	See STOPPP's Pollutant Prevention and Control Measures Plan dated June 29, 2001. While the Plan ends on June 30, 2004, it is expected that equivalent tasks will be required during the following fiscal year.	$36,000	See schedule in the Plan
3.7 Implement Pesticide Management Plan: This includes implementing tasks in this Plan other than those in the Public Education and Outreach and Household Hazardous Waste Collection sections.	The final version of the Plan is dated July 16, 2002, and this Plan has been approved for implementation by the Regional Board staff.	$37,000	See schedule in the Plan

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.8 Assist with NPDES Permit Reissuance: This task includes providing assistance to STOPPP in working with the Regional Board staff in obtaining a reissued NPDES permit.	After the permit reissuance package is submitted to the Regional Board staff in January 2004, there may be areas where additional discussion with the Regional Board staff on the draft Stormwater Management Plan and draft NPDES permit will be useful. It is assumed that the number and types of unresolved issues will be limited given the effort put into STOPPP's permit amendment in FY 2002/03.	$10,000	July 2004 until the NPDES permit is reissued.
	Total Budget	**$ 174,000**	

Table 4-1 PIP FY 2003/04

Task	2003-2004	Task Description	Responsible Staff and Plan	Hours 2003	Hours 2004	Total Hours	Cost	Materials Cost	Total
				$90	$91				
4.1		**Implement and Assist with the Performance Standards**							
	4.1.1	Performance Standards.				20	$1,810.00		$1,810.00
		Assist municipalities to understand and implement standards. Provide list of suggestions to improve standards.	Ken	10	10	20	$1,810.00		
4.2		**Assist with Regulatory Compliance and Planning**							
	4.2.1	Provide support to P/IP				120	$10,860.00	$500.00	$11,360.00
		Attend 12 montly meetings and assist chair with preparation, discussion topics and handouts. Update SC on other P/IP activity in State i.e. BASMAA							
		Meeting attendance	Susan & Ken	36	36	72	$6,516.00		
		Meeting preparation	Susan	24	24	48	$4,344.00		
		Materials						$500.00	
	4.2.2	Annual Report				80	$7,240.00	$ --	$7,240.00
		Assist EOA in preparing the P/IP section of the Annual Report	Ken and Susan will prepare PIP section	40	40	80	$7,240.00		
	4.2.3	Stormwater Management Plan				160	$14,480.00	$ --	$14,480.00
		Assist EOA in preparing the P/IP section of the SWMP, and updating the performance standards	Susan will prepare the PIP section.	80	80	160	$14,480.00		
4.3		**Encourage Public Involvement, Outreach, and Education**							
	4.3.1	Point of Purchase - IPM Point of Purchase Campaign				168	$15,264.00	$10,000.00	$25,264.00
		12 meetings - 4 hours	Sara	24	24	48	$4,344.00		
		Store visits and set up - 20 stores 2 hrs each 2x per season	Sara/Susan	0	80	80	$7,280.00		
		Store phone calls and correspondence	Sara	0	20	20	$1,820.00		
		Training planning - contract administration	Sara	0	20	20	$1,820.00		
		Materials						$10,000.00	
	4.3.2	Website/ Informational Materials				70	$6,325.00	$5,000.00	$11,325.00
		Maintain website with a registered domain name that includes all STOPPP brochures, IPM information and BMPs. Advertise website in all STOPPP publications, and on promotional items	Contractor					$5,000.00	
		Contract Administration	Susan	20		20	$1,800.00		
		Communication with web contractor	Susan	25	25	50	$4,525.00		
	4.3.3	Promotional Items, pamphlets, displays, and exhibit items				30	$2,720.00	$16,500.00	$19,220.00
		Assist in purchasing promotional items for fair	Susan	0	10	10	$910.00	$6,500.00	
		Reprint brochures	Susan/Ken	10	10	20	$1,810.00	$10,000.00	
	4.3.5	Mercury campaign	Partner with HHW program to conduct a mercury public awareness and collection program.			160	$14,530.00	$15,000.00	$29,530.00
		Mercury POP campaign			90	90	$8,190.00	$15,000.00	
		Thermometer exchange planning	Susan and Ken	10	10	20	$1,810.00		
		Coordinate with cities and hospitals to collect thermometers	Susan and Ken	10	20	30	$2,720.00		
		Correspondence with cities	Susan and Ken	10	10	20	$1,810.00		
		Disposal	HHW Program						

Table 4-1 PIP FY 2003/04

Task	2003-2004	Task Description	Responsible Staff and Plan	Hours 2003	Hours 2004	Total Hours	Cost	Materials Cost	Total
	4.3.6	Elementary Outreach				40	$3,620.00	$5,000.00	$8,620.00
		Partner with the Used Oil Program to have Zun Zun perform at County Elementary Schools.							
		Contract Administration	Susan	20	20	40	$3,620.00		
		Shows	PIP Funding				$5,000.00		
	4.3.7	Develop Newspaper advertising campaign with stormwater chemicals of concern				80	$7,280.00	$20,000.00	$27,280.00
		Contract with graphic artist	Susan	0	40	40	$3,640.00		
		Contract with newspaper to run ads quarterly	Susan	0	40	40	$3,640.00		
		Ads costs	Newspapers						
	4.3.8	Cable Television campaign				60	$5,460.00	$24,750.00	$30,210.00
		Stormwater Commercial	Contractor/Susan	0	20	20	$1,820.00	$4,750.00	
		Contract with cable 26 weeks	Contractor			0		$20,000.00	
		Write contract with cable	Susan	0	40	40	$3,640.00		
	4.3.9	Trash Campaign Research	Susan		40	40	$3,640.00		$3,640.00
4.4		**Assist with Focused Staff Training**							
	4.4.1	Focused Staff training				100	$9,100.00	$10,300.00	$19,400.00
		Develop training video based on live training provided to TAC and other subcommittees	Contractor					$10,000.00	
		Contract Administration	Susan	0	50	50	$4,550.00		
		Work with contractor to develop and edit training	Ken will prioritize training needs and develop program	0	50	50	$4,550.00		
		Materials						$300.00	
4.5		**Collaborate with Other Groups**							
	4.5.1	Community Outreach Grants - Collaborate with Volunteer Groups				28	$2,970.00	$450.00	$3,420.00
		Provide STOPPP with an application to be distributed by the SC							
		Conduct 2-hr grant workshop							
		Update application	Susan	8	0	8	$720.00		
		Update database and organize mailing distribution	Susan	20	0	20	$1,800.00		
		Mailing printing	Mail room					$450.00	
		Press release		5			$450.00		
	4.5.2	Assist other STOPPP committees				60	$5,430.00	$0.00	$5,430.00
		Work with other subcommittees to integrate PIP activities with the general program components. This may involve participating in other SCs, inviting SC chairs to participate in PIP meetings, or developing educational materials for Employee Training.	Work w/CII to reach County Schools and encourage use of less toxic pest control	30	30	60	$5,430.00		
			Total			1,216	$110,729.00	$107,500.00	$218,229.00

Table 4-2 PIP FY 2004/05

Task	2004-2005	Task Description	Responsible Staff and Plan	Hours 2004	Hours 2005	Total Hours	Cost	Materials Cost	Total
				$90	$91				
4.1		**Implement and Assist with the Performance Standards**							
	4.1.1	Performance Standards.				20	$1,830.00		$1,830.00
		Assist municipalities to understand and implement standards. Provide list of suggestions to improve standards.	Ken	10	10	20	$1,830.00		
4.2		**Assist with Regulatory Compliance and Planning**							
	4.2.1	Provide support to P/IP				120	$10,980.00	$500.00	$11,480.00
		Attend 12 montly meetings and assist chair with preparation, discussion topics and handouts. Update SC on other P/IP activity in State i.e. BASMAA							
		Meeting attendance	Susan & Ken	36	36	72	$6,588.00		
		Meeting preparation	Susan	24	24	48	$4,392.00		
		Materials						$500.00	
	4.2.2	Annual Report				80	$7,320.00	$ --	$7,320.00
		Assist EOA in preparing the P/IP section of the Annual Report	Ken and Susan will prepare PIP section	40	40	80	$7,320.00		
4.3		**Encourage Public Involvement, Outreach, and Education**							
	4.3.1	Point of Purchase - IPM Point of Purchase Campaign				168	$15,432.00	$10,000.00	$25,432.00
		12 meetings - 4 hours	Sara	24	24	48	$4,392.00		
		Store visits and set up - 20 stores 2 hrs each 2x per season	Sara/Susan	0	80	80	$7,360.00		
		Store phone calls and correspondence	Sara	0	20	20	$1,840.00		
		Training planning - contract administration	Sara	0	20	20	$1,840.00		
		Materials						$10,000.00	
	4.3.2	Website/ Informational Materials				0	$6,395.00	$5,000.00	$11,395.00
		Maintain website with a registered domain name that includes all STOPPP brochures, IPM information and BMPs. Advertise website in all STOPPP publications, and on promotional items	Contractor					$5,000.00	
		Contract Administration	Susan	20		20	$1,820.00		
		Communication with web contractor	Susan	25	25	50	$4,575.00		
	4.3.3	Promotional Items, pamphlets, displays, and exhibit items				30	$2,750.00	$16,500.00	$19,250.00
		Assist in purchasing promotional items for fair	Susan	0	10	10	$920.00	$6,500.00	
		Reprint brochures		10	10	20	$1,830.00	$10,000.00	
	4.3.5	Mercury campaign	Partner with HHW program			130	$11,960.00	$29,000.00	$40,960.00
		Mercury POP campaign			90	90	$8,280.00	$15,000.00	
		Thermometer exchange planning	Susan and Ken	0	10	10	$920.00		
		Coordinate with cities and hospitals to collect thermometers	Susan and Ken	0	20	20	$1,840.00		
		Correspondence with cities	Susan and Ken	0	10	10	$920.00		
		Disposal	HHW Program						
		Replacement themometers 1% ountry population 7,000 at $2 each	Contractor					$14,000.00	
	4.3.6	Elementary Outreach				40	$3,660.00	$5,000.00	$8,660.00
		Partner with the Used Oil Program to have Zun Zun perform at County Elementary Schools.							
		Contract Administration	Susan	20	20	40	$3,660.00		
		Shows	PIP Funding					$5,000.00	
	4.3.7	Develop Newspaper advertising campaign with stormwater chemicals of concern				80	$7,360.00	$20,000.00	$27,360.00

Table 4-2 PIP FY 2004/05

Task	2004-2005	Task Description	Responsible Staff and Plan	Hours 2004	Hours 2005	Total Hours	Cost	Materials Cost	Total
		Contract with graphic artist	Susan	0	40	40	$3,680.00		
		Contract with newspaper to run ads quarterly	Susan	0	40	40	$3,680.00		
		Ads costs	Newspapers					$20,000.00	
	4.3.8	Cable Television campaign				60	$5,520.00	$24,750.00	$30,270.00
		Stormwater Commercial	Contractor/Susan	0	20	20	$1,840.00	$4,750.00	
		Contract with cable 26 weeks	Contractor			0		$20,000.00	
		Write contract with cable	Susan	0	40	40	$3,680.00		
	4.3.9	Trash Campaign Development	Susan/Sara/Ken	40	45	85	$7,780.00	$500.00	$8,280.00
4.4		**Assist with Focused Staff Training**							
	4.4.1	Focused Staff training				55	$5,060.00	$10,300.00	$15,360.00
		Develop training video based on live training provided to TAC and other subcommittees	Contractor					$10,000.00	
		Contract Administration	Susan	0	30	30	$2,760.00		
		Work with contractor to develop and edit training	Ken	0	25	25	$2,300.00		
		Materials						$300.00	
4.5		**Collaborate with Other Groups**							
	4.5.1	Community Outreach Grants - Collaborate with Volunteer Groups				33	$3,003.00	$450.00	$3,453.00
		Provide STOPPP with an application to be distributed by the SC							
		Conduct 2-hr grant workshop							
		Update application	Susan	8	0	8	$728.00		
		Update database and organize mailing distribution	Susan	20	0	20	$1,820.00		
		Mailing printing	Mail room					$450.00	
		Press release		5		5	$455.00		
	4.5.2	Assist other STOPPP committees				60	$5,490.00	$0.00	$5,490.00
		Work with other subcommittees to integrate PIP activities with the general program components. This may involve participating in other SCs, inviting SC chairs to participate in PIP meetings, or developing educational materials for Employee Training.	Work w/CII to reach County Schools and encourage use of less toxic pest control	30	30	60	$5,490.00		
			Total			961	$94,540.00	$122,000.00	$216,540.00

Table 5-1. New Development and Construction Controls General Program Work Plan and Budget - FY 2003/04

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: Update the performance standards.	See SWMP. Performance standards are reviewed every two years.	$5,300	Ongoing
5.2 Conduct Watershed Resource Inventory and Planning: Provide guidance on assessment of creek and habitat conditions through field observations and impervious cover estimates of representative watersheds. Continue to assist municipalities develop a framework useful for including watershed management principles in the development plan review process. Continue to coordinate efforts with Watershed & Monitoring Subcommittee.	See SWMP.	$4,500	Ongoing
Work with the municipalities to establish priorities for Hydrograph Modification Management Plan (HMP) implementation and track the issues associated with the SCVURPPP's HMP methodology. Complete work on a detailed work plan and schedule for the HMP, submit a literature review, and work on draft HMP as required by Provision C.f.viii.	Required by NPDES permit amendment.	$57,500	see permit amendment
5.3 Assist with Implementing Stormwater Quality Controls: Through the New Development Subcommittee (NDS) meetings and biannual reports from municipalities, track implementation and effectiveness of stormwater controls in municipal and private projects; assist municipalities' efforts to control pollutant discharges from construction sites; expand existing outreach programs and prepare and distribute appropriate educational materials.	See SWMP. This task includes up to one workshop for municipal staff, up to one external outreach effort and development or revision of up to one outreach piece, as appropriate each year.	$15,000	Ongoing
As possible within the available budget, assist the municipalities with the implementation of Provision C.3 tasks other than HMP assistance, which is provided by Task 5.2. This assistance will not include any assistance with optional tasks, such as setting up a model alternative compliance program (Provision C.3.g) nor assisting with an alternative Group 2 definition (Provision C.3.c.iii).	Required by NPDES permit amendment	$40,000	See permit amendment
5.4 Evaluate the Effectiveness of Implemented Controls: Through the NDS, continue implementing and tracking the effectiveness of updated or pilot methods for measuring the effectiveness of performance standards, enforcement of construction site BMPs, and requirements for appropriate stormwater controls. Continue to test pilot methods for measuring effectiveness. Recommend BMP effectiveness monitoring studies to the Watershed & Monitoring Subcommittee, as appropriate.	See SWMP.	$5,300	June 2004

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.5 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); developing two year work plans and budgets for General Program; creating the new development section of the next Stormwater Management Plan (SWMP); conducting the NDS meetings; and developing a detailed NDS work plan for each fiscal year.	See SWMP.	$16,400	See permit
	Total Budget	$144,000	

5-2. New Development and Construction Controls General Program Work Plan and Budget - FY 2004/05

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: Prepare and distribute information to assist the municipalities understand and implement the updated performance standards including the pesticide requirements for new development projects.	See SWMP. Performance standards are reviewed every two years. Assumes that pesticide requirements for new development projects will be included in the reissued NPDES permit in FY 2004/05 similar to the SCVURPPP's and the ACCWP's permits.	$5,200	Ongoing
5.2 Conduct Watershed Resource Inventory and Planning: Provide guidance on assessment of creek and habitat conditions through field observations and impervious cover estimates of representative watersheds. Continue to assist municipalities develop a framework useful for including watershed management principles in the development plan review process. Continue to coordinate efforts with Watershed & Monitoring Subcommittee. Complete the final HMP for priority watersheds as possible within the available budget. It is anticipated that the San Francisquito Creek watershed would have a high priority.	See SWMP. Required by NPDES permit amendment.	$4,500 $100,000	Ongoing See permit amendment
5.3 Assist with Implementing Stormwater Quality Controls: Through the New Development Subcommittee (NDS) meetings and biannual reports from municipalities, track implementation and effectiveness of stormwater controls in municipal and private projects; assist municipalities' efforts to control pollutant discharges from construction sites; expand existing outreach programs and prepare and distribute appropriate educational materials. As possible within the available budget, assist the municipalities with the implementation of Provision C.3 tasks other than HMP assistance, which is provided by Task 5.2. This assistance will not include any assistance with optional tasks, such as setting up a model alternative compliance program (Provision C.3.g) nor assisting with an alternative Group 2 definition (Provision C.3.c.iii).	See SWMP. This task includes one workshop for municipal staff, one external outreach effort and development or revision of one outreach piece, as appropriate each year. Required by NPDES permit amendment.	$15,000 $40,000	Ongoing

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.4 Evaluate the Effectiveness of Implemented Controls: Through the NDS, continue implementing and tracking the effectiveness of updated or pilot methods for measuring the effectiveness of performance standards, enforcement of construction site BMPs, and requirements for appropriate stormwater controls. Continue to test pilot methods for measuring effectiveness. Recommend BMP effectiveness monitoring studies to the Watershed & Monitoring Subcommittee, as appropriate.	See SWMP.	$5,300	June 2005
5.5 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); developing two year work plans and budgets for General Program; providing any improvements to the new development section of the SWMP; conducting the NDS meetings; and developing a detailed NDS work plan for each fiscal year.	See SWMP.	16,000	See permit
	Total Budget	$186,000	

Table 6-1. Watershed and Monitoring General Program Work Plan and Budget - FY 2003/04

Task Number and Description	Rationale/Background	Planning Budget	Schedule/ Due Date
6.1 Participate in the BASMAA Monitoring Strategy: Prepare for and participate in BASMAA's monthly Monitoring Committee meetings.	Budget based on participation in up to twelve meetings.	$7,000	Ongoing.
6.2 Evaluate BMPs Effectiveness: Perform work related to controlling the pollutants listed in STOPPP's NPDES permit as potentially exceeding water quality standards. This task implements the monitoring portion of STOPPP's June 29, 2001 Pollutant Prevention and Control Measures Plan. Planned activities include follow-up on previous PCBs studies, further evaluation of sediment BMPs and controls, further evaluation of dioxins, an evaluation of copper and nickel, and preparing a model mercury virtual elimination policy.	In general, assess whether specific pollutants of concern are found in stormwater discharges from San Mateo County at levels that impact water quality in San Mateo County creeks and/or San Francisco Bay. For more information, see STOPPP's June 29, 2001 Pollutant Prevention and Control Measures Plan and June 28, 2002 Generalized Five-year Monitoring Program Plan.	$106,000	See STOPPP's June 29, 2001 Pollutant Prevention and Control Measures Plan and June 28, 2002 Generalized Five-year Monitoring Program Plan.
6.3 Conduct Watershed Assessment: Perform chemical, biological and/or physical monitoring in the San Pedro and San Mateo Creek watersheds. Activities may include field probe measurements, physical habitat assessment, rapid bioassessments, toxicity screening, contaminant chemistry (e.g., pesticides), sediment studies and trash assessment. Characterize Cordilleras Creek watershed based on existing data and design a monitoring program.	Assess baseline water quality conditions in representative watersheds in San Mateo County, evaluate stormwater impacts and help solve creek drainage basin-specific water quality impairment problems. For more information, see STOPPP's June 28, 2002 Generalized Five-year Monitoring Program Plan and March 1, 2003 Monitoring Program Plan for Fiscal Year 2003/04.	$80,000	See STOPPP's June 28, 2002 Generalized Five-year Monitoring Program Plan.
6.4 Assist with Regulatory Compliance and Planning: This task includes assistance with preparing STOPPP's annual report, two year work plans, annual monitoring plan and coordination of the Watershed and Monitoring Subcommittee meetings. Support watershed and monitoring-related aspects of STOPPP's permit reapplication.	See the SWMP.	$20,000	NPDES permit required reports will be completed by the required dates. Other activities will be ongoing.
6.5 Evaluate the Effectiveness of the Watershed and Monitoring Studies Conducted: Track the progress of others to identify assessment methods appropriate for stormwater programs. Identify what additional information, if any, needs to be collected to improve STOPPP's assessment methods.	See the SWMP.	Budget included in previous tasks.	Ongoing.
	Total Budget	**$213,000**	

Table 6-2. Watershed and Monitoring General Program Work Plan and Budget - FY 2004/05

Task Number and Description	Rationale/Background	Planning Budget	Schedule/ Due Date
6.1 Participate in the BASMAA Monitoring Strategy: Prepare for and participate in BASMAA's monthly Monitoring Committee meetings.	Budget based on participation in up to twelve meetings.	$7,000	Ongoing.
6.2 Evaluate BMPs Effectiveness: Perform work related to controlling the pollutants listed in STOPPP's NPDES permit as potentially exceeding water quality standards.	In general, assess whether specific pollutants of concern are found in stormwater discharges from San Mateo County at levels that impact water quality in San Mateo County creeks and/or San Francisco Bay. For more information, see STOPPP's June 28, 2002 Generalized Five-year Monitoring Program Plan.	$96,000	See STOPPP's June 28, 2002 Generalized Five-year Monitoring Program Plan.
6.3 Conduct Watershed Assessment: Perform chemical, biological and/or physical monitoring in the San Pedro, San Mateo Creek and Cordilleras Creek watersheds. Activities may include field probe measurements, physical habitat assessment, rapid bioassessments, toxicity screening, contaminant chemistry (e.g., pesticides), sediment studies and trash assessment. Characterize a new San Mateo Creek watershed based on existing data and design a monitoring program.	Assess baseline water quality conditions in representative watersheds in San Mateo County, evaluate stormwater impacts and help solve creek drainage basin-specific water quality impairment problems. For more information, see STOPPP's June 28, 2002 Generalized Five-year Monitoring Program Plan.	$90,000	See STOPPP's June 28, 2002 Generalized Five-year Monitoring Program Plan.
6.4 Assist with Regulatory Compliance and Planning: This task includes assistance with preparing STOPPP's annual report, two year work plans, annual monitoring plan and coordination of the Watershed and Monitoring Subcommittee meetings.	See the SWMP.	$10,000	NPDES permit required reports will be completed by the required dates. Other activities will be ongoing.
6.5 Evaluate the Effectiveness of the Watershed and Monitoring Studies Conducted: Track the progress of others to identify assessment methods appropriate for stormwater programs. Identify what additional information, if any, needs to be collected to improve STOPPP's assessment methods.	See the SWMP.	Budget included in previous tasks.	Ongoing.
	Total Budget	**$203,000**	

APPENDIX B

Performance Standards

APPENDIX B

PERFORMANCE STANDARDS

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ATTACHMENT:

- Definitions for New Development and Construction Controls

INTRODUCTION TO PERFORMANCE STANDARDS

Performance standards to be implemented by member agencies have been developed for the following five areas of the Plan:

- Municipal Maintenance Activities,
- Industrial and Commercial Discharge Controls,
- Illicit Discharge Controls,
- Public Information and Participation, and
- New Development and Construction Controls.

These performance standards define a large part of what each member agency will need to do to implement the Plan and comply with the NPDES permit. The implementation of these performance standards by member agencies is required by the Plan.

These performance standards describe *what* each municipality is responsible for achieving. Each municipality will decide *how* it achieves these performance standards using its own staff, a contracted agency, or other arrangements. The performance standards for the Industrial and Commercial Discharge Controls and for the Illicit Discharge Controls require that each municipality prepare written five-year plans that describe how the municipality will implement these requirements. The CII Subcommittee has agreed that these plans will be prepared for submittal to the Regional Board by September 1, 2004, unless specified otherwise by STOPPP's reissued NPDES permit. Similarly, the Municipal Maintenance Performance Standards for corporation yards require that each municipality with a corporation yard will prepare a written Stormwater Pollution Prevention Plan that describes how it will implement the corporation yard performance standards.

Unless a specific requirement or commitment has been made to implement a performance standard, such as STOPPP's commitment to implement the performance standards that are unchanged from the July 1998 – June 2003 version of the Stormwater Management Plan and its commitment to develop the five-year plans for industrial and commercial business inspections and for controlling illicit discharges, municipalities may wait to implement these performance standards until they are determined in writing to be acceptable to the Regional Board staff or they have been accepted as part of the reissuance of STOPPP's NPDES permit.

The following provides a brief background on how these performance standards were developed and the process that will be used for their review and improvement.

BACKGROUND

The San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) developed these baseline performance standards as a tool to help STOPPP member agencies comply with their NPDES permit. The Clean Water Act and STOPPP's stormwater NPDES discharge permit require STOPPP member agencies to control discharges of pollutants to the maximum extent practicable (MEP) and to effectively prohibit illicit discharges. STOPPP developed the performance standards to define the MEP level of effort that each

member municipality will attain to control pollutants in stormwater. In addition, the performance standards define the level of effort that each member municipality will attain to effectively prohibit illicit discharges[1] from entering its municipal storm drain conveyance system[2].

The Performance Standards provide an effective, consistent, and predictable countywide approach to minimizing water quality impacts. Having consistent countywide standards assures similar treatment to businesses, developers, contractors, and property owners. In addition, such standards will assist STOPPP member agencies with training and educational outreach. Furthermore, the performance standards will be used as the basis for measuring the effectiveness of each municipality's planning and permitting procedures, and inspection and enforcement activities.

The status of each agency's implementation of the performance standards will be described in the annual reports to the Regional Board. Each subcommittee that developed a set of performance standards has been assigned responsibility for resolving general problems with interpreting and attaining the performance standards and for reviewing and updating them as needed.

Alternative Performance Standards

Any municipality may develop alternative performance standards that are comparably effective as these baseline performance standards and submit the alternative performance standards to the Regional Board staff for review and possible approval. It is anticipated that the need for individual tailoring of the performance standards is limited given that the baseline performance standards reflect the collective input of the municipalities in San Mateo County.

Prior to any municipality relying on the implementation of its alternative performance standards as satisfying NPDES permit requirements, the municipality should obtain written approval from the Regional Board staff.

[1] Illicit discharges include non-stormwater discharges disallowed by the STOPPP NPDES permit.

[2] Municipal storm drain conveyance system includes roads with drainage systems, municipal streets, curbs, gutters, catch basins, storm drain inlets, ditches, man-made channels, or storm drains.

INTRODUCTION TO MUNICIPAL MAINTENANCE PERFORMANCE STANDARDS

The Stormwater Management Plan separates municipal maintenance performance standards into eight activity areas. All municipalities must implement performance standards for the following six activity areas:

1. Road Repair and Maintenance
2. Street Sweeping
3. Storm Drain Facilities
4. Operation and Maintenance of Stormwater Pump Stations
5. Pesticide Usage and Integrated Pest Management
6. Corporation Yards

Specific municipalities were designated by the NPDES permit adopted in July 1999 to develop and implement performance standards for two additional activity areas, Rural Public Works Maintenance and Lagoon Management. Other municipalities are not required to meet these standards. San Mateo County, Half Moon Bay, Menlo Park, Pacifica, Portola Valley, and Woodside are responsible for implementing Rural Public Works Maintenance Activities performance standards. And lastly the cities of Foster City, Redwood City, and San Mateo are responsible for implementation of the attached Lagoon Management performance standards. The Regional Board acknowledged approval of the lagoon performance standards in correspondence dated May 21, 2002.

I. GENERAL PRACTICES

1. Schedule excavation and road maintenance activities for dry weather, if feasible.

2. Equipment repairs and refueling or maintaining vehicles and equipment will be conducted in accordance with the Corporation Yard Performance Standard.

3. Recycle used motor oil, diesel oil, concrete, broken asphalt, etc. whenever possible.

4. Train employees in using these performance standards. At least one staff meeting will be held annually to educate road repair and maintenance personnel about these performance standards.

5. Each municipality will provide educational and outreach materials provided by the Regional Board or the General Program, as appropriate, to those utilities or utility contractors (e.g., water supply, cable, phone, electrical, etc.) seeking encroachment and/or grading permits from the municipality.

II. ASPHALT/CONCRETE REMOVAL

1. Take measures to protect storm drain inlets prior to asphalt breaking or concrete-sawing operations (e.g., place sand bags or filtering barrier around inlets). Clean afterwards by sweeping up as much material as possible.

2. After breaking up old pavement, remove and recycle as much as possible to avoid contact with rainfall and storm water runoff.

3. During saw-cutting operations, block or berm around storm drain inlets using sand bags or an equivalent appropriate filter device, or absorbent materials such as pads, pillows and socks to contain slurry. If slurry enters the storm drain system, remove the material immediately.

4. Remove saw-cut slurry (e.g., with a shovel or vacuum) before leaving at the end of the day.

III. PATCHING AND RESURFACING

1. To minimize runoff from patching and resurfacing activities, materials will not be stockpiled in streets, gutter areas or near storm drain inlets or creeks unless these areas are protected (e.g. stockpiled material should be covered to minimize stormwater runoff).

2. Cover and seal manholes and storm drain inlets before applying seal coat, slurry seal, etc.

3. Never wash excess material from exposed aggregate concrete or similar treatments into a street or storm drain inlet. Designate an unpaved area for clean up and proper disposal of excess materials.

4. Use only as much water as necessary for dust control to avoid runoff.

5. Sweep up as much material as possible and dispose of properly. Wash down of streets only permitted if runoff is controlled or contained.

6. Clean up all spills and leaks from other equipment and work site areas using "dry" methods (absorbent materials and/or rags). Properly dispose of absorbent materials and rags. If spills occur on dirt areas, the contaminated soil will be removed properly and on a timely basis.

7. After the job is complete, remove stockpiles (asphalt materials, sand, etc.) within five days and other extra materials immediately.

8. If it rains unexpectedly, take appropriate action to prevent pollution of storm water runoff (e.g., divert runoff around work areas).

IV. SIGNING AND STRIPING

1. Store spill absorbent materials on trucks to be used in the event of a spill.

2. Contain and clean up waste materials and dispose of them properly according to the Material Safety Data Sheet.

V. EQUIPMENT CLEAN UP/STORAGE

1. Flush paint sprayer supply lines at the corporation yard. Use approved collection methods and dispose or recycle waste materials at an approved hazardous waste facility.

2. Clean sprayers, patch and paving equipment at the end of the day. Use approved collection methods and dispose or recycle waste materials at an approved facility.

3. Cover sprayers, patch and paving equipment to prevent rainfall from contacting pollutants; if practicable (examples of cover include but are not limited to tarps, over hangs or inside buildings).

I. STREET SWEEPING FREQUENCY

Applicable to the Cities of Atherton, Hillsborough, Portola Valley, and Woodside:

Inspect high traffic and other potential problem areas at least twice a year and clean as needed.

Applicable to the Cities of Belmont, Brisbane, Burlingame, Colma, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, San Mateo County, and South San Francisco:

Clean streets on at least a monthly average unless an alternative schedule is approved. In calculating this average, the number of curb miles swept in a fiscal year divided by the number of curb miles within a municipality will equal twelve or greater. The removal of cars should be encouraged by having a fixed sweeping schedule.

II. PROBLEMS ASSOCIATED WITH EFFICIENT STREET CLEANING

A. Getting Parked/Abandoned Vehicles off Streets

1. Maintain a consistent sweeping schedule.

2. Take appropriate measures to keep curbed areas clear during street cleaning. Measures may include but are not limited to developing and distributing newsletters and other public education materials notifying residents and businesses of street sweeping schedules.

B. Removing Leaves During Leaf Season

1. Investigate alternative leaf handling methods and implement an appropriate leaf removal program. Leaf removal programs may include but are not limited to the following:

   - Operating street cleaning equipment in tandem; and/or,
   - Using a leaf removal machine prior to cleaning; and/or,
   - Using a front end loader with a dump truck prior to cleaning.

2. Encourage residents to collect and compost leaves or coordinate with a local composting program. If composting is not feasible, consider scheduling removal of bagged leaves.

C. Trees Near Streets

Provide adequate resources to operators for conveniently reporting trees interfering with street cleaning.

III. STREET CLEANING OPERATION TO MAXIMIZE POLLUTANT REMOVAL

1. Provide a clean looking street, free of dirt tracks, trails or debris.

2. Check street cleaning equipment for proper adjustment.

3. Operate street cleaning equipment at the

speed specified by the manufacturer.

IV. STREET CLEANING MAINTENANCE TO MAXIMIZE POLLUTANT REMOVAL

Replace worn components as required to maximize efficiency.

V. SPILL RESPONSE

1. Report spills observed on streets immediately for quick response by appropriate personnel.

2. Respond to spills in accordance with response procedures described in the Storm Drainage Facility Performance Standards.

VI. RECORD KEEPING

1. Track miles swept using a broom odometer or by tracking mileage only when cleaning (Do not include mileage driving to an area).

2. Track volume or weight of material removed each street cleaning day.

3. Identify and target areas for: 1) more frequent cleaning throughout the year or just prior to the rainy season; 2) additional efforts to remove vehicles; 3) distribution of public education materials to discourage illegal dumping, etc.

4. Document and track areas where spills were reported and coordinate with your municipality's illicit discharge coordinator.

VII. CONTRACT SWEEPERS

Specify in contracts that in case of equipment failure, back up equipment must be available to ensure that the route is completed that day, and that all information necessary for record keeping is provided.

VIII. EDUCATION

Municipal staff and contract sweepers responsible for street sweeping shall be trained annually to identify and report illicit discharges, and to comply with the street sweeping performance standards.

I. ROUTINE INSPECTION AND CLEANING

Inspect, and clean as necessary, storm drainage facilities (inlets, culverts, V-ditches, pump stations, open channels, and watercourses), at least once a year on average unless an alternative schedule is approved. The inspections and needed cleaning will preferably occur prior to the rainy season. In calculating this average, some facilities may be inspected more than once per year and others less than once per year.

II. STORM DRAIN INLET AND LINE CLEANING

Remove the maximum amount of material at the nearest access point to minimize discharges to watercourses.

III. OPEN CHANNEL and WATERCOURSE CLEANING

A. Planning

1. Determine which local, regional, state, and federal environmental regulatory agencies[1] have jurisdiction over the proposed maintenance activities, particularly those activities that generate sediment, erode or alter the streambed, and disturb special status species. Complete the CEQA review process, if required, by your local agency. Submit applications[2] to each appropriate agency and complete their permit process.

2. Refer to conditions set forth in permits, memorandum of understandings (MOU's), and other agreements related to maintenance activities between your agency and regional, state and/or federal regulatory agencies.

3. Schedule routine maintenance work in channels during the dry season or in dewatered conditions if flowing water is present.

4. Schedule routine maintenance work to minimize the extent of site disturbance at any one time.

B. Cleaning Operation to Maximize Removal and Minimize Habitat Damage

1. Pick up debris with equipment operated from the top of the bank or access road, when possible.

2. When operation of equipment is necessary in a channel use appropriate equipment to minimize environmental disturbance.

3. Control runoff that is transporting trash or debris with appropriate measures. Use berm, dam, or temporary grates to prevent runoff from flowing through solid waste and picking up pollutants.

[1] Potential agency regulations include, but are not limited to, Department of Fish and Game 1601 and 1603 Agreements, US Army Corps of Engineers Section 10 and Section 404 Permits, as well as Regional Water Quality Control Board Section 401 Water Quality Certifications and Waste Discharge Requirements.

[2] Applicants only need to fill out one application form, if they follow the Joint Aquatic Resource Permit Application (JARPA) process. The form is then submitted to all appropriate regulatory agencies.

4. Use appropriate control measures for soil erosion, sediment and silt to prevent sediment transport and siltation downstream of the work area. Recommended measures can be found in *Flood Control Facility Maintenance Best Management Practices* manual prepared for the San Francisco Bay Area Stormwater Management Agencies Association (June 2000). Monitor control measures for effectiveness and repair or replace as needed.

5. If cleaning a "natural" creek or waterway, minimize removal of natural vegetation and focus on litter and trash removal. When natural vegetation must be removed, use the following guidelines in creek sections with little to no manmade improvements:

   a) Use hand operated equipment, (loppers, handsaws, chain saws, weed eaters, and other tools) to remove or trim vegetation where it is feasible. Vehicles and larger machinery should only be used as a last resort for tree or debris removal.

   b) Use small vehicles and equipment to aid in cutting and removing vegetation.

   c) Keep equipment away from trees to avoid trunk damage caused by equipment scarring the trunk, and to prevent soil compaction near roots.

   d) Avoid topping live willows or other trees[3], because topping encourages shrubby, dense growth that is more flow resistant.

   e) Only remove vegetation that could obstruct flows. Only remove willows from a creek bed if they are diverting water against a bank or obstructing flow. Consider leaving stumps in place after trees are cut to create essential creek habitat and to maintain bank stability. If leaving the stump in place, position and anchor the stump into the bank to minimize movement.

   f) Remove downed wood that is loose and can be washed downstream or that obstructs flow or diverts flow into a bank. Leave logs that are parallel to creek flow and embedded in a creek's bank. Stumps from fallen trees, can be left if the bank is stabilized.

   g) Leave small, vegetation accumulations trapped under trees unless they are diverting flow and causing erosion.

   i) Deposit woody debris or vegetation collected from the channel away from storm drain inlets, drainage facilities, other watercourses and other areas that will cause storm-related problems.

[3] Tree is defined as vegetation with at least four (4) inch diameter trunk at five (5) feet above grade.

IV. RECORD KEEPING

1. Report the amount of material removed when cleaning storm drainage facilities in monthly record keeping forms.

2. Document and track spill incidents and response to spill incidents.

V. SPILL RESPONSE

1. If non-hazardous materials are spilled, maintenance staff will contain the spill area and clean when practical to prevent additional discharge of pollutants into the storm drain system.

2. Maintenance staff will be aware of the municipality's around-the-clock immediate response/removal procedure for hazardous or unknown materials.

3. Establish a response/removal procedure for non-hazardous materials after work hours.

4. Maintenance staff will report spills to, and work with, the municipalities' illicit discharge coordinator to determine the most appropriate follow up response (e.g., track the source of the spill and identification product labels that have a bar code, contact Building and Planning Departments, send a clean-up bill to the responsible party, etc.).

VI. DISPOSAL AND RECYCLING OF MATERIAL

1. Store material removed from storm drainage facilities on a concrete pad or other type of impermeable material, unless conditions only permit storage on a pervious surface, e.g., remote rural areas. During storm events, cover with impermeable material and/or contain runoff. Drain wastewater to the sanitary sewer or filter out pollutants or allow to evaporate to prevent discharges to the storm drain system. Dispose of the material at an appropriate facility.

2. Salvage or recycle useful vegetation debris, when possible. For example, native trees and shrubs can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Cut willows can be used to revegetate an eroding bank.

VII. EDUCATION

Educate maintenance crews on performance standards related to cleaning storm drain facilities, particularly those performance standards for cleaning debris, including vegetative debris, in open storm drain channels and watercourses.

STORMWATER PUMP STATIONS IN SAN MATEO COUNTY

The San Mateo County Flood Control District and approximately half of the cities in San Mateo County operate and maintain a total of 50 stormwater pump stations. Almost all stormwater pump stations ultimately discharge to San Francisco Bay. The cities of San Mateo and Redwood City each operate approximately 15 pump stations; other cities which operate pump stations include the cities of South San Francisco (5), Burlingame (3), Pacifica (2), San Bruno (2), San Carlos (2), East Palo Alto (1), Foster City (1), Menlo Park (1) and Millbrae (1). The San Mateo County Flood Control District operates 4 pump stations.

I. VISUAL INSPECTIONS

Inspect wet wells or forebays once per month in the dry season, and once per week in the wet season, for oil spills or other noticeable discharges.

II. MAXIMIZING REMOVAL OF POLLUTANTS PRIOR TO DISCHARGE

1. Conduct at least one comprehensive cleaning of wet wells annually to remove sediment prior to the start of the rainy season to minimize discharge of sediment. Clean wet wells with a vactor, if possible.

2. If adequate storage exists at pump stations, store oil absorbent materials on-site to clean spills, if needed.

3. Contain lubricates, fuel and batteries to prevent accidental spills to wet wells.

4. If any spill is reported or observed (e.g., petroleum products, paint, antifreeze), try to remove the material at the nearest access point. If the material may reach the pump station, the station will be shut down if practical [e.g., a peak storm water event may prevent practical shut down of the pump station].

5. Track spills upstream to try to locate sources of pollution. Document spill incidents as part of the illicit discharge program, and implement appropriate enforcement actions.

6. Store oil absorbent materials in appropriate maintenance vehicles.

III. DISPOSAL

Dispose of screenings at a landfill, sediment at a location which will not re-enter the storm drain system or receiving waters through erosion, and oil-absorbed materials as hazardous waste.

IV. EDUCATION

Educate all personnel responsible for maintaining stormwater pump stations about these performance standards. At least one staff meeting will be held each year to educate pump station personnel about the performance standards and illicit discharge identification and reporting.

These performance standards apply to all pest prevention and control activities undertaken by a municipality using its own staff or contractors.

I. GENERAL INTEGRATED PEST MANAGEMENT BEST MANAGEMENT PRACTICES

1. Before performing any pest control activity, each municipality will consider the following alternatives:

   a. No controls (e.g., use of pest resistant plants, allowing plant to die naturally, or tolerating the infestation),

   b. Physical/mechanical controls (hand labor, or machine pulling),

   c. Cultural controls (mulching, alternative vegetation, prescribed burns),

   d. Biological controls (predators, parasites, goats, etc.),

   e. Less toxic chemical controls (e.g., soaps and oils), or

   f. Seek expert advice to increase the use of non-pesticide alternatives.

2. When pesticides are used, use the least toxic pesticide available. Consider the LD_{50}, overall risk to the applicator and impact to the environment.

3. Implement municipal Integrated Pest Management (IPM) Policy and/or Ordinance. The Policy and/or Ordinance will require the use of IPM techniques, the minimization of pesticide use, and the restricted use of organophosphate (OP) pesticides.

4. Encourage municipal staff and contractors who are responsible for pest control to attend U.C. Cooperative Extension classes, Pesticide Applicator Professional Association meetings or other professional avenues for continuing education about IPM.

5. Contact the U.C. Statewide IPM Project (916-752-7671), the San Mateo County Cooperative Extension Office (650-726-9059) and the San Mateo County Department of Agriculture (650) 363-4700 as well as private consulting firms, and libraries for information on integrated pest management.

II. PESTICIDE USAGE

1. Review the history of a site to determine pest conditions and monitor problem areas periodically in order to identify pest conditions.

2. Apply pesticides at the optimal time to maximize their effectiveness and minimize the likelihood of discharging non-degraded pesticides in stormwater runoff.

3. Mix or load only as much pesticides as needed at an appropriate location where a spill will not enter a storm drain inlet, culvert, watercourse, or wellhead.

4. Select pesticides and application techniques along sloped roadsides that will retain some vegetative cover to help prevent soil erosion, trap

pollutants and slow the rate of stormwater runoff, where possible.

5. Calibrate field equipment (e.g., backpack sprayers) as needed to ensure desired application rate. Agencies will mix only as much material as necessary for treatment.

6. Inspect applicator equipment to prevent accidental pesticide leaks, spills and hazards to applicators and the environment.

7. Direct questions regarding the safe and legal use of pesticides and label interpretations to the San Mateo County Agricultural Commissioner.

8. Ensure municipality contractors:

   - comply with municipality's IPM Policy and/or Ordinance and these performance standards;
   - provide evidence of current IPM training; and
   - provide documentation in a timely manner of pesticide use.

9. Follow all federal, state and local laws and regulations.

   a. Federal: U.S. EPA Region 9 Pesticides Section, 415-947-8704 (www.epa.gov/pesticides) ,

   b. State: Cal-EPA Department of Pesticide Regulation 916-324-4100 (www.cdpr.ca.gov) ,

   c. Local: San Mateo County Agricultural Commissioner 650-363-4700.

10. Appropriate agency personnel will read and follow label instructions.

III. PROBLEMATIC PESTICIDES

A. COPPER AS AN ACTIVE INGREDIENT

1. If applying copper as an algaecide for lagoon management, consider using a chelated form of copper for greater water solubility (less settling to the bottom),

2. Avoid use of copper-based pesticides. With the exception of the use of copper for lagoon management, employ mechanical and biological controls or less toxic chemicals instead of copper-based pesticides.

B. ORGANOPHOSPHATE AND PYRETHROID CHEMICALS AS ACTIVE INGREDIENTS

1. Avoid use of organophosphate and pyrethroid pesticides.

2. Promote through STOPPP, public outreach efforts which educate homeowners about the effects of home use of organophosphate and pyrethroid pesticides on aquatic life.

IV. PESTICIDE STORAGE

1. Implement storage requirements for pesticide products with guidance from the local fire department and San Mateo County Agricultural

Commissioner. Provide secondary containment for liquids, if required.

2. Provide spill kits, store the kits near pesticides, and train employees to use them.

3. Store pesticides indoors in a locked and posted individual storage unit (e.g., separate from fertilizer storage and any other materials).

4. Store pesticides only in labeled containers.

5. Conduct a periodic municipal-wide search of chemical storage areas for pesticides no longer legal for application per CalEPA Department of Pesticide Regulation or local policy and properly dispose of any such pesticides pursuant to appropriate waste disposal regulations.

V. PESTICIDE DISPOSAL

1. Triple rinse empty pesticide containers and empty rinse water in the spray equipment.

2. Dispose of triple rinsed empty pesticide containers according to recommendations of the San Mateo County Agricultural Commissioner and the manufacturer.

3. Try to find a qualified user for any unwanted pesticides, or return to the manufacturer if unopened. If disposal is required, contact San Mateo County's household hazardous waste collection program regarding the Very Small Quantity Generator Program (650-363-4305) or other local agency to arrange for disposal.

4. When changing pesticides or cleaning spray tanks, use tank rinse water as product over a targeted area within the application site.

VI. COMMUNICATION AND TRAINING

1. Designate a representative responsible for staying sufficiently informed with the activities of the Parks & Recreation Integrated Pest Management Work Group and for serving as the municipality representative for the work group.

2. Ensure that employees who apply pesticides for the municipality obtain the appropriate training as required by the State Department of Pesticide Regulation.

3. Educate all employees responsible for pesticide application of the municipality's IPM Policy and/or Ordinance, these performance standards, and the latest IPM techniques.

4. On annual basis, remind all agency employees not responsible for pesticide application to follow the municipality's IPM Policy and/or Ordinance when a pest management action is desired

5. Encourage the use of state-certified pesticide applicators who are experienced in implementing IPM techniques.

VII. USE OF PROGRAM OUTREACH

1. Display informational materials on integrated pest management.

2. Participate in community outreach activities coordinated by STOPPP for the purpose of communicating the integrated pest management message.

VIII. RECORD KEEPING

1. Track each pest treatment for each site and document in STOPPP's Annual Report when use involves organophosphate (OP) pesticides; specifically report best management practices employed and justification for use of the OP pesticide. Maintain a record of all treatments including pesticide use for each site.

2. Document efforts to reduce or eliminate the use of copper-based and organophosphate pesticides.

REFERENCES

California Code of Regulations, Title 3.

California Food and Agricultural Code Division 6 and Division 7.

Pesticide Safety Information Series, Department of Pesticide Regulation.

Alameda Countywide Clean Water Program Municipal Maintenance Performance Standards, 1997

I. DEVELOP STORMWATER POLLUTION PREVENTION PLAN(S)

1. Develop a Stormwater Pollution Prevention Plan (SWPPP) for each corporation yard or similar facility that your municipality owns and/or operates. The SWPPP will follow the format agreed upon by the Municipal Maintenance Subcommittee and will describe how these corporation yard performance standards are implemented by your municipality.

2. Implement the SWPPP prepared by your municipality and document that implementation is occurring.

3. At least every two years evaluate the effectiveness of your SWPPP(s) and make any improvements needed based on this evaluation.

II. GENERAL STANDARDS

1. Assign one person the primary responsibility for ensuring that Performance Standards are implemented. This person will also be responsible for ensuring that all persons using the facility are aware of Performance Standards.

2. Prepare spill containment kits and store them in locations that have potential for spills (fueling areas, etc.).

3. Stencil inlets to the storm drainage system with a message such as "No Dumping, Drains to Bay".

4. Refer to existing plans (e.g., Hazardous Materials Business Plans and/or Spill Prevention Control and Countermeasures Plan), incorporate stormwater Performance Standards in annual updates, and periodically review with persons using the facility.

5. Conduct facility surveys annually - possibly in conjunction with hazardous materials management and/or spill prevention inspections. Use corporation yard's SWPPP for guidance.

6. Develop educational materials and post them in appropriate areas.

III. WASHING VEHICLES/ EQUIPMENT

1. Clean all vehicles/equipment on designated wash pad areas.

2. Wash vehicles and equipment off-site if needed so wash water drains to the sanitary sewer or is recycled.

3. Discharge wash water to the sanitary sewer or recycle.

4. Ensure that wash pad area and sump are large enough so that all wash water drains to the sanitary sewer or recycling system. Re-grade area if necessary or install dikes to convey washwater.

5. Monitor wash pad area to make sure it is consistently used.

6. Consider assigning schedules for use of wash pad area, if appropriate.

IV. REFUSE HOLDING AREAS

Store material removed from storm drainage facilities on a concrete or other type of impermeable material, unless conditions permit storage only

on a pervious surface, e.g., remote rural areas. During storm events, cover removed material with impermeable material and/or contain runoff. Drain wastewater to the sanitary sewer, or filter out pollutants, or allow to evaporate to prevent discharges to the storm drain system. Dispose of the material in an appropriate facility.

V. FUEL DISPENSING AREAS

1. Store spill containment kits nearby. If spills occur, use dry methods to clean the fueling area and follow procedures in the Hazardous Materials Business Plan (HMBP) and/or Spill Prevention Control and Countermeasure Plan.

2. Train employees in proper fueling, cleaning and spill response procedures.

3. Install signs reminding people not to "top off" tanks.

4. Discourage mobile fueling. If mobile equipment is fueled with a mobile fuel truck, establish designated areas for fueling.

5. Consider covering fuel dispensing areas. All newly constructed fueling areas shall be covered. Prohibit fueling over open ground (ground should be covered by concrete or asphalt protected with a sealant).

6. Design the fueling area to prevent "runon" of storm water and runoff of spills.

7. Follow the automotive Service – Service Stations Stormwater Pollution Control Guide Sheet as prepared for the California Stormwater Quality Association (January 2003). See attached.

VI. CHEMICAL STORAGE

1. Store paint and other chemicals in an approved covered containment area. Design the floor inside so that any spilled materials will be contained and easily removed. Keep all 55 gallon drums containing hazardous materials or waste closed when not filling or emptying. Label the outside according to Department of Transportation regulations. Also, protect the area from vandalism.

2. If 55 gallon drums containing hazardous materials or wastes are stored outside, keep drums in an approved containment area. Ensure that all of the drums are closed with tight-fitting lids.

3. Review the Hazardous Material Business Plan for hazardous materials storage requirements.

4. Review Material Safety Data Sheets to ensure that incompatible materials have the appropriate separation.

VII. CHEMICAL USAGE

1. Ensure that necessary safety equipment and spill containment kits are readily accessible in areas where chemicals are used. Inspect safety equipment (eye flushing stations, etc.) regularly to ensure they are operational.

2. Review Material Safety Data Sheets.

3. Minimize use of chemicals. Use water-based paints and non-toxic chemicals as much as possible.

4. Recycle or dispose of excess chemicals at an approved local Household Hazardous Waste Facility or other approved location.

5. Ensure chemical containers have secure lids and are tied down properly to vehicle during transport.

6. Properly remove any soils contaminated with spilled materials.

A. Oil-based Paints

Wipe paint out of brushes. Filter and reuse thinners or dispose as hazardous waste. Dispose of the excess paint as hazardous waste or recycle it.

B. Water-based Paints

Rinse paint out of brushes and discharge rinsewater to the sanitary sewer. Recycle, or dry excess paint in cans and dispose of the cans in the trash. If there is too much paint to dry, recycle the paint or dispose of it as hazardous waste.

C. Automotive Fluids

Collect used fluids and recycle or dispose of them at an appropriate facility.

D. Pesticides

Implement Pesticide Usage and Integrated Pest Management Performance Standards.

E. Solvents/Cleaning Solutions

Properly recycle or dispose of used solvents/chemicals.

VIII. FLEET MAINTENANCE/VEHICLE PARKING AREAS

1. Be cognizant of potential for equipment leaks and inspect equipment for leaks on a routine basis. Use drip pans under leaky vehicles. Repair vehicles with significant leaks.

2. Drain and replace motor oil and other fluids in a covered shop area. If fluids are changed outdoors, designate an area where there are no connections to storm drains, watercourses or the sanitary sewer and where spills can be easily cleaned up.

3. Clean equipment using proper collection and disposal methods.

4. Schedule outdoor repair activities for dry weather, if possible. Prevent repair supplies or work material from entering storm drains or watercourses.

IX. AUXILIARY STORAGE AREAS/YARDS

Store chemicals in appropriate areas.

X. GENERAL HOUSEKEEPING

1. Inspect the yard at least monthly to ensure that there are no illicit discharges to the storm drain system and that during storms, pollutant discharges are controlled to the maximum extent practicable.

2. Keep chemical storage areas neat and orderly.

3. Dry sweep the corporation yard at least monthly. Dispose of material removed from streets and storm drainage facilities often to eliminate exposure to rainwater and runoff to the storm drain system.

4. Stockpile materials away from streets, gutters, storm drain inlets or water channels when possible.

XI. EDUCATION

Municipal staff and contractors who use the corporation yard shall be trained annually a) on the contents and location of the SWPPP; b) to identify and report illicit discharges, as well as to eliminate and clean them up; and c) to comply with the corporation yard performance standards.

RURAL PUBLIC WORKS MAINTENANCE ACTIVITIES

Applicable to the County of San Mateo:

1. Continue to implement the practices described in its detailed maintenance manual titled *Endangered Species and Watershed Protection Program, Volume 1 Maintenance Standards* that includes standards and best management practices for the following rural public works maintenance and support activities:

    a) management and/or removal of large woody debris and live vegetation from channels;
    b) streambank stabilization projects;
    c) road construction, maintenance, and repairs in rural areas to prevent and control road-related erosion; and
    d) environmental permitting for rural public works activities.

2. Evaluate the effectiveness of the *Watershed Protection Program, Volume 1 Maintenance Standards*, and make improvements, as needed.

Applicable to Cities of Half Moon Bay, Menlo Park, Pacifica, Portola Valley, and Woodside:

1. Each city will identify which rural public works maintenance and support activities listed in 1 above are conducted by the city.

2. For each of the maintenance and support activities that the city conducts, each city will identify as part of its FY 2003/04 Annual Report submittal the standards and best management practices it uses to protect stormwater quality. This will include developing specific written descriptions of the standards and best management practices that the city will use, and these may be copied from or be similar to those developed in the *Watershed Protection Program, Volume 1 Maintenance Standards* or similar resources.

These performance standards apply to all lagoon management activities undertaken by Foster City, Redwood City and the City of San Mateo using its own staff or contractors. All lagoons are designed as flood control facilities, and as such are subject to intentional periodic draw-down of operating levels in anticipation of wet-weather flows, and require periodic maintenance for protection of flood control benefits.

I. GENERAL MANAGEMENT OBJECTIVES

Manage the lagoon in such a manner and by such means as to provide reasonable protection of *beneficial uses*, as defined in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan).

II. LAGOON DESIGN AND IMPROVEMENTS

1. Comply with all applicable local, state, and federal requirements in connection with lagoon dredging, shoreline alteration, or other applicable construction projects.

2. Utilize natural materials for bank protection that provide habitat for terrestrial and aquatic life in addition to effectively preventing erosion whenever possible.

3. For new construction, use only non-chemically treated in-water support structures, such as piers made of metal, concrete, or synthetic wood.

4. Use STOPPP approved best management practices (BMPs) in connection with construction activities.

5. Future redevelopment of a lagoon should incorporate design measures that help support estuarine (bay-like) conditions to the maximum extent possible and minimization of potential future maintenance, which include, but are not limited to, source water supply, water exchange rates, circulation, bank slope and bank stability, siltation control, and other measures that support aesthetic and ecological values.

III. WATER QUALITY MONITORING AND SOURCE CONTROL

1. Each city will develop and implement a monitoring program for aquatic pesticides, consistent with monitoring plan requirements of the Statewide General NPDES Permit for Discharges of Aquatic Pesticides to Waters of the United States.

2. Minimize sediment and nutrient inputs through implementation of STOPPP Performance Standards for Commercial/industrial Discharges, Illicit Discharge Elimination, Municipal Maintenance, New Development and Construction Site Controls, and informing residents through venues described in Section VIII of these performance standards.

3. Minimize potential of pathogens by following Performance Standards for Storm Drain Facilities, promoting compliance with pet waste control methods through public education and code compliance efforts, and investigating and implementing methods to discourage high concentrations of waterfowl in public beach areas.

4. When monitoring indicates poor water quality conditions from sources other than the bay intake water, attempt to identify the cause of the water quality problem through surveying potential locations, such as shoreline areas, storm drain inlets, side streams, and identifying potential sources using principles of illicit discharge investigation, including water sampling and testing if needed.

IV. PLANT NUISANCE MANAGEMENT

1. Incorporate principles of integrated pest management into lagoon plant nuisance prevention and control strategies by employing one or more of the following control measures prior to use of herbicides, where practicable: water exchange and circulation rates, non-toxic dyes, mechanical harvesting and/or other practical mechanical methods, growth target thresholds for herbicide application, and using hydraulic controls to enhance herbicide contact and contact time.

2. Each municipality shall set growth thresholds that establish action levels for plant nuisance control. Thresholds shall be set so as to ensure that community values are protected while ensuring that use of herbicides is minimized. An appropriate threshold ensures that herbicides will not be used prior to there being visual evidence of growth, but at the same time ensuring that projected growth rates do not result in routine exceedance of the threshold. (Note: There are currently no pre-emergent herbicides licensed for aquatic use. Should a properly licensed pre-emergent product become available in the future, an alternate type of threshold may be warranted.)

3. In cooperation with and approval of all regulatory agencies, support research and development efforts on use of experimental technologies for lagoon plant nuisance management.

4. Use approved herbicides that have the most potential to provide the most effective nuisance control and have the least impact on beneficial uses.

5. Encourage municipal staff and their agents to attend professional training for continuing education in lagoon management.

6. Conduct visual observations by boat or from shore, at a frequency deemed prudent to help identify emerging nuisance conditions. Such observations may include, but are not limited to, looking for accumulation of bottom or floating algae, and spot "raking" for evidence of weed growth if not otherwise visible.

V. APPLICATION AND HANDLING OF HERBICIDES

1. City staff and their agents will follow federal, state, and local laws and regulations with respect to herbicide handling, use, and disposal.

2. Apply herbicides at the optimal time and conditions to maximize their effectiveness and minimize amount applied.

3. Mix or load herbicides in a safe and prudent manner so as to minimize

potential for spillage of raw or mixed product.

4. Calibrate application equipment as needed to assure the desired application rate.

5. Mix only as much material as is necessary for treatment.

6. Ensure that applicators practice herbicide use safety and that applicator equipment is properly inspected to prevent accidental leaks, spills, and hazards to applicators and the environment.

7. Herbicides shall be applied when it is found that non-herbicide control options, such as use of dyes, water exchange, and mechanical methods, are unable to maintain plant or algae growth beneath growth thresholds.

8. When copper based herbicides are called for, a chelated form of copper that offers the greatest affinity for adherence to the target and least likelihood of settling to the bottom shall be used.

9. Implement herbicide storage and disposal performance standards as identified in Municipal Maintenance Performance Standards for Pesticide Usage and Integrated Pest Management.

10. Maintain a record of all herbicide treatments, including herbicides used, general location on the lagoon and acres treated, and application rate. At the end of each calendar year, report to the Regional Water Quality Control Board the total quantity of each aquatic pesticide used during the reporting year.

VI. LITTER AND DEBRIS CONTROL

1. Minimize debris entering the lagoon by providing a sufficient number of proper litter control receptacles in public areas, and service receptacles at a frequency that minimizes potential for overflow, as well as protect aesthetic values.

2. Promote compliance with local ordinances and policies in connection with littering, dock maintenance, disposal of yard waste, recycling, and other potential sources of litter and debris. This may be accomplished through venues described in Section VIII.

3. Inspect, service, and maintain structural litter and debris controls, such as debris curtains, trash racks, and storm drain outfalls, at a frequency sufficient to assure effective unit operation and efficiency.

VII. COMMUNICATION AND TRAINING

1. Representatives from each city will meet periodically to share information on lagoon management issues, as well as to evaluate these performance standards for effectiveness, and submit proposed changes to the Municipal Maintenance Subcommittee for comment.

2. New employees involved with lagoon maintenance, and aquatic plant nuisance control activities in particular, will be trained on use of

these lagoon performance standards and the role of the new employee's position.

VIII. PUBLIC EDUCATION AND OUTREACH

1. At public facilities located near the lagoon, make information available about current lagoon issues which may include, but are not limited to, how to reduce sources of pathogens, nutrients, herbicides, litter and debris.

2. Conduct targeted newsletter/mailings or public service announcements promoting water pollution prevention within the first year of the effective date of these performance standards, and biannually thereafter.

3. Participate in community outreach activities coordinated by STOPPP for the purpose of communicating STOPPP's water quality protection message.

4. Encourage public participation in stewardship of the lagoon, including promotion of volunteer community cleanup events.

I. INDUSTRIAL AND COMMERCIAL BUSINESS INSPECTION PLAN AND ANNUAL WORK PLAN

Five-Year Inspection Plan

1. Each municipality will prepare a written Five-Year Inspection Plan that demonstrates the municipality's commitment to conduct an effective industrial and commercial business stormwater pollutant control program and that describes how these performance standards will be implemented within the municipality. The Five-Year Inspection Plan will:

    a. List by type of business the names and addresses of all businesses within its jurisdiction that have a reasonable potential to adversely affect stormwater quality.

    b. Describe the municipality's business inspection procedures including its procedures for deciding what frequency of inspection a business warrants.

    c. Describe how the municipality's activities will be documented.

    d. Describe the municipality's plan for conducting educational outreach to businesses, such as making presentations to business groups, distributing stormwater BMP information to new businesses, etc.

    e. Describe municipality's procedures for following up problems found and conducting enforcement. If a municipality has an agreement with County Environmental Health to conduct business inspections, describe the municipality's procedures for coordinating with the County Environmental Health to correct problems found, such as discharges of soapy water, that fall outside the county's authority to correct.

    f. Describe how and when staff training will be conducted for all municipal staff responsible for helping to implement these performance standards.

    g. Describe staff and/or positions responsible for implementing the various parts of the Five-Year Inspection Plan. Include the name, title and contact information for the Municipal Coordinator described in section IV.

2. The Five-Year Inspection Plan will be submitted to the Regional Board by September 1, 2004 (unless specified otherwise by STOPPP's reissued NPDES permit). This Plan will cover the five fiscal years beginning on July 1, 2004.

Annual Inspection Work Plan

1. Each municipality will prepare a written Annual Inspection Work Plan that outlines specific steps the municipality will take to implement its Five-Year Inspection Plan during the following fiscal year. The Annual Inspection Work Plan will:

    a. Contain a written evaluation of inspection results from the previous year that assesses whether the previous year's inspection goals were met and identifies which types of businesses or specific businesses are having the most problems and would benefit from additional educational outreach, inspections, and/or enforcement.

    b. An estimate of the number of businesses, listed by type of business, to be inspected in the coming fiscal year.

    c. An estimate of the number of high priority businesses that will be inspected in the coming fiscal year.

2. The Annual Inspection Work Plan for the coming fiscal year will be submitted to the Regional Board by March 1 of each year with the first Work Plan submitted in 2005 (unless specified otherwise by STOPPP's reissued NPDES permit).

II. PRIORITIZING BUSINESSES TO INSPECT AT DIFFERENT FREQUENCIES

1. At a minimum each municipality will inspect and provide educational outreach at least once every five years to all of the following types of businesses within its jurisdiction:

    a. Retail gasoline outlets;

    b. Vehicle service facilities;

    c. Restaurants;

    d. Businesses that have Hazardous Materials Business Plans;

    e. Facilities that have filed a Notice of Intent for coverage under the California Industrial Stormwater NPDES General Permit; and

    f. Any other business the municipality identifies as having a reasonable potential to adversely affect stormwater quality.

2. Each municipality will conduct inspections of high priority businesses annually. High priority businesses include those that were identified as having a first priority for re-inspection based on the most recently completed *Standard Stormwater Facility Inspection Report Form.*

3. Based on the assessment required to develop its Annual Inspection Work Plan, a municipality may change its priorities for inspecting particular businesses or types of businesses.

III. EDUCATIONAL OUTREACH AND TRAINING

1. Each municipality will conduct educational outreach in addition to inspection activities, in order to inform facility representatives about appropriate stormwater BMP information. This may include responding to telephone calls from business representatives, making presentations to business groups, and/or participating in focused outreach efforts coordinated by the Commercial/Industrial/Illicit Discharge (CII) Subcommittee for targeted business groups.

2. Each municipality will ensure that its business inspectors are adequately trained so that each inspector possesses the knowledge and skills necessary to conduct effective stormwater inspections and educational outreach. Each inspector will be familiar with the following: stormwater regulations and requirements (including the municipality's ordinance, municipal stormwater NPDES permit, and the Industrial Stormwater NPDES General Permit); the impacts of non-stormwater discharges to creeks, bay, and ocean; inspection techniques and procedures; follow-up and enforcement procedures; stormwater BMPs; how to fill out the *Standard Stormwater Facility Inspection Report Form* and the *Stormwater Inspections & Violations Summary* form, and STOPPP's agreed upon procedure for referring to the Regional Board staff businesses that might need to obtain Industrial Stormwater NPDES General Permit coverage.

3. At least one inspector representing each municipality will attend General Program inspector training workshops.

IV. MUNICIPAL COORDINATOR

Each municipality will designate a person responsible for coordinating the implementation of its industrial/commercial stormwater pollutant control activities and for acting as a liaison with the CII Subcommittee. For municipalities that have an agreement with the County Environmental Health to conduct business inspections, this designated person will be responsible for acting as a liaison with the county's inspector and for assuring completion of any needed municipal follow up to problems reported by the county's inspector. This designated person will stay sufficiently informed by attending Subcommittee meetings or using other means to participate in the CII Subcommittee decisions and activities.

V. INSPECTION ACTIVITIES

1. Inspectors will review the facility's layout to locate the storm drain system and/or stormwater drainage path, storage areas, process areas, vehicle and heavy equipment wash and maintenance areas, stormwater sampling locations, and stormwater

treatment system(s), if any.

2. If access is safe, inspectors will review/inspect the following areas, for the potential to discharge pollutants from non-stormwater discharges, pollutant exposure to stormwater, and the status of implementation of Best Management Practices (BMPs) using available guidance, such as the California Stormwater Quality Association's *Stormwater Best Management Practice Handbook Industrial and Commercial*:

   a. Outdoor process/ manufacturing areas;

   b. Outdoor material storage areas;

   c. Outdoor waste storage/ disposal areas;

   d. Outdoor vehicle and heavy equipment storage and maintenance areas;

   e. Outdoor parking areas and access roads;

   f. Outdoor wash areas;

   g. Rooftop equipment; and

   h. Outdoor drainage from indoor areas.

3. Inspectors will record the information on the most recently adopted *Standard Stormwater Facility Inspection Report Form*, or an equivalent form containing substantially the same information. Inspectors will also complete the most recently adopted *Stormwater Inspections & Violations Summary* form for any business that was found to have a violation as defined on this form.

4. Inspectors will use the facility's Stormwater Pollution Prevention Plan (SWPPP), if available, as a tool in assessing the facility's stormwater pollutant sources and control activities.

5. At the end of an inspection, the inspector will inform the facility representative about the results of the inspection including any problems and violation(s) found, such as unpermitted non-stormwater discharges and/or pollutant exposure to rainfall and runoff that does not attain maximum extent practicable control. A schedule for correcting problems identified during the inspection and a method for verifying their implementation will be discussed between the inspector and the facility representative. This information will be noted on the inspection form.

6. Inspectors will provide facility representatives with appropriate BMP information, educational materials, and inter/intra-agency referrals as needed. The inspectors will ask the facility owner or operator whether his or her employees have been trained about how to prevent stormwater pollution. The inspectors will provide BMP information that is available in other languages, if requested by the facility owner or operator.

VI. FACILITY COMPLIANCE

1. If a problem is identified during an inspection, the inspector will perform a follow up site visit or initiate a self-certification process where the facility representative certifies in writing that the problem has been remedied within the time specified by the inspector.

2. In order to achieve the most cost-effective overall compliance program, problems found at facilities that have coverage under the California Industrial Stormwater NPDES General Permit will generally be referred to the Regional Board staff for follow up and correction.

3. Municipalities will conduct enforcement activities and report these activities as outlined in the most recent version of STOPPP's *Guidance on Enforcement Options for Illicit Discharges and Industrial/Commercial Business Storm Water Pollution Violations* or equivalent document. Enforcement authorities are set forth in the individual municipal ordinances, and sometimes stormwater violations may be enforced as violations of other statutes and regulations as well.

4. For municipalities that have an Agreement with County Environmental Health to perform commercial and industrial facility inspections for stormwater pollution prevention, the following describes the roles and responsibilities of County Environmental Health and municipalities for resolving problems that are found:

   a. County Environmental Health will be responsible for resolving any stormwater quality problems that are associated with the handling of hazardous materials and wastes, the exposure of these materials to rainfall, or the discharge of wastes or washwaters from retail food facilities.

   b. Each municipality will be responsible for resolving any stormwater quality problems that are not covered under a) above.

   c. County Environmental Health will provide written summaries of the results of its inspections to the municipalities it has agreements with at least quarterly and it will notify promptly a municipality's Municipal Coordinator identified under IV about any stormwater pollutant problems that require her or his assistance or lead in resolving.

These performance standards describe only part of the effort to identify and eliminate illicit discharges. Other activities to effectively eliminate illicit discharges are described in the Plan's component 3 and the Performance Standards for Public Information/Participation, New Development and Construction Controls, and Industrial and Commercial Discharge Controls. These documents also describe the educational and public information activities that are conducted to encourage the proper management and disposal of used oil and toxic materials.

I. ILLICIT DISCHARGE CONTROL ACTION PLAN

1. Each municipality will prepare a written Five-Year Illicit Discharge Control Action Plan (Action Plan) that demonstrates the municipality's commitment to conduct an effective illicit discharge elimination program and that describes how these performance standards will be implemented within the municipality. The Action Plan will:

    a. Define a priority of first (problem areas), second, and third for conducting proactive, field screening surveys of all areas within its jurisdiction.

    b. Demonstrate a commitment to survey high priority areas annually.

    c. Define schedule of field screening surveys for second and/or third priority areas so that the entire municipality's drainage area will be screened at least once during the five-year period covered by the Action Plan.

    d. Describe how municipality's activities will be documented.

    e. Describe municipality's procedures for follow up and enforcement for illicit discharges.

    f. Describe how and when staff training will be conducted for all municipal staff responsible for helping to implement these performance standards. Training will cover the Action Plan, these performance standards, and the municipality's procedures for identifying, following up and eliminating illicit discharges.

    g. Describe staff and/or positions responsible for implementing the various parts of the Action Plan including who is the municipality's Illicit Discharge Coordinator. When more than one department is involved with conducting an activity describe how this will be coordinated.

2. The Five-Year Action Plan will be submitted to the Regional Board by September 1, 2004 (unless specified otherwise by STOPPP's reissued NPDES permit) and cover the five fiscal years beginning on July 1, 2004.

3. Each municipality will review annually and update, if necessary, its Action Plan. The review will include an evaluation of field screening survey results from the previous fiscal year and an assessment of which types of illicit discharges were most prevalent. Any proposed changes to the Action Plan will be submitted to the Regional Board for any needed approvals or information sharing as required by STOPPP's NPDES permit.

4. Each municipality will possess accurate maps of the municipality's storm drain system including major drain segments, reaches, and outfalls that the municipality owns.

II. ILLICIT DISCHARGE COORDINATOR

Each municipality will identify in its Action Plan a person and/or position that is responsible for serving as the municipality's Illicit Discharge Coordinator. The Illicit Discharge Coordinator will:

1. Develop, update, and coordinate the implementation of the Action Plan and coordinate implementation of these performance standards.

2. Receive information about illicit discharges from municipal staff, other agencies, and the public.

3. Assure that needed follow up, elimination, and clean up of illicit discharges is conducted.

4. Assure that municipal staff who maintain and repair the municipal storm drain system, conduct construction site inspections, and who conduct other field work where illicit discharges are likely to be encountered, will be trained to recognize illicit discharges and the procedures for responding to these discharges. New staff that fills these positions will be trained about illicit discharge recognition and response procedures within six months of being hired.

5. Provide municipal staff with information about the status of illicit discharge source identification and elimination.

6. Coordinate the completion of any required NPDES permit reporting.

7. Provide information to the municipality's management staff and elected officials, as requested, about the resources needed to implement these performance standards.

8. Be responsible for liaison with the CII Subcommittee and participate in any illicit discharge related training conducted by the STOPPP General Program or have a representative participate for the Illicit Discharge Coordinator. The Illicit Discharge Coordinator will

stay sufficiently informed by attending Subcommittee meetings or using other means to participate constructively in CII Subcommittee decisions and activities.

III. FIELD SCREENING SURVEYS

1. Each agency will conduct pro-active field screening surveys that include doing surface investigations primarily by driving around looking for illicit discharges and by inspecting municipal storm drain system outfalls.

2. Survey areas as prioritized in the Action Plan. Record areas surveyed and observed dry weather flows and report suspected illicit discharges to the municipality's Illicit Discharge Coordinator or to an adjoining municipality's Illicit Discharge Coordinator if the discharge is coming from a neighboring municipality.

IV. FIELD INVESTIGATIONS

1. Using information provided as part of field screening surveys and complaints received from the public, municipal staff or other agencies, each municipality will conduct a field investigation to check whether an illicit discharge has occurred. The goal will be to initiate follow up activities within twenty-four hours of receipt by the Illicit Discharge Coordinator of a report about a suspected illicit discharge.

2. When an illicit discharge has occurred, each municipality will attempt to find the source and eliminate it. The source(s) of the illicit discharge will be traced by using storm drain maps, inspecting manholes, and making surface observations. The *Field Manual: Illicit Discharge Identification and Elimination Program* or a comparable document will be used as guidance in conducting these investigations. Findings will be recorded and maintained by the Illicit Discharger Coordinator.

3. Inspection and follow up activities will continue until: 1) the source of the illicit discharge is found and eliminated[1]; or 2) the discharge has stopped and no source could be found.

4. If a municipality identifies three or more illicit discharges in a fiscal year within an area served by any "major outfall"[2], this information will be used when defining or re-evaluating priorities for areas to conduct field screening.

V. FOLLOW UP TO FIELD INVESTIGATIONS

1. When a party responsible for an illicit discharge is found, the party will be provided with educational information about the impacts of his or her actions, the requirements of the local stormwater ordinance, the options for proper discharge or

[1] Elimination means that the discharge no longer occurs, has been diverted to the sanitary sewer or continues discharging to the municipal storm drain conveyance system under an NPDES permit.

[2] Major outfalls are greater than 12-inches in diameter for outfalls serving industrial areas and 36-inches in diameter for outfalls in all other areas.

disposal, and educational materials describing BMPs. When the source of an illicit discharge that has reached the municipal storm drain conveyance system has not been found, educational outreach material will be distributed to residents and/or businesses located in the immediate vicinity of repeated illicit discharges.

2. If the discharge is traced to a commercial or industrial facility, the Illicit Discharge Coordinator will share information about the illicit discharge with its industrial and commercial discharge control inspector. Similarly, if the discharge is traced to a construction site, the Illicit Discharge Coordinator will share information about the illicit discharge with the municipality's construction inspectors.

3. The municipality will begin enforcement procedures, if appropriate, using the *Guidance on Enforcement Options for Illicit Discharges and Industrial/Commercial Business Storm Water Pollution Violations* or comparable procedures developed by the municipality and described in its Action Plan.

4. The goal of follow up investigations will be to stop and clean up the illicit discharge(s) as soon as practicable.

VI. PROCEDURES FOR SPILL PREVENTION, CONTAINMENT, AND RESPONSE

Since a network of spill prevention, containment, response and clean up programs already exists, the approach of the STOPPP illicit discharge control component is to supplement these services and respond to spill incidents that are not under the purview of previously existing clean-up programs. Within this context, each municipality will assure that the following occurs.

1. The Illicit Discharge Coordinator or his/her representative will investigate spill reports and/or complaints about incidents within the municipality's jurisdiction and record his/her activities.

2. The Illicit Discharge Coordinator will become familiar with the existing spill prevention, containment, response and clean-up programs that cover the municipality's jurisdiction and coordinate illicit discharge prevention, elimination, and cleanup activities with these existing programs.

3. The Illicit Discharge Coordinator will establish a mechanism for obtaining information about spill incidents from other agencies and departments within the municipality so that source identification and follow up activities can be coordinated.

IV. DOCUMENT AND REPORT COMPLETION

1. Each municipality will document the number and types of illicit discharge incidents reported and follow up investigations conducted within the municipality's jurisdiction. This does not need to include information from fluid spills resulting from automobile accidents. Each municipality will summarize field investigations and follow up activities every three months using the *Illicit Discharge Inspection Quarterly Summary Report* form.

2. Information about each illicit discharge found and follow up conducted to eliminate the source will be recorded using the *Illicit Discharge Source Identification* form.

3. Completed reports will be submitted to the STOPPP General Program Coordinator or his or her representative in time for submittal to the Regional Board as part of the NPDES permit's required annual report.

I. GENERAL PROGRAM ACTIVITIES

A. Participation in the PIP Subcommittee

1. Each municipality will designate a person responsible for implementing its Public Information and Participation (PIP) activities and for acting as a liaison with the PIP Subcommittee. This designated person will stay sufficiently informed by attending Subcommittee meetings or using other means to participate constructively in PIP Subcommittee decisions and activities.

2. The chairship of the PIP Subcommittee will rotate periodically so that the responsibility of chairing the subcommittee is shared among the municipalities.

3. Each municipality will complete its PIP semiannual deliverable reports within the approximate schedule established by the General Program.

B. Distribution of STOPPP Information Pieces

1. Public education materials developed by the General Program will be distributed to each municipality. A high priority will be placed on developing, adapting, or using existing public outreach materials that focus on creek and wetland protection and pollutants of concern. Upon receipt of public education materials, each municipality will have the goal of initiating distribution of the materials within two months and completing the distribution within two years.

2. Each municipality will be responsible for tracking the number of General Program information pieces distributed with sufficient accuracy to be able to determine the quantity to re-order, to track progress with achieving No. 1 above, and to document for NPDES permit reporting.

II. INTERNAL MUNICIPALITY COMMUNICATION AND TRAINING

A. City Staff and Officials

1. Each municipality is responsible for identifying, developing, and communicating information about STOPPP to its stormwater staff and elected officials so that they are well informed about the requirements of STOPPP, their role in implementing STOPPP, and the progress of STOPPP. Annually, each municipality will communicate Program information to elected officials and all municipal staff involved with STOPPP activities.

2. New employees involved with STOPPP activities will be provided with information about STOPPP and a description of their role in STOPPP.

B. Procedures and Training for Handling Telephone Calls from the Public about Stormwater Pollution Prevention

1. Each municipality will establish procedures for answering, tracking, and efficiently routing stormwater related telephone calls to the appropriate municipal staff for handling.

2. Municipality staff assigned to answering or responding to telephone calls will be trained and familiar with the established procedures.

3. Each municipality will promote the use of one of its telephone numbers to facilitate public reporting of the presence of illicit discharges.

III. STORM DRAIN INLET STENCILS AND SIGNS

Storm drain inlet stencils/signs are one of the most effective venues for getting the stormwater message to residents, as determined by a residential survey conducted in San Mateo County in 2001[1]. Seventy percent of the residents surveyed reported seeing the "No Dumping, Flows to Bay/Ocean/Lagoon" message stenciled on storm drains.
Municipalities will maintain and facilitate stenciling of storm drain inlets or continue to implement the Regional Board staff's previously agreed to alternative educational activities in lieu of stenciling/signing each municipality-owned inlet. Stencils may be maintained by public works staff and/or community volunteers. Stencils will be loaned to individuals, businesses, homeowner associations, and community groups who desire to stencil on private property or conduct volunteer stenciling.

1. As a goal, all stencils and signs installed will be maintained sufficiently to be legible.

IV. COORDINATION WITH PUBLIC SCHOOLS (K-12)

Distribution of Information/Materials

1. Information provided by the General Program about activities, such as the Zun Zun assembly program, County Science Fair, community action grants, or other educational opportunities, will be provided to each municipality. In turn, each municipality will make materials/information available to the public schools within its jurisdiction according to schedules agreed upon by the PIP Subcommittee.

2. Each municipality will make materials available to the public schools in its area, materials such as, children's educational activity booklets, and other information the General Program develops or helps develop. This may include disseminating information on how to obtain copies of material.

V. MUNICIPALITIES' COMMUNITY OUTREACH PROGRAM

Municipalities will participate in community outreach activities from the areas listed below (a through f) for the purpose of communicating the general stormwater pollution prevention message,

[1] Fairbank Maslin, Maulin and Associates, 2001 Countywide Public Opinion Survey Summary Report, June 2001.

complementing the General Program's specific message for its targeted audiences, and facilitating the proper management and disposal of used oil and toxic materials. Each municipality will participate in a prescribed number of activities annually based on the criteria below:

Over 50,000 in population
- each municipality will participate in at least five activities annually

Between 5,000 and 50,000
- each municipality will participate in at least four activities annually

Less than 5,000
- each municipality will participate in at least three activities annually

Municipalities will use the General Program's information or develop their own messages based on the General Program message and provide it to the public through other venues. The 2001 Public Opinion Survey cited the most common source for getting information about stormwater pollution prevention practices such as properly disposing of household hazardous waste were garbage company flyer, television and newspaper. Based on this community outreach activities shall include any combination of the following:

a. Provide General Program Information through Other Venues

Other venues include:

- Utility inserts
- Municipality newsletter
- Other municipal newsletter
- Local magazine and newspaper
- Mailing to target group
- Website and links
- Local telephone directories
- Flyers
- Cable TV

b. Participate in Existing Community Events

Distribute STOPPP information by participating in existing community events (County fair, festivals, exhibits, etc.) held within its or a nearby jurisdiction. This participation may include the setting up of a booth, kiosk display, or other creative means of communicating the general stormwater pollution prevention message, using a specific message to a target group, or making a presentation to a local community service group. Examples include the following:

- Earth Day or other festival or fair
- Business mixer
- Seminar for a target group
- Contests

c. Contact Media and Conduct Advertising

Maintain local media contacts with newspaper, radio, or television stations in order to communicate the general stormwater pollution prevention message, complement the General Program's specific targeted audience(s) and message(s), and complement any regional PIP activities. Media outreach activities may include the adaptation and/or

development and distribution of stormwater related press releases or public service announcements.

d. Develop and Implement Integrated Outreach Approaches

This area includes approaches that increase the effectiveness of pollution prevention activities using one or more of the following:

- Conduct a point of purchase display and giveaway program.
- Plan, create, and/or distribute videos.
- Create and stage a play.
- Develop special displays or kiosks for your message especially interactive ones.
- Develop/implement program for school curriculum and provide materials.
- Support and partner with other municipalities to increase or improve pollution prevention capabilities.
- Coordinate with city department staff to maximize stormwater pollution prevention message to residents.

e. Develop Watershed Awareness

This area includes one or more of the following activities:

- Identify and support a "Friends of (a watershed)" group and encourage creek (lagoon or shoreline) cleanups, or adopt-a-creek or other volunteer monitoring and resource inventorying activities.
- Conduct a creek (lagoon or shoreline) cleanup within municipality-jurisdiction on an annual basis.
- Participate in a local event, e.g., the Coastal Commission's annual Coastal Clean-Up Day and/or Earth Day activities.

f. Coordinate with Local Volunteer Groups to Conduct Outreach

- This task may be combined with other activities presented in these performance standards. For example, the volunteer groups may assist with school outreach activities, stenciling activities, or creek cleanup activities.
- Coordinate with local groups to implement stormwater education through the community action grants.

The Performance Standards for Control of Stormwater Pollutants from Development and Construction Activities were developed in accordance with STOPPP's 1999 NPDES permit as amended on February 19, 2003.

All municipalities have agreed to implement local programs that meet the following performance standards. Municipalities will continue to improve, as necessary, the performance standards within the permit period in response to any pertinent new technical information on effectiveness of control measures. Effective implementation of the performance standards and incremental program improvement will be demonstrated in annual report submittals.

I. DEVELOPMENT PLAN REVIEW AND PERMITTING

1. Each municipality will have adequate legal authority to implement stormwater quality control measures for development and construction activities as part of its development plan review and approval procedures.

2. Each municipality will, at the next scheduled update of its General Plan confirm that it has incorporated policies and implementation measures into its General Plan to help preserve and enhance water quality and protect sensitive areas[1], and that these policies meet the intent of Provision C.3.l of STOPPP's 1999 NPDES permit as amended on February 19, 2003 (amended permit) or the subsequently reissued version of this permit.

3. Each municipality will require environmental documents for projects under CEQA or NEPA review to address stormwater quality impacts during the life of the project (including significant and cumulative impacts), and specify appropriate mitigation measures. Environmental review shall address issues identified in Provision C.3.m of STOPPP's amended permit, in accordance with Provision C.3.m guidance prepared by STOPPP. Environmental documents include initial study checklists, EIRs, negative declarations, and mitigation monitoring plans. Mitigation measures must address both construction stage and post-construction impacts.

4. Each municipality will require developers and owner/builders to control stormwater quality impacts of their projects by using appropriate best management practices (BMPs)[1]. All projects, regardless of size, will be required to implement appropriate BMPs during construction activity. Each municipality as part of its permit approval process will consider incorporating appropriate source control and site design measures that minimize stormwater pollutant discharge to the maximum extent practicable as required by Provision C.3.c of STOPPP's amended permit. Developers of projects that meet Group 1 or Group 2 criteria[1] will also be required to address post-construction impacts through site design, source control, treatment measures, and hydrograph modification management in accordance with Provision C.3 of STOPPP's permit amendment. For such projects, efforts will be made to avoid, minimize, and mitigate, in that order, the potential adverse impacts to water quality[3].

[1] Definitions are provided in the attachment at the end of this section.

5. Each municipality will require developers and owner/builders of projects that disturb a land area of one acre or more to demonstrate coverage under the State Construction Activity Stormwater General Permit. Utilities, developers and owner/builders of linear underground/ overhead projects that disturb from one to five acres of land will be required to demonstrate coverage under the State General Permit for Stormwater Discharges Associated with Construction Activity from Small Linear Underground/Overhead Projects (Small LUP General Permit).

6. Each municipality will require developers and owner/builders of projects with potential for significant erosion and planned construction activity during the wet season[1] to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

7. Each municipality will require developers and owner/builders of projects that include stormwater treatment measures to ensure ongoing operation and maintenance (O&M) of such measures, as part of project approval documents, and in accordance with the O&M verification program it develops in compliance with Provision C.3.e of STOPPP's amended permit.

8. Each municipality will ensure access to treatment measures for mosquito and vector control by the San Mateo County Abatement District or comparable staff, as required by Provision C.3.e.i of the amended permit.

9. Each municipality will ensure that municipal capital improvement projects include stormwater quality control measures during and after construction, as appropriate for each project. Capital improvement projects that meet Group 1 or Group 2 criteria and are not otherwise exempt will also be required to address impacts through site design, source control, treatment measures, and hydrograph modification management controls in accordance with Provision C.3 of STOPPP's amended permit. Each municipality will also ensure that these control measures are included in project documents such as plans and contract specifications.

10. Each municipality will maintain a map or listing of parcels containing category 2.) sensitive areas[1]. If a municipality finds that it is infeasible to complete such a map or list, it will include in its deliverable reports for FY 2003/04 an explanation of the reasons why it was infeasible and identify a schedule for preparing the maps/listing or provide a proposal for an alternative method of identifying category 2 sensitive areas for the review and approval of RWQCB.

11. Effective February 15, 2005, each municipality will implement source control measures for all projects that meet Group 1 and Group 2 criteria[1], with the assistance of STOPPP's Source Control Measures Guidance and Model List, subject to the Regional Board staff's approval of the Model List, as required by Provision C.3.k of STOPPP's amended permit.

[1] Definitions are provided in the attachment at the end of this section.

II. EROSION AND SEDIMENT CONTROL

1. Each municipality will maintain an erosion and/or sediment control program that includes requirements for minimum BMPs, sufficient enforcement authority, training and tools for inspectors, and information for developers and contractors.

2. As a condition for issuance of a grading permit, each municipality will require developers and owner/builders to prepare, submit to the municipality for review and approval, and implement an effective erosion and/or sediment control plan or similar administrative document that contains erosion and/or sediment control provisions.

III. CONSTRUCTION INSPECTION

1. As part of preparing for building demolition, each municipality will assure that all mercury containing fluorescent tubes, thermostats and other devices are removed and either recycled or disposed of at a permitted hazardous waste facility.[1]

2. Each municipality will require through a construction inspection process that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites and prevent illicit discharges[2] to storm drains and watercourses.

3. For development projects with significant erosion potential[2] and planned construction activity during the wet season, each municipality will require, through a construction inspection process, that erosion and/or sediment control measures are implemented. Measures will be implemented in accordance with local ordinances and project conditions of approval, including the approved erosion and/or sediment control plan, and maintained as needed during construction.

4. Each municipality will oversee the inspection of construction sites for adequacy of stormwater quality control measures on a regular basis. This will include inspection of the construction of any stormwater treatment measures. The frequency of inspections will be based on the following criteria: the project's potential impact on stormwater quality, the size of the project; the site topography and soil characteristics; the season in which the project occurs; and the nature of construction activity.

   Prior to the beginning of the wet season, each municipality will require that each active construction site be stabilized to minimize erosion and discharges of sediment from disturbed areas and oversee the inspection of these sites to make sure these requirements are being met. Prior to November 15th of each year, municipalities will complete a letter certifying that all active sites have been inspected prior to the beginning of the wet season. Each certification letter will include a list of the active construction sites that were inspected, including the following information for each site: the address of the site, the type of project, the type of winterization

[1] As required by California Code of Regulations, Title 22, division 4.5, chapter 23, section 66273.8.

[2] Definitions are provided in the attachment at the end of this section.

methods used, what violations were found, and how the violations were corrected. Each municipality will include the certification letters with the annual report deliverables submitted to the Regional Board.

5. During the wet season, each municipality will oversee the inspection of all construction sites with erosion and/or sediment controls within 14 calendar days following each major storm event[1]. High priority sites, as determined by each municipality, will be inspected as soon as possible after major storm events[1] and more frequently as required.

IV. EDUCATION AND OUTREACH

1. Each municipality will provide training at least annually to its staff responsible for plan review and plan check for permit compliance on planning procedures, policies, design guidelines, construction-phase BMPs, and treatment measures for stormwater pollution prevention and control, and hydrograph modification management planning, if needed.

2. Each municipality will provide training at least annually to its staff responsible for stormwater pollution prevention during construction on inspection procedures, documentation, and enforcement.

3. Each municipality will provide appropriate educational and training materials to municipal staff, contractors, construction site operators, developers, and owner/builders. Appropriate materials will include information on a) construction BMPs (including erosion and sediment controls) and compliance with the State Construction Activity Stormwater General Permit and Small LUP General Permit (if applicable), b) site planning or design measures and post-construction controls, and c) information provided by Regional Board staff regarding State and Federal permit and approval requirements for project activities in wetlands and stream channels[2].

4. Each municipality will provide appropriate educational materials to municipal staff, developers, contractors, construction site operators, and owner/builders early in the planning process and as appropriate.

5. Each municipality will provide appropriate educational and outreach materials provided by the Regional Board to those utility contractors (water supply, cable, phone, electrical, etc.) seeking encroachment and/or grading permits from the municipality.

V. SUBCOMMITTEE MEETINGS AND WORKSHOPS

1. Each municipality will designate a person responsible for overseeing the implementation of these performance standards and for acting as a liaison with the STOPPP New Development Subcommittee. This person will stay informed sufficiently to participate in New Development Subcommittee decisions and activities.

[1] Definitions are provided in the attachment at the end of this section.

[2] Until the time the Regional Board develops and provides appropriate materials for distribution, municipalities will provide copies of the STOPPP "Guide to Creek & Wetland Project Permitting" or update thereof.

2. At least one representative from each municipality will attend STOPPP annual training workshops.

PERFORMANCE STANDARDS ATTACHMENT A:

Definitions for New Development and Construction Controls

DEFINITIONS FOR NEW DEVELOPMENT AND CONSTRUCTION CONTROLS

Projects with significant stormwater pollution potential - A project which causes substantial or potentially substantial adverse change in the quantity and/or quality of stormwater runoff generated from the site. (Note: This is consistent with the CEQA definition of significance. Professional judgment will be required in evaluation of project impacts, until specific thresholds for significance have been adopted.) Projects will be considered to have significant stormwater pollution potential if the project site contains or is adjacent to a "sensitive area" (see definition below) and/or the project disturbs sufficient area to require coverage under the State Water Resources Control Board (SWRCB) NPDES General Permit for Stormwater Discharges Associated with Construction Activity (construction General Permit) or the NPDES General Permit for Stormwater Discharges from Small Linear/Underground/Overhead Projects (small LUP General Permit)[1]

Sensitive Area - Any area in which plant or animal life or their habitats are rare or especially valuable, including any area in the following categories:

1. habitats containing or supporting "rare and endangered" species as defined by the State Fish and Game Commission;
2. perennial and intermittent streams and their tributaries that support aquatic habitat;
3. riparian corridors (see definition below);
4. lakes, ponds, and adjacent shore habitat;
5. wetlands, marshes, and coastal tide lands;
6. coastal and offshore areas containing breeding or nesting sites or used by migratory and resident water-associated birds for resting areas and feeding;
7. areas used for scientific study and research concerning fish and wildlife;
8. existing game and wildlife refuges and reserves; and
9. sand dunes and sea cliffs.[2]

Riparian Corridor - The contiguous area of vegetation adjacent to perennial and intermittent streams, lakes, and other water bodies, as determined by the association of plant species typically found in riparian areas. For creeks, the riparian corridor includes any defined creek channels up to the bank full-flow line as well as adjacent upland vegetation. Riparian plant species may include: alder, jaumea, pickleweed, big leaf maple, cattail, willow, horsetail, dogwood, cottonwood, sycamore, oak, and box elder. The riparian corridor is limited to areas containing at least a 50 percent cover of some combination of the plants listed.[3]

Wet Season - October 15 to April 15 of each year, or as defined by local ordinance.

Illicit Discharge - Any non-stormwater discharge to a storm drain or watercourse, except for those discharges allowed under STOPPP's NPDES permit or another applicable NPDES permit.

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[1] Construction activity that disturbs one acre or more of land is subject ot the construction General Permit, with the exception of linear underground/overhead projects that disturb from one to five acres, which are subject to the small LUP General Permit.

[2] Adapted from the San Mateo *Local Coastal Program Policies*, August, 1992.

[3] Adapted from the San Mateo County *Local Coastal Program Policies*, August 1992, and the City of San Jose *Riparian Corridor Policy Study*, May 1994.

Significant Erosion Potential - A substantial or potentially substantial adverse change in site conditions that could result in erosion and/or sedimentation of site soils. (Note: This is consistent with the CEQA definition of significance. Conditions created by land disturbance activities which require a grading permit, as defined by local ordinance, can be used as thresholds of significance.)

Major Storm Event - A storm or series of storms of such intensity or duration as to create significant quantities of runoff and potential for erosion. A series of storms will be considered as one major storm event if there is less than 72 hours of dry weather between storms.

Appropriate Best Management Practices - Appropriate BMPs are those listed in, or providing an equivalent level of protection as those provided in the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment (January 2003).

Group 1 Projects – STOPPP's STOPPP's 1999 NPDES permit as amended on February 19, 2003 states that STOPPP's member agencies shall require Group 1 projects to implement appropriate source control and site design measures and to design and implement stormwater treatment measures to reduce the discharge of stormwater pollutants to the maximimum extent practical. Implementation of this requirement shall begin on February 15, 2005. Group 1 projects consist of all public and private projects that create or replace one acre or more of impervious surface, as indicated in the categories listed In Provision C.3.c, except specific project types for which exemptions are identified.

Group 2 Projects - STOPPP's STOPPP's 1999 NPDES permit as amended on February 19, 2003 states that STOPPP's member agencies shall require Group 2 projects to implement appropriate source control and site design measures and to design and implement stormwater treatment measures to reduce the discharge of stormwater pollutants to the maximum extent practical. Implementation of this requirement shall begin on August 15, 2006. Group 2 projects consist of all public and private projects that create or replace 10,000 square feet or more of impervious surface, as indicated in the categories listed In Provision C.3.c, except specific project types for which exemptions are identified.

APPENDIX C

List of Municipal Stormwater Ordinances

Municipal Stormwater Ordinances Adopted

Municipality	*Stormwater Management and Discharge Control Ordinance*	
	Ordinance Number	**Date Adopted**
City of Atherton	481	March 23, 1994
City of Belmont	883	June 14, 1994
City of Brisbane	392	June 1994
City of Burlingame	1503	June 20, 1994
City of Colma	465	May 11, 1994
City of Daly City	1194	February 14, 1994
City of East Palo Alto	176	September 6, 1994
City of Foster City	See "Legal Authority" section of Chapter 1 (Introduction and Background) of this SWMP for explanation.	
City of Half Moon Bay	C-5-94	May 3, 1994
City of Hillsborough	530	November 8, 1993
City of Menlo Park	859	July 19, 1994
City of Millbrae	607	June 14, 1994
City of Pacifica	617 - C.S. [Chapter 12 of Title 6 of P.M.C.]	June 27, 1994
City of Portola Valley	1998 - 308	February 5, 1998
City of Redwood City	2090	June 13, 1995
City of San Bruno	1558	August 8, 1994
City of San Carlos	1149	April 25, 1994
City of San Mateo	1994-9	April 18, 1994
City of South San Francisco	1145-94	July 22, 1994
City of Woodside	52.01 - 52.37	June 22, 1994
County of San Mateo	3633	February 14, 1995

APPENDIX D

Monitoring Program Plan

San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)
Programmatic Monitoring

Type of Monitored Activity	Parameters	Frequency	Documentation Methods	Reporting Interval
Street sweeping	Curb miles swept and volume or weight of material removed.	Whenever streets are swept	STOPPP's monthly municipal maintenance record keeping forms	Submitted as part of Annual Report
Street sweeping	Removal rate of swept material (volume or weight of material removed per mile swept).	Calculated annually	Table in Annual Report	Submitted as part of Annual Report
Removal of material from storm drain system	Number of storm drain inlets inspected, number of inlets cleaned, length of conveyances[1] inspected and/or cleaned, and volume and/or weight of material removed.	Whenever these activities are conducted	STOPPP's monthly municipal maintenance record keeping forms	Submitted as part of Annual Report
Leaf and litter control	Amount of material removed and for litter this also includes the amount disposed from litter collection receptacles located in public areas, such as in parks and along streets in commercial areas.	Whenever these activities are conducted	STOPPP's monthly municipal maintenance record keeping forms	Submitted as part of Annual Report
Municipal pesticide use	Description of activities to implement the *Pesticide Usage and Integrated Pest Management* performance standards. This will include whether any organophosphate pesticides were used, and if so, why, and what best management practices were used to minimize the amount used.	Annually	STOPPP's deliverable forms	Submitted as part of Annual Report
Training municipal staff on use of integrated pest management (IPM)	Number of municipal staff who have attended IPM training offered by STOPPP.	Annually	STOPPP's deliverable forms	Submitted as part of Annual Report
Control of stormwater pollutants from commercial and industrial businesses	Number of businesses inspected, number of stormwater violations[2], enforcement actions, follow-up actions, violation corrected, and date of violation correction.	Whenever a business is inspected	STOPPP's Stormwater Inspections & Violations Summary forms	Submitted as part of Annual Report
Activities to find illicit discharges	Field activities conducted including number of established location visited and number of calls received from public, other agencies, and municipality's maintenance crews about illicit discharges found.	Whenever field activity is undertaken or notification	STOPPP's Illicit Discharge Inspection Quarterly Summary Report Forms	Submitted as part of Annual Report

[1] Conveyances include v-ditches, storm drain lines, channels, creeks, and culverts.
[2] Violations are defined as either the discharge of pollutants due to pollutant exposure to rainfall runoff or the discharge of non-stormwater materials that are disallowed by STOPPP's NPDES permit.

Type of Monitored Activity	Parameters	Frequency	Documentation Methods	Reporting Interval
		received		
Control of illicit discharges	For each illicit discharge found, information on the source of illicit discharge, type of illicit discharge, and follow up activities undertaken to stop the illicit discharge, including enforcement actions taken and informational material distributed	Whenever an illicit discharge is found	STOPPP's Illicit Discharge Source Identification Forms	Submitted as part of Annual Report
Activities to educate residents about stormwater	Description of community outreach events held or participated in to educate residents about stormwater pollution problems and solutions including the proper management and disposal of used oil and toxic materials.	Whenever an event is held or participated in.	STOPPP's deliverable forms	Submitted as part of Annual Report
Status of maintaining storm drain stencils and/or signs	Information confirming that storm drain inlet stencils/signs are being maintained as they wear out.	Annually	STOPPP's deliverable forms	Submitted as part of Annual Report
Training municipal staff on construction site inspections	Information on the number of municipal staff that have completed this training each year and the number that have certificates of completion from this training within the past three years (certificates are good for three years).	Annually	STOPPP's deliverable forms	Submitted as part of Annual Report
Control of erosion from construction sites in preparation for wet season	Information on names of active construction sites inspected to evaluate the adequacy of erosion and sedimentation controls in preparation for wet season, dates of inspection, and corrective actions, if any, that were needed.	Prior to wet season starting in summer/fall 2004	STOPPP's List of Active Construction Sites forms	Submitted as part of Annual Report
Incorporation of stormwater quality controls into requirements for new development projects	Information on all new development and significant redevelopment projects equal to or greater than five acres and on three other representative projects from each municipality regarding location, type of project, acreage, status, site design and stormwater treatment measures and construction controls.	Annually	STOPPP's deliverable forms	Submitted as part of Annual Report
Amounts of impervious surface being constructed	For each project where 10,000 square feet or more of impervious surface will have been created, added, and/or replaced, information on the name of the project, type of projects, site size, and amount of newly constructed impervious surface.	Annually	STOPPP's deliverable forms	Submitted as part of Annual Report

San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)
Watershed Assessment and Monitoring
Environmental Monitoring and Assessment - FYs 2003/04 and 2004/05

Type	Activity	Location	Number of Sample Sites	Parameters	Frequency/Interval
FY 2003/04					
Watershed characterization, assessment of receiving waters and impacts to beneficial uses.	Bioassessment.	San Mateo Creek watershed.	6	Macroinvertebrate assemblages, physical habitat characteristics.	One episode (spring 2004).
	Creek water quality testing.		3	Temperature, pH, conductivity, flow, organophosphate pesticides, aquatic toxicity.	One episode (wet season 2003/04).[1]
	Creek water quality testing.	San Pedro Creek watershed.	3	Temperature, pH, conductivity, flow, organophosphate pesticides, aquatic toxicity.	Two episodes (summer 2003 and wet season 2003/04).[2]
Evaluation of pollutant sources and control measures.	Embedded sediment testing and land use research.	Colma Creek, Colma.	3	PCBs congeners, mercury, total organic carbon, percent moisture and particle size.	One episode (fall 2003).
FY 2004/05					
Watershed characterization, assessment of receiving waters and impacts to beneficial uses.	Bioassessment.	Cordilleras Creek watershed.	6	Macroinvertebrate assemblages, physical habitat characteristics.	One episode (spring 2004).
	Creek water quality testing.		3	Temperature, pH, conductivity, flow, organophosphate pesticides, metals,[3] aquatic toxicity.	Three episodes (summer, wet season and spring).

1 - During FY 2002/03, STOPPP funded two episodes (spring and summer) of testing water samples from San Mateo Creek for organophosphate pesticides and aquatic toxicity.

2 - During FY 2002/03, STOPPP performed one episode (spring) of testing water samples from San Pedro Creek for organophosphate pesticides and aquatic toxicity.

3 - The following metals will be analyzed for (total and dissolved): Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se, Hg (total only).

San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)
Watershed Assessment and Monitoring
Regional Environmental Monitoring and Assessment
FYs 2003/04 and 2004/05

Type	Activity	Location	Number of Sample Sites	Parameters	Frequency/Interval
Pollutants of concern and assessment of receiving waters and impacts to beneficial uses.	Provide funding and program representation to Regional Monitoring Program (RMP).	San Francisco Estuary.	Please refer to RMP work plans.	Numerous water, sediment, and biota parameters.	Please refer to RMP work plans. For more information see: www.sfei.org/rmp
Watershed characterization, pollutants of concern, and assessment of receiving waters and impacts to beneficial uses.	Provide fee-based funding to Surface Water Ambient Monitoring Program (SWAMP)/Regional Monitoring and Assessment Strategy (RMAS).	San Francisco Bay Area.	Please refer to SWAMP work plans.	Macroinvertebrate assemblages, physical habitat characteristics, general water quality, trash, water and sediment pollutants, pathogens, nutrients and toxicity.	Please refer to SWAMP work plans. For more information see: www.swrcb.ca.gov/rwqcb2
Pollutants of concern and evaluation of BMP effectiveness.	Provide funding and/or program representation to Clean Estuary Partnership (CEP).	San Francisco Bay Area.	Please refer to CEP work plans.	Pollutants of concern.	Please refer to CEP work plans. For more information see: www.cleanestuary.org

San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)
Watershed Assessment and Monitoring
Support of Existing Watershed Assessment and Monitoring Activities, Evaluation of Existing Data and Planning
FYs 2003/04 and 2004/05

Type of Activity	Associated Location
FY 2003/04	
Provide in-kind staff support to Bay Area Macroinvertebrate Bioassessment Information (BAMBI) network.	San Francisco Bay Area.
Compilation and evaluation of existing data.	Cordilleras Creek watershed.
Survey of municipal staff knowledge of trash management practices and problem areas.	Countywide.
Compilation and evaluation of existing data on sediment management practices and evaluation.	Countywide.
Collaboration with other BASMAA programs to compile and evaluate information on dioxins and urban runoff, including an evaluation of potential control measures.	NA
FY 2004/05	
Provide in-kind staff support to Bay Area Macroinvertebrate Bioassessment Information (BAMBI) network.	San Francisco Bay Area.
Perform activities related to trash control and/or monitoring.	To be determined.
Compilation and evaluation of existing data.	Bayside watershed to be determined.
Prepare a new multi-year monitoring plan.	Countywide.
Prepare a new monitoring and management plan for pollutants of concern.	Countywide.

APPENDIX E

BMPs and Implementation Procedures for
Conditionally Exempted Discharges

BMPs and Implementation Procedures for Conditionally Exempted Discharges

CONDITIONALLY EXEMPT DISCHARGES	BMPs	IMPLEMENTATION PROCEDURES
1. Surface cleaners	Sidewalks and Plazas-All soapy washwater used to clean sidewalks and plazas must be discharged to the sanitary sewer system or landscaping. Debris must be collected and disposed of prior to washing. This BMP does not apply to an area where there has been an oil or hazardous chemical spill. If surface cleaning is conducted without the use of soap and no oil or hazardous material/waste is present, all washwater may go to the storm drain. If the sidewalk or plaza contains light oil, dry clean oil spots with absorbents such as kitty litter, vermiculite, sand, or absorbent mats prior to cleaning. Collect and dispose of the debris. Drive-throughs, Driveways, Parking Garages, Service Stations- If these areas contain excess oil deposits, the procedure for cleaning, with or without soap, is as follows: (1) seal the storm drains; (2) collect and dispose of debris; (3) dry clean oil spots with absorbents; (4) pump wash water to a sanitary sewer system after obtaining permission from the sanitary sewer's owner. Building Exterior Walls- If soap is used, water must be discharged to the sanitary sewer system after obtaining permission from the sewer's owner. When washing glass or steel buildings without the use of soap, washwater should be directed to unpaved surface/landscaped areas. If you are not using soap to clean a building that has been painted after 1978, washwater may be directed to unpaved landscaping. If you are cleaning buildings painted with lead-based paints or mercury-additive paints, all storm drains must be sealed and washwater must be pumped to a collection tank. The wastewater and sludge may have to be disposed of as hazardous waste.	All STOPPP municipalities will follow the BMPs for surface cleaning that they conduct. STOPPP will support workshops/seminars for workers in surface cleaning industry to ensure that they have a clear understanding of the requirements. STOPPP will request that employers train/inform new employees about BMPs. STOPPP will distribute educational flyers prepared by BASMAA or others that update workers on any changes in the BMPs or laws.
2. Uncontaminated pumped groundwater[1]	Identify the source of the discharge. Check historical records regarding potential for groundwater pollution. If there is doubt about the quality of the groundwater, testing for volatile, semi-volatile, or any other likely pollutants will need to be conducted prior to discharge. If the discharge of the groundwater will not cause an exceedance of a water quality standard/objective for any pollutant, the water may be discharged to the municipal storm drain system. Characterize the flow rate; if greater than 20 gpm, call your local municipality's Illicit Discharge Coordinator (list available at http://www.flowstobay.org/contacts/illicitdischargecoord.html).	Each agency's designated Illicit Discharge Coordinator is responsible for implementing or overseeing the implementation of these BMPs. County Environmental Health staff will notify the clean up sites that it oversees about these BMPs.

[1] Anyone proposing to discharge uncontaminated pumped groundwater to land where it does not flow to a storm drain or surface water body may need to obtain coverage under the State Water Resources Control Board's Statewide General Waste Discharge

BMPs and Implementation Procedures for Conditionally Exempted Discharges

CONDITIONALLY EXEMPT DISCHARGES	BMPs	IMPLEMENTATION PROCEDURES
3. Dechlorinated swimming pool waters[2]	Call your local municipality's Illicit Discharge Coordinator (see 2. for where to obtain list) if you intend to empty your pool. If the local municipality allows the discharge of pool water to the municipal storm drain, you must first dechlorinate the pool's water. Dechlorinating a pool takes only a few hours, with the use of chemicals such as sodium thiosulfate. Check chlorine concentrations and once the pool water has zero measurable chlorine residual and the path of the discharge will not introduce further pollutants, the water may be discharged to the municipal storm drain, where municipalities allow. Manage the flow rate so that it does not create an erosion problem. Do not use copper-based algaecides. Alternatives may be found at pool supply stores.	Continue to distribute educational materials, such as the *Pool, Spa and Fountain Water Disposal Guidelines* and the *Landscaping, Gardening, and Pool Maintenance* trifold to homeowners with pools, pool supply shops, pool contractors, and pool service/repair workers.
4. Foundation drains	Examine the site to determine whether the drain water may contact pollutants. If there is a potential for the water to contact chemicals, such as at storage areas, a sample should be tested for the chemicals of concern. The site should also be evaluated for the possible presence of local groundwater pollution. If a potential exists for groundwater pollutants to occur in the drainage water, a sample should be tested for the chemical(s) of concern. The drain water should also be visually examined for turbidity, discoloration, oil or other materials. Contact your local municipality's Illicit Discharge Coordinator (see 2. for where to obtain list) who will decide, based on the results of the testing and visual examination, whether the flow should be allowed to discharge to the municipal storm drain. If pollutants are present which could result in an exceedance of a water quality standard/objective for any pollutant, the drain water must be discharged to the sanitary sewer after obtaining permission from the sanitary sewer's owner.	Each municipality's Illicit Discharge Coordinator is responsible for implementing or overseeing the implementation of these BMPs. STOPPP will distribute these BMPs to all of these coordinators.
5. Water from crawl space pumps	Same as "4. Foundation drains."	Same as above
6. Footing drains	Same as "4. Foundation drains."	Same as above
7. Air conditioning condensate[3]	Small air conditioning units: Air conditioning condensate should be directed to landscaped areas as a minimum BMP.	Develop and distribute outreach

Requirements for Discharges to Land with a Low Threat to Water Quality. Contact the San Francisco Bay Regional Water Quality Control Board for instructions.

[2] Anyone proposing to discharge commercial and public swimming pool water to land where it does not flow to a storm drain or surface water body may need to obtain coverage under the State Water Resources Control Board's Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality. Contact the San Francisco Bay Regional Water Quality Control Board for instructions.

BMPs and Implementation Procedures for Conditionally Exempted Discharges

CONDITIONALLY EXEMPT DISCHARGES	BMPs	IMPLEMENTATION PROCEDURES
	Large air conditioning units: In new developments or remodels, the condensate lines of the unit must be directed to landscaped areas or, alternatively, connected to the sanitary sewer system after obtaining permission from the sanitary sewer's owner. As with smaller units, any anti-algal or descaling agents must be properly disposed of.	material to businesses and homeowners. This material will encourage homeowners to direct air conditioning condensate to landscaped areas or to the sanitary sewer where this is a permissible option.
8. Landscape irrigation	Landscape design, installation and maintenance can and should be water efficient. Irrigation systems can avoid runoff by matching water application rates to infiltration rates. Systems must avoid overspray onto impervious surfaces. Avoid overhead sprinkler irrigation of median strips that are less than ten feet in width.[4] Drip systems are the most water efficient way to irrigate non-turf areas. Avoid over irrigation that causes erosion. Use Integrated Pest Management methods for weed and insect control. Any pesticide application should be done at the optimal time to maximize its effectiveness and minimize the possibility of discharging pesticides with landscape irrigation or stormwater runoff. Wash landscaping equipment away from paved areas. Do not blow or rake vegetative wastes into the street. Dispose of lawn clippings and other vegetative wastes in waste receptacles or use as compost.	Each agency's Illicit Discharge Coordinator will coordinate with his or her local potable water counterpart responsible for implementing local Urban Water Management Plans. Municipalities will target the distribution of educational material to areas known to have significant runoff from landscape overwatering. The Illicit Discharge Coordinators will also conduct field investigations of reports of significant runoff caused by landscape overwatering.
9. Irrigation water	Same as "8. Landscape irrigation."	Same as above
10. Lawn or garden watering	Same as "8. Landscape irrigation."	Same as above
11. Planned and unplanned	Dechlorinate potable water or under appropriate circumstances (see Attachment A), allow potable water to	All STOPPP member agencies that are

[3] Discharges of air conditioning condensate to land may trigger the need to obtain coverage under the State Water Resources Control Board's Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality. Contact the San Francisco Bay Regional Water Quality Control Board for instructions.

[4] These water efficiency BMPs are based on DWR's Model Water Efficient Landscape Ordinance adopted on January 1, 1993.

BMPs and Implementation Procedures for Conditionally Exempted Discharges

CONDITIONALLY EXEMPT DISCHARGES	BMPs	IMPLEMENTATION PROCEDURES
discharges from potable water sources[5]	aerate or to discharge to a sanitary sewer system. Aeration can occur when the potable water flows along a pathway before entering receiving waters or is contained long enough for chlorine to dissipate. Dechlorination is generally accomplished with a chemical in either liquid or tablet form. One common method is to use a five-gallon carboy equipped with a spigot to feed a dechlorinating solution into the potable water flow stream. The rate of discharge of the dechlorinating solution must be calculated based on the strength of the dechlorinating solution and the water's flow rate and chlorine residual. Another method is to lay a net or burlap bag with dechlorination tablets across the flow path or over the storm drain. The erosive potential of potable water discharges must be controlled using BMPs to limit the erodibility of soils (such as covering the soil with plastic sheeting, erosion control matting, gravel, etc.) or diverting flows to areas not susceptible to erosion, e.g., the sanitary sewer. Sediment control BMPs include a variety of practices, such as, using filter material to trap sediment being discharged as part of excavation dewatering for water line repair; using vegetative filtration or gravel check dams; and using various other sedimentation/filtration controls.	retail water purveyors will implement these BMPs. Water purveyors who are not members of STOPPP will be requested to submit copies of their BMPs, if they ever discharge potable water to the municipal storm drain system. STOPPP will plan additional training or educational outreach based on the information submitted.
12. Water line and hydrant flushing[5]	Same as "11. Planned and unplanned discharges from potable water sources." Plus some agencies place dirt bags or silt sacks over the hydrant's stream to collect sediment that had accumulated in the water line.	Same as above
13. Individual residential car washing	The best alternative is to wash cars at a commercial car wash. If washing at home, wash cars over lawn, gravel or other areas where soapy water will not run into the street or storm drain. Wipe brake dust off of wheels before washing. Minimize the use of soap and of washwater. Do not use spray on wheel or engine cleaners where the rinse water would flow to the street or storm drain.	Distribute existing educational, outreach material to residents; especially in areas where significant amounts of soapy washwater have been found in the street or municipal storm drain system.
14. Discharges or flows from emergency fire fighting	If there are toxic substances on the property where the fire is, foam will probably be used instead of water. After public safety and property are protected, firefighters should plug the storm drain system that drains the fire area to try to contain any firefighting runoff water. The captured water may then be removed for proper disposal.	Determine better what current firefighting practices are as regards non-stormwater discharge. Develop and distribute

[5] Discharges of water main, water storage tank, water hydrant flushing, pipelines, and tank hydrostatic testing discharges to land where it does not flow to a storm drain or surface water body may need to obtain coverage under the State Water Resources Control Board's Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality. Contact the San Francisco Bay Regional Water Quality Control Board for instructions.

BMPs and Implementation Procedures for Conditionally Exempted Discharges

CONDITIONAL-LY EXEMPT DISCHARGES	BMPs	IMPLEMENTATION PROCEDURES
		educational, outreach material to firefighters, if needed.

Draft BMPs and Implementation Procedures for Conditionally Exempted Discharges

ATTACHMENT A

A municipality may elect, under some conditions, to use non-chemical treatment to achieve dechlorination of potable water discharges. The following summarizes information about non-chemical treatment methods and considerations from the AWWA Research Foundation's "Guidance Manual for Disposal of Chlorinated Water"[1] (Guidance Manual).

The Guidance Manual states that insufficient information is currently available to develop comprehensive BMPs for dechlorinating water associated with the operation of water utilities. For non-chemical treatment methods, **STOPPP recommends that field testing of the chlorine residual be conducted to verify that the non-chemical method of dechlorination has removed chlorine residual to safe levels prior to the water entering the municipal storm drain system or a creek**. Field testing of chlorine residual would be unnecessary when the discharge of chlorinated water would not reach a creek or storm drain, such as discharges to the sanitary sewer or for groundwater recharge.

Retention in Holding Tanks Background: Several utilities in the U.S. and Canada store filter backwash water and main disinfection water in holding tanks to allow for residual chlorine decay (due to aeration, reaction with sunlight, and reaction with the surfaces of the holding tanks) prior to discharge. Rapidity of Dissipation: *Free chlorine* at 0.5 to 2 mg/l concentrations typically found in distribution systems, it would take several hours to a few days to meet regulatory discharge limits. *Combined chlorine* is more stable in the environment and would take three to four times longer than free chlorine to dissipate.
Land Application of Chlorinated Water Background: The Guidance Manual concludes that this technique appears to be more effective for discharging small amounts of water in locations far from storm drainages and receiving streams. Rapidity of Dissipation: Tacoma Waters discharged water with1.2 mg of *free chlorine* from a hydrant at 300 gpm, as sheet flow on a semi-paved surface. After traveling 500 feet in 4 minutes and 10 seconds, only 0.2 mg/l reduction of chlorine had been achieved. EBMUD conducted a test of water containing 1 - 2 mg/l of *combined chlorine* discharged at 300 – 500 gpm as sheet flow onto dirty gravel or pavement surfaces on a sunny day. The water had to travel at least one-half mile to decay to safe levels for discharge.
Discharge of Chlorinated Water for Groundwater Recharge Background: Metropolitan Water District of Southern California (MWD) sometimes discharges chlorinated water to dry streambeds or to land for groundwater discharge. The Guidance Manual describes this as an acceptable practice if the water percolates before reaching surface waters. MWD always surveys the area where the discharge will go and estimates how far it will travel based upon the quantity and discharge rate. Rapidity of Dissipation: not applicable if the flows are all recharged so that nothing reaches local surface waters.
Discharging through Hay Bales and Other Natural Obstructions Background: This method would be applicable for discharging planned water releases, such as filter backwash, to hay bales or other obstructions to dissipate chlorine prior to the water reaching a storm drain or stream. There may be practical difficulties in constructing such barriers, and this method may cause soil erosion. Rapidity of Dissipation: The Guidance Manual provides no specific information; it does find that while the chlorine demand of hay bales and other obstructions "can be reasonably high, it may be difficult to achieve regulatory discharge limits in some cases."

[1] AWWA Research Foundation. 2001. Guidance Manual for Disposal of Chlorinated Water

APPENDIX F

Pollutant Prevention and Control Measures Plan

POLLUTANT PREVENTION AND CONTROL MEASURES PLAN

San Mateo Countywide Stormwater Pollution Prevention Program

June 29, 2001
(revised January 20, 2004)

SAN MATEO COUNTYWIDE STORMWATER POLLUTION PREVENTION PROGRAM
POLLUTANT PREVENTION AND CONTROL MEASURES PLAN

REVISED

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter referred to as the Regional Board) adopted a reissued National Pollutant Discharge Elimination System (NPDES) permit for the San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) on July 21, 1999 (hereinafter referred to as the reissued NPDES permit). Finding 12 of the reissued NPDES permit states:

...the Regional Board finds that there is a reasonable potential that municipal stormwater discharges may cause or contribute to an excursion above water quality standards for: a) copper, nickel, mercury, dioxin-like compounds, DDT, dieldrin, chlordane, and PCBs into Lower and South San Francisco Bay; b) sediment in Pescadero Creek, San Francisquito Creek, and San Gregorio Creek basins; c) diazinon in San Francisquito Creek, San Mateo Creek, and in Lower and South San Francisco Bay.

Provision C.2 of the NPDES permit reissued in July 1999 required that STOPPP prepare a Pollutant Prevention and Control Measures Plan to address the above potentially impairing pollutants. STOPPP previously developed and submitted to the Regional Board such a plan (dated June 29, 2001). This revised Pollutant Prevention and Control Measures Plan (hereinafter referred to as the Plan) describes STOPPP's current pollutant-specific activities (FY 2003/04), and it extends the activities through the end of FY 2004/05.

The following sections briefly summarize activities in the Plan related to specific pollutants of concern. Table 1 summarizes annual planning-level budgets for STOPPP's General Program components to implement the Plan. Tables 2 through 6 summarize STOPPP's pollutant-specific General Program activities, planning-level budgets and schedules for each of STOPPP's components.

All Pollutants of Concern

STOPPP's strategy to address all of the pollutants of concern includes providing funding and program representation to regional collaborative efforts. These include the Bay Area Stormwater Management Agencies Association (which supports the Brake Pad Partnership to address copper), the San Francisco Estuary Regional Monitoring Program and the Clean Estuary Partnership.

In addition, in FY 2004/05 (the final year of this Plan) STOPPP will prepare a new plan for controlling specific pollutants of concern and begin implementing the new plan FY 2005/06.

PCBs

STOPPP's Watershed Assessment and Monitoring Subcommittee (WAM) will continue to address PCBs (Table 2) by performing a PCBs and mercury field investigation during FY 2003/04 in Colma Creek, Colma. This case study is part of the process of attempting to identify controllable sources of PCBs and mercury and beginning to develop and implement potential strategies to reduce discharges of these pollutants of concern from municipal storm drains.

Mercury

STOPPP's Public Information/Participation Subcommittee (PIP), Commercial/Industrial/Illicit Discharge Subcommittee (CII) and WAM will continue to address mercury. Activities include:

- Performing a PCBs and mercury field investigation during FY 2003/04 in Colma Creek, Colma, as described in the previous section (Table 2).

- Developing a model policy for the virtual elimination of mercury for STOPPP's municipalities to use in reducing municipal use of mercury (Table 2).

- Continuing multi-faceted outreach to residents to provide information about mercury and encourage residents to dispose of mercury-containing products (especially fluorescent light tubes) at San Mateo County's Household Hazardous Waste (HHW) collection centers. The continued outreach will include newspaper and television advertising, press releases, and updating STOPPP's website (www.flowstobay.org) to reflect any new programs (Table 3).

- Adapting educational outreach materials for businesses to encourage fluorescent lamp recycling. Developing educational outreach materials for businesses that remove thermostats to encourage them to recycle mercury-containing thermostats. Developing model language for modifying municipalities' demolition ordinances to require that all mercury containing devices that are present in buildings being demolished are disposed properly. Evaluating the possible importance of mercury containing non-fever thermometers to stormwater pollution (Table 4).

- Evaluating opportunities for STOPPP through C/CAG of San Mateo County to support and/or sponsor state legislation to encourage and/or require the recycling of fluorescent lamps and other mercury containing products. (Table 4).

Pesticides (including Diazinon)

STOPPP's Parks and Recreation Integrated Pest Management (IPM) work group, PIP, and CII will continue to perform activities addressing pesticides, including the following:

- Continuing multi-faceted outreach to residents on pesticides. The outreach includes partnering with other groups to set up an IPM demonstration garden at the County Fair, providing boilerplate articles to municipalities, postings on STOPPP's web page, press releases and updating STOPPP's website (www.flowstobay.org) to reflect any new activities in the program. The ongoing IPM partnership program with pesticide retailers is expanding statewide and continues to improve with new fact sheets and more buy-in from store participants. (Table 3).

- Targeting Pesticide Control Operators (PCOs) working in San Mateo County with a training workshop held jointly with the Santa Clara Valley Urban Runoff Pollution Prevention Program about IPM and the increasing market for these services (Table 4).

- Conducting a train the trainer session(s) for each municipality's representative so that the representative may train his or her municipality's employees who could purchase or apply pesticides, including over-the-counter pesticides, about pesticide-related surface water toxicity, proper use and disposal of pesticides and less-toxic methods of pest prevention and pest control and/or train municipal employees (Table 5).

- Developing guidance documents to facilitate implementation of pesticide management policies at the local municipal level, such as purchasing/contract or specification language for PCO services and pesticide chemicals and/or standardized forms for documenting integrated pest management efforts (Table 5).

- Reviewing the requirements for pesticide reduction measures for new development and significant redevelopment projects that are included in the recently reissued NPDES permits for other stormwater programs, such as the Alameda Countywide Clean Water Program and the Fairfield Suisun Sewer District. Identify tools or steps that will be useful in preparing to meet these or similar requirements (Table 6).

- Including in STOPPP's 04/05 new development workshop a presentation regarding the tools or steps that STOPPP will be taking to prepare to meet requirements for pesticide reduction measures for new development and significant redevelopment projects and information about landscaping design methods that minimize the need for pesticides (Table 6).

San Mateo County Environmental Health will also continue to provide information on pesticides and IPM in its ReNews newsletter. This newsletter is distributed at IPM Partnership stores and as an insert to the Independent, Almanac, Half Moon Bay Review, and Pacifica Tribune newspapers (circulation of 228,000 customers) bi-annually.

Sediment

Sediment water quality problems in San Mateo County have primarily been addressed by STOPPP's municipalities with creeks that have been designated impaired by sediment. In accordance with the reissued NPDES permit, San Mateo County and the Cities/Towns of Half Moon Bay, Menlo Park, Pacifica, Portola Valley, and Woodside have developed performance standards for rural public works maintenance activities. San Mateo County has incorporated these standards into a manual with maintenance standards intended to meet both NPDES requirements and the Endangered Species Act Section 4(d) Rule for steelhead and salmon. The manual includes BMPs for roads and park maintenance activities expected to take place during the winter, including stream bank stabilization and road-related erosion control.

General Program work to address sediment includes actions by STOPPP's WAM and New Development Subcommittee (NDS):

- Evaluating the effectiveness of existing and proposed Best Management Practices to prevent and control excess sediment production to creeks and recommending new sediment management practices and/or improvements to existing practices (Table 2).

- Conducting STOPPP's annual new development workshop - topics include erosion and sediment control as well as post-construction BMPs, such as using site design, source control and treatment measures to reduce impacts to water quality. Supporting the San Francisco Estuary Program/Regional Board erosion and sediment control workshops. Identifying ways to improve the enforcement of erosion and sediment control measures at construction sites (Table 6).

Dioxins

STOPPP's WAM has collaborated with other BASMAA programs to compile and evaluate information on dioxins and urban runoff, including an evaluation of potential control measures (Table 2). It is anticipated that a final report on this project will be completed during FY 2003/04.

Table 1.
Annual Planning-level Budgets to Implement the Revised Pollutant Prevention and Control Measures Plan

	WAM	PIP	CII	IPM	ND	TOTAL
fy 03/04	$204,000	$85,961	$36,000	$10,500	$16,700	$353,161
fy 04/05	$174,000	$67,477	$39,000	$10,500	$16,700	$307,677
TOTAL	$378,000	$153,438	$75,000	$21,000	$33,400	$660,838

WAM - STOPPP's Watershed and Monitoring component.
PIP - STOPPP's Public Information/Participation component.
CII - STOPPP's Commercial/Industrial/Illicit Discharge component.
IPM - STOPPP's Parks and Recreation Integrated Pest Management Work Group.
ND - STOPPP's New Development component.

Table 2. Watershed Assessment and Monitoring Activities Related to Pollutants of Concern

Pollutant(s)	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
PCBs Mercury	Perform PCBs/mercury field investigation case study in Colma Creek, Colma.	$25,000	Perform work during fy 03/04.
Sediment	Continue project started in FY 02/03 to evaluate the effectiveness of existing and proposed Best Management Practices to prevent and control excess sediment production to creeks. Recommend new sediment management practices and/or improvements to existing practices.	$10,000	Perform work during fy 03/04.
All Pollutants of Concern	Provide funding and program representation to the Regional Monitoring Program (RMP).	fy 03/04 $72,000 fy 04/05 $72,000	Contributions and program representation provided for fy 03/04 and fy 04/05.
All Pollutants of Concern	Provide funding and/or program representation to the Clean Estuary Partnership (CEP).	fy 03/04 $82,000 fy 04/05 $82,000	Contributions and program representation provided for fy 03/04 and fy 04/05.
Dioxins	Collaborate with other BASMAA programs to compile and evaluate information on dioxins and urban runoff, including an evaluation of potential control measures.	$5,000	Perform work during fy 03/04.

Table 2. WAM Activities Related to Pollutants of Concern (Cont.)

Pollutant(s)	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
Mercury	Develop a model policy for use by STOPPP's municipalities for the virtual elimination of mercury use by the municipalities.	$10,000	Complete model policy by June 2004.
All Pollutants of Concern	Prepare a new monitoring and management plan for pollutants of concern.	$20,000	Complete plan by March 2005.

Table 3. PIP Activities Related to Pollutants of Concern

Pollutant(s)	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
Mercury	Coordinate with HHW on accepting mercury-containing products. Mercury containing products currently accepted at nine HHW sites by appointment, also accepted in Half Moon Bay, Pacifica, San Bruno, San Carlos, South San Francisco without an appointment.	--	Ongoing.
Mercury	Place advertisements in County newspapers regarding mercury water quality problems and encouraging residents to dispose of mercury-containing products (especially fluorescent lamp tubes) at HHW collection centers.	fy 03/04 $10,000 fy 04/05 $5,000	Ongoing.
Mercury	Place Public Service Announcements on local cable television regarding mercury water quality problems and encouraging residents dispose of mercury-containing products (especially fluorescent lamp tubes) at HHW collection centers.	fy 03/04 $24,750 fy 04/05 $24,750	Ongoing.
Pesticides	Four IPM videos developed by Contra Costa Central Sanitary District in circulation at San Mateo County public libraries	--	Ongoing.
Pesticides	Partner with San Mateo County composting program and other groups to set up an IPM demonstration garden at the County Fair.	--	Ongoing .

Table 3. PIP Activities Related to Pollutants of Concern

Pollutant(s)	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
Pesticides	Pitch pesticide-related stories to regional media. Assist municipalities pitch stories to local media by providing press releases.	fy 03/04 $900 fy 04/05 $900	Press releases will be issued as appropriate (e.g., registrant information changes, new pesticide ordinances).
Pesticides Mercury	Provide boilerplate articles to municipalities to distribute through local newsletters and city publications. Provide to IPM Partnership stores with other publications. Make articles available on www.flowstobay.org as a PDF file or a link.	--	Ongoing.
Pesticides	Continue to participate in the IPM partnership program. Outreach materials will continue to include information on the HHW program.	fy 03/04 $31,746 fy 04/05 $25,432	Ongoing.
All Pollutants of Concern	Update www.flowstobay.org website as needed with new information on pollutants of concern, links and STOPPP programs.	fy 03/04 $18,565 fy 04/05 $11,395	Ongoing.

Notes:
HHW – San Mateo County Household Hazardous Waste program
IPM – Integrated Pest Management
PIP – STOPPP's Public Information/Participation Subcommittee
STOPPP – San Mateo Countywide Stormwater Pollution Prevention Program

Table 4. CII Activities Related to Pollutants of Concern

Pollutant	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
Mercury	Adapt educational outreach materials for businesses to encourage fluorescent lamp recycling. This will include revising San Mateo County's *The Very Small Quantity Generator (VSQG) Program Brochure* and its *Fluorescent Lamps and Recycling-A Good Combination Fact Sheet* to include additional information about fluorescent lamp recycling. In addition, a *Recycle Fluorescent Lamps and Ballasts Fact Sheet* prepared by the Oregon Environmental Council will be adapted for use by STOPPP. Using the revised and adapted informational materials, stormwater inspectors will distribute these informational materials to businesses to increase awareness of mercury contamination, fluorescent light tube recycling/proper disposal and the benefits to businesses of recycling. In addition, develop and distribute fluorescent lamp recycling/proper disposal cards for use by business inspectors and other municipal employees. The effectiveness of this outreach will be evaluated by changes in the amount of fluorescent light tube recycling under San Mateo County's VSQG Program to the extent that this type of information is tracked by the VSQG Program.	fy 03/04 $15,000 fy 04/05 $15,000	Initiate implementation of outreach by April 2004 and continue through June 2005.
Mercury	Add information about mercury contamination and pollution prevention on any new general CII informational materials for businesses and on appropriate reprints of existing materials, if any are reprinted. The success of all of the business mercury outreach will be evaluated by obtaining feedback from the business inspectors on the level of awareness they are finding at businesses.	fy 03/04 $1,000 fy 04/05 $1,000	Ongoing.
Mercury	Develop educational outreach materials for businesses that remove thermostats to encourage them to recycle mercury-containing thermostats. Develop model language for modifying municipalities' demolition ordinances to require that all mercury containing devices that are present in buildings being demolished are disposed properly. Evaluate the possible importance of mercury containing non-fever thermometers to stormwater pollution, and decide whether it is worthwhile pursuing the development of an educational outreach program for consumers, possibly in conjunction with Our Water Our World's campaign. If such an educational outreach program is worthwhile, develop and distribute materials.	fy 03/04 $10,000 fy 04/05 $10,000	Initiate implementation of the activities to address controllable sources of mercury by April 2004 and continue through June 2005. If any outreach materials are developed for mercury containing non-fever thermometers, this task would occur in fy 04/05.

Table 4. CII Activities Related to Pollutants of Concern (Cont.)

Pollutant	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
Mercury	Evaluate opportunities for STOPPP through C/CAG of San Mateo County to support and/or sponsor state legislation to encourage and/or require the recycling of fluorescent lamps and other mercury containing products. One possible bill that C/CAG should consider supporting is SB 511, the California Mercury Recycling Act of 2004 (Figueroa), which would require that every manufacturer of a mercury-containing fluorescent lamp sold in the state develop a plan to ensure that all of its mercury-containing lamps are collected, transported and recycled in accordance with applicable state laws.	fy 04/05 $3,000	July 2004 through June 2005.
Pesticides	Target Pesticide Control Operators (PCO) working in San Mateo County with a training workshop held jointly with the Santa Clara Valley Urban Runoff Pollution Prevention Program about integrated pest management and the increasing market for these services. Continue to explore opportunities to collaborate with local schools to encourage the voluntary use of integrated pest management methods. The specific activities, if any, which might be undertaken with the schools, will depend on the mutual interests of STOPPP and school representatives.	fy 03/04 $10,000 fy 04/05 $10,000	The PCO training workshop will be held in fy 03/04, and the exploration of opportunities for school outreach is ongoing.

Notes:

CII – STOPPP's Commercial/Industrial/Illicit Discharge Subcommittee
STOPPP – San Mateo Countywide Stormwater Pollution Prevention Program

Table 5. Parks and Recreation IPM Work Group Activities Related to Pollutants of Concern

Pollutant	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
Pesticides	Conduct 1) a train the trainer session(s) for each municipality's representative so that the representative may train his or her municipality's employees who could purchase or apply pesticides, including over-the-counter pesticides, about pesticide-related surface water toxicity, proper use and disposal of pesticides and less-toxic methods of pest prevention and pest control and/or 2) train municipal employees. The success of this training will be measured by the level of participation from municipalities and by their ability to use the information provided as documented in each municipality's deliverable forms.	fy 03/04 $10,000 fy 04/05 $10,000	Continue to conduct annual municipal employee training sessions through the NPDES permit period.
Pesticides	Develop guidance documents to facilitate implementation of pesticide management policies at the local municipal level, such as 1) purchasing/contract or specification language for PCO services and pesticide chemicals and/or 2) standardized forms for documenting integrated pest management efforts. The success of this activity will be measured by the amount of implementation that occurs as documented in each municipality's deliverable forms.	fy 03/04 $500 fy 04/05 $500	Ongoing.

Notes:

IPM – Integrated Pest Management
PCO – Pest Control Operator
STOPPP – San Mateo Countywide Stormwater Pollution Prevention Program
WAM – STOPPP'S Watershed and Monitoring Subcommittee

Table 6. NDS Activities Related to Pollutants of Concern

Pollutant(s)	Ongoing and Planned Activities	Planning Level Program Budget	Schedule/Due Date(s)
Sediment and Potentially Other Pollutants of Concern	Coordinate STOPPP's annual new development workshops. Workshop topics include erosion and sediment control as well as post-construction BMPs, such as using site design, source control and treatment measures to reduce impacts to water quality. The success of the workshops will be evaluated by surveying workshop participants.	fy 03/04 $12,000 fy 04/05 $12,000	Workshops will be conducted annually.
Sediment	Support San Francisco Estuary Program/Regional Board erosion and sediment control workshops. The success of the support for the workshops will be evaluated by the number of municipal staff who have completed this training and have current certifications for Construction Site Planning and Management for Water Quality Protection.	fy 03/04 $500 fy 04/05 $500	Workshops will be conducted annually.
Sediment	Identify ways to improve the enforcement of erosion and sediment control measures at construction sites. This may include reviewing existing ordinances, making recommendations for improving reporting and documentation, and/or providing tools to assist municipalities require post-construction controls.	fy 03/04 $2,200 fy 04/05 $2,200	Each year activities will be identified and conducted and described in STOPPP's Annual Report.
Pesticides	Review the requirements for pesticide reduction measures for new development and significant redevelopment projects that are included in the recently reissued NPDES permits for other stormwater programs, such as the Alameda Countywide Clean Water Program and the Fairfield Suisun Sewer District. Identify tools or steps that will be useful in preparing to meet these or similar requirements.	fy 03/04 $2,000 fy 04/05 $2,000	Prepare a technical memorandum each fiscal year until STOPPP's permit is reissued.
Pesticides	Include in STOPPP's 04/05 new development workshop a presentation regarding the tools or steps that STOPPP will be taking to prepare to meet requirements for pesticide reduction measures for new development and significant redevelopment projects and information about landscaping design methods that minimize the need for pesticides.	fy 04/05 workshop budget is shown above	The workshop will be conducted in fy 04/05.

Notes:

BMP – Best Management Practice
NDS – STOPPP's New Development Subcommittee
STOPPP – San Mateo Countywide Stormwater Pollution Prevention Program

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SAN MATEO COUNTYWIDE
STORMWATER POLLUTION PREVENTION PROGRAM
555 County Center, Redwood City, California 94063 650.599.1406 Fax 650.361.8227

MAR - 1 2005

March 1, 2005

HAND DELIVERED

Mr. Habte-Mariam T. Kifle
Regional Water Quality Control Board
1515 Clay St. Suite 1400
Oakland CA 94612

Subject: Submittal of the Mid-Fiscal Year Report

Dear Habte:

Enclosed are the report and plan required by the NPDES permit for STOPPP and its member municipalities.

The permit requires that STOPPP submit General Program work plans each year for the following two fiscal years. This permit also requires that these work plans be similar in terms of level of detail and format to the work plans contained in the *Stormwater Management Plan*. The enclosed work plans meet these requirements.

Each of these work plans was reviewed and approved by the appropriate subcommittees, and STOPPP's Technical Advisory Committee (TAC) has approved all of the work plans and budgets. Please note that the City/County Association of Governments has not yet approved the enclosed work plans and budgets, but its consideration and approval is expected this spring.

The planning level budgets for each STOPPP component are contingent on the availability of funding.

If you have any questions, please contact me.

Very truly yours,

Robert Davidson
STOPPP Coordinator

Enc: Mid-Fiscal Year Report 2004/05

010154

MID-FISCAL YEAR REPORT 2004/05

San Mateo Countywide
Stormwater Pollution
Prevention Program

A Program of the City/County Association of Governments

Credits

This report is being submitted by the participating agencies in the

San Mateo Countywide Stormwater Pollution Prevention Program

Town of Atherton
City of Belmont
City of Brisbane
City of Burlingame
Town of Colma
City of Daly City
City of East Palo Alto
City of Foster City
City of Half Moon Bay
Town of Hillsborough
City of Menlo Park
City of Millbrae
City of Pacifica
Town of Portola Valley
City of Redwood City
City of San Bruno
City of San Carlos
City of San Mateo
County of San Mateo
City of South San Francisco
Town of Woodside

Implementation of the Program Coordinated by:

San Mateo Countywide Stormwater Pollution Prevention Program
555 County Center, Redwood City, California, 94065

A Program of the City/County Association of Governments
(C/CAG)

Report Prepared by:
County Environmental Health and
EOA, Inc.
(Eisenberg, Oliveri and Associates)

Table 1-1. FY 2005/06 General Program Draft Budget Summary

Budget Categories		FY 2005/06 General Program Budget
Personnel Services		
Executive Director		$25,000
Program Manager		$43,500
Program Secretary		$0
Member Agency Support		$22,500
Miscellaneous		$1,000
	Subtotal	$92,000
Fees and Dues*		
BASMAA Dues		$26,600
Regional Monitoring Program		$76,500
Clean Estuary Partnership		$80,000
	Subtotal	$183,100
Supplies and Other Charges		
Copier and Service Agreement		$0
Publications		$15,000
Conferences and Meetings		$1,500
Education and Training		$0
	Subtotal	$16,500
Additional Expenses		
Data Base Management		$12,500
EDP Consultant Work		$13,000
Controller's Processing Fee @ $.30/APN		$65,000
Miscellaneous (litigation)		$100,000
	Subtotal	$190,500
Tasks in the SWMP		
2.0 Municipal Maintenance		$69,000
3.0 Industrial and Illicit Discharge Controls		$174,000
4.0 Public Information and Participation		$280,159
5.0 New Development		$186,000
6.0 Watershed Assessment and Monitoring		$203,000
	Subtotal	$912,159
	TOTAL BUDGET	$1,394,259

*Assumes fees and dues remain unchanged from FY 2004/05

Table 1-2. FY 2006/07 General Program Draft Budget Summary

Budget Categories		FY 2006/07 General Program Budget
Personnel Services		
Executive Director		$25,000
Program Manager		$43,500
Program Secretary		$0
Member Agency Support		$22,500
Miscellaneous		$1,000
	Subtotal	$92,000
Fees and Dues		
BASMAA Dues		$26,600
Regional Monitoring Program		$76,500
Clean Estuary Partnership		$80,000
	Subtotal	$183,100
Supplies and Other Charges		
Copier and Service Agreement		$0
Publications		$15,000
Conferences and Meetings		$1,500
Education and Training		$0
	Subtotal	$16,500
Additional Expenses		
Data Base Management		$12,500
EDP Consultant Work		$13,000
Controller's Processing Fee @ $.30/APN		$65,000
Miscellaneous (litigation)		$100,000
	Subtotal	$190,500
Tasks in the SWMP		
2.0 Municipal Maintenance		$69,000
3.0 Industrial and Illicit Discharge Controls		$174,000
4.0 Public Information and Participation		$290,449
5.0 New Development		$186,000
6.0 Watershed Assessment and Monitoring		$203,000
	Subtotal	$922,449
	TOTAL BUDGET	$1,404,549

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Table 2-1 Municipal Maintenance General Program Work Plan and Budget - FY 2005/06

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements will be prepared, as appropriate, for approval by the STOPPP and for submittal to the Regional Board. Potential areas for new Performance Standard development include BMPs for mobile fuel vehicles and parking lots and sidewalks	The Maintenance Subcommittee and its work groups will review existing performance standards and make needed revisions every two years beginning in FY 1999/00. A minimum of one performance standard will be developed in FY2005/06.	$ 5,000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$15,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs. Potential projects would be to work with schools on integrated pest management, utilities on controlling potable water discharges or golf courses on other common areas of concern.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$4,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance	See SWMP	$30,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Task 2.10 Integrated Pest Management Continue to work with the Park and Recreation Work Group to implement the integrated pest management (IPM) performance standards.	See SWMP	$15,000	ongoing
	Total Budget	**$ 69,000**	

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Table 2-2 Municipal Maintenance General Program Work Plan and Budget - FY 2006/07

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements will be made, as appropriate, for approval by STOPPP and for submittal to the Regional Board.	Improvements to the performance standards will be formally considered by the Maintenance Subcommittee every two years.	$4,000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$15,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs. Coordinate with the PI/P Subcommittee to design an outreach piece.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$5,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance. Subtasks may include participation in the development of a new 5 year Municipal NPDES Stormwater Permit.	See SWMP	$30,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Task 2.10 Integrated Pest Management Continue to work with the Park and Recreation Work Group to implement the integrated pest management (IPM) performance standards. Conduct IPM training.	See SWMP and Pesticide Management Plan.	$15,000	ongoing
	Total Budget	**$ 69,000**	

Table 3-1. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 2005/06

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation and improvement of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements, if any, may be prepared for approval by STOPPP for submittal to the Regional Water Board.	See SWMP. Performance standards are reviewed every two years. This task will include participation in reviewing, commenting, and representing STOPPP in the adoption of the regional general permit anticipated to occur in the fall of 2005.	$10,000	December 2005
3.2 Provide Guidance on Developing and Implementing Discharge and Business Inspection Plans: STOPPP will assist with developing model materials.	This task will depend on the requirements adopted in the regional general permit.	$10,000	Ongoing
3.3 Assist Compliance with Requirements for Conditionally Exempted Discharges: Continue to facilitate compliance with the requirements for handling non-stormwater discharges that have been identified as conditionally exempted from the permit's discharge prohibition.	This will include providing assistance in implementing the BMPs and Implementation Procedures for Conditionally Exempted Discharges.	$5,000	Ongoing
3.4 Conduct Outreach and Training: This task includes conducting targeted educational outreach and training to municipal staff and to businesses. Educational outreach to businesses will need to focus increasingly on particular pollutants of concern, such as mercury, pesticides, and PCBs.	The CII Subcommittee will be responsible for identifying the target audience and methods used for conducting training and/or other types of educational outreach.	$23,000	June 2006
3.5 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist STOPPP's municipalities to comply with the reporting and other requirements of the NPDES permit; (including development of deliverable reporting forms and preparation of the industrial and illicit discharge controls section of STOPPP's Annual Report); develop General Program work plans and budgets; assist with any additional planning needed to improve the industrial and illicit discharge controls section of the Plan; continue to assist the CII Subcommittee to conduct its meetings and other activities.	See SWMP	$ 61,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
3.6 Develop and Implement Pollutants of Concern Plan: This includes tasks required by the regional general permit.	The Regional Water Board is developing TMDLs for specific pollutants of concern, and STOPPP will need to respond to pollutant load reduction tasks and/or allocations that it is assigned.	$55,000	June 2006

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.7 Assist with NPDES Permit Reissuance: This task includes providing assistance to STOPPP in working with the Regional Water Board staff on the regional general permit.	The Regional Water Board is developing a regional general permit that will require coordination of comments with other municipal stormwater programs and negotiations prior to adoption.	$10,000	December 2005
	Total Budget	**$ 174,000**	

Table 3-2. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 2006/07

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation and improvement of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements, if any, may be prepared for approval by STOPPP for submittal to the Regional Board.	Possible improvements in the performance standards will be formally considered by the Commercial, Industrial, and Illicit Discharge (CII) Subcommittee every two years and will not occur in FY 2006/07.	$0	N.A.
3.2 Provide Guidance on Developing and Implementing Discharge and Business Inspection Plans: STOPPP will assist with developing model materials.	This task will include updating materials that are used to help implement the anticipated performance standards.	$10,000	Ongoing
3.3 Assist Compliance with Requirements for Conditionally Exempted Discharges: Continue to facilitate compliance with the requirements for handling non-stormwater discharges that have been identified as conditionally exempted from the permit's discharge prohibition.	This will include providing assistance in implementing the BMPs and Implementation Procedures for Conditionally Exempted Discharges or whatever similar requirements have been adopted as part of the regional general permit.	$5,000	Ongoing
3.4 Conduct Outreach and Training: This task includes conducting targeted educational outreach and training to municipal staff and to businesses. Educational outreach to businesses will need to focus increasingly on particular pollutants of concern, such as mercury and PCBs.	The CII Subcommittee will be responsible for identifying the target audience and methods used for conducting training and/or other types of educational outreach. The decision on which audience to target will consider previous trainings.	$23,000	June 2007
3.5 Assist with Regulatory Compliance and Planning: This	See SWMP	$ 61,000	NPDES permit

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
task includes the following activities: assist STOPPP's municipalities to comply with the reporting and other requirement of the NPDES permit; (including development of deliverable reporting forms and preparation of the industrial and illicit discharge controls section of STOPPP's Annual Report); develop General Program work plans and budgets; assist with any additional planning needed to improve the industrial and illicit discharge controls section of the Plan; and continue to assist the CII Subcommittee to conduct its meetings and other activities.			required reports will be completed by required dates. other activities will be ongoing
3.6 Implement Pollutants of Concern Tasks: This includes implementing pollutants of concern tasks contained in the regional general permit and/or in a plan developed to comply with this permit.	The Regional Water Board is developing TMDLs for specific pollutants of concern, and STOPPP will need to respond to pollutant load allocations that it is assigned.	$70,000	ongoing
3.7 Assist with NPDES Permit Reissuance: This task includes providing assistance to STOPPP in working with the Regional Water Board staff to resolve any issues raised by the adopted regional general permit.	There may be areas where additional follow up with the Regional Water Board staff or others is needed regarding the adopted regional general permit.	$5,000	June 2007
	Total Budget	**$ 174,000**	

Table 4-1 Public Information and Participation General Program Work Plan and Budget

Task	2005-2006	Task Description	Responsible Staff and Plan	Hours 2005	Hours 2006	Total Hours	Cost	Materials Cost	Total
				$103	$107				
4.1		**Implement and Assist with the Performance Standards**							
	4.1.1	Performance Standards				20	$ 2,100.00	$ -	$ 2,100.00
		Assist municipalities to understand and implement standards. Provide list of suggestions to improve standards	Ken	10	10	20	$ 2,100.00		
4.2		**Assist with Regulatory Compliance and Planning**							
	4.2.1	Provide support to P/IP				84	$ 8,820.00	$ 500.00	$ 9,320.00
		Attend 6 monthly meetings and assist chair with preparation, discussion topics and handouts. Update SC on other P/IP activity in State i.e. BASMAA							
		Meeting attendance	Susan	18	18	36	$ 3,780.00		
		Meeting preparation	Susan	24	24	48	$ 5,040.00		
		materials						$ 500.00	
	4.2.2	Annual Report				80	$ 8,400.00	$ -	$ 8,400.00
		Assist EOA in preparing the P/IP section of the Annual Report	Ken and Susan will prepare PIP section.	40	40	80	$ 8,400.00		
4.3		**Encourage Public Involvement, Outreach, and Education**							
	4.3.1	Point of Purchase - IPM Point of Purchase Campaign				334	$ 35,070.00	$ 6,000.00	$ 41,070.00
		12 meetings - 4 hours	Sarah	24	24	48	$ 5,040.00		
		Store visits and set up - 19 stores 3 hrs each +10hrs per season correspondence, training coord.	Sarah	143	143	286	$ 30,030.00		
		Materials-signage, books, etc						$ 6,000.00	
	4.3.2	Website/ Informational Materials				140	$ 14,660.00	$ 6,000.00	$ 20,660.00
		Maintain website with a registered domain name that includes all STOPPP brochures, IPM information and BMPs. Advertise website in all STOPPP publications, and on promotional items	Contractor/Susan	60	60	120	$ 12,600.00	$ 6,000.00	
		Contract Administration	Susan	20		20	$ 2,060.00		
	4.3.3	Promotional Items, pamphlets, displays, and exhibit items				90	$ 9,470.00	$ 16,500.00	$ 25,970.00
		Assist in purchasing promotional items for fair	Susan	0	10	10	$ 1,070.00	$ 6,500.00	
		Reprint brochures		40	40	80	$ 8,400.00	$ 10,000.00	
	4.3.5	Mercury campaign	Partner with HHW program			40	$ 4,280.00	$ 6,000.00	$ 10,280.00
		Mercury POP campaign			20	20	$ 2,140.00		
		Fluorescent Lamp Collection Planning	Susan	0	10	10	$ 1,070.00		
		Coordinate with transfer stations and retail outlets to collect lamps	Susan	0	10	10	$ 1,070.00		
		Disposal	HHW Program						
		Outreach materials						$ 6,000.00	

Table 4-1 Public Information and Participation General Program Work Plan and Budget

4.3.6	Elementary Outreach				40	$ 4,200.00	$ 10,000.00	$ 14,200.00
	Partner with the Used Oil Program to have Zun Zun perform at County Elementary Schools.							
	Contract Administration	Susan	20	20	40	$ 4,200.00		
	Shows	PIP Funding					$ 10,000.00	
4.3.7	Develop Newspaper advertising campaign with stormwater chemicals of concern				40	$ 4,280.00	$ 40,000.00	$ 44,280.00
	Contract with newspaper to run ads quarterly	Sarah	0	40	40	$ 4,280.00		
	Ad costs	Newspapers					$ 40,000.00	
4.3.8	Cable Television campaign				40	$ 4,280.00	$ 20,000.00	$ 24,280.00
	Contract with cable 26 weeks	Contractor			0		$ 20,000.00	
	write contract with cable	Susan	0	40	40	$ 4,280.00		
4.3.9	Trash Campaign Kick off				40	$ 4,200.00	$ 40,000.00	$ 44,200.00
	Contract with non profit program to coordinate trash campaign, community outreach, coastal cleanup and other community based awareness about the effects of trash on watersheds - ideas work w/ food establishment BMPs, Cal Trans	Contractor					$ 40,000.00	
	Contract Administration	Susan	20	20	40	$ 4,200.00		
4.4	**Assist with Focused Staff Training**							
4.4.1	Focused Staff training				50	$ 5,250.00	$ 20,000.00	$ 25,250.00
	Develop training videos based on live training provided to TAC and other subcommittees	Contractor					$ 20,000.00	
	Work with contractor to develop and edit tapes about Inspector Training	Ken	25	25	50	$ 5,250.00		
4.5	**Collaborate with Other Groups**							
4.5.1	Community Outreach Grants - Collaborate with Volunteer Groups				33	$ 3,399.00	$ 450.00	$ 3,849.00
	Provide STOPPP with an application to be distributed by the SC. Conduct 2-hr grant workshop.							
	Update application	Susan	8	0	8	$ 824.00		
	Update database and organinze mailing distribution	Susan	20	0	20	$ 2,060.00		
	mailing printing	mail room					$ 450.00	
	press release		5		5	$ 515.00		
4.5.2	Assist other STOPPP committees				60	$ 6,300.00	0	$ 6,300.00
	Work with other subcommittees to integrate P/IP activities with the general program components. This may involve participating in other SCs, inviting SC chairs to participate in PIP meetings, or developing educational materials for Employee Training.		30	30	60	$ 6,300.00		
		Total			1091	$ 114,709.00	$ 165,450.00	$ 280,159.00

Table 4-2 Public Information and Participation General Program Work Plan and Budget

Task	2006-2007	Task Description	Responsible Staff and Plan	Hours 2006	Hours 2007	Total Hours	Cost	Materials Cost	Total
				$107	$110				
4.1		**Implement and Assist with the Performance Standards**							
	4.1.1	Performance Standards				20	$ 2,170.00	$ -	$ 2,170.00
		Assist municipalities to understand and implement standards. Provide list of suggestions to improve standards	Ken	10	10	20	$ 2,170.00		
4.2		**Assist with Regulatory Compliance and Planning**							
	4.2.1	Provide support to P/IP				84	$ 9,114.00	$ 500.00	$ 9,614.00
		Attend 6 monthly meetings and assist chair with preparation, discussion topics and handouts. Update SC on other P/IP activity in State i.e. BASMAA							
		Meeting attendance	Susan	18	18	36	$ 3,906.00		
		Meeting preparation	Susan	24	24	48	$ 5,208.00		
		materials						$ 500.00	
	4.2.2	Annual Report				80	$ 8,680.00	$ -	$ 8,680.00
		Assist EOA in preparing the P/IP section of the Annual Report	Ken and Susan will prepare PIP section.	40	40	80	$ 8,680.00		
4.3		**Encourage Public Involvement, Outreach, and Education**							
	4.3.1	Point of Purchase - IPM Point of Purchase Campaign				334	$ 36,239.00	$ 6,000.00	$ 42,239.00
		12 meetings - 4 hours	Sarah	24	24	48	$ 5,208.00		
		Store visits and set up - 19 stores 3 hrs each +10hrs per season	Sarah	143	143	286	$ 31,031.00		
		correspondence, training coord.							
		Materials-signage, books, etc						$ 6,000.00	
	4.3.2	Website/ Informational Materials				140	$ 15,160.00	$ 6,000.00	$ 21,160.00
		Maintain website with a registered domain name that includes all STOPPP brochures, IPM information and BMPs. Advertise website in all STOPPP publications, and on promotional items	Contractor/Susan	60	60	120	$ 13,020.00	$ 6,000.00	
		Contract Administration	Susan	20		20	$ 2,140.00		
	4.3.3	Promotional Items, pamphlets, displays, and exhibit items				90	$ 9,780.00	$ 16,500.00	$ 26,280.00
		Assist in purchasing promotional items for fair	Susan	0	10	10	$ 1,100.00	$ 6,500.00	
		Reprint brochures		40	40	80	$ 8,680.00	$ 10,000.00	
	4.3.5	Mercury campaign	Partner with HHW program			40	$ 4,400.00	$ 6,000.00	$ 10,400.00
		Mercury POP campaign			20	20	$ 2,200.00		
		Fluorescent Lamp Collection Planning	Susan	0	10	10	$ 1,100.00		
		Coordinate with transfer stations and retail outlets to collect lamps	Susan	0	10	10	$ 1,100.00		
		Disposal	HHW Program						
		Outreach materials						$ 6,000.00	

Table 4-2 Public Information and Participation General Program Work Plan and Budget

06-07 Draft

	4.3.6	Elementary Outreach				40	$ 4,340.00	$ 10,000.00	$ 14,340.00
		Partner with the Used Oil Program to have Zun Zun perform at County Elementary Schools.							
		Contract Administration	Susan	20	20	40	$ 4,340.00		
		Shows	PIP Funding					$ 10,000.00	
	4.3.7	Develop Newspaper advertising campaign with stormwater chemicals of concern				40	$ 4,400.00	$ 40,000.00	$ 44,400.00
		Contract with newspaper to run ads quarterly	Sarah	0	40	40	$ 4,400.00		
		Ad costs	Newspapers					$ 40,000.00	
	4.3.8	Cable Television campaign				40	$ 4,400.00	$ 20,000.00	$ 24,400.00
		Contract with cable 26 weeks	Contractor			0		$ 20,000.00	
		write contract with cable	Susan	0	40	40	$ 4,400.00		
	4.3.9	Trash Campaign Continuation				40	$ 4,340.00	$ 40,000.00	$ 44,340.00
		Contract with non profit program to coordinate trash campaign, community outreach, coastal cleanup and other community based awareness about the effects of trash on watersheds	Contractor					$ 40,000.00	
		Contract Administration	Susan	20	20	40	$ 4,340.00		
4.4		**Assist with Focused Staff Training**							
	4.4.1	Focused Staff training				50	$ 5,425.00	$ 20,000.00	$ 25,425.00
		Develop training videos based on live training provided to TAC and other subcommittees	Contractor					$ 20,000.00	
		Work with contractor to develop and edit tapes about Inspector Training	Ken	25	25	50	$ 5,425.00		
4.5		**Collaborate with Other Groups**							
	4.5.1	Community Outreach Grants - Collaborate with Volunteer Groups				33	$ 3,531.00	$ 450.00	$ 3,981.00
		Provide STOPPP with an application to be distributed by the SC.							
		Update application	Susan	8	0	8	$ 856.00		
		Update database and organinze mailing distribution	Susan	20	0	20	$ 2,140.00		
		mailing printing	mail room					$ 450.00	
		press release		5		5	$ 535.00		
	4.5.2	Assist other STOPPP committees				120	$ 13,020.00	0	$ 13,020.00
		Work with EOA and other subcommittees to integrate P/IP activities with the general program components, developing public, municipal and commercial pollution prevention outreach materials, programs and trainings.		60	60	120	$ 13,020.00		
			Total			1151	$ 124,999.00	$ 165,450.00	$ 290,449.00

5-1. New Development and Construction Controls General Program Work Plan and Budget - FY 2005/06

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: Continue to assist the municipalities understand and implement the updated performance standards including the pesticide requirements for new development projects. This will include, through New Development Subcommittee meetings and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP. Performance standards are reviewed every two years. This task will include participation in reviewing, commenting, and representing STOPPP in the adoption of the regional general permit anticipated to occur in the fall of 2005.	$10,000	Ongoing
5.2 Assist with the Implementation of Provision C.3: Continue to assist municipalities to implement source controls, site design measures, post-construction stormwater treatment measures and provisions for the continued operation and maintenance of stromwater treatment controls as part of the municipalities' new development review approval processes. This may include, through the New Development Subcommittee and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP.	$55,000	Ongoing
5.3 Assist with Implementation of the Hydrograph Modification Management Plan: Assist municipalities in the implementation of the HMP that is ultimately approved by the Regional Board after its submittal in May 2005. This may include any revisions required by the Regional Board, as well as special outreach and training programs timed to coincide with the date on which the Regional Board ultimately requires the HMP to be implemented.	See SWMP. Required by NPDES permit amendment.	$83,000	See permit amendment
5.4 Assist with Improving Construction Site Controls: Assist municipalities in conducting appropriate inspections and enforcement for construction sites and project-specific stormwater management plans.	See SWMP.	$2,000	Ongoing
5.5 Promote Outreach and Training: Reinforce and, as necessary, expand educational outreach to agency planning and engineering staff, planning commissions, city councils, builders, and builders' consultants and contractors.	See SWMP. This task includes one workshop for municipal staff, up to two outreach events, and the development or revision of one outreach piece, as appropriate.	$20,000	June 2006
5.6 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); developing two year work plans and budgets for	See SWMP.	$16,000	See permit amendment

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
General Program; providing any improvements to the new development section of the SWMP; assisting the NDS in conducting meetings; and developing a detailed NDS work plan for each fiscal year.			
	Total Budget	$186,000	

5-2. New Development and Construction Controls General Program Work Plan and Budget - FY 2006/07

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: Continue to assist the municipalities understand and implement the updated performance standards including the pesticide requirements for new development projects. This will include, through New Development Subcommittee meetings and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP. Performance standards are reviewed every two years.	$5,000	Ongoing
5.2 Assist with the Implementation of Provision C.3: Continue to assist municipalities to implement source controls, site design measures, post-construction stormwater treatment measures and provisions for the continued operation and maintenance of stromwater treatment controls as part of the municipalities' new development review approval processes. This may include, through the New Development Subcommittee and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP.	$55,000	Ongoing
5.3 Assist with Implementation of the Hydrograph Modification Management Plan: Assist municipalities in the implementation of the HMP that is ultimately approved by the Regional Board after its submittal in May 2005. This may include any revisions required by the Regional Board, as well as special outreach and training programs timed to coincide with the date on which the Regional Board ultimately requires the HMP to be implemented.	See SWMP. Required by NPDES permit amendment.	$83,000	See permit amendment

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.4 Assist with Improving Construction Site Controls: Assist municipalities in conducting appropriate inspections and enforcement for construction sites and project-specific stormwater management plans.	See SWMP.	$2,000	Ongoing
5.5 Promote Outreach and Training: Reinforce and, as necessary, expand educational outreach to agency planning and engineering staff, planning commissions, city councils, builders, and builders' consultants and contractors.	See SWMP. This task includes one workshop for municipal staff, up to two outreach events, and the development or revision of one outreach piece, as appropriate.	$20,000	June 2006
5.6 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); developing two year work plans and budgets for General Program; providing any improvements to the new development section of the SWMP; assisting the NDS in conducting meetings; and developing a detailed NDS work plan for each fiscal year.	See SWMP.	$21,000	See permit
	Total Budget	**$186,000**	

DRAFT

Table 6-1. Watershed Assessment and Monitoring General Program Work Plan and Budget - FY 2005/06

Task Number and Description	Rationale/Background	Planning Budget	Schedule/ Due Date
6.1 Conduct Watershed Assessments: Perform chemical, biological and/or physical monitoring in selected San Mateo County watersheds. In the Cordilleras Creek watershed, activities will include field probe measurements, physical habitat assessment, and rapid bioassessment. Other potential assessment activities will include toxicity screening, pollutant analysis (e.g., pesticides), compiling existing data, designing monitoring programs and developing and implementing strategies to assess and manage trash in San Mateo County watersheds.	Assess water quality conditions in representative watersheds in San Mateo County, evaluate stormwater impacts and assist STOPPP to solve creek drainage basin-specific water quality impairment problems.	$133,000	Work will be performed during FY 2005/06.
6.2 Develop Plans to Address Specific Pollutants of Concern: Develop plans to address specific pollutants of concern and perform related special studies as appropriate.	Assist STOPPP to plan management actions to address specific pollutants of concern in relation to STOPPP's NPDES permit requirements and TMDLs.	$40,000	Work will be performed during FY 2005/06.
6.3 Participate in Regional Monitoring and TMDL-related Programs: Participate in BASMAA (e.g., Monitoring Committee), the Clean Estuary Partnership, the San Francisco Estuary Regional Monitoring Program and the Bay Area Macroinvertebrate Bioassessment Information Network.	Participate in regional efforts to monitor water quality and solve water quality impairment problems.	$18,000*	Ongoing.
6.4 Perform Activities Related to Regulatory Compliance and Planning: Prepare the WAM component section of STOPPP's annual report and work plans, and coordinate the Watershed Assessment and Monitoring Subcommittee.	Meet specific requirements in STOPPP's NPDES permit, oversee current watershed assessment and monitoring activities and plan future activities.	$12,000	NPDES permit required reports will be completed by the required dates. Other activities will be ongoing.
	Total Budget	**$203,000**	

* STOPPP's funding of BASMAA, the Clean Estuary Partnership and the San Francisco Estuary Regional Monitoring Program is not included here, but is shown under the General Program Budget Summary, Fees and Dues.

Table 6-2. Watershed Assessment and Monitoring General Program Work Plan and Budget - FY 2006/07

Task Number and Description	Rationale/Background	Planning Budget	Schedule/ Due Date
6.1 Conduct Watershed Assessments: Perform chemical, biological and/or physical monitoring in selected San Mateo County watersheds. Potential assessment activities will include field probe measurements, physical habitat assessment, rapid bioassessment, toxicity screening, pollutant analysis (e.g., pesticides), compiling existing data, designing monitoring programs and developing and implementing strategies to assess and manage trash in San Mateo County watersheds.	Assess water quality conditions in representative watersheds in San Mateo County, evaluate stormwater impacts and assist STOPPP to solve creek drainage basin-specific water quality impairment problems.	$133,000	Work will be performed during FY 2006/07.
6.2 Develop Plans to Address Specific Pollutants of Concern: Develop plans to address specific pollutants of concern and perform related special studies as appropriate.	Assist STOPPP to plan management actions to address specific pollutants of concern in relation to STOPPP's NPDES permit requirements and TMDLs.	$40,000	Work will be performed during FY 2006/07.
6.3 Participate in Regional Monitoring and TMDL-related Programs: Participate in BASMAA (e.g., Monitoring Committee), the Clean Estuary Partnership, the San Francisco Estuary Regional Monitoring Program and the Bay Area Macroinvertebrate Bioassessment Information Network.	Participate in regional efforts to monitor water quality and solve water quality impairment problems.	$18,000*	Ongoing.
6.4 Perform Activities Related to Regulatory Compliance and Planning: Prepare the WAM component section of STOPPP's annual report and work plans, and coordinate the Watershed Assessment and Monitoring Subcommittee.	Meet specific requirements in STOPPP's NPDES permit, oversee current watershed assessment and monitoring activities and plan future activities.	$12,000	NPDES permit required reports will be completed by the required dates. Other activities will be ongoing.
	Total Budget	**$203,000**	

* STOPPP's funding of BASMAA, the Clean Estuary Partnership and the San Francisco Estuary Regional Monitoring Program is not included here, but is shown under the General Program Budget Summary, Fees and Dues.

Pilot Study to Identify Trash Sources and Management Measures at an In-stream Trash Accumulation Area

San Mateo County, California

San Mateo Countywide
Stormwater Pollution
Prevention Program

August 2005

SUMMARY

At the recommendation of San Francisco Bay Region Water Board staff, all Bay area urban creeks, lakes and shorelines were placed on the State Water Resources Control Board 2002 "Monitoring List" due to the potential of trash to impair water quality. In response, STOPPP initiated a program to begin identifying and addressing trash in urban water bodies in San Mateo County. The program is initially focusing on urban creeks.

The trash pilot study was a follow-up to STOPPP's FY 2003/04 survey on existing municipal trash management practices and known trash problem areas. The objective was to attempt to identify trash sources and management measures at a selected in-stream trash accumulation area. The methodology included applying a Rapid Trash Assessment protocol developed by Water Board staff in conjunction with research on adjacent and upstream land uses, sources and transport pathways. A reach of San Mateo Creek in Gateway Park in the City of San Mateo was selected for the pilot study.

Assessments using the Rapid Trash Assessment protocol were performed at the study site during three different hydrologic periods: the dry season, in mid-winter between rainstorms, and in the spring. Assessment dates were October 7, 2004, January 20, 2005, and May 16, 2005. In addition, City of San Mateo staff was interviewed regarding adjacent and upstream land uses, potential trash sources and transport pathways, and current municipal trash management activities. Principal findings of the pilot study included:

- Trash was removed during each assessment but persistently accumulated at the site, though levels and types of trash varied during each assessment. Potential causes of this temporal variation include varying public use of Gateway Park, varying rainfall patterns, occasional site cleanups by the City of San Mateo Parks Department, and site conditions intermittently interfering with the assessment (e.g., abundant algal growth interfered with visually sighting pieces of trash below the creek waterline during the May 2005 assessment).

- Field reconnaissance in the vicinity of the site and interviews with City of San Mateo staff indicated that littering at Gateway Park and nearby upstream bridges and occasional dumping from the bridges were the most likely sources of trash to the site, rather than accumulation from further upstream sources or discharges from storm drains in the vicinity of the site. This conclusion was supported by the results of the trash assessment fieldwork performed by STOPPP, based on the types of trash observed by field staff, evidence of littering at the site, and lack of indications of waterborne trash accumulating on the creek bed or banks.

- The results of the pilot study suggested that applying the Rapid Trash Assessment protocol, in conjunction with research on adjacent and upstream land uses, sources and transport pathways, is potentially a useful methodology for addressing trash in San Mateo County creeks. More specifically, this methodology may help identify trash sources and inform the selection of trash management measures at in-stream trash accumulation sites. However, further confirmation of the utility of the methodology would require additional pilot testing at a variety of trash sites.

The City of San Mateo may wish to implement measures to help mitigate littering and dumping at Gateway Park and the nearby upstream bridges. Potential measures include erecting signs prohibiting dumping and littering. The effectiveness of such signs would potentially be

enhanced by including educational messages about the value of San Mateo Creek as a natural and community resource.

Pilot Study to Identify Trash Sources and Management Measures at an In-stream Trash Accumulation Area

San Mateo County, California

INTRODUCTION

California Regional Water Quality Control Board, San Francisco Bay Region (Water Board) staff has indicated that trash potentially impairs water quality in all Bay Area surface waters (SFBRWQCB 2001). At the Water Board's recommendation, all Bay area urban creeks, lakes and shorelines were placed on the State Water Resources Control Board 2002 "Monitoring List" due to the potential of trash to impair water quality. In response, the San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) initiated a program to begin identifying and addressing trash issues in urban water bodies in San Mateo County. The program is initially focusing on urban creeks.

This FY 2004/05 trash pilot study was a follow-up to STOPPP's FY 2003/04 survey on existing municipal trash management practices and known trash problem areas. The objective of the pilot study was to attempt to identify trash sources and management measures at a selected in-stream trash accumulation area. The methodology included applying a Rapid Trash Assessment protocol developed by Water Board staff in conjunction with research on adjacent and upstream land uses, sources and transport pathways, in accordance with the study work plan (STOPPP 2004).

Rapid Trash Assessment

During 2002, Water Board staff developed a Rapid Trash Assessment methodology as a tool to monitor trash levels in creeks and potentially help inform efforts to identify sources and controls. STOPPP subsequently developed a work plan to pilot-test this procedure (STOPPP 2002). STOPPP implemented the work plan during September 2002 in collaboration with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). The pilot study (SCVURPPP and STOPPP 2003) concluded that the Rapid Trash Assessment procedure might be useful for:

- measuring baseline levels of trash,
- identifying and prioritizing trash problem areas,
- identifying potential sources of trash, and
- identifying Best Management Practices (BMPs) that target trash and evaluating their effectiveness.

The study concluded that implementing the Rapid Trash Assessment at all urban creeks in jurisdictions the size of San Mateo and Santa Clara Counties is infeasible; rather, priority should be given to evaluating known accumulation and dumping areas. The study also recommended modifications to the Water Board methodology that would increase its usefulness for use in municipal trash control programs. Water Board staff subsequently released later versions of the Rapid Trash Assessment that incorporated some of the pilot study recommendations.

Water Board staff has continued to apply the Rapid Trash Assessment in Bay Area watersheds monitored through the statewide Surface Water Ambient Monitoring Program (SWAMP).

FY 2003/04 Survey

In June 2003, STOPPP submitted a FY 2003/04 trash control work plan (STOPPP 2003) to the Water Board. The work plan tasks included surveying San Mateo County municipalities regarding known trash accumulation/dumping areas and existing municipal trash management efforts. STOPPP convened a trash control work group to oversee the survey and generally assist efforts to assess and manage trash in San Mateo County. The work group included maintenance, parks and recreation, code enforcement and recycling program staff from STOPPP's municipalities.

The completed survey report (STOPPP 2004) summarizes activities carried out by most San Mateo County municipalities that fall under three general categories of municipal trash management practices:

- Local government services to collect and cleanup trash, including routine trash collection, street sweeping, storm drain facility maintenance, recycling programs, trash cleanup services by municipal staff or contractors, and facilitation of volunteer creek/shoreline cleanup events.

- Enforcement procedures to discourage littering, dumping, and discharge of trash, including the use of code enforcement staff to enforce municipal ordinances related to trash, inspection of construction sites and source control conditions of approval for trash/recycling areas at new developments.

- Incentive and education programs, such as anti-littering campaigns, community recognition programs, and outreach at community events regarding litter control.

The survey report also discusses municipal organizational structure in relation to trash management and how municipalities evaluate the success of their trash management activities. Finally, the report documents trash accumulation/dumping areas reported by municipal staff, including the location of each area, the origin of the trash, and the source of information about the area. Most of the reported accumulation/dumping areas were not within creeks.

METHODS

Site Selection

STOPPP General Program staff initially narrowed potential pilot study locations to three in-stream creek sites, based on the results of the FY 2003/04 survey and discussions with STOPPP's Trash Control Work Group. The sites were locations on San Pedro, San Mateo and Redwood Creeks where trash accumulates. A reach of San Mateo Creek in Gateway Park was

selected (Figure 1) based on the following factors:

- the study site was identified in STOPPP's FY 2003/04 survey on existing municipal trash problem areas,
- City of San Mateo staff was available to assist with the fieldwork and land use research,
- prior year data were available from the Water Board's Surface Water Ambient Monitoring Program (SWAMP), which also employed the Rapid Trash Assessment protocol, and
- the study site was accessible and not located on private property.

Research on Land Use, Sources, Pathways and Management Activities

General Program staff interviewed City of San Mateo Public Works and Parks and Recreation staff regarding adjacent and upstream land uses, potential trash sources and transport pathways, and current municipal trash management activities. City staff also accompanied General Program staff on a drive-by reconnaissance of the study site and vicinity on October 20, 2004.

Trash Field Assessments

The pilot study incorporated Version 8 of the Rapid Trash Assessment protocol (Appendix A). The protocol is applied at a 100-linear foot section of creek. The study assessment site was located along San Mateo Creek adjacent to a condominium complex in Gateway Park in the City of San Mateo (Appendix B contains photographs of the study site). Two landmarks identified the ends of the assessment site – a small willow tree on the south bank of the creek marked the downstream end and a dead Eucalyptus stump on the north bank marked the upstream end. Assessments were performed during three differing hydrologic periods: the dry season, in mid-winter between rainstorms, and in the spring. Assessment dates were October 7, 2004, January 20, 2005, and May 16, 2005. Field staff attempted to collect all of the trash at the assessment site during each assessment episode. Water Board and General Program staff performed the initial October assessment; City of San Mateo staff assisted General Program staff to perform the assessments in January and May. The initial assessment was performed jointly with Water Board staff to ensure that the assessment site was identical to the SWAMP location and that STOPPP applied the protocol consistently to the SWAMP.

RESULTS AND DISCUSSION

Research on Land Use, Sources, Pathways and Management Activities

The field reconnaissance revealed that an upstream, accessible section of San Mateo Creek in Arroyo Court Park accumulated natural woody debris but little trash. This park is located in a residential neighborhood. City of San Mateo staff believes that trash accumulation in the creek is generally less of a problem in the mainly residential areas west of El Camino Real than east

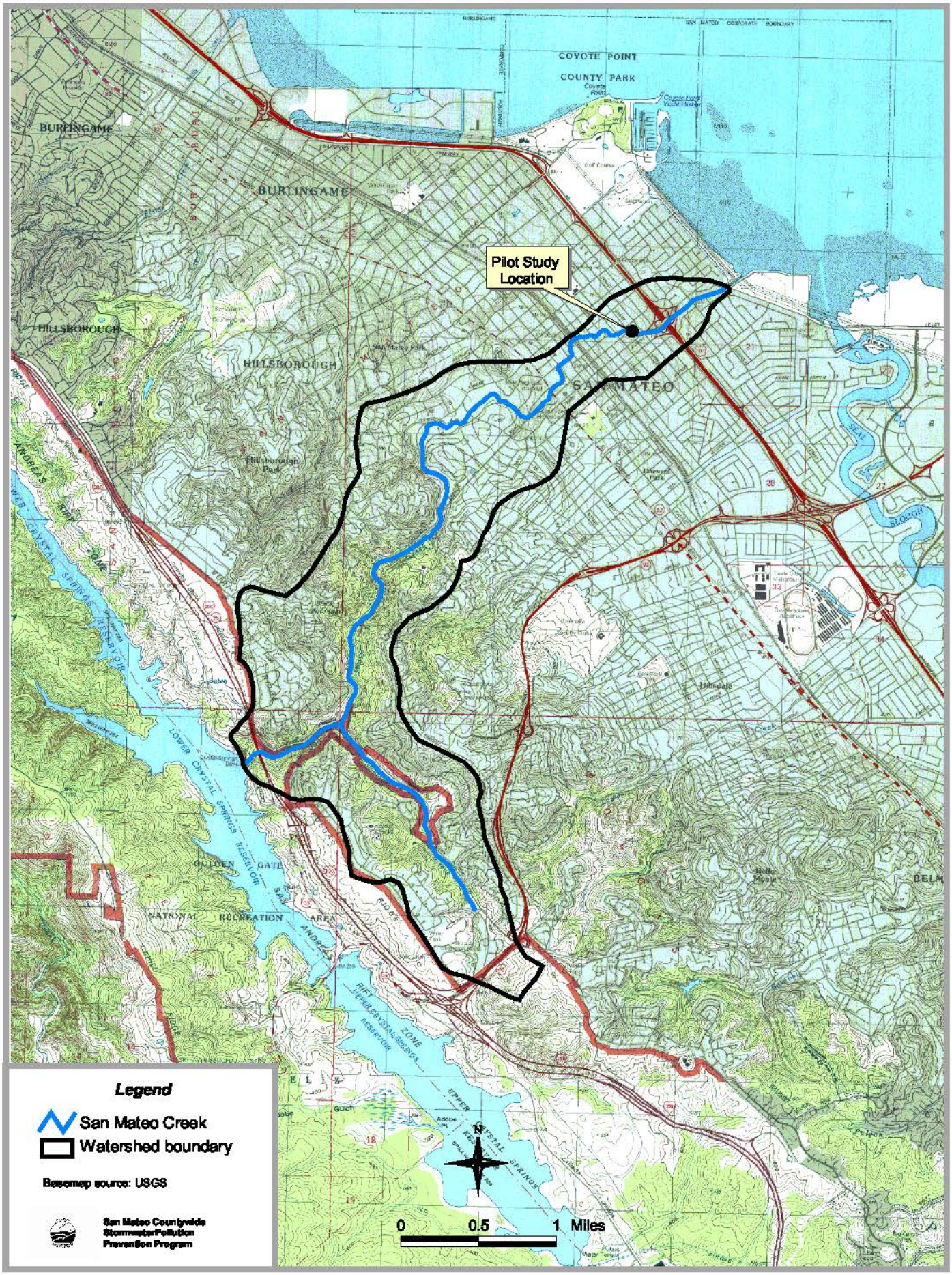


Figure 1. Pilot Study location.

of this roadway. City staff identified the following potential trash sources to the study site:

- Littering at Gateway Park.
- Littering and occasional dumping from bridges upstream and nearby to the study site. The bridges are the Fremont Street crossing over San Mateo Creek on the western end of Gateway Park and a small pedestrian bridge in Gateway Park downstream of the Fremont Street bridge. Dumping from the bridges was inferred based on the presence of bags of trash on the creek bank beneath the bridges.
- Litter from downtown commercial areas transported by storm drains that discharge to San Mateo Creek upstream of the study site.
- Homeless encampments along a section of San Mateo Creek that is adjacent to the railroad station at Main Street. This relatively inaccessible reach is fenced off and has steep banks.

City staff identified littering at Gateway Park and the nearby upstream bridges and occasional dumping from the bridges as the most likely sources of trash to the study site. City staff also identified the following trash management activities at Gateway Park and upstream:

- Parks Department staff indicated that workers remove easily retrievable trash items from the creek in Gateway Park as frequently as once per week. Workers perform a more thorough cleanup of the creek in Gateway Park every one to two months, which includes using waders to remove more difficult to reach trash items.
- Juvenile work crews clean up the creek and banks at the railroad station site.
- The City has erected fences at the Fremont Street and 2nd Avenue bridge and the railroad station site to prevent illegal dumping from vehicles.

Trash Field Assessments

Tables 1 and 2 and Figures 2, 3 and 5 summarize the results of STOPPP's three episodes of applying the Rapid Trash Assessment protocol during the pilot study. It should be noted that the results from STOPPP's third assessment (May 16, 2005) might understate levels of trash. Abundant algal growth on the surface of the water interfered with visually sighting pieces of trash below the creek waterline during this assessment. Figures 2 - 4 summarize earlier data gathered by Water Board staff during the SWAMP using similar methods at the same site.

Table 1. Trash Item Tally for STOPPP Trash Pilot Assessments

Date	Plastic	Bio-hazard	Construc-tion Debris	Misc	Metal	Large	Toxic	Biode-gradable	Glass	Fabric and Cloth	Total Pieces of Trash
10/7/04	68	1	6	46	16	0	0	26	39	3	205
1/20/05	29	0	12	35	18	0	0	9	58	1	162
5/16/05	13	1	0	15	24	0	0	5	32	2	92

Table 2. Parameter Scores[1] for STOPPP Trash Pilot Assessments

Date	Level of Trash (Qualitative)	Number of Trash Items	Threat to Aquatic Life	Threat to Human Health	Illegal Dumping/ Littering	Accumulation of Trash	TOTAL
10/7/04	11	4	4	9	10	15	53
1/20/05	17	5	6	5	9	15	57
5/16/05	14	6	8	10	12	15	65

[1]Each parameter is scored from 0 to 20. Higher parameter scores indicate better conditions (i.e., lower qualitative and quantitative levels of trash, lower potential impacts to aquatic life and human health, and less illegal dumping, littering and trash accumulation).

Based on the trash tallies and parameter scores, the levels and types of trash at the study site varied considerably. For the STOPPP assessments, total trash tallies and parameters scores (Figure 2) indicated higher trash levels in the fall (October 7, 2004) and lower levels in the late spring (May 16, 2005).[1] The earlier SWAMP data (Figure 2) showed a different pattern, with lower trash levels in the fall (October 20, 2003) and higher levels in the winter (February 13, 2004) and preceding spring (March 21, 2003). SWAMP data were collected at several different locations on San Mateo Creek in 2003 and 2004 and each location showed the same trend of higher trash levels during periods with higher flows (spring and winter) and lower levels in the relatively dry summer and fall seasons.

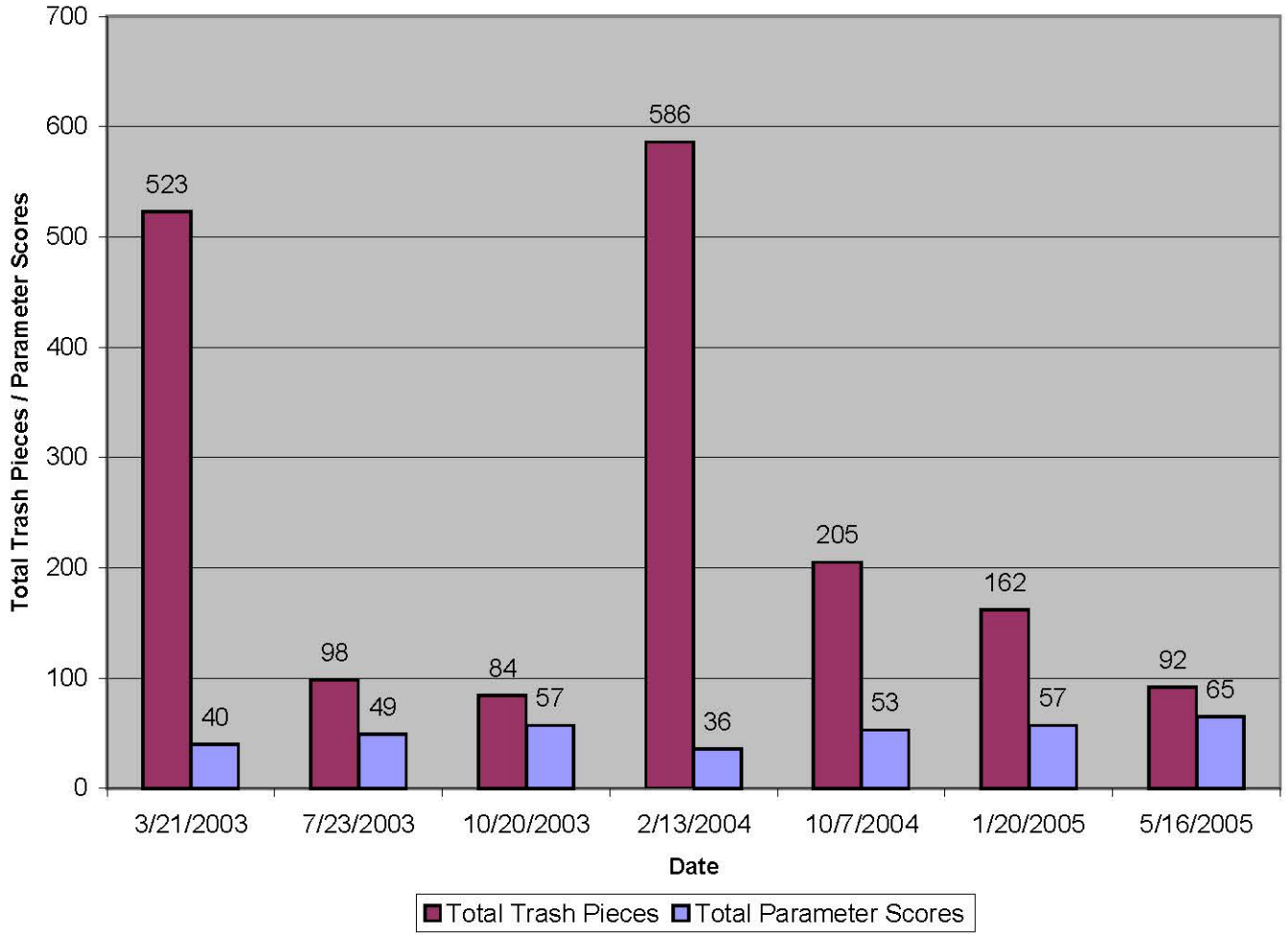
Potential causes of the temporal variation in trash levels and types include varying public use of Gateway Park, varying rainfall patterns, occasional site cleanups by the City of San Mateo Parks Department, and site conditions intermittently interfering with the assessment (e.g., abundant algal growth, as described previously). Trash was removed during each of STOPPP's assessments but persistently accumulated at the site.

Figures 4 and 5 show the relative proportions of trash types found during the SWAMP and STOPPP assessments, respectively. Most notable was the high proportion of glass, particularly during the SWAMP assessments (about 68% of all pieces collected). In general, STOPPP field staff observed relatively large amounts of heavier, non-floatable materials on the creek bed, such as glass, pottery shards and hard plastic. Large amounts of glass found during some assessments appeared consistent with littering during intermittent social gatherings at the site (e.g., drinking parties) or occasional illegal dumping. Other indications of littering at the site included cigarette butts surrounding a park bench located immediately adjacent to the creek within the 100-foot assessment site.

The SWAMP data point toward accumulation from upstream sources, based on higher levels of trash during the rainy season and corresponding accumulation parameter scores (Figure 3). However, the more recent STOPPP assessments yielded accumulation scores (Figure 3) consistent with STOPPP field staff observing little evidence of waterborne accumulation of trash from upstream sources. Such evidence may include floatable trash (e.g., paper products) accumulating along the creek bank near the waterline or caught on vegetation (e.g., roots) within the creek.

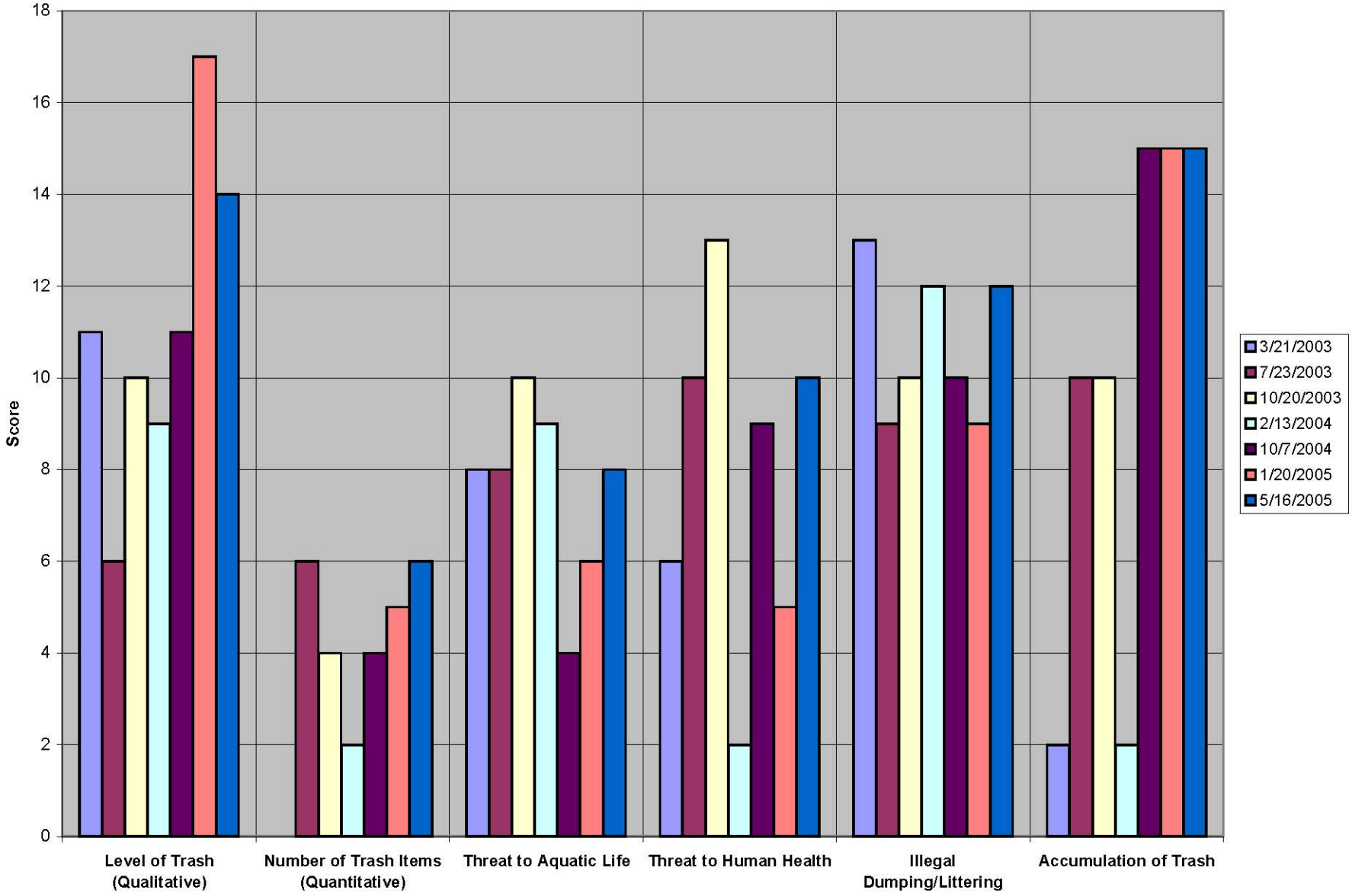
[1]Parameter scores are generally inversely proportional to trash tallies.

Figure 2
San Mateo Creek at Gateway Park Trash Assessment
Total Parameter Scores and Tallies



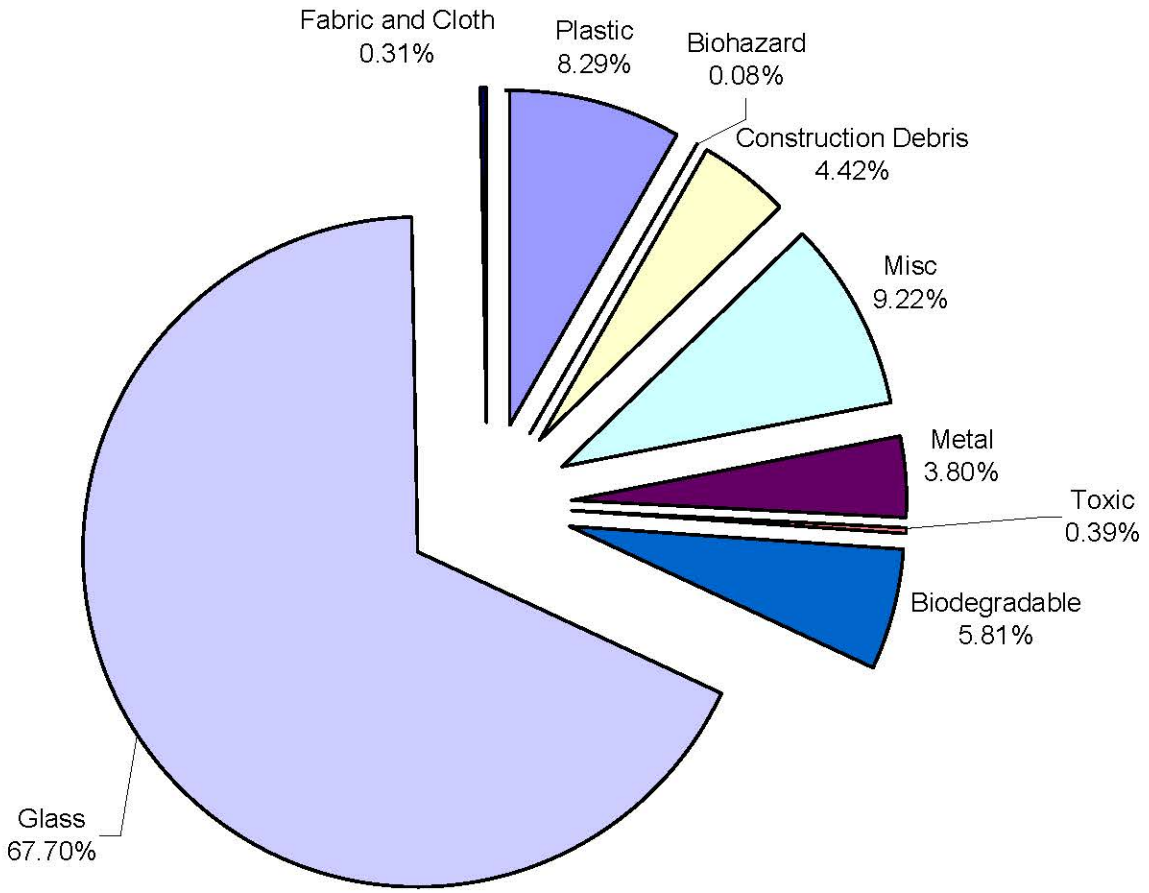
1. 2003 and Feb 04 are SWAMP data provided by Water Board staff, Oct 04 and 2005 are STOPPP data.
2. Total parameter scores are the sum of 6 individual trash parameter scores, each scored from 0 to 20. Higher scores indicate better conditions.

Figure 3
San Mateo Creek at Gateway Park Trash Assessment
Individual Parameter Scores



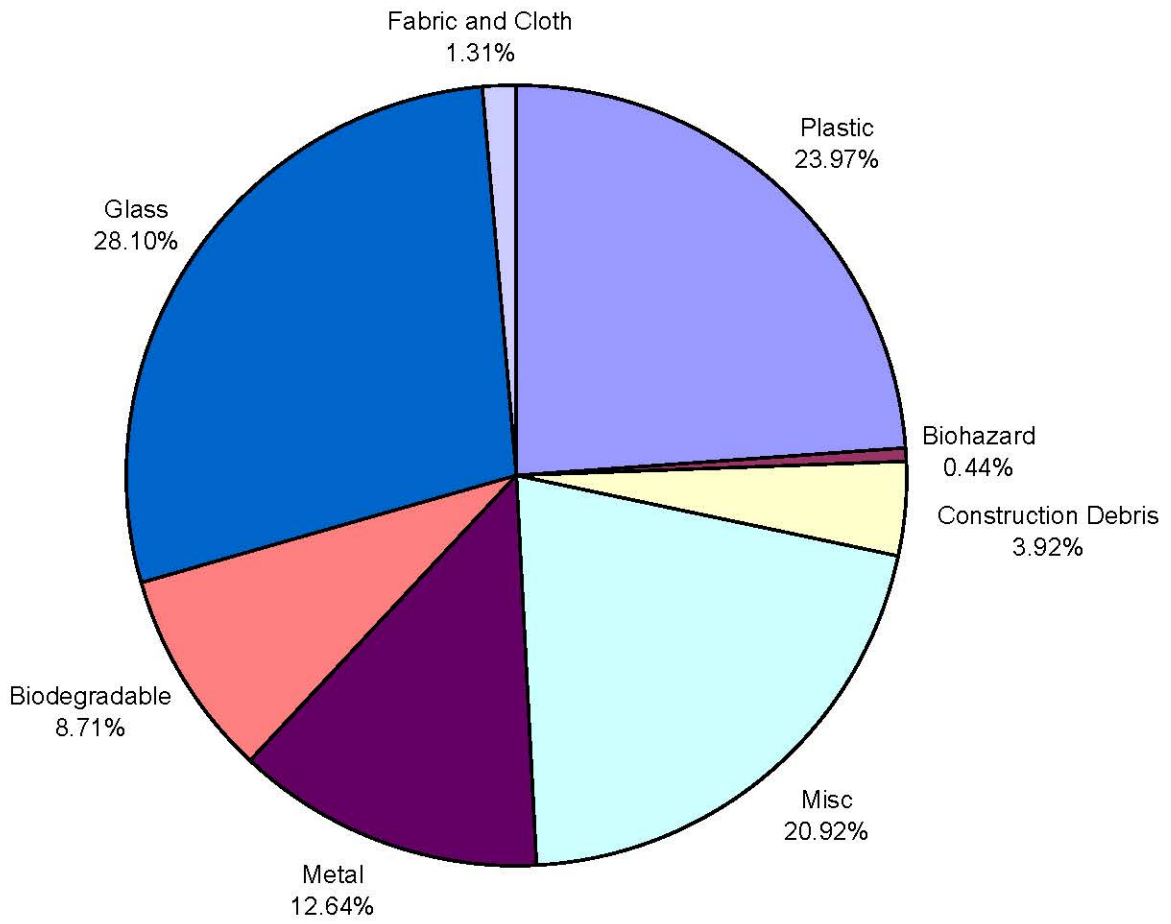
Notes:
1. The following dates are SWAMP data provided by Water Board staff: 3/21/03, 7/23/03,10/20/03 and 2/13/04.
2. The following dates are STOPPP data: 10/7/04, 1/20/05 and 5/16/05.

Figure 4
San Mateo Creek at Gateway Park Trash Assessment
Types of Trash Collected during SWAMP Assessments



Source: SWAMP March 2003 - February 2004 data provided by Water Board staff.

Figure 5
San Mateo Creek at Gateway Park Trash Assessment
Types of Trash Collected during STOPPP Assessments



FINDINGS

Principal findings of the pilot study included:

- Trash was removed during each assessment but persistently accumulated at the site, though levels and types of trash varied during each assessment. Potential causes of this temporal variation include varying public use of Gateway Park, varying rainfall patterns, occasional site cleanups by the City of San Mateo Parks Department, and site conditions intermittently interfering with the assessment (e.g., abundant algal growth interfered with visually sighting pieces of trash below the creek waterline during the May 2005 assessment).

- Field reconnaissance in the vicinity of the site and interviews with City of San Mateo staff indicated that littering at Gateway Park and nearby upstream bridges and occasional dumping from the bridges were the most likely sources of trash to the site, rather than accumulation from further upstream sources or discharges from storm drains in the vicinity of the site. This conclusion was supported by the results of the trash assessment fieldwork performed by STOPPP, based on the types of trash observed by field staff, evidence of littering at the site, and lack of indications of waterborne trash accumulating on the creek bed or banks.

- The results of the pilot study suggested that applying the Rapid Trash Assessment protocol, in conjunction with research on adjacent and upstream land uses, sources and transport pathways, is potentially a useful methodology for addressing trash in San Mateo County creeks. More specifically, this methodology may help identify trash sources and inform the selection of trash management measures at in-stream trash accumulation sites. However, further confirmation of the utility of the methodology would require additional pilot testing at a variety of trash sites.

RECOMMENDATION

The City of San Mateo may wish to implement measures to help mitigate littering and dumping at Gateway Park and the nearby upstream bridges. Potential measures include erecting signs prohibiting dumping and littering. The effectiveness of such signs would potentially be enhanced by including educational messages about the value of San Mateo Creek as a natural and community resource.

ACKNOWLEDGEMENTS

STOPPP would like to acknowledge assistance provided during this project by Water Board and City of San Mateo staff, which greatly contributed to the success of the project. Water Board staff assisted STOPPP General Program staff in the field with the initial field assessment of the pilot study site. City of San Mateo staff assisted with the subsequent assessments and also helped General Program staff identify potential trash sources, transport pathways and management measures.

REFERENCES

SCVURPPP and STOPPP 2003. *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of RWQCB Rapid Trash Assessment*. Santa Clara Valley Urban Runoff Pollution Prevention Program and San Mateo Countywide Stormwater Pollution Prevention Program. March 1, 2003.

SFBRWQCB 2001. *Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads (TMDLs) for the San Francisco Bay Region.* Staff Report of the California Regional Water Quality Control Board, San Francisco Bay Region. November 14, 2001.

STOPPP 2002. *Work Plan for Pilot Testing a Rapid Trash Assessment Procedure in San Pedro Creek.* San Mateo Countywide Stormwater Pollution Prevention Program. September 17, 2002.

STOPPP 2003. *FY 2003/04 Trash Control Work Plan.* San Mateo Countywide Stormwater Pollution Prevention Program. June 2003.

STOPPP 2004. *Pilot Study to Evaluate Trash Sources and Control Measures at an In-stream Trash Accumulation Area in San Mateo County, California, Work Plan.* San Mateo Countywide Stormwater Pollution Prevention Program. August 2004.

APPENDIX A

RAPID TRASH ASSESSMENT PROTOCOL
Surface Water Ambient Monitoring Program
California Regional Water Quality Control Board, San Francisco Bay Region

Monitoring Design. The rapid trash assessment can be used for a number of purposes, such as ambient monitoring, evaluation of management actions, determination of trash accumulation rates, or comparing sites with and without public access. Ambient monitoring efforts should provide information at sites distributed throughout a waterbody, and several times a year to characterize spatial and temporal variability. Additionally, the ambient sampling design should document the effects of episodes that affect trash levels such as storms or community cleanup events. Pre- and post-project assessments can assist in evaluating the effectiveness of management practices ranging from public outreach to structural controls, or to document the effects of public access on trash levels in waterbodies (e.g., upstream/downstream). Such evaluations should consider trash levels over time and under different seasonal conditions. Revisiting sites where trash was collected during previous assessments enables the determination of accumulation rates. This methodology was developed for sections of wadeable streams, but can be adapted to shorelines of lakes, beaches, or estuaries. Ultimately, the monitoring design will strongly affect the usefulness of any rapid trash assessment information.

Site Definition. Upon arrival at a designated monitoring site, a team of two people or more defines or verifies a 100-foot section of the stream or shoreline to analyze, associated with a sampling location or station. When a site is first established, it is recommended that the 100-foot distance be accurately measured. The length should be measured not as a straight line, but as 100 feet of the actual stream or shore length, including sinuous curves. Where possible, the starting and ending points of the survey should be easily identified landmarks, such as an oak tree or boulder, and noted on the worksheet ("Upper/Lower Boundaries of Reach"), or documented using a global positioning system (GPS), so that future assessments are made at the same location. The team should confer and document the upper boundary of the banks to be surveyed, based on evaluation of whether trash can be carried to the water body by wind or water (e.g., an upper terrace in the stream bank). The team documents the location of the high water line based on site-specific physical indicators, such as a debris line found in the riparian vegetation along the stream channel. If the high water line cannot be determined, it is suggested that bankfull height be documented, noting that the high water line could not be determined. Trash located below the high water line can be expected to move into the streambed or be swept downstream during the next winter season. Visually extend all boundaries in order to encompass the 100' section. Defining site characteristics will facilitate the comparison of trash assessments conducted at the same site at different times of the year.

Survey. It is highly recommended that all trash items within an assessed site be picked up, so that the site can be revisited and re-assessed for impairment and usage patterns. A survey, including notes and scoring, will take approximately one to two hours based on how trash-impacted the site is and how many people are working together. The first time a site is assessed, the process will generally take longer than on subsequent visits. Begin the survey at the downstream end of the selected reach so that trash can be seen in the undisturbed stream channel. Tasks can be divided according to the number of team members. In one scenario of a team with two members, one team member begins walking along the bank or in the water (wear waders) at the edge of the stream or shore, looking for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either above or below the high water line based on the previously determined boundary. The other person walks in the streambed and up and down the opposite bank, picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line, for the tally person to mark down appropriately on the trash assessment sheet. All team members pick up the trash items as they are found. Keep in mind that the person tallying will not be able to pick up nearly as much trash as the other team members. All team members make sure to avoid injuries by using gloves. Avoid touching trash with unprotected hands!

The person tallying the trash indicates on the sheet whether the trash was found above the high water line on the bank, or below the high water line either on the bank or in the stream (i.e., tally dots or circles (•) for above high water line, tally lines (|) for below). If it is evident that items have been littered, dumped, or accumulated via downstream transport, make a note in the designated rows near the bottom of the tally sheet - this will help when

assessing scores. A trash grabber, metal kitchen tongs, or a similar tool should be used to help pick up trash. Be sure to look under bushes, logs, and other plant growth to see if trash has accumulated underneath. The ground and substrate should be inspected to ensure that small items such as cigarette butts and pieces of broken glass or Styrofoam are picked up and counted. The tally count is an important indicator of trash impairment and should be used in conjunction with the total score to assist in site comparisons. It is important not to miss items that can affect human health such as diapers, fecal matter, and needles; these items can strongly affect the total score.

Once the team is finished with the tallying, use the tally sheet margins to count up two totals for each trash item line, one total for items found above the high water line, and one total for items found below the high water line. Now sum the totals of above and below for each trash category, and write in next to each trash category. Be sure to complete the worksheets before leaving the site while everything is still fresh in the memory. The team should discuss each parameter and agree on a score based on a discussion of the condition categories. Discuss and document possible influential factors affecting trash levels at the site, such as a park, school, or nearby residences or businesses. Within each trash parameter, narrative language is provided to assist with choosing a condition category. The worksheet provides a range of numbers within a given category, allowing for a range of conditions encountered in the field. For instance, trash located in the water leads to lower scores than trash above the high water line. Not all specific trash conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., "site frequently used by people"), nor do the narratives describe all possible conditions. Scores of "0" should be reserved for the most extreme conditions. Once the scores are assigned for the six categories, sum the final score and include specific notes about the site at the end of the sheet. A site should be assessed several times in a given year, during different seasons, to characterize the variability and persistence of trash occurrence for water quality assessment purposes.

Trash Assessment Parameters. The rapid trash assessment includes a range of parameters that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters estimate actual threat to water quality, and the last two parameters represent how trash enters the water body at a site, either through on-site activities or downstream accumulation.

1. **Level of Trash.** This assessment parameter is intended to reflect a qualitative "first impression" of the site, after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the waterbody. No trash should be obviously visible at sites that score in the "optimal" range.

2. **Actual Number of Trash Items Found.** Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 100 items have been tallied, assign the following scores: 5: 101-200 items; 4: 201-300 items; 3: 301-400 items; 2: 401-500 items; 1: 501-600 items; 0: over 600 items. Use similar guidelines to assign scores in other condition categories.

   Sometimes items are broken into many pieces. Fragments with higher threat to aquatic life such as plastics should be individually counted, while paper and broken glass, with lower threat and/or mobility, should be counted based on the parent item(s). Broken glass that is scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, and waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

3. **Threat to Aquatic Life.** As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as

food items. Larger items can cause entanglement. Some discarded debris may contain toxic substances. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. **Threat to Human Health.** This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment, such as mercury. The worst conditions have the potential for presence of dangerous bacteria or viruses, such as with medical waste, diapers, and human or pet waste.

5. **Illegal Dumping and Littering.** This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. **Accumulation of Trash.** Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

Technical Notes on Trash and Water Quality

Trash is a water pollutant that has a large range of characteristics of concern. Not all litter and debris delivered to streams are of equal concern to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to aquatic life in the form of ingestion or entanglement. Some elements of trash exhibit significant threats to human health, such as discarded medical waste, human or pet waste, and broken glass. Also, some household and industrial wastes may contain toxic substances of concern to human health and wildlife, such as batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Larger trash such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistence and accumulation of trash in a waterbody are of particular concern, and signify a priority area for prevention of trash discharges. Also of concern are trash "hotspots" where illegal dumping, littering, and/or accumulation of trash occur.

Rapid Trash Assessment. Trash assessment includes a visual survey of the waterbody (e.g., streambed and banks) and adjacent areas from which trash elements can be carried to the waterbody by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet is designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the Clean Water Act and the California Water Code. The worksheet also provides a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations.

Trash Characteristics of Concern. For aquatic life, buoyant (floatable) elements tend to be more harmful than settleable elements, due to their ability to be transported throughout the waterbody and ultimately to the marine environment. Persistent elements such as plastics, synthetic rubber and synthetic cloth tend to be more harmful than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002). Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. Larger plastic elements such as plastic grocery bags are also harmful to larger aquatic life such as sea turtles, which can mistake the trash for floating prey and ingest it, leading to starvation or suffocation. Floating debris that is not trapped and removed will eventually end up on the beaches or in the ocean, repelling visitors and residents from the beaches and degrading coastal and open ocean waters.

Trash in water bodies can threaten the health of people who use them for wading or swimming. Of particular concern are the bacteria and viruses associated with diapers, medical waste (e.g., used hypodermic needles and pipettes), and human or pet waste. Additionally, broken glass or sharp metal fragments in streams can cause puncture or laceration injuries. Such injuries can then expose a person's bloodstream to microbes in the stream's water that may cause illness. Also, some trash items such as containers or tires can pond water and support mosquito production and associated risks of diseases such as encephalitis and the West Nile virus.

Leaf litter is trash when there is evidence of intentional dumping. Leaves and pine needles in streams provide a natural source of food for organisms, but excessive levels due to human influence can cause nutrient imbalance and oxygen depletion in streams, to the detriment of the aquatic ecosystem. Clumps of leaf litter and yard waste from trash bags should be treated as trash in the water quality assessment, and not confused with natural inputs of leaves to streams. If there is a question in the field, check the type of leaf to confirm that it comes from a nearby riparian tree. In some instances, leaf litter may be trash if it originates from dense ornamental stands of nearby human planted trees that are overloading the stream's assimilative capacity for leaf inputs. Other biodegradable trash, such as food waste, also exerts a demand on dissolved oxygen, but aquatic life is unlikely to be adversely affected unless the dumping of food waste is substantial and persistent at a given location.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion. Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food (i.e., plastic bags look like jellyfish, a prey item of sea turtles). Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Larger settleable items such as automobiles, shopping carts, and furniture can redirect stream flow and destabilize the channel.

In conclusion, trash in water bodies can adversely affect humans, fish, and wildlife. Not all water quality effects of trash are equal in severity or duration, thus the trash assessment methodology was designed to reflect a range of trash impacts to aquatic life, public health, and aesthetic enjoyment. When considering the water quality effects of trash while conducting a trash assessment, remember to evaluate individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. Utilize the narratives in the worksheet, refer to the technical notes and trash parameter descriptions in the text as needed, and select your scores after careful consideration of actual conditions.

<u>References:</u>

U.S. Environmental Protection Agency, 2001. Draft Assessing and Monitoring Floatable Debris.

U.S. Environmental Protection Agency, 2002. The Definition, Characterization and Sources of Marine Debris. Unit 1 of Turning the Tide on Trash, a Learning Guide on Marine Debris.

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

WATERSHED/STREAM: _____ DATE/TIME: _____
MONITORING GROUP, STAFF: _____ SAMPLE ID: _____
SITE DESCRIPTION (Station Name, Number, etc.): _____

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
1. Level of Trash	On first glance, no trash visible. Little or no trash (<10 pieces) evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.	On first glance, little or no trash visible. After close inspection small levels of trash (10-50 pieces) evident in stream bank and streambed.	Trash is evident in low to medium levels (51-100 pieces) on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.	Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris (>100 pieces). Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Actual Number of Trash Items Found	0 to 10 trash items found based on a trash assessment of a 100-foot stream reach.	11 to 50 trash items found based on a trash assessment of a 100-foot stream reach.	51 to 100 trash items found based on a trash assessment of a 100-foot stream reach.	Over 100 trash items found based on a trash assessment of a 100-foot stream reach.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Threat to Aquatic Life	Trash, if any, is mostly paper or wood products or other biodegradable materials. Note: A large amount of rapidly biodegradable material like food waste creates high oxygen demand, and should not be scored as optimal.	Little or no (<10 pieces) transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts. Presence of settleable, degradable, and non-toxic debris such as glass or metal.	Medium prevalence (10-50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts Larger deposits (< 50 pieces) of settleable debris such as glass or metal. Any evidence of clumps of deposited yard waste or leaf litter.	Large amount (>50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, balloons, Styrofoam, cigarette butts; toxic items such as batteries, lighters, or spray cans; large clumps of yard waste or dumped leaf litter; or large amount (>50 pieces) of settleable glass or metal.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Threat to Human Health	Trash contains no evidence of bacteria or virus hazards such as medical waste, diapers, pet or human waste. No evidence of toxic substances such as chemical containers or batteries. No ponded water for mosquito production. No evidence of puncture and laceration hazards such as broken glass or metal debris.	No bacteria or virus hazards or sources of toxic substances, but small presence (<10 pieces) of puncture and laceration hazards such as broken glass and metal debris. No presence of ponded water in trash items such as tires or containers that could facilitate mosquito production.	Presence of **any one** of the following: hypodermic needles or other medical waste; used diaper, pet waste, or human feces; any toxic substance such as chemical containers, batteries, or fluorescent light bulbs (mercury). Medium prevalence (10-50 pieces) of puncture hazards.	Presence of **more than one** of the items described in the marginal condition category, or high prevalence of any one item (e.g. greater than 50 puncture or laceration hazards).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
5. Illegal Dumping	D: No evidence of illegal dumping. No bags of trash, no yard waste, no household items placed at site to avoid proper disposal, no shopping carts.	D: Some evidence of illegal dumping. Limited vehicular access limits the amount of potential dumping, or material dumped is diffuse paper-based debris.	D: Presence of **one** of the following: furniture, appliances, shopping carts, bags of garbage or yard waste, coupled with vehicular access that facilitates in-and-out dumping of materials to avoid landfill costs.	D: Evidence of chronic dumping, with **more than one** of the following items: furniture, appliances, shopping carts, bags of garbage, or yard waste. Easy vehicular access for in-and-out dumping of materials to avoid landfill costs.
Illegal Littering	L: Any trash is incidental litter (< 5 pieces) or carried downstream from another location.	L: Some evidence of litter within creek and banks originating from adjacent land uses (<10 pieces).	L: Prevalent (10-50 pieces) in-stream or shoreline littering that appears to originate from adjacent land uses.	L: Large amount (>50 pieces) of litter within creek and on banks that appears to originate from adjacent land uses.
D-SCORE	10 9	8 7 6	5 4 3	2 1 0
L-SCORE	10 9	8 7 6	5 4 3	2 1 0
6. Accum-ulation of Trash	There does not appear to be a problem with trash accumulation from downstream transport. Trash, if any, appears to have been directly deposited at the stream location.	Some evidence (<10 pieces) that litter and debris have been transported from upstream areas to the location, based on evidence such as silt marks, faded colors or location near high water line.	Evidence that (10 to 50 pieces) trash is carried to the location from upstream, as evidenced by its location near high water line, siltation marks on the debris, or faded colors.	Trash appears to have accumulated in substantial quantities at the location based on delivery from upstream areas, and is in various states of degradation based on its persistence in the waterbody. Over 50 items of trash have been carried to the location from upstream.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Total Score _____

SITE DEFINITION:

UPPER/LOWER BOUNDARIES OF REACH: _____

HIGH WATER LINE: _____

UPPER EXTENT OF BANKS OR SHORE: _____

_____

NOTES:

_____

_____

_____

_____

_____

_____

_____

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

TRASH ITEM TALLY (Tally with (•) if found above high water line, and (|) if below)

PLASTIC # Above___ # Below___	**METAL** # Above___ # Below___
Plastic Bags	Aluminum Foil
Plastic Bottles	Aluminum or Steel Cans
Plastic Bottle Caps	Bottle Caps
Plastic Cup Lid/Straw	Metal Pipe Segments
Plastic Pipe Segments	Auto Parts (specify below)
Plastic Six-Pack Rings	Wire (barb, chicken wire etc.)
Plastic Wrapper	Metal Object
Soft Plastic Pieces	**LARGE (specify below)** # Above___ # Below___
Hard Plastic Pieces	Appliances
Styrofoam cups pieces	Furniture
Styrofoam Pellets	Garbage Bags of Trash
Fishing Line	Tires
Tarp	Shopping Carts
Other (write-in)	Other (write-in)
BIOHAZARD # Above___ # Below___	**TOXIC** # Above___ # Below___
Human Waste/Diapers	Chemical Containers
Pet Waste	Oil/Surfactant on Water
Syringes or Pipettes	Spray Paint Cans
Dead Animals	Lighters
Other (write-in)	Small Batteries
CONSTRUCTION DEBRIS#Above___#Below__	Vehicle Batteries
Concrete (not placed)	Other (write-in)
Rebar	**BIODEGRADABLE** # Above___ # Below___
Bricks	Paper
Wood Debris	Cardboard
Other (write-in)	Food Waste
MISCELLANEOUS # Above___ # Below___	Yard Waste (incl. trees)
Synthetic Rubber	Leaf Litter Piles
Foam Rubber	Other (write-in)
Balloons	**GLASS** # Above___ # Below___
Ceramic pots/shards	Glass bottles
Hose Pieces	Glass pieces
Cigarette Butts	**FABRIC AND CLOTH** # Above___ # Below___
Golf Balls	Synthetic Fabric
Tennis Balls	Natural Fabric (cotton, wool)
Other (write-in)	Other (write-in)
Total pieces Above: **Below:**	**Grand total:**
Tally all trash in above rows; make notes below as needed to facilitate scoring.	
Littered:	
Dumped:	
Downstream Accumulation:	

SPECIFIC DESCRIPTION OF ITEMS FOUND:_____

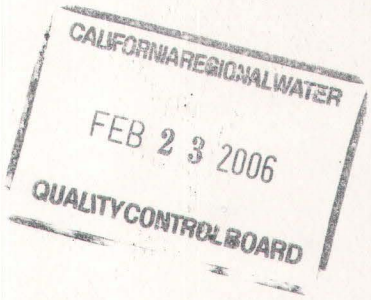
APPENDIX B

Trash Pilot Study Site. San Mateo Creek at Gateway Park in the City of San Mateo.

Trash Pilot Study Site. Pedestrian bridge in background is located nearby and upstream to the assessment site.

SAN MATEO COUNTYWIDE
STORMWATER POLLUTION PREVENTION PROGRAM

555 County Center, Redwood City, California 94063 650.599.1406 Fax 650.361.8227



March 1, 2006

Mr. Habte-Mariam Kifle
Regional Water Quality Control Board
1515 Clay St. Suite 1400
Oakland CA 94612

Subject: Submittal of the Mid-Fiscal Year Report

Dear Habte:

Enclosed are the report and plan required by the NPDES permit for STOPPP and its member municipalities.

The permit requires that STOPPP submit General Program work plans each year for the following two fiscal years. This permit also requires that these work plans be similar in terms of level of detail and format to the work plans contained in the *Stormwater Management Plan*. The enclosed work plans meet these requirements.

Each of these work plans was reviewed and approved by the appropriate subcommittees, and STOPPP's Technical Advisory Committee (TAC) has approved all of the work plans and budgets. Please note that the City/County Association of Governments has not yet approved the enclosed work plans and budgets, but its consideration and approval is expected this spring.

The planning level budgets for each STOPPP component are contingent on the availability of funding.

If you have any questions, please contact me.

Very truly yours,

Matthew Fabry
STOPPP Coordinator

Enc: Mid-Fiscal Year Report 2005/06

010198

010199

MID-FISCAL YEAR REPORT 2005/06

San Mateo Countywide
Stormwater Pollution
Prevention Program

A Program of the City/County Association of Governments

Credits

This report is being submitted by the participating agencies in the

San Mateo Countywide Stormwater Pollution Prevention Program

Town of Atherton
City of Belmont
City of Brisbane
City of Burlingame
Town of Colma
City of Daly City
City of East Palo Alto
City of Foster City
City of Half Moon Bay
Town of Hillsborough
City of Menlo Park
City of Millbrae
City of Pacifica
Town of Portola Valley
City of Redwood City
City of San Bruno
City of San Carlos
City of San Mateo
County of San Mateo
City of South San Francisco
Town of Woodside

Implementation of the Program Coordinated by:

San Mateo Countywide Stormwater Pollution Prevention Program
555 County Center, Redwood City, California, 94065

A Program of the City/County Association of Governments
(C/CAG)

Report Prepared by:
County Environmental Health and
EOA, Inc.
(Eisenberg, Oliveri and Associates)

Table 1-1. FY 2006/07 General Program Draft Budget Summary

Budget Categories		FY 2006/07 General Program Budget
Personnel Services		
Executive Director		$25,000
Program Manager		$60,000
Program Secretary		$0
Member Agency Support		$10,000
Miscellaneous		$1,000
	Subtotal	$96,000
Fees and Dues		
BASMAA Dues		$35,000
Regional Monitoring Program		$77,500
Clean Estuary Partnership		$79,000
Regional Ad Campaign		$40,000
	Subtotal	$231,500
Supplies and Other Charges		
Copier and Service Agreement		$0
Publications		$10,000
Conferences and Meetings		$1,500
Education and Training		$0
	Subtotal	$11,500
Additional Expenses		
Data Base Management		$12,500
EDP Consultant Work		$13,000
Controller's Processing Fee @ $.30/APN		$66,000
Miscellaneous (litigation)		$75,000
	Subtotal	$166,500
Tasks in the SWMP		
2.0 Municipal Maintenance		$69,000
3.0 Industrial and Illicit Discharge Controls		$174,000
4.0 Public Information and Participation		$285,000
5.0 New Development		$186,000
6.0 Watershed Assessment and Monitoring		$203,000
	Subtotal	$917,000
	TOTAL BUDGET	$1,422,500

Table 1-2. FY 2007/08 General Program Draft Budget Summary

Budget Categories	FY 2007/08 General Program Budget
Personnel Services	
Executive Director	$25,000
Program Manager	$60,000
Program Secretary	$0
Member Agency Support	$10,000
Miscellaneous	$1,000
Subtotal	$96,000
Fees and Dues	
BASMAA Dues	$36,000
Regional Monitoring Program	$84,000
Clean Estuary Partnership	$80,000
Regional Ad Campaign	$40,000
Subtotal	$240,000
Supplies and Other Charges	
Copier and Service Agreement	$0
Publications	$10,000
Conferences and Meetings	$1,500
Education and Training	$0
Subtotal	$11,500
Additional Expenses	
Data Base Management	$12,500
EDP Consultant Work	$13,000
Controller's Processing Fee @ $.30/APN	$66,000
Miscellaneous (litigation)	$75,000
Subtotal	$166,500
Tasks in the SWMP	
2.0 Municipal Maintenance	$69,000
3.0 Industrial and Illicit Discharge Controls	$174,000
4.0 Public Information and Participation	$311,000
5.0 New Development	$186,000
6.0 Watershed Assessment and Monitoring	$203,000
Subtotal	$943,000
TOTAL BUDGET	$1,457,000

Table 2-1 Municipal Maintenance General Program Work Plan and Budget - FY 2006/07

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements will be made, as appropriate, for approval by STOPPP and for submittal to the Regional Board.	Improvements to the performance standards will be formally considered by the Maintenance Subcommittee every two years.	$4,000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$15,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs. Coordinate with the PI/P Subcommittee to design an outreach piece.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$5,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance. Subtasks may include participation in the development of a new 5 year Municipal NPDES Stormwater Permit.	See SWMP	$30,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Task 2.10 Integrated Pest Management: Continue to work with the Park and Recreation Work Group to implement the integrated pest management (IPM) performance standards. Conduct IPM training.	See SWMP and Pesticide Management Plan.	$15,000	ongoing
	Total Budget	**$ 69,000**	

Table 2-2 Municipal Maintenance General Program Work Plan and Budget - FY 2007/08

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/ Due Date
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements will be prepared, as appropriate, for approval by the STOPPP and for submittal to the Regional Board. Potential areas for new Performance Standard development include BMPs for parking lots and maintenance of publicly owned dry detention basins and other stormwater treatment controls.	The Maintenance Subcommittee and its work groups will review existing performance standards and make needed revisions every two years beginning in FY 1999/00. A minimum of one performance standard will be developed in FY2007/08.	$ 5,000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$15,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the STOPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs. Potential projects would be to work with schools on integrated pest management, utilities on controlling potable water discharges or golf courses on other common areas of concern.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$4,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance	See SWMP	$30,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Task 2.10 Integrated Pest Management: Continue to work with the Park and Recreation Work Group to implement the integrated pest management (IPM) performance standards.	See SWMP	$15,000	ongoing
	Total Budget	**$ 69,000**	

Table 3-1. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 2006/07

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation and improvement of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements, if any, may be prepared for approval by STOPPP for submittal to the Regional Board.	Possible improvements in the performance standards will be formally considered by the Commercial, Industrial, and Illicit Discharge (CII) Subcommittee every two years and will not occur in FY 2006/07.	$0	N.A.
3.2 Provide Guidance on Developing and Implementing Discharge and Business Inspection Plans: STOPPP will assist with developing model materials.	This task will include updating materials that are used to help implement the anticipated performance standards.	$10,000	Ongoing
3.3 Assist Compliance with Requirements for Conditionally Exempted Discharges: Continue to facilitate compliance with the requirements for handling non-stormwater discharges that have been identified as conditionally exempted from the permit's discharge prohibition.	This will include providing assistance in implementing the BMPs and Implementation Procedures for Conditionally Exempted Discharges or whatever similar requirements have been adopted as part of the regional general permit.	$5,000	Ongoing
3.4 Conduct Outreach and Training: This task includes conducting targeted educational outreach and training to municipal staff and to businesses. Educational outreach to businesses will need to focus increasingly on particular pollutants of concern, such as mercury and PCBs.	The CII Subcommittee will be responsible for identifying the target audience and methods used for conducting training and/or other types of educational outreach. The decision on which audience to target will consider previous trainings.	$23,000	June 2007
3.5 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist STOPPP's municipalities to comply with the reporting and other requirement of the NPDES permit; (including development of deliverable reporting forms and preparation of the industrial and illicit discharge controls section of STOPPP's Annual Report); develop General Program work plans and budgets; assist with any additional planning needed to improve the industrial and illicit discharge controls section of the Plan; and continue to assist the CII Subcommittee to conduct its meetings and other activities.	See SWMP	$ 61,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing

3.6 Implement Pollutants of Concern Tasks: This includes implementing pollutants of concern tasks contained in the regional general permit and/or in a plan developed to comply with this permit.	The Regional Water Board is developing TMDLs for specific pollutants of concern, and STOPPP will need to respond to pollutant load allocations that it is assigned.	$70,000	ongoing
3.7 Assist with NPDES Permit Reissuance: This task includes providing assistance to STOPPP in working with the Regional Water Board staff to resolve any issues raised by the adopted regional general permit.	There may be areas where additional follow up with the Regional Water Board staff or others is needed regarding the adopted regional general permit.	$5,000	June 2007
	Total Budget	**$ 174,000**	

Table 3-2. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FY 2007/08

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
3.1 Assist implementation and improvement of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards and guidance material to assist with their implementation will be reviewed and improvements will be made.	The municipal regional permit's baseline performance standards are scheduled by the Water Board staff for adoption in 2006. This task will be to assist agencies to better understand, implement, and document their implementation of the adopted performance standards.	$10,000	June 2008
3.2 Provide Guidance on Developing and Implementing Discharge and Business Inspection Plans: STOPPP will assist with developing model materials.	This task will depend on the requirements adopted in the municipal regional permit.	$10,000	Ongoing
3.3 Assist Compliance with Requirements for Conditionally Exempted Discharges: Continue to facilitate compliance with the requirements for handling non-stormwater discharges that have been identified as conditionally exempted from the permit's discharge prohibition.	This will include providing assistance in implementing the BMPs and Implementation Procedures for Conditionally Exempted Discharges.	$5,000	Ongoing
3.4 Conduct Outreach and Training: This task includes conducting targeted educational outreach and training to municipal staff or to businesses. Any educational outreach to businesses will need to focus increasingly on particular pollutants of concern, such as mercury, pesticides, and PCBs.	The CII Subcommittee will be responsible for identifying the target audience and methods used for conducting training and/or other types of educational outreach. This task will include updating the *Handbook for Facility and Illicit Discharge Inspectors* as possible within the available budget.	$28,000	June 2008
3.5 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist STOPPP's municipalities to comply with the reporting and other requirements of the NPDES permit; (including development of deliverable reporting forms and preparation of the industrial and illicit discharge controls section of STOPPP's Annual Report); develop General Program work plans and budgets; assist with any additional planning needed to improve the industrial and illicit discharge controls section of the Plan; continue to assist the CII Subcommittee to conduct its meetings and other activities; and continue to participate in STOPPP's TAC meetings.	See SWMP	$ 61,000	NPDES permit required reports will be completed by required dates. other activities will be ongoing
3.6 Develop and Implement Pollutants of Concern Plan: This includes assistance with tasks required by the municipal	The Water Board is continuing to develop TMDLs for specific pollutants of concern, and	$55,000	June 2008

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
regional permit.	STOPPP will need to respond to pollutant load reduction tasks and/or allocations that it is assigned.		
3.7 Assist with NPDES Permit Reissuance: This task includes providing assistance to STOPPP in working with the Water Board staff on any appeals of the municipal regional permit or issues of its interpretation.	The Water Board should have adopted in 2006 a municipal regional permit that covers STOPPP. This task will include ongoing support needs that are related to this adopted permit.	$5,000	June 2008
	Total Budget	**$ 174,000**	

Task	2006-2007	Task Description	Responsible Staff and Plan	Hours 2006	Hours 2007	Total Hours	Cost	Materials Cost	Total
				$107	$110				
4.1		**Implement and Assist with the Performance Standards** for PIP							
	4.1.1	Performance Standards				20	$ 2,170.00	$ -	$ 2,170.00
		Assist municipalities to understand and implement standards. Provide list of suggestions to improve standards	Dermot	10	10	20	$ 2,170.00		
4.2		**Assist with Regulatory Compliance and Planning**							
	4.2.1	Provide support to P/IP				84	$ 9,114.00	$ 500.00	$ 9,614.00
		Attend 6 monthly meetings and assist chair with preparation, discussion topics and handouts.							
		Meeting attendance	Susan and Sarah	18	18	36	$ 3,906.00		
		Meeting preparation	Susan	24	24	48	$ 5,208.00		
		materials						$ 500.00	
	4.2.2	Annual Report				80	$ 8,680.00	$ -	$ 8,680.00
		Assist EOA in preparing the P/IP section of the Annual Report	Dermot and Susan will prepare PIP section.	40	40	80	$ 8,680.00		
	4.2.3	Mercury campaign - Fluorescent Lamp Collection Strategy				200	$ 21,700.00	$ -	$ 21,700.00
		Collaborate with San Mateo County Environmental Health on a Vendor Take Back (VTB) or Legislative effort for Universal Waste including Fluorescent Lamps. This period will be a time of research and development of a strategy to implement a countywide ordinance to develop a sustainable system for the disposal and recycling of u-waste. EH will co-fund this position to research other u-waste and emerging contaminants such as batteries and pharmaceuticals. The countywide ordinance or push for legislation will be implemented in 07-08.	Susan	100	100	200	$ 21,700.00		
4.3		**Encourage Public Involvement, Outreach, and Education**							
	4.3.1	Point of Purchase - IPM Point of Purchase Campaign				334	$ 36,239.00	$ 6,000.00	$ 42,239.00
		12 meetings - 4 hours including travel time	Sarah	24	24	48	$ 5,208.00		
		Store visits and set up - 19 stores 3 hrs each +10hrs per season correspondence, training coord.	Sarah	143	143	286	$ 31,031.00		
		Materials-signage, books, etc						$ 6,000.00	
	4.3.2	Website				112	$ 12,152.00	$ 20,000.00	$ 32,152.00
		Provide ongoing design and updating support for website	Contractor/Susan	30	30	60	$ 6,510.00	$ 10,000.00	
		quarterly meetings with subcommittee working group.	Susan	16	16	32	$ 3,472.00		
		Geographic Information System interface						$ 10,000.00	
		Contract Administration	Susan	10	10	20	$ 2,170.00		
	4.3.3	Promotional Items, pamphlets, displays, and exhibit items	Contractor			90	$ 9,780.00	$ 16,500.00	$ 26,280.00
		Assist in purchasing promotional items for fair	Susan	0	10	10	$ 1,100.00	$ 6,500.00	
		Reprint brochures	Dermot	40	40	80	$ 8,680.00	$ 10,000.00	
	4.3.4	Outreach development PR Firm				60	$ 6,510.00	$ 5,000.00	$ 11,510.00
		Continue work with PR or graphics firm to develop public recognition of program. Retain services for ongoing outreach and graphic development	Contractor			0		$ 5,000.00	
		Interface with other subcommittes on graphic/brochure development needs	Susan	20	20	40	$ 4,340.00		
		Contract Administration	Susan	10	10	20	$ 2,170.00		
	4.3.5	Produce Spanish ReNews newsletter and insert in Spanish language Newspapers				15	$ 1,650.00	$ 1,550.00	$ 3,200.00

		Work with translator to produce insert for ReNews	Contractor/Susan		5	5	$ 550.00	$ 1,000.00		
		Insert in El Observador newspaper.	Susan			0	$ -	$ 550.00		
		Contract Administration/Evaluation	Susan	0	10	10	$ 1,100.00			
	4.3.6	Elementary Outreach				40	$ 4,340.00	$ 10,700.00	$	15,040.00
		Contract Administration	Susan	20	20	40	$ 4,340.00			
		Provide ZunZun "Watersongs" cd to schools who see performance 100@ $7 each						$ 700.00		
		Partner with the Used Oil Program to have Zun Zun perform at County Elementary Schools.	PIP Funding					$ 10,000.00		
	4.3.7	Watershed Stewardship - with The Watershed Project				40	$ 4,340.00	$ 32,500.00	$	36,840.00
		Kids in Gardens workshop + teacher stipends	Susan					$ 15,000.00		
		Healthy Schools Inside and Out workshop for teachers and custodians						$ 12,000.00		
		Garden Registration program (for 10 school or community gardens)						$ 5,500.00		
		Contract Administration and Evaluation		20	20	40	$ 4,340.00			
	4.3.8	Cable Television commercials				40	$ 4,400.00	$ 20,000.00	$	24,400.00
		Run commercials on cable	Contractor			0		$ 20,000.00		
		Contract	Susan	0	40	40	$ 4,400.00			
	4.3.9	Trash Campaign Research and implementation				180	$ 19,620.00	$ 5,000.00	$	24,620.00
		Coordinate coastal cleanup with CA. Coastal Commission and creek and beach cleanup site leaders. Integrate social marketing theory into promotion of canvas bag usage in partnership with solid waste agencies to reduce use of plastic bags. Research and development for implementation of community outreach efforts for 07-08.	Sarah					$ 5,000.00		
		Coastal Cleanup coordination	Sarah	60	20	80	$ 8,620.00			
		Research and development for implementation of outreach efforts	Sarah		100	100	$ 11,000.00			
4.4		**Assist with Focused Staff Training**								
	4.4.1	Focused Staff training				40	$ 4,400.00	$ 5,000.00	$	9,400.00
		Develop training videos based on live training provided to TAC and other subcommittees - contract with DeAnza College. Training available on the website and 2 cd copies per city	Contractor					$ 5,000.00		
		Work with contractor to develop and edit cds about Inspector Training.	Dermot	0	40	40	$ 4,400.00			
4.5		**Collaborate with Other Groups**								
	4.5.1	Community Outreach Grants - Collaborate with Volunteer Groups				33	$ 3,531.00	$ 450.00	$	3,981.00
		Provide STOPPP with an application to be distributed by the SC.								
		Update application	Susan	8	0	8	$ 856.00			
		Update database and organinze mailing distribution	Susan	20	0	20	$ 2,140.00			
		mailing printing	mail room					$ 450.00		
		press release		5		5	$ 535.00			
	4.5.2	Assist other STOPPP committees				120	$ 13,020.00	$ -	$	13,020.00
		Work with EOA and other subcommittees to integrate P/IP activities with the general program components, developing public, municipal and commercial pollution prevention outreach materials, programs and trainings.	Susan and Dermot	60	60	120	$ 13,020.00			
			Total			**1,488**	**$ 161,646**	**$ 123,200**	**$**	**284,846**

Task	2007-2008	Task Description	Responsible Staff and Plan	Hours 2007	Hours 2008	Total Hours	Cost	Materials Cost	Total
				$110	$114				
4.1		**Implement and Assist with the Performance Standards**							
	4.1.1	Performance Standards				20	$ 2,240.00	$ -	$ 2,240.00
		Assist municipalities to understand and implement standards. Provide list of suggestions to improve standards	Dermot	10	10	20	$ 2,240.00		
4.2		**Assist with Regulatory Compliance and Planning**							
	4.2.1	Provide support to P/IP				84	$ 9,408.00	$ 500.00	$ 9,908.00
		Attend 6 monthly meetings and assist chair with preparation, discussion topics and handouts.							
		Meeting attendance	Susan and Sarah	18	18	36	$ 4,032.00		
		Meeting preparation	Susan	24	24	48	$ 5,376.00		
		materials						$ 500.00	
	4.2.2	Annual Report				80	$ 8,960.00	$ -	$ 8,960.00
		Assist EOA in preparing the P/IP section of the Annual Report	Dermot and Susan will prepare PIP section.	40	40	80	$ 8,960.00		
	4.2.3	Mercury campaign - Fluorescent Lamp Collection Strategy				300	$ 33,600.00	$ -	$ 33,600.00
		Collaborate with San Mateo County Environmental Health to implement Vendor Take Back (VTB) or Legislative ordinance for Universal Waste including Fluorescent Lamps and other emerging contaminants and chemicals of concern.	Susan	150	150	300	$ 33,600.00		
4.3		**Encourage Public Involvement, Outreach, and Education**							
	4.3.1	Point of Purchase - IPM Point of Purchase Campaign				334	$ 37,408.00	$ 6,000.00	$ 43,408.00
		12 meetings - 4 hours including travel time	Sarah	24	24	48	$ 5,376.00		
		Store visits and set up - 19 stores 3 hrs each +10hrs per season correspondence, training coord.	Sarah	143	143	286	$ 32,032.00		
		Materials-signage, books, etc						$ 6,000.00	
	4.3.2	Website				112	$ 12,544.00	$ 20,000.00	$ 32,544.00
		Provide ongoing design and updating support for website	Contractor/Susan	30	30	60	$ 6,720.00	$ 10,000.00	
		quarterly meetings with subcommittee working group.	Susan	16	16	32	$ 3,584.00		
		Geographic Information System interface						$ 10,000.00	
		Contract Administration	Susan	10	10	20	$ 2,240.00		
	4.3.3	Promotional Items, pamphlets, displays, and exhibit items	Contractor			90	$ 10,100.00	$ 16,500.00	$ 26,600.00
		Assist in purchasing promotional items for fair	Susan	0	10	10	$ 1,140.00	$ 6,500.00	
		Reprint brochures	Dermot	40	40	80	$ 8,960.00	$ 10,000.00	
	4.3.4	Outreach development PR Firm				60	$ 6,720.00	$ 5,000.00	$ 11,720.00
		Continue work with PR or graphics firm to develop public recognition of program. Retain services for ongoing outreach and graphic development.	Contractor			0		$ 5,000.00	
		Interface with other subcommittes on graphic/brochure development needs	Susan	20	20	40	$ 4,480.00		
		Contract Administration	Susan	10	10	20	$ 2,240.00		
	4.3.5	Produce Spanish ReNews newsletter and insert in Spanish language Newspapers				15	$ 1,710.00	$ 1,550.00	$ 3,260.00
		Work with translator to produce insert for ReNews	Contractor/Susan		5	5	$ 570.00	$ 1,000.00	
		Insert in El Observador newspaper.	Susan			0	$ -	$ 550.00	
		Contract Administration/Evaluation	Susan	0	10	10	$ 1,140.00		

	4.3.6	Elementary Outreach				40	$ 4,480.00	$ 10,700.00	$ 15,180.00
		Contract Administration	Susan	20	20	40	$ 4,480.00		
		Provide ZunZun "Watersongs" cd to schools who see performance 100@ $7 each						$ 700.00	
		Partner with the Used Oil Program to have Zun Zun perform at County Elementary Schools.	PIP Funding					$ 10,000.00	
	4.3.7	Watershed Stewardship - with The Watershed Project				40	$ 4,480.00	$ 32,500.00	$ 36,980.00
		Kids in Gardens workshop + teacher stipends	Susan					$ 15,000.00	
		Healthy Schools Inside and Out workshop for teachers and custodians						$ 12,000.00	
		Garden Registration program (for 10 school or community gardens)						$ 5,500.00	
		Contract Administration and Evaluation		20	20	40	$ 4,480.00		
	4.3.8	Cable Television commercials				40	$ 4,560.00	$ 20,000.00	$ 24,560.00
		Run commercials on cable	Contractor			0		$ 20,000.00	
		Contract	Susan	0	40	40	$ 4,560.00		
	4.3.9	Trash Campaign Research and implementation				80	$ 20,280.00	$ 15,000.00	$ 35,280.00
		Coordinate coastal cleanup with CA. Coastal Commission and creek and beach cleanup site leaders. Integrate social marketing theory into promotion of canvas bag usage in partnership with solid waste agencies to reduce use of plastic bags. Research and dev	Sarah					$ 5,000.00	
		Coastal Cleanup coordination	Sarah	60	20	80	$ 8,880.00		
		Implement community outreach program developed through 06-07 workplan.	Sarah		100	100	$ 11,400.00	$ 10,000.00	
4.4		**Assist with Focused Staff Training**							
	4.4.1	Focused Staff training				40	$ 4,560.00	$ 5,000.00	$ 9,560.00
		Develop training videos based on live training provided to TAC and other subcommittees - contract with DeAnza College	Contractor					$ 5,000.00	
		Work with contractor to develop and edit cds about Inspector Training.	Dermot	0	40	40	$ 4,560.00		
		cd copies # per city							
4.5		**Collaborate with Other Groups**							
	4.5.1	Community Outreach Grants - Collaborate with Volunteer Groups				33	$ 3,630.00	$ 450.00	$ 4,080.00
		Provide STOPPP with an application to be distributed by the SC.							
		Update application	Susan	8	0	8	$ 880.00		
		Update database and organinze mailing distribution	Susan	20	0	20	$ 2,200.00		
		mailing printing	mail room					$ 450.00	
		press release		5		5	$ 550.00		
	4.5.2	Assist other STOPPP committees				120	$ 13,440.00	$ -	$ 13,440.00
		Work with EOA and other subcommittees to integrate P/IP activities with the general program components, developing public, municipal and commercial pollution prevention outreach materials, programs and trainings.	Susan and Dermot	60	60	120	$ 13,440.00		
			Total			**1,488**	**$ 178,120**	**$ 133,200**	**$ 311,320**

5-1. New Development and Construction Controls General Program Work Plan and Budget - FY 2006/07

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: Continue to assist the municipalities to understand and implement the updated performance standards including the pesticide requirements for new development projects. This will include, through New Development Subcommittee meetings and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP. Performance standards are reviewed every two years. This task will include participation in reviewing, commenting, and representing STOPPP in the adoption of the regional general permit anticipated to occur in the summer of 2006.	$5,000	Ongoing
5.2 Assist with the Implementation of Provision C.3: Continue to assist municipalities to implement source controls, site design measures, post-construction stormwater treatment measures and provisions for the continued operation and maintenance of stormwater treatment controls as part of the municipalities' new development review approval processes. This may include, through the New Development Subcommittee and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP.	$55,000	Ongoing
5.3 Assist with Implementation of the Hydrograph Modification Management Plan: Assist municipalities in the implementation of the HMP that is ultimately approved by the Regional Board. This may include any revisions required by the Regional Board, as well as special outreach and training programs timed to coincide with the date on which the Regional Board ultimately requires the HMP to be implemented.	See SWMP. Required by NPDES permit amendment.	$83,000	See permit amendment
5.4 Assist with Improving Construction Site Controls: Assist municipalities in conducting appropriate inspections and enforcement for construction sites and project-specific stormwater management plans.	See SWMP.	$2,000	Ongoing

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.5 Promote Outreach and Training: Reinforce and, as necessary, expand educational outreach to agency planning and engineering staff, planning commissions, city councils, builders, and builders' consultants and contractors.	See SWMP. This task includes one workshop for municipal staff, up to two outreach events, and the development or revision of one outreach piece, as appropriate.	$20,000	June 2006
5.6 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); developing two year work plans and budgets for General Program; providing any improvements to the new development section of the SWMP; assisting the NDS in conducting meetings; and developing a detailed NDS work plan for each fiscal year.	See SWMP.	$21,000	See permit
	Total Budget	**$186,000**	

5-2. New Development and Construction Controls General Program Work Plan and Budget - FY 2007/08

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
5.1 Implement and Improve Performance Standards: Continue to assist the municipalities understand and implement the updated performance standards including the pesticide requirements for new development projects. This will include, through New Development Subcommittee meetings and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP. Performance standards are reviewed every two years.	$5,000	Ongoing
5.2 Assist with the Implementation of Provision C.3: Continue to assist municipalities to implement source controls, site design measures, post-construction stormwater treatment measures and provisions for the continued	See SWMP.	$55,000	Ongoing

Task No. and Description	Rationale/Background (if necessary)	Budget	Schedule/Due Date
construction stormwater treatment measures and provisions for the continued operation and maintenance of stormwater treatment controls as part of the municipalities' new development review approval processes. This may include, through the New Development Subcommittee and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.			
5.3 Assist with Implementation of the Hydrograph Modification Management Plan: Assist municipalities in the implementation of the HMP.	See SWMP. Required by NPDES permit amendment.	$83,000	See permit amendment
5.4 Assist with Improving Construction Site Controls: Assist municipalities in conducting appropriate inspections and enforcement for construction sites and project-specific stormwater management plans.	See SWMP.	$2,000	Ongoing
5.5 Promote Outreach and Training: Reinforce and, as necessary, expand educational outreach to agency planning and engineering staff, planning commissions, city councils, builders, and builders' consultants and contractors.	See SWMP. This task includes one workshop for municipal staff, up to two outreach events, and the development or revision of one outreach piece, as appropriate.	$20,000	June 2007
5.6 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); developing two year work plans and budgets for General Program; providing any improvements to the new development section of the SWMP; assisting the NDS in conducting meetings; and developing a detailed NDS work plan for each fiscal year.	See SWMP.	$21,000	See permit
	Total Budget	**$186,000**	

Table 6-1. Watershed Assessment and Monitoring General Program Work Plan and Budget - FY 2006/07

Task Number and Description	Rationale/Background	Planning Budget	Schedule/ Due Date
6.1 Conduct Watershed Assessments: Perform chemical, biological and/or physical monitoring in local tributaries. Potential activities will include field probe measurements, physical habitat assessment, bioassessment, toxicity screening, pollutant analysis (e.g., pesticides), compiling existing data, designing monitoring programs and developing and implementing strategies to assess and manage trash. This task may also include participating in regional watershed assessment and monitoring efforts.	Assess water quality conditions in representative watersheds in San Mateo County and thereby help evaluate the overall effectiveness of STOPPP's BMPs and inform STOPPP's efforts to select new BMPs. See STOPPP's SWMP for more details.	$103,000	Work will be performed during FY 2006/07.
6.2 Develop Plans to Address Specific Pollutants of Concern: Develop plans to address specific pollutants of concern and perform related special studies as appropriate.	Assist STOPPP to select BMPs to address specific pollutants of concern in accordance with Bay Area TMDLs. See STOPPP's SWMP for more details.	$70,000	Work will be performed during FY 2006/07.
6.3 Participate in Regional Monitoring and TMDL-related Programs: Participate in selected regional collaborative programs (e.g., BASMAA, the San Francisco Estuary Regional Monitoring Program and the Bay Area Macroinvertebrate Bioassessment Information Network). Includes participating on selected committees and work groups and assisting with their development of study work plans and reports.	Participate in regional efforts to monitor water quality and solve water quality impairment problems. See STOPPP's SWMP for more details.	$18,000*	Ongoing.
6.4 Perform Activities Related to Regulatory Compliance and Planning: Prepare the WAM component section of STOPPP's annual report and work plans and coordinate the Watershed Assessment and Monitoring Subcommittee.	Meet specific requirements in STOPPP's NPDES permit and facilitate oversight of WAM component activities by STOPPP's municipalities. See STOPPP's SWMP for more details.	$12,000	NPDES permit required reports will be completed by the required dates. Other activities will be ongoing.
	Total Budget	**$203,000**	

* STOPPP's funding of regional collaborative programs is not included in the above table, but is shown under the General Program Budget Summary, Fees and Dues.

Mid-Fiscal Year Report 2005/06

Table 6-2. Watershed Assessment and Monitoring General Program Work Plan and Budget - FY 2007/08

Task Number and Description	Rationale/Background	Planning Budget	Schedule/ Due Date
6.1 Conduct Watershed Assessments: Perform chemical, biological and/or physical monitoring in local tributaries. Potential activities will include field probe measurements, physical habitat assessment, bioassessment, toxicity screening, pollutant analysis (e.g., pesticides), compiling existing data, designing monitoring programs and developing and implementing strategies to assess and manage trash. This task may also include participating in regional watershed assessment and monitoring efforts.	Assess water quality conditions in representative watersheds in San Mateo County and thereby help evaluate the overall effectiveness of STOPPP's BMPs and inform STOPPP's efforts to select new BMPs. See STOPPP's SWMP for more details.	$103,000	Work will be performed during FY 2007/08.
6.2 Develop Plans to Address Specific Pollutants of Concern: Develop plans to address specific pollutants of concern and perform related special studies as appropriate.	Assist STOPPP to select BMPs to address specific pollutants of concern in accordance with Bay Area TMDLs. See STOPPP's SWMP for more details.	$70,000	Work will be performed during FY 2007/08.
6.3 Participate in Regional Monitoring and TMDL-related Programs: Participate in selected regional collaborative programs (e.g., BASMAA, the San Francisco Estuary Regional Monitoring Program and the Bay Area Macroinvertebrate Bioassessment Information Network). Includes participating on selected committees and work groups and assisting with their development of study work plans and reports.	Participate in regional efforts to monitor water quality and solve water quality impairment problems. See STOPPP's SWMP for more details.	$18,000*	Ongoing.
6.4 Perform Activities Related to Regulatory Compliance and Planning: Prepare the WAM component section of STOPPP's annual report and work plans and coordinate the Watershed Assessment and Monitoring Subcommittee.	Meet specific requirements in STOPPP's NPDES permit and facilitate oversight of WAM component activities by STOPPP's municipalities. See STOPPP's SWMP for more details.	$12,000	NPDES permit required reports will be completed by the required dates. Other activities will be ongoing.
	Total Budget	**$203,000**	

* STOPPP's funding of regional collaborative programs is not included in the above table, but is shown under the General Program Budget Summary, Fees and Dues.

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SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

County Government Center
455 County Center
Redwood City, CA 94063

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flowstobay.com

CALIFORNIAREGIONALWATER

FEB 2 8 2007

QUALITYCONTROLBOARD

February 27, 2007

Mr. Habte-Mariam Kifle
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay St., Suite 1400
Oakland CA 94612

Subject: Submittal of 2006/07 Mid-Fiscal Year Report

Mr. Kifle:

Enclosed is the mid-fiscal year report required by the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)'s NPDES permit. The permit requires that SMCWPPP submit work plans each year describing General Program activities planned for the following two fiscal years. The permit also requires that these work plans be similar in terms of level of detail and format to the work plans contained in SMCWPPP's Stormwater Management Plan. The enclosed work plan tables meet these requirements.

The attached 2006/07 mid-fiscal year report contains the same 2007/08 work plan tables approved by the appropriate SMCWPPP subcommittees and Technical Advisory Committee (TAC) and submitted with last year's mid-fiscal year report. In this year's report, these tables are designated to apply to FYs 2007/08 and 2008/09. SMCWPPP took this approach because the Municipal Regional Permit (MRP) is still under development and it is uncertain at this time whether SMCWPPP's work plans will need to be reprioritized to meet MRP requirements during the next two fiscal years.

Please note that the City/County Association of Governments (C/CAG) has not yet approved the enclosed work plan tables and budgets, but C/CAG's consideration and approval of the 2007/08 work plan and budget is expected this spring. As always, the planning level budgets presented for each component are contingent upon the availability of funding. If you have any questions, please contact me.

Sincerely,

Matthew Fabry
SMCWPPP Coordinator

Att: Mid-fiscal Year Report 2006/07

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2006/07 MID-FISCAL YEAR REPORT

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

February 22, 2007

A Program of the City/County Association of Governments

Credits

This report is submitted by the participating agencies in the

SAN MATEO COUNTYWIDE
Water Pollution
Prevention Program
Clean Water. Healthy Community.

Town of Atherton
City of Belmont
City of Brisbane
City of Burlingame
Town of Colma
City of Daly City
City of East Palo Alto
City of Foster City
City of Half Moon Bay
Town of Hillsborough
City of Menlo Park
City of Millbrae
City of Pacifica
Town of Portola Valley
City of Redwood City
City of San Bruno
City of San Carlos
City of San Mateo
County of San Mateo
City of South San Francisco
Town of Woodside

San Mateo Countywide Water Pollution Prevention Program
555 County Center, Redwood City, California, 94065

A Program of the City/County Association of Governments
(C/CAG)

This report was prepared by the
San Mateo County Department of Environmental Health
and
EOA, Inc.

Mid-fiscal Year Report 2006/07

Table 1. FYs 2007/08 and 2008/09 General Program Budget Summary

Budget Categories		General Program Budget
Personnel Services		
Executive Director		$25,000
Program Manager		$60,000
Program Secretary		$0
Member Agency Support		$10,000
Miscellaneous		$1,000
	Subtotal	$96,000
Fees and Dues		
BASMAA Dues		$36,000
Regional Monitoring Program		$84,000
Clean Estuary Partnership		$80,000
Regional Ad Campaign		$40,000
	Subtotal	$240,000
Supplies and Other Charges		
Copier and Service Agreement		$0
Publications		$10,000
Conferences and Meetings		$1,500
Education and Training		$0
	Subtotal	$11,500
Additional Expenses		
Data Base Management		$12,500
EDP Consultant Work		$13,000
Controller's Processing Fee @ $.30/APN		$66,000
Miscellaneous (litigation)		$75,000
	Subtotal	$166,500
Tasks in the SWMP		
2.0 Municipal Maintenance		$69,000
3.0 Industrial and Illicit Discharge Controls		$174,000
4.0 Public Information and Participation		$311,000
5.0 New Development		$186,000
6.0 Watershed Assessment and Monitoring		$203,000
	Subtotal	$943,000
	TOTAL BUDGET	$1,457,000

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Mid-fiscal Year Report 2006/07
Table 2. Municipal Maintenance General Program Work Plan and Budget - FYs 2007/08 and 2008/09

Task No. and Description	Rationale/Background	Budget	Schedule/ Due Date[1]
Task 2.1 Develop and Implement Performance Standards: Assist municipalities to understand and implement the performance standards. The performance standards will be reviewed and improvements will be prepared, as appropriate, for approval by the SMCWPPP and for submittal to the Regional Board. Potential areas for new Performance Standard development include BMPs for parking lots and maintenance of publicly owned dry detention basins and other stormwater treatment controls.	The Maintenance Subcommittee and its work groups will review existing performance standards and make needed revisions every two years beginning in FY 1999/00. A minimum of one performance standard will be developed in FY2007/08.	$ 5,000	ongoing
Task 2.2 Conduct Outreach and Training: Coordinate the annual workshop. Prepare educational materials to increase the awareness of performance standards.	See SWMP	$15,000	ongoing
Task 2.3 Coordinate with Maintenance Related Activities by Other Subcommittees of the SMCWPPP, Other Agencies and Private Industries: Participate in work groups with staff from other public agencies and private industries to identify issues of common concern and appropriate BMPs. Potential projects would be to work with schools on integrated pest management, utilities on controlling potable water discharges or golf courses on other common areas of concern.	Coordination among agencies and industries whose activities affect municipal maintenance will result in greater efficiency and effectiveness in meeting this component's goal.	$4,000	ongoing
Task 2.4 Assist with Regulatory Compliance and Planning: This task includes the following items: assist with NPDES permit required reporting; provide administrative support and guidance for the Municipal Maintenance Subcommittee; revise two year work plan and budget as needed; and provide other regulatory assistance	See SWMP	$30,000	NPDES permit required reports will be completed by required dates. Other activities will be ongoing.
Task 2.10 Integrated Pest Management: Continue to work with the Park and Recreation Work Group to implement the integrated pest management (IPM) performance standards.	See SWMP	$15,000	ongoing
	Total Budget	**$ 69,000**	

[1] Schedule is for FY 2007/08 and a similar schedule would be applicable to FY 2008/09.

Mid-fiscal Year Report 2006/07

Table 3. Industrial and Illicit Discharge Controls General Program Work Plan and Budget - FYs 2007/08 and 2008/09

Task No. and Description	Rationale/Background	Budget	Schedule/Due Date[1]
3.1 Assist implementation and improvement of the performance standards: Assist the municipalities to understand and implement the performance standards. The performance standards and guidance material to assist with their implementation will be reviewed and improvements will be made.	The municipal regional permit's baseline performance standards are scheduled by the Water Board staff for adoption in 2006. This task will be to assist agencies to better understand, implement, and document their implementation of the adopted performance standards.	$10,000	June 2008
3.2 Provide Guidance on Developing and Implementing Discharge and Business Inspection Plans: SMCWPPP will assist develop model materials.	This task will depend on the requirements adopted in the municipal regional permit.	$10,000	Ongoing
3.3 Assist Compliance with Requirements for Conditionally Exempted Discharges: Continue to facilitate compliance with the requirements for handling non-stormwater discharges that have been identified as conditionally exempted from the permit's discharge prohibition.	This will include providing assistance in implementing the BMPs and Implementation Procedures for Conditionally Exempted Discharges.	$5,000	Ongoing
3.4 Conduct Outreach and Training: This task includes conducting targeted educational outreach and training to municipal staff or to businesses. Any educational outreach to businesses will need to focus increasingly on particular pollutants of concern, such as mercury, pesticides, and PCBs.	The CII Subcommittee will be responsible for identifying the target audience and methods used for conducting training and/or other types of educational outreach. This task will include updating the *Handbook for Facility and Illicit Discharge Inspectors* as possible within the available budget.	$28,000	June 2008
3.5 Assist with Regulatory Compliance and Planning: This task includes the following activities: assist SMCWPPP's municipalities to comply with the reporting and other requirements of the NPDES permit; (including development of deliverable reporting forms and preparation of the industrial and illicit discharge controls section of SMCWPPP's Annual Report); develop General Program work plans and budgets; assist with any additional planning needed to improve the industrial and illicit discharge controls section of the Plan; continue to assist the CII Subcommittee to conduct its meetings and other activities; and continue to participate in SMCWPPP's TAC meetings.	See SWMP	$ 61,000	NPDES permit required reports will be completed by required dates, other activities will be ongoing
3.6 Develop and Implement Pollutants of Concern Plan: This includes assistance with tasks required by the municipal regional permit.	The Water Board is continuing to develop TMDLs for specific pollutants of concern, and SMCWPPP will need to respond to pollutant load reduction tasks and/or allocations that it is assigned.	$55,000	June 2008
3.7 Assist with NPDES Permit Reissuance: This task includes providing assistance to SMCWPPP in working with the Water Board staff on any appeals of the municipal regional permit or issues of its interpretation.	The Water Board should have adopted in 2006 a municipal regional permit that covers SMCWPPP. This task will include ongoing support needs that are related to this adopted permit.	$5,000	June 2008
	Total Budget	**$ 174,000**	

[1] Schedule is for FY 2007/08 and a similar schedule would be applicable to FY 2008/09.

Table 4. Public Information/Participation General Program Work Plan and Budget - FYs 2007/08 and 2008/09

Task	Task Description	Responsible Staff and Plan	Hours 2007	Hours 2008	Total Hours	Cost	Materials Cost	Total
			$110	$114				
4.1	**Implement and Assist with the Performance Standards**							
4.1.1	Performance Standards				20	$ 2,240.00	$ -	$ 2,240.00
	Assist municipalities to understand and implement standards. Provide list of suggestions to improve standards	Dermot	10	10	20	$ 2,240.00		
4.2	**Assist with Regulatory Compliance and Planning**							
4.2.1	Provide support to P/IP				84	$ 9,408.00	$ 500.00	$ 9,908.00
	Attend 6 monthly meetings and assist chair with preparation, discussion topics and handouts.							
	Meeting attendance	Susan and Sarah	18	18	36	$ 4,032.00		
	Meeting preparation	Susan	24	24	48	$ 5,376.00		
	materials						$ 500.00	
4.2.2	Annual Report				80	$ 8,960.00	$ -	$ 8,960.00
	Assist EOA in preparing the P/IP section of the Annual Report	Dermot and Susan will prepare PIP section.	40	40	80	$ 8,960.00		
4.2.3	Mercury campaign - Fluorescent Lamp Collection Strategy				300	$ 33,600.00	$ -	$ 33,600.00
	Collaborate with San Mateo County Environmental Health to implement Vendor Take Back (VTB) or Legislative ordinance for Universal Waste including Fluorescent Lamps and other emerging contaminants and chemicals of concern.	Susan	150	150	300	$ 33,600.00		
4.3	**Encourage Public Involvement, Outreach, and Education**							
4.3.1	Point of Purchase - IPM Point of Purchase Campaign				334	$ 37,408.00	$ 6,000.00	$ 43,408.00
	12 meetings - 4 hours including travel time	Sarah	24	24	48	$ 5,376.00		
	Store visits and set up - 19 stores 3 hrs each +10hrs per season correspondence, training coord.	Sarah	143	143	286	$ 32,032.00		
	Materials-signage, books, etc						$ 6,000.00	
4.3.2	Website				112	$ 12,544.00	$ 20,000.00	$ 32,544.00
	Provide ongoing design and updating support for website	Contractor/Susan	30	30	60	$ 6,720.00	$ 10,000.00	
	quarterly meetings with subcommittee working group.	Susan	16	16	32	$ 3,584.00		
	Geographic Information System interface						$ 10,000.00	
	Contract Administration	Susan	10	10	20	$ 2,240.00		
4.3.3	Promotional Items, pamphlets, displays, and exhibit items	Contractor			90	$ 10,100.00	$ 16,500.00	$ 26,600.00
	Assist in purchasing promotional items for fair	Susan	0	10	10	$ 1,140.00	$ 6,500.00	
	Reprint brochures	Dermot	40	40	80	$ 8,960.00	$ 10,000.00	
4.3.4	Outreach development PR Firm				60	$ 6,720.00	$ 5,000.00	$ 11,720.00
	Continue work with PR or graphics firm to develop public recognition of program. Retain services for ongoing outreach and graphic development.	Contractor			0		$ 5,000.00	
	Interface with other subcommittes on graphic/brochure development needs	Susan	20	20	40	$ 4,480.00		
	Contract Administration	Susan	10	10	20	$ 2,240.00		
4.3.5	Produce Spanish ReNews newsletter and insert in Spanish language Newspapers				15	$ 1,710.00	$ 1,550.00	$ 3,260.00
	Work with translator to produce insert for ReNews	Contractor/Susan		5	5	$ 570.00	$ 1,000.00	
	Insert in El Observador newspaper.	Susan			0	$ -	$ 550.00	
	Contract Administration/Evaluation	Susan	0	10	10	$ 1,140.00		

Table 4. Public Information/Participation General Program Work Plan and Budget - FYs 2007/08 and 2008/09

Task		Task Description	Responsible Staff and Plan	Hours 2007	Hours 2008	Total Hours	Cost	Materials Cost	Total
	4.3.6	Elementary Outreach				40	$ 4,480.00	$ 10,700.00	$ 15,180.00
		Contract Administration	Susan	20	20	40	$ 4,480.00		
		Provide ZunZun "Watersongs" cd to schools who see performance 100@ $7 each						$ 700.00	
		Partner with the Used Oil Program to have Zun Zun perform at County Elementary Schools.	PIP Funding					$ 10,000.00	
	4.3.7	Watershed Stewardship - with The Watershed Project				40	$ 4,480.00	$ 32,500.00	$ 36,980.00
		Kids in Gardens workshop + teacher stipends	Susan					$ 15,000.00	
		Healthy Schools Inside and Out workshop for teachers and custodians						$ 12,000.00	
		Garden Registration program (for 10 school or community gardens)						$ 5,500.00	
		Contract Administration and Evaluation		20	20	40	$ 4,480.00		
	4.3.8	Cable Television commercials				40	$ 4,560.00	$ 20,000.00	$ 24,560.00
		Run commercials on cable	Contractor			0		$ 20,000.00	
		Contract	Susan	0	40	40	$ 4,560.00		
	4.3.9	Trash Campaign Research and implementation				80	$ 20,280.00	$ 15,000.00	$ 35,280.00
		Coordinate coastal cleanup with CA. Coastal Commission and creek and beach cleanup site leaders. Integrate social marketing theory into promotion of canvas bag usage in partnership with solid waste agencies to reduce use of plastic bags. Research and dev	Sarah					$ 5,000.00	
		Coastal Cleanup coordination	Sarah	60	20	80	$ 8,880.00		
		Implement community outreach program developed through 06-07 workplan.	Sarah		100	100	$ 11,400.00	$ 10,000.00	
4.4		**Assist with Focused Staff Training**							
	4.4.1	Focused Staff training				40	$ 4,560.00	$ 5,000.00	$ 9,560.00
		Develop training videos based on live training provided to TAC and other subcommittees - contract with DeAnza College	Contractor					$ 5,000.00	
		Work with contractor to develop and edit cds about Inspector Training.	Dermot	0	40	40	$ 4,560.00		
		cd copies # per city							
4.5		**Collaborate with Other Groups**							
	4.5.1	Community Outreach Grants - Collaborate with Volunteer Groups				33	$ 3,630.00	$ 450.00	$ 4,080.00
		Provide SMCWPPP with an application to be distributed by the SC.							
		Update application	Susan	8	0	8	$ 880.00		
		Update database and organinze mailing distribution	Susan	20	0	20	$ 2,200.00		
		mailing printing	mail room					$ 450.00	
		press release		5		5	$ 550.00		
	4.5.2	Assist other SMCWPPP committees				120	$ 13,440.00	$ -	$ 13,440.00
		Work with EOA and other subcommittees to integrate P/IP activities with the general program components, developing public, municipal and commercial pollution prevention outreach materials, programs and trainings.	Susan and Dermot	60	60	120	$ 13,440.00		
					Total	**1,488**	**$ 178,120**	**$ 133,200**	**$ 311,320**

Table 5. New Development and Construction Controls General Program Work Plan and Budget - FYs 2007/08 and 2008/09

Task No. and Description	Rationale/Background	Budget	Schedule/Due Date[1]
5.1 Implement and Improve Performance Standards: Continue to assist the municipalities understand and implement the updated performance standards including the pesticide requirements for new development projects. This will include, through New Development Subcommittee meetings and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP. Performance standards are reviewed every two years.	$5,000	Ongoing
5.2 Assist with the Implementation of Provision C.3: Continue to assist municipalities to implement source controls, site design measures, post-construction stormwater treatment measures and provisions for the continued operation and maintenance of stormwater treatment controls as part of the municipalities' new development review approval processes. This may include, through the New Development Subcommittee and semi annual reports from the municipalities, the tracking of the implementation and effectiveness of stormwater controls in municipal and private projects.	See SWMP.	$55,000	Ongoing
5.3 Assist with Implementation of the Hydrograph Modification Management Plan: Assist municipalities in the implementation of the HMP.	See SWMP. Required by NPDES permit amendment.	$83,000	See permit amendment
5.4 Assist with Improving Construction Site Controls: Assist municipalities in conducting appropriate inspections and enforcement for construction sites and project-specific stormwater management plans.	See SWMP.	$2,000	Ongoing
5.5 Promote Outreach and Training: Reinforce and, as necessary, expand educational outreach to agency planning and engineering staff, planning commissions, city councils, builders, and builders' consultants and contractors.	See SWMP. This task includes one workshop for municipal staff, up to two outreach events, and the development or revision of one outreach piece, as appropriate.	$20,000	June 2007
5.6 Assist with Regulatory Compliance and Planning: This task includes assistance with: NPDES permit required reporting (including new development section of annual reports); developing two year work plans and budgets for General Program; providing any improvements to the new development section of the SWMP; assisting the NDS in conducting meetings; and developing a detailed NDS work plan for each fiscal year.	See SWMP.	$21,000	See permit
	Total Budget	**$186,000**	

[1] Schedule is for FY 2007/08 and a similar schedule would be applicable to FY 2008/09.

Mid-fiscal Year Report 2006/07

Table 6. Watershed Assessment and Monitoring General Program Work Plan and Budget - FYs 2007/08 and 2008/09

Task Number and Description	Rationale/Background	Planning Budget	Schedule/ Due Date[1]
6.1 Conduct Watershed Assessments: Perform chemical, biological and/or physical monitoring in local tributaries. Potential activities will include field probe measurements, physical habitat assessment, bioassessment, toxicity screening, pollutant analysis (e.g., pesticides), compiling existing data, designing monitoring programs and developing and implementing strategies to assess and manage trash. This task may also include participating in regional watershed assessment and monitoring efforts.	Assess water quality conditions in representative watersheds in San Mateo County and thereby help evaluate the overall effectiveness of SMCWPPP's BMPs and inform SMCWPPP's efforts to select new BMPs. See SMCWPPP's SWMP for more details.	$103,000	Work will be performed during FY 2007/08.
6.2 Develop Plans to Address Specific Pollutants of Concern: Develop plans to address specific pollutants of concern and perform related special studies as appropriate.	Assist SMCWPPP to select BMPs to address specific pollutants of concern in accordance with Bay Area TMDLs. See SMCWPPP's SWMP for more details.	$70,000	Work will be performed during FY 2007/08.
6.3 Participate in Regional Monitoring and TMDL-related Programs: Participate in selected regional collaborative programs (e.g., BASMAA, the San Francisco Estuary Regional Monitoring Program and the Bay Area Macroinvertebrate Bioassessment Information Network). Includes participating on selected committees and work groups and assisting with their development of study work plans and reports.	Participate in regional efforts to monitor water quality and solve water quality impairment problems. See SMCWPPP's SWMP for more details.	$18,000*	Ongoing.
6.4 Perform Activities Related to Regulatory Compliance and Planning: Prepare the WAM component section of SMCWPPP's annual report and work plans and coordinate the Watershed Assessment and Monitoring Subcommittee.	Meet specific requirements in SMCWPPP's NPDES permit and facilitate oversight of WAM component activities by SMCWPPP's municipalities. See SMCWPPP's SWMP for more details.	$12,000	NPDES permit required reports will be completed by the required dates. Other activities will be ongoing.
	Total Budget	**$203,000**	

* SMCWPPP's funding of regional collaborative programs is not included in the above table, but is shown under the General Program Budget Summary, Fees and Dues.

[1] Schedule is for FY 2007/08 and a similar schedule would be applicable to FY 2008/09.

FISCAL YEAR 2007/08

ANNUAL REPORT

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.
www.flowstobay.org

July 2007 through June 2008
Volume I of V
August 29, 2008

A Program of the City/County Association of Governments

Credits

This report is being submitted by the participating agencies in the

SAN MATEO COUNTYWIDE
Water Pollution
Prevention Program
Clean Water. Healthy Community.
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City of Atherton
City of Belmont
City of Brisbane
City of Burlingame
Town of Colma
City of Daly City
City of East Palo Alto
City of Foster City
City of Half Moon Bay
Town of Hillsborough
City of Menlo Park
City of Millbrae
City of Pacifica
Town of Portola Valley
City of Redwood City
City of San Bruno
City of San Carlos
City of San Mateo
County of San Mateo
City of South San Francisco
Town of Woodside

Implementation of the Program Coordinated by:
San Mateo Countywide Water Pollution Prevention Program
555 County Center
Redwood City, California, 94063
A Program of the City/County Association of Governments
(C/CAG)

Report Prepared by:
County Environmental Health and
EOA, Inc.

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- *The Unified Stream Assessment: Potential Uses for Stormwater Programs, San Francisco Bay Area Examples, July 2008 (cover page and summary).*
- *FY 2007/08 Trash Assessments in Urban Creeks in San Mateo County, California, August 2008.*
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- Atherton
- Belmont
- Brisbane
- Burlingame
- Colma
- Daly City

VOLUME III
- East Palo Alto
- Foster City
- Half Moon Bay
- Hillsborough
- Menlo Park
- Millbrae

VOLUME IV
- Pacifica
- Portola Valley
- Redwood City
- San Bruno
- San Carlos
- San Mateo (City of)

VOLUME V
- San Mateo County
- South San Francisco
- Woodside

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List of Acronyms

BAMBI:	Bay Area Macroinvertebrate Bioassessment Information Network
BASMAA:	Bay Area Stormwater Management Agencies Association
BMPs:	Best Management Practices
CEP:	Clean Estuary Partnership
CEQA:	California Environmental Quality Act
C/CAG:	City/County Association of Governments of San Mateo County
CII:	Commercial/Industrial/Illicit (Subcommittee)
CIPs:	Capital Improvement Projects
COAs:	Conditions of Approval
HMP:	Hydromodification Management Plan
IPM:	Integrated Pest Management
MRP:	Municipal Regional Stormwater Permit
NDS:	New Development Subcommittee
NEPA:	National Environmental Policy Act
NPDES:	National Pollutant Discharge Elimination System
PIP:	Public Information and Participation
POP:	Point of Purchase (PIP campaign)
POTW:	Publicly-Owned Treatment Works (sewage treatment plants)
RGO:	Retail Gasoline Outlets
RMP:	Regional Monitoring Program
SMCWPPP:	San Mateo Countywide Water Pollution Prevention Program
SWMP:	Stormwater Management Plan
TAC:	Technical Advisory Committee

1 EXECUTIVE SUMMARY

INTRODUCTION

This report summarizes the San Mateo Countywide Water Pollution Prevention Program's (SMCWPPP) stormwater pollution prevention and control activities in FY 2007/08. This report was developed to comply with SMCWPPP's municipal stormwater National Pollutant Discharge Elimination System (NPDES) permit adopted in July 1999 and amended in 2003, twice in 2004, and again in 2007. The San Francisco Bay Regional Water Quality Control Board (Regional Water Board) staff has administratively extended the permit beyond its normal five-year expiration period while it continues to prepare a municipal regional stormwater permit that will provide permit coverage for a majority of the municipalities located in the Bay Area.

This report summarizes progress in implementing the following five major components of the SMCWPPP:

- Municipal Government Maintenance Activities
- Industrial and Illicit Discharge Control
- Public Information and Participation
- New Development and Construction Controls
- Watershed Assessment and Monitoring

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Information summarized in this report originated from work completed by the General Program and semiannual deliverable reports prepared by SMCWPPP's member agencies (Volumes II-V). Each municipality's two semiannual reports are located together within one of these volumes. Table 1-1 summarizes the submittals received from each of the municipalities.

The NPDES Program Coordinator, County Environmental Health or consultants conduct General Program activities for the benefit of all municipalities. Copies of General Program materials are contained in Appendices A-E including workshop training materials, summaries from reports, and BMP educational outreach materials.

The following describes the organizational structure of SMCWPPP and funding information

that is not contained elsewhere.

Organizational Structure

The current organizational structure of SMCWPPP is illustrated in Figure 1-1. The City/County Association of Governments (C/CAG) of San Mateo County, comprised of local elected city council representatives from each municipality, a member of the County Board of Supervisors, and representatives from the transit district and transportation authority, is the administrative and policy making body for SMCWPPP. C/CAG operates as a joint powers authority on issues of regional importance to San Mateo County jurisdictions. Administrative and policy making responsibilities were assumed under Amendment No. 3 to the Joint Powers Authority Agreement issued on April 22, 1993. This agreement makes C/CAG responsible for assisting with the Stormwater Management Plan's implementation and for assisting the municipalities' compliance with the NPDES permit. C/CAG has established an NPDES Subcommittee whose members are appointed by the C/CAG Chair.

C/CAG's deliberations are assisted by the NPDES Technical Advisory Committee (TAC), which is comprised of municipal representatives in the fields of engineering, planning, environmental health, wastewater treatment, source control inspection, and public works administration. The TAC has established five subcommittees to implement the five major program components. The names of subcommittee chairs, typical meeting dates, and meeting times are also shown in Figure 1-1.

General Program Financing Mechanism

During the 1992 California Legislative Session, AB 2635 (Chapter 1208, Statutes of 1992) extended the authority of the San Mateo County Flood Control District Act. As a result, the Board of Supervisors, acting in its capacity as the Flood Control District Board of Directors, upon a two-thirds vote, may adopt an ordinance to impose charges in any zone or subzone. These charges may be used for the specific purposes of funding flood control, storm drainage, water conservation or supply, or water pollution abatement projects or programs. This ability to impose fees provided a central revenue source for General Program activities that can also be used by local municipal programs to finance local NPDES permit program activities.

In FY 2000/01 C/CAG established a Task Force to evaluate a possible fee increase for supporting the General Program. This process included notifying each property owner and it culminated in the County Board of Supervisors approving an additional fee in July 2001.

The charges appear on the property tax rolls and are imposed as a separate line item on the property tax bill. The approved FY 2007/08 C/CAG budget was $1,479,994. Generally, fees to fund the General Program were applied according to land use area as follows:

- $3.44 residential parcel – basic fee;
  $2.86 – additional fee.

- $1.72 condominium, agriculture and vacant parcel – basic fee;
  $1.42 – additional fee.
- $3.44 all other uses for first 11,000 square feet, plus $0.32 per 1,000 additional square feet of parcel area – basic fee;
  $2.86 for first 11,000 square feet plus $0.26 per 1,000 additional square feet of parcel area - additional fee.

All of the municipalities except Woodside rely on the countywide collection of the basic fee to support their contribution to the General Program. The Town of Woodside uses an alternative source of funding to pay its General Program cost share.

The Cities of Brisbane, Colma, and San Mateo participated in the collection of the basic fee, but not the additional fee for supporting the General Program.

The Cities of Belmont, Brisbane, Colma, Daly City, East Palo Alto, Hillsborough, Menlo Park, Millbrae, Pacifica, and South San Francisco also have established local fees to fund municipality-specific activities.

Bay Area-Wide Collaboration

SMCWPPP has continued to be an active participant in several region-wide collaborative pollution prevention and control efforts and in planning for Total Maximum Daily Loads (TMDLs). Notable among these is its continued support for BASMAA at both the Directors' level and at the committees' level during the past year. This support included contributing $40,000 to BASMAA's Regional Advertising campaign that focused on watersheds. In addition, SMCWPPP has so far contributed $22,000 towards the development of BASMAA's Treatment Measure Design Tool.

SMCWPPP has actively supported the San Francisco Estuary Project's Implementation Committee. Lastly, SMCWPPP has participated in the Water Board's Mercury Watershed Council since it was initiated in 1999.

SMCWPPP is also supporting the maintenance of the Bay Area Hydrology Model (BAHM), along with the Santa Clara Valley Urban Runoff Pollution Prevention Program and the Alameda Countywide Clean Water Program. The BAHM was adapted from the Western Washington Hydrology Model to help local agencies and development community engineers to design correctly Flow Duration Control measures that comply with SMCWPPP's 2007 hydromodification provisions permit amendment.

SUMMARY OF PROGRESS IN EACH PLAN COMPONENT

A summary of FY 2007/08 major accomplishments is described below, along with a discussion of the goals of each component

Municipal Government Maintenance Activities

The goals of this component are:

- To maximize the removal of pollutants while sweeping streets, cleaning storm drain inlets, and conducting other routine maintenance activities.
- To minimize non-stormwater discharges to storm drains and watercourses from maintenance-related activities.

Outreach to local maintenance staff is conducted primarily through regular Public Works Supervisors/Municipal Maintenance Subcommittee meetings, Parks Maintenance and Integrated Pest Management Work Group meetings, and two annual training workshops for supervisors and field staff. One of these annual workshops focused on parks maintenance and the use of integrated pest management techniques.

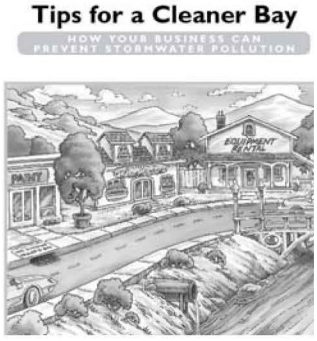
Major accomplishments during the past fiscal year include the following:

- Facilitated four San Mateo Public Works Supervisors/Municipal Maintenance Subcommittee meetings and three Parks Maintenance and Integrated Pest Management (IPM) Work Group meetings.
- Conducted the 15th Annual Maintenance Workshop that was attended by 75 public works, facilities, and parks maintenance supervisors and field staff. Based on an evaluation survey completed by attendees, all 49 respondents indicated that the workshop met their expectations.
- Conducted the 8th Annual Parks Maintenance and IPM Workshop attended by 67 people. Most of the workshop's attendees reported that the workshop met their expectations.
- Tracked records for street sweeping, maintenance of storm drainage facilities, and removal of leaf and litter in order to evaluate effectiveness and document improvements in best management practices (BMPs).

Industrial and Illicit Discharge Controls

The primary goals of this component parallel the requirements of the Clean Water Act as follows:

- To effectively prohibit the discharge of non-stormwater (illicit) discharges to the municipal storm drain system.
- To control the discharge of pollutants in stormwater from commercial and industrial businesses to the maximum extent practicable.



The following major accomplishments were achieved last fiscal year:

- Adapted for Program use ACCWP's *Tips for a Cleaner Bay* best management practices (BMPs) booklet that is applicable to any business. Copies of the booklet were printed in English and Spanish, and this booklet is a feature topic on the Program's website (www.flowstobay.org).
- Held stormwater orientation training for 27 municipal staff members.
- Prepared orientation materials in a binder for participants in the orientation training. These training materials are also available on the Program's website, www.flowstobay.org.
- Prepared a four-page fact sheet that summarizes the Program's successes in FY 2006/07. The fact sheet summarizes concisely what the Program does and what it is accomplishing. The fact sheet has been used to provide educational outreach to the public and elected officials.
- Evaluated potential stormwater funding options by contracting with HF&H Consultants to prepare a report that reviews funding sources that may be available to municipalities. The report describes existing and potential funding sources for municipal stormwater activities, restrictions, and specific examples of use of these funding sources by other agencies.
- Continued to conduct stormwater inspections and provide educational outreach to businesses in FY 2007/08, as part of the effort to re-inspect high priority businesses annually and inspect other businesses that impact stormwater quality at least once every five years. The total number of inspections in FY 2007/08 (2,332) was a little higher than the average number of annual inspections (2,124) reported during the five years preceding last fiscal year. The total number of inspections conducted during the last six years (12,951) is about one-third higher than the total number inspected during the preceding six-year period (9,488).
- Approximately 10 percent of the businesses inspected in FY 2007/08 (224) had a municipal stormwater violation. The percentage of violations found last fiscal year is the same as the percent violations found during the five-year period between FYs 2002/03 through 2006/07. For reporting purposes, the CII Subcommittee defines the term violation as either the discharge of pollutants to the storm drain system because pollutants are exposed to stormwater runoff or there was a discharge to the storm drain system of non-stormwater disallowed by the NPDES permit. All of the violations except one were reportedly corrected by June 30, 2008.
- Found more illicit discharges (454) than have been found annually since FY 1997/98. There was only one illicit discharge that was reported as continuing on June 30, 2008.

Public Information and Participation

The primary goals of SMCWPPP's Public Information and Participation (PIP) component are:

- To educate the public about the causes of stormwater pollution and its serious effect on the quality of local creeks, lagoons, shorelines, and neighborhoods;
- To encourage residents to adopt less polluting and more environmentally beneficial practices; and
- To increase residents' hands-on involvement in SMCWPPP's activities.

PIP is essential for controlling pollution at the source because most pollutants originate from preventable, everyday activities. Pollutants in stormwater may be reduced by educating residents about the benefits of preventing stormwater pollution and motivating them to do their share to reduce pollution.

This approach is recognized as being both cost-effective and efficient in meeting the goal of reducing pollutants in stormwater to the maximum extent practicable.

The PIP Subcommittee met six times in FY 2007/08 to oversee the development of educational materials and to guide the implementation of countywide PIP activities.

SMCWPPP accomplished the following major public information and participation tasks during FY 2007/08:

- Continued to conduct school outreach to schools, reaching over 8,266 students through "The Water Beat" Zun Zun assembly program.
- Held a workshop for School Maintenance Supervisors and staff on reducing pollution at schools. Part of the training focused on learning about environmentally friendly cleaning and pest control products for use around schools.
- Continued the Community Action Grant Program.
- Continued to participate in the region-wide Integrated Pest Management "Our Water Our World" campaign by working with local retail stores.
- Continued to coordinate the California Coastal Cleanup Day event in collaboration with the California Coastal Commission.

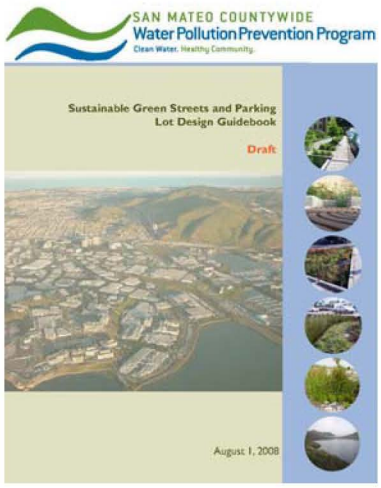
- Hosted an educational booth at the County Fair.
- Redesigned SMCWPPP's website, www.flowstobay.org, by making it more user friendly and appealing. All of the brochures are available online and monthly updates were maintained. The educational outreach provided by the website is supplemented by using public service announcements on cable television.
- Continued collaborative outreach with the Used Oil Block Grant Program and the Retail-Take Back Program of the County Household Hazardous Waste Program in Environmental Health.
- Implemented the municipalities' community outreach programs.

New Development and Construction Controls

The goal of this component is to assist municipalities in developing and adopting procedures to ensure that appropriate measures are implemented to control stormwater pollution associated with new development and significant redevelopment projects. These measures may include site planning and design techniques to mitigate stormwater impacts, BMPs and controls during construction, and BMPs and stormwater treatment measures to reduce stormwater pollutants over the life of the project.

SMCWPPP's strategies are to integrate procedures for stormwater pollution prevention and control into existing municipal review and inspection programs and to coordinate with other Bay Area programs.

SMCWPPP's primary accomplishments related to new development and construction controls during the past fiscal year included:



- The City/County Association of Governments of San Mateo County solicited a call for projects for municipalities to apply for grant funds to construct sustainable green streets and parking lot demonstration projects. Five grant recipients were selected. C/CAG also executed a contract with Nevue Ngan Associates teamed with Sherwood Design Engineers to prepare a Sustainable Green Streets and Parking Lot Design Guidebook.
- Held construction site stormwater management training workshops in collaboration with the San Francisco Estuary Project and the Santa Clara Valley Urban Runoff Pollution Prevention Program.
- Sponsored the 2008 New Development Workshop, featuring the new C.3 Technical Guidance document prepared in FY 2006/07.

- Updated an appendix to the C.3 Technical Guidance to include nine maintenance plan templates for use by project applicants that use stormwater treatment measures in their projects. The cover page of the applicable C.3 Technical Guidance appendix is included in Appendix D.
- Updated the Project Applicant Checklist for NPDES Permit requirements to include information on hydromodification management (HM) requirements, which began to be implemented in June 2007. The updated checklist is included in Appendix D.
- Reviewed two draft HM worksheets. The HM Applicability Workshop will assist municipal staff in determining whether a project needs to comply with HM requirements. The Flow Duration Control Review Worksheet will help municipal staff review submittals for projects that incorporate flow duration controls, pursuant to the HM requirements. These forms, which were based on worksheets prepared by the Alameda Countywide Clean Water Program, will be finalized in FY 2008/09.
- Coordinated with Regional Water Board staff to include an update to the HM Control Area Map in the draft municipal regional stormwater permit, for approval by the Regional Water Board. The map update incorporates newly available digitized map data that will allow the HM control area boundary to follow Assessors parcel boundaries.
- Prepared soil guidelines for landscape-based treatment measures, based on soil specification prepared by the Alameda Countywide Clean Water Program. The soil guidelines are included in Appendix D.
- Provided input to the redesign of SMCWPPP's website to improve the organization of materials related to new development, redevelopment and construction. Christina Horrisberger of Pacifica represented the NDS on the website redesign work group.
- Updated frequently used documents and forms with SMCWPPP's new name and logo.
- The NDS took a field trip in April to view stormwater treatment measures at two projects in San Francisco. A summary of the field trip is included in Appendix D.
- The following municipalities reported approximately 74 projects that created and or replaced 10,000 square feet or more of impervious surface, triggering the amended NPDES permit's Provision C.3 requirements: Belmont, Brisbane, Burlingame, Colma, Daly City, Menlo Park, Millbrae, Pacifica, Redwood City, San Carlos, San Mateo, San Mateo County, and South San Francisco. These projects incorporated a variety of BMPs.
- Approximately 64 projects incorporated vegetated swales and/or detention basins. These projects represent approximately 660 acres of new and redevelopment projects.
- SMCWPPP's municipalities are continuing to verify the operation and maintenance of stormwater treatment measures as required by the amended NPDES permit's Provision C.3.e.
- Municipalities have continued to use the Summary of Pre-Wet Season Erosion Control

Inspections Form to document the basis of the annual certification letter's determination that each active construction site has been stabilized to minimize erosion and the discharge of sediment from disturbed areas prior to the wet season. These forms can be found as Attachment E to the first half-year deliverable forms submitted by the municipalities.

- SMCWPPP continued to coordinate with the San Mateo County Mosquito Abatement District by providing information on new development projects.

Watershed Assessment and Monitoring

The goals of SMCWPPP's Watershed Assessment and Monitoring (WAM) component include:

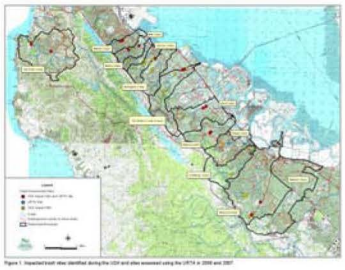
- Characterizing creek function, health and water quality conditions in representative watersheds in San Mateo County and evaluating potential stormwater runoff impacts;
- Developing plans to address specific pollutants of concern associated with stormwater runoff, such as mercury and polychlorinated biphenyls (PCBs), and performing related special studies (e.g., to identify pollutant sources); and
- Evaluating long-term trends in water quality and thereby informing the SMCWPPP's efforts to improve the effectiveness of its BMPs to prevent or reduce stormwater runoff impacts.

SMCWPPP focuses on using integrative tools such as creek walks and bioassessments to characterize creek condition. The monitored creeks are typically receiving waters for stormwater discharges from municipal storm drain systems in watersheds with significant urban land uses. The Program also participates in regional collaborative efforts that develop information needed to improve water quality in San Francisco Bay and local watersheds in San Mateo County and throughout the Bay Area. SMCWPPP's WAM component accomplishments during FY 2007/08 are summarized below.

- Performed creek walks during fall 2007 in seven watersheds in San Mateo County – the Atherton, Redwood, Burlingame, Sanchez, Easton, Mills, and Millbrae Creek watersheds. The primary objective was to characterize physical conditions and features of creek channels and riparian corridors in the study watersheds. The creek walks were conducted using the Unified Stream Assessment (USA) protocol developed by the Center for Watershed Protection. The USA is a rapid assessment tool used to collect data on instream and riparian habitat conditions and identify possible influencing factors and opportunities for improvement.
- Prepared a guidance document for municipal stormwater programs and other interested agencies on the potential uses of the USA based on recent experience in the

Bay Area. This effort was performed in collaboration with the Santa Clara Valley Urban Runoff Pollution Prevention Program. The guidance document shows how data generated through USA surveys can address multiple stormwater program monitoring-related objectives. These include establishing baseline data, identifying the types and locations of potential impacts to water quality, identifying potential beneficial uses to protect and threats to such uses, and refining monitoring program objectives and design. USA survey data can also assist in the interpretation of existing monitoring data and the identification of appropriate stormwater BMPs and potential restoration activities.

- As a follow-up to some of the issues documented during the USA creek walks (e.g., erosion and unsound erosion control practices), SMCWPPP began to explore the potential for developing a program in San Mateo County modeled after Contra Costa County's Stream Management Program for Landowners (SMPL). Many of the impacts observed during SMCWPPP's USA creek walk surveys are associated with efforts by individual private property owners to control bank instability on their properties. Education and outreach through a program similar to SMPL could help landowners understand the impacts of such actions on creeks and potentially lead to the use of better practices in the future. One difficulty is that the activities implemented by the SMPL program are not specifically required by any of the provisions in the draft municipal regional stormwater permit. The best opportunity to fund a program similar to SMPL in San Mateo County may be to apply for grant funding.
- Used the Urban Rapid Trash Assessment (URTA) protocol to further characterize trash conditions at some of the trash accumulation sites identified during the fall 2007 USA creek walks. URTAs were performed at a total of seven of the 27 trash accumulation sites identified during the creek walks. The URTA was conducted twice at each site, once during fall 2007 and a second time during spring 2008, for a total of 14 assessments. Trash sources identified during the study included littering, dumping and accumulation from upstream sources.
- Developed a draft fact sheet that describes typical trash management activities conducted by SMCWPPP's municipalities and SMCWPPP's multi-faceted program-wide efforts to characterize trash and reduce trash levels in urban creeks.
- Reviewed the Regional Water Board's June 30, 2007 San Francisquito Creek Sediment Total Maximum Daily Load (TMDL) and Habitat Enhancement Plan Preliminary Project Report and prepared a comment letter.



- Continued to coordinate its WAM component activities with other Bay Area stormwater management agencies through the Bay Area Stormwater Management Agencies Association (BASMAA).
- Continued to provide in-kind assistance to the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI is developing a regional Index of Biological Integrity (IBI), which will help with classifying creek condition,

evaluating attainment of beneficial uses in creeks, identifying stressors to creeks, and establishing water quality goals.

- Continued to participate in the San Francisco Estuary Regional Monitoring Program (RMP) by providing funding to the RMP in FY 2007/08. General Program staff also continued to represent BASMAA on the RMP Sources, Pathways and Loadings Work Group and advocated for stormwater program interests during study design, implementation and reporting. General Program staff also reviewed the RMP's draft report on 2006 fish tissue contaminant data and prepared comments and co-authored a RMP Pulse of the Estuary article on contaminant loading to Bay from local watersheds.
- Assisted Regional Water Board staff to compile selected data on San Mateo County stormwater pump stations as part of a regional data collection effort.
- Continued assisting BASMAA to participate in a Proposition 50 grant-funded project (Taking Action for Clean Water) that will develop Bay Area-specific BMPs to prevent release of PCBs from building materials into urban runoff during renovation, maintenance and demolition of structures.
- Continued to help represent BASMAA during development of the San Francisco Bay PCBs TMDL cleanup program. This included reviewing the December 2007 revised PCBs TMDL Regional Water Board staff report and Basin Plan Amendment and assisting BASMAA to prepare comments. SMCWPPP General Program staff also testified on behalf of BASMAA at Regional Water Board hearings on the PCB TMDL in September 2007 and February 2008.
- SMCWPPP's WAM Subcommittee met regularly during FY 2007/08 to oversee the WAM component's activities. The subcommittee also took a field trip to San Mateo Creek in June 2008 to observe and discuss typical trash impacts to urban creeks.

The effectiveness of WAM component efforts during FY 2007/08 should be assessed in the context of the WAM component goals described earlier. SMCWPPP's bioassessments, USA creek walks, and trash assessments in urban creeks in San Mateo County have helped define baseline water quality conditions. These data will facilitate future evaluations of long-term trends and thereby inform efforts to evaluate the overall effectiveness of SMCWPPP's stormwater pollution prevention and control BMPs. These data also potentially help identify impairment problems and pollutant sources, a first step in selecting new BMPs to prevent or reduce stormwater runoff impacts throughout San Mateo County. For example, SMCWPPP's trash assessments help identify sources of trash at accumulation sites in urban creeks, and therefore will inform the development of new or improved BMPs to address trash in urban creeks. In addition, SMCWPPP's participation in regional monitoring efforts (e.g., the RMP) assists TMDL development, especially those TMDLs focusing on improving water quality in San Francisco Bay.

SMCWPPP's WAM component will continue to focus on watershed-related activities, specific pollutants of concern such as trash, and regional collaboration during FY 2008/09. A principle

focus next year will be to conduct pilot work to evaluate potential sources of trash to urban creeks and control measures. This increased emphasis on developing trash and litter BMPs is intended to assure continued compliance with Provision C.1 of SMCWPPP's NPDES permit and to respond to the high priority that Bay Area communities place on addressing trash and litter in creeks and other waterways.

To the extent possible, all WAM component activities will be planned and conducted in coordination with the ongoing development of the municipal regional stormwater permit. In preparation for implementing this permit, SMCWPPP will continue to support and participate in development of a regional monitoring collaborative among Bay Area stormwater agencies. SMCWPPP will also continue to participate in existing regional collaborative monitoring programs in the Bay Area such as BAMBI and the RMP.

FIGURE 1-1: SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM ORGANIZATIONAL STRUCTURE AND MEETINGS

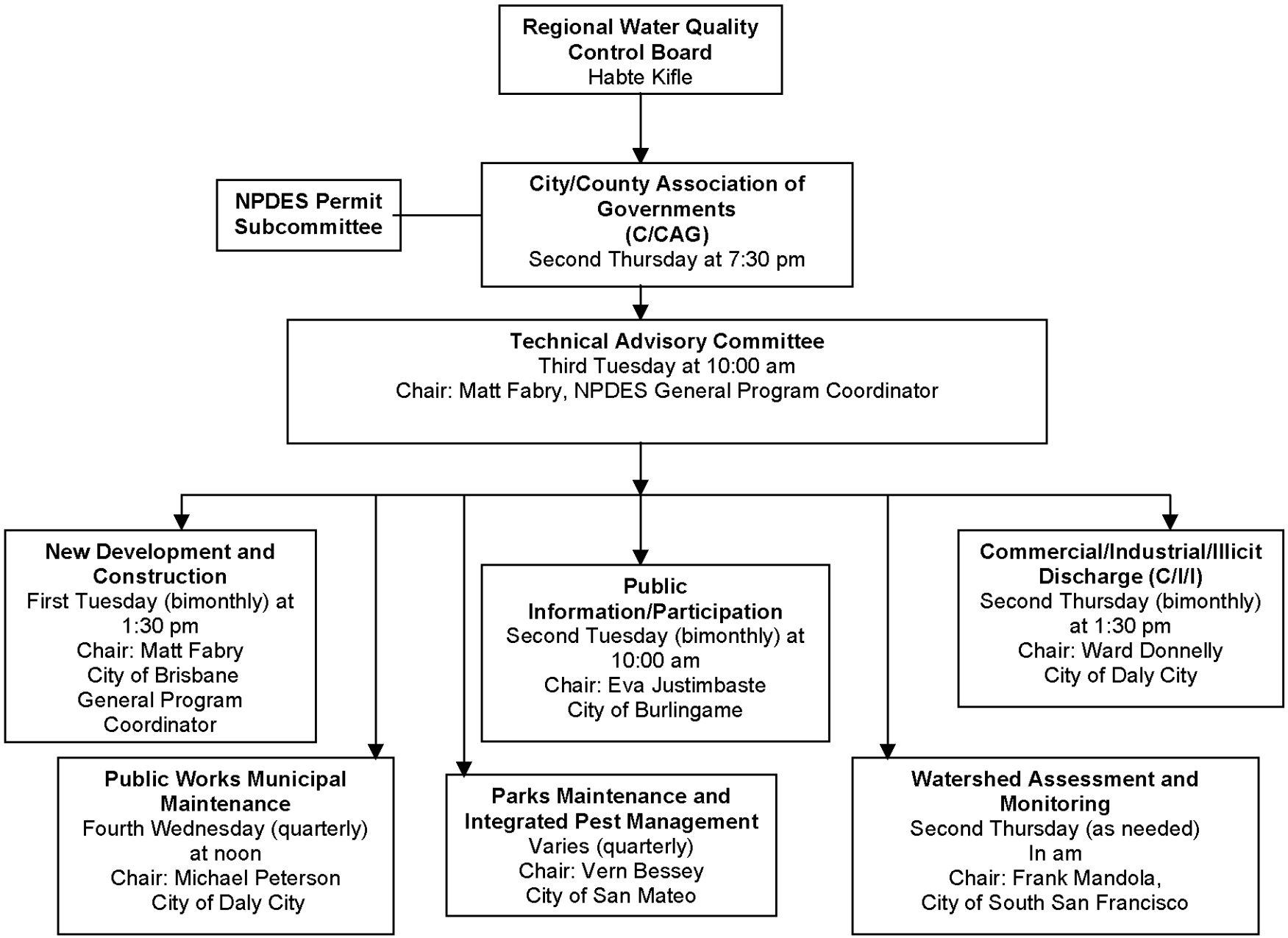


Table 1-1. SMCWPPP Submittals for the FY 2007/08 Annual Report

Agency	Deliverable Report Forms		Certification Letter*	Monthly Maintenance Forms		Illicit Discharge Quarterly Reports	
	1st Half	2nd Half		1st Half	2nd Half	1st Half	2nd Half
Atherton	✓	✓	Duncan Jones	✓	✓	✓	✓
Belmont	✓	✓	Karen Borrmann	✓	✓	✓	✓
Brisbane	✓	✓	Matthew Fabry	✓	✓	✓	✓
Burlingame	✓	✓	Syed Murtuza	✓	✓	✓	✓
Colma	✓	✓	Phil Scramaglia Muneer Ahmed	✓	✓	✓	✓
Daly City	✓	✓	Patrick Sweetland	✓	✓	✓	✓
East Palo Alto	✓	✓	Lucy Chen	✓	✓	✓	✓
Foster City	✓	✓	Norman Dorais	✓	✓	✓	✓
Half Moon Bay	✓	✓	Charles Voos	✓	✓	✓	✓
Hillsborough	✓	✓	Dave Bishop	✓	✓	✓	✓
Menlo Park	✓	✓	Jennifer Ng	✓	✓	✓	✓
Millbrae	✓	✓	Khee Lim	✓	✓	✓	✓
Pacifica	✓	✓	Van Dominic Ocampo	✓	✓	✓	✓
Portola Valley	✓	✓	Howard Young	✓	✓	✓	✓
Redwood City	✓	✓	Larry Barwacz	✓	✓	✓	✓
San Bruno	✓	✓	Jane Chambers Steven Davis	✓	✓	✓	✓
San Carlos	✓	✓	Mark Weiss	✓	✓	✓	✓
San Mateo, City of	✓	✓	Vern Bessey Larry Patterson	✓	✓	✓	✓
San Mateo County	✓	✓	Dean Peterson	✓	✓	✓	✓
South San Francisco	✓	✓	Cassie Prudhel	✓	✓	✓	✓
Woodside	✓	✓	Gratien Etchebehere	✓	✓	✓	✓

✓ = Municipality submitted all or most of the forms.
N/A = Not applicable.
* Construction certification letters are typically signed by different staff than the person responsible for certifying overall deliverable reports. Refer to each municipality's deliverables for information about construction certification letters.

2

MUNICIPAL GOVERNMENT MAINTENANCE ACTIVITIES

INTRODUCTION

The goals of this component are:

- To maximize the removal of pollutants while sweeping streets, cleaning storm drain inlets, and conducting other routine maintenance activities.
- To minimize non-stormwater discharges to storm drains and watercourses from maintenance-related activities.

Educational outreach to local maintenance staff is conducted primarily through regular public works and parks supervisors meetings and two annual training workshops for supervisors and field staff. One of these annual workshops is focused on park maintenance and the use of integrated pest management.

ACCOMPLISHMENTS

Major accomplishments during the past fiscal year include the following:

- Facilitated four San Mateo Public Works Supervisors/Municipal Maintenance Subcommittee meetings and three Parks Maintenance and Integrated Pest Management (IPM) Work Group meetings.
- Conducted the 15th Annual Maintenance Workshop that was attended by 75 public works, facilities, and parks maintenance supervisors and field staff. Based on an evaluation survey completed by attendees, all 49 respondents indicated that the workshop met their expectations.
- Conducted the 8th Annual Parks Maintenance and IPM Workshop attended by 67 people. Most of the workshop's attendees reported that the workshop met their expectations.
- Tracked records for street sweeping, maintenance of storm drainage facilities, and removal of leaf and litter in order to evaluate effectiveness and document improvements in BMPs.

Participation and Coordination with the Municipal Maintenance Subcommittee

The San Mateo Public Works Supervisors/Municipal Maintenance Subcommittee (Municipal Maintenance Subcommittee) held its regular meetings to share information about current maintenance activities, methods to optimize pollutant removal, and BMPs to minimize non-stormwater discharges to storm drains.

Craig Centis from Millbrae presided as chair during the first half of FY 2007/08 and Daly City's Michael Peterson has chaired the subcommittee since January 2008. Most municipalities (see Appendix A) routinely participated in these subcommittee meetings.

Fifteenth Annual Maintenance Workshop

The Fifteenth Annual Maintenance Workshop was held at the Green Business Exchange in Redwood City on June 26, 2008. A planning work group comprised of Daly City's Michael Peterson; Craig Centis, City of Millbrae; James Hardie, City of South San Francisco; and Louis Gotelli, City of Colma, helped to plan this training. This planning work group assisted with developing the agenda, contacting speakers, and identifying equipment vendors.

Seventy-five municipal maintenance supervisors and field staff attended the workshop. Attendees identified the following categories of maintenance work as their responsibility:

1. Storm drain system maintenance (32 responses);
2. Sanitary sewer maintenance (23 responses);
3. Paving and road repair (22 responses);
4. Litter pick-up (17 responses);
5. Facilities maintenance (8 responses);
6. Maintenance supervisor (8 responses);
7. Sweeper operators (6 responses); and
8. Parks maintenance (5 responses).

All of SMCWPPP's municipalities, except four, were represented at the workshop. Based on an evaluation survey, 49 respondents reported that the workshop met their expectations and three did not respond to this question. In addition, almost all of the attendees who completed the survey reported that they would be interested in attending a similar workshop next year. Appendix A contains a copy the workshop agenda, list of attendees, and a summary of the evaluation forms.

The following summarizes some of information presented at the workshop.

<u>City of Long Beach's Trash and Litter Control Program</u>

One of the key speakers at the workshop was Tom Leary, Stormwater Program Officer from the City of Long Beach. The city has an award-winning litter abatement program. The City of Long Beach's Parks, Recreation, and Marine Department cleans up about 4,500 tons of trash per year from its four miles of beach. Most of this material comes from the Los Angeles River. About 60 percent is composed of green wastes and the rest includes a lot of plastics and Styrofoam. The city uses education, source control, and structural controls to limit the amount of trash, and

Mr. Leary believes that they need to be doing more enforcement.

The city spent $841,000 to install 1,904 inserts on 529 of its 3,872 storm drain inlets. One product used is the "Smart Sponge©" manufactured by Ab Tech Industries. The basket like device kills some bacteria and collects trash, and it takes about 45 minutes to install. The installed inserts have been capturing about 90,000 lbs per year of trash, litter, and sediment. The city's public works webpage contains a study on the effectiveness of these inserts. Another structural control used is Vortex Separation systems that are installed under streets. At the city's five stormwater pump stations the city installed trash net collection systems that cost about $2,300,000. The city also installed a boom across part of the Los Angeles River, and this boom collects about 100 tons of trash per year.

The city has also undertaken projects to try to change litter and trash generating behavior. It is important to make polluting Long Beach socially unacceptable. One of these projects is called EcoZone, which includes installing signs in the public right of way about not polluting. In addition, the signs generate advertising revenue for the city's environmental projects.

Oakland's Garbage Cops

The City of Oakland's litter enforcement officers ("garbage cops") discussed their formation in 2001 to handle the out of control illegal dumping in Oakland.

There are eight officers who work in two shifts. The city's ordinance allows prosecution against an illegal dumper if three addressed letters are found in the illegally dumped material.

The officers have also cracked down on illegal haulers of trash, people that are paid to remove trash, but do not have a contractor's license. If you hire someone to haul trash and the trash is disposed illegally, you are responsible.

The officers also spend time educating the public, and there has been an increase in the public's reporting of illegal dumping.

New Sewer Spill Reporting and Remediation Requirements

Gary Batis from the City of South San Francisco provided information about the new requirements for reporting sanitary sewer overflows. Municipal staff has up to two hours to report any sanitary sewer spill that reaches a waterway or is over 1,000 gallons. The report must go to the Office of Emergency Services, the Regional Water Quality Control Board, and the Department of Environmental Health. Spills that are less than 1,000 gallons and do not reach waterways must be reported electronically within 24 hours.

Cities need to contain and clean up spills as much as possible. Municipal staff needs to have training on spill response and have spill control materials readily available. He believes that reporting requirements similar to sanitary sewer spill reporting requirements will also eventually apply to stormwater.

Facilitated Parks Maintenance and IPM Work Group

The work group, which was chaired by the City of San Mateo's Vern Bessey, met three times. Participation on the work group declined during last year. In FY 2007/08 only ten agencies attended one or more work group meetings

(Appendix A) compared with 17 in FY 2006/07 and 18 in FY 2005/06.

Discussion topics were broadened two years ago to include parks maintenance as well as IPM methods. One of the recurring topics has been the proposed requirements contained in the draft municipal regional stormwater permit. In addition, the subcommittee provided suggestions on possible locations of a bayside, countywide demonstration project for sustainable, green streets and parking lots. Staff from the County's Agriculture Department continued to provide regulatory guidance on pesticide use and safe application practices.

Eighth Annual Park Maintenance and Integrated Pest Management Workshop

SMCWPPP's annual Park Maintenance and IPM workshop was held on February 28, 2008 at the Green Building Exchange in Redwood City. Sixty-seven people representing 14 municipalities attended the workshop. The 2008 workshop showed a decline in participation compared with the 91 attendees from 18 municipalities who attended in 2007 and the 94 attendees from 20 municipalities who attended in 2006.

Among the 39 workshop attendees who completed an evaluation form, 31 indicated that the workshop met their expectations; two indicated that it "kind of" met their expectations; one reported that it did not, and six did not respond. One of the complaints about the workshop is that the number of credit hours for pesticide applicators was reduced from 3 to 2 hours as the workshop attempted to deal with a broader range of park maintenance topics than previous workshops. Appendix A contains a copy of the workshop agenda, attendance list, and a summary of the evaluation forms.

The following summarizes briefly some of the information presented at the workshop.

<u>Aquatic Vegetation Management</u>
Dave Najera from Aquatic Environments and the maintenance contractor for the City of San Mateo's Marina Lagoon described their multifaceted biological approach to managing excessive aquatic vegetation. He does not believe in trying to create sterile aquatic systems with chemicals.

Part of his approach is to harvest aquatic plants that grow excessively. In local lagoons this requires harvesting two to four times during a three-month period each year. They also need to start treating Marina Lagoon with chemicals in April. The location of herbicide applications is tracked using GPS.

The biggest nuisances are caused by non-native aquatic weeds. Widgeon grass likes brackish water, and it can help to promote good water quality when it does not proliferate to nuisance levels. Mr. Najera believes that aquatic vegetation can be managed correctly with a minimal amount of chemical use.

In Alameda County Aquatic Environments used tilling to destroy the root crown of tules so that the county could then establish a regular maintenance program. To control *Arundo donax* the first step is to mow this giant reed and the second step is to apply a small amount of herbicide.

Mr. Najera emphasized the need to be proactive instead of reactive in

managing aquatic vegetation. There will be less vegetation to control if preventative measures are used. In some freshwater situations Nytella can be encouraged to grow, and it dominates other types of aquatic vegetation and provides clean water.

Creek Maintenance

Julie Casagrande from San Mateo County's Public Works Department provided information about how the county maintains creeks that often contain endangered species. Generally, the county does not apply herbicides for vegetation control on the coastside because of the prevalence of endangered species. It has used mechanical methods to control cattails in some channels, and nonviolent criminal offenders have helped to provide the labor needed to implement these controls. It can take up to two years to obtain the necessary permits to remove excessive vegetation and sediment from flood control channels. The county believes it would be more efficient to obtain a programmatic permit instead of individual permits for each project.

The county has created a maintenance standards manual, and this year it is completing a report on goals for fish habitat restoration. One of the challenges is enhancing fish habitat while protecting county roads. The county has installed a fish friendly culvert in a county park in Woodside.

Enforcement Response Policy

Jerry Ade from the County Agricultural Commissioner's Office provided information about their pesticide use violations' enforcement response plan that they follow. The plan requires progressively more severe enforcement for repeat violations. The question and answer portion of the presentation was particularly helpful to parks maintenance staff that are responsible for the safe use of pesticides.

Use of Synthetic Sports Fields

Peter Vorametsanti from the City of Redwood City provided information about the pros and cons of using synthetic sports fields. The city uses synthetic turf to save on water and allow more usage. His experience is that the amount of soccer play that can be accommodated on synthetic fields is two to three times greater than what natural turf fields can handle. This increase in usage has been accompanied by an approximately two to three-fold increase in the amount of trash and litter generated. Another downside to using synthetic fields is that they are hotter.

The backing of the synthetic turf allows rainwater to pass through the turf. One of the problems they have experienced is that glued seams came apart sooner than stitched seams. At one of their facilities it will be costing $1.5 million to replace the top layer of synthetic turf after six years of use.

Coordination with Maintenance Related Activities by Others

The Municipal Maintenance Subcommittee tries to improve communication and coordination with other agencies responsible for maintenance. During FY 2007/08 the San Francisco International Airport's maintenance staff was the focus of increased communication. San Francisco International Airport's Bay Area Pollution Prevention Compliance Manager, Charlie Freas, presented information at the January 2008 Municipal Maintenance Subcommittee meeting about the challenges posed in

preventing pollution at the airport.

One of the unique aspects of the airport is that dry weather runoff and first flush stormwater that is collected around the terminal areas flows to detention basins and then is treated at the airport's industrial wastewater treatment plant prior to being discharged to the bay. Stormwater from the eastern runways flows directly to the bay without treatment.

Street Sweeping and Maintenance of Storm Drainage Facility Records

The municipalities provided information on their Municipal Government Maintenance Activities Monthly Record Keeping Forms on street sweeping and maintenance of storm drainage facilities and watercourses. Municipalities continued to use the agreed upon monthly maintenance forms to provide the information.

Leaf Removal and Litter Control

Table 2-1 summarizes the volume of leaves and litter removed from each municipality. Municipal personnel collected about 15,700 cubic yards and 77 tons of litter and about 5,800 cubic yards and 210 tons of leaves. Documentation of the amount of leaves removed is challenging because leaves are generally mixed with debris from street sweeping and storm drain system cleaning or with turf clippings, tree pruning and other green wastes. A large amount of leaf and other green wastes that are collected by the local waste pick up and recycling companies is not reported by the municipalities.

Storm Drainage Facilities and Watercourses

Information on the municipalities' inspecting and cleaning of storm drain inlets, V-ditches, drain lines, channels, creeks, culverts, junction boxes and pump stations is summarized in Table 2-2. Other storm drainage facilities were also inspected and/or cleaned. Overall, approximately 5,500 cubic yards and about 140 tons of material were cleaned from storm drainage facilities.

Street Sweeping

A summary of street sweeping data, including the volume of material removed and miles swept by each municipality in FY 2007/08, is provided in Table 2-3. About 148,000 curb miles were swept, removing about 26,000 cubic yards and about 840 tons of material.

ASSESSMENT OF EFFECTIVENESS

Completion of SWMP Tasks

The General Program has completed all of the municipal maintenance tasks scheduled for FY 2007/08.

Effectiveness

Municipal maintenance staff help reduce litter, trash, leaves, and other pollutants by sweeping streets, cleaning storm drain conveyances, and implementing stormwater pollution prevention BMPs while performing routine maintenance, such as road repair and maintaining storm drains.

As mentioned above, maintenance crews removed about 26,000 cubic yards and 840 tons of material during street sweeping and about 5,500 cubic yards and 140 tons during storm drain cleaning that otherwise would have had an opportunity to be discharged to local creeks and the bay or ocean.

Trash and litter collection yielded about

15,700 cubic yards and 77 tons of trash and litter and about 5,800 cubic yards and 210 tons of leaves. The volume of trash and litter reportedly collected last fiscal year was the highest since FY 1998/99. There does not appear to be any overall trend in the amount of cubic yards of trash and litter reportedly collected during the past ten years considering the large amount of variability in the data.

Trends in Reported Amounts of Litter Removed
Table 2-4

Fiscal Year	Trash and Litter	
	Cubic yards	tons
2007/08	15,733	77
2006/07	13,712	41
2005/06	13,572	62
2004/05	10,478	51
2003/04	14,774	42
2002/03	14,868	85
2001/02	5,579	13
2000/01	9,102	0
1999/00	9,753	0
1998/99	16,064	7

A municipality's ability to increase the amount of pollutants removed depends partially on factors that it controls, such as the frequency of storm drain inlet inspection/cleaning and targeting of sweeping/litter removal efforts in areas that generate a high pollutant load.

Other factors that influence the effectiveness of pollutant removal are not under a jurisdiction's control, such as when and how much it will rain. Although maintenance activities can be effective at removing pollutants, the costs and timing of these activities are practical considerations. In some instances, pollution prevention alternatives may be more cost effective.

FUTURE ACTIONS

- Meet up to four times with the Municipal Maintenance Subcommittee and up to four times with Parks Maintenance and IPM Work Group to share information and disseminate material to field staff regarding stormwater pollution prevention and control.
- Assist municipal maintenance staff to understand and participate in the process for commenting on the municipal maintenance requirements that will be included in the revised draft, municipal regional stormwater permit.
- If the municipal regional stormwater permit is adopted this fiscal year, the Program will initiate the process for helping municipalities to comply with new maintenance-related permit requirements.
- Hold the municipal maintenance and the Parks Maintenance and IPM training workshops.
- Continue to coordinate with maintenance related activities conducted by other agencies, such as the San Francisco Public Utilities Commission, the San Francisco International Airport, and Caltrans.

Table 2-1. FY 2007/08 Summary of Leaf Removal and Litter Control

Municipality	Leaf Removal				Litter Control	
Atherton	74	yd^3	0	bags	144	yd^3
Belmont	0	yd^3	0	bags	37	tons
Brisbane	8	yd^3	0	bags	539	yd^3
Burlingame*	332	yd^3	0	bags	914	yd^3
Colma	45	yd^3	23.5	bags	244	yd^3
Daly City	0	yd^3	0	bags	1,004	yd^3
East Palo Alto	155	tons	0	bags	0	yd^3
Foster City	69	yd^3	0	bags	0	yd^3
Half Moon Bay	612	yd^3	0	bags	45	yd^3
Hillsborough	148	yd^3	0	bags	540	yd^3
Menlo Park	0	yd^3	0	bags	1,283	yd^3
Millbrae	30	yd^3	0	bags	162	yd^3
Pacifica	0	yd^3	0	bags	3,460	yd^3
Portola Valley	0	yd^3	0	bags	1,039	yd^3
Redwood City	1,124	yd^3	0	bags	1,796	yd^3
San Bruno	1,017	yd^3	0	bags	66	yd^3
San Carlos	73	yd^3	0	bags	41	tons
San Mateo, City of	57	tons	0	bags	1,645	yd^3
San Mateo County	2,291	yd^3	1	bags	1,304	yd^3
South San Francisco	0	yd^3	0	bags	1,550	yd^3
Woodside	0	yd^3	0	bags	0	yd^3
TOTAL	**5,822** **212**	**yd^3** **tons**	**25**	**bags**	**15,733** **77**	**yd^3** **tons**

Notes:
Some municipalities include leaf debris and/or litter in their street sweeping debris total.
Portola Valley figures include residential curb-side pickup of green waste for recycling.

The amount of leaves collected by municipal staff and reported in Table 2-1 is only a tiny portion of the total volume being collected. Allied Waste collects green yard wastes, including grass clippings, brush prunings, and leaves, for the eleven municipalities who are members of South Bayside Waste Management Authority (Atherton, Belmont, Burlingame, East Palo Alto, Foster City, Hillsborough, Menlo Park, Redwood City, San Carlos, and San Mateo County).

*In FY 2007/08 Burlingame hired a full-time maintenance worker to pick up litter and do other cleaning in its downtown area.

Table 2-2. FY 2007/08 Summary of Material Removed From Municipal Storm Drainage Facilities

Municipality	No. of Storm Drain Inlets in Municipality	No. of Inlets[1] Inspected	No. of Inlets[1] Cleaned	Other Facilities Inspected and/or Cleaned							Total Volume Removed	
				V-Ditch (miles)	Storm Drain Lines (miles)	Channels (miles)	Creeks (miles)	Culverts[2] (linear feet)	Junction Boxes (no.)	Pump Stations (no.)	(yd^3)	(tons)
Atherton	198	695	340	- - -	- - -	33.8	- - -	528	- - -	- - -	138	0
Belmont	1,410	2,605	615	46.5	25.3	0.4	7.5	800	4.0	52	132	0
Brisbane	410	795	660	0.2	- - -	0.1	- - -	1300	1.0	- - -	100	138
Burlingame	1,100	953	833	0.9	- - -	0.8	0.1	- - -	- - -	60	431	0
Colma	185	31	31	- - -	- - -	- - -	- - -	- - -	- - -	- - -	1	0
Daly City	1,850	1,923	230	- - -	- - -	1.4	- - -	- - -	- - -	- - -	250	0
East Palo Alto	437	0	0	- - -	- - -	- - -	- - -	- - -	- - -	- - -	0	0
Foster City	1,275	0	0	- - -	- - -	- - -	- - -	814	- - -	- - -	30	0
Half Moon Bay	70	621	94	16.0	6.0	- - -	10.0	380	- - -	- - -	29	0
Hillsborough	646	341	341	0.2	0.4	- - -	- - -	- - -	190.0	- - -	125	0
Menlo Park	704	1,483	386	- - -	2.0	0.0	2.9	- - -	25.0	20	69	0
Millbrae	623	2,352	2,110	12.8	2.6	14.2	17.9	10,351	10.0	29	1,023	0
Pacifica	986	1,717	1,717	- - -	- - -	1.3	- - -	- - -	- - -	- - -	629	0
Portola Valley	264	293	108	28.9	- - -	- - -	- - -	207	- - -	- - -	32	0
Redwood City[3]	2,685	1,153	2,765	0.1	2.6	- - -	2.6	4,800	- - -	204	1,205	0
San Bruno	950	1,194	1,194	- - -	3.8	- - -	- - -	- - -	2.0	2	74	0
San Carlos	701	4,120	1,680	0.9	3.6	1.9	0.4	2	- - -	19	322	0
San Mateo, City of	5,000	0	2,909	- - -	3.5	- - -	13.5	- - -	- - -	37	98	0
San Mateo County	1,136	2,488	1,442	31.7	24.8	13.0	45.1	7,478	121.0	14	591	0
South San Francisco	1,500	10,477	4,014	60.0	24.5	- - -	4.8	39,600	40.0	105	250	0
Woodside	350	60	51	8.8	- - -	- - -	- - -	- - -	- - -	- - -	0	0
TOTAL	22,480	33,301	21,520	207	99.0	66.8	104.7	66,260	393	542	5,527	138

NOTES:

1. Inlets include conduits, curb inlets/outlets (convey stormwater around street corners), as well as storm drain inlets.
2. Culverts include cross-culverts and pipes.

Table 2-3. FY 2007/08 Summary of Street Sweeping Activities

Municipality	Curb Miles of Street In Municipality	Material Removed		Curb Miles Swept (miles)	Removal Rate (yd^3/miles swept)
		(yd^3)	(tons)		
Atherton	10	111	0	724	0.15
Belmont	162	419	0	4,750	0.09
Brisbane	48	144	26	901	0.16
Burlingame	140	3,645	0	13,120	0.28
Colma	14	253	0	327	0.77
Daly City	374	2,456	0	19,628	0.13
East Palo Alto	76	0	406	9,119	0.00
Foster City	109	593	0	4,567	0.13
Half Moon Bay	68	414	0	2,583	0.16
Hillsborough[1]	140	0	0	0	0.00
Menlo Park	140	3,813	0	5,753	0.66
Millbrae	110	1,215	0	7,020	0.17
Pacifica	178	1,212	0	8,575	0.14
Portola Valley	43	141	0	216	0.65
Redwood City	350	2,202	405	9,003	0.24
San Bruno	176	1,860	0	4,304	0.43
San Carlos	166	635	0	4,900	0.13
San Mateo, City of	570	2,386	0	16,499	0.14
San Mateo County	640	3,315	0	13,631	0.24
South San Francisco	252	1,633	0	21,941	0.07
Woodside	86	0	0	0	#DIV/0!
TOTAL	**3,852**	**26,444**	**836**	**147,563**	

Notes:

[1] The rural nature of Hillsborough precludes street sweeping.

3

INDUSTRIAL AND ILLICIT DISCHARGE CONTROLS

INTRODUCTION

The primary goals of this component parallel the requirements of the federal Clean Water Act as follows:

- To effectively prohibit the discharge of illicit, non-stormwater discharges to the municipal storm drain system.
- To control the discharge of pollutants in stormwater from commercial and industrial businesses to the maximum extent practicable.

General Program and municipality-specific accomplishments under the "Industrial and Illicit Discharge Controls" section of the SWMP are described in this section of the annual report. The Commercial/Industrial/Illicit Discharge (CII) Subcommittee guides SMCWPPP's implementation of this component.

Ward Donnelly from the City of Daly City continued to preside as chair of the CII Subcommittee during FY 2007/08. The municipalities that attended the majority of the subcommittee's meetings include staff from the Cities of Belmont, Brisbane, Burlingame, Daly City, Menlo Park, Millbrae, San Mateo and South San Francisco and the unincorporated San Mateo County. Dermot Casey from the County of San Mateo Health Services Agency, Environmental Health Services Division (County Environmental Health), represented San Mateo County and most of the cities for which the county conducts business inspections. A complete list of subcommittee attendees is contained in Appendix B.

The CII Subcommittee's Training Work Group developed educational outreach materials. This work group included the following members:

1. Eva Justimbaste, City of Burlingame;
2. Catherine Allin, City of Millbrae;
3. Dermot Casey, County of San Mateo.
4. Sarah Pratt, County of San Mateo and the Program's public information and participation consultant.

ACCOMPLISHMENTS

The following major accomplishments were achieved last fiscal year:

- Adapted for Program use ACCWP's *Tips for a Cleaner Bay* best management practices (BMPs) booklet that is applicable to any business. Copies of the booklet were printed in English and Spanish, and this booklet is a feature topic on the Program's website www.flowstobay.org.
- Held stormwater orientation training for 27 municipal staff members.
- Prepared orientation materials that were distributed in a binder to participants in the orientation training. These training materials have also been added to the Program's website.
- Prepared a four-page fact sheet that summarizes the Program's successes in FY 2006/07. The fact sheet summarizes concisely what the Program does and what it is accomplishing. The fact sheet has been used to provide educational outreach to the public and elected officials.
- Evaluated potential stormwater funding options by contracting with HF&H Consultants to prepare a report that reviews funding sources that may be available to municipalities. The report describes existing and potential funding sources, restrictions, and specific examples of use of these funding sources by other agencies.
- Continued to conduct stormwater inspections and provide educational outreach to businesses in FY 2007/08, as part of the effort to re-inspect high priority businesses annually and inspect other businesses that impact stormwater quality at least once every five years. The total number of inspections in FY 2007/08 (2,332) was a little higher than the average number of annual inspections (2,124) reported during the five years preceding last fiscal year. The total number of inspections conducted during the last six years (12,951) is about one-third higher than the total number inspected during the preceding six-year period (9,488).
- Approximately 10 percent of the businesses (224) inspected in FY 2007/08 had a municipal stormwater violation. The percentage of violations found last fiscal year is the same as the percent violations found during the five-year period between FYs 2002/03 through 2006/07. For reporting purposes, the CII Subcommittee defines the term violation as either the discharge of pollutants to the storm drain system because pollutants are exposed to stormwater runoff or there was a discharge to the storm drain system of non-stormwater disallowed by the NPDES permit. All of the violations except one were reportedly corrected by June 30, 2008.
- Found more illicit discharges (454) than have been found annually since FY 1997/98. There was only one illicit discharge that was reported as continuing on June 30, 2008.

Tips for a Cleaner Bay BMPs Booklet

SMCWPPP obtained permission from ACCWP to adapt the ACCWP's new *Tips for a Cleaner Bay* BMPs booklet for local use. The CII Subcommittee's

Training Work Group coordinated with the Program's Public Information and Participation Subcommittee to tailor this booklet.

The purpose of this booklet is to provide businesses with basic information about stormwater pollution prevention practices and BMPs. Business inspectors like having user-friendly booklets describing BMPs that can be distributed to business owners and operators. The booklet presents information about BMPs using simple illustrations and concise text.

Tips for a Cleaner Bay also includes BMPs for controlling the release of mercury from fluorescent lamps, manometers, switches, and batteries, and BMPs for controlling trash and litter. This emphasis on implementing better controls on trash and litter reflects the increased emphasis the Program and its municipalities have placed during the past two years on better controlling trash and litter. The increased emphasis on trash and litter BMPs is intended to assure continued compliance with the NPDES permit's Provision C.1 and to respond to the importance placed by the community in controlling trash and liter that ends up in waterways.

Similar to the *Vehicle Service Facilities* BMPs booklet produced in FY 2006/07, the *Tips for a Cleaner Bay* includes a comprehensive list of local telephone numbers for contacting stormwater business inspectors, the Certified Unified Program Agency (CUPA), and local sanitary sewer treatment authorities. In addition, the booklet includes County Environmental Health's new telephone number.

Four thousand copies of the *Tips for a Cleaner Bay* were printed in English and 2,000 in Spanish. This number was based on an estimate of the amount needed to be able to distribute the booklet to businesses for at least two years.

In June 2008 copies of the booklet were divvied up among the municipalities for business inspectors to distribute to business owners and operators during inspections. In addition, this booklet is a featured topic on the Program's website.

Lastly, the booklet was printed using a green business, and the booklet encourages businesses to consider becoming a green business.

Orientation Training

For the second year in a row the Program sponsored a stormwater orientation training workshop for new staff and existing staff that need a basic primer on stormwater pollution prevention and control. The training included information about the materials and procedures that the Program has developed with the municipalities to help achieve permit compliance. The FY 2007/08 training attracted 27 municipal staff (Appendix B).

Fact Sheet Describing Program's Successes

The Program prepared a fact sheet (Appendix B) that summarizes the Program's successes in FY 2006/07. The fact sheet is intended to give the public and elected officials a concise summary about what the Program is and what it is accomplishing. The CII Subcommittee's Training Work Group developed the fact sheet with input from the Public Information and Participation Subcommittee. The Technical Advisory Committee approved the fact sheet for

distribution and posting on the Program's website, www.flowstobay.org.

Prepared *Stormwater Program Funding Options* Report

The Program contracted with HF&H Consultants to evaluate potential stormwater funding options. This work included HF&H Consultants' preparation of a report completed in June 2008 that describes existing and potential funding sources, restrictions, and specific examples of other agencies' use of these funding sources. The report (excerpts included in Appendix B) concludes, in part, the following: "Surveys indicate the public is unwilling to pay fees directly for stormwater requirements. Significant lead time (i.e., multiple years rather than months) is required to try to secure these funds with no guarantee of success. In the current economic environment and given the recent results of public surveys, success will probably be minimal."

Inspections and Educational Outreach to Businesses

SMCWPPP has continued to conduct stormwater inspections of businesses as part of other business inspections, such as hazardous waste storage or generation. To this end, 2,332 inspections were completed in FY 2007/08 (Table 3-1). The number of inspections conducted was a little higher than the average number of annual inspections (2,124) reported during the five years preceding last fiscal year.

Trends in Total Number of Inspections & Violations Found
Table 3-1

Fiscal Year	No. Inspections	No. Violations
2007/08	2,332	224
2006/07	2,059	238
2005/06	2,513	169
2004/05	1,906	227
2003/04	2,137	253
2002/03	2,004	198
2001/02	1,849	Not reported
2000/01	1,109	Not reported
1999/00	1,142	Not reported
1998/99	1,079	Not reported
1997/98	1,500	Not reported
1996/97	2,809	Not reported
1995/96	1,699	Not reported
1994/95	918	Not reported

The number of inspections conducted annually during the last six years (2,159 inspections per year average) is about one-third higher than the 1,581 inspections per year average conducted during the preceding six-year period from FYs 1996/97 to 2001/02. Most of the increase in the number of inspections is attributable to increases accomplished by the County Environmental Health's food facility inspectors. Due to the efforts of County Environmental Health staff during the last six years, stormwater compliance was more routinely integrated into food facility inspections than in previous years.

The number of violations found during business inspections has been tracked for the last six years. For reporting purposes the CII Subcommittee agreed that the term violation would be defined as either the discharge of pollutants to the storm drain system because pollutants are exposed to stormwater runoff or a discharge to the storm drain system of non-stormwater disallowed by

SMCWPPP's NPDES permit. During this five year period about 10% of the businesses inspected had at least one violation. About 10% of the businesses inspected in FY 2007/08 showed a violation. The percentage of businesses with violations has varied annually between 7% in FY 2005/06 to 12% in FYs 2002/03, 2004/05, and 2006/07.

Similar to previous years, County Environmental Health and municipal inspectors continued to provide educational outreach during stormwater inspections by discussing the Program's requirements with each facility's representative and by distributing a variety of BMP materials, including the recently adapted *Tips for a Cleaner Bay* and the *Vehicle Service Facilities* BMP booklets.

Identification and Elimination of Illicit Discharges

More illicit discharges (454) were found in FY 2007/08 than had been found since FY 1997/98. The annual average number of illicit discharges found during the nine years preceding last fiscal year was 285.

As shown in Table 3-3, many municipalities conducted field investigations of their storm drainage system to look for illicit discharges. This proactive, field surveying approach to detect and eliminate illicit discharges complements the business inspections because some of the illicit discharges originate from mobile sources, residents, and businesses that are not inspected or are inspected infrequently as part of the business inspection program. In addition to municipality-led field surveys, another source of information about illicit discharges is reports from the public and other agencies.

Field Surveys

In FY 2007/08 SMCWPPP's municipalities inspected a combined total of about 17,800 established locations. This is about 92 percent of average number reported (19,337) during the five years preceding last fiscal year.

Similar to previous years, the majority of both the established locations visited (77%) and the channel miles surveyed (77%) were located in residential areas. Of the established locations visited, approximately 87% were inlets, 4% were manholes and the rest were composed of a mix of outfalls, pump stations, junction boxes, and other locations.

Investigation of Illicit Discharge Reports and Complaints

In addition to looking for illicit discharges by conducting field surveys, member agencies also responded to reports and complaints from:

- Maintenance crews
- Other agencies
- The public

Table 3-4 summarizes the number of illicit discharge incidents found either through field surveys or by responding to calls reporting illicit discharges. Of the 454 illicit discharge incidents reported, 53% were found during field surveys, and the rest were reported through calls. During field surveys, illicit discharge inspectors found about 40% of the illicit discharges. During field surveys and as referrals, maintenance crews accounted for finding about 31% of the incidents. The public called in about 23% of the illicit discharges and 6% of the illicit discharges were reported

by other agencies.

Identification of Illicit Discharge Materials

Table 3-5 shows that of the 454 illicit discharge incidents reported, 480 illicit discharge materials were identified. Illicit discharges sometimes consist of more than one type of material. Of the 480 illicit discharge materials identified, the most commonly found categories included:

1. washwaters (31%);
2. automotive fluids (12%);
3. sewage (11%);
4. construction materials (10%);
5. food wastes (8%);
6. paint (7%); and
7. sediment and/or silt (6%).

These seven categories account for 85% of the illicit discharge materials identified. Tracking of information on sediment and silt was initiated in FY 2006/07 as a separate category. The six categories of illicit discharges other than sediment/silt have been the most commonly found types of illicit discharges during the previous six years. Over the last six years there are also similarities in the frequency of occurrence of these different types of illicit discharge materials.

Elimination and Enforcement of Illicit Discharges

Of the 454 illicit discharges, Table 3-7 shows that 377 sources were identified. Note that an illicit discharge is often a one-time incident, and a source and responsible party cannot always be found. There was only one continuing discharge as of the June 30, 2008 time of reporting.

The municipalities reported conducting 269 enforcement activities last fiscal year to correct illicit discharges. Approximately 44% of the enforcement activities conducted consisted simply of verbal warning notices. About 48% were informal violations, while 8% resulted in a formal violation. There was one legal action taken.

San Mateo County's Activities

The County Environmental Health's Household Hazardous Waste and Very Small Quantity Generator Programs assist residents and businesses to dispose properly their unwanted household hazardous wastes and business small quantity generator wastes.

Another important way that San Mateo County Environmental Health continues to help to prevent future illicit discharges is in its requirements for remodeling retail food facilities or constructing new retail food facilities. Environmental Health Consumer Protection Program staff review submitted plans to make sure that any stormwater BMP deficiencies are corrected. For example, storm drain inlets are not allowed near outside trash storage areas.

ASSESSMENT OF EFFECTIVENESS

Completion of SWMP Tasks

The General Program has completed all of the Industrial and Illicit Discharge Control tasks scheduled for FY 2007/08.

Effectiveness

Business Inspections

One measure of an improvement in effectiveness is the approximately one-third increase in the number of stormwater inspections of businesses completed in FYs 2002/03 through 2007/08 compared to the preceding six year period. As mentioned above, this

increase has been attributed largely to the routine integration of stormwater compliance in the food facility inspections conducted by County Environmental Health. The county uses its Food Program Official Inspection Report forms for these inspections, which are different from the Standard Stormwater Facility Inspection Report Forms.

Another measure of effectiveness of the inspection program is its ability to identify and correct stormwater violations. As described above, approximately 10% of the business inspections in FY 2007/08 found a stormwater violation. This is similar to the 12% rate of violations found in FYs 2006/07, 2004/05, and 2003/04 and identical to the 10% rate of compliance reported in FY 2002/03. In addition, in FY 2007/08 all of the violations except one were reported to have been corrected by June 30, 2008. This rate of correction of violations is similar to FYs 2006/07 (100%); 2005/06 (97%), and 2004/05 (96%). This is an improvement over the 91% violations reportedly corrected in FY 2003/04 and the 90% in FY 2002/03 with the remaining violations pending correction at the time of reporting.

Illicit Discharge Elimination

The effectiveness of the illicit discharge field investigations may be measured by the overall decline in the number of illicit discharges found over time. The number of illicit discharges found in FY 2007/08 (454) is the highest reported during the past ten years. The increase in the number of illicit discharges is partly attributable to the 141 illicit discharges reported by the City of San Mateo's illicit discharge inspectors compared to an average of 10 per year found during the preceding 10-year period. San Mateo County staff also reported a higher number of illicit discharges last fiscal year (90) compared to its average of about 32 per year reported during the preceding 10-year period.

Number of Reported Illicit Discharges
Table 3-6

Fiscal Year	No. Illicit Discharges	Screening Point Visits
2007/08	454	16,460
2006/07	279	13,803
2005/06	244	17,607
2004/05	352	24,373
2003/04	246	17,433
2002/03	271	23,323
2001/02	249	24,913
2000/01	327	12,155
1999/00	306	7,211
1998/99	294	6,650
1997/98	511	4,217
1996/97	463	2,416
1995/96	303	2,045
1994/95	46	Not available

There does not appear to be a discernible relationship between the reported number of field surveys conducted and the number of illicit discharges detected. One possible explanation for this is that the reported number of screening points visited increased starting around FYs 2000/01 and 2001/02 as municipal staff increased its familiarity with how to use the reporting forms. The number of reported screening points visited over the years is probably an inaccurate way to evaluate the actual effort to find illicit discharges. Information collected on the reporting forms should be revised to reflect this type of information once the municipal regional stormwater permit is adopted in FY 2008/09.

The information on the most commonly found types of illicit discharges will be

used to evaluate effective methods for targeting their elimination. For example, the relatively large number of construction related materials being found as illicit discharges helped some of the Program's municipalities to decide three years ago to participate in the reprinting of BASMAA informational cards about construction-related illicit discharges.

FUTURE ACTIONS

The activities anticipated in FY 2008/09 include the following:

1. Develop stormwater related training materials for municipal staff that will need to become familiar with the new, regional municipal stormwater permit that is expected to be adopted this fiscal year.
2. Conduct a training workshop for municipal staff about the new, regional municipal stormwater permit, if the permit is adopted by March 2009.
3. Assist with the development of additional materials, guidelines, and templates, such as a one-page Enforcement Response Plan, and assist municipalities to begin implementing the following permit sections: Industrial and Commercial Site Controls; Illicit Discharge Detection and Elimination; and Exempted and Conditionally Exempted Discharges.
4. Collaborate with the Bay Area Pollution Prevention Group by providing input on its planned educational outreach materials, such as with the flyer that describes BMPs to control pollutants in runoff from metal finishers and electroplaters.
5. Following the municipal regional stormwater permit's adoption, consider the possibility of offering some countywide training for inspectors responsible for identifying, responding to, and controlling illicit discharges.

Table 3-3. Illicit Discharge Field Surveys Conducted

Municipality	Number of Visits to Established Locations												Channel Miles Surveyed		
	Industrial				Commercial				Residential						
	outfalls	inlets	manholes	other	outfalls	inlets	manholes	other	outfalls	inlets	manholes	other	Industrial	Commercial	Residential
Atherton															
Belmont	2	107	16		2	460	18		8	4175	145			2	30
Brisbane															
Burlingame*		501.3		30		501.3		30		501.3			0.30	0.30	0.30
Colma										31					
Daly City						14				1965		1			4.7
East Palo Alto															
Foster City															
Half Moon Bay**															
Hillsborough										1830		596			0.3
Menlo Park	4	96			24	291			6	1211			1	1.864	0.6
Millbrae								88				40			
Pacifica						1	2	4			7	14			0.05
Portola Valley						9			28	26					12
Redwood City					34	968	302		20	1972	300	20		9.69	1.35
San Bruno															
San Carlos***															
San Mateo, City of	2	12			2	17			2	8				2	8
San Mateo County****	172.3	121			172.3	132			172.3	531		81			
So. San Francisco		3				9				4					
Woodside - no rept.															
Total	180.3	840.3	16	30	234.3	2402	322	122	236.3	12254	452	752	1.30	15.85	57.30
	1066.7				3080.7				13694.7						
	17,842												74.45		

* reported inlets are combined for industrial, commercial, and residential areas. Amounts are split evenly among three areas. Pump stations are reported under other and are considered evenly divided between commercial and industrial areas.

** Half Moon Bay reports: "NO ILLICIT DISCHARGES TO REPORT" for both halves of fiscal year.

***San Carlos states in Second Half-Year Deliverables: "Paul Baker, Public Works Superintendent reported no illicit discharge reports for this period."

****San Mateo County unincorporated creek outfall surveys were not reported by landuse, and on this table were divided evenly among landuses.

Table 3-4. How Illicit Discharges Detected Were Found

Municipality	Illicit Discharges Incidents Found During Field Surveys -- Conducted By:		Illicit Discharges Incidents Reported Through Calls From:		
	Maintenance Crews	Illicit Discharge Inspectors	Maintenance Crews	Other Agencies	Public
Atherton					
Belmont				2	2
Brisbane	0	0	3	1	0
Burlingame	0	4	2	0	2
Colma	1				
Daly City		11	35	1	10
East Palo Alto	1				
Foster City					
Half Moon Bay					
Hillsborough		2			
Menlo Park					6
Millbrae		3	3	0	2
Pacifica	4		6	4	14
Portola Valley	0	0	0	0	0
Redwood City	8				
San Bruno		2	17	4	
San Carlos					
San Mateo, City of	2	141	10	10	25
San Mateo County	43			4	36
So. San Francisco	1	19	4	1	8
Woodside					
Totals	60	182	80	27	105
	242		212		
Total Illicit Discharges Reported	454				

Table 3-5. Illicit Discharge Materials Identified

Municipality	Sewage	Automotive Fluids			Paint	Construction Materials			Food Wastes	Yard Wastes	Sediment and/or Silt	Washwaters				Industrial Wastes	Other[1]
		Used Motor Oil	Anti-freeze	Fuels		Concrete	Construction Debris	Wall Com-pound				Concrete Cutting Slurry/ Washwaters	Vehicle Cleaning Washwaters	Building/ Sidewalk Washwaters	Other Washwaters		
Atherton																	
Belmont		3	1		7	2	2	2		6		2					
Brisbane					1								1				2
Burlingame									2				1		3		1
Colma					1												
Daly City	3	2			3	8	1	2	3	1	5	11	1		10		8
East Palo Alto																	1
Foster City																	
Half Moon Bay																	
Hillsborough											1						1
Menlo Park	2	1			1								1	1			2
Millbrae									5								2
Pacifica	13					1	2					2			1		2
Portola Valley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redwood City	7	1							4								
San Bruno	17				3				2		1						
San Carlos																	
San Mateo, City	6	11	1		10	5	5	2	19	3	3	7	31	27	34	5	19
San Mateo, Co.		32	5		8	3	10	2	1	4	13		2			5	5
S. San Francisco	3	2			1	1			4	1	7	2	4	3	3	1	1
Woodside																	
Total	51	52	7	0	35	20	20	8	40	15	30	24	41	31	51	11	44
		59				48						147					
Percent of Total	11%	11%	1%	0%	7%	4%	4%	2%	8%	3%	6%	5%	9%	6%	11%	2%	9%
		12%				10%						31%					

Total Illicit Discharge Materials Found = 480

Other includes:

unknown milky, white discharge 2x
unknown liquid 1x
granite slurry 1x
stucco 2x
Styrofoam 1x
bird seed 1x
sand 1x
underground water 1x
plaster 1x
hydrocarbon soil 2x
Powder Release paint 1x
Interceptor contents 1x
used cooking oil 1x
olive grey water 1x
residual from water heater 1x
loading dock discharge 1x
car batteries 4x
household garbage 1x

Table 3-7. Illicit Discharges: Follow-up Activities

Municipality	If Source Identified [1]		If Discharge Eliminated [1]			Enforcement Activities			
	Number of Sources Identified	Discharges Where No Source Was Identified	Eliminated Discharges	Continuing Discharges (reported once)	Continuing Discharges (reported more than once)	Warning Notice (verbal)	Informal Violation	Formal Violation	Legal Action
Atherton									
Belmont	3		3			3	3		1
Brisbane	2	2	4			2			
Burlingame	7	0	7			7			
Colma	1		1					1	
Daly City	56	1	57			33	15	2	
East Palo Alto	1					1			
Foster City									
Half Moon Bay									
Hillsborough	2		2			1	1		
Menlo Park	3	0	3			1	1		
Millbrae	8	0	8	0	0	3	0	5	0
Pacifica	24	2	25	1			4	1	
Portola Valley	0	0	0	0	0	0	0	0	0
Redwood City	8		8						
San Bruno	23	0	23	0	0	3		3	
San Carlos									
San Mateo, City	159	29	188			51	105	3	
San Mateo, Co.	47	36	83						
S. San Francisco	33		33			13		6	
Woodside									
Totals	377	70	445	1	0	118	129	21	1
						269			

4

PUBLIC INFORMATION AND PARTICIPATION

INTRODUCTION

The primary goals of SMCWPPP's Public Information and Participation (PIP) component are:

- To educate the public about the causes of stormwater pollution and its serious effects on the quality of local creeks, lagoons, shorelines, and neighborhoods;
- To encourage residents to adopt less polluting and more environmentally beneficial practices; and
- To increase residents' hands-on involvement in SMCWPPP activities.

PIP is essential for controlling pollution at the source because most pollutants originate from preventable, everyday activities. Pollutants in stormwater may be reduced by educating residents about the benefits of preventing stormwater pollution and motivating them to do their share to reduce pollution.

This approach is recognized as being both cost-effective and efficient in meeting the goal of reducing pollutants in stormwater to the maximum extent practicable.

This section describes SMCWPPP's PIP accomplishments, assesses the effectiveness of the PIP activities completed in 2007/08 and presents the PIP activities planned for FY 2008/09.

Eva Justimbaste from Burlingame served as the PIP subcommittee's chairperson this fiscal year.

ACCOMPLISHMENTS

The PIP Subcommittee met six times in FY 2007/08 to oversee the development of educational materials and to guide the implementation of the PIP component.

SMCWPPP accomplished the following major public information and participation tasks during FY 2007/08:

- Conducted school outreach to schools, reaching over 8,266 students through "The Water Beat" Zun Zun assembly program.

- Held a workshop for School Maintenance Supervisors and staff on reducing pollution at schools by learning about the products used in and around school for cleaning and pest control.
- Continued the Community Action Grant Program.
- Continued to participate in the region-wide Integrated Pest Management "Our Water Our World" campaign by working with local retail stores.
- Continued to coordinate the California Coastal Cleanup Day event in collaboration with the California Coastal Commission.
- Hosted an educational booth at the County Fair.
- Redesigned SMCWPPP's website, www.flowstobay.org, by making it more user friendly and appealing. All of the brochures are available online and monthly updates were maintained. The educational outreach provided by the website is supplemented by using public service announcements on Cable Television.
- Continued collaborative outreach with the Used Oil Block Grant Program and the Retail-Take Back Program of the County Household Hazardous Waste Program in Environmental Health.
- Implemented the municipalities' community outreach programs.

The following is a description of each area of accomplishment.

School Outreach

School Assembly Program

Contracted with ZunZun (a two-person musical theatrical team that specializes in school assemblies) to develop and present interactive, multicultural shows about stormwater and Household Hazardous Waste, in English and Spanish. The show provides information about storm drains, recycling used motor oil, keeping water clean, while highlighting the connection of the audience to their watershed. They use a variety of instruments (many of Latin American origin) incorporating audience participation and humor into each show.

In FY 2007/08 Zun Zun performed at 43 elementary schools and public libraries, with a total of 8,266 students who saw the "Water Beat" Assembly. To date Zun Zun has reached approximately 103,766 students in San Mateo County.

The shows are funded jointly as a cost-effective collaboration between the Used Oil Program and SMCWPPP. Each student who attends the assembly receives the 12-month Pollution Prevention Calendar. On average the program costs about $2.42 per student.

San Mateo County Used Oil Program and SMCWPPP will continue their collaboration this fiscal year to fund school outreach assemblies using Zun Zun.

Science Fair Project

SMCWPPP presented an award to the science project that demonstrated water quality protection at the 2008 San Mateo County Science, Mathematics and Technology Fair. The Fair features student projects from grades 5 through high school, from over 37 different schools within San Mateo County.

SMCWPPP's Certificate of Recognition went to the "Some Butte-Y Cares" project done by Halie Michaels, an 8th Grader from Redwood City. Her experiment was to grow plants in both fresh water and water with cigarette butts submerged in it and examine the differences in plant health. She concluded that cigarette butts negatively affect water quality, and was presented with a $50 Discover Store.com Gift Certificate by the PIP Chair, Eva Justimbaste.

Healthy Schools Inside and Out Workshop

Contracted with The Watershed Project to conduct the "Healthy Schools Inside & Out" workshop held on Saturday, October 20, 2007 for School Maintenance Supervisors who make purchasing decisions regarding cleaners and pest control products and for the staff who use them. This half-day workshop focused on reducing pollution at school by learning about the products used in and around school for cleaning and pest control. Participants learned about risks to human health and the environment from common household hazardous waste, ways to compare less-toxic products, and how to understand the Healthy Schools Act. Each attendee received a green clean kit with recipes and free samples, plus an activity binder.

School Janitorial Less Toxic Products Brochure

Contracted with The Watershed Project to create a brochure for school janitorial and maintenance staff on the health, safety, and environmental impacts of cleaning products used in schools. The brochure featured easy to read charts on high-risk ingredients and the significance of signal words to help janitors and school staff assess products and active ingredients on toxicity and potential risks. Information about resources on this topic and how to properly dispose of hazardous waste in the schools was placed on the back of the brochure.

Brochures were distributed to each school district Director of Maintenance and Operations, the San Mateo County Office of Education, and the President of the San Mateo County Parent Teacher Association (PTA).

Pollution Prevention Calendar 2008

The Environmental Health Pollution Prevention group produced and distributed 30,000 pollution prevention calendars for students and county residents. The 2008 calendar includes full color photos and monthly articles on how residents can prevent pollution. It also incorporates dates and locations of Household Hazardous Waste events and a back cover recycling matrix that lists all oil collection centers in the county including places to recycle common household hazardous waste products like paint, batteries, and fluorescent lights.

The Community Action Grant Program

Community Action Grants have been awarded to volunteer groups, teachers, environmental organizations, and other local, not-for-profit associations interested in implementing projects that improve the quality of local creeks, the bay or the Pacific Ocean.

As in previous years, the Community Action Grant application and information was available on SMCWPPP's website including descriptions of previous projects that received funding. Six grant

recipients received a total of $15,000 in funding.

The following projects were awarded grants:

1. ***Half Moon Bay Riparian Restoration Project.*** San Mateo Coast Natural History Association, Half Moon Bay. Restore native riparian areas at various locations within Half Moon Bay State Beach. Includes removal of non-native vegetation, planting native riparian plants, and removing trash.
2. ***San Francisquito Creek Stewardship Project.*** San Francisquito Creek Watershed Council, Palo Alto. Enlist community in reestablishing healthy native creek-side habitat at nine long-term sites in the watershed, including removal of debris and non-native species, and planting of native vegetation.
3. ***Notre Dame High School Creek Restoration Project.*** Notre Dame High School, Belmont. Restore the Notre Dame Creek native riparian ecosystem located on school campus. Includes native plant restoration, litter cleanup, water quality monitoring, public access nature trail, and pollution prevention outreach.
4. ***Cordilleras Creek Native Plant Project.*** Redwood High School, Redwood City. Restore a portion of Cordilleras Creek riparian habitat located on school campus. Proposes to restore vegetation, eliminate non-native species, increase natural riparian habitat. The project will be incorporated into the science curriculum.
5. ***"Hey! No Trash in the Bay" Campaign.*** Marine Science Institute, Redwood City. Promotes litter prevention through installation of signage for gathering area at the Marine Science Institute facility located on the Bay across from Bair Island, and purchase of "green bags" for Earth Day outreach event.

Integrated Pest Management

This fiscal year's *Our Water Our World* (OWOW) partnership continued with participation from 22 San Mateo County stores, with the addition of Golden Nursery in San Mateo as a new partnership store.

San Mateo County staff visited each store twice during the year, once in the fall and again in the spring. During each visit, communication with the Store Managers and employees was maintained, store displays were updated, and fact sheets restocked. Staff also noted any new less toxic products to report to BASMAA for investigation and inclusion on the master products list.

County staff attended all IPM partnership meetings with BASMAA and participating jurisdictions to coordinate the program in San Mateo County.

<u>OWOW Outreach Events</u>

Staffed a booth at:

- Half Moon Bay Flower Market on July 21, 2007.
- NorCal Spring Trade Show, January 31, 2008 at the San Mateo Event Center: This is a horticultural trade show with Professional Landscapers and Retail Nursery owners and staff in attendance.

Presentations

- San Mateo/San Francisco University of California Cooperative Extension completed its second Master Gardener Training Program in November 2007. County staff conducted an hour-long training class on "Reducing Pollutants in Our Watersheds" on September 19, 2007 to the Master Gardener's Class.
- Healthy Home workshop in Millbrae for residents, September 29. Presentation covered IPM techniques for ants, fleas, and spiders.

Regional Presentations

- Green-Blue Summit: Clean Water through Residential Integrated Pest Management (July 2007)
- Southern California Academy of Sciences Symposium Controlling Runoff Pollution (May 2008)
- Pesticides and the Chesapeake Bay Watershed Project (June 2008)

Regional Advertising

- Regional effort in Bay Area to continue to brand the *Our Water, Our World* logo, website, and flower head. Placed print ads as Movie Theater flash animation ads from August 17-September 5 (including Labor Day weekend). Print ads were also placed on transit buses including SamTrans and on BART from August 27-September 23.
- San Francisco KRON 4 News recorded the show "Henry's Garden" on August 22 at Orchard Supply Hardware in Foster City. The two-minute segment featured information about the *Our Water, Our World* and the in-store elements: fact sheets, shelf talkers, and less toxic products. The show was aired Saturday, September 1 between 10-10:30am.
- Green Zebra 2008 Savings Coupon Guide for the Peninsula featured one "coupon" page article on the program titled, "Avoid Pesticides to Save the Bay." IPM tips, the *Our Water, Our World* logo and website were featured.
- Bay Nature magazine, one-half page Ad for Spring 2008 Issue (April –June).

Regional Event Sponsorships

- EcoWise Certified / UP3 Integrated Pest Management Contracting Workshop (November 2007)
- 2008 Bay-Friendly Landscaping & Gardening Conference (February 2008)

New materials

SMCWPP ordered the following for distribution through the IPM partnership stores, outreach tabling events, residential and organization requests, and through the cities:

- 2,000 Pocket Product Guides "Pests Bugging You? A Pocket Guide for Choosing Less Toxic to People and Pets"
- 14,800 Our Water, Our World Fact Sheets
- Our Water, Our World Rack Headers with new graphics, 22 pieces
- 2,000 Bay Friendly Garden Guides, with custom back page
- Pest or Pal Activity Guide, 1,000 pieces
- Beneficial Bug Brochure, 1,000 pieces

Bay Friendly Gardening/Landscaping

County staff attended the Bay Area Coalition for Sustainable Landscaping Meetings hosted by Stopwaste.org on September 26 in Novato and February 29 in San Jose. Participants include solid waste, water agencies, storm water, non-profits, water conservation, green business and planning; with the goal of supporting a Bay Area effort to educate landscapers and home gardeners about bay friendly gardening.

On February 29, 2008 the first Bay Friendly Landscaping Conference was held in Berkeley. SMCWPPP organized a printing for postcards sent to Landscape Professionals in San Mateo County, notifying them of the Conference. Over 300 Bay Area Landscapers and Municipal staff attended the Conference.

In addition, Blue Sky Farms in Half Moon Bay planned classes that will be for the public on the principles of Bay Friendly Gardening; along with the opening of a California Native plant nursery. SMCWPPP provided the nursery with Our Water, Our World fact sheets, a literature rack, and Bay Friendly Gardening and Landscaping Guides for use at the nursery and classes located at 3068 N Hwy 1 in Half Moon Bay.

California Coastal Cleanup Day and Litter Reduction Outreach

California Coastal Cleanup Day, held each year on the third Saturday in September, is the largest volunteer event in the state. The California Coastal Commission sponsors the event with the support of County and Regional Coordinators. SMCWPPP coordinated the event for the second year because it recognizes that this event is a great opportunity to get many residents of all ages actively involved in a way that fosters an understanding of the problems associated with litter.

To promote the event, the continuation of the reusable bag outreach from last year was continued at supermarkets, colleges, and the County Fair. Two thousand (2,000) reusable, foldable-compact "Chico" bags were given out at nine (9) outreach tabling events, with information that plastic bags are the number one most dangerous debris item to aquatic wildlife, as well as one of the most common items picked up at the cleanups.

From poster distribution, to outreach tabling events, to press releases and word of mouth, our outreach resulted in an increase in the number of volunteers within San Mateo County who turned up to volunteer. Two thousand, one hundred eighty-three volunteers turned up at the 31 site locations, picking up a total of 24,633 pounds of debris (trash and recyclables). Last year 1,644 volunteers cleaned up 21,162 pounds of debris. That is a 33% increase in volunteers and additional 3,471 pounds of debris picked up from last year (see Figure 4.2).

California Coastal Cleanup Coordination

SMCWPP coordinated and publicized the 31 beach and creek cleanup locations. Major tasks included the following:

- Recruit cleanup captains for specific sites.
- Arrange for cleanup sites with beach property owners.
- Coordinate with the California Coastal Commission.
- Order publicity supplies.

- Organize cleanup logistics in cooperation with cleanup site captains:
  1. Hold site captain meeting with captains to clarify procedures.
  2. Arrange for trash hauling and recycling.
  3. Distribute cleanup supplies and promotional items to cleanup captains.
- Act as the central contact point for volunteers from San Mateo County. The California Coastal Commission's statewide brochure and the state web site list SMCWPPP as a local contact for all prospective volunteers.
- Assign volunteer groups to specific cleanup sites.
- Get local press and event publicity by placing posters, distributing brochures and flyers, arrange and staff tabling events, issue press release, and secure County proclamation.
- Collect and report results of the cleanup to the California Coastal Commission on the cleanup day. Arrange collection of cleanup data cards from cleanup captains.

Outreach Tabling Events

County staff researched and ordered reusable shopping bags to use at nine tabling events throughout the County. The Program ordered 2,000 "Chico Bags" that fold-up to an easy to carry pouch. A postcard commitment form was developed and given out; the postcard describes the problems with plastic bags and offers tips to remember the reusable bag when going to the store. Each bag recipient was asked to make and sign a commitment to bring a reusable bag to the store. Outreach events were held at community colleges and supermarkets in the county:

- Community Colleges: College of San Mateo, Skyline College, and Canada College; for two hours each, giving out 43-76 bags per event.
- Grocery Stores: Safeway's (Half Moon Bay, Pacifica, and South San Francisco), Lunardi's of Burlingame, and Whole Foods (Redwood City, and San Mateo). Gave out between 70-100 bags at each two-hour event.

Local Publicity and Media

- Telephone interviews were giving to five local newspapers following the distribution of a press release on the event: Half Moon Bay Review, Pacifica Tribune, Daily News, Peninsula Examiner, and San Mateo County Times.
- Coastal Cleanup Day slide show was developed and aired on local community television stations, including Peninsula TV.

California Stormwater Quality Association (CASQA) Award

The 2007 Outstanding Stormwater News, Information, Outreach and Media Award was presented to SMCWPPP for the "Eliminating Trash in Our Waterways" Project, which incorporated Coastal Cleanup Day Coordination that increased volunteer participation by over 60 percent combined with our successful outreach with reusable shopping bags. The award was presented to Matthew Fabry at the 3rd Annual Stormwater Conference awards luncheon Tuesday, September 11, 2007 at the Hilton Hotel in Costa Mesa. The CASQA awards identify and recognize exemplary leadership, outstanding projects, activities and contributors in

the field of stormwater quality management

California Coastal Cleanup Day Material Distribution

- 1000 Posters: all County public schools, libraries, community centers, and for Site Captain's.
- 6000 Brochures: sent to youth organizations; including Boys and Girls clubs, YMCAs, and Boy and Girl Scouts, and given out at Reusable Bag tabling events (farmers markets/grocery stores), County Fair booth, OWOW partnership stores, Environmental Health's front table, and the County Courthouse building's information booth, as well as libraries and community centers.
- 1000 Postcards: Sent to 96 local organizations, churches, youth groups in the county. Given out at reusable bag tabling events (farmers markets/grocery stores), County Fair SMCWPPP booth, and the office of Environmental Health's front table.
- Location List Handout: The location list included the date and time of the clean up, cleanup sites with directions, and contact information including the phone number and website. Listed on our website www.flowstobay.org with Site Captain Contact information. Given out at Reusable Bag tabling events (farmers markets/grocery stores), the County Fair SMCWPPP booth, and the office of Environmental Health's front table. Posted on the Craigslist website under the "volunteers" and "events" sections.
- Newsletter Articles for the Environmental Health's Pollution Prevention Post on the "23rd Annual California Coastal Cleanup Day" with site list, and "10 Things You Can Do to Stop Marine Debris."

Results

On California Coastal Cleanup Day, volunteers who served as Site Captains for 31 Clean-up Sites, both coastal and inland, signed in gave out supplies and safety talks to 2,183 volunteers. Twenty-one of the sites were located on the beach and 10 were located at inland creeks and the Bay, for a total of 63.75 miles of shoreline cleaned.

Volunteers diligently cleaned up litter, keeping track of the type of trash that they picked up on a data card. The data cards were turned in to SMCWPPP and entered in a spreadsheet, in order to assess the type, amount and source of litter in San Mateo County. The data cards were then sent on to the Ocean Conservancy where it is included with the statewide data in order to better understand the litter problem: what is found? Where does it come from? How would the information be used to implement further outreach and regulation?

In San Mateo County, the majority (four out of the top five) of litter picked up during Coastal Clean-up Day originates from shoreline and recreational activities including urban runoff.

The top three debris items picked up were cigarette/cigarette filters, food wrappers/containers, and bags. Cigarettes outnumbered all other debris items, with a total of 25,565 picked up, followed by single-use plastic items: 6,855 food wrappers and containers, and 4,363 plastic bags.

Amounts of Top 5 Debris Items Removed at 2007 Coastal Cleanup Day in San Mateo County

Table 4.2

Top 5 Debris Items	Amount
Cigarettes/Cigarette Filters	25,565
Food Wrappers/Containers	6,855
Bags	4,353
Caps, Lids	3,271
Beverage Bottles (Plastic)	1,908

By evaluating and characterizing the specific items flowing from inland areas to the ocean, we can use the data to further our goals of education and source reduction by targeting the specific litter activities, people, and business groups for our program.

Mercury Campaign: Fluorescent Lamp Collection Strategy

As part of this fiscal year's SMCWPPP Mercury Campaign, County Environmental Health secured additional funding to implement public outreach on mercury containing products through a Household Hazardous Waste Grant from the California Integrated Waste Management Board. This allowed County staff in collaboration with SMCWPPP to initiate take-back programs with local retail stores in San Mateo County, in order to provide additional disposal options for residents. In FY 2007/2008 County staff researched retail take-back models for household batteries and fluorescent lights and developed a marketing and information package for retail take-back. Starting January 2008, store managers were able to collect customers' bulbs and batteries and transport them to the County Household Hazardous Waste Program, without being charged a fee for disposal (normally assessed to businesses for waste generated as part of their own operations). Staff signed up the first retail take-back partners, and received first delivery of customer bulbs and batteries this fiscal year. In FY 2008/09 county staff will continue to sign up retail stores as take-back partners.

County Fair Educational Booth

For the fifteenth year in a row, SMCWPPP hosted a booth at the San Mateo County Fair. Thousands of visitors obtained SMCWPPP information, such as the IPM fact sheets, Coastal Cleanup Day information, and other giveaways, and interacted with SMCWPPP staff who answered questions from the public regarding stormwater pollution prevention and hazardous waste recycling. Stormwater pollution was demonstrated on a watershed model. Six hundred reusable "Chico Bags" were given away and were extremely successful in attracting fair-goers to our booth. Volunteers from all of the municipalities staffed the booth. The total number of contacts with fair goers was up 50% over last year to 4,060!

Website, Cable Television, and Newspapers

Website

During FY 2007/08 San Mateo County continued to update SMCWPPP's website (www.flowstobay.org). A contractor, Ikorb, Inc., was hired to redesign the website to make it more visually appealing, and user friendly for community members, businesses, and municipalities. A website working group made up of representatives from each subcommittee worked together with Ikorb to provide guidance, edits, and to approve home page and secondary page graphics. The new website will

debut in July 2008 and feature three sections: "Community", "Business", and "Municipalities;" 45-content pages; and three dynamic features including a Calendar of Events, Videos Page, and Password Protected area for Program use.

The website address is included on all residential and business outreach materials. The website was visited an average of 8,896 times each month in FY 2007/08, up from 7,000 visits per month in FY 2006/07.

Monthly Website Views in FY 07-08
Table 4.3

Website Views	
Month	**Visits**
Jul-07	10,819
Aug-07	8,657
Sep-07	7,126
Oct-07	7,161
Nov-07	7,766
Dec-07	7,404
Jan-08	8,298
Feb-08	7,888
Mar-08	9,642
Apr-08	11,209
May-08	12,757
Jun-08	8,027

Cable Television

A new Program public service announcement, the "Water Spot Sweeper," was produced in English and Spanish and began airing on Cable Television in 2008. This most recent commercial is animated and informs viewers that storm drains lead directly to local waterways. It also advertises the new Program logo and name.

- The commercial ran on Comcast and Viamedia (Astound) from April through June with a total of 1,221 spots airing on Comcast and 880 spots on Viamedia.
- On the following networks: AMC (American Movie Channel), Black Entertainment, CNN, E! TV(Entertainment), ESPN, Family, Food Network, Fox, Fox-Sports, Galavision (Spanish), Golf, MTV, Oxygen Network, Spike TV, TBS, TLC, TNT, TRU TV, and VH-1

Newsletter

Issues of the "P3: Pollution Prevention Post" newsletter were published in September and April to coincide with Pollution Prevention Week and Earth Day, respectively. A total of 6,000 hard copies were distributed at libraries, city halls, community centers, organizations, and outreach events. It is also available on the website with total downloads totaling:

- 374 for Fall 2007 issue
- 1,443 for Spring 2008 issue

Currently there are 153 residents that receive the newsletter by mail, and 563 residents that receive it by email. Spanish newsletters were distributed through the local newspaper, "El Mensajero" with a distribution of 20,000. 3,000 hard copies were also distributed at libraries, city halls, community centers, organizations, outreach events, laundromats, and ethnic supermarkets.

Continued Collaborative Efforts with the Used Oil Program

Used Oil Collection

There are currently 67 used oil collection centers in San Mateo County. Out of these, 45 are state certified used oil collection centers and 22 are county certified. In addition to used motor oil,

used oil filters are collected at 52 of these centers as part of the county's used oil filter collection program.

Total gallons of oil collected for FY 2007/08 = 112,109

Number of oil filters collected FY 2007/08= 22,758

Marinas

The Environmental Health Used Oil Block Grant Program continues to reduce the potential for illicit discharges at the Pillar Point, Oyster Cover, Brisbane and Coyote Point marinas by collecting used motor oil, oil filters, and sponsoring the oil absorbent pad exchange program.

The Used Oil Program applied for and was awarded a 9th cycle Used Oil Opportunity Grant from CIWMB. This grant will pay for the installation of a new permanent oil collection facility at Pillar Point Marina and incorporate a boater education program in FY 2008/09.

Implemented Municipalities' Community Outreach Program

SMCWPPP's Public Information and Participation performance standards describe a number of different types of community outreach events that each municipality may choose to implement locally. In addition, the annual number of community outreach activities that each municipality is responsible for completing varies from three (for towns less than 5,000 in population) to five (for municipalities that are over 50,000 in population).

As summarized in Table 4-1, most municipalities met or surpassed the performance standard for community outreach. Community outreach has included mailing educational information to targeted groups, such as creekside property owners, property owners and contractors with active building permits, shopping mall property managers, and schools. Other methods of distributing stormwater pollution prevention information include the following: as part of local utility and garbage bills; municipal counters and displays; and local fairs. Information is posted on websites and is also mailed out in response to telephone and written inquiries.

In FY 2007/08 the Cities of Burlingame, Daly City and South San Francisco conducted outreach to schools. Burlingame and South San Francisco taught sewer science courses at Burlingame High School and El Camino High School, respectively, and South San Francisco staff conducted pollution prevention classes for twelve, 4th grade classes. Daly City staff demonstrated street sweepers and Vac-Cons at two elementary schools for Public Works Week.

The Cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Hillsborough, Redwood City, San Mateo and South San Francisco held or participated in local creek or bayfront clean up events in their cities. The Cities of Daly City and Pacifica led shoreline cleanups.

Promotion of IPM concepts is widely supported, and IPM fact sheets were distributed at many of the events that municipalities participated in. These sheets were also available to all interested residents. In addition to distributing IPM educational materials, Redwood City offered a series of spring gardening workshops, including Irrigation Basics for Homeowners, Drought Tolerant Plants, Smart

Gardening and Garden Design Concepts. The City of Daly City hosted a water-wise and smart gardening workshop for residents. Pacifica partnered with the San Pedro Creek Watershed Coalition for a Wet and Wild Water Camp Watershed Tour and Education Day in July and the Capistrano Fish Passage Restoration Project and Non-Native Invasive Plant Species Removal Event in October. The Cities of Burlingame, Hillsborough and Redwood City held compost giveaway events.

The Cities of Menlo Park, Redwood City, and San Bruno and the Towns of Hillsborough and Portola Valley held HHW and e-waste collection events. Millbrae and South San Francisco offered thermometer exchanges. Redwood City also offered an event where residents could recycle old tires free of charge.

Many of the municipalities have also remained active in maintaining their storm drain inlet signage (Table 4-1). Most municipalities prefer using the thermoplastic stencils because they are more durable than the painted stencils. The City of Brisbane has an "Adopt-a-Drain" program where residents and middle school students can stencil and maintain a storm drain for a year.

ASSESSMENT OF EFFECTIVENESS

Completion of SWMP Tasks

The General Program has completed all of the Public Information and Participation tasks scheduled for FY 2007/08.

Effectiveness

Municipality Participation

A majority of the municipalities participated in the PIP Subcommittee, reviewed Subcommittee materials, and kept current on other subcommittees' activities through the TAC meeting reports. The municipalities that took an active role in the PIP Subcommittee by participating in a majority of the six meetings held during FY 2007/08 were Atherton, Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Hillsborough, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, San Mateo County and South San Francisco. Atherton, Belmont, Daly City, Millbrae, Redwood City, San Carlos, South San Francisco and San Mateo County had perfect attendance.

Evidence of Effectiveness

There were no specific SMCWPPP surveys conducted during FY 2007/08 to measure the effectiveness of the public information and outreach activities implemented by the municipalities and County Environmental Health. However there are specific project indications that show evidence that more and more residents are being engaged and educated about stormwater pollution prevention and about the Program:

1. Coastal Cleanup Day Participation – the number of volunteers participating in Coastal Cleanup Day has increased by 127% in just two years (961 volunteers in 2005 compared to 2,183 volunteers in 2007). By engaging the public in clean-up efforts, awareness is raised about the problems with trash in and near waterways.
2. Website - the number of people visiting our website each month on

average has increased by 78% in two years (5,000 visits per month in 2005 compared to 8,896 visits per month in 2007).

3. County Fair – the number of fair contacts has increased by 62% in two years (2,500 people visiting our booth in 2005 compared to 4,060 contacts in 2007) despite the overall decline in Fair attendance.

In FY 2008/09 the Program will evaluate the effectiveness of outreach activities by conducting a public awareness survey to measure progress and effectiveness of the program since the last survey in 2001.

FUTURE ACTIONS

The following PIP activities are planned or being considered for FY 2008/09:

- Continue to hold PIP Subcommittee meetings;
- Continue the IPM "Our Water Our World" partnership campaign;
- Continue the mercury public awareness campaign initiating fluorescent lamp take-back programs with local retail stores;
- Continue the Community Action Grant Program;
- Continue to coordinate the annual California Coastal Cleanup Day event in San Mateo County;
- Continue to update and create new materials with the new Program name and logo.
- Initiate a Trash Marketing Campaign focused on cigarette butt litter; and
- Evaluate Program effectiveness with a residential telephone survey.

Figure 4.1. Coastal Cleanup Day Volunteers in San Mateo County, 2005-2007

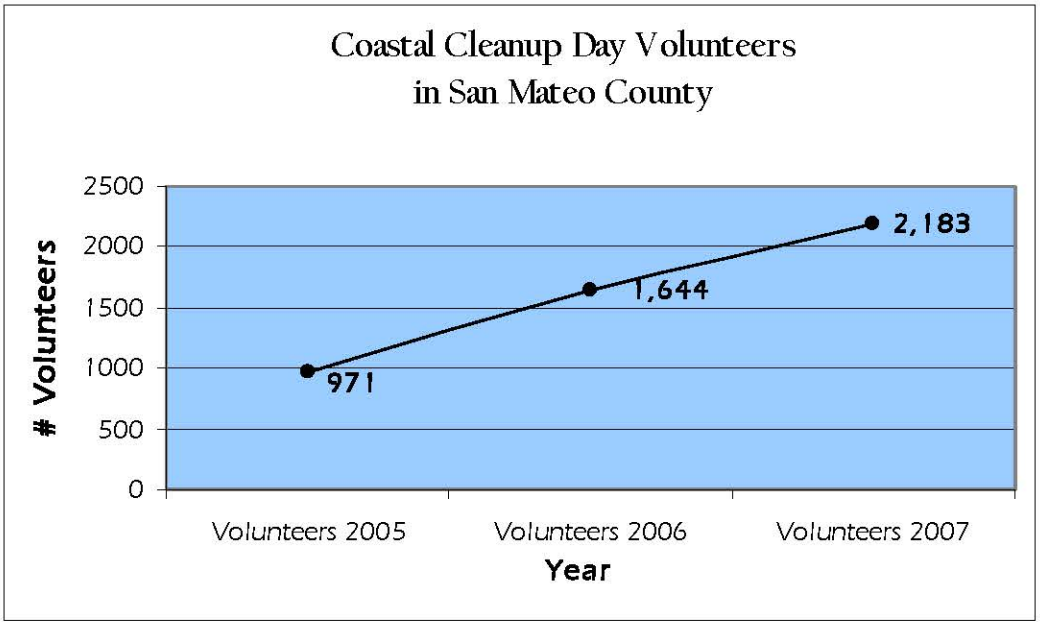


Figure 4.2. Total Debris Removed on Coastal Cleanup Days in San Mateo County, 2005-2007

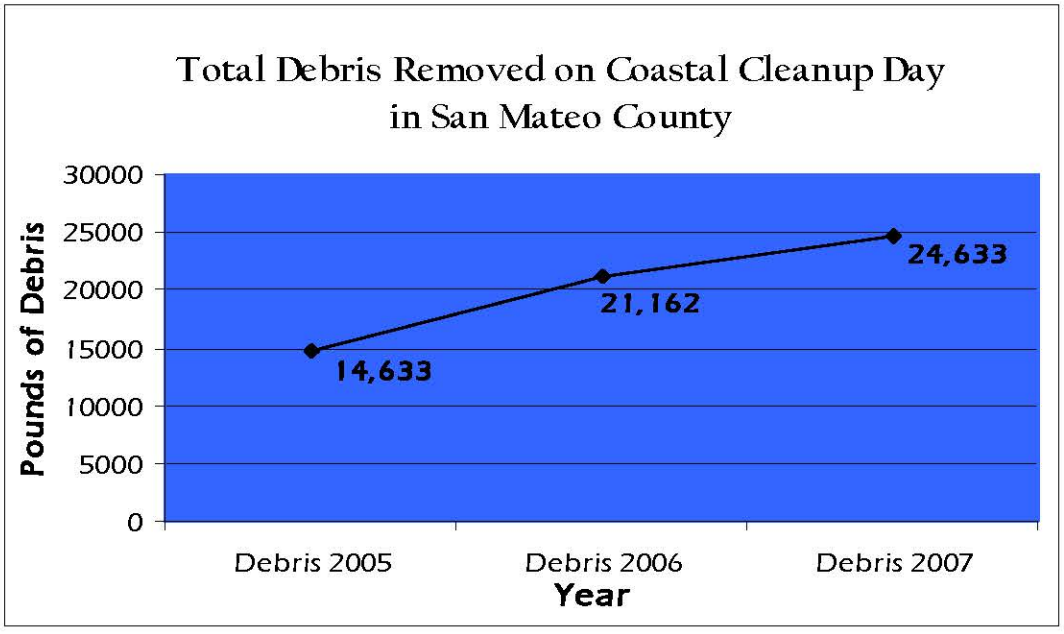


Table 4-1. Municipal Public Information and Participation (PIP) Activities for FY 2007/08

The table on the next page summarizes outreach activities reported by each agency in FY 2007/08. It provides a concise overview of the following activities:

1. Stenciling and Signage:
   Includes numbers of stencils installed and/or replaced. If no numbers have been reported but stenciling and signage was conducted, it is mentioned as *on going*.
2. Number of Implemented Community Outreach Events:
   Reported outreach activities have been categorized into activity areas as described in the PIP Performance Standards listed in the 1998 Stormwater Management Plan.
3. Educational Material:
   Shows agencies' development of new educational materials and distribution of SMCWPPP's outreach materials.
4. PIP Subcommittee Participation
   Indicates the number of PIP meetings attended by agencies and additional participation such as work group activities, chairing the Subcommittee, etc.

Details of the reported outreach activities can be found in Section four of the deliverable forms submitted by each agency. The forms are included in Volumes II to V of this Annual Report.

Table Legend

1. Stenciling and Signage
   OG = on going (stenciling conducted as needed)
   PR = stencils/signage provided to local Home Owner Associations, businesses, and/or schools
   NC = not conducted or temporarily suspended due to budget restrictions

2. Community Outreach Events
   a) Other venues include disseminating information via utility inserts, agency newsletters, local magazines, mailings to target group, web site.
   b) Existing community events include county fairs, festivals, compost give away events, mercury thermometer exchange events, and other events held within agency's jurisdiction.
   c) New community events include pharmaceutical take back events.
   d) Media outreach activities include development and/or distribution of stormwater related press releases or public service announcements to local media.
   e) Integrated outreaches include conducting a point of purchase display and giveaway program, distributing videos to local libraries, providing outreach to schools, developing/maintaining special displays (i.e., IPM garden) and other programs such as gardening or composting seminars, holding stormwater presentations at City Services Academy, etc.
   f) Watershed awareness includes creek, lagoon, shoreline cleanup, or Earth Day activities.
   g) Coordination with local volunteer group to conduct outreach includes school outreach, stenciling, or creek cleanup activities.

3. Educational Material
   a) Checkmark indicates development of new materials.
   b) Checkmark indicates distribution of SMCWPPP's outreach material.

4. PIP Subcommittee Participation
   a) Shows PIP meeting attendance.
   b) Check mark indicates work group participation or other additional involvement in subcommittee activities.

Table 4-1: Municipal PIP Activities for FY 2007/08

OUTREACH ACTIVITIES	NAME OF MUNICIPALITIES																				
	Town of Atherton	City of Belmont	City of Brisbane	City of Burlingame	Town of Colma	City of Daly City	City of East Palo Alto	City of Foster City	City of Half Moon Bay	Town of Hillsborough	City of Menlo Park	City of Millbrae	City of Pacifica	Town of Portola Valley	City of Redwood City	City of San Bruno	City of San Carlos	City of San Mateo	County of San Mateo	City of South San Francisco	Town of Woodside
1. Stenciling & Signage																					
a) Number of stencils installed/ replaced:	25	OG	OG	OG	OG	477	NC	OG	155	OG	192	OG	OG	NC	OG	OG	NC	NC	OG	158	NR
2. Number of Implemented Community Outreach Events																					
a) Provide General Program information through other venues:	2	1	1	2	1	10		1		2	6	9	2		5	1		1	64	22	
b) Participate in existing community events:	1	2	3	14	2	21	2	3	2	7	6	16	5	4	11	4		2	28	5	
c) Initiate new community events:		1		1		1	1					4	2		4				2		
d) Contact media and conduct advertising:						6					2	2							7		
e) Coordinate with local volunteer groups to conduct outreach:			1	2		1						6	2		2				✓		
3. Educational Material																					
a) Developed educational materials:	✓	✓				✓	✓			✓	✓	✓	✓		✓				✓		
b) Distributed educational materials:	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
4. PIP Subcommittee Participation																					
a) Number of PIP meetings attended:	6	6	5	5	3	6	5	1	1	4	5	6	4	1	6	5	6	5	6	6	1
b) Other participation:	✓	✓	✓	✓*		✓				✓	✓		✓		✓			✓	✓		

* Burlingame chairs the subcommittee.

Table 4.4. Website Pages Viewed and Documents Downloaded in FY 2007/08

Website Pages Viewed and Documents Downloaded		
Month	**Most Viewed Page**	**Most Downloaded**
Jul-07	About Pollution Program	ReNews Spring 2007
Aug-07	Coastal Cleanup	Construction Site Design
Sep-07	Coastal Cleanup	ReNews Spring 2007
Oct-07	About Pollution Program	Ch 5 General Technical Guidance for Treatment Measures
Nov-07	Additional Information	Hydromodification Management Plan
Dec-07	Additional Information	Mercury Brochure and Construction Site Design Guidebook
Jan-08	Additional Information	06/07 Annual Report
Feb-08	C3 Stormwater Tech Guide	SMCWPPP FY06-07 Annual Report FINAL
Mar-08	Community Events	SMCWPPP FY06-07 Annual Report FINAL
Apr-08	Community Events	Too Toxic To Trash Poster
May-08	Community Events	Too Toxic To Trash Poster
Jun-08	Community Events	Too Toxic To Trash Poster

5

NEW DEVELOPMENT AND CONSTRUCTION CONTROLS

INTRODUCTION

The primary goal of this component is to minimize the adverse impacts on water quality and beneficial uses of land development, both during and after construction. To reach this goal, SMCWPPP assists municipalities in developing and adopting procedures for the control of stormwater pollution from new development and significant redevelopment projects. This includes site design and source control to prevent stormwater pollution, post-construction stormwater treatment for projects that result in the addition and/or replacement of 10,000 square feet or more of impervious surface, and (since June 12, 2007) hydromodification management measures for projects that create and/or replace one acre or more of impervious surface and are located in areas susceptible to development-induced erosion of creek beds or banks. Another area of emphasis is on the implementation of BMPs during construction.

SMCWPPP's strategy is to integrate procedures for stormwater pollution prevention and control into existing municipal review and inspection processes, and to coordinate with other Bay Area stormwater programs that are implementing the same NPDES permit requirements. SMCWPPP provides guidance to the local municipal programs through its New Development Subcommittee (NDS) meetings.

Since the start of the second NPDES permit period in July 1999, the municipalities have continued to improve their plan review, erosion control, and inspection programs; have expanded the use of stormwater treatment control measures; and have continued to implement performance standards for new development and construction activities. Since the adoption of the Provision C.3 amendment to SMCWPPP's NPDES permit in February 2003, the NDS's emphasis has been on assisting the municipalities to comply with these more prescriptive requirements for new and redevelopment projects.

Matthew Fabry from the City of Brisbane and SMCWPPP Coordinator continued to serve as chair of the New Development Subcommittee. The subcommittee enjoyed good participation. Appendix D contains the subcommittee's attendance

sheet for FY 2007/08 with representatives from the following municipalities showing perfect attendance: Brisbane, Burlingame, South San Francisco, and San Mateo County. Representatives of Belmont, Menlo Park, and Pacifica attended five of the six meetings.

ACCOMPLISHMENTS

SMCWPPP's primary accomplishments related to new development and construction controls during the past fiscal year included:

- The City/County Association of Governments of San Mateo County solicited a call for projects for municipalities to apply for grant funds to construct sustainable green streets and parking lot demonstration projects. Five grant recipients were selected. C/CAG also executed a contract with Nevue Ngan Associates teamed with Sherwood Design Engineers to prepare a Sustainable Green Streets and Parking Lot Design Guidebook.
- Held construction site stormwater management training workshops in collaboration with the San Francisco Estuary Project and the Santa Clara Valley Urban Runoff Pollution Prevention Program.
- Sponsored the 2008 New Development Workshop, featuring the new C.3 Technical Guidance document prepared in FY 2006/07.
- Updated an appendix to the C.3 Technical Guidance to include nine maintenance plan templates for use by project applicants that use stormwater treatment measures in their projects. The cover page of the applicable C.3 Technical Guidance appendix is included in Appendix D.
- Updated the Project Applicant Checklist for NPDES Permit requirements to include information on hydromodification management (HM) requirements, which began to be implemented in June 2007. The updated checklist is included in Appendix D.
- Reviewed two draft HM worksheets. The HM Applicability Workshop will assist municipal staff in determining whether a project needs to comply with HM requirements. The Flow Duration Control Review Worksheet will help municipal staff review submittals for projects that incorporate flow duration controls, pursuant to the HM requirements. These forms, which were based on worksheets prepared by the Alameda Countywide Clean Water Program, will be finalized in FY 2008/09.
- Coordinated with Regional Water Board staff to include an update to the HM Control Area Map in the draft municipal regional stormwater permit, for approval by the Regional Water Board. The map update incorporates newly available digitized map data that will allow the HM control area boundary to follow Assessors parcel boundaries.
- Prepared soil guidelines for landscape-based treatment measures, based on soil specification prepared by the Alameda Countywide Clean Water Program. The soil guidelines are included in Appendix D.
- Provided input to the redesign of SMCWPPP's website to improve the organization of materials related to new development, redevelopment and construction. Christina Horrisberger of Pacifica represented the NDS on the website redesign work group.
- Updated frequently used documents

and forms with SMCWPPP's new name and logo.

- The NDS took a field trip in April to view stormwater treatment measures at two projects in San Francisco. A summary of the field trip is included in Appendix D.
- The following municipalities reported approximately 74 projects that created and or replaced 10,000 square feet or more of impervious surface, triggering the amended NPDES permit's Provision C.3 requirements: Belmont, Brisbane, Burlingame, Colma, Daly City, Menlo Park, Millbrae, Pacifica, Redwood City, San Carlos, San Mateo, San Mateo County, and South San Francisco. These projects incorporated a variety of BMPs.
- Approximately 64 projects incorporated vegetated swales and/or detention basins. These projects represent approximately 660 acres of new and redevelopment projects.
- SMCWPPP's municipalities are continuing to verify the operation and maintenance of stormwater treatment measures as required by the amended NPDES permit's Provision C.3.e.
- Municipalities have continued to use the Summary of Pre-Wet Season Erosion Control Inspections Form to document the basis of the annual certification letter's determination that each active construction site has been stabilized to minimize erosion and the discharge of sediment from disturbed areas prior to the wet season. These forms can be found as Attachment E to the first half-year deliverable forms submitted by the municipalities.
- SMCWPPP continued to coordinate with the San Mateo County Mosquito Abatement District by providing information on new development projects.

Sustainable, Green Streets and Parking Lots Program

The Sustainable, Green Streets and Parking Lots Program is funded by a countywide vehicle registration fee under Assembly Bill (AB) 1546, which went into effect on July 1, 2005. The fee will terminate at the end of 2008 unless extended. Senate Bill (SB) 613 has been introduced to extend the fee for an additional four years. The NDS's Green, Sustainable Streets and Parking Lots Work Group is guiding the development and implementation of this program, which will fund demonstration projects and create a design guidebook for incorporating post-construction stormwater green BMPs in street and parking lot projects. The program awarded five competitive grants to the following municipalities: Belmont, Brisbane, Burlingame, Daly City and San Bruno. In the previous fiscal year, one non-competitive grant was awarded to the Fitzgerald Marine Reserve, on the coastside, to include stormwater BMPs in its new parking lot.

The consultant team of Nevue Ngan Associates, of Portland, Oregon, and Sherwood Design Engineers, of San Francisco was selected to prepare the Sustainable Green Streets and Parking Lot Design Guidebook. A draft was under preparation in June, and a final version is anticipated to be complete in early FY 2008/09.

2008 New Development Workshop

The NDS conducted a New Development Workshop in May, focusing on the

Program's C.3 Technical Guidance, which was prepared in 2007. Sessions included an overview of the C.3 Technical Guidance and presentations on site designs and low-impact development, stormwater treatment measures, HM measures, planting guidance, and operations and maintenance. The workshop was held at the Green Building Exchange in Redwood City, and had 39 people in attendance (not including staff and guest speakers). The agenda, attendance list and workshop evaluation summary are included in Appendix D.

Construction Site Stormwater Compliance Training

SMCWPPP coordinated with the San Francisco Estuary Project (SFEP) to offer construction site management training in San Mateo County this fiscal year. The workshop was offered on October 31 and November 1 at the Green Building Exchange in Redwood City. SMCWPPP sponsored the October 31 session for municipal staff, and SFEP conducted the November 1 session for contractors and developers. In order to accommodate municipal staff's schedules, SMCWPPP coordinated with SFEP and the Santa Clara Valley Urban Runoff Pollution Prevention Program to allow staff from municipalities in San Mateo County to attend the SFEP's session on November 1 or the SCVURPPP-sponsored session on December 3. The workshop in Redwood City had 33 people in attendance. The agenda, attendance list and workshop evaluation summary are included in Appendix D.

ASSESSMENT OF EFFECTIVENESS

Completion of SWMP Tasks

The General Program has completed all of the New Development and Construction Controls tasks scheduled for FY 2007/08.

Effectiveness

Through continued education and local implementation efforts, SMCWPPP is continuing to reduce the discharge of pollutants from development and construction activities. The effectiveness of stormwater pollution prevention efforts during FY 2007/08 can be assessed in the following areas:

- Participation in General Program efforts, such as the NDS.
- Implementation of the performance standards.
- Enforcement of construction site BMPs, including erosion and sediment and general pollution prevention controls.
- Demonstration of the use of appropriate construction and post-construction stormwater controls in conditions of approval for development projects.

Development projects under review by the municipalities in FY 2007/08 are listed in Table 5-1, and Appendix D includes the NDS attendance list.

Information summarizing each municipality's efforts during FY 2007/08 to implement the NPDES permit requirements for new development is contained in the completed deliverable forms. Municipalities prepare annually certification letters that each active site has been stabilized (see Municipal Submittals). Table 5-1, along with Appendix D and the completed deliverable forms, indicate that, in general, most municipalities continue to make progress in incorporat-

ing stormwater pollution prevention requirements into their development plan review and construction inspection procedures, and are continuing to review and improve their programs especially with respect to incorporating post construction controls.

A comparison of development projects incorporating vegetated swales and/or detention basins between the current and five previous fiscal years can be found in Table 5-2. The table shows that the use of detention basins and vegetative swales, while down from FY 2005/07, is still much higher than in years 2005/06 and earlier. Table 5-3 lists the development projects using inlet filters (by themselves and also with other treatment measures) during the last and six fiscal years.

Projects using inlet filters by themselves are down by half over FY 2006/07. Projects using inlet filters as part of a "treatment train" are slightly up from FY 2006/07. Additional information on the municipalities' efforts can be found in their individual half-yearly deliverable forms.

FUTURE ACTIONS

General Program activities during FY 2008/09 will continue to focus on supporting the municipalities' efforts to implement the Provision C.3 NPDES permit amendment requirements, and to work with the Water Board staff to adopt the proposed municipal regional stormwater permit.

Major tasks will include the following:

- Continue to exchange information with the municipalities through bi-monthly NDS meetings, and at the next new development workshop.
- Continue participation in the development of the municipal regional stormwater permit as it pertains to Provision C.3, construction inspections, and other aspects of the New Development and Construction Controls component of SMCWPPP.
- Conduct round table discussions, and/or project review presentations, to assess and/or track effectiveness.
- Prepare a flyer on Provision C.3 compliance for projects that create and/or replace less than 10,000 square feet of impervious surface.
- Conduct a survey of the member municipalities regarding how they are implementing new development- and construction-related inspections, and whether they are using design specifications for post-construction stormwater controls.
- Update SMCWPPP's Guidebook of Site Design Examples.
- Continue to prepare for the adoption and implementation of the municipal regional stormwater permit.

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	Name of Developer; Project Phase No.[2]; Project Description	Status of Project	Project Type[3]	Site Area	New or Replaced Impervious Surface Area	Source Control Measure BMPs	Site Design Measure BMPs	Post-Construction Treatment BMPs				Pesticide Reduction Measures Included in Project	Alternative Compliance[4]		HMP[6]
								Treatment BMPs Used	Hydraulic Sizing Criteria Used	Operation & Maintenance Responsibility Mechanism	Referred to O&M Inspection Team (y/n)?		Basis of Impracticability	Alternative Compliance Measures	
ATHERTON															
NO PROJECTS MEET GROUP 2 CRITERIA															
BELMONT															
873/877 Ralston Avenue; one block west of El Camino Real	Ralston Assoc.; reconstruction of parking lot and remodeling a commercial building	Design Review approved in 2006. Building permits applied for in December 2007. Project is in plan check.	Commercial	15,000 sq. ft.	Replace 8,000 sq. ft. parking lot	Roofed trash enclosure; sweeping parking lot	Pervious pavement for parking lot area	Pervious pavement	WEF method	Owner's responsibility	Yes	Condition for pesticide reduction, pervious paving to reduce impervious surface	N/A	N/A	N/A
1300 El Camino Real at O'Neill Ave.	Parvis Kamanagar; apartment building and commercial restaurants on ground floor	Project in design review stage Construction may begin in summer 2008.	Mixed-Use	10,000 sq. ft.	Replace demolished building	Oil & grease interceptor at underground garage	Oil & grease interceptor at underground garage	Oil interceptor	WEF method	Owner's responsibility	Yes	Landscaping is minimal. Condition for reduced pesticide use.	N/A	N/A	N/A
Ralston Ranch Subdivision	4 lots subdivision	Tentative map	Residential	4 acres	paved long driveway	Bioswale	Retention pond, swale	Bioswale	WEF method	Owner's responsibility	Yes	Condition for pesticide reduction	N/A	N/A	N/A
1000 South Condo	24 Condo units conversion	Tentative map	Residential	1 acre	paved parking area	Fossil filters, landscape swale	Roofed trash enclosure	Swale and filters	WEF method	Owner's responsibility	Yes	Condition for pesticide reduction	N/A	N/A	N/A
BRISBANE															
Southeasterly corner of Sierra Point at Sierra Point Parkway and Shoreline Court	Slough Estates International, Biotech complex encompassing 540,185 sq. ft. of office, 15,000 sq. ft. of retail, and 1,801 parking spaces (961 in 5-level garage). 487,490 sq. ft. of landscaping.	Development agreement approved by City Council 6/16/08, EIR certified, and approved design and use permits. Grading and building permits pending	Commercial	22.8 acres	Will be >1 acre, but still to be determined	To be determined (TBD) during grading / building permit process	Still being finalized, but minize impervious area, use of multistory parking garage, many self-treating areas	Vegetated swales, bioretention areas, and underground vaults	TBD, still being designed	TBD	TBD	TBD	TBD	TBD	N/A, direct discharge to SF Bay.

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
325 Valley Drive	International Airport Carriers, redevelopment of existing 5.1 acre site with new 90,000 sq. ft. building, asphalt paved parking, concrete walkways, landscaping, and driveway areas.	Design and use permits conditionally approved by Planning Commission, as of June 30 2008, under appeal to City Council.	Commercial	5.1 acres	4.25 acres	Loading dock seals, bermed trash enclosure, stenciled drain inlets, water conserving and pest-resistant landscaping	Entire site being redeveloped, cannot maintain any existing vegetation, building footprint reduced but paved area increased to accommodate truck traffic, self treating area on east side	Bioretention area, vegetated swale, and CDS media filter	Simplified 4% volume-based sizing for bioretention area, 0.2 inches per hour for flow based swale and media filter.	Applicant required to enter into O&M agreement with City and record maintenance responsibilities on property deed prior to issuance of a certificate of occupancy. Agreement pending.	Not approved for construction yet. Pending.	Applicant required to incoporate Bay Friendly Landscaping designs in project. Planting selections for treatment measures taken from SMCWPPP's C.3 Technical Guidance manual.	N/A	N/A	N/A
Northwesterly corner of Sierra Point off of Marina Boulevard and adjacent to Highway 101 (3000-3500 Marina Blvd.)	Opus West Office Center, 8.87 acre site on top of Class III Landfill, construction of two office buildings totaling 445,500 sq. ft., five level parking garage (1,175 spaces), 214 surface parking spaces, landscape improvements	Environmental review underway	Commercial	8.87 acres	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	N/A

5-1: Table of New Development Projects[1]

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Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
BURLINGAME															
Sunrise of Burlingame; 1818 Trousdale Avenue	Sunrise Assisted Living; 79-unit assisted living development and underground parking garage	Planning approval: July 06, building permit issued June 2007	Multi-family residential	1 acre	28,055 sq. ft. +/-	Beneficial landscaping; Outdoor material storage protection; Maintenance (sweeping, catch basin cleaning)	Minimized land disturbance; Underground parking to reduce impervious surface; Disconnected downspouts; Preserve open space	Hydrody-namic device	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	
Chateau Bellevue; 1441 & 1445 Bellevue Avenue	Bellevue Associates, LLC c/o Litke Properties	Planning approval: November 05	17-unit residential condominium building and below grade parking garage	24,637 sq. ft. or .56 acre	Less than 1 acre; Approved before August 15, 2006	Landscaped areas designed to reduce excess runoff; subsurface drainage system	Large open space area at rear with softscape around creek bed (5,222 sq. ft.); Underground parking to reduce impervious surface.	Drainage from parking garage designed to drain to sewer system; Floodwalls to prevent contami-nation of creek	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
Residential Condominium; 1226 El Camino Real	1226 El Camino LLC	Planning approval: May 08	9-unit residential condominium building with below-grade parking	12,874 SF or .30 acre	Less than 1 acre; approved May 27, 2008	Beneficial landscaping, sediment basins, silt fences, and storm drain inlet protection shall be maintained until permanent erosion controls are established.	945 SF of open space area at grade, 85% of which shall be landscaped. Underground pkg to reduce impervious surface.	Common open space designed to reduce excess irrigation runoff and promote surface infiltration.	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	
Burlingame Hills Manor; 1840 Ogden Drive	Burlingame Hills Manor, LLC; 17-unit residential condominium building and below grade parking garage	Planning approval: July 06	Multi-family residential	38,905 sq. ft. or .89 acre	Less than 1 acre; Approved before August 15, 2006	Beneficial landscaping; Outdoor material storage protection; Maintenance (sweeping, catch basin cleaning)	Large open space area with substantial softscape (8,762 sq. ft.); Underground pkg to reduce impervious surface.	Open space areas designed to reduce excess irrigation run-off	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	
Peninsula Humane Society; 1450 Rollins Road / 20 Edwards Court	Peninsula Humane Society; Animal shelter and rescue facility; pet adoption center	Planning approval: June 07	Animal shelter	1.18 acres	Less than 1 acre; approved before June 12, 2007	Maintenance (sweeping, catch basin cleaning); material storage protection	On-site filtration system; procedures for proper disposal of pet waste	Unpaved open space (dog run) area to reduce impervious area; landscaping to reduce excess runoff	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
Residential Condominium; 1800 Trousdale Drive	25-unit residential condominium building and below-grade parking garage	Planning approval: April 07	Multi-family residential	0.5 acre	Less than 1 acre; approved before June 12, 2007	Beneficial landscaping; Outdoor material storage protection; Maintenance (sweeping, catch basin cleaning)	Large open space area with substantial softscape; underground parking to reduce impervious area	Open space areas designed to reduce excess irrigation run-off	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	
Office Building, 1427 Chapin	Office	Planning approval: April 2006; Building permits issued April 2007	Office	0.43 acre	Less than 1 acre; approved before June 12, 2007	Beneficial landscaping; material storage protection	Side and rear pathways made of pervious material	N/A	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	
Peninsula Hospital Replacement Project; 1783 El Camino Real		Planning approval: November 04; Building Permits issued: April 05, September 05 and February 06.	Hospital Replacement and multi level parking garage	25.9 acres	18.59 acres	Beneficial landscaping; Material storage protection	Multi-level garage structure to reduce impervious surface; Preserved 8.1 acres open space	Vegetated swale	N/A	N/A	N/A	Yes-landscaping measures	N/A	N/A	

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
COLMA															
Serra Station, 990 Serramonte Blvd, Colma, CA	Dean Najdawi; Commercial redevelopment: retail and office space	Plan check	Commercial	0.8 acres	0.65 acres	Stenciled inlets, trash enclosure connected to sanitary sewer, pervious asphalt	Bioswale, detention basin, pervious asphalt	Bioswale, detention basin, pervious asphalt	WEF method	O&M Agreement will be recorded with County. Annual O&M report will be submitted to City. Followup inspections will be conducted by PW staff	N/A Project in design stages	N/A	N/A	N/A	N/A
Lexus Dealership; 700 Serramonte Blvd.	Sonic Automotive Group	Grading began 06/30/08	Commercial	4.2 acres	4.13 acres	Stenciled inlets, covered parking, trash enclosure and service areas drain to sanitary sewer	bioswale, detention basin	Media filter, bioswale, detention basin	Flow-based method	O&M Agreement will be recorded with County. Annual O&M report will be submitted to City. Followup inspections will be conducted by PW staff	N/A Project under construc-tion	N/A	N/A	N/A	N/A

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Impervious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracticability**	**Alternative Compliance Measures**	
DALY CITY															
Mixed-Use / Jiffy Lube Oil Change Center; 1000 King Drive	John Tealdi; two commercial buildings (office building 4.824 sq. ft. / oil change center 4.445 sq. ft)	Application submitted 1/03 and approved in 9/06; City Council approved 8/28/06; building permits issued 1/17/07 and 11/19/07; construction currently underway	Commercial	19,000 sq. ft.	19,000 sq. ft.	Trash enclosure, the drainage system for the oil change station shall include approved oil/grease interceptor; prevent pollutants from entering the storm drain system	Provide as much soil infiltration as possible	Provide detention for the increase of drainage flow for a 10-year/2 hour frequency storm event		Annual O&M		Integrated Pest Management for landscaping, including pest-resistant landscaping, diversity of native plants, and utilizing plants that attract beneficial insects.			
Five-lot subdivision; 1616 Annie Street	Creation of five lots ranging in size from 2,550 sq. ft. to 3,835 sq. ft. and construction of a new single family residence on each lot	Application submitted 12/12/06; Planning Commission approved 6/5/07; City Council approved 6/25/07; Design review approved 8/23/07; permits ussed 9/21/07; construction underway	Residential	15,000 sq. ft.	7,500 sq. ft.	Covered parking required	Pervious pavers required for all paved areas at front of each five lots, including walkways and driveways.	Onsite detention required to limit drainage rate of flow to the predevelopment rate, based on a 10-year frequency and 2-hour storm event.							

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Impervious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracticability**	**Alternative Compliance Measures**	
Twelve-lot subdivision; Accacia Street south of Velasco Street	Creation of twelve 2,916.7 sq. ft. lots and construction of a new single family residence on each lot	Planning Commission approved on 7/3/07	Residential	35,000 sq. ft.	19,250 sq. ft.		Maximized on-site filtration	Provide detention capacity to accommodate drainage flow in excess of the pre-existing conditions for a 10-year/2-hour design frequency storm.		Annual O&M reporting; agreement binding on all future owners					
36 Condominium units over podium parking; 7555 Mission Street	Construction of 36 condominium units over 57-space podium parking garage	Application submitted on 6/25/07; Planning Commission approved 12/4/07; City Council review 2/11/08	Residential	30,046 sq. ft.	16,398 sq. ft.	Trash enclosure, recycling area drains to sanitary sewer	IPM for landscaping	Onsite detention required to limit drainage flow in excess of the pre-existing conditions for a 10-year/2-hour design frequency storm.				IPM practices for landscaping			
EAST PALO ALTO															
151 Tara Road	3 commercial buildings	rough grading	Commercial												
264 Tara Road	Industrial parking	grading, almost finished	Industrial												
872 Runnymede St.	7 SF	Framing	Residential												

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Impervious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracticability**	**Alternative Compliance Measures**	
Cumming's Park	55 Condos, retail	Finished	Mixed-Use												
Pulgas DKB Commercial		Reviewing map	Commercial												
Pulgas DKB Residential	T homes and condos	Reviewing map	Residential												
University Plaza	Office and retail	Reviewing plan	Mixed-Use												
Edison School Parking Lot	Parking lot	Finished	Parking lot												
Bay Road Phase 1, University and Clarke Avenue	J.J. Abenies	Advised the project on 8/23/07. Begin construction on 1/7/08. Proposed completion on 7/30/08	Capital improvement: street repaving, sidewalk, drainage systems												
FOSTER CITY															
NO PROJECTS MEET GROUP 2 CRITERIA															
HALF MOON BAY															
PDP-015-06; 2805 Pullman Ave	1 single-family home	Building permit issued 7/30/07. Under construction	Residential	7,498 sq. ft.	2,986 sq. ft.	N/A	Vegetated swale through landscape and downpouts hardpiped to drywells	Vegetated swales and drywells	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5-1: Table of New Development Projects[1]

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								Treatment BMPs Used	Hydraulic Sizing Criteria Used	Operation & Maintenance Responsibility Mechanism	Referred to O&M Inspection Team (y/n)?		Basis of Impracticability	Alternative Compliance Measures	
PDP 019-06; 663 Seymour St.	1 single-family home	Building permit issued 8/3/07	Residential	7,267 sq. ft.	3,058 sq. ft.	N/A	Vegetated swale through landscape and downpouts hardpiped to drywells	Vegetated swales and drywells	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PDP 019-07; 552 Filbert St.	1 single-family home	Building permit issued 8/24/07	Residential	7,361 sq. ft.	2,132 sq. ft.	N/A	Vegetated swale through landscape and downpouts hardpiped to drywells	Vegetated swales and drywells	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PDP 073-06; 225 Miramontes Ave.	1 single-family home	Building permit issued 11/1/07	Residential	7,500 sq. ft.	3,697 sq. ft.	N/A	Vegetated swale through landscape and downpouts hardpiped to drywells	Vegetated swales and drywells	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PDP-078-05; 640 Purissima St.	1 single-family home upstairs with commercial office downstairs	Building permit issued 10/11/07	Mixed use: residential and commercial	5,079 sq. ft.	3,487 sq. ft.	N/A	Parking lot is pervious pavement with vegetated swales and downspouts hardpiped to drywells	Vegetated swales, pervious pavement and drywells	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5-1: Table of New Development Projects[1]

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								Treatment BMPs Used	Hydraulic Sizing Criteria Used	Operation & Maintenance Responsibility Mechanism	Referred to O&M Inspection Team (y/n)?		Basis of Impracti-cability	Alternative Compliance Measures	
HILLSBOROUGH															
NO PROJECTS MEET GROUP 2 CRITERIA															
MENLO PARK															
100-190 Independence Dr	Hotel, restaurants, health club	1/14/08 Early development review, no applications rec'd	Commercial	7.11 acres	approx 7 acres	awaiting hydrology report	awaiting checklist and plans	Awaiting hydrology report	Awaiting hydrology report	City will propose O&M Agreement	not built yet	Awaiting checklist and plans	n/a	n/a	n/a
101-135 Constitution Dr	David Bohannon, Office space and commercial condos	Gen'l Plan and Zoning Ordinance amendment under review.	Commercial	10.98 acres	approx 9-10 acres	roofed trash enclosures, pest-resis-tant land-scaping	disconnected downspouts	vegetated swales, bioretention	Flow-based method	City will propose O&M Agreement	not built yet	Awaiting checklist and plans	n/a	n/a	n/a
1300 El Camino Real	Mixed Use Condos, retail	Planning permit under review. Preliminary design started.	Commercial	3.4 acres	3.4 acres	roofed trash enclosures, pest-resis-tant land-scaping	disconnected downspouts	flow-through planters	Flow-based method	City will propose O&M Agreement	not built yet	"	n/a	n/a	n/a
1460 El Camino Real (Beltramos)	Major Subdivision, condos	10/14/06 Applied for planning permit. Preliminary design started.	Residential	0.9 acres	0.9 acres	roofed trash enclosures, pest-resis-tant land-scaping	awaiting plans	vegetated swales, bio-retention	"	City will propose O&M Agreement	not built yet	"	n/a	n/a	n/a
2825 Sand Hill Rd	Rosewood Hotel	7/10/07 construction in process	Commercial, Residential	21.3 acres	21.3 acres	review checklist & plans	swales & detention basins	pervious pavement, veg swales, bioretention	Flow-based method	City is currently negotiating O&M Agreement	not built yet	"	n/a	n/a	n/a
525 El Camino Real	Grocery Store (Safeway) renovation	Construction almost complete. Building permit for on-site improvements issued 11/06.	Commercial	3.86 acres	3.86 acres	review checklist & plans	downspouts to impervious areas	veg swales, bioretention	Flow-based method	O&M agreement executed	yes	yes	n/a	n/a	n/a

5-1: Table of New Development Projects[1]

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								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
580 Oak Grove (Derry Ln)	Mixed Use Condos retail	Revised planning permit under review. Application received 06/07.	Commercial, Residential	4.1 acres	4.1 acres	pervious pavement	downspouts to pervious pipe	vegetated swales, bio-retention	Flow-based method	City will propose O&M Agreement	not built yet	not built yet	n/a	n/a	n/a
8 Homewood Pl. (301, 303, 305, 307, 309, 311, 313 Homewood Pl)	Kenneth Namimatsu for HKN, II, LLC, Major Subdivision, 37 Homes	1/14/07 none issued yet. 8/27/07 through 2/8/2005 Bldg permit application rec'd	Residential Subdivision	2.0 acres	2.0 acres	"	"	"	"	City will propose deed restriction	not built yet	yes	n/a	n/a	n/a
507-595 Hamilton Ave. Clarum Homes and Hamilton Park	Clarum Homes & City Redevelpment funds	completed	Residential subdiv (47 lots + new city park)	6.2 acres	approx 5 acres	pest-resis-tant land-scaping	review checklist and plans	closed pipe detention system	Flow-based method	Deed restrictions were completed in March 2007	Yes	yes	n/a	n/a	n/a
75 Willow Rd.	Major Subdivision, 33 homes	on-site construction permit issued 11/07.	Residential	4.50 acres	4.5 acres (16% decrease in imp surface)	roof leaders to spashblocks	several driveways are pavers	grassy swales	Flow-based method	O&M agreement and deed restrictions executed	not built yet	yes	n/a	n/a	n/a
64 Willow Place	office bldg (group II)	Under construction. Demolition permit issued 5/07, on-site building permit issued 8/07.	Commercial	2.46 acres	approx 1.6 acres	roofed trash enclosures, pest-resis-tant land-scaping	review checklist and plans	review checklist & plans	Review hydrology report	City will propose O&M Agreement	Yes	"	n/a	n/a	n/a
996-1002 Willow Rd	Major Subdivision (group II)	completed	Residential	0.95 acres	0.95 acres	roofed trash enclosures, pest-resis-tant land-scaping	disconnected downspouts	pervious pavement, veg swales, bioretention	Flow-based method	deed restrictions executed	yes	yes	n/a	n/a	n/a

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								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
321 Middlefield	Pollock Financial Group, converting a 48,200 SF office building into Medical Office Bldg.	7/9/07 seismic upgrade bldg permit issued. Hydrology & engr plan review in process	Commercial	3.1 acres	2 acres	roofed trash enclosures, pest-resis-tant land-scaping	reduced impervious surfaces, downspouts to pervious areas, use of land-scaping as drainage and treatment	pervious pavement, bioswales	flow based method	O&M agreement executed	Yes	yes	n/a	n/a	n/a
110 & 175 Linfield	Major Subdivision, 56 detached, single family, 2 & 3 story homes	on-site construction permit issued 2/07.	Residential	5.36 acres	5.36 acres	pervious pavement	disconnected downspouts	veg swales, bioretention	Flow-based method	Deed restrictions executed	Yes- partial buildout achieved	pest-resis-tant land-scaping	n/a	n/a	n/a
1001 Santa Cruz	1001 Santa Cruz LLC, 3 new single family homes (after demolition of one single family home)	Under construction. Building permit for on-site work issued 10/07.	residential	0.28 acres	0.28 acres	review checklist & plans	review checklist and plans	review checklist & plans	Review hydrology report	City will propose deed restriction	not built yet	review checklist and plans	n/a	n/a	n/a
1204 N. Lemon Ave	NOLL, subdivide one parcel into two lots	Planning review application received 09/07.	residential	0.54	review checklist	review checklist & plans	review checklist and plans	review checklist & plans	Review hydrology report	City will propose deed restriction	not built yet	review checklist and plans	n/a	n/a	n/a
1250 Laurel St	Nativity School (demolish existing & bld new 14,016 SF multi-use bldg and 1321 SF kindergarten)	Under construction. Building permit for on-site work issued 07/07.	School	4.96 acres	0.35 acres	roofed trash enclosures, pest-resis-tant land-scaping	on-site retention "eggcrates"	bioswales	Flow-based method	City negotiating O&M Agreement			n/a	n/a	n/a
1275 El Camino Real	PARK THEATER, renovate historic theater	Planning review application received 07/07.	commercial	0.41	0.41		none, site is completely covered by bldg	none	none	none	na/	n/a	n/a	n/a	n/a

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								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
2122 Santa Cruz	Royal Oak Ct Homes subdivision	Under construction. Grading permit issued 09/06.	Residential	2.0 acres	0.88 acres	review checklist & plans	disconnected downspouts	bioreten-tion basins and Filtera Units	Review hydrology report	deed restrictions executed	not built yet	review checklist and plans	n/a	n/a	n/a
2245 Avy Philips Brooks School	Philip Brooks School, school addition	1/14/07 under construction	School	7.84 acres	review checklist	review checklist & plans	review checklist & plans	closed pipe detention system	Flow-based method	City is currently negotiating O&M Agreement	not built yet	yes	N/A	N/A	N
66 Willow Pl.	Frykberg, demo old commercial building and construct new with site improvements	3/07 planning review application received	Commercial	2.66 acres	1.13 acres	pervious pavement	disconnected downspouts	vegetated swales, bioretention	Flow-based method	City will propose O&M Agreement	not built yet	yes	N/A	N/A	
2199 Clayton Dr.	Cupertino Development Corp. minor subdivision, create 4 from one parcel	5/23/07 engineering review of hydrology report and plans	Residential	1.02 acres	0.40 acre	gravel basin, storage pipe	disconnected downspouts	vegetated swales, on-site pipe detention	Flow-based method	City will propose deed restriction	not built yet	Awaiting checklist and plans	N/A	N/A	
1906 El Camino Real	1906 ECR LLC, demo office building and install new 10,000 sq ft., 2-story office building and commercial condos	Planning application received 8/30/06. In preliminary design.	Commercial	0.42 acre	0.40 acre	roofed trash enclosures, pest-resis-tant land-scaping	pervious pavement, disconnected downspouts	CDS unit	Flow-based method	City will propose O&M Agreement	not built yet	yes	N/A	N/A	

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4040 Campbell Ave.	T.J. Bianchi, demo office & R&D building and replace with smaller, 41,284 sq. ft. same	Under construction. Building permit for on-site improvements issued 10/07.	Limited industrial	2.11 acres	1.11 acres	pervious pavement	disconnected downspouts	bioswales	Flow-based method	O&M agreement executed	not built yet	yes	N/A	N/A	
737 Fremont St.	4 condominium units	planning permit submitted	Residential	0.41 acre	awaiting hydrology report	awaiting hydrology report	pervious pavement, disconnected downspouts	vegetated swales, bioretention	Flow-based method	City will propose O&M Agreement	not built yet	will require	N/A	N/A	
MILLBRAE															
Park Broadway 1355 El Camino Real AKA 1388 Broadway cross street ludeman	Silverstone Development - 116 unit residential with 13 work loft units	2/23/06 submitted for permits. 5/16/06 approved plan submittals, permit issued and construction began 9/19/06, work not yet complete	Mixed-use	2 acres	2 acres	Stenciled inlets, street sweeping	On site storm water retention / cleaning	Landscape filtering, drain inlet sand /oil separation	WEF Method	Home Owner's Association	No	Pesticide reduction	N/A	N/A	N/A
88 South Broadway	Glenborough Pauls LLC - 110-unit residential and commercial building	2/7/03 plans submitted for building permit, 8/18/03 plans approved, 8/23/03 construction begins, work 6/20/08 project completed.	Mixed-use	2 acres	2 acres	Stenciled inlets, street sweeping	On site storm water retention / cleaning	Landscape filtering, drain inlet sand /oil separation	WEF Method	Home Owner's Association	No	Pesticide reduction	N/A	N/A	N/A

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151 El Camino Real	L.F. George - construction of 142 residential and commercial shops, underground parking	6/27/07 submitted for permit; 6/20/08 parking structure substantially complete, building finishing structure plancheck	Mixed-use	1.7 acres	1.7 acres	Stenciled inlets, street sweeping	On site storm water retention / cleaning	Landscape filtering, drain inlet sand /oil separation	WEF Method	Home Owner's Association	No	Pesticide reduction	N/A	N/A	N/A
1 Alp Way	Braddock and Logan Properties 37 home subdivision	10/16/07 utility plan check submitted, 12/18/07 home model plan check submitted, 5/6/08 grading permits issued, grading underway	Single family homes	10.5 acres	6.4 acres	Stenciled inlets, street sweeping	Down spouts connected to landscaping	Landscape filtering	WEF Method	Home Owner's Association	No	Pesticide reduction	N/A	N/A	N/A
Friendship Plaza, 45 & 135 South El Camino Real	Friendship Plaza - new Walgreens commercial building and a 4-unit commercial building	2/2/06 plans submitted for permit, 6/25/06 plans approved, 6/29/06 grading and building permits issued, work not yet complete	Commercial	1 acre	1 acre	Stenciled inlets, street sweeping	On site storm water retention / cleaning	Landscape filtering, drain inlet sand /oil separation	WEF Method	Property Owner	No	Pesticide reduction	N/A	N/A	N/A

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								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracticability**	**Alternative Compliance Measures**	
PACIFICA															
100 Juanita	Kevin Russell	Approved by Planning Commission and awaiting issuance of a building permit	New single-family residence	28 acres	23,300 sq. ft.	Stormwater BMPs required as part of mitigation measures	Multi-story building to offset building footprint	Stormwater to be colected and routed through landscape to drainage swale	N/A	N/A	N/A	Native and pest-resistant plants			N/A
McDonald's, 125 Monterey	RHL Design Group	Approved and pending building permits	Commercial	29,476 sq. ft.	22,796 sq. ft.	Covered trash areas, wastewater will not drain to storm drain, streets or gutters	Minimized impervious surfaces, drought-tolerant landscaping	Unknown at this time	N/A	N/A	N/A	Native, non-invasive and pest-resistant plants			
Harmony @ 1; Fassler @ Robert's Road	Taiten Cowan and Stuart Newton	Planning approved but pending final map / building permit	Residential subdivision	67 acres	>10,000 sq. ft.	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Detention ponds	Unknown at this time	N/A	not yet	Unknown at this time			
The Bowl, North End of Palmetto Avenue	North Pacifica LLC; 19 detached condos and 24 attached condos	Application approved by City but pending Coastal Commission Approvals	Residential subdivision	4.2 acres	Unknown	Stenciled inlets and covered trash areas	Clustering to reduce impervious surfaces	not required	N/A	N/A	N/A	Native and pest resistant plants			

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Pacifica View LLC	Legacy Quest; 17 single-family detached units	Application incomplete - no recent progress	Residential subdivision	5.6 acres	Unknown	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Unknown at this time	Unknown at this time	Unknown at this time	not yet	Unknown at this time			
Vistamar Development, 503-511 Monterey	Javier Chavarria; 8 townhome condominiums	Application incomplete - no recent progress	Residential subdivision	1 acre	Unknown	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Unknown at this time	Unknown at this time	Unknown at this time	not yet	Unknown at this time			
Sunset Estates, 500 block of Palmetto Avenue	Jack Lowe; 7-lot residential subdivision	Application incomplete - no recent progress	Residential subdivision	8 acres	Unknown	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Unknown at this time	Unknown at this time	Unknown at this time	not yet	Unknown at this time			N/A
Westview School Site; Cypress Walk; 367 Glen Court Way	Joe Bradford of the Olson Company; 92 single-family residential	Under construction	Residential subdivision	10.5 acres	3.6 acres	Stenciled inlets, covered trash areas, wastewater will not drain to stormdrain, streets or gutters	Multi-story dwellings, common landscaped areas	Detention pond	CASQA BMP Handbook	O&M agreement	not yet	No invasive plants permitted			N/a

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Lorry Lane	Carlos Dominguez; 7 detached single-family homes	Application incomplete - no recent progress	Residential subdivision	53,418 sq. ft.	21, 367 sq. ft.	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Unknown at this time	Unknown at this time	Unknown at this time	not yet	Unknown at this time			
The Prospects; 801 Fassier Avenue	Rick Lee; 34 attached and detached residential units	Planning application is incomplete	Residential subdivision	11.2 acres	60,840 sq. ft.	enclosed trash / recydling areas, on-site stormwater collection - reuse for irrigation	Multi-story, clustered structures, pervious roadways, living roofs	Detention ponds, retention basin, swales, rain gardens, cistern	Unknown at this time	Unknown at this time	not yet	Native, non-invasive and pest-resistant plants			
Gypsy Hill and Clarendon Road	JC Engineering, subdivision	Application incomplete-no recent activity	8-lot subdivision for future residential use	13.9 acres	unknown	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Unknown at this time	Unknown at this time	N/A	not yet	N/A			
Walgreen's, 520 Palmetto Ave.	John Pechnenica, Tecta; Commercial	Under construction	Retail space with drive-through	15,600 sq. ft.	15,000 sq. ft.	oil and grease filters, enclosed trash and recycling areas	No wastewater to flow to storm drain, street and/or gutters	Uknown at this time	Unknown at this time	N/A	not yet	Native and pest-resistant plants			

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270 Old County Road	JC Engineering, office/retail	Approved by Planning Commission and awaiting approval by City Council and Coastal Commission	Mixed commercial and office uses	14,070 sq. ft.	>10,000 sq. ft.	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Unknown at this time	Unknown at this time	N/A	not yet	Appropriate landscaping condition will apply			
4545 Coast Highway	Guru Thalapaneni, mixed-use	Application incomplete - no recent progress	Mixed-Use	2.873 acres	unknown	Unknown at this time but will apply all relevant source control measures as conditions of approval	Unknown at this time	Unknown at this time	Unknown at this time	N/A	not yet	Appropriate landscaping condition will apply			
Beach Boulevard	Legacy Quest, 9 condos	Project approved but no building permit application has been filed	Residential subdivision	17,962 sq. ft.	10, 575 sq. ft.	Enclosed trash and recycling areas, wastewater will not drain to storm drain streets or gutters	Unknown at this time	stormwater directed away from impervious surfaces, possible detention pond (depend on practica-bility)	Unknown at this time	N/A	not yet	Pest resistant, noninvasive plants			
Waterford @ Monterey	Miramar development	Approved, pending issuance of building permit	mixed-use, commercial and 5 residential units	9,597 sq. ft.	8,155 sq. ft.	Enclosed trash and recycling areas, wastewater will not drain to storm drain streets or gutters	N/A	N/A	N/A	N/A	N/A	native and pest and drought-tolerant plants			N/A

5-1: Table of New Development Projects[1]

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								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
Lower Miagra Ridge; Connemara; 900 Oceana Blvd.	Jim Poliart; mixed-use project	Under construction	25 residential units and 10,000 sq. ft. of commercial	40+ acres	95,830 sq. ft.	Stenciled inlets and covered trash areas	Multi-story dwellings, common landscaped areas	None - project deemed complete prior to 2/15/05	CASQA BMP Handbook	O&M agreement not approved by City Council yet	not yet	Native and pest resistant plants			
PORTOLA VALLEY															
Barratt/Oakley 348 Westridge Drive	New single-family residence	Design review approval October 2006. Project is under construction.	single-family residential	2.5 acres	>10,000 sq. ft.	Covered stock piles, jute netting, silt fencing, straw wattles, protected entrace, concrete wash out station	Retained existing landscape and trees	N/A	N/A	N/A	N/A	The Town's Conservation Committee requires native landscape plantings as selected from the Town's Design Guidelines.			N/A
Holland/Yates 170 Mapache Drive	Demo existing residence and build new, also new guest house, garage, sport storage cellar, sports court and swimming pool	Application approved in April 2007. Construction anticipated to start Spring 2008	single-family residential	2.5 acres	>10,000 sq. ft.			constructed wetlands				pest-resistant and native plants proposed			
Town of Portola Valley 765 Portola Road	Phase II New Community Hall, Library and Town Hall project	Project approved subject to EIR and mitigation monitoring program 08/05. Construction began May 2007 and completion is expected by Fall 2008	Redevelop-ment of Town Center Property	11 acres	>10,000 sq. ft.	roofed trash enclosures, covered stock piles, jute netting, silt fencing, straw wattles, protected entrace, concrete wash out station						Native, pest-resistant landscaping required			

5-1: Table of New Development Projects[1]

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Corman 120 Golden Hills Drive	New single-family residence	Design review approval September 2006.	single-family residential	2.1 acres	3,867 sq. ft.	Covered stock piles, jute netting, silt fencing, straw wattles, protected entrace, concrete wash out station	Minimized grading, retained existing landscape and trees	N/A	N/A	N/A	No	Native, pest-resistant landscaping required			N/A
REDWOOD CITY															
Westpoint Marinia - 1529 Seaport Blvd.	Mark Sanders Phase 1A	Building permit pending	Commercial	5 acres	5 acres	Bioswales	Landscaping	Vegetated swale	Flow based	O&M agreement with City Engineer	Yes	N/A	N/A		
1703 East Bayshore Road	David Brett and Lisa Casentini	Approved August 31, 2007	Commercial	4.4 acres	0.78 acres	Label inlets	Landscaping	Flow-thru planters	Flow based	O&M agreement with City Engineer	Yes	N/A	N/A		
1616 Gordon Street	Zenaida Mallari	Approved September 25, 2007	Commercial	2.16 acres	0.36 acres	Pesticide reduction	Landscaping	Vegetated swale	Flow based	O&M agreement with City Engineer	Yes	pest-resistant landscaping	N/A		
420-450 Broadway	Stanford Hospital Clinics	Approved August 29, 2007	Commercial	11.5 acres	4.3 acres	Label inlets	Landscaping	Media filter, bioswales, vegetated strip and swale	HEC-1 program	O&M agreement with City Engineer	Yes	Stormwater detention	N/A		HEC-1 program

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71 & 77 Oakwood	Curtis Peterson	Approved August 17, 2007	Residential	0.36 acre	0.24 acre	Pesticide reduction	Landscaping	Bioretention	Volume based	O&M agreement with City Engineer	Yes	pest-resistant landscaping	N/A		exempt area
Lincoln Townhomes	Peninsula Habitat for Humanity, Inc.	Approved February 19, 2008	Residential	0.3 acre	0.26 acre	Reduce pesticides and label inlets	Landscaping	Media filter system	Flow based	O&M agreement with City	Yes	pest-resistant landscaping			exempt area
Costco 2300 Middlefield	Costco Wholesale	Approved June 20, 2008	Commercial	13.65 acres	12.78 acres	Reduce pesticides, label inlets, follow guidelines in Redwood City's Local Source Control Measures List for fuel dispensing area, loading docks, refuse areas, parking facilities, outdoor storage and food service facilities	Bay-friendly landscaping	Media filter system, oil/water separator, vegetated buffer strips	Flow based	O&M agreement with City	Yes	pest-resistant landscaping			exempt area

5-1: Table of New Development Projects[1]

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718 Canyon Road	Gary Ernst	Approved May 19, 2008. Building permit pending	Residential	0.8 acre	.33 acre	Landscaping	Landscaping	Vegetated swale and detention pipe	Flow based	O&M agreement with City	Building permit pending	None	N/A		BAHM
SAN BRUNO															
Skycrest Homes. Glenview Drive & San Bruno Avenue. 200' south of intersection	Kenmark Realty. Development of 24 single-family homes on former shopping center site.	Project approved 4/18/06. Building permits issued 6/28/07 and construction is underway	Single-family design, with medium-density site plan.	3 acres		Stenciled inlets, SWPPP required, increased landscaping, require post-construction BMP plan during improvement plan stage	Increased landscaping with native plants	Vegetated swales, detention basins		HOA is required to maintain onsite facilities per conditions and CC&Rs.	N	N/A			
Glenview Terrace Condos. NE Corner of Glenview Drive @ San Bruno Avenue.	Panko Architects. Development of 16 townhomes.	Project approved 6/27/06. Plans are currently being reviewed by our Building Division. Postponed by applicant.	Medium density townhomes development	1.1 acres		Stenciled inlets, SWPPP required, increased landscaping, require post-construction BMP plan during improvement plan stage	Increased landscaping with native plants	Vegetated swales, detention basins		HOA is required to maintain onsite facilities per conditions and CC&Rs.	N	N/A			

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Merrimont Homes. Evergreen Drive at Maywood Drive	Summerhill Homes. Development of 70 single-family homes on former school site.	Project Approved 11.28.06. Currently under construction.	Low-density single-family home site plan	10.3		Stenciled inlets, SWPPP required, onsite detention required, increased landscaping, require post-construction BMP plan during improvement plan stage	Increased landscaping with native plants	Vegetated swales, detention basins		HOA is required to maintain onsite facilities per conditions and CC&Rs.	N	N/A			
599 Cedar Ave. at Pepper. Former church site.	Tyger Construction. Development of 14 clustered single-family homes	Project approved 6/17/08. Applicant developing construction documents.	Residential: medium density clustered single-family development	1.9 acres		Stenciled inlets, SWPPP required, onsite detention required, increased landscaping, require post-construction BMP plan during improvement plan stage	Cluster buildings to minimize impervious surfaces. Increased landscaping. Pervious paving used for driveways.	detention basins		HOA is required to maintain onsite facilities per conditions and CC&Rs.					
400-418 San Mateo Ave. at El Camino Real	Conceptual Investment and Mangement, Inc. Demolition of commercial buildings and construction of mixed-use building.	Application submitted, under review.	Residential medium density and commercial	0.95 acre		TBD	Compact, mixed-use building. Parking integrated into building	TBD		TBD but anticipated that a maintenance agreement will be executed					

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Treetops Apartments Skyline Blvd at Sharp Park Road	0	0	Residential: medium density apartments	1.9 acres		TBD	TBD	TBD	TBD	TBD	TBD	TBD			
The Crossing Specific Plan Area	SNK Development; 350 condominiums	Project approved 6/20/06. Plans currently under review by Building Division	High-density apartments	7 acres		Stenciled inlets, SWPPP required, increased landscaping, onsite detention required, require post-construction BMP plan during improvement plan stage	Increased landscaping with native plants	Vegetated swales, detention basins		HOA is required to maintain onsite facilities per conditions and CC&Rs.	N	N/A			
SAN CARLOS															
San Carlos Marketplace 1133 Industrial Road	SPI Holdings, Inc. Construct new shopping mall	application received 1/26/06, approved 1/23/07, construction began 5/2/07 and project completed 7/14/08	Commercial	6.5 acres	3.1 acres	Stenciled inlets, street sweeping, CDS units on drainage system	None	2 CDS units PMSU 20-15-5		Stormwater system maintenance agreement signed with owner		No			
Palo Alto Medical Foundation, 301 Industrial Road	Palo Alto Medical Foundation new medical facility with clinics	Began demolition and limited grading to remove contaminated soil	Institutional	17.86 acres	~12.5 acres										

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SAN MATEO															
501 Edgewood (x Midway Ave)	Mark Strambi, SFD	Application submitted 01.2007 and approved 06/2007; grading began 06/2007; construction TBD.	Residential	21,683 sq. ft.	5,000 sq. ft.	Covered garage	Pervious pavement for driveway	Vegetated swales, detention basins	C.3 design guidelines	Conditions of approval	Yes	Pest-resistant landscaping; pervious paving to reduce impervious surface.			N/A
493 Edgewood (x Midway Ave)	Craig Suhi, SFD	Application submitted 01.2007 and approved 06/2007; grading began 06/2007; construction TBD.	Residential	21,683 sq. ft.	5,000 sq. ft.	Covered garage	Pervious pavement for driveway	Vegetated swales, detention basins	C.3 design guidelines	Conditions of approval	Yes	Pest-resistant landscaping; pervious paving to reduce impervious surface.			N/A
602 E. 4th Avenue (X S. Eldorado)	ASI Construction, 5 commercial spaces	Application submitted 11/2006 and approved 1/2007, construction 5/2007	Commercial	11,800 sq. ft.	9,000 sq. ft.	Covered trash enclosure	Landscaping along building edge	Vegetated swale	C.3 design guidelines, rational formula	Conditions of approval	Yes	Pest-resistant landscaping			N/A
613 & 701 2nd Avenue (x S. Delaware St.)	ASI Construction, 8-unit residential complex	Application submitted 08/2006 and approved 03/2007, construction TBD	Residential	12,050 sq. ft.	10,000 sq. ft.	Covered garage, enclosed trash area	Pervious pavement for driveway	Storage detention and filtration basin	C.3 design guidelines, rational formula	Conditions of approval	Yes	Pest-resistant landscaping			N/A
50-100 Barneson Avenue (x. Jasmine St.)	Fairrock Development, 10-unit residential complex	Application submitted 08/2006 and approved 01/2007, construction 05/2007	Residential	20,610 sq. ft.	11,119 sq. ft.	Covered garage, enclosed trash area	Permeable pavers	Vegetated bioswale	C.3 design guidelines, rational formula	Conditions of approval	Yes	Pest-resistant landscaping			N/A

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San Mateo Executive Park, 3000 Clearview Way (x Hillsdale Blvd.)	Lowe Enterprises Real Estate Group	Application submitted 09/07, approval 1/14/08, construction 2/13/08	Office space	22 acres	~50,000 sq. ft.	N/A	More landscape	Vegetated bioswale	C.3 design guidelines, rational formula	Conditions of approval	Yes	Pest-resistant landscaping			N/A
Police Station, 200 Franklin Parkway (x Saratoga Blvd.)	City of San Mateo, construction of new Police Station	Application submitted 2005 and approved 06/2006; grading begin 05/2006	Public facility	2.2 acres	1.9 acres	Enclosed trash area, covered parking, delivery area drains to sanitary sewer	Landscaping surrounding structure	Bioswales and media filter	C.3 design guidelines	Conditions of approval	Yes	Pest-resistant landscaping, pervious paving to reduce impervious surface	High groundwater table	vortex media filter	N/A
Verona Ridge, property bounded by Hillsdale Blvd. Between State Route 92 and the Peninsula Golf and Country Club	Taylor Woodrow Company; construction of a 34 single-family homes and a private street system	Project approved may 27, 2003, Construction began June 2007. Project is still ongoing	Residential	12.5 acres	4.5 acres	Small footprint homes	Narrow street and only one sided sidewalks	Storm detention system	Rational method	HOA	Yes	Native plants			N/A

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SAN MATEO COUNTY															
New Commercial Building, 866 Warrington Avenue, Redwood City	Gary Ernst, New Commercial Building	Building permit application received 5/3/07. Building permit and stormwater treatment plan are under review.	Commercial	12,375 sq. ft.	11,885 sq. ft.	TBD	TBD	Flow-based treatment	TBD	TBD	TBD	TBD	TBD	TBD	TBD
101 5th Avenue	Randy Blair, 2-5-unit buildings on an 18,000 sq. ft. common parcel	Subdivision approved 1/2007; buildings in building permit review	Residential	18,000 sq. ft.	~15,000 sq. ft.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Brasher Properties	Ned Brasher, COC Type A, CDP, RM and grading permit to allow construction of a new 3,284 sq. ft. residence, driveway, and construction of Bay View Rd.	Planning application is incomplete	Residential	3.2 acres	Unknown	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

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Brasher Properties	Ned Brasher, RM permit, CD permit and grading permit for a 3,294 sq. ft. residence with approx. 1,100 cy of cut and 1,100 cy of fill	Planning application is incomplete	Residential	1.7 acres	Unknown	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Highlands Estates Major Subdivision, San Mateo Highlands	Jack Chamberlain, 9 lot subdivision	Application received 8/22/06; project not yet approved	Residential	99 acres	TBD	N/A	Vegetated swale	N/A	CASQA Method	O&M agreement required for final permit	TBD	TBD	TBD	TBD	TBD
Palomar Oaks Major Subdivision, 1520 Edgewood Road, Redwood City	A/CF Redwood I LLC (Builder), 12-lot subdivision	Application received 10/18/00 (Group 1); Parcel Map recorded 1/10/06; building permits issued of SFDs on 4 of 12 lots between 10/06-1/07	Residential	Appx. 7 acres	Varies by lot	Varies by lot	Varies by lot	Varies by lot	Varies by lot	CASQA method	O&M agreement executed on 9/6/07	Varies by lot	N/A	N/A	Varies by lot

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Rathgar Estates Major Subdivision, 1718 Edgewood Road, Redwood City	Patrick Fellows, Subdivision & grading permit to create 5 lots	Approved 2/4/03 and grading permit issued (Group 2); final map recorded. Building permits applied for 6/13/08	Residential	Appx. 1.5 acres	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	N/A	N/A	TBD
Minor subdivision at 317 6th Avenue, Menlo Park	Abdel Ismail, subdivision and re-zoning for a condominium	Approved 9/28/05, grading permit and recordation of final map pending	Residential	12,000 sq. ft.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	N/A	N/A	TBD
Highland Estates Major Subdivision, San Mateo Highlands	Jack Chamberlain, subdivision to create 9 new lots	Application received 8/22/06; project has not been approved.	Residential	99 acres	TBD	N/A	Vegetated swale	N/A	CASQA Method	An O&M agreement required for final permit	TBD	TBD	N/A	N/A	TBD
Ascension Heights Major Subdivision, San Mateo Highlands	Dennis Thomas, subdivision & grading permit to create 25 new lots	Application received 8/28/05; project has not yet been deemed complete	Residential	13.25 acres	TBD	TBD	Vegetated swale	CDS Unit, hydrodyna-mic device	CASQA Method	An O&M agreement required for final permit	TBD	TBD	N/A	N/A	TBD

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Big Wave Office and Housing Project, Pillar Point Marsh, Princeton	Big Wave LLC, Major subdivision into 5 lots for 4 office buildings and housing units for disabled adults	Application received 10/18/05; project has not yet been deemed complete	Residential and Commercial Office	14.88 acres	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	N/A	N/A	TBD
Bridge Housing Transit Village, 7880 El Camino Real	Bridge Housing, Major Subdivision including 158-unit multifamily residential development and day care center	Application received 8/24/06 (Group 2). Approved by Board of Supervisors on 1/23/07. Map recorded 3/26/07. Building Permits have been applied for.	Residential with Day Care Center	Appx. 3 acres	TBD	Inlet stenciling / employee education; maintenance (street seeping, catch basin cleaning)	Vegetated swale	CDS Unit, hydrodynamic device	TBD	An O&M agreement required for final permit	TBD	TBD	N/A	N/A	TBD
YMCA's Camp Jones Gulch, 11000 Pescadero Rd., La Honda	Peter Jones (applicant); use permit amendment to make modifications to YMCA's existing camp facilities as a part of the Master Plan	Application received on 7/2/03 (C3 not required). Zoning Hearing Officer approved 3/29/07. No building permit received yet (Master Plan put on hold due to funding issues).	Significant redevelopment	Appx. 100 acres	Appx. 65,000 sq. ft.	TBD	TBD	Vegetated swale	TBD	TBD	TBD	None	N/A	N/A	TBD

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Eternal Gardens Burial Section at Skylawn Memorial Park, 10600 Skyline Blvd.; Half Moon Bay	Stephen Elliott, Skylawn Corporation; 1250 sq. ft. garden mausoleum, 9 acre cemetery section with road, retaining walls, sidewalks, plazas, and water fountain and pond	Application for RM permit, Use Permit and grading permit received on 11/12/03 (C.3 not required). Building Permit was revised / downscaled and issued on 10/17/06. Public Works has approved SWMP.	Significant redevelop-ment	9 acres	97,405 sq. ft.	Inlet stenciling / employee education; maintenance (street sweeping, catch basin cleaning)	Min. impervious surface, min.-impact street or parking lot design, min. change in runoff hydrograph, erosion control and site stabilization	Infiltration trench	CASQA Method	Applicant is to execute O&M agreement prior to final by DPW on all 3 building permits	Future	Native landscaping	N/A	N/A	TBD
Extra Space Storage, 477 Harbor Blvd., Belmont	Michael Bassilios / Kier & Wright; new storage building	Applications received for four buildings on 1/12/05 (group 1); building permits issued 4/20/06. Building permits have been finalled.	Significant redevelop-ment	1.65 acres	100% replace-ment			CDS unit; hydrody-namic device	CASQA method	A maintenance agreement was executed on 6/19/07	Future	None	N/A	N/A	N/A
South San Francisco															
Malcolm Bldg., 200 Oyster Point Blvd.	Malcolm Bldg. LLC, Biotech facility	60% complete	Industrial, R&D labs and offices	1.9 acres	1.77 acres	Stabilized entrance, tire wash area, concrete wash out area, inlet filters, fiber roll	None	Inlet filters, bioswales, hydro-seeding, jute mat, hydrodyna-mic separator	Unknown	Property owner	Yes	N/A			
Marbella (City Lights), NW corner of Gellert Blvd. and Westborough Blvd., SSF, CA	Watt Communities, residential	Completed	Residential condos	14.9 acres	5.7 acres	Catch basin cleaning, tire wash area, street sweeping	None	Inlet filter, straw wattles, hydro-seeding, jute mat	Unknown	Property owner currently; HOA after completion	Yes	N/A			

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Impervious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracticability**	**Alternative Compliance Measures**	
West Building (Alexandria Real Estate), 249 E. Grand	Alexandria Real Estate Equities, Inc., 4-story office and R&D facility	Completed	Office and R&D	7.41 acres	6.91 acres	Street sweeping, beneficial landscaping, tire wash area	None	Inlet filters, straw wattles, bioswales	WEF Method	Property owner	Yes	Yes			
Genentech Child Care Center, 444 Allerton Ave.	SL Construction, construction of child care facilities (6 new structures)	Completion by Fall 2008	Child Care	5.6 acres	2.52 acres	Fiber roll, stabilize construction entrance, street sweeping, vacuuming, tire wash area, inlet protection	Minimize impervious surfaces, minimum impact parking lot design	bioswale, storm water inlet filter insets, straw wattles	WEF Method	Property owner	Yes	N/A			
Kaiser SSF Cancer Treatment Facility, 220 Oyster Pt. Blvd.	Rudolph & Sletten Cancer Treatment Facility	Completion by Winter 2009	Construction of cancer treatment clinic and parking	1.6 acres	1.3 acres	Fiber roll, stabilize construction entrance, street sweeping, vacuuming, tire wash area, inlet protection, cover soil stockpiles	Preservation of existing vegetation	Hydrodynamic separator, hydroseeding and planting, drainage swales	WEF Method	Property owner	Yes	N/A			

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
Home Depot, 900 Dubuque	Home Depot USA, Inc., Demo existing building, construction of warehouse hardware store	Project discontinued	Retail	7.62 acres	7.62 acres	Street sweeping, tire wash area, stabilized construction entrance, dissipation devices, check dams, interceptor swale, silt fence, maintain existing vegetation, gravel bag berms	Storm water detention ponds, permanent vegetation, permanent diversion dike, hydroseed	Flow attenuation by use of open vegetated swales and natural depressions, storm water detention structures (including wet ponds)	WEF	Property owner	Yes	N/A			
Brittannia Oyster Point II, 333 Oyster Point Blvd.	Hathaway Dinwiddie, demolition of existing building, construction of new office and lab buildings with parking underneath	Completed	Office, R&D	8.84 acres	6.54 acres	Roofed dumpster area, covers for loading dock drains, street sweeping, catch basin cleaning	Minimize impervious surfaces, disconnect downspouts	Biofilters, media filters, hydrodyna-mic device (in-line treatment unit)	WEF	Property owner	Yes	N/A			

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
Brittannia East Grand Phase II, 620, 625, 640, 645, 660 East Grand	Hathaway Dinwiddie, demolition of existing building, construction of new office, lab and parking structures	Completed	Office, R&D	27 acres	13.5 acres	Beneficial landscaping, outdoor material storage protection, covers for loading docks, street sweeping, catch basin cleaning	Minimum-impact street and parking lot design, protect riparian and wetland areas	Biofilter, media filters, inlet filters	WEF	Property owner	Yes	N/A			
East Jamie Court Tech Center, E. Jamie Court @ Haskins Way	BNB Builders, construction of new office and lab buildings with parking underneath	Completed	Office, R&D	6.83 acres	5.12 acres	Catch basin cleaning, street sweeping	Minimize land disturbance, minimize impervious surfaces, native plants	Inlet filters	WEF	Property owner	Yes	Yes			
Park Station, 1488 El Camino Real	Summerhill Homes; 99 residential units	90% complete	Multi-family residential	2.04 acres	1.47 acres	Fiber roll, catch basin cleaning, street sweeping, tire wash area, sediment trap	None	Inlet filters	Unknown	Property owner	Yes	N/A			

5-1: Table of New Development Projects[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Area**	**New or Replaced Imper-vious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[6]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracti-cability**	**Alternative Compliance Measures**	
Lowe's of SSF, 600-790 Dubuque Avenue, SSF, CA	Lowe's HIW, Inc.; Demo 3 buildings and construct warehouse hardware store	Completed	Retail	10.89 Acres	10.1 acres	Fiber roll, catch basin cleaning, street sweeping, tire wash area, sediment trap	Minimum-impact street or parking lot design	CDS units, biofilters	WEF	Property owner	Yes	N/A			
Mandalay Terrace, Airport Blvd. and Sister Cities Blvd.	Hathaway Dinwiddie, Inc.; mass grading and construction of two office towers and parking structure	50% complete	Construction of two high-rise office towers and parking structure	11.9 acres	5.95 acres	Silt fencing, fiber roll, catch basin cleaning, street sweeping and vacuuming, inlet protection, gravel bag berms, check dams, stabilize entrances, tire wash area	Preservation of existing vegetation, hydro-seeding, earth dikes, geotextiles and mats	Drainage swales, velocity dissipation devices, hydrodyna-mic separator	WEF	Property owner	Yes	N/A			
WOODSIDE															
Not reported															

[1] Projects that create at least 10,000 square feet but less than 1 acre of impervious surface are required to report information in columns 1 through 15 only.

[2] If a project is being constructed in Phases, each Phase should have a separate entry.

[3] Indicate project type, based on NPDES Permit Provision C.3.c categories: Commercial, Industrial, Residential, Streets/Road/Highways/Freeways, Significant Redevelopment.

[4] If a project was granted Alternative Compliance (Provision C.3.g), report required information on the Interim Alternative Compliance Form (Attachment __).

[5] If hydromodification (HM) control is not required, state why not. If HM control is required, describe the control method used and attach the pre- and post-project hydrographs.

TABLE 5-2. NEW DEVELOPMENT AND REDEVELOPMENT PROJECTS THAT USE VEGETATED SWALES AND/OR DETENTION BASINS: FY 2001/02 TO FY 2007/08

Fiscal Year	Reported Projects Incorporating Swales and/or Detention Basins	
	Approximate Number of Projects	Approximate Acres Represented
2001/02	38	452
2002/03	25	303
2003/04	23	441
2004/05	22	312
2005/06	38	302
2006/07	72	447
2007/08	64	660

Sources: Annual Reports for fiscal years 2001/02 through 2004/05, Second Half Year deliverable forms for FY 2005/06 and First and Second Half Year deliverable forms for FYs 2006/07 and 2007/08.

TABLE 5-3. NEW DEVELOPMENT AND REDEVELOPMENT PROJECTS THAT USE INLET FILTERS: FY 2001/02 TO FY 2007/08

Fiscal Year	Reported Projects with Inlet Filters and ...		Total Reported Projects with Inlet Filters
	NO Other Treatment Measure in Project	Other Treatment Measure Included in Project	
2001/02	9	3	12
2002/03	4	4	8
2003/04	4	9	13
2004/05	5	6	11
2005/06	2	6	8
2006/07	6	14	20
2007/08	3	17	20

Sources: Annual Reports for fiscal years 2001/02 through 2005/06, Second Half Year deliverable forms for FY 2005/06 and First and Second Half Year deliverable forms for FYs 2006/07 and 2007/08.

6

WATERSHED ASSESSMENT AND MONITORING

INTRODUCTION

Watershed Assessment and Monitoring (WAM) is one of SMCWPPP's key components. The current emphasis is on characterizing representative watersheds in San Mateo County and addressing pollutants of concern that may impair water quality. More specifically, the goals of the WAM component include:

- Characterizing creek function, health and water quality conditions in representative watersheds in San Mateo County and evaluating potential stormwater runoff impacts;
- Developing plans to address specific pollutants of concern associated with stormwater runoff such as mercury and polychlorinated biphenyls (PCBs) and performing related special studies (e.g., to identify pollutant sources); and
- Evaluating long-term trends in water quality and thereby informing SMCWPPP's efforts to improve the effectiveness of its BMPs to prevent or reduce stormwater runoff impacts.

SMCWPPP focuses on using integrative tools such as creek walks and bioassessments to characterize creek condition. The monitored creeks are typically receiving waters for stormwater discharges from municipal storm drain systems in watersheds with significant urban land uses. SMCWPPP also participates in regional collaborative efforts that develop information needed to improve water quality in San Francisco Bay and local watersheds in San Mateo County and throughout the Bay Area.

ACCOMPLISHMENTS

SMCWPPP's WAM component accomplishments during FY 2007/08 are summarized below. The accomplishments fall under three general categories:

1. Watershed-related Activities;
2. Regional Collaborative Efforts; and
3. Regulatory Compliance, Coordination and Planning.

Watershed-related Activities

- SMCWPPP performed creek walks in seven watersheds in San Mateo County using the Unified Stream Assessment (USA) protocol and completed a report on this work.
- SMCWPPP, in collaboration with the Santa Clara Valley Urban Runoff Pollution Prevention Program, prepared a guidance document for municipal stormwater programs and other interested agencies on the potential uses of the USA based on recent experience in the Bay Area.
- As a follow-up to the USA creek walks, SMCWPPP began to explore potentially developing a program in San Mateo County similar to Contra Costa County's Stream Management Program for Landowners (SMPL).
- SMCWPPP performed trash assessments at seven urban creek sites in San Mateo County and completed a report on this work.
- SMCWPPP prepared a draft fact sheet that describes typical trash management activities conducted by SMCWPPP's municipalities and SMCWPPP's multi-faceted program-wide efforts to characterize trash and reduce trash levels in urban creeks.
- SMCWPPP reviewed the Regional Water Board's June 30, 2007 San Francisquito Creek Sediment Total Maximum Daily Load (TMDL) and Habitat Enhancement Plan Preliminary Project Report and prepared a comment letter.

Regional Collaborative Efforts

- SMCWPPP continued to coordinate its WAM component activities with other Bay Area stormwater management agencies through the Bay Area Stormwater Management Agencies Association (BASMAA).
- SMCWPPP continued to provide in-kind assistance to the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI).
- SMCWPPP continued to participate in the San Francisco Estuary Regional Monitoring Program (RMP).
- SMCWPPP assisted Regional Water Board staff to compile selected data on San Mateo County stormwater pump stations as part of a regional data collection effort.
- SMCWPPP General Program staff continued to assist BASMAA to participate in a Proposition 50 grant-funded project (Taking Action for Clean Water) that will develop Bay Area-specific BMPs to prevent release of PCBs from building materials into urban runoff during renovation, maintenance and demolition of structures.
- SMCWPPP General Program staff continued to help represent BASMAA'S interests during development of the San Francisco Bay PCBs TMDL cleanup program.

Regulatory Compliance, Coordination and Planning

- SMCWPPP's WAM Subcommittee met regularly during FY 2007/08 to oversee the WAM component's activities.
- SMCWPPP prepared the WAM component section of SMCWPPP's annual report and work plans.

DESCRIPTIONS OF ACCOMPLISHMENTS

SMCWPPP's accomplishments are described in more detail below.

Watershed-related Activities

During FY 2007/08, SMCWPPP continued to perform creek walks and trash assessments in representative urban watersheds in San Mateo County. These data help characterize aquatic ecosystem health and water quality conditions in local creeks.

Unified Stream Assessment Creek Walks

During fall 2007, SMCWPPP performed creek walks in seven watersheds in San Mateo County – the Atherton, Redwood, Burlingame, Sanchez, Easton, Mills, and Millbrae Creek watersheds (*Unified Stream Assessment in Seven Watersheds in San Mateo County, California, August 2008*). Appendix E contains a copy of the cover and summary of this report. The primary objective was to characterize physical conditions and features of creek channels and riparian corridors in the study watersheds. A few potential illicit discharges were also observed and reported to the appropriate municipal illicit discharge coordinator.

The creek walks were conducted using the Unified Stream Assessment (USA) protocol developed by the Center for Watershed Protection. The USA is a rapid assessment tool used to collect data on instream and riparian habitat conditions and identify possible influencing factors and opportunities for improvement. Each study creek was delineated into reaches. Each reach represented a relatively uniform set of conditions within the creek corridor. Factors that contributed to delineating a reach included land use in the immediate vicinity, elevation, creek order, access, and total length. The study reaches were typically less than one mile long, began and ended at major creek crossings or grade changes, and reflected the general condition of the area adjacent to the creek. Tributaries were generally considered separate reaches. Creek sections were not assessed if inaccessible (e.g., due to culverts or dense vegetation) or if little apparent urban influence was present.

A single overall "reach level assessment" was conducted for each reach. This reach level assessment qualitatively evaluated characteristics such as base flow, dominant substrate, water clarity, biota, shading, and active channel dynamics. Each reach was ranked for overall stream condition and overall buffer and floodplain condition based on eight subcategories: in-stream habitat, vegetative protection, bank erosion, floodplain connection, vegetated buffer width, floodplain vegetation, floodplain habitat, and floodplain encroachment. Each subcategory was given a score on a 20-point scale (in general, a score of zero to 5 is designated as poor condition, 6 to 10 is marginal, 11 to 15 is suboptimal and 16 to 20 is optimal). The subcategory scores were summed to give a total reach score ranging from zero to 160.

The USA protocol was also used to identify eight potential creek impacts: channel modification, erosion, utilities, outfalls, creek crossings, trash/debris, recreation sites, and miscellaneous features. The location, extent and general characteristics of each impact were documented.

Reach Level Assessment

In the larger study watersheds (i.e., Atherton and Redwood Creek), overall creek condition scores generally increased in the upstream direction as urbanization decreased. The scores were largely driven by improved instream habitat and increased buffer widths and floodplain connection in the upper parts of the larger watersheds. In the smaller study watersheds (i.e., Burlingame, Sanchez, Easton and Mills Creek), overall creek condition was generally marginal or suboptimal in all reaches due to extensive urbanization throughout the watershed. Impacts were typically associated with low buffer widths (e.g., homes constructed very close to the creek) or highly impacted riparian corridor due to culverting beneath roads and driveways and extensive channel armoring, often to protect the backyards of residential properties.

Channel Modification

Construction of bank revetments along homes and yards was the most common type of channel modification observed. Culverted sections of creek, typically below roads or driveways, were also common. Some of the channel modifications identified appeared to be failing and/or causing erosion. Older revetments were especially vulnerable to scour and undercutting by increased peak flows associated with urbanization.

Erosion

The majority of erosion observed was in the form of bank scour, especially at meander bends and revetments. Bank failure was also common, especially the failure of steep banks within highly incised channels. Channel incision in the study watersheds generally appeared to be associated with historical land use changes and may no longer be active (i.e., the watersheds have likely been developed for a long enough period of time for the channel to have adjusted to change in the hydrograph and reached a new equilibrium). The channel bed in many of the reaches appeared to be clay, which is relatively resistant to erosion. In some cases grade control structures appeared to further stabilize the channel bed.

Utilities

In most cases, utilities in the study watersheds did not appear to have much impact on the creeks. The majority of utilities observed consisted of small pipes crossing over the creek high above the channel bed without any apparent impact on the creek. In some cases, utilities were located near the channel bed and were associated with bank erosion, apparently during high flow events. In areas that had major utilities, such as a San Francisco Public Utilities Commission water supply pipeline, grade control structures and bank armoring had often been constructed to protect the facility.

Outfalls

The assessments were carried out during the dry season and few dry weather flows were observed. Only a small fraction of the outfalls with discharge showed any indications of illicit discharge (e.g., discoloration, odor). All suspicious discharges were reported to a municipal illicit discharge coordinator. Some outfall pipes were associated with erosion, either immediately downstream from the outfall or at head cuts perpendicular to the creek.

Creek Crossings

The most common type of creek crossing observed was road crossings. Other types of crossings identified include houses, yards and driveways. In addition to habitat alteration impacts, creek crossings can potentially impact upstream passage for fish. The study watersheds are not expected to support anadromous fish (e.g., steelhead); however, native warm water fish, primarily stickleback, were observed in several reaches. These fish need to migrate to search for spawning habitat and refuge during summer low flow conditions. Conversely, creek crossings can be beneficial by serving as grade controls. When the bottoms of creek crossings are hardened, creek bed erosion may be prevented from migrating upstream.

Trash/Debris

Trash is deposited in urban creeks in several different ways including illegal dumping and/or littering at the site, windborne transport from adjacent land uses, and waterborne transport from upstream sources. Littering and illegal dumping are typically problematic when urban creeks are adjacent to areas that receive high vehicle and/or foot traffic (e.g., shopping centers) or locations with good public access (e.g., parks and schools). The study area was predominately comprised of residential land uses west of major transportation corridors, such as El Camino Real or Alameda de las Pulgas. As a result, littering or dumping in creeks occurred in only a limited number of locations.

Trash impacts in the study area were often associated with the dumping of yard waste into creek channels behind residential properties. Impacted sites also included areas where trash accumulated due to obstructions in the channel, such as dense vegetation or utilities. Other impacted sites occurred where creeks passed through parks or vacant lands that were in close proximity to schools.

Recreation

Evidence of recreation was limited to two sites located within one creek reach in a public park (Stulsaft Park in Redwood City). Both of these sites had rope swings over the creek with excellent public access. However, the potential for water contact recreation appeared limited at the time of the assessment due to low flow conditions and the lack of deep-water pools.

Guidance Document on the Potential Uses of the USA

During FY 2007/08 SMCWPPP prepared a guidance document for municipal stormwater programs and other interested agencies on the potential uses of the USA based on recent experience in the Bay Area (*The Unified Stream Assessment: Potential Uses for Stormwater Programs, San Francisco Bay Area Examples, July 2008)*. Appendix E contains a copy of the cover and summary of this report. This effort was performed in collaboration with the Santa Clara Valley Urban Runoff Pollution Prevention Program.

The guidance document shows how data generated through USA surveys can address multiple stormwater program monitoring-related objectives. These include establishing baseline data, identifying the types and locations of potential impacts to water quality, identifying potential beneficial uses to protect and threats to such uses, and refining monitoring program objectives

and design. USA survey data can also assist stormwater programs to better understand creek conditions and threats to water quality upstream and downstream of existing monitoring sites, thereby assisting in the interpretation of existing monitoring data and the identification of appropriate stormwater BMPs and potential restoration activities.

Stream Management Program for Landowners

As a follow-up to some of the issues documented during the USA creek walks (e.g., erosion and unsound erosion control practices), SMCWPPP began to explore the potential for developing a program in San Mateo County modeled after Contra Costa County's Stream Management Program for Landowners (SMPL).

Many of the impacts observed during SMCWPPP's USA creek walk surveys are associated with efforts by individual private property owners to control bank instability on their properties. An education, outreach and support program similar to SMPL could help landowners understand the impacts of such actions on creeks and potentially lead to the use of better practices in the future.

SMPL is administered by the Urban Creeks Council (UCC), a 501(c) Non-profit organization in Berkeley. The UCC gave a presentation to SMCWPPP's WAM Subcommittee in November 2007. SMPL was initiated in the year 2000 and is funded by the Contra Costa Clean Water Program. It provides free advice about creek care to Contra Costa County property owners. Services include free site visits and consultations on creek restoration techniques and associated permitting, including how to address issues such as bank failure, erosion, and flooding using low-cost, environmentally sensitive creek-side management practices. The program promotes ecologically sensitive restoration and bank stabilization methods that improve habitat, riparian vegetation and biodiversity. UCC staff works with property owners one-on-one and also coordinates hands-on neighborhood workshops to train landowners and encourage them to work together to solve shared problems along creek reaches. UCC also assists landowners with the permitting/regulatory process and can provide referrals to qualified professionals and contractors when needed for restoration work. The current level of funding in Contra Costa County allows about 40 to 50 site visits and five to seven workshops and presentations per year. Surveys of property owners that have used the SMPL program have been very positive.

One challenge is that SMPL is currently a reactive program and demand varies seasonally and with the amount of rainfall. A more proactive program might have some advantages, especially for addressing impacts on the reach scale rather than just at individual properties. The data from SMCWPPP's USA creek walk surveys could potentially provide the basis for a more proactive creek management program in San Mateo County by informing efforts to target and optimize creek management and restoration efforts.

Currently a funding source to implement a program similar to SMPL in San Mateo County has not been identified. One difficulty is that the activities implemented by the SMPL program are not specifically required by any of the provisions in the municipal regional

stormwater permit. While some of the outreach actions associated with SMPL could fit under the Public Information and Outreach provision of the permit, these actions are not a direct requirement. This makes funding the SMPL program difficult at the current time, since the limited resources available to implement the municipal regional stormwater permit will likely be dedicated to performing actions specifically required by the permit. The best opportunity to fund a program similar to SMPL in San Mateo County may be to apply for grant funding. The Urban Creek Council has already taken some initial steps towards applying for grant funds to develop a program similar to the SMPL in several Bay Area counties.

Trash Assessments

SMCWPPP completed a report on trash assessments conducted at seven urban creek sites in San Mateo County during FY 2007/08 (*FY 2007/08 Trash Assessments in Urban Creeks in San Mateo County, California, August 2008*). Appendix E contains a copy of this report. The primary objectives of this study were to:

- Evaluate the status and condition of selected trash accumulation sites in urban creeks, including establishing a baseline against which to track future trends; and
- Collect data that will help identify primary trash sources and transport pathways associated with the selected trash accumulation sites and inform development of BMPs to address trash in urban creeks.

The Urban Rapid Trash Assessment (URTA)[1] protocol (Version 1.0) was used to further characterize trash conditions at a subset of the trash accumulation sites identified during the fall 2007 USA creek walks. URTAs were performed at a total of seven of the 27 trash accumulation sites identified during the creek walks - two sites in the Redwood Creek watershed, two sites in the Mills Creek watershed, two sites in the Millbrae Creek watershed and one site in the Burlingame Creek watershed. The URTA was conducted twice at each site, once during fall 2007 and a second time during spring 2008, for a total of 14 assessments.

Trash sources identified during the study included littering, dumping and accumulation from upstream sources. Yard waste was the most common type of trash at sites with illegal dumping. All seven URTA sites had fewer trash items during the spring 2008 assessments compared to the fall 2007 assessments. However, URTA scores did not increase greatly at four of the sites, suggesting persistent ongoing sources of trash, since trash was removed during the fall assessment. Plastic was the most common item collected during the URTA assessments, representing over 60% of all trash. Miscellaneous, glass, biodegradable and metal items were the next most common trash items, representing about 33% of the trash observed. Approximately 13 percent of

[1]During FY 2005/06, the Santa Clara Valley Urban Runoff Pollution Prevention Program revised the Regional Water Board's Rapid Trash Assessment protocol to increase its utility in evaluating trash conditions at typical impacted sites in urban watersheds. The revisions were intended to enhance the utility of this tool in assisting municipal staff to identify, prioritize and evaluate trash management activities in urban creeks. The revised protocol is referred to as the Urban Rapid Trash Assessment (URTA).

the trash that was identified during the URTAs was categorized as hazardous (biohazard, toxic, or sharp). Most items in this category were glass and metal objects; biohazardous items were not observed and toxic items were relatively uncommon. Most sites with hazardous trash had limited public access.

The trash observed during the 14 URTAs typically originated from upstream sources and accumulated at the assessment sites due to dense vegetation or instream structures (e.g., a pipeline) that captured it during conveyance downstream. Litter was an important source of trash at sites in or near parks, schools and roadways.

Trash Fact Sheet

SMCWPPP has initiated a program to begin identifying and addressing trash accumulation areas in urban waterways in San Mateo County. During FY 2007/08 SMCWPPP prepared a draft fact sheet that describes typical trash management activities conducted by SMCWPPP's municipalities and SMCWPPP's multi-faceted program-wide efforts to characterize and reduce trash levels. Highlights of SMCWPPP's trash program during the past several years have included:

- Surveying San Mateo County municipalities regarding their existing municipal trash management efforts and known trash accumulation/dumping areas. The survey revealed that SMCWPPP's municipalities typically perform a wide variety of trash management efforts that include trash collection and cleanup (e.g., street sweeping, stormwater conveyance facility maintenance), use of enforcement to discourage littering, dumping, and discharge of trash, and use of incentive and education programs (e.g., anti-littering campaigns).
- Performing an initial pilot study to identify trash sources and management measures at a selected in-stream trash accumulation area (Gateway Park in San Mateo Creek).
- Coordinating and publicizing creek and beach cleanups in San Mateo County as part of the California Coastal Commission's annual "California Coastal Cleanup Day" in September 2006 and 2007. This effort appeared successful in that volunteer participation in the cleanups increased each of these years in comparison to the proceeding year.
- Pilot-testing Regional Water Board staff's Rapid Trash Assessment (RTA) protocol as a tool to monitor the amount and types of trash in creeks and inform efforts to identify sources and controls.
- Assessing most of the major urban creeks on the Bay-side of San Mateo County for trash accumulation areas (and other impacts) using the USA creek walk protocol.
- Using the URTA to further evaluate a subset of the trash accumulation sites identified during the USA creek walks. The information collected is establishing a baseline against which to track future trends and will assist with efforts to identify trash sources and transport pathways. A total of 46 urban creek trash accumulation sites have been identified to-date within 13 San Mateo County watersheds. Detailed assessments have been performed twice (during the fall and spring

seasons) at 19 of these sites using the URTA.

San Francisquito Creek Watershed Sediment TMDL

SMCWPPP reviewed the Regional Water Board's June 30, 2007 San Francisquito Creek Sediment Total Maximum Daily Load (TMDL) and Habitat Enhancement Plan Preliminary Project Report and prepared a comment letter (*Review of San Francisquito Creek Sediment TMDL and Habitat Enhancement Plan Preliminary Project Report, August 2008).* Appendix E contains a copy of the letter. SMCWPPP's primary comments included the following:

- The project should clearly separate pollutant-based TMDL requirements (i.e., sediment load allocation and targets) from habitat enhancement requirements (i.e., non-pollutant based);
- The targets/allocations and source areas should be linked, i.e., the targets/allocations should be applied to specific impacted habitat areas at or downstream of the anthropogenic sediment source areas. The TMDL should clearly identify these specific areas where targets/allocations are applicable;
- The project should clearly identify the responsible party and regulatory tool or authority for each sediment source category;
- Any actions specified in the TMDL's implementation plan that would be regulated under a municipal stormwater NPDES permit should be consistent with the municipal regional stormwater permit, once it is adopted; and
- As with the implementation of other TMDLs, it is important to maintain a reasonable balance between resources expended on monitoring activities and those expended for actual pollutant control measures.

Regional Collaborative Programs

An important aspect of SMCWPPP's WAM component is participating in regional collaborative programs that monitor San Francisco Bay and help coordinate monitoring in Bay Area watersheds. During FY 2007/08, SMCWPPP continued to participate in the Bay Area Stormwater Management Agencies Association (BASMAA), the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI), the San Francisco Estuary Regional Monitoring Program (RMP), and the Taking Action for Clean Water grant-funded project, as described below. SMCWPPP also assisted Regional Water Board staff to compile selected data on San Mateo County stormwater pump stations as part of a regional data collection effort and represented BASMAA'S interests during development of the PCBs TMDL in San Francisco Bay cleanup program.

BASMAA

During FY 2007/08, SMCWPPP continued to coordinate its WAM component activities with other Bay Area stormwater management agencies through the BASMAA Monitoring Committee.

BAMBI

BAMBI is a regional program that helps coordinate Bay Area benthic macroinvertebrate bioassessment efforts such as those performed by

SMCWPPP's WAM component during previous years. SMCWPPP continued to provide in-kind staff support to BAMBI during FY 2007/08. BAMBI will help Bay Area stormwater management agencies interpret local bioassessment data and use the results to inform development of urban runoff pollution prevention and control strategies. BAMBI's specific goals include:

- Standardizing rapid bioassessment protocols in the Bay Area, including quality assurance and control in field sampling and laboratory analyses;
- Establishing reference conditions for Bay Area creeks;
- Facilitating regional coordination and data management and sharing;
- Refining physical habitat assessment protocols; and
- Developing a regional Index of Biological Integrity (IBI), which will help with classifying creek condition, evaluating attainment of beneficial uses in creeks, identifying stressors to creeks, and establishing water quality goals.

RMP

SMCWPPP continued to participate in the RMP in FY 2007/08. The RMP is administered by the San Francisco Estuary Institute, and monitors pollutant concentrations in water, sediments, and fish and shellfish tissue in San Francisco Bay and Delta, together known as the San Francisco Estuary. A major goal of the RMP is to provide information on how pollutant concentrations in the Estuary are responding to pollution prevention and control measures. Thus the RMP aims to help determine whether efforts by Bay Area stormwater management agencies such as SMCWPPP and others are helping to improve water quality in the Estuary. In recent years the RMP has also began to measure pollutant loadings to the Bay from selected local watersheds, an important type of information needed in development and implementation of TMDL cleanup programs for pollutants such as mercury and PCBs. SMCWPPP continued to provide funding to the RMP in FY 2007/08. General Program staff also continued to represent BASMAA on the RMP Sources, Pathways and Loadings Work Group and advocated for stormwater program interests during study design, implementation and reporting. General Program staff also reviewed the RMP's draft report on 2006 fish tissue contaminant data and prepared comments and co-authored a RMP Pulse of the Estuary article on contaminant loading to Bay from local watersheds.

Stormwater Pump Station Data

During FY 2007/08, Regional Water Board staff compiled selected data on stormwater pump stations throughout the Bay Area region. Data types collected included the agency that maintains and operates each pump station, location (including coordinates), number of pumps at a station, catchment area, dominant land uses in a catchment, the receiving water body, maximum capacity per pump, wet and dry weather discharge rates, storage capacity of sumps or wet wells, and a description of any trash control measures. Regional Water Board staff envision that these data will inform planning and prioritizing pump station monitoring, implementing pollutant controls (e.g., trash), and studying the feasibility of diverting flows to wastewater treatment plants. SMCWPPP General Program staff worked with municipal staff to compile

the specific pump station data requested. This included reviewing the data request and initial information provided by municipal staff, identifying data gaps, assisting municipal staff with understanding the request, extensive follow-up with municipal staff to obtain all of the requested data, and compiling the data into one countywide spreadsheet.

Taking Action for Clean Water Grant

In November 2006, the State Water Resources Control Board awarded the San Francisco Estuary Project a Proposition 50 Coastal Nonpoint Source Pollution grant for a project called "Taking Action for Clean Water." The project includes several tasks to further implementation of Bay Area TMDLs, including a task that involves the historic use of PCBs in building materials. The primary goal of this task is to develop Bay Area-specific BMPs to prevent release of PCBs from building materials into urban runoff during renovation, maintenance and demolition of structures. Bay Area-specific information about the presence of PCBs in building materials will also be obtained through a field sampling program, so that management actions can be targeted specifically to the structures most likely to contain PCBs that threaten water quality. During FY 2007/08, General Program staff continued to assist BASMAA to participate in the project as a stakeholder and project partner.

PCB TMDL

SMCWPPP General Program staff continued to help represent BASMAA'S interests during development of the San Francisco Bay PCBs TMDL cleanup program. This included reviewing the December 2007 revised PCBs TMDL Regional Water Board staff report and Basin Plan Amendment and assisting BASMAA to prepare comments. SMCWPPP General Program staff also testified on behalf of BASMAA at Regional Water Board hearings on the PCB TMDL in September 2007 and February 2008.

Regulatory Compliance, Coordination and Planning

SMCWPPP's WAM Subcommittee met regularly during FY 2007/08 to oversee component activities. Frank Mandola from the City of South San Francisco continued to preside as chair of the subcommittee. Municipalities that were active subcommittee participants included Belmont, Brisbane, Burlingame, Daly City, Pacifica, City of San Mateo, San Mateo County and South San Francisco. A complete record of meeting attendees is contained in Appendix E.

The subcommittee also took a field trip to San Mateo Creek in June 2008 to observe and discuss typical trash impacts to urban creeks. The WAM Subcommittee is planning on conducting pilot work during FY 2008/09 in San Mateo Creek and possibly other locations to evaluate potential trash sources and control measures. The field trip was part of the planning process for this pilot work. Attendees included WAM Subcommittee members and municipal maintenance staff from the City of San Mateo. The group visited two creek sites along San Mateo Creek that were previously assessed for trash: 1) the Caltrain station crossing in downtown San Mateo and 2) the Claremont Avenue crossing in a residential area approximately two blocks further downstream. EOA staff presented a summary of the methods

and approach currently being used by the SMCWPPP to identify and characterize trash accumulation areas in urban creeks. USA creek walks are used to identify accumulation areas and the URTA protocol is used to further characterize selected areas with higher levels of trash. Information was provided to the field trip participants showing the location of all documented trash accumulation sites in San Mateo Creek. URTA scores and photographs from each site were also provided to the group and discussed. The group discussed the two basic ways we are using the URTA: 1) to record baseline conditions for the trash accumulation areas we have identified in urban creeks, and 2) to collect data that will help identify sources of trash to these accumulation areas. EOA summarized the major types of trash items documented at the two assessment locations, as well as potential trash sources and pathways associated with each site. These include 1) littering from pedestrians, primarily at bridges; 2) illegal dumping at bridges; 3) illegal dumping behind private residences, primarily apartment complexes; 4) homeless encampments under bridges; and 5) transport and deposition of trash from upstream sources, including storm drain catchments draining commercial areas along major transportation corridors such as El Camino Real. It was noted that relatively little trash has been found above El Camino Real in most creeks.

The WAM Subcommittee also oversaw preparation of the WAM component section of SMCWPPP's annual report and mid-fiscal year work plans.

ASSESSMENT OF EFFECTIVENESS

The effectiveness of WAM component efforts during FY 2007/08 should be assessed in the context of the WAM component goals described earlier. These goals include 1) characterizing creek function, health and water quality conditions in representative watersheds in San Mateo County and evaluating potential stormwater runoff impacts; 2) developing plans to address specific pollutants of concern associated with stormwater runoff such as mercury and PCBs and performing related special studies (e.g., to identify pollutant sources); and 3) evaluating long-term trends in water quality and thereby informing the SMCWPPP's efforts to improve the effectiveness of its BMPs to prevent or reduce stormwater runoff impacts. SMCWPPP's bioassessments, USA creek walks, and trash assessments in urban creeks in San Mateo County have helped define baseline water quality conditions. These data will facilitate future evaluations of long-term trends and thereby inform efforts to evaluate the overall effectiveness of SMCWPPP's stormwater pollution prevention and control BMPs. These data also potentially help identify impairment problems and pollutant sources, a first step in selecting new BMPs to prevent or reduce stormwater runoff impacts throughout San Mateo County. For example, as mentioned above, SMCWPPP is assisting with development of a regional Index of Biologic Integrity (IBI) based on SMCWPPP's bioassessment data and other Bay Area data. The IBI will potentially help SMCWPPP to evaluate attainment of creek beneficial uses and identify stressors to creeks, and thereby inform management actions. In another example, SMCWPPP's trash

assessments help identify sources of trash to accumulation sites in urban creeks, and therefore will inform the development of new or improved BMPs to address trash in urban creeks. In addition, SMCWPPP's participation in regional monitoring efforts (e.g., the RMP) assists TMDL development, especially those TMDLs focusing on improving water quality in San Francisco Bay.

FUTURE ACTIONS

SMCWPPP's WAM component will continue to focus on watershed-related activities, specific pollutants of concern such as trash, and regional collaboration during FY 2008/09. A principle focus will be to conduct pilot work to evaluate potential sources of trash to urban creeks and control measures. This increased emphasis on developing trash and litter BMPs is intended to assure continued compliance with Provision C.1 of SMCWPPP's NPDES permit and to respond to the high priority that Bay Area communities place on addressing trash and litter in creeks and other waterways.

To the extent possible, all WAM component activities will be planned and conducted in coordination with the ongoing development of the municipal regional stormwater permit. In preparation for implementing this permit, SMCWPPP will continue to support and participate in development of a regional monitoring collaborative among Bay Area stormwater agencies. SMCWPPP will also continue to participate in existing regional collaborative monitoring programs in the Bay Area such as BAMBI and the RMP.

APPENDIX A: TABLE OF CONTENTS

Municipal Maintenance Subcommittee Attendance List FY 2007/08

Parks Maintenance and IPM Work Group Attendance List FY 2007/08

2008 Parks Maintenance and Integrated Pest Management Workshop
- *Agenda*
- *Flyer*
- *Evaluation Summary*

15th Annual Municipal Maintenance Training Workshop
- *Agenda*
- *Flyer*
- *Evaluation Summary*

San Mateo Countywide Water Pollution Prevention Program
Municipal Maintenance Subcommittee Attendance List
FY 2007/08

MUNICIPALITY	REPRESENTATIVE	PHONE FAX EMAIL	22-Aug	24-Oct	23-Jan	26-Mar	June Trng Workshop
Atherton	Steve Tyler	650/576-1655	X	X	X		3
	Troy Henderson	650/752-0551	X		X	X	
	Bill Butler	650/743-3028	X	X		X	
	Eddie Lopez Jr.	650/743-3032	X	X			
	Javier Andrade		X	X		X	
Belmont	Randy Ferrando	650/595-7464	X	X		X	13
	Tim Murray				X		
Brisbane	Walt Peters	415/508-2135			X	X	3
	Matt Fabry	see below					
Burlingame	John Baack	558-7674		X	X		0
	Stephen McDonnell			X	X		
	Vincent Falzon						
	Les Priest						
	Orlando La Rosa						
	Rick Horne						
Colma	Vicente Gonzalez	650/333-0550	X	X			3
	Louis Gotelli	650/757-8888	X			X	
	Brian Dossey					X	
	Ryan Rodriguez			X			
Daly City	Mike Peterson	650/991-8097	X	X	X	X	4
	John Peterson	650/991-8097	X		X	X	
	Ryan Fernandez	650/991-8097					
	Joe Stabile					X	
East Palo Alto	Ray Lopez	650/280-1945	X	X	X	X	1
	Emmanuel Funches	650/280-0741					
	Mae Pugh		X	X	X	X	
Foster City	Mike Mattias	650/286-7502					9
	Mike McElligott	286-3546				X	
	John Schulze	286-8140					

Half Moon Bay	Tony Moorhouse	650/726-4283 or -8264		X			0
Hillsborough	Gary Francis	650/375-7444	X	X	X	X	1
	Frank Henwood	650/375-7444					
	Clay Dahl						
	John Paulino	650/375-7444					
Menlo Park	Julie Robinson					X	X	
	Joe Pimentel	330-6780 or -6317					1
	Nelson Gutierrez	330-6780	X				
	Larry D. Gorman					X	
	Ruben Nino	330-6780					
	Randy Dwight						
	Dulani Spencer		X				
Millbrae	Martin Crean	650/259-2374					1
	Craig Centis	650/259-2374	X	X	X	X	
	R. Clark					X	
	Ray Mendez	650/259-2374					
	Linda Harrington			X			
	Florian Ebo		X				
	Russ Clark		X	X			
	Anthony Ridddell		X				
	R. Cuarn						
	Mike Riddell		X				
Pacifica	Todd Estrada						2
	Eric Steele	650/738-3775		X	X	X	
Portola Valley	Josh Maierle	650/851-1700 x21					0
Redwood City	Rich Del Ben	650/780-7464	X	X		X	6
	Eddie Lopez	650/740-7473	X	X	X	X	
	Victor Casteneda	650/780-7473	X	X	X	X	
	Sione Tu'uhoko	650/780-7473	X		X	X	
	Albert Murguiz	650/780-7473	X	X	X	X	
	Teli Tan	650/780-7473					
	Latu Taufalele	650/780-7473	X	X	X	X	
San Bruno	Gino Quinn	616-7160	X	X	X	X	3
	Dennis Bosch		X	X			
	Cliff Vanuver	616-7160					
	Jim Evangelist				X		

	Mike Lysak	616-7160					
San Carlos	Chris Zanoni	650/802-4140	X	X	X	X	9
	Paul Baker	650/802-4143	X	X	X		
San Mateo	Ray Fitch	650/522-7354					1
	Bob Correa						
	Vern Bessey						
San Mateo Co.	Chris Porter	650/599-7281	X				12
	Katie Beltrano						
	Brian Gatt	650/573-2591					
	Dermott Casey						
	Dewayne Johnson			X			
	Sarah Pratt				X		
South San Francisco	Mike Aquilina	650/877-8553	X		X	X	2
	James Hardie		X		X	X	
	Michael Charan	650/877-8552					
	Jim Bombaci	650/877-8552					
	Keith Potter					X	
	Gary Batis					X	
SMCWPPP	Matt Fabry	415/508-2134		X		X	
Woodside	Richard Chiu	650/851-6790	X	X			0
EOA	Fred Jarvis	510/832-2852 x11	X	X	X	X	
Water Board	Habte Kifle		X				0
Caltrans	John Michels	510/622-5996					
	Ray Fox						
Oakland	Markley Bavinger	510/238-6266		X			1
San Francisco International Airport	Charlie Freas	650/821-7749			X		
Notes:			36	32	28	33	

F:\Sm7x\SM73.05 ANNUAL REPORT\FINAL\Appendices\Appendix A\[A1 Attendance 07-08 year.xls]Sheet1

San Mateo Countywide Water Pollution Prevention Program
Parks Maintenance & IPM Work Group Attendance List FY 2007/08

MUNICIPALITY	REPRESENTATIVE	Contact Information		Attendance			
		Email	Phone	28-Aug	30-Oct	Feb Training Workshop [1]	29-Apr
Atherton	Mike Anderson	manderson@ci.atherton.ca.us	650/752-0541			1	
Belmont	Henry Ruspil	hruspil@ci.belmont.ca.us	650/595-7441			0	
Brisbane	Don McClymond	dmcclymond@brisbance.ca.us	415/716-0105	√	√	6	√
Burlingame	Tim Richmond	trichmond@burlingame.org	650/558-7333	√	√	5	√
Colma	Phil Scramaglia	phil@csgengr.com				3	
	Bill Segale, Segale & Cerini Inc.	segcerbill@aol.com	650/755-7343				
Daly City	Paul Thompson	pthompson@dalycity.org	650/991-8006	√	√	2	√
East Palo Alto	Fernando Bravo	Fernando Bravo<FBravo@cityofepa.org>				0	
Foster City	Bill Gomba	bgomba@fostercity.org	650/286-8140			3	
	Dorte Drastrup	ddrastrup@fostercity.org			√		√
Half Moon Bay	Tony Moorhouse	tmoorhouse@ci.half-moon-bay.ca.us	650/726-8260			0	
Hillsborough	Gary Francis	gfrancis@hillsca.org	650/375-7506			1	
Menlo Park	David Mooney	damooney@menlopark.org	650/330-6794			1	
Millbrae	Russell Clark		650/259-2481			1	
Pacifica	Ron Fascenda	fascendar@ci.pacifica.ca.us ?	650-738-3760	√		0	
	Tom Lessa						
Portola Valley	Josh Maierle	JMaierle@portolavalley.net	650/851-1700, Ext.21			0	
Redwood City	Valerie Matonis	vmatonis@redwoodcity.org	650/780-7280	√	√	10	√
San Bruno	David Perazzo	dperazzo@ci.sanbruno.ca.us	650/616-7193			3	
San Carlos	Guy Wallace	guywallace@cityofsancarlos.org				0	
	Frank Rivera						
San Mateo	Vern Bessey	vbessey@cityofsanmateo.org	650/522-7342		√	7	√
San Mateo Co. Parks	William Crawford	bcrawford@co.sanmateo.ca.us	650/573-2591 Fax-347-8276	√	√	5	√
	Sheila Gostisha						
Agriculture Weights and Measures	Ronald Pummer	rpummer@co.sanmateo.ca.us	650/363-4700		√		
	Jeremy Eide						
	Koren Widdel						√
Public Wks	Tsutomu Imamura	timamura@co.sanmateo.ca.us	650/363-4149	√			√
	Jeff Pacini	JPacini@rcn.com			√		
South San Francisco	David Venturini	david.venturini@ssf.net	650/829-3834			4	
	Norman Gok						√
	Brian Brunelli			√			
Woodside	Eunejune Kim	EKim@woodsidetown.org	650/851-6790			0	
Regional Bd	Habte Kifle	HK@rb2.swrcb.ca.gov	510/622-2371			0	
EOA	Fred Jarvis	fejarvis@eoainc.com	510/832-2852 x111	√	√	2	√
	Vishakha Atre	vatre@eoainc.com	408/720-8811				
Program	Matt Fabry	mfabry@ci.brisbane.ca.us	415/508-2134	√	√	1	√

Notes:

[1] Number indicates number of attendees from jurisdiction at the workshop.

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

AGENDA
Integrated Pest Management Workshop
SMCWPPP Parks Maintenance and IPM
Green Building Exchange
February 28, 2008
11:00 a.m. – 3:00 p.m.

Lunch *Registration*	11:00 - 11:30
Welcoming Remarks	11:30 - 11:40
Aquatic Vegetation Management Dave Najera, *Aquatic Environments*	11:40 - 12:20
Creek Maintenance Julie Casagrande, *San Mateo County Public Works*	12:20 - 12:50
Pesticide Use Enforcement Update *Representative from San Mateo County Agricultural Weights and Measures*	12:50 – 1:35
Break	1:35 – 1:50
NEW Pros and Cons of Using Artificial Sports Fields Peter Vorametsanti, *City of Redwood City*	1:50 – 2:20
Maintenance of Landscape-Based Stormwater Treatment Control Measures Ed Boscacci, *BKF Engineers*	2:20 – 2:50
Closing Remarks	2:50 – 3:00

SAN MATEO COUNTYWIDE
Water Pollution
Prevention Program
Clean Water. Healthy Community.
www.flowstobay.org

Integrated Pest Management Workshop

Green Building Exchange
305 Main Street, Redwood City

Thursday, February 28, 2008
11:00 a.m. – 3:00 p.m.

Sponsored by the SMCWPPP Parks Maintenance and IPM Work Group

This is a free workshop and will be eligible for Department of Pesticide Regulations Continuing Education Credits.

Workshop Highlights:

- ***Creeks Maintenance***
- ***Aquatic Vegetation Management***
- ***Pesticide Use Violations and Penalties***
- ***More Artificial Sports Fields Pros and Cons***
- ***Maintenance of Landscape-Based Stormwater Treatment Controls***

RSVP

Please complete the attached RSVP form to let us know that you will be attending. If you have any questions or would like additional information please contact Christina Hovland at (510)-832-2852 ext. 126 or chovland@eoainc.com. We look forward to seeing you at the workshop!

The San Mateo Countywide Water Pollution Prevention Program is a consortium of the following local agencies: Atherton, Belmont, Brisbane, Burlingame, Colma, Daly City, East Palo Alto, Foster City, Half Moon Bay, Hillsborough, Menlo Park, Millbrae, Pacifica, Portola Valley, Redwood City, San Bruno, San Carlos, San Mateo, San Mateo County, and South San Francisco. The program is part of the National Pollutant Discharge Elimination System (NPDES) permit issued to the City/County Association of Governments (C/CAG), each incorporated city and town in the county, and the County of San Mateo.

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community.

2008 Integrated Pest Management Workshop
February 28, 2008
SUMMARY OF WORKSHOP EVALUATIONS

Total Number of Evaluations: 39 (68% response) **Total Number of Attendees: 57**

What did you think of the following presentations?

Aquatic Vegetation Management–
Dave Najera

18-Very helpful	15-Somewhat helpful	6-Not helpful	0-No answer

Creeks Maintenance –
Julie Casagrande

21-Very helpful	18-Somewhat helpful	0-Not helpful	0-No answer

Pesticide Use Enforcement Update–
Jeremy Eide

29-Very helpful	10-Somewhat helpful	0-Not helpful	0-No answer

Artificial Sports Fields –
Peter Vorametsanti

24-Very helpful	13-Somewhat helpful	1-Not helpful	1-No answer

Maintenance of Landscape-Based Stormwater Treatment Control Measures –
Ed Boscacci

16-Very helpful	17-Somewhat helpful	0-Not helpful	6-No answer

Did this workshop meet your expectations?
Yes: 31
No: 1 (2 credit hours vs. 3 in other years)
Kind of: 2
No Answer: 6

Suggestions for future workshop topics
More credit hours (2)
Gophers (1)
Emergency spill response / hazardous materials (2)
Use of recycled water (1)
Row weed control (1)

Organic fertilizers – their use and cost to public agencies (1)
More local data on artificial turf projects (1)
Marsh filtering (1)
Control of invasive plants (1)
Discussion on local implementation of IPM programs (1)

General Comments
Great workshop / Keep up the good work (8)
Good location (7)
Good lunch (7)
Good speakers / varied topics / useful information (4)
More IPM in grounds/park maintenance (1)
More energy from some of the speakers (1)
Poor audio (1)
Pesticide enforcement info very beneficial (1)
Liked Ed Boscacci's presentation best (1)
First two speakers were fantastic – good information (1)

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

15TH ANNUAL MAINTENANCE WORKSHOP

Green Building Exchange
305 Main Street, Redwood City
June 26, 2008
8:00 a.m. – 1:30 p.m.

Coffee and Pastries *Registration for workshop participants*	8:00 – 8:30
Welcome Mike Peterson, *City of Daly City Street Supervisor, Municipal Maintenance Subcommittee Chair*	8:30 – 8:35
Stormwater BMPs and Trash Control in the City of Long Beach Tom Leary, *City of Long Beach Stormwater Management Program Officer*	8:35 – 9:50
City of Oakland Trash Control Program Markley Bavinger, *City of Oakland Watershed Program Specialist*	9:50 – 10:05
City of Oakland Illegal Dumping Program Richard Wright, *City of Oakland Litter Enforcement Officer*	10:05 – 10:20
Break	10:20 – 10:35
Sanitary Sewer Spills Gary Batis, *City of South San Francisco Public Works Superintendent*	10:35 – 11:10
Creek Maintenance and Permitting Darcy Aston, *FishNet 4C Program Director*	11:10 – 11:55
Introduction of Vendors	11:55 – 12:15 (Time will depend on number of vendors)
Lunch and Product Show	12:15 – 1:25
Closing Remarks	1:25 – 1:30

Training participants complete evaluation forms and receive workshop souvenirs

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

15th ANNUAL MUNICIPAL MAINTENANCE TRAINING

June 26, 2008

8:00 a.m. to 2:00 p.m.
Location: Green Building Exchange
305 Main Street, Redwood City, CA 94063

Sponsored by the San Mateo Countywide Water Pollution Prevention Program's Municipal Maintenance Subcommittee

Workshop Highlights:

- Structural trash controls – the different types available and lessons learned by the City of Long Beach's staff
- How to respond to sanitary sewer spills
- Creek maintenance dos and don'ts and the permits that may be required
- Trash Control and Litter Enforcement in Oakland
- Vendor display

RSVP

Please complete the attached RSVP form to let us know that you will be attending. If you have any questions, contact Christina Hovland at (510) 832-2852 ext. 126. We look forward to seeing you at the workshop!

San Mateo Countywide Water Pollution Prevention Program
15th Annual Municipal Maintenance Workshop – June 26, 2008
Evaluation Summary

94 Attendees (including staff, speakers and vendors)
75 Attendees (not including staff, speakers and vendors)
52 Evaluations (69% response)

Presentation	Very helpful	Somewhat helpful	Not helpful	No Answer	Comments
Trash Control in the City of Long Beach Tom Leary	30	22	0	0	• Great presentation, very informative • Two different situations – they have more money, less water
Oakland's Trash Control Program Markley Bavinger	29	23	0	0	
Oakland's Illegal Dumping Program German Gella and Bobby McConnell	32	20	0	0	• Least helpful but still interesting
Sanitary Sewer Spills Gary Batis	33	17	2	0	• Good continued exposure to regulations • Poor outline, not focused
Creek Maintenance and Permitting Darcy Aston	26	19	0	7	
Introduction of Vendors and Product Show	14	21	1	16	

Did the workshop meet your expectations?
Yes- 49 No- 0 No response-3

Which topics were most beneficial?
Sanitary Sewer Spills – 15
Oakland's Illegal Dumping Program – 12
Trash Control – 11
All beneficial – 7
Stormwater BMPs and Trash Control in the City of Long Beach – 6
Oakland's Trash Control Program – 2
Creek Maintenance and Permitting – 1
No answer - 9

Which topics were the least beneficial?
None / All beneficial - 13

Creek Maintenance and Permitting - 7
Sanitary Sewer Spills – 3
Oakland's Illegal Dumping Program – 3
Oakland's Trash Control Program – 2
Stormwater BMPs and Trash Control in Long Beach – 2
Trash Control - 1

How many previous workshops have you attended?

Zero- 9	*Five- 6*	*Ten- 2*
One- 5	*Six- 2*	*Eleven- 1*
Two- 2	*Seven- 5*	*Twelve+- 4*
Three- 4	*Eight- 4*	
Four- 6	*Nine- 1*	

Would you be interested in attending a workshop next year?
Yes-48 No-1 No response-3

How will your work procedures change as a result of this workshop?

- More awareness of issues/more knowledge always helps – 9
- Look more closely at my city's trash control program – 6
- Always try to improve - 5
- Increased knowledge of reporting requirements for sanitary sewer spills - 5
- Try to implement an Illegal Dumping Enforcement Program in my city – 4
- Share information with coworkers – 3
- Increase trash/litter awareness amongst the public - 3
- If budget allows – 2
- If supervisor gets on board– 2
- Already meeting all procedures – 1
- Not sure – 1
- Still trying to find a balance – 1

Suggestions for future workshop topics:

- Local cities introduce themselves and their procedures; how they're implementing BMPs – 2
- Compare city-to-city policies for overflows / SSIs
- More info on spill or overflow response
- Increasing public awareness
- Different catch basin design
- Illicit waste
- Proper use of hydro-vac equipment
- Permitting
- Local projects and how they were completed
- Lagoon maintenance programs
- Street sweeping
- Grant funding towards storm maintenance activities
- Any new information

What are you duties?

Sweeper operator-6; Paving and road repair-22; Litter pick-up-17; Storm drain system maintenance-32; sanitary sewer maintenance-23; Parks maintenance-5; Facilities maintenance-8; Maintenance

supervisor-8; Other –7 (road maintenance manager, electrician, creek maintenance, mechanic, open area cleanup, CCTV, Deputy PW Director,)

General comments/suggestions:

- Very good workshop overall / great job – 7
- Appreciate food and drinks – 3
- Very informative presentations - 3
- Thank you – 2
- More handouts
- Make the workshop longer/ all day
- Two screens needed – hard to see from the back of the room
- Love the veggie dishes, keep them up.
- It's amazing how much trash builds up and ends up in the bay.
- Best seminar to date. Looking forward to next year's.

APPENDIX B: TABLE OF CONTENTS

CII Subcommittee Attendance List FY 2007/08

Fact Sheet: Successes in Fiscal Year 2006/07

Stormwater Orientation for Municipal Staff

- *Agenda*
- *Flyer*
- *Evaluation Summary*
- *Sign-in Sheet*
- *Workshop Binder Table of Contents*

Excerpt from Stormwater Program Funding Options Final Report

Tips for a Cleaner Bay

Sugerencias para una Bahia mas Limpias

CII Subcommittee Attendance List – FY 2007/08

Name	Agency	PHONE	FAX No.	E-Mail	Aug.	Oct.	Dec	Feb	April	June
	City of Atherton									
Bozhena Palatnik Gilbert Yau	City of Belmont	659 593-7463		Bpalatnik@ci.Belmont.ca.us	√	√	√	√	√	√
Matt Fabry	City of Brisbane	415 508-2134	415 467-5547	mfabry@ci.brisbane.ca.		√	√	√		√
Eva Justimbaste	City of Burlingame	342-3727	342-3712	eva.justimbaste@veoliawaterna.com	√	√	√	√	√	√
Muneer Ahmed	City of Colma	757-8888	757-8890	Muneer.ahmed@colma.ca.us						
Ward Donnelly	City of Daly City	991-8208	991-8220	wdonnelly@dalycity.org	√	√	√	√	√	√
Cynthia Royer	City of Daly City	991-8203	991-8220	Croyer@dalycity.org		√				
John Latu	City of East Palo	853-3165		jlatu@cityofepa.org						
Norm Dorais	City of Foster City	286-3279	349-7204	ndorais@fostercity.org						
Gary Whelen/ Tom Jahns	City of Half Moon	726-88260								
Jen Chen	Town of Hillsborough									
John Simonetti	City of Menlo Park	321-0384	321-4265							
Virginia Parks/ Jennifer Ng	City of Menlo Park	330-6752 330-6743		vkfparks@menlopark.org	√		√	√	√	
Catherine Allin	City of Millbrae	259-2470	259-2398	callin@ci.millbrae.ca.us	√	√		√	√	√
David Ocampo	City of Millbrae	259-2392	259-2398	docampo@ci.millbrae.ca.us			√	√		
Raymund Donguines	City of Pacifica	738-3767	738-3003	donguinesr@ci.pacifica.ca.us	√		√		√	
	Town of Portola Valley									
Gary Lepori	City of Redwood	780-7472		glepori@redwoodcity.org						
Ray Bartolo	City of Redwood			rbartolo@redwoodcity.org						
Gino Quinn	City of San Bruno									
	City of San Carlos									
Vern Bessey	City of San Mateo	522-7342	522-7341	vbessey@cityofsanmateo.org	√	√	√			
Alan Atwater	City of San Mateo	522-7343	522-7341	AAtwater@cityofsanmateo.org				√		√
Rob Lecel	City of San Mateo	522-7344	522-7341	RLecel@cityofsanmateo.org		√	√	√		√
Craig Lustenberger	City of So. San	829-3882	829-3855	Clustenberger@wqcp.ci.ssf.ca.us	√		√	√	√	√
Frank Mandola	City of So. San	829-3880	829-3855	Fmandola@wqcp.ci.ssf.ca.us						
Cassie Prudhel	City of So. San Fran	829-3840	829-3855	Cassie.prudhel@ssf.net						
	Town of Woodside									
Dermot Casey	County of San Mateo	363-4957	363-7337	djcasey@co.sanmateo.ca.us	√	√	√	√	√	√
Matt Fabry	SMCWPPP Coordinator	415 508-2134	415 467-5547	mfabry@ci.brisbane.ca.		√	√	√		√
Michael Li	SBSA	594-8411 Ext. 139	591-7122	mli@sbsa.org			√		√	
Norm Domingo	SBSA	650 594-8411		ndomingo@sbsa.com		√				
Habte Kifle	Water Board	510 622-2371		hk@waterboards.ca.gov				√		
Cecil Felix	Water Board	510 622-2343		CFelix@waterboards.ca.gov		√		√		
Fred Jarvis	EOA, Inc.	510 832-2852	510 832-2856	Fejarvis@eoainc.com	√	√	√	√	√	√
No. Attending					10	12	13	14	10	11

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Successes in Fiscal Year 2006/07

The City/County Association of Governments of San Mateo County created the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) in 1993 to coordinate countywide efforts to prevent stormwater pollution. Stormwater runoff is the biggest transporter of pollutants to the bay and a major pathway for contaminants to reach local coastal beaches. Common pollutants found in stormwater runoff from public streets and storm drains include silt, litter, pesticides, bacteria, oil, and metals. During the last couple of decades the U.S Environmental Protection Agency and the San Francisco Bay Regional Water Quality Control Board have recognized the need to control stormwater pollutants by adopting regulations and increasingly stringent permits that municipalities must follow to discharge stormwater into creeks, the bay and ocean.

Matt Fabry, SMCWPPP Coordinator, receiving CASQA award in September 2007

Each municipality in San Mateo County is responsible for complying with the municipal stormwater National Pollutant Discharge Elimination System (NPDES) permit requirements for stormwater runoff from its streets and local storm drain system. The permit prescribes how each local municipality will regulate new and redevelopment projects, conduct its municipal maintenance activities, eliminate non-stormwater discharges, inspect businesses to control stormwater pollutants, and encourage the public's help in preventing pollution.

Last fiscal year SMCWPPP successfully assisted its member agencies (20 cities and the county) to protect stormwater quality by complying with the countywide municipal stormwater NPDES permit. This information sheet highlights examples of last year's successes, followed by a description of accomplishments in several areas: achieving permit compliance, conducting community information outreach and school programs, building cost-effective partnerships, and measuring progress.

Example of Successes

- Received an "Outstanding Stormwater News, Information, Outreach, and Media category" award from the California Stormwater Quality Association for SMCWPPP's Plastic Bag Outreach/Coastal Cleanup Day project. One of the results of this outreach was Whole Foods Market volunteering to be the primary sponsor of the fall 2007 Cleanup Day.
- Completed technical guidance (http://www.flowstobay.org/p2business/C3stormwatertechguide.html) for developers, builders and permit applicants. This guidance shows how to comply with the NPDES permit's extensive requirements for new and redevelopment projects.
- Worked with Alameda and Santa Clara Counties to cost-effectively develop the Bay Area Hydrology Model (www.bayareahydrologymodel.org) software for use in designing controls that limit the quantity of stormwater runoff from development projects. The Bay Area Hydrology Model allows users to design flow duration detention facilities to prevent erosion of creek channels and banks.

- Conducted nine training workshops on a wide range of topics that targeted various groups. For example, SMCWPPP helped educators to train students on environmentally friendly practices, and it trained municipal planning and engineering staff, project builders, and the building community on the stormwater requirements for new and redevelopment projects. Eighty-nine municipal staff responsible for maintaining streets, storm drains, and roads attended the annual stormwater maintenance workshop and product exposition. In addition, San Mateo County Agricultural Commissioner's staff helped to train 91 parks maintenance staff on less toxic ways to control pests.
- Inspected over 2,000 businesses for compliance with stormwater requirements. About 12 percent of the inspections identified a violation that was subsequently corrected.
- Found and stopped the discharge of about 280 illicit, non-stormwater discharges. About three-quarters of the illicit discharges consisted of one of the following: washwaters, sewage, construction materials, or vehicle fluids.
- Monitored a number of representative creeks in San Mateo County to assess aquatic life and pollutant levels, including the amounts of trash and litter on creek banks. This monitoring provides information on creek health and helps to identify ways to improve creek and bay water quality.

Ward Donnelly, City of Daly City, inspecting vehicle service facility.

Achieving Permit Compliance

Each fiscal year SMCWPPP and its municipalities submit an annual report to the San Francisco Bay Regional Water Quality Control Board to demonstrate compliance with the municipal stormwater permit. The Fiscal Year 2006/07 Annual Report is on SMCWPPP's website at www.flowstobay.org (click on "Additional Information").

The last time that the San Francisco Bay Regional Water Quality Control Board staff assessed the status of permit compliance was in 2005. At that time it concluded that SMCWPPP "is generally in compliance with its permit." The level of effort to achieve permit compliance has been similar since this last evaluation.

Conducting Community Information Outreach and School Programs

California Coastal Cleanup Day Volunteers in San Mateo County, September 2006

In FY 2006/07 SMCWPPP continued to implement an extensive program of community outreach and school education. One award-winning aspect of this program was the promotion of an alternative to using disposable plastic bags and coordinating the annual California Coastal Cleanup Day described above. Attendance at the California Coastal Cleanup Day in 2006 increased by about 60 percent (1,644 volunteers) and the amount of trash and litter removed from beaches and other waterways increased by about 45 percent (21,000 lbs.) compared to 2005. A plastic bag educational outreach tabling event at the Whole Foods Market in Redwood City inspired Whole Foods to become the main sponsor for the 2007 statewide California Coastal Cleanup Day. Information on the importance of controlling trash and

litter and the California Coastal Cleanup Day was published in Environmental Health's newsletter, "ReNews" that has a circulation of 220,000 and is distributed in local newspapers.

SMCWPPP and the county's Used Oil Program funded ZunZun, a two-person municipal theatrical team that presents school assemblies on stormwater and household hazardous wastes. The assemblies reached about 12,000 elementary school students at 51 schools last fiscal year.

Additional school outreach included providing one-day teacher training workshops on environmentally friendly ways to manage pests and protect the health of families, pets, and the environment.

ZunZun performing its new "The Water Beat" pollution prevention school assembly program

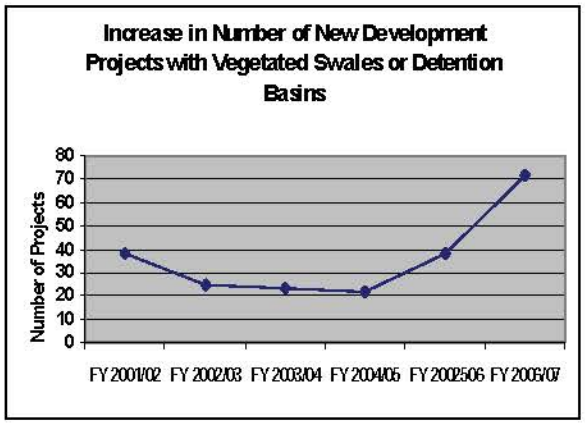
Building Cost-Effective Partnerships

SMCWPPP seeks opportunities for cost-effective collaboration with other pollution prevention programs. The Program participated in the following beneficial partnerships last fiscal year:

- SMCWPPP continued to participate in the Our Water Our World (OWOW) program that assists consumers to manage pests using non-toxic or less toxic methods by making alternative pest control products available in retail stores and by promoting their use. Last fiscal year twenty-one stores in San Mateo County participated in OWOW. The original costs for developing OWOW was supported by a grant from U.S. EPA, and the State Water Resources Control Board provided a subsequent grant to help it expand beyond the Bay Area.
- The majority of municipalities in San Mateo County have an agreement with the San Mateo County Environmental Health that allows the county staff to conduct stormwater inspections of businesses while staff is conducting its regular inspections of retail food facilities, hazardous waste generators, and hazardous materials users. This combining of inspections minimizes the intrusion on businesses and is a cost-effective way to inspect businesses for compliance with stormwater requirements and make sure business owners have up-to-date information on stormwater pollution prevention practices.
- SMCWPPP continued to participate in regional efforts to monitor San Francisco Bay and Bay Area watersheds. Along with about 70 other dischargers SMCWPPP continued to help fund the Regional Monitoring Program. This program is designed to assess long-term pollutant levels in water, sediment, fish, and shellfish in the bay and delta. SMCWPPP has also supported ways to assess the health of creeks by standardizing how data is collected and helping to develop a regional index to gauge creek health.
- SMCWPPP is an active participant, along with other countywide municipal stormwater programs, in the Bay Area Stormwater Management Agencies Association (BASMAA). BASMAA provides input on the Water Board staff's development of the next municipal stormwater permit. This permit will be regionwide and apply to 76 municipalities and flood control districts. In addition, BASMAA has provided SMCWPPP an opportunity to coordinate its comments on the various total maximum daily loads that the Water Board staff has been developing for high priority pollutants, such as mercury and polychlorinated biphenyls, which impair the bay.

Measuring Progress

SMCWPPP measured its progress last fiscal year in various ways.

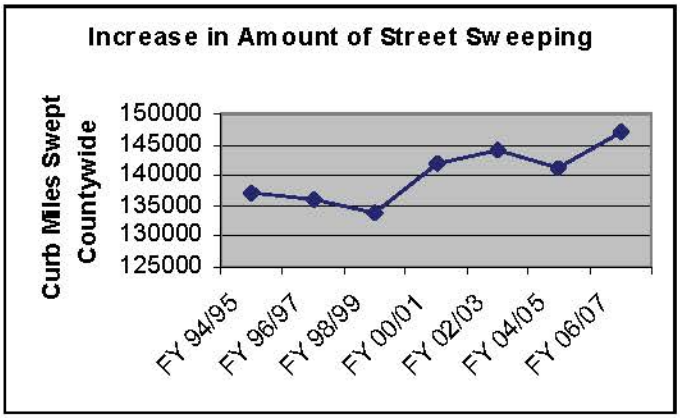


New development. Last fiscal year there were 72 new and redevelopment projects on over 400 acres that used vegetated swales or detention basins to treat pollutants found in stormwater runoff. As shown in the graph, this represents an approximately two-fold increase in the number of projects using these methods to treat stormwater compared to previous years.

Municipal Maintenance. Last fiscal year municipalities swept about 147,000 curb miles of streets and removed about 29,000 cubic yards of material. The amount of curb miles swept has increased about 7 percent in the last twelve years. There has been no measurable change in the amount of material being removed by sweeping, which may indicate progress in educating residents and businesses not to dispose of litter, leaves, and other materials in streets.

Public Information and Participation. The amount of waste oil recycled increased by about 25 percent last fiscal year and 63 percent over the last two years. The large increase in recycling reflects the success of joint efforts by SMCWPPP and the county's Household Hazardous Waste and Small Quantity Generator Programs, using funds from the California Integrated Waste Management Board.

Illicit discharges. The number of illicit discharges eliminated last fiscal year is close to the average found during the last nine years. The number of illicit discharges found and eliminated during this period represents a 40 percent decline from what was found around ten years ago when SMCWPPP initiated efforts to stop these types of discharges. The approach taken has been to increase people's awareness that these non-stormwater discharges are untreated and are illegal under local municipal ordinances.



SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
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SMCWPPP is a program of the City/County Association of Governments of San Mateo County. Created to coordinate cost-effective implementation of the municipal stormwater National Pollutant Discharge Elimination System (NPDES) permit, it consists of twenty cities and towns and San Mateo County.

For additional information, visit the Program's website at www.flowstobay.org or contact Matt Fabry at (415) 508-2134
November 2007

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
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AGENDA

Stormwater Orientation for Municipal Staff

May 21, 2008, 8:00 AM – 12:00 Noon
Checuti Room
450 Poplar Avenue, Millbrae

Registration and Refreshments	8:00 – 8:30
Introductions and Request Questions that People Want Answered *Matt Fabry, Program Coordinator, San Mateo Countywide Water Pollution Prevention Program*	8:30 – 8:45
Regulatory Background, Overview of Stormwater Permit Requirements, and Upcoming Municipal Regional Permit *Fred Jarvis, EOA, Inc.*	8:45 - 9:05
San Mateo Countywide Water Pollution Prevention Program Organization, Decision-Making, and Funding *Matt Fabry*	9:05 – 9:25
Specific Requirements of the Municipal Stormwater Permit and Compliance Resources ▪ Municipal Maintenance, *Fred Jarvis* ▪ Industrial and Illicit Discharge Controls, *Fred Jarvis*	9:25 – 10:10
BREAK	10:10 – 10:25
More Specific Requirements of the Municipal Stormwater Permit and Compliance Resources ▪ New Development and Construction Controls *Laura Prickett, EOA, Inc.* ▪ Public Information and Participation *Sarah Pratt, San Mateo County*	10:25 – 11:15

Organizations, Training, and Useful Websites *Matt Fabry*	11:15 – 11:30
Regional Water Quality Control Board Staff Availability for Assistance *Habte Kifle, Regional Water Quality Board Staff*	11:30 – 11:45
Questions and Answers and Closing Remarks *Matt Fabry*	11:45 – 12:00

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Announcing the 2008 Countywide:

Attention!

- **Do you have stormwater responsibilities for your municipality?**
- **Do you need an introduction to stormwater requirements and resources?**

Don't miss this event!

Wednesday, May 21, 2008

8:00 am to 12:00 Noon
Checuti Room
450 Poplar Avenue
Millbrae

Come learn about municipal stormwater requirements, and how the San Mateo Countywide Water Pollution Prevention Program can help you keep your municipality in compliance. Sessions will be led by countywide program staff and consultants directly involved in developing program guidance and supporting the program's subcommittees. This workshop is for new employees and others who need introductory information. Sessions will:

- ✓ Answer your questions about municipal ***stormwater permit requirements*** (municipal maintenance, new development, public information/participation, commercial and industrial businesses, illicit discharge controls, and more)
- ✓ Update you on the upcoming ***municipal regional stormwater permit***,
- ✓ Describe the ***countywide stormwater program's*** organization and decision-making process,
- ✓ Describe what assistance is available from ***Regional Water Board*** staff,
- ✓ Show you available ***tools for implementation*** of the municipal stormwater permit.

There is no fee for this event

Please pass this flyer to appropriate staff in your organization!

Fill out the attached registration form - Registration questions? Call Melissa at (510) 832.2852 x 101

Evaluation Summary Stormwater Orientation Workshop for Municipal Staff

May 21, 2008

Summary of Workshop Evaluations

Total Number of Evaluations: 26 (% Response) Total Number of Attendees:

I. **Regulatory Background, Overview of Stormwater Permit Requirements, and Upcoming Municipal Regional Permit**
Fred Jarvis, EOA, Inc.

11-Very Useful	6-Useful	0-Not Useful	0-No Answer

II. **San Mateo Countywide Water Pollution Prevention Program Organization, Decision-Making, and Funding**
Matt Fabry, San Mateo Countywide Water Pollution Prevention Program

8-Very Useful	9-Useful	1-Not Useful	0-No Answer

III. **Specific Requirements of the Stormwater Permit: Municipal Maintenance and Industrial and Illicit Discharge Controls**
Fred Jarvis, EOA, Inc.

11-Very Useful	5-Useful	0-Not Useful	1-No Answer

IV. **Specific Requirements of the Stormwater Permit: New Development and Construction Controls**
Laura Prickett, EOA, Inc.

10-Very Useful	7-Useful	0-Not Useful	0-No Answer

V. **Specific Requirements of the Stormwater Permit: Public Information and Participation**
Sarah Pratt, San Mateo County

10-Very Useful	7-Useful	0-Not useful	0-No Answer

Evaluation Summary Stormwater Orientation Workshop for Municipal Staff

May 21, 2008

VI. Organizations, Training and Useful Websites

Matt Fabry, San Mateo Countywide Water Pollution Prevention Program

8-Very Useful 9-Useful 0-Not useful 0-No Answer

1. **Which Topics were most beneficial?**

I – 7
II – 7
III – 6
IV- 8
V – 7
VI- 5

2. **Which Topics were the least beneficial?**

IV – 1
V – 1
Habte but wonderful that he came.
History of permit.
Heirarchy of Board.
Public Participation
Way too many acronyms

3. **Would you be interested in attending another workshop on construction site management?**

12 - Yes

4. **Suggestion for future topics?**

New Erosion Control Measures
More focus on Construction Site Practice and Post Construction
Single Family Dwelling < 20,000 Stormwater Control
Educating decision makers on Permit and Funding to meet requirements
Types of pollution control equipment. Large and small, simple and complex.
Practical implementation techniques to get compliance with smaller project.
As discussed, perhaps a more general section or what NPDES is, more layman.
How to do Municipal Inspections on post-construction BMPs.
We never hear about mechanical choices. Are these allowed in SMC?

Evaluation Summary Stormwater Orientation Workshop for Municipal Staff

May 21, 2008

Diversion of Stormwater to Treatment Plant.
Field Operations applicable in reducing waste into storm drain system.
Enforcement during construction that inspectors are authorized to perform.

5. **Comments?**
   Very informative workshop
   Thank you all
   Nice Introduction Topic
   Nice pace-great materials! Well organized – clear and concise presenters, great location, room a little too cool. Expand on WAM.
   Thank you!
   Could the C.3 Technical guidance be modified. Provide information as to appropriate C-values?(for day soils, for bay mud, for permeable pavers, for green roofs?)
   It's hard to know exactly what is required for small cities to comply with new requirements.
   Excellent workshop!!
   Maintenance is seemingly to be an issue for us to be in compliance-possibly providing training for maintenance staff/making it mandatory/evaluation

End of Evaluations

SIGN-IN SHEET
Stormwater Orientation for Municipal Staff
Wednesday, May 21, 2008

Date	Last Name	First Name	Agency	Sign-In
5/19/2008	Allén	Catherine	City of Millbrae	
5/13/2008	Atwater	Alan	City of San Mateo	
4/7/2008	Bell	Doug	City of Burlingame	
4/7/2008	Benedik	Tanya	City of Millbrae	
5/19/2008	Cesar	Kevin	City of Millbrae	
4/7/2008	Chan	Catherine	Hillsborough	
4/7/2008	Chen	Jen	Hillsborough	
5/13/2008	DeMeo	Sarah	City of San Mateo	
5/20/2008	Dennis	Jeremy	~~Redwood City~~ County of SAN MATEO	
4/7/2008	Disco	Bob	City of Burlingame	
4/7/2008	Ebo	Florian	City of Millbrae	Febo
4/10/2008	Etchebehere	Gratien	Town of Woodside	Gratien
	Fabry	**Matt**	**City of Brisbane**	
4/9/2008	Falzon	Vincent	City of Burlingame	
5/12/2008	Fulford	Daniel	City of South San Francisco	
5/14/2008	Gallegos	Sean	City of Half Moon Bay	
5/20/2008	Gourley	Heather	City of Santa Rosa	
5/20/2008	Gundy	Renae	City of Santa Rosa	
4/7/2008	Hirsch	Rick	City of Millbrae	
	Jarvis	**Fred**	**EOA, Inc.**	
	Kifle	**Habte**	**Water Board**	
5/13/2008	Lecel	Rob	City of San Mateo	
4/7/2008	Mallick	Rob	City of Burlingame	
4/7/2008	Moynahan	Gavin	San Carlos Planning	
4/7/2008	Mullins	John	Town of Hillsborough	
5/13/2008	Ng	Jennifer	City of Menlo Park	
4/10/2008	O'Dea	Kelly	City of Millbrae	
	Pratt	**Sarah**	**San Mateo County**	
	Prickett	**Laura**	**EOA, Inc.**	
4/7/2008	Rawley	Joshua	Town of Colma	
4/7/2008	Schwartz	Randy	City of Burlingame	
4/7/2008	Voong	Victor	City of Burlingame	
5/21/08	WEST	CHRISTINE	CITY OF HALF MOON BAY	chris@hmbcon com
5/21/08	ANDERSON	TIM	TOWN OF HILLSBOROUGH	
5/21/08	BLACK	JOHN	CITY OF BURL	

Stormwater Orientation for Municipal Staff

Workshop Binder

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6. List of Stormwater-Related Acronyms
7. Annual Report Deliverable Forms (First Half of FY 2007/08)
8. Useful Websites for Information
9. Fact Sheet of FY 2006/07 Accomplishments

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13. Flyer on Stormwater Quality Control Requirements
14. Flyer on Hydromodification Management (HM) Requirements
15. Project Applicant Checklist for NPDES Permit Requirements
16. Impervious Surface Data Collection Worksheet
17. Cover and Table of Contents for C.3 Stormwater Technical Guidance
18. Source Control Model List (Page 1, with downloading information)
19. Operation and Maintenance Form
20. Model Maintenance Agreement
21. Soil Guidelines (Page 1, with downloading information)
22. Construction BMP Flyer: General Construction and Site Supervision
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27. Our Water Our World Store List
28. Outreach Materials Request Form

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30. List of CII Subcommittee Members
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SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM

STORMWATER PROGRAM FUNDING OPTIONS

HF&H CONSULTANTS, LLC

June 10, 2008

FINAL REPORT

010385

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Category 5. Implement Stormwater Fees

Because of the need for voter approval, creating new or increasing existing stormwater fees has been challenging since the passage of Proposition 218. A few communities with heightened public awareness of the problems posed by stormwater pollution or flooding have been successful. At that, however, provisions such as sunset clauses have limited the duration of the fees and the public's willingness to pay has limited the amount of the fees.

It is unlikely that very many agencies will succeed in creating new or increasing existing stormwater fees given the current voter approval requirement. As a result, agencies will struggle to fund stormwater programs, which may lead to deteriorating conditions. Deteriorating conditions may improve the chances of achieving voter approval for stormwater fees, although surveys indicate that the public's unwillingness to pay much.

If SCA 12 passes, creating new or increasing existing stormwater fees will become as easy as it currently is to set rates for water, sewer, and refuse services. SCA 12 is the latest attempt to remove the voter approval requirement. Prior attempts, such as ACA 10 failed. Agencies should not plan on SCA 12 passing soon or at all. If and when SCA 12 or successor legislation passes, agencies should not hesitate to enact stormwater fees.

Category 6. Implement Taxes/Assessments

Implementing taxes or assessments to cover the cost of O&M or capital improvements is comparable in difficulty to creating new or increasing existing stormwater fees: both require voter approval. The results can yield substantial funding to construct and operate facilities. The success of the City of Los Angeles in establishing a tax to fund a $500 million bond is a noteworthy lesson. The public appreciated the need for the funding and perceived the value in the cost and, as a result, the tax passed. When those circumstances exist, the chances of achieving voter approval greatly increase. Agencies considering taxation as part of their funding strategy should pay attention to the Los Angeles example.

CONCLUSION

Agencies can develop an appropriate funding strategy from the preceding categories. Stormwater programs have for the most part prioritized and institutionalized certain key program functions over the roughly past 15 years of operation. Most agencies may have already implemented some of the options, particularly those with fewer legal, political, and implementation challenges. Some options may now be within reach while others may never be realistic. For the most part, whatever is done requires that the public pay more. Surveys indicate the public is unwilling to pay fees directly for stormwater requirements. Significant lead time (i.e., multiple years rather than months

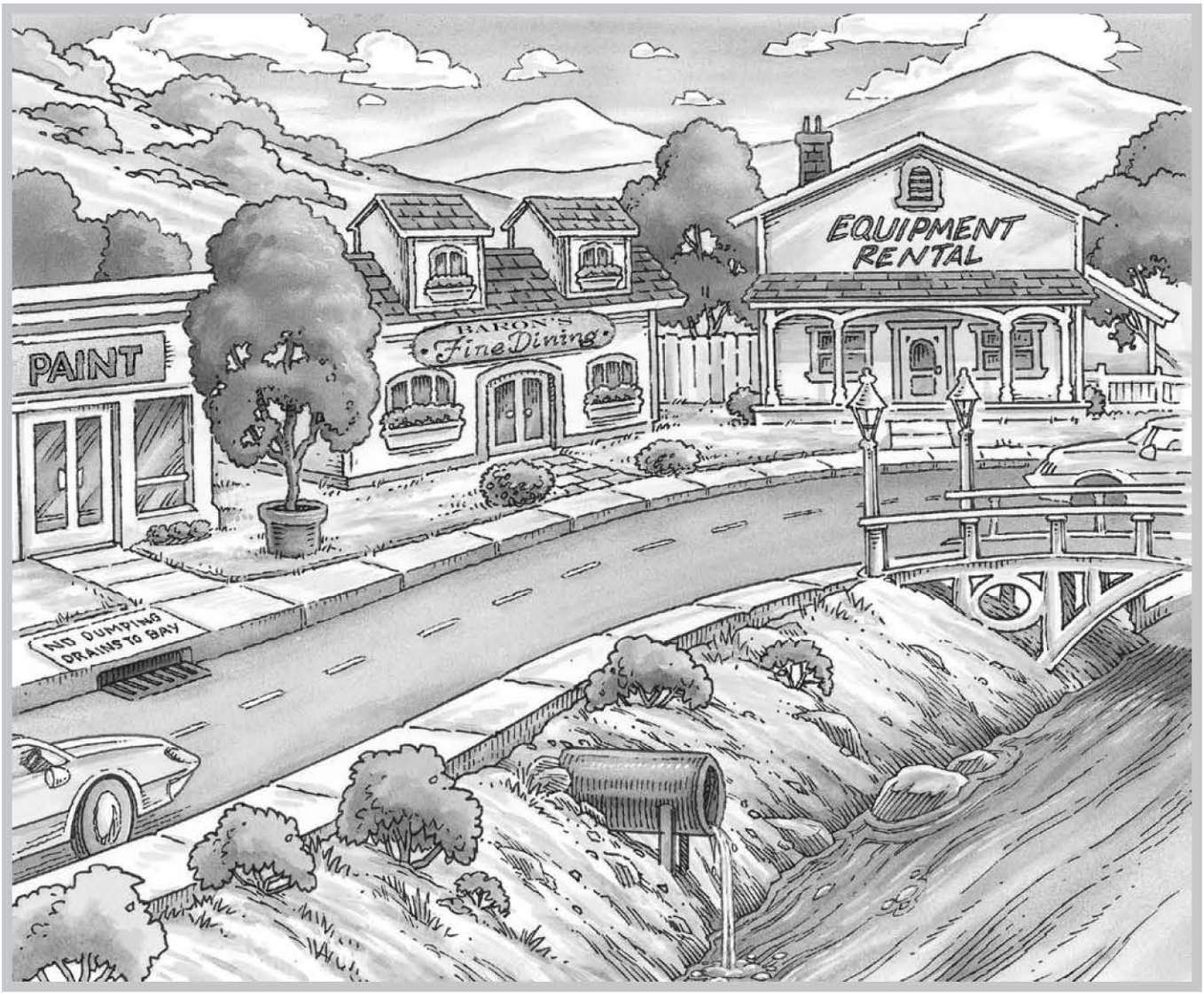
is required to try and secure these funds with no guarantee of success. In the current economic environment and given the recent results of public surveys, success will probably be minimal.

Even the best funding strategies are limited, leading agencies to seek legal remedies. The ever increasing cost of regulatory compliance has led to court cases[27] concerning the reimbursement of unfunded State mandates. The cities in Los Angeles County have established their right in court to have the Commission on State Mandates review their MS4 permits to determine if any aspects fall within the scope of unfunded mandates that would require the State to either fund the permit requirements or suspend or delete them. Because federal mandates are exempt, the next step will be to determine whether the MS4 permits contain any additional State mandates. Guidance from the Commission's forthcoming actions will no doubt play a part in shaping stormwater funding strategies.

[27] *County of Los Angeles v. Commission on State Mandates.*

Tips for a Cleaner Bay

HOW YOUR BUSINESS CAN PREVENT STORMWATER POLLUTION



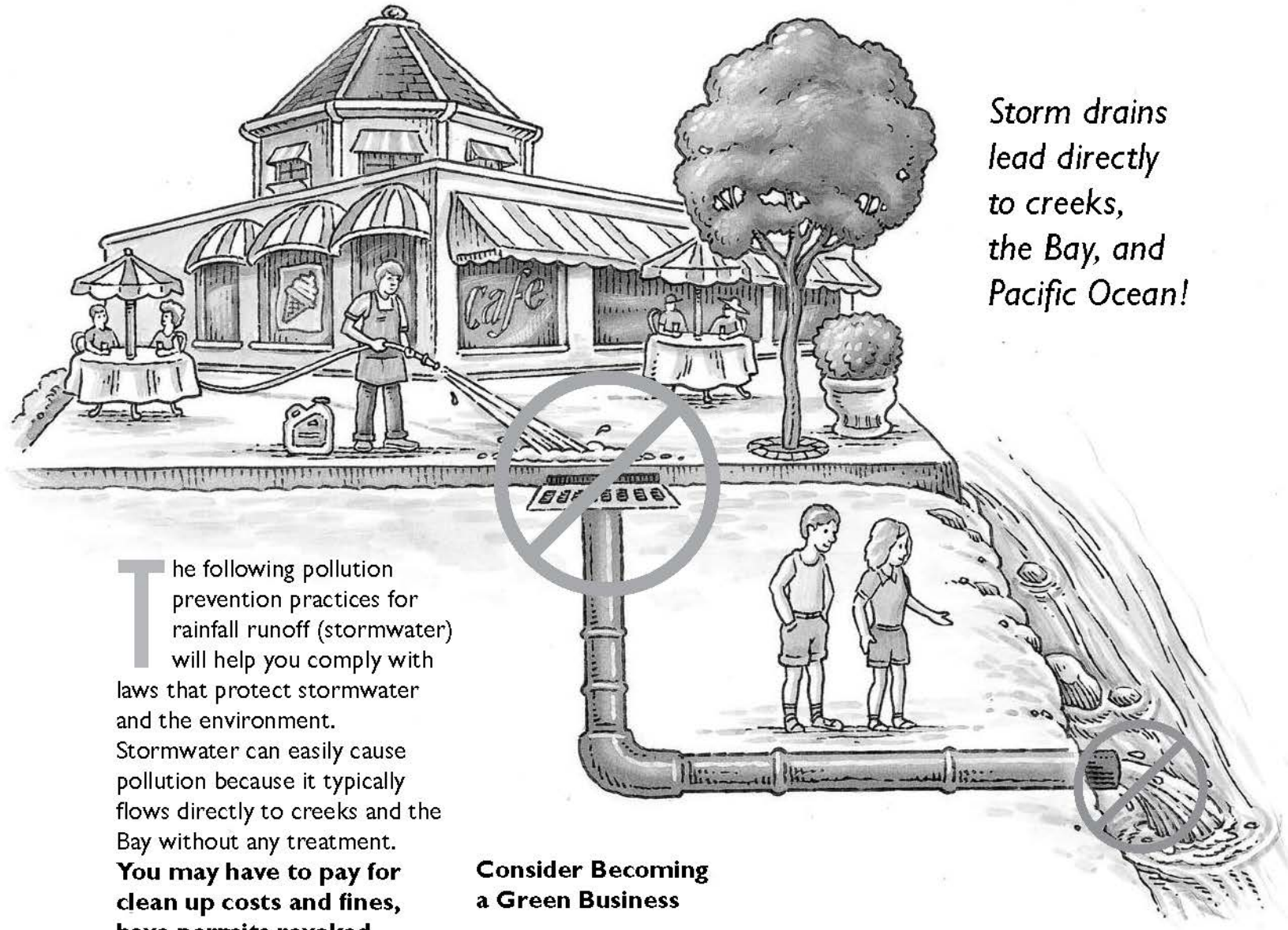
These guidelines cover the following topics:

General Stormwater Pollution Prevention Practices and
Good Housekeeping • Outdoor Storage of Materials and Wastes
Equipment and Vehicle Washing • Landscape Maintenance • Mercury and Litter
Additional Information and Local Agency Contacts

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.
www.flowstobay.org

A PROGRAM OF THE CITY/COUNTY ASSOCIATION OF GOVERNMENTS OF SAN MATEO COUNTY (C/CAG)

You Can Prevent Water Pollution!



Storm drains lead directly to creeks, the Bay, and Pacific Ocean!

The following pollution prevention practices for rainfall runoff (stormwater) will help you comply with laws that protect stormwater and the environment. Stormwater can easily cause pollution because it typically flows directly to creeks and the Bay without any treatment. **You may have to pay for clean up costs and fines, have permits revoked, or even go to jail for stormwater pollution,** such as spilling chemicals and/or discharging other wastes and washwaters to streets, storm drains, creeks, and the Bay.

Polluting stormwater is against the law!

Consider Becoming a Green Business

Green Businesses must comply with environmental laws plus meet established standards for conserving natural resources, preventing pollution, and reducing wastes. The Bay Area Green Business Program certifies businesses as green and promotes *Green Business* use and recognition. For more information visit www.greenbiz.ca.gov/index.html.

Hosing dirt, soap, litter and other pollutants down a storm drain is illegal. Unlike flows from building interior fixtures (sinks, toilets, etc.) that are treated at wastewater treatment plants, outdoor washwaters and rainfall runoff flow directly to creeks and the Bay typically without treatment of any kind.

General Pollution Prevention Practices

These good housekeeping practices are required and critical to protecting our environment.

Five Important Things to Remember:

1. Keep your business neat and clean – it saves time and money and prevents pollution.
2. Protect your storm drain inlets from pollution of any kind.
3. **Be prepared!** Keep spill cleanup materials easily accessible.
4. Use dry methods to clean up spills whenever possible. Never wash spills down the storm drain.
5. Train staff regularly on these practices.

- **Label/stencil each storm drain inlet** to remind workers and customers that no dumping is allowed.
- **Routinely inspect and clean:**
  - ✓ Storm drain inlets (grates and sumps)
  - ✓ Loading docks and shipping/ receiving areas
  - ✓ Work areas
  - ✓ Chemical storage areas
  - ✓ Waste storage and recycling areas
  - ✓ Treatment devices for proper functioning
- **Keep surfaces clean** by sweeping, vacuuming or mopping – never wash down surfaces to gutter, storm drain inlet, street, or waterway. For pressure washing of pavement or other surfaces hire a cleaning contractor trained to use pollution prevention practices (see Bay Area Stormwater Management Agencies Association's list of recognized surface cleaners at www.basmaa.org/recognition/). Make sure all wash water is collected and disposed properly as described at website.
- **Sweep parking areas and gutters** at least monthly and before it rains and pick up litter and trash daily.
- **Prevent spills** when transferring liquids by using drip pans, secondary containment, and absorbents.
- **Clean up spills** immediately with rags, absorbents*, or wet/dry vacuum. Do not allow fluids to accumulate or run across surfaces. Never wash spills down or allow spills to flow into a storm or sanitary sewer drain inlet. Clean up absorbents immediately following their use.
- **Perform work indoors or under cover,** whenever possible, to avoid exposure to rainfall, runoff, and wind. If outdoor work generates small particles or dust, the particles must be contained and vacuumed up.

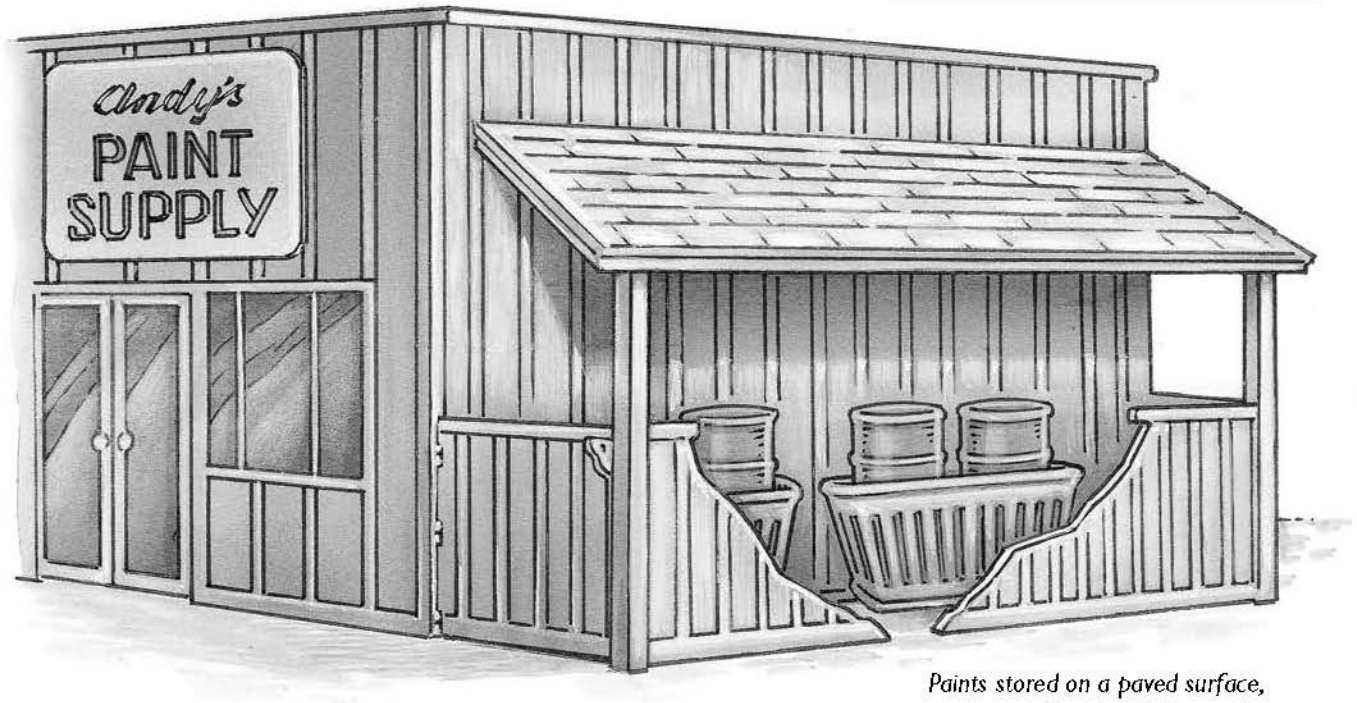
**Absorbent that was used on a small spill is being swept up for disposal. Used absorbents may be hazardous waste and must be properly disposed.*

Outdoor Materials Storage

- Store materials on a **paved surface** and **under a roof**, in a fully enclosed container, or under a temporary waterproof covering to prevent contact with rainfall and runoff.
- Store fluids within **secondary containment** to prevent accidental release. **Keep container lids, caps, and openings closed** when not in use. Keep containers out of pooled or standing water. Regularly inspect containers for cracks, corrosion, or leaky seams.
- Apply **caution and control when transferring liquids** to minimize spill potential.
- Have **cleanup materials** easily accessible. Regularly train employees on spill clean up procedures.
- Store all items **as far as possible from storm drain inlets.**
- Use **drip pans** under outdoor work or storage areas where there is the potential for spills and leaks.

If You Must Store Materials Outdoors:

1. Protect from rain and runoff.
2. Place primary containers of liquids within secondary containment.
3. Do not place near storm drain inlets.
4. Check with Fire Department if sprinklers may be required under roof/cover.
5. Keep spill cleanup materials in easily accessible areas.



Paints stored on a paved surface, under a roof, and within secondary containment to catch spills.

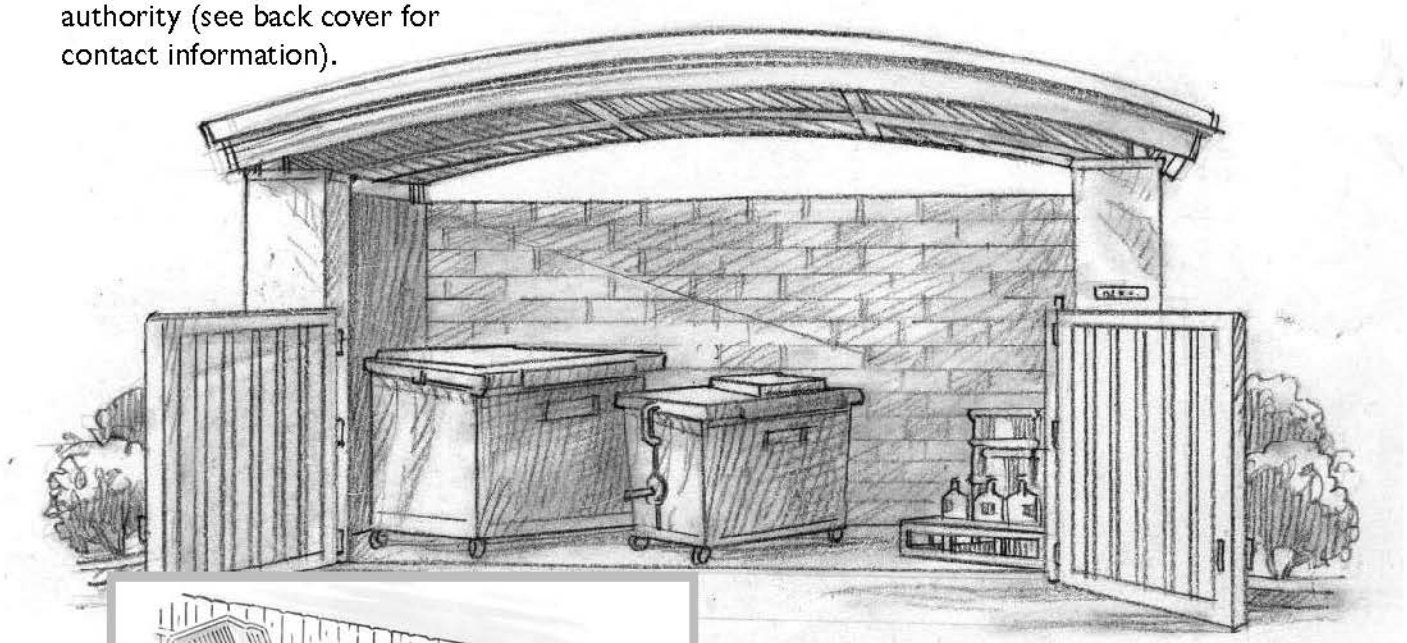
Education and Training
Train new employees and remind existing ones to use these stormwater pollution prevention practices.

Outdoor Waste Storage

- **Inspect dumpsters and waste recycling area daily.** Pick up dropped wastes and sweep area. Make sure dumpsters are not overfilled and lids are kept closed. Dumpsters without tight lids or that leak must be replaced or repaired. Some dumpsters have plugs that need to be in place. Contact your service provider.
- Prevent and **clean up any trash compactor leachate** drippings or direct to sanitary sewer with approval of your local sanitary sewer treatment authority (see back cover for contact information).
- Use separate, appropriate, clean, sealed, and secondarily **contained storage device** for recyclable fluids and hazardous wastes. Label containers as required by hazardous waste regulations.
- Use a licensed company to haul and recycle or dispose of wastes.
- Do not rinse waste containers or areas to storm drain.

Waste Disposal and Recycling:

1. Don't dispose to storm drain. Recycle whenever possible.
2. Divide wastes by types and store separately in sealed containers.
3. Use a big enough dumpster so you can keep the lids closed.
4. Replace leaking dumpsters.



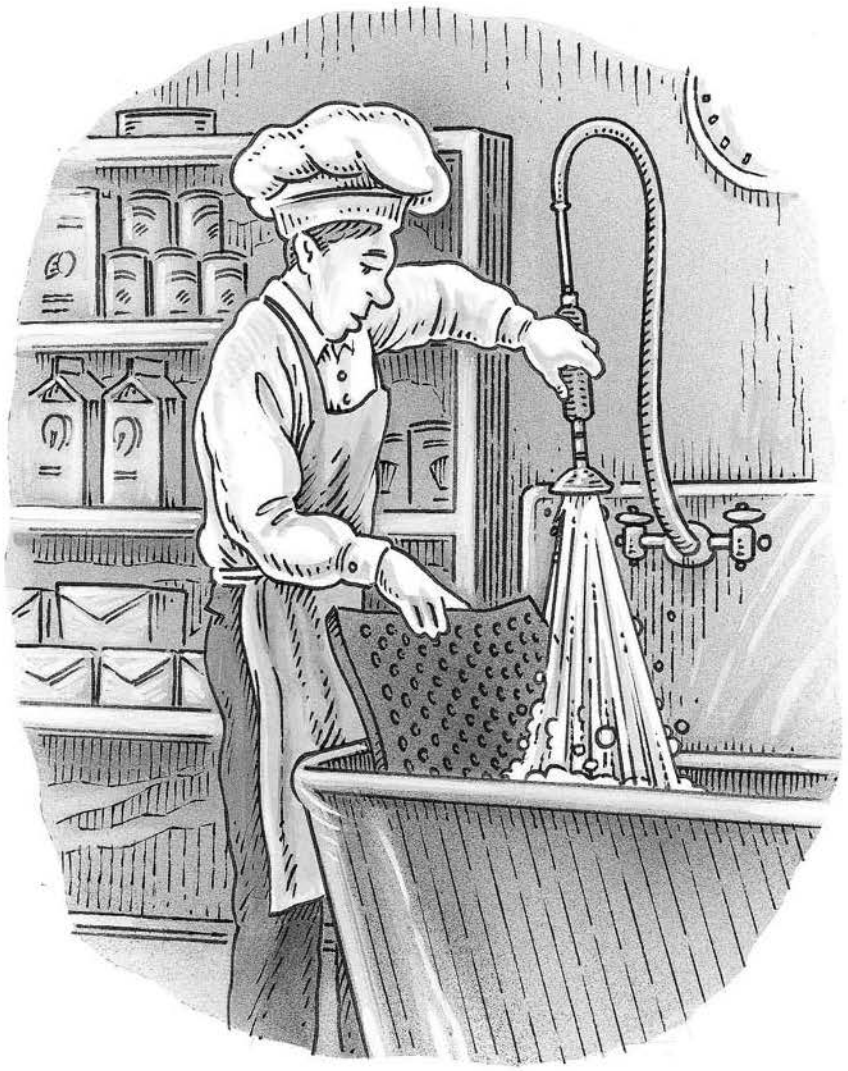
Dumpster, tallow bin, and materials for recycling stored on a paved surface, under a roof, protected from rainfall runoff.

Drum storage container that prevents contact with rainfall and provides secondary containment of spills.

***Consult your local hazardous waste regulator** about hazardous materials disposal and handling. See back page for contact information.*

Equipment and Vehicle Washing

- If possible, **wash equipment indoors**, at a utility sink or location where washwaters drain to the sanitary sewer. Contact your local sanitary sewer treatment authority for approval (See back page).
- Alternatively, **wash equipment or vehicles** on an adequately-sized, wash pad that is roofed, bermed, and connected to a washwater treatment system and the sanitary sewer.
- Connection to the sanitary sewer may also require a plumbing permit from your local jurisdiction. Contact your City.
- All grease traps and interceptors and vehicle washing systems **shall be maintained and cleaned out** on a regular schedule. Collected solids must be disposed using a licensed waste hauler.
- Mobile washing of some types of equipment, such as roof exhaust equipment or shopping carts, is acceptable if all washwater is contained, vacuumed up, and disposed to sanitary sewer.



Kitchen floor mat washing in a janitorial/mop sink.

Equipment Washing:

1. Direct all washwaters to the sanitary sewer.
2. Maintain any required treatment system.
3. Don't direct any wash or rinse water to gutter, street, or storm drain.
4. Clean equipment or vehicles off site, if other options are unavailable.

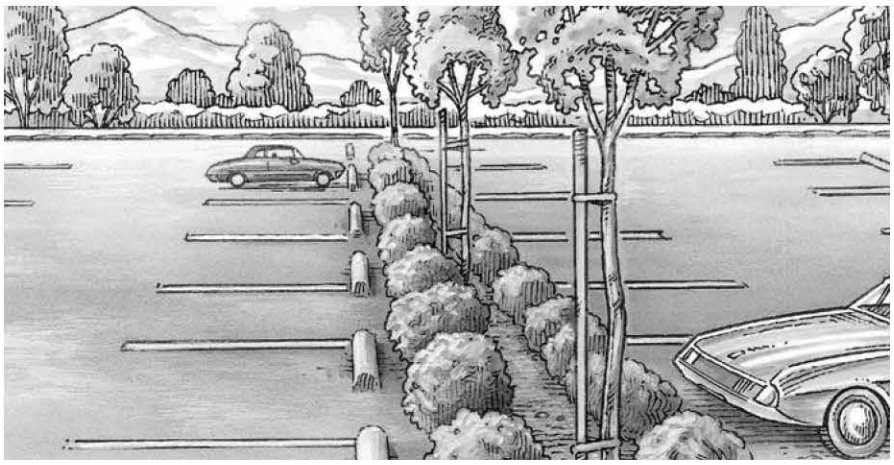
Consult your local sanitary sewer treatment authority *for approval regarding any equipment or vehicle washing system. See back page for contact information.*

Landscaping and Safer Alternatives to Pesticides

- Stormwater pollution prevention and treatment systems are being increasingly included in landscaping. Know whether your landscaping is specifically designed to minimize and treat stormwater runoff, and, if it is, make sure it is maintained as designed.
- Follow Bay-Friendly Landscaping and Gardening Program practices. Visit www.bayfriendly.org.
- Use less toxic alternatives to pesticides. For more information on integrated pest management, visit www.ourwaterourworld.org.
- **Do not overwater** – maintain sprinklers to avoid pavement watering.
- **Clean up fallen leaves** and remove prunings for composting or disposal with green wastes. Don't dispose in street, storm drain, or creek.

Landscape Maintenance:

1. Follow maintenance plan for any landscape-based stormwater treatment system.
2. Use least toxic pest control methods.
3. Minimize use of fertilizer.



Here is an example of a vegetated swale used for treating stormwater drainage from a parking lot. Swales allow stormwater pollutants a chance to settle and, where soils are sandy, to recharge groundwater aquifers.

Mercury and Litter

MERCURY

Mercury contaminates fish making them unsafe to eat. The state health agency has issued detailed health advisories that are available at www.oehha.ca.gov/fish/general/sfbaydelta.html.

- Properly **dispose** as hazardous waste **or recycle** all mercury-containing products, including **fluorescent** lamps light bulbs, manometers, thermostats, switches, and batteries. **In order to prevent contamination of fish, it is no longer legal to dispose any of these wastes as trash with your regular garbage.**
- Consult the California Department of Toxic Substances Control's website www.dtsc.ca.gov/HazardousWaste/UniversalWaste/index.cfm for detailed information on how to dispose of mercury-containing and other universal hazardous wastes. Don't throw in the trash – it is illegal!

LITTER

Litter and trash are bad for business and harm the health of creeks and the Bay.

- **Provide enough trash receptacles** for customers and employees. All outdoor receptacles must be covered.
- **Pick up litter daily**. Maintain the sidewalk in front of your business so that it is free of litter and dirt. Don't wash into street or storm drain.
- Any **creek** passing through or next to your property **must be maintained free of trash and debris**.

Local Agency Contacts

Local Stormwater Inspectors

City	Phone Number
Atherton	(650) 372-6200
Belmont	(650) 372-6200
Brisbane	(650) 372-6200
Burlingame	(650) 342-3727 and (650) 372-6200
Colma	(650) 372-6200
Daly City	(650) 991-8208
East Palo Alto	(650) 372-6200
Foster City	(650) 522-7300
Half Moon Bay	(650) 372-6200
Hillsborough	(650) 372-6200
Menlo Park	(650) 372-6200
Millbrae	(650) 372-6200
Pacifica	(650) 372-6200
Portola Valley	(650) 372-6200
Redwood City	(650) 372-6200
San Bruno	(650) 372-6200
San Carlos	(650) 372-6200
San Mateo	(650) 522-7300
South San Francisco	(650) 829-3848
Unincorporated San Mateo County	(650) 372-6200
Woodside	(650) 372-6200

Local Hazardous Waste Regulator — **Phone Number**

(Certified Unified Program Agency – CUPA)

The San Mateo County Environmental Health Division is the CUPA for all areas of San Mateo County ..... (650) 372-6200

Local Sanitary Sewer Treatment Authorities — **Phone Number**

Burlingame Waste Water Treatment Facility ..... (650) 342-3727
(Serves Burlingame, Hillsborough, and Burlingame Hills)

Millbrae Water Pollution Control Plant ..... (650) 259-2388

North San Mateo County Sanitation District ..... (650) 991-8200
Wastewater Treatment Plant
(Serves Daly City and parts of Westborough)

Pacifica's Calera Creek Water Recycling Plant ..... (650) 738-4660

San Mateo Waste Water Treatment Plant ..... (650) 522-7300
(Serves Foster City and San Mateo)

Sewer Authority Mid Coastside Wastewater ..... (650) 726-0124
Treatment Facility
(Serves Half Moon Bay, Granada, Moss Beach, and Montara)

South Bayside System Authority ..... (650) 594-8411 ext.140
(Serves Atherton, Belmont, Menlo Park, Portola Valley, Redwood City, San Carlos, and Woodside)

South San Francisco/San Bruno Water ..... (650) 877-8555
Quality Control Plant
(Serves Colma, San Bruno, South San Francisco, and southern part of Daly City)

Palo Alto Regional Water Quality Control Plant ..... (650) 329-2598
(Serves East Palo Alto, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford)

San Francisco's Southeast Treatment Plant ..... (415) 648-6882
(Serves Brisbane and east side of San Francisco)

Version dated May 2008

Your business may be regulated by several State and Local agencies for environmental compliance. In addition to what is listed, you may need to obtain coverage under the State Water Resources Control Board's Stormwater Industrial General Permit. Call: (916) 341-5538 for more information.

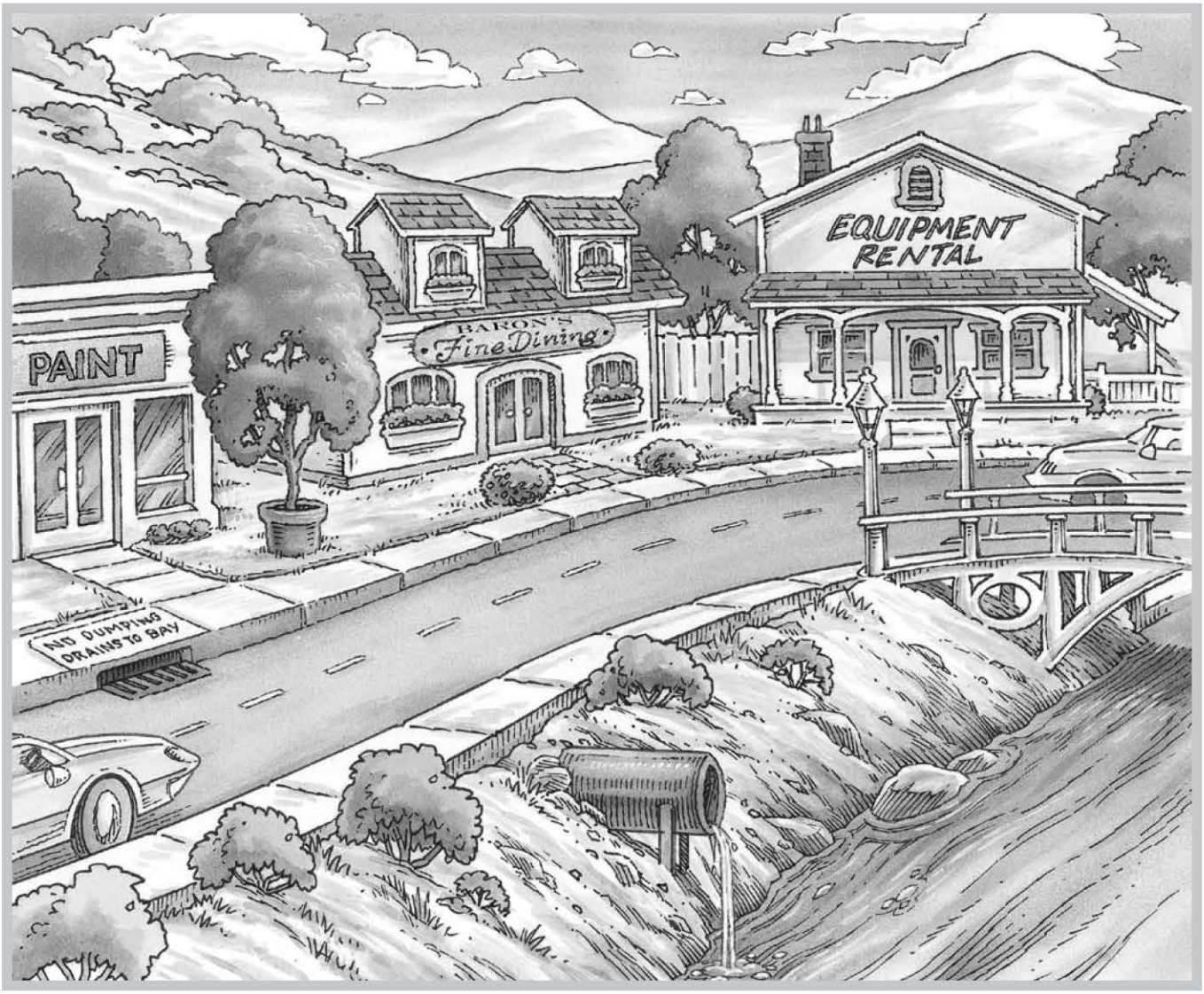
All discharges to sanitary sewer must be approved by your local sanitary sewer treatment authority. See list of contacts to the left. Never discharge into a storm drain.

The Program gratefully acknowledges the Alameda Countywide Clean Water Program for allowing the adaptation of its booklet.

Printed on 50% recycled paper with 30% Post Consumer Waste (PCW), utilizing soy-based inks.

Sugerencias para una Bahía más Limpia

CÓMO PUEDE SU NEGOCIO PREVENIR LA CONTAMINACIÓN DEL AGUA PLUVIAL



Estos principios cubren los siguientes temas:

Prácticas Generales para la Prevención de la Contaminación del Agua Pluvial y Limpieza Adecuada del Negocio • Almacenamiento Externo de Materiales y Desechos
Lavado de Equipo y Vehículos • Mantenimiento de Áreas Verdes • Mercurio y Basura
Información Adicional y Contacto con Agencias Locales

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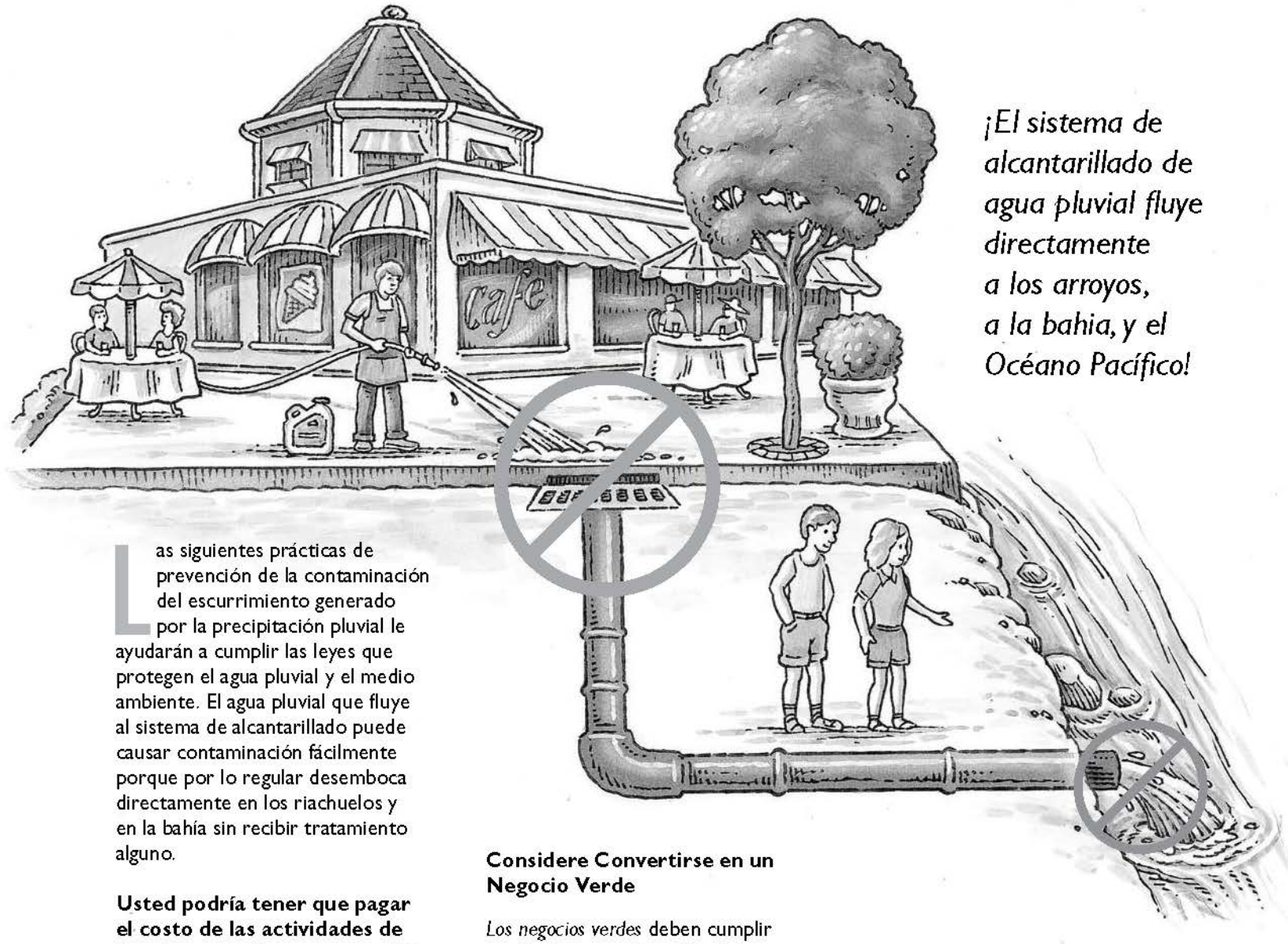
UN PROGRAMA DE LA ASOCIACIÓN DE GOBIERNOS MUNICIPALES Y DE CONDADOS DEL CONDADO DE SAN MATEO (C/CAG)

¡Usted Puede Prevenir la Contaminación del Agua!



¡El sistema de alcantarillado de agua pluvial fluye directamente a los arroyos, a la bahia, y el Océano Pacífico!

Las siguientes prácticas de prevención de la contaminación del escurrimiento generado por la precipitación pluvial le ayudarán a cumplir las leyes que protegen el agua pluvial y el medio ambiente. El agua pluvial que fluye al sistema de alcantarillado puede causar contaminación fácilmente porque por lo regular desemboca directamente en los riachuelos y en la bahía sin recibir tratamiento alguno.

Usted podría tener que pagar el costo de las actividades de limpieza y multas, ser sometido a la revocación de sus permisos o, inclusive, ir a la cárcel por contaminar las aguas pluviales, así como por verter sustancias químicas y/o otras descargas de desechos y agua resultante de actividades de lavado a las calles, sistema de alcantarillado de agua pluvial, arroyos y la bahía.

¡La contaminación de las aguas pluviales es contra la ley!

Considere Convertirse en un Negocio Verde

Los negocios verdes deben cumplir con las leyes medio ambientales además de adherirse a los estándares establecidos para la conservación de recursos naturales, la prevención de la contaminación así como la reducción de desechos. El programa de negocio verde *Bay Area Green Business Program* certifica a las compañías con la denominación de verde y promueve el uso y reconocimiento del término *Green Business*. Si desea mayor información, visite www.greenbiz.ca.gov/index.html.

Es en contra de la ley limpiar con el chorro de la manguera suciedad, basura residuos de jabón, y otros contaminantes que fluyan hacia el sistema de alcantarillado de agua pluvial. A diferencia de los flujos de lavaderos, inodoros etc. interiores de los edificios que son procesados en las plantas de tratamiento de agua residual, el agua resultante de actividades de lavado en exteriores y el agua de la precipitación pluvial fluyen directamente a los arroyos y a la bahía generalmente sin recibir tratamiento alguno.

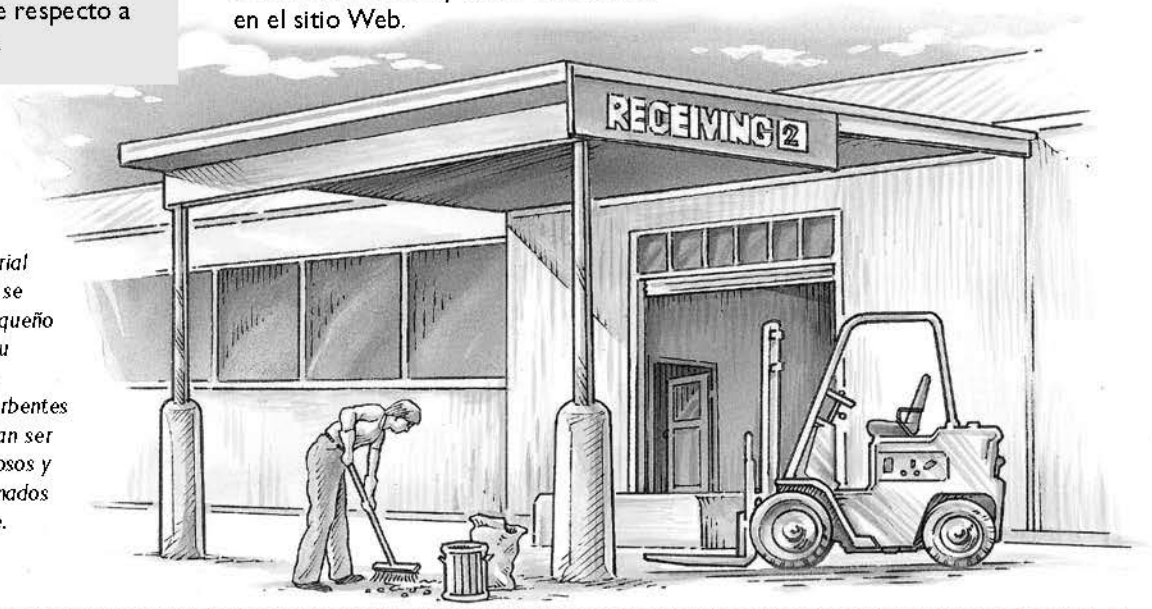
Prácticas Generalas para la Prevención de la Contaminación

Las siguientes son buenas prácticas de limpieza de su negocio que se requieren y son de vital importancia para proteger nuestro medio ambiente.

Cinco cosas importantes que debe recordar:

1. Conserve su negocio limpio y ordenado – le ahorra dinero y evita la contaminación.
2. Proteja los desagües de las alcantarillas de agua pluvial contra todo tipo de contaminación.
3. **¡Prepárese!** Tenga los materiales de limpieza a la mano.
4. Siempre que sea posible use métodos secos de limpieza para eliminar los derrames. Nunca enjuague los derrames de forma que el agua contaminada vaya a dar al sistema de alcantarillado pluvial.
5. Capacite al personal periódicamente respecto a estas prácticas.

- **Identifique/indique cada alcantarilla de agua pluvial** a fin de recordarles a sus trabajadores y clientes que no se permite desechar aguas residuales.
- **Inspeccione y limpie regularmente:**
  - ✓ las alcantarillas de agua pluvial (las parrillas y los sumideros),
  - ✓ las plataformas de carga y las áreas de envío y recepción
  - ✓ las áreas de trabajo
  - ✓ las áreas de almacenamiento de sustancias químicas
  - ✓ las áreas de almacenamiento de desechos y de reciclaje
  - ✓ los dispositivos de tratamiento para obtener un funcionamiento adecuado.
- **Conserve limpias las superficies** barriendo, aspirando o pasando el trapeador – nunca lave las superficies dirigiendo el agua hacia la cuneta, las alcantarillas de agua pluvial, la calle o vía de agua. Para lavar a presión el pavimento u otras superficies, solicite los servicios de un contratista en limpieza capacitado para seguir las prácticas de la prevención de la contaminación (consulte la lista de la asociación de agencias para el manejo del agua pluvial *Bay Area Stormwater Management Agencies Association* de reconocidas empresas dedicadas a la limpieza de superficies en www.basmaa.org/recognition/). Cerciórese de que toda el agua de lavado sea recolectada y desechada adecuadamente tal y como se describe en el sitio Web.
- **Barra las áreas de estacionamiento y las cunetas** al menos mensualmente y antes de que llueva. Recoja la basura diariamente.
- **Prevenga los derrames** cuando esté transfiriendo líquidos utilizando colectores de aceite, contención secundaria y absorbentes.
- **Limpie los derrames** de inmediato con trapos, materiales absorbentes* o métodos de aspiración húmeda o seca. No permita que los líquidos se acumulen o se derramen por la superficie. Nunca utilice agua para eliminar derrames ni permita que los derrames fluyan hacia las alcantarillas pluviales ni a los drenajes sanitarios. Limpie los absorbentes inmediatamente después de su uso.
- **Realice las labores en interiores o bajo techo** cuando sea posible, a fin de evitar la exposición a la precipitación pluvial, el escurrimiento de agua y el viento. Si el trabajo externo genera pequeñas partículas o polvo, las partículas deberán ser contenidas y aspiradas.



**Se retira material absorbente que se utilizó en un pequeño derrame para su eliminación. Los materiales absorbentes utilizados podrían ser desechos peligrosos y deben ser eliminados adecuadamente.*

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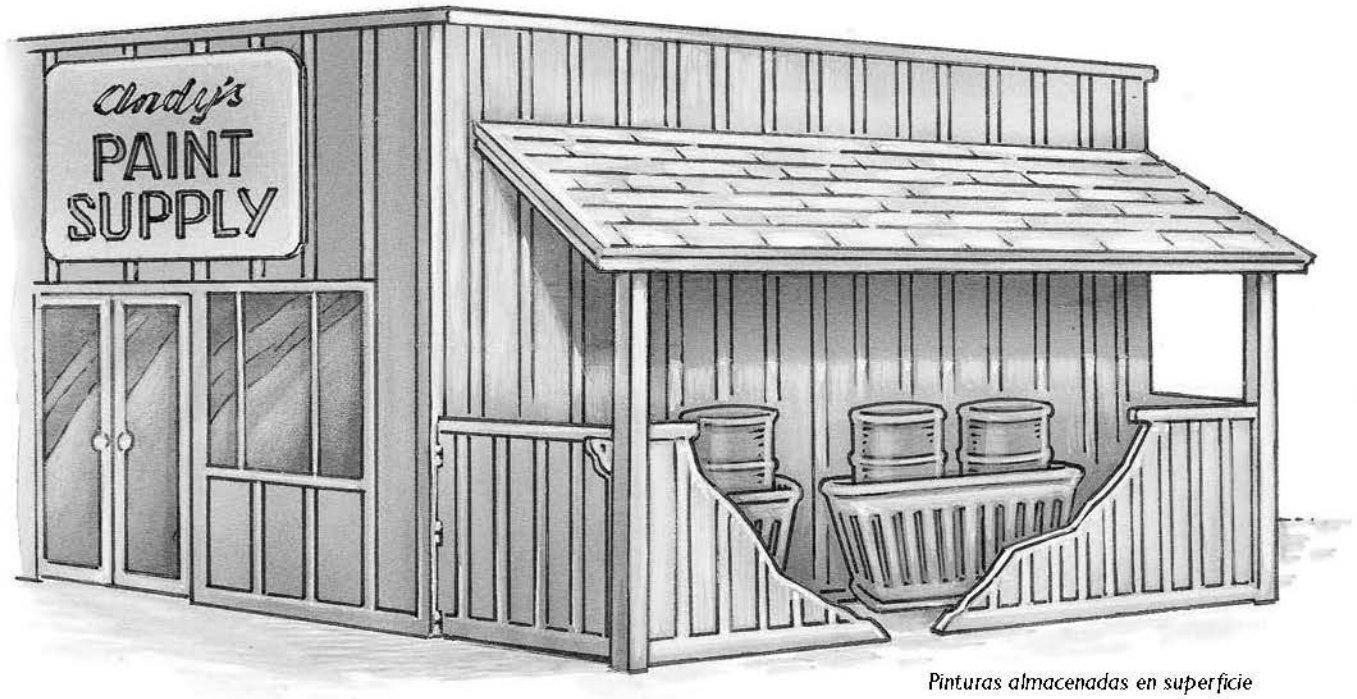
Almacenamiento de Materiales en Exteriores

- Guarde los materiales en una **superficie pavimentada** y **bajo techo**, en un recipiente completamente cerrado, o debajo de una cubierta temporal a prueba de agua a fin de prevenir el contacto con el agua pluvial y el escurrimiento.
- Guarde los líquidos dentro de una **contención secundaria** con objeto de prevenir su fuga accidental. **Mantenga cerradas las tapas y las aberturas de los recipientes** cuando no se estén utilizando. Mantenga los recipientes lejos del agua estancada. Inspeccione periódicamente los recipientes para detectar cuarteaduras, corrosión o uniones que tengan fugas.
- Ejerza la **precaución y el control al transferir líquidos** para minimizar un derrame potencial.
- Tenga siempre a la mano **materiales de limpieza**. Capacite periódicamente a los empleados respecto a los procedimientos de limpieza para eliminar derrames.
- Almacene todos los materiales **lo más lejos posible de las alcantarillas de agua pluvial**.
- Coloque **colectores de derrames** debajo de las labores que se realicen en exteriores o áreas de almacenamiento en donde exista potencial de derrames y fugas.

Si es necesario almacenar materiales en el exterior:

1. Protéjalos de la lluvia y el escurrimiento.
2. Coloque recipientes primarios de líquidos dentro de la contención secundaria.
3. No los coloque cerca de las alcantarillas de agua pluvial.
4. Consulte con el Departamento de Bomberos si podrían requerirse rociadores bajo techos/cubiertas.
5. Conserve los materiales de limpieza de derrames en lugares de fácil acceso.



Pinturas almacenadas en superficie pavimentada, bajo techo y dentro de contención secundaria para atrapar derrames.

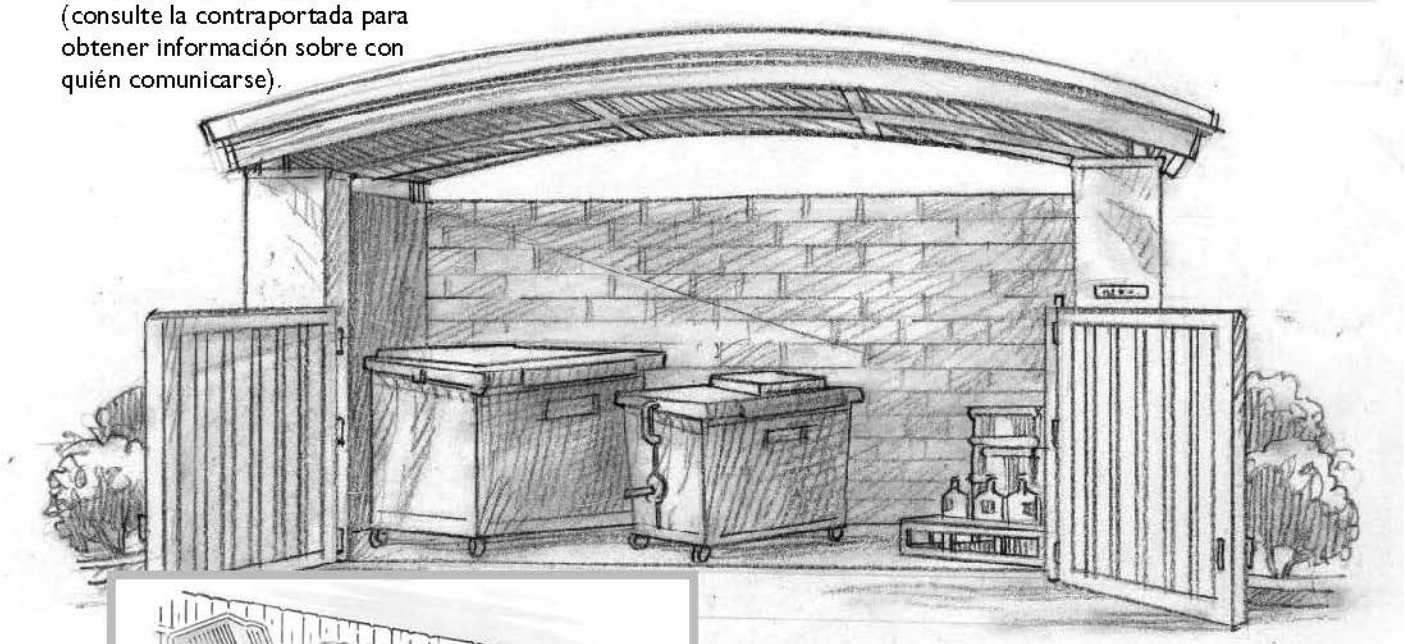
Educación y Capacitación
Capacite a los nuevos empleados y recuérdeles a los existentes utilizar estas prácticas de prevención de la contaminación del agua pluvial.

Almacenamiento de Desechos en Exteriores

- **Inspeccione los contenedores de basura y el área de reciclaje de desechos diariamente.** Recoja los desechos tirados y barra el área. Cerciórese de que los contenedores de basura no estén excesivamente llenos y que las tapas estén siempre cerradas. Los contenedores de basura sin tapas bien colocadas o que tengan fugas deberán ser reemplazados o reparados. Algunos contenedores tienen tapones que deben estar colocados. Comuníquese con su proveedor de servicio.
- Prevenga y **limpie todo goteo o escurrimiento proveniente del compactador de basura** o canalícelo hacia el drenaje sanitario con la aprobación de la autoridad local para el tratamiento del sistema de drenaje sanitario (consulte la contraportada para obtener información sobre con quién comunicarse).
- Use un **dispositivo de almacenamiento de contención secundaria** por separado, apropiado, limpio, herméticamente cerrado para los líquidos reciclables y los desechos peligrosos. Identifique los recipientes conforme a los reglamentos que rigen a los desechos peligrosos.
- Contrate a una empresa transportista acreditada para acarrear y reciclar o tirar los desechos.
- No permita que el agua para enjuagar recipientes de desechos o áreas fluya hacia el sistema de alcantarillado de agua pluvial.

Eliminación de Desechos y Reciclaje:

1. No deseche nada a través del sistema de alcantarillado de agua pluvial. Recicle siempre que sea posible hacerlo.
2. Divida los desechos según su tipo y almacénelos por separado en recipientes herméticamente cerrados.
3. Use un contenedor de basura lo suficientemente grande de manera que pueda mantener cerradas las tapas.
4. Remplace los contenedores de basura que estén goteando.



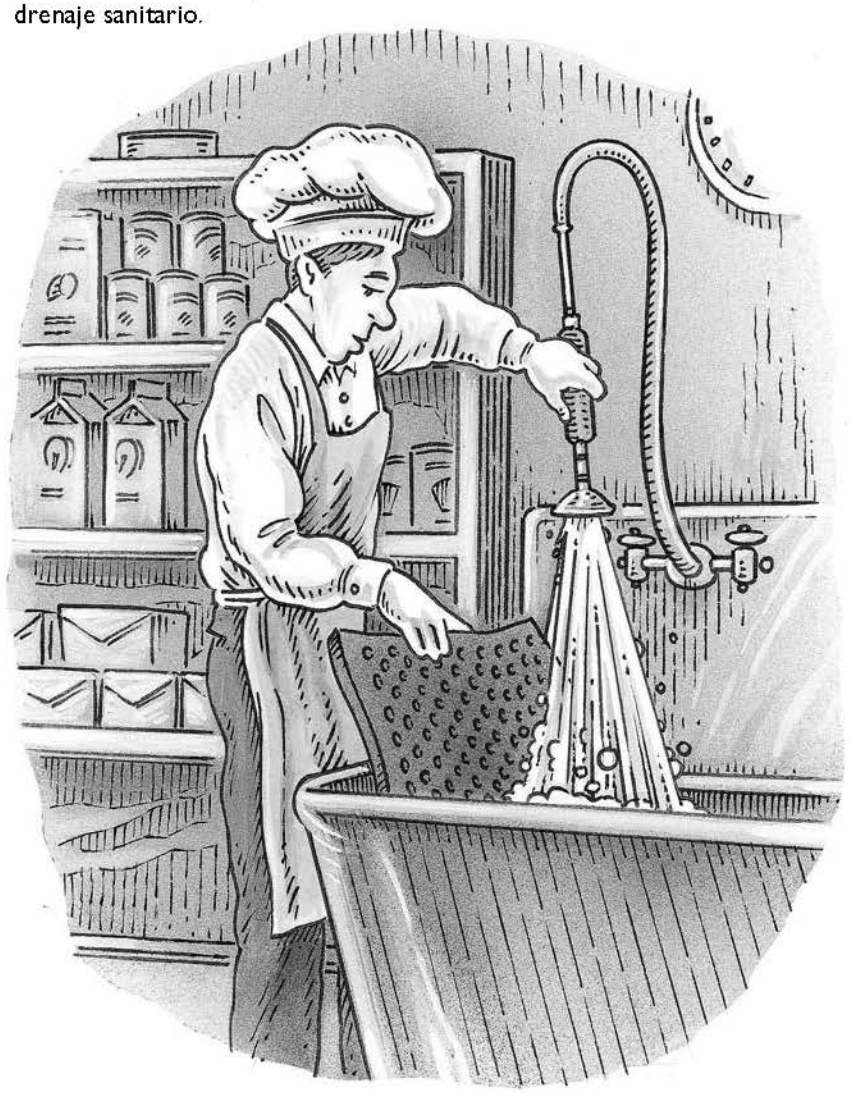
Contenedor de basura, recipiente de grasa, y materiales de reciclaje almacenados en una superficie pavimentada, bajo techo, protegidos del escurrimiento del agua pluvial.

Recipiente de almacenamiento de tambores que evita el contacto con el agua pluvial y proporciona contención secundaria en contra de los derrames.

***Consulte a la agencia de reglamentación sobre desechos peligrosos de su localidad** acerca de los medios apropiados de desecho y manejo de materiales peligrosos. Consulte la información de contacto en la contraportada.*

Lavado de Equipo y Vehículos

- De ser posible, **lave el equipo en interiores**, en un lavadero industrial o en un lugar en donde el agua resultante de actividades de lavado fluya hacia el sistema de drenaje sanitario. Comuníquese con la autoridad encargada del tratamiento del agua del sistema de drenaje sanitario de su localidad a fin de obtener su autorización (Consulte la contraportada).
- Alternativamente, **lave el equipo o los vehículos** sobre una superficie de lavado de tamaño adecuada, techada, elevada y rodeada por un canal, y que esté conectada a un sistema de tratamiento de agua resultante de actividades de lavado y al sistema de drenaje sanitario.
- La conexión al sistema de drenaje sanitario también podría requerir un permiso de plomería por parte de la agencia pertinente de su jurisdicción. Comuníquese con su Ayuntamiento.
- Todos los colectores de grasa e interceptores y sistemas de lavado de vehículos **deberán recibir mantenimiento y ser limpiados** siguiendo un programa regular. Los sólidos que sean recolectados deberán ser desechados a través del uso de un transportista de desechos que posea la licencia correspondiente.
- El lavado móvil de algunos tipos de equipo, tal como equipo de extracción de techo o carritos para hacer compras, es aceptable si toda el agua resultante de actividades de lavado es contenida, aspirada y eliminada en el sistema de drenaje sanitario.



Tapete de piso de cocina en un lavadero de limpieza/trapeado.

Lavado de Equipo:

1. Desvíe toda el agua resultante de actividades de lavado al sistema de drenaje sanitario.
2. Dele mantenimiento a cualquier sistema de tratamiento que posea.
3. No dirija el agua resultante del lavado o enjuagado a la cuneta, la calle, o el sistema de alcantarillado de agua pluvial.
4. Limpie el equipo o los vehículos fuera de las instalaciones, si no cuenta con otras opciones.

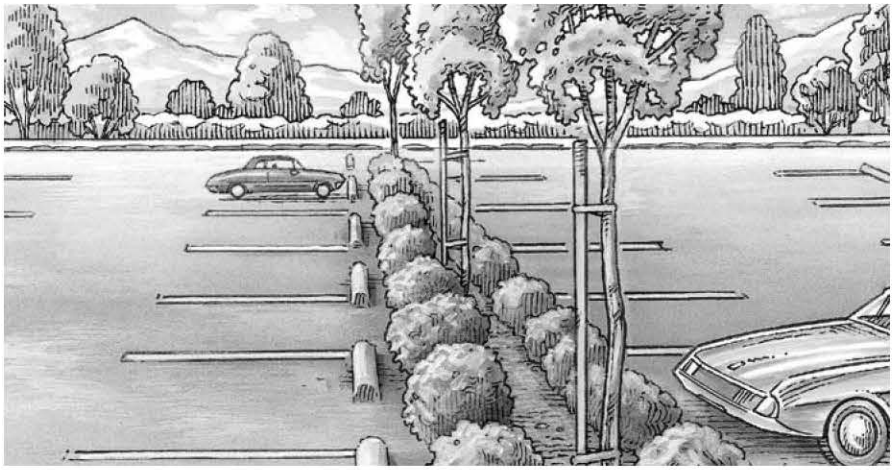
***Consulte a la autoridad de tratamiento de drenajes sanitarios de su localidad** para obtener la autorización de su equipo o sistema de lavado de vehículos. Consulte la información de contacto en la contraportada.*

Áreas Verdes y Alternativas más Seguras a los Pesticidas

- Las medidas para la prevención de la contaminación y los sistemas de tratamiento del agua pluvial forman cada vez más parte de la jardinería ornamental. Debe saber si sus áreas verdes están diseñadas específicamente para minimizar y tratar el escurrimiento del agua pluvial, y, de ser así, cerciórese de que reciba el mantenimiento adecuado tal y como fue diseñado.
- Siga las prácticas ecológicas del programa de jardinería ornamental *Bay-Friendly Landscaping and Gardening Program*. Visite www.bayfriendly.org.
- Use alternativas menos tóxicas a los pesticidas. Si desea mayor información sobre la administración integrada de plagas, visite www.ourwaterourworld.org.
- **No riegue de más** – dé mantenimiento a los rociadores a fin de evitar mojar el pavimento.
- **Quite las hojas caídas** y retire los recortes para convertirlos en composta o ser eliminados junto con los desechos verdes. No deseche nada en la calle, sistema de alcantarillado de agua pluvial o arroyo.

Mantenimiento de Áreas Verdes:

1. Siga el plan de mantenimiento del sistema de tratamiento de agua pluvial basado en áreas verdes que posea.
2. Use métodos para el control de plagas menos tóxicos.
3. Minimice el uso de fertilizantes.



Este es un ejemplo de un terreno pantanoso con vegetación utilizado para dar tratamiento al drenaje del agua pluvial de un estacionamiento. Los terrenos pantanosos le dan a los contaminantes del agua pluvial la oportunidad de asentarse y, cuando el suelo es arenoso, cargar nuevamente los acuíferos de agua subterránea.

Mercurio y Basura

MERCURIO

El mercurio contamina a los peces, provocando que su consumo sea dañino. La agencia estatal de salud ha emitido una serie de recomendaciones detalladas de salud, las cuales están disponibles en *www.oehha.ca. gov/fish/general/sfbaydelta.html*.

- **Deseche** correctamente los desperdicios peligrosos **o recicle** todos los productos que contengan mercurio, incluyendo focos (bombillas) de lámparas **fluorescentes**, manómetros, termómetros, interruptores y baterías. **A fin de evitar la contaminación de los peces, ahora es ilegal desechar cualquiera de estos residuos en la basura junto con el resto de sus desechos comunes.**
- Consulte el sitio web del departamento de control de sustancias tóxicas *California Department of Toxic Substances Control* www.dtsc.ca.gov/HazardousWaste/UniversalWaste/index.cfm para obtener información detallada sobre cómo deshacerse de los desechos que contienen mercurio y otros desechos peligrosos. No lo tire a la basura – ¡es ilegal!

BASURA

La basura es mala para las ventas y hace daño a la salud de los arroyos y de la bahía.

- **Proporcione suficientes receptáculos de basura** para los clientes y empleados. Todos los receptáculos exteriores deben estar cubiertos.
- **Recoja la basura diariamente.** Mantenga la acera en frente de su negocio libre de basura y suciedad. No limpie los derrames utilizando agua que fluya hacia la calle o el sistema de alcantarillado de agua pluvial.
- Todo **arroyo** que pase a través de su propiedad o junto a ella **deberá mantenerse libre de basura y desechos**.

Contacto con Agencias Locales

Inspectores locales del sistema de alcantarillas pluviales

Ciudad	Número telefónico
Atherton	(650) 372-6200
Belmont	(650) 372-6200
Brisbane	(650) 372-6200
Burlingame	(650) 342-3727 y (650) 372-6200
Colma	(650) 372-6200
Daly City	(650) 991-8208
East Palo Alto	(650) 372-6200
Foster City	(650) 522-7300
Half Moon Bay	(650) 372-6200
Hillsborough	(650) 372-6200
Menlo Park	(650) 372-6200
Millbrae	(650) 372-6200
Pacifica	(650) 372-6200
Portola Valley	(650) 372-6200
Redwood City	(650) 372-6200
San Bruno	(650) 372-6200
San Carlos	(650) 372-6200
San Mateo	(650) 522-7300
South San Francisco	(650) 829-3848
Área no Incorporada del Condado de San Mateo	(650) 372-6200
Woodside	(650) 372-6200

Regulador local de desechos peligrosos — **Número telefónico**

(Agencia Certificada del Programa Unificado-CUPA)

La División de Salud Ambiental del Condado de San Mateo (San Mateo County Environmental Health Division) es la CUPA de todas las áreas del Condado de San Mateo ..... (650) 372-6200

Autoridades locales del sistema de drenaje sanitario — **Número telefónico**

Instalaciones de Tratamiento de Aguas Residuales de Burlingame ..... (650) 342-3727
(Brinda servicio a Burlingame, Hillsborough y Burlingame Hills)

Planta de Control de la Contaminación del Agua de Millbrae..... (650) 259-2388

Distrito Sanitario del Norte del Condado de San Mateo .... (650) 991-8200
Planta de Tratamiento de Aguas Residuales
(Brinda servicio a Daly City y partes de Westborough)

Planta de Reciclaje de Aguas Calera Creek de Pacifica.....(650) 738-4660

Planta de Tratamiento de Aguas Residuales de San Mateo..... (650) 522-7300
(Brinda servicio a Foster City y San Mateo)

Instalaciones de Tratamiento de Aguas Residuales de la Autoridad de Alcantarillas del Centro de la Costa ..... (650) 726-0124
(Brinda servicio a Half Moon Bay, Granada, Moss Beach y Montara)

Autoridad del Sistema del Sur de la Bahía ..... (650) 594-8411 ext.140
(Brinda servicio a Atherton, Belmont, Menlo Park, Portola Valley, Redwood City, San Carlos y Woodside)

Planta de Control de la Calidad del Agua de South San Francisco/ San Bruno..... (650) 877-8555
(Brinda servicio a Colma, San Bruno, South San Francisco, y la parte sur de Daly City)

Planta Regional de Control de la Calidad del Agua de Palo Alto... (650) 329-2598
(Brinda servicio a East Palo Alto, Los Altos, Los Altos Hills, Mountain View, Palo Alto y Stanford)

Planta de Tratamiento del Sudeste de San Francisco ..... (415) 648-6882
(Brinda servicio a Brisbane y al este de San Francisco)

Versión fechada mayo de 2008

Su negocio podría tener que ser reglamentado por varias agencias estatales y locales en lo que respecta al cumplimiento de las disposiciones ambientales. Además de seguir estas prácticas para la prevención de la contaminación del agua pluvial, es posible que tenga que obtener la cobertura de un Permiso Industrial General sobre Aguas que Fluyen al Sistema de Alcantarillado (Stormwater Industrial General Permit) de la Junta Estatal de Control de Recursos de Agua (State Water Resources Control Board). Llame al: (916) 341-5538 si desea obtener información adicional.

Todo flujo de aguas residuales hacia el sistema de drenaje sanitario deberá estar autorizado por la autoridad de tratamiento del drenaje sanitario de su localidad. Consulte la lista de contactos que se incluye a la izquierda. Nunca deseche aguas residuales a través del sistema de alcantarillado pluvial.

El programa le extiende su gratitud al Programa para Mantener el Agua Limpia del Condado de Alameda (Alameda Countywide Clean Water Program) por permitirnos la adaptación de este folleto.

Impreso en 50% de papel reciclado con 30% de desechos post-consumidor (PCW), utilizando tintas a base de soya.

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Our Water, Our World Partnering Retail Stores

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Coastal Cleanup Day Reporting Form

Reusable Bag Commitment Form

CASQA Award Presentation

Retail Take-Back Flyer

2007 County Fair Booth Contacts

Homepage for Redesigned Website

ATTENDANCE ROSTER
PUBLIC INFORMATION PARTICIPATION SUBCOMMITTEE
SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM

FY 2007-2008

				1st Half Year				2nd Half Year		
AGENCY	NAME	ALTERNATE / PHONE #	PHONE	Jul-07	Aug-07	Sep-07	Nov-07	Jan-08	Mar-08	May-08
Atherton	Kathy Hughes Anderson		752-0526	1	**	1				
Atherton	Andrea Mardesich	GM	752-0544				1	1	1	1
Belmont	Jozi Plut		595-7425	1	**	1	1	1	1	1
Brisbane	Matthew Fabry		415-508-2134	1	**		1	1	1	1
Burlingame	Eva C. Justimbaste		342-3727		**	1	1	1	1	1
Colma	Muneer Ahmed	Daniel Gonzalez 757-8888	757-8888	1	**	1		1		
Daly City	Ward Donnelly		991-8200	1	**	1	1	1	1	1
East Palo Alto	John Latu	Jaime Camacho 444-0476	853-3165	1	**	1	1		1	1
Foster City	Mike McElligot		286-3279		**					1
Half Moon Bay	Tony Moorhouse		726-7177		**	1				
Hillsborough	Rachelle Ungaretti		375-7444	1	**	1	1		1	
Menlo Park	Dianne Dryer		330-6764	1	**	1	1	1	1	
Millbrae	Shelly Reider	Krista Kuehnhackl	259-2444	1	**	1	1	1	1	1
Pacifica	Lizzy Claycomb	Christina Horrisberger	738-7361	1	**		1		1	1
Portola Valley	Howard Young		851-1700 x 14		**					
Portola Valley	Josh Maierle		851-1700 x 20						1	
Redwood City	Marilyn Harang	Kathy Hunter	780-7477	1	**	1	1	1	1	1
San Bruno	Jim Shannon		616-7046	1	**	1	1	1		1
San Carlos	Michael Fossati	Gavin Moynahan	802-4361	1	**	1				1
San Carlos	Andrea Mardesich		802-4263				1	1	1	
San Mateo City	Vern Bessey		522-7342		**	1	1	1	1	1
San Mateo County	Sarah Pratt		599-1325	1	**	1	1	1	1	1
San Mateo County	Ana Clayton		599-1514	1	**	1			1	1
San Mateo County	Mary Bell Austin		599-1549		**		1	1		1
San Mateo County	Dermot Casey		363-4957		**					
San Mateo County	Julie Colvin		599-1634	1	**	1	1	1		
South San Francisco	Cassie Prudhel	Daniel Fulford	829-3840	1	**			1	1	1
South San Francisco	Frank Mandola				**	1				
South San Francisco	Janice Peregrino						1			
Woodside	EJ Kim			1	**					
E.O.A. Inc.	Fred Jarvis		510-832-2852							
RWQCB, Oakland	Habte Kifle		510-622-2371							
SMCWPPP Prgm. Coord.	Matt Fabry		415-508-2134	1			1	1	1	1
Mosquito Abatement	Chindi Peavey		650-344-8592			1				
Public:						1				
1 - Attendance										
*No Meeting										
**No Meeting (County Fair)										

Zun Zun School Assembly Schedule - 2007/2008

School Name/Venue	City	Month	Day	shows	Price	# Students
Atherton Library	Atherton	July	2	1	0	40
Millbrae Library	Millbrae	July	10	1	0	40
Foster City Library	Foster City	July	11	1	550	40
Baywood Elem	San Mateo	July	12	1	550	490
Brisbane Library	Brisbane	July	12	1	550	40
Belmont Library	Belmont	July	18	1	550	40
Sanchez Library	Pacifica	July	24	1	550	40
E.Palo Alto Library	EPA	July	24	1	550	40
Portola Valley	Portala	July	26	1	550	40
San Carlos Library	San Carlos	July	31	1	550	40
Half Moon Bay Libr	HMB	August	8	1	550	40
Woodrow Wilson	Daly City	Sept	19	2	800	400
Nesbit Elem	Belmont	Sept	20	2	800	360
S. SF Library	SSF	Sept	25	1	550	40
Thomas Edison	Daly City	October	12	2	800	500
Pescadero	Pescadero	October	18	1	550	200
La Honda	La Honda	October	18	1	550	200
Edison Brentwood		October	26	1	550	500
Lomita Park	San Bruno	October	10	1	550	250
SanMateo/Foster City Childrens Annex		October	12	1	550	30
Borel	San Mateo	October	17	1	550	915
Westlake	Daly City	November	20	2	800	360
Medows	Millbrae	December	18	2	800	310
Highlands	San Mateo	December	12	2	800	400
Daniel Webster	Daly City	December	13	2	800	455
Trinity School	Menlo Park	January	8	1	550	150
Laurel Elementary	Atherton	February	6	2	800	487
Washington Elementary	Burlingame	February	5	1	550	234
Millbrae	Millbrae	February	28	2	800	315
Audobon	Foster City	April	25	1	550	547
Cabrillo	Pacifica	June	5	2	800	558
Panorama	Daly City	June	11	2	800	165
			Totals	43	19250	8266

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

FREE ASSEMBLY

Attention Principal or Assembly Coordinator: A musical adventure about storm drains, recycling, and keeping our water clean is available for FREE.

Book NOW for 2007-2008 School Year!

San Mateo County Pollution Prevention Program is thrilled to invite you to enjoy a **FREE** 45-minute assembly*.

Through the use of over 25 instruments from North, Central, and South America, ZunZun will provide an interactive, educational, multicultural, and environmentally focused show. ZunZun's participatory shows promise to engage audiences and provide your school with an assembly to remember.

Topics covered include water pollution, recycling, watershed ecology, storm-drain runoff, ways to save water, and how we are all connected to our waterways. Students will learn water facts and things they can do now to help protect and preserve this vital resource. The shows are lively, fun, funny, and keep children and adults entertained! Shows can be in Spanish, English, or bilingual.

If you have questions about the program, call Ana Clayton at (650) 599-1514.

Book Now!

831-426-0684 or zunzun@zunzuntunes.com

***The Pollution Prevention Program will cover the cost of each show contingent upon grant funding.**
www.flowstobay.org

Sponsored by San Mateo County Environmental Health Department and the San Mateo Countywide Water Pollution Prevention Program, a program of the City/County Association of Governments (C/CAG), and the California Integrated Waste Management Board.

010408

Healthy Schools
Inside & Out

the watershed project

Saturday, October 20, 2007, 9AM–2:30PM

SAN MATEO COUNTY OFFICE OF EDUCATION, 101 TWIN DOLPHIN DRIVE, REDWOOD CITY

A WORKSHOP FOR TEACHERS, ADMINISTRATORS, MAINTENANCE STAFF, PARENTS, AND ANYONE INTERESTED IN LESS TOXIC PRODUCTS

Make the right choices to protect children's health and the environment!

Find out what's in the many products used in and around your school—and home—for cleaning and pest control. • Learn about risks to human health and the environment from common hazardous household waste • compare less-toxic products • understand the Healthy Schools Act • reduce pollution at school and beyond.

Includes green clean kit with recipes and free samples, plus activity binder for K-12 educators. Cost $30.
Register at **510.665.3430** or **www.theWatershedProject.org**. Academic credit available through CSU East Bay.

Registration Form

NAME _____

HOME ADDRESS _____ CITY _____ ZIP _____

HOME PHONE _____ EMAIL *(If provided, confirmation of registration will be sent via email.)* _____

WORK/SCHOOL _____

WORK ADDRESS _____ CITY _____ ZIP _____

WORK PHONE _____ GRADES TAUGHT _____

❒ YES, I've taken one of your workshops before.
❒ YES, you may give out my email/phone number to class participants for carpooling.
❒ YES, I teach at a school where at least half the students are eligible for free or reduced-price lunch.

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community.

the watershed project

This workshop is funded with support from the San Mateo Countywide Water Pollution Prevention Program and sponsored by the Watershed Project. The mission of the Watershed Project is to educate and inspire communities to protect their local watersheds.

Mail your completed registration form, with your non-refundable payment to:

the Watershed Project
1327 South 46th Street
155 Richmond Field Station
Richmond, CA 94804

Make checks payable to:
the Watershed Project

010409

Leading the way to...

Healthy Schools©

... less toxic alternatives for school maintenance

Funded by: SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community. www.flowstobay.org

Produced by: the watershed project

WHY *Should you be concerned?*

Safety was cited as the #1 concern among many janitors and building maintenance workers.

Health & Safety

- Many cleaning products contain **carcinogens, asthmagens** and substances associated with damage to reproductive organs, birth defects, kidney failure, blindness and other health effects. Substances not only can be inhaled, but also absorbed through the skin to damage organs.
- Recent worker's compensation data shows that approximately **6% of janitors have lost-time injuries** per year.
- EPA ranks indoor air quality as one of the **top 5 environmental risks,** partially due to the use of conventional cleaning products.
- 12% of asthma cases were from exposure to cleaning products at work.
- Bleaches that contain chlorine become **extremely toxic** when mixed in any wastewater that contain ammonia.

Cleaning products also contribute to environmental pollution by making their way to our creeks and the bay, and are toxic to aquatic organisms.

Environmental Impact

- In California, nearly **10%** of all non-vehicular VOCs (Volatile Organic Compounds) released to the outdoor environment, come from cleaning products.
- Cleaners containing phosphate **kill marine life** by causing excess algae blooms that rob water of oxygen and block sunlight.
- Ingredients, such as alkylphenol ethoxylate surfactants, do not break down easily in the environment and may interfere with the hormonal system of exposed organisms.

How Toxic is My Product?

Look for **Signal Words** (Keywords that warn of the potential *immediate* danger level, as tested on a *180lb male*)

SIGNAL WORDS	
WARNING or CAUTION	Substance may pose a lesser degree of hazard, even though they may still be flammable, combustible, corrosive, or have harmful vapors.
DANGER	Substance is extremely toxic or highly flammable or corrosive.
POISON	Substance is most toxic and can kill.

Avoid ingredients that pose the **greatest** health hazard.

HIGH RISK INGREDIENTS

Class	*Ingredient*	*Health Hazard*
Acids	Hydrochloric Acid Phosphoric Acid	Corrosive. Causes blindness and damages skin.
Caustic	Sodium Hydroxide Sodium Metasilicate Potassium Hydroxide	Corrosive. Causes blindness and can cause severe skin damage.
Solvents	Perchloroethylene Butoxyethanol Ethanolamine Toluene	Causes cancer. Absorbs through skin & poisons liver, kidneys, and fetuses.
Disinfectants	Alkyl Phenol Ethoxylates	Persists in the environment and affects animal hormone systems.
Surfactants	Bleach Urinal Blocks Quaternary-Ammonium Chloride	Corrosive. Bleach mixes with ammonia or acid and causes poisonous gas. Can cause cancer.

the watershed project http://www.TheWatershedProject.org

What can I do and where can I find out more?

Resources

Fact Sheet: ***Environmentally Preferable Janitorial Cleaning Products***
http://www.stopwaste.org/docs/janitorial_cleaning_products.pdf

For a guide to buying green cleaning products, go to:
http://www.responsiblepurchasing.org/purchasing_guides/cleaners/products

To buy green janitorial products online:
http://www.all-greenjanitorialproducts.com/

Green Janitorial Service in San Mateo area:
Phone: *(415) 642-2100*
http://www.gmgjani.com/

The Green Cleaning Pollution Prevention Calculator:
http://www.ofee.gov/janitor/index.asp

Proper Disposal

Unused portions of cleaning supplies must be dealt with as household hazardous waste!

Household Hazardous Waste Program (San Mateo County):
Very Small Quantity Generator Program: *(650) 363-4607*
http://www.smhealth.org/vsqg

Schools Hazardous Waste Collection, Consolidation, and Accumulation Facility:
More info: http://www.calcupa.net/programs/hazwaste/FS-02-030.pdf
Implementation questions: http://www.desc.ca.gov

Recycle Works: A Program of San Mateo County
Recycle Works Hotline: *1-888-442-2666*
http://www.recycleworks.org/index.html

Publication produced by: the watershed project

010412

San Mateo County Pollution Prevention Calendar 2008

KIDS ACTIVITY GUIDE INSIDE

Funded by a Grant from the California Integrated Waste Management Board

San Mateo County POLLUTION PREVENTION PROGRAM

WHO WE ARE

San Mateo County Environmental Health works to ensure a safe and healthful environment for residents through education, monitoring, and enforcement.

The Pollution Prevention Program focus is on recycling used oil, reducing and properly disposing of household hazardous waste, and storm water pollution prevention. This calendar can be used as a tool for pollution prevention and a resource for discovering the natural beauty of San Mateo County.

ENVIRONMENTAL HEALTH
SAN MATEO COUNTY

Protecting Our Health and Environment

CONVENIENT, SAFE DISPOSAL OF HOUSEHOLD HAZARDOUS WASTE (HHW)

We collect paints, pesticides, thinners, pool chemicals, cleaners, and other toxics at collection events held throughout the year. San Mateo County residents may use any of the dates shown on the calendar by the HHW icon. An appointment must be made to dispose of toxics. Call (650) 363-4718 or go to www.smhealth.org/hhw

USED OIL RECYCLING

Used motor oil is a large portion of the pollution in our waterways. Oil is sometimes dumped or leaks from cars or other mechanical equipment. Do the right thing—keep your car in tune, if you change your own oil, take the oil and filter to one of the collection centers listed on the back of the calendar.

RECYCLE USED OIL

WATER POLLUTION PREVENTION

The storm drain system channels rainwater from streets and landscaping into creeks that flow to the Bay or the Pacific Ocean. The water is not treated at a sewage treatment plant, and can be contaminated by oil, pesticides, litter and other contaminants that run off pavement and yards. Learn about preventing pollution and best management practices at www.flowstobay.org

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community.

SIMPLE THINGS YOU CAN DO TO BE EARTH FRIENDLY

Make conscious choices.

1. Reduce the amount of stuff you buy and look for things that are sold in recyclable packaging.
2. Recycle everything you can, reuse the things you can't.
3. Replace the light bulbs in your house with energy efficient bulbs.
4. Bring your own bags to the grocery store so you don't have to use new plastic or paper bags.
5. Buy and use rechargeable batteries. They last longer and pollute less.

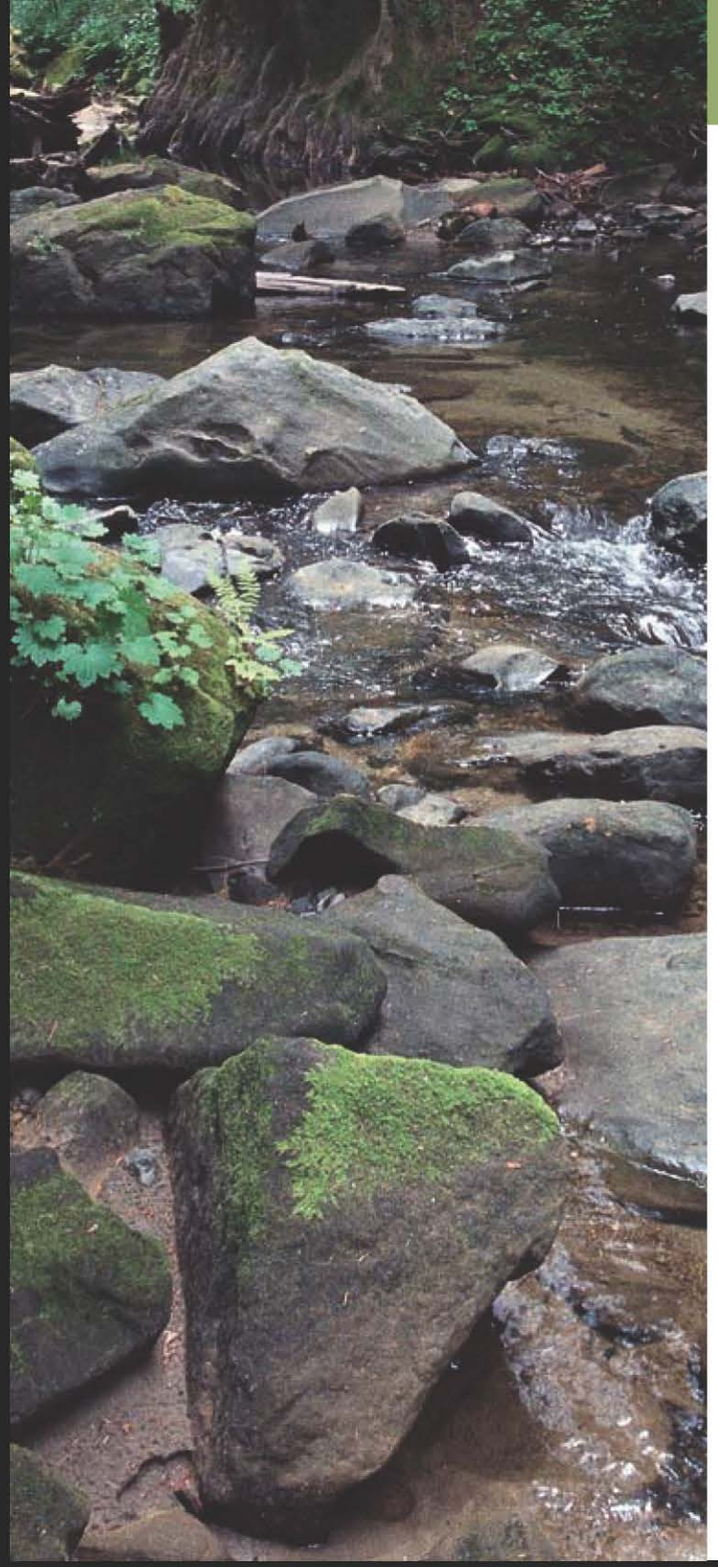
Reduce, Reuse, and Recycle.

Are you looking for other alternatives to reduce, reuse, and recycle products that go beyond what municipal recyclers and compost bins can handle? Let's **Reduce, Reuse, and Recycle the following:**

1. **Appliances:** Goodwill accepts working appliances, www.goodwill.org, or you can contact the Steel Recycling Institute to recycle them, www.recycle-steel.org.
2. **Clothes:** Wearable clothes can go to your local Goodwill outlet or shelter. Consider holding a clothes swap at your office, school, faith congregation or community center. Swap clothes with friends and colleagues, and save money on a fall wardrobe and back-to-school clothes.
3. **Computers and electronics:** Find the most responsible recyclers, local and national, at rethinkwaste.org or mygreenelectronics.org.
4. **Ink/toner cartridges:** Recycleplace.com pays $1/each or more.
5. **Miscellaneous:** Get your unwanted items into the hands of people who can use them. Offer them up on your local Craigslist.org listserv, or try giving them away in your local community.

Vote with your dollars.

You can make a difference. Let companies know that you won't accept toxic and over packaged products into your home. Get more information about the companies who produce and sell the products you use at www.responsibleshopper.org. Choose less toxic and buy less!



WEB RESOURCES

Web resources are incorporated throughout the calendar to enhance the text provided with each month. Listed below are a few general websites that list information about the environment, pollution prevention and conservation.

San Mateo Countywide Water Pollution Prevention Program
www.flowstobay.org
Solutions to help control water pollution.

San Mateo County Environmental Health
www.smhealth.org
Link to Environmental Health Department Programs–food, toxics, housing, solid waste, and water.

San Mateo County Recycleworks
www.recycleworks.org
Reuse, recycling, composting, sustainable living and green building information.

Earth 911
www.earth911.org
National hotline with local information on recycling, green shopping, energy conservation, household hazardous waste, environmental education, and more.

California Integrated Waste Management Board
www.ciwmb.ca.gov
State agency that oversees all statewide recycling requirements.

U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics
www.epa.gov/p2
Pollution prevention information for businesses and residents.

Newsletters
Lighter Foot Step: www.lighterfootstep.com
Treehugger: www.treehugger.com
Environmental Health News: www.environmentalhealthnews.org

Other
Cosmetic Safety Database
www.cosmeticsdatabase.com
Surf Your Watershed
www.epa.gov/surf
Green TV www.green.tv

FROM THE PHOTOGRAPHER

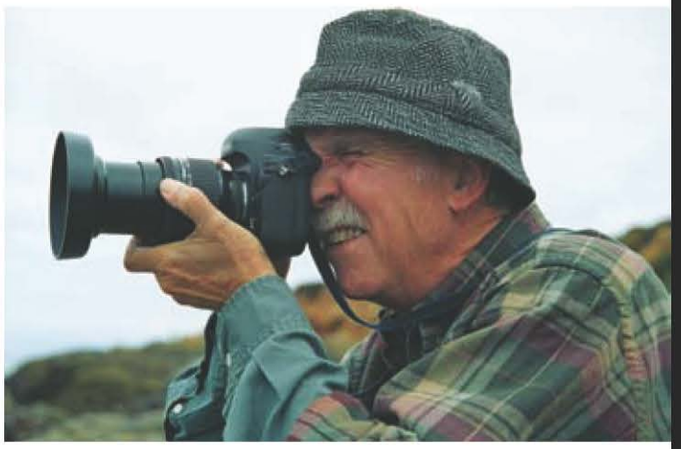


Photo by Bev Baldwin

I would like to thank my colleagues for their work in producing the 2008 Pollution Prevention Calendar. Their subject ideas, text writing, photo selection, technical and graphic support, and project management make this yearly project a pleasure.

Pete Smith (650) 599-1600
pasmith@co.sanmateo.ca.us

This calendar is printed on recycled paper.

NEW LEAF PAPER™

ENVIRONMENTAL BENEFITS STATEMENT

San Mateo County saved the following resources by using New Leaf Primavera, made with 80% recycled fiber, 40% post-consumer waste, and processed chlorine free.

trees	water	energy	solid waste	greenhouse gases
89 fully grown	54,809 gallons	65 million BTUs	4,399 pounds	11,446 pounds

Calculations based on research by Environmental Defense and other members of the Paper Task Force.

©2006 New Leaf Paper www.newleafpaper.com

A San Mateo County Health Department Program • Funded by a grant from the California Integrated Waste Management Board • Project Manager/Editor: Ana Clayton • Project Staff: Sarah Pratt, Mary Bell Austin and Julie Colvin • Design and Production: Schmidt Creative

010416

JANUARY 2008

Least Sandpiper

The least sandpiper is the smallest shorebird in the world. Shorebirds like the least sandpiper aren't hurt just by ecological disasters like large oil tanker spills. Small amounts of motor oil from cars, trucks, and busses can also find their way through the storm drains onto these birds' feeding grounds.

Tiny creatures living in the banks and mudflats absorb the petroleum. Some die, depriving the birds of a food source. Others survive, and pass on the contamination to the birds that eat them.

The least sandpiper and similar shorebirds forage on the mudflats for food, eating mainly small crustaceans, insects, and snails. When birds eat foods contaminated by petroleum, it hurts their health in a number of ways. Effects range from weakness to illnesses like pneumonia and liver failure, to problems creating healthy eggs that will survive.

You can help protect the least sandpiper and other shorebirds by keeping your car leak-free and making sure its motor oil and filter gets recycled.

Resources:
www.ciwmb.ca.gov/UsedOil

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
DECEMBER 2007 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	FEBRUARY 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29	1 New Year's Day	2	3	HHW 4 San Mateo	HHW 5 San Carlos San Mateo
6	7	8 ●	9	HHW 10 San Bruno	HHW 11 San Mateo	HHW 12 San Mateo
13	14	15 ◐	16	17	HHW 18 San Mateo	HHW 19 Pacifica San Mateo
20	21 Martin Luther King, Jr. Day	22 ○	23	HHW 24 So. San Francisco	HHW 25 San Mateo	HHW 26 Half Moon Bay San Mateo
27	28	29	30 ◑	31	*"We need to push ourselves to make as many reductions as possible in our own energy use first…and that takes time. But we must do this quickly…the climate will not wait for us."* —Rupert Murdoch	

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

FEBRUARY 2008

1948 International

Americans express their fondness for motor vehicles in many ways. One is to hold on to a car or truck long after others would have parted ways. Some restore their automobile for car shows, others might use them to go for rides on weekends, and some, like the the owner of the truck above, might use them to perform the occasional chore around the ranch.

One thing that automobile collectors have in common is that they are more likely to be do-it-yourself oil changers. If you change your own oil on your car or truck, work carefully and dispose of the used motor oil and filters at one of the free collection centers in San Mateo County. Look for the "oil drop" symbol in the window of local stores.

Tips for Changing Your Own Oil:

- Drain used oil into a clean non-breakable container that has a screw on cap.
- Do not mix used oil with any other materials, not even water.
- Place your used oil filter in a sealed plastic bag. Take it to a collection center that accepts oil filters.
- Take the container of used oil to your nearest free used oil collection site. (If your trash company offers curbside pickup, you can place it next to your trash can instead.)

To Find a Free Collection Center:

- Call 1-800-CLEANUP or
- Look on the back of this calendar

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
"Quality means doing it right when no one is looking." —Henry Ford			JANUARY 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	MARCH 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	HHW San Mateo 1	HHW San Carlos San Mateo 2 Groundhog Day
3	4	5	6 Ash Wednesday	7 ● Chinese New Year	HHW San Mateo 8	HHW Menlo Park San Mateo 9
10	11	12 Lincoln's Birthday	13	HHW San Bruno 14 ◐ Valentine's Day	HHW San Mateo 15	16
17	18 Presidents' Day (observed)	19	20	21 ○	HHW San Mateo 22 Washington's Birthday	HHW San Mateo 23
24	25	26	27	HHW So San Francisco 28	HHW San Mateo 29 ◑	

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

010420

MARCH 2008

Corte de Madera Open Space

El Corte de Madera Creek Open Space Preserve encompasses 2,817 acres in the upper headwaters of the San Gregorio Creek watershed.

A watershed is an area of land that water flows across on its way to creeks, rivers, streams, and finally into the bay and ocean. Humans use our watersheds for drinking water, recreation, food production, and for many other activities. Healthy watersheds are vital for a healthy environment and economy.

So the next time you think about washing your car in your driveway or using pesticides in your yard, remember water that falls on streets, yards, and sidewalks can carry pollutants and litter into storm drains. This water does not go to the sewer or water treatment plant; it flows untreated straight to the nearest creek, river, estuary, bay, or ocean.

Help protect our watershed:

- Take your vehicle to a commercial car wash. If you choose to wash your car use biodegradable, phosphate-free, water based cleaners and wash on an area that absorbs water, such as gravel or grass.
- Do not use pesticides. Allow insect- and pest-eating birds to eat the pests in your backyard. Go to www.ourwaterourworld.org for information on pesticide alternatives.
- Properly dispose of household hazardous waste: paints, pesticides, cleaners and other toxics. Call 650-363-4718 to make an appointment.

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
"A journey of a thousand miles must begin with a single step." —Lao-Tsu		FEBRUARY 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29	APRIL 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30			HHW San Carlos San Mateo 1
2	3	4	5	6	HHW San Mateo 7 ●	HHW Daly City San Mateo 8
9 Daylight Savings Time Begins	10	11	12	HHW San Bruno 13	HHW San Mateo 14 ◐	HHW Pacifica San Mateo 15
16 Palm Sunday	17 St. Patrick's Day	18	19	20 First Day of Spring	HHW San Mateo 21 ○ Good Friday	HHW San Mateo 22
23 Easter	24	25	26	HHW So San Francisco 27	HHW San Mateo 28	HHW San Mateo 29 ◑
30	31					

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

010422

APRIL 2008

California Sea Lions

California sea lions are known for their intelligence, playfulness, and noisy barking. They are very social animals that feed on squid, octopus, herring, rockfish, mackerel, and small sharks. Sea lions, as well as other animals, are affected by oil contamination and plastic debris.

If the sea lions get oil on their coats, their natural insulation can be reduced, leading to body temperature fluctuations and hypothermia. They also ingest the oil as they clean themselves – causing kidney damage, altered liver function and digestive tract irritation.

Animals are also greatly affected by marine debris. In the sea, big pieces of plastic look like jellyfish or squid, while small pieces look like fish eggs. When plastic debris is swallowed it may remain in the animal's stomach, blocking digestion and even causing starvation.

Remember, April 22, 2007 is Earth Day!

Take these simple measures to ensure every day is Earth Day:

- Pick up litter around your neighborhoods and beaches.
- Do not dump ANYTHING into storm drains.
- Properly dispose of household toxics, used oil, and boating wastes.
- Reduce, Reuse, and Recycle.

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
"It is a curious situation that the sea, from which life first arose should now be threatened by the activities of one form of that life. But the sea, though changed in a sinister way, will continue to exist; the threat is rather to life itself." —Rachel Carson		1 April Fool's Day	2	3	HHW San Mateo 4	HHW San Carlos San Mateo 5
6 ●	7	8	9	HHW San Bruno 10	HHW San Mateo 11	HHW La Honda San Mateo 12 ◐
13	14	15	16	17	HHW San Mateo 18	HHW Pacifica San Mateo 19 Passover begins at sundown
20 ○	21	22 Earth Day	23	HHW So. San Francisco 24	HHW San Mateo 25 National Arbor Day	HHW Half Moon Bay San Mateo 26
27	28 ◑	29	30			

MARCH 2008

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MAY 2008

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HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

MAY 2008

Bike to Work Day

Never used your bike to commute to work? National Bike to Work Day is a great time to start! Local groups like the Peninsula Bicycle and Pedestrian Network can provide you with a biking buddy, a bike tune-up clinic, or snacks and encouragement.

A bike commute lets you:

- Improve your health. Why drive to the gym?
- Save money on auto gas, maintenance, parking, and tickets.
- Reduce air, water and noise pollution. Be part of the solution!
- Reduce traffic congestion.
- Explore your community, and have FUN.

You can use your bike for in-town errands, too – most trips the average person makes by car are less than two miles. In addition, San Mateo County has hundreds of miles of scenic roads and trails for bikers.

To make biking in San Mateo County easier and more enjoyable, pick up the new, updated map of bike routes in the County.

Resources:
www.bayareabikes.org
www.penbiped.net
www.sfbike.org

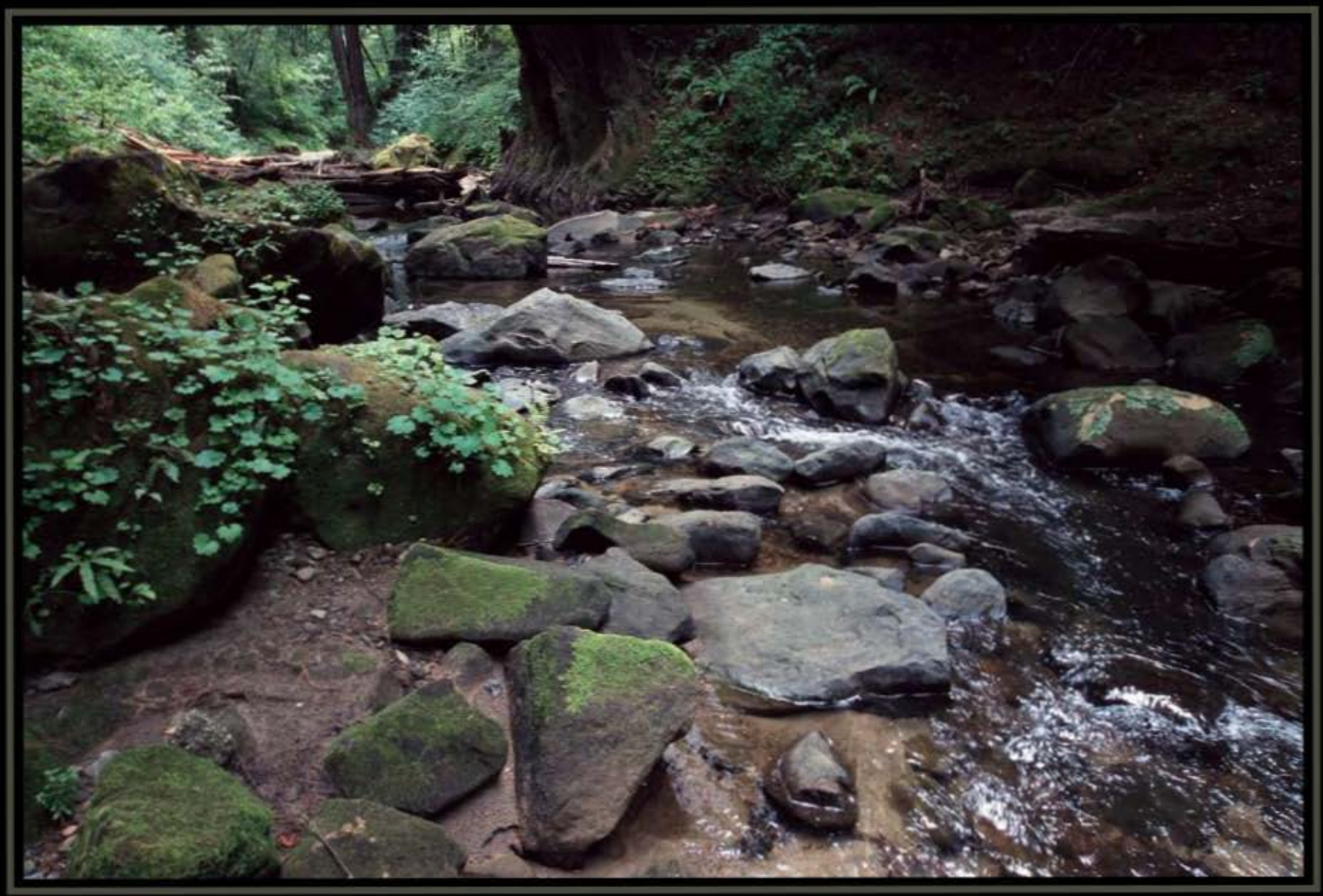
Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
APRIL 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	JUNE 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	*"Every day is a new beginning. Treat it that way. Stay away from what might have been, and look at what can be."* —Marsha Petrie Sue	1	HHW San Mateo 2	HHW San Carlos San Mateo 3 Cinco de Mayo
4	5 ●	6	7	HHW San Bruno 8	HHW San Mateo 9	HHW Redwood City San Mateo 10
11 Mother's Day	12 ◐	13	14	15	HHW San Mateo 16 Bike to Work Day	HHW Pacifica San Mateo 17
18	19	20 ○	21	HHW So. San Francisco 22	HHW San Mateo 23	24
25	26 Memorial Day (observed)	27	28 ◑	29	HHW San Mateo 30	HHW San Mateo 31

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.



010426

JUNE 2008

Pescadero Creek

Pescadero Creek begins near Skyline Blvd. and runs through woods and neighborhoods to the Pacific Ocean. It flows all year round, and is home to steelhead trout and silver salmon. Both types of fish spawn in the stream, are endangered species, and are affected by the pesticides that end up in the creek.

Pesticides end up in our local waterways when rain or over watering carries them from lawns and gardens through the storm drain system to local waterways. Currently the synthetic form of a pesticide made from chrysanthemum flowers, known as "pyrethroids" are the most common pesticides used in urban areas and are extremely toxic to fish. They are designed to kill a wide variety of insect pests, including ants, cockroaches, and lawn grubs. However, they are also highly toxic to fish, aquatic insects, crustaceans, and the beneficial insects. These beneficial insects such as ladybugs, lacewings, and earthworms naturally keep pest populations low.

It only takes a little pollution to affect an aquatic ecosystem, destroy a habitat, and kill wildlife. When less-toxic alternatives are selected wisely, used in combination with other pest control measures (known as Integrated Pest Management – IPM), and applied safely, the contamination of our surface waters and aquatic life can be prevented.

To learn more about IPM & less toxic pesticides: www.ourwaterourworld.org

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3 ●	4	5 World Environment Day	6 HHW San Mateo	7 HHW San Carlos San Mateo
8	9	10 ◐	11	12 HHW San Bruno	13 HHW San Mateo	14 HHW Daly City San Mateo Flag Day
15 Father's Day	16	17	18 ○	19	20 HHW San Mateo First Day of Summer	21 HHW Pacifica San Mateo
22	23	24	25	26 HHW So San Francisco ◑	27 HHW San Mateo	28 HHW San Mateo
29	30					

MAY 2008

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JULY 2008

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"There is a way that nature speaks, that land speaks. Most of the time we are simply not patient enough, quiet enough, to pay attention to the story."
—Linda Hogan

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

LYNDIE J.
250246

JULY 2008

Pillar Point Harbor

Home to nine marinas, San Mateo County is an excellent place for boating. However, being so close to the habitat of water birds, fish and mammals, boaters must take special care to prevent pollution from their activities.

Key things you can do:

- Place an absorbent pad in the bilge to prevent discharge of oily water. Dispose of the pad in an oil collection bin, or at a hazardous waste collection center.
- Never apply detergent to an oil sheen on the water. Use absorbent pads or booms instead.
- Prevent leaks and spills from the engine by proper maintenance of lines and hoses.
- Prevent fueling spills. Don't let the tank overflow, and use an absorbent pad for drips.
- Recycle your oil, oil filters, paint, batteries, and other chemicals at an official collection center.
- Never discharge sewage overboard. Use pump-outs instead.
- Use only bio-degradable, phosphate-free cleaning products.
- Secure plastics, styrofoam, and trash on board and recycle or dispose of it at shore-side.

Resources:
www.coastal.ca.gov
www.americanboating.org/clean.asp

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
"We may have all come on different ships, but we're in the same boat now." —Martin Luther King, Jr.		1	2	3 ●	4 Independence Day (observed)	5
6	7	8	9	HHW San Bruno 10 ◐	HHW San Mateo 11	HHW Menlo Park San Mateo 12
13	14	15	16	17	HHW San Mateo 18 ○	HHW Pacifica San Mateo 19
20	21	22	23	HHW So. San Francisco 24	HHW San Mateo 25 ◑	HHW Half Moon Bay San Mateo 26
27	28	29	30	31		

JUNE 2008

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AUGUST 2008

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HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

AUGUST 2008

Horse, Cañada Road

Long before the automobile was invented, horse-drawn vehicles were used throughout the world for all kinds of transportation and farming. While they are still needed in parts of the world for these purposes, most horses today are used for recreation.

Although most of us can't ride a horse for our current transportation needs, we can choose the best vehicle available and maintain it properly. Remember:

- **Choose a clean, fuel efficient vehicle.** The more efficient the engine, the cleaner it burns fuel, reducing a variety of air pollutants. The better the gas mileage, the less fuel burned. And when you burn less fuel, you not only cut emissions, but also save all the resources related to making and transporting it.
- **Drive fewer miles.** Whenever possible, take public transportation, carpool, and combine activities into one trip.
- **Maintain your vehicle properly.** A poorly tuned vehicle pollutes significantly more than one that is well-maintained.
- **Refuel wisely.** When the weather is warm, try to refuel early in the morning or late in the evening to reduce the amount of fuel vapors that escape during the heat of the day. And never top off your tank beyond the automatic shutoff point.

Resources:
http://www.fueleconomy.gov

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
"Everywhere is within walking distance if you have the time." —Steven Wright		JULY 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	SEPTEMBER 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30		HHW San Mateo 1 ●	HHW San Carlos San Mateo 2
3	4	5	6	7	HHW San Mateo 8 ◐	HHW Daly City San Mateo 9
10	11	12	13	HHW San Bruno 14	HHW San Mateo 15	HHW Pacifica San Mateo 16 ○
17	18	19	20	21	HHW San Mateo 22	HHW San Mateo 23 ◑
24 31	25	26	27	HHW So San Francisco 28	HHW San Mateo 29	30 ●

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

SEPTEMBER 2008

Surfers, Linda Mar Beach

San Mateo County has 54 miles of spectacular coastline bluffs and beaches. Unfortunately, trash from houses, stores, restaurants, roadsides, schools and parks routinely ends up in our coastal waterways and the ocean.

All types of trash imaginable – cigarette filters and cigar tips, beverage bottles and cans, straws, six-pack rings and plastic bags, fishing line, and more – work their way into our waterways. When mishandled, these discarded packaging materials and products harm our environment. Trash and pollution from parking lots and roadways often wind up in storm drains that flow directly into our creeks, bay, and ocean.

California Coastal Cleanup Day is the largest water quality-related volunteer event in California. Each year, thousands of volunteers turn out to California's beaches, lakes, and waterways to help remove hundreds of thousands of pounds of accumulated debris. In 2007, 2,017 volunteers collected 24,033 pounds of trash and recyclables in San Mateo County.

On Saturday, September 20th from 9 am to noon volunteer and join your friends, family, and neighbors to take care of your own environment, show community support, learn the impacts of trash, and have fun.

Trash Facts

- Most trash that collects on California's beaches comes from inland sources.
- 60-80% of what volunteers remove is plastic, which never decomposes in the environment.

Resources:

www.flowstobay.org
www.coastal.ca.gov
www.algalita.org

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
	1 Labor Day (observed)	2 Ramadan	3	4	5 HHW San Mateo	6 HHW San Carlos San Mateo
7 Grandparent's Day	8	9	10	11 HHW San Bruno	12 HHW San Mateo	13 HHW Portola Valley San Mateo
14	15 POLLUTION PREVENTION WEEK	16	17	18	19 HHW San Mateo	20 HHW Pacifica San Mateo California Coastal Cleanup Day
21	22 First Day of Autumn	23	24	25 HHW So San Francisco	26 HHW San Mateo	27 HHW San Mateo
28	29 Rosh Hashanah Begins at Sundown	30				

AUGUST 2008

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31						

OCTOBER 2008

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26	27	28	29	30	31	

"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has."
—Margaret Mead

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

Lesser Yellowlegs

The lesser yellowlegs *(Tringa flavipes)* is a medium-sized shore bird that is known for its bright yellow legs and fairly long, thin, straight bill. They appear along the coast of California in the early wintertime and feed on insects and small fish and crustaceans.

This yellow-legged bird prefers to live in wetland areas such as coastal mudflats, lagoons, inland lakes, ponds, rivers, and flooded grasslands. These habitats are crucial for providing food, shelter and nesting grounds. Wetlands also act as a filter for contaminants from polluted runoff.

When water runoff flows along the ground, it can pick up contaminants such as mercury. Mercury is harmful to creatures that ingest it. As larger animals eat smaller animals contaminated by it, the mercury continues to increase in concentration and toxicity.

If you have mercury in your household never throw it away. Properly dispose of it through the County's Household, Hazardous Waste program, for free.

Products that contain mercury:

- Fluorescent lamps
- Household batteries
- Non-digital thermometers
- Barometers and gas meters
- Musical greeting cards
- Children's shoes that light up

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

OCTOBER 2008

SUN	MON	TUE	WED	THU	FRI	SAT
SEPTEMBER 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	*"Environmental protection doesn't happen in a vacuum. You can't separate the impact on the environment from the impact on our families and communities."* —Jim Clyburn		1	2	HHW San Mateo 3	HHW San Carlos San Mateo 4
5	6	7 ◐	8 Yom Kippur begins at sundown	HHW San Bruno 9	HHW San Mateo 10	HHW Redwood City San Mateo 11
12	13 Columbus Day (observed)	14 ○	15	16	HHW San Mateo 17	HHW Pacifica San Mateo 18
19	20	21 ◑	22	HHW So. San Francisco 23	HHW San Mateo 24 United Nations Day	HHW Half Moon Bay San Mateo 25
26 Mother-in-law-Day	27	28 ●	29	30	HHW San Mateo 31 Halloween	NOVEMBER 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

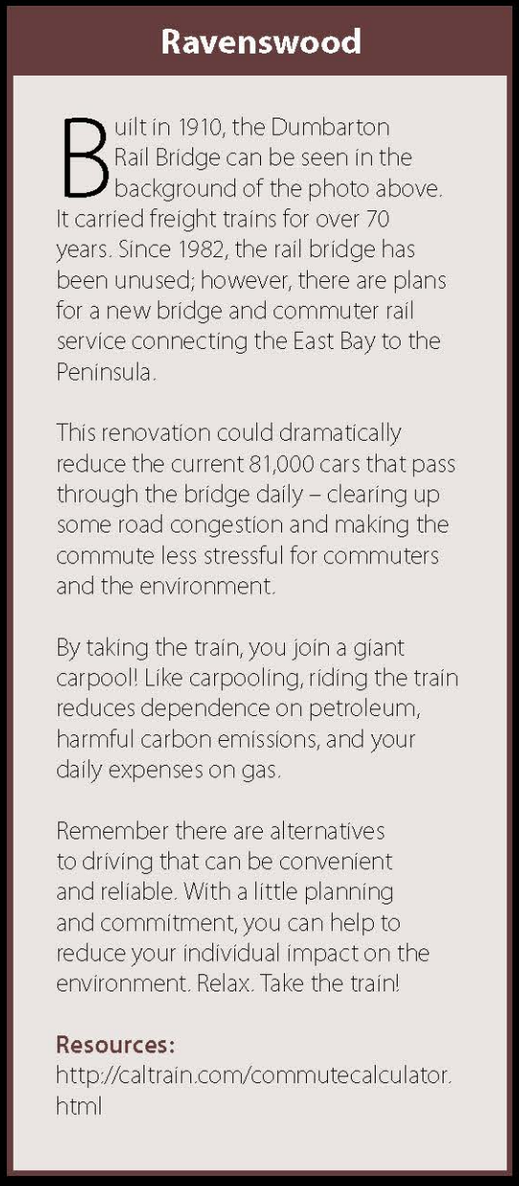
HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

010435

NOVEMBER 2008

Ravenswood



Built in 1910, the Dumbarton Rail Bridge can be seen in the background of the photo above. It carried freight trains for over 70 years. Since 1982, the rail bridge has been unused; however, there are plans for a new bridge and commuter rail service connecting the East Bay to the Peninsula.

This renovation could dramatically reduce the current 81,000 cars that pass through the bridge daily – clearing up some road congestion and making the commute less stressful for commuters and the environment.

By taking the train, you join a giant carpool! Like carpooling, riding the train reduces dependence on petroleum, harmful carbon emissions, and your daily expenses on gas.

Remember there are alternatives to driving that can be convenient and reliable. With a little planning and commitment, you can help to reduce your individual impact on the environment. Relax. Take the train!

Resources:
http://caltrain.com/commutecalculator.html

SUN	MON	TUE	WED	THU	FRI	SAT
"Our personal consumer choices have ecological, social, and spiritual consequences. It is time to re-examine some of our deeply held notions that underlie our lifestyles." —David Suzuki			OCTOBER 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	DECEMBER 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		HHW San Carlos San Mateo 1
2 Daylight Savings Time Ends	3	4 Election Day	5	6 ◐	HHW San Mateo 7	HHW Daly City San Mateo 8
9	10	11 Veterans Day (observed)	12	HHW San Bruno 13 ○	HHW San Mateo 14	HHW Pacifica San Mateo 15 America Recycles Day
16	17	18	19 ◑	20	HHW San Mateo 21	HHW San Mateo 22
23	24	25	26	27 ● Thanksgiving	28 Buy Nothing Day	29
30						

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

DECEMBER 2008

Suburban Garden

A garden provides us with a good example of the remarkable balance of life in an ecosystem and the interactions between the creatures that share habitat. Every garden needs "good" bugs in it that will feed on the "bad" bugs or garden pests. These garden pests are the ones that are responsible for eating your plants and flowers.

When gardeners use pesticides to control garden pests, the chemicals don't just kill the pests; they kill the "good bugs" or beneficial insects too. Encouraging a natural balance in the garden eliminates the need for garden chemicals.

One way to protect the natural balance is to choose plants for the garden that will attract beneficial insects. Plants in the carrot family (*Apiaceae*), the sunflower or daisy family (*Asteraceae*), the mustard family (*Brassicaceae*), and many mints (*Lamiacaeae*) are good choices for attracting beneficial insects to your garden. December is a great month to begin planning for your spring garden.

Garden Tasks for December:

- Prune fruit trees and grapevines.
- Fill bird feeders and birdbaths.
- Harvest any winter crops that are ready.
- Monitor the garden to check for pests.
- Check any cuttings you made and maintain even watering.
- Look over seed catalogs to plan for your spring garden.

Resources:
www.groworganic.com
www.buginfo.com

Recycle Used Oil
Call 1-800-CLEANUP

See the back of this calendar to find more information on where to dispose of used oil and other hazardous materials.

SUN	MON	TUE	WED	THU	FRI	SAT
NOVEMBER 2008 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1	2	3	4	HHW San Mateo 5 ◐	HHW San Carlos San Mateo 6
7 Pearl Harbor Day	8	9	10 Human Right's Day	HHW San Bruno 11	HHW San Mateo 12 ○	HHW San Mateo 13
14	15	16	17	18	HHW San Mateo 19 ◑	HHW Pacifica San Mateo 20
21 First Day of Winter Hanukkah begins at sundwn	22	23	24	25 Christmas	26 Kwanzaa	27 ●
28	29	30	31 New Year's Eve	JANUARY 2009 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	*"Earth laughs in Flower."* —Ralph Waldo Emerson	

HHW Household Hazardous Waste Event

Call 650-363-4718 or visit *www.smhealth.org/hhw* to make an HHW appointment.

Recycle your used motor oil, oil filters, antifreeze, car batteries, latex paint, fluorescent lamps[1], and household batteries![2]

San Mateo County has compiled this list as a reference. If you have any questions about proper disposal of other household chemicals, please call 650-363-4305. To dispose of other household waste at a collection event call **363-4718** or visit **smhealth.org/hhw** to make an appointment.

AUTOMOTIVE
A–antifreeze
B–car batteries
O–used motor oil
F–oil filters
T–tires (fee)

HOUSEHOLD
H–household batteries
P–latex paint
L–fluorescent lamps
C–computers, TVs (fee)

Oil and oil filters are accepted free of charge at all locations. State Certified Collection Centers will pay 16 cents per gallon for used oil upon request. A fee may apply for antifreeze, tires, and batteries. Call before visiting collection centers. Used oil and antifreeze must not be mixed with any other automotive products. No broken batteries can be accepted. **Do not leave your oil at an unattended station.**

Site	Address	Phone	Automotive					Household			
Atherton[4]											
Town Hall	91 Ashfield Rd.	325-4457						H			
Permit Center	83 Station Lane	752-0560						H			
Belmont[4]											
Carlmont Village Shell[3]	2000 Ralston Ave.	592-3637			O		T				
Brisbane[4]											
Brisbane City Hall	50 Park Place	415-508-2130						H			
Burlingame[4]											
Burlingame City Hall	501 Primrose Rd.	558-7200						H			
Burlingame Valero	601 California Dr.	347-0486			O	F					
Curries Chevron[3]	260 El Camino Real	344-6120			O	F					
Lithia Chrysler Jeep Dodge[3]	1025 Rollins Rd.	342-2120			O						
Daly City											
Allied Waste	1680 Edgeworth Ave.	756-1130						H			C
Bayshore Chevron[3]	2690 Bayshore Blvd.	415-330-9888		B	O	F					
Bayshore Library Third Floor	460 Martin St.	991-8074						H			
BFI Mussel Rock T.S.	Westline & Skyline Dr.	755-7068	A		O	F	T				
City Hall Main Lobby	333 90th St.	991-8038						H			
Firestone Store[3]	4 Serramonte Center	994-1500	A	B	O	F	T				
Kragen Auto Parts[3]	5 Skyline Plaza	994-2650		B	O	F					
Kragen Auto Parts[3]	7283 Mission St.	755-8890		B	O						
Serramonte Library	40 Wembley Dr.	991-8023						H			
SpeeDee Oil Change[3]	1600 Sulivan Ave.	755-8777			O						
Westlake Library	275 Southgate Ave.	991-8071						H			
East Palo Alto[4]											
Auto Zone[3]	2160 University Ave.	321-7221	A	B	O			H			
Corporation Yard[3]	150 Tara Street	853-5916			O	F					
IKEA	1700 East Bayshore Rd.	323-4532						H	L		
Foster City[4]											
AM/PM Hillsdale Arco	880 E. Hillsdale Blvd.	349-1849			O						
City Hall	610 Foster City Blvd.	286-3200						H			
Valero	501 Foster City Blvd.	345-6500			O	F					
Half Moon Bay[4]											
Ocean Shore Hardware	111 Main St.	726-5505						H	L	P	
Ox Mountain Landfill[3]	12310 Highway 92	726-1819	A	B	O	F	T				C
Menlo Park[4]											
Belle Haven Child Development Center	410 Ivy Drive	330-2270						H			
M&R Automotive[3]	1281 El Camino Real	325-3900			O	F					
Menlo Park Library	800 Alma St.	330-2500						H			
Oil Changer[3]	944 Willow Rd.	321-9047			O	F					
Onetta Harris Community Center	100 Terminal Ave.	330-2250						H			
Sharon Heights Shell	125 Sharon Park Dr.	854-3400			O	F					
Millbrae[4]											
Auto Zone[3]	320 El Comino Real	697-3504			O						
Firestone Store[3]	1201 El Camino Real	871-9096	A	B	O	F	T	H			
Kragen Auto Parts[3]	1145 El Camino Real	583-0443		B	O	F					
Millbrae Library	1 Library Ave.	697-7607						H			
Millbrae Square Chevron	501 El Camino Real	697-3275	A	B	O	F	T				
SpeeDee Oil Change[3]	390 El Camino Real	692-6740			O	F					
Pacifica[4]											
Coastside Scavenger	1046 Palmetto Ave.	355-9000	A	B	O	F	T	H	L	P	C
Oil Changer[3]	2880 Skyline Blvd.	355-7233			O						
Sanford Firestone	705 Hickey Blvd.	355-1154		B	O	F	T				
Pescadero											
BFI Waste Systems	Bean Hollow Rd.	879-0729		B	O	F	T				
Portola Valley											
Ladera Autoworks	104 La Mesa Dr.	854-4522			O	F					
Redwood City[4]											
Boardwalk Auto Center[3]	1 Bair Island Rd.	364-0100			O						
Chanique's Auto Repair	425 Dumbarton St.	365-1322		B	O	F					
County Government Center	455 County Center, 1st Floor	363-4957						H			
Firestone Store[3]	1458 El Camino Real	364-1900	A	B	O	F	T				
Jiffy Lube[3]	640 Whipple Ave.	369-8067			O	F					
Kings Union 76	975 Woodside Rd	364-9620	A	B	O	F	T				
Kragen Auto Parts[3]	2411 El Camino Real	368-2831		B	O	F					
Oil Changer[3]	2762 El Camino Real	366-5394			O	F					
Roosevelt Shell	2108 Roosevelt Ave.	366-1886			O	F	T				
Silver Auto Services	1603 Broadway	245-5783			O	F					
Towne Ford Sales[3]	1601 El Camino Real	366-5744			O						
Veterans Blvd Shell	690 Veterans Blvd.	369-6675			O	F					
San Bruno[4]											
Jiffy Lube[3]	1580 El Camino Real	588-3970			O	F					
San Bruno Garbage Company	101 Tanforan Ave.	583-8536	A	B	O	F		H	L	P	C
Sharma Auto Repair[3]	1089 Montgomery Ave.	872-9600			O						
Skyline College	3300 College Dr.	738-4126			O	F					
SpeeDee Oil Change[3]	801 El Camino Real	952-5178			O	F					
San Carlos[4]											
Allied Waste	333 Shoreway Rd .	592-2411	A		O	F	T	H	L	P	C
City Hall	600 Elm St.	743-2974						H			
Jiffy Lube[3]	1030 El Camino Real	594-1688			O	F					
Kragen Auto Parts[3]	1272 El Camino Real	595-5112		B	O	F					
Oil Changer[3]	1188 El Camino Real	591-0695			O	F					
Pep Boys[3]	1087 Old County Road	632-1522			O	F					
Quality Tune Up[3]	400 El Camino Real	593-7873			O	F					
San Mateo[4]											
Auto Zone[3]	3880 S. El Camino Real	372-0535		B	O						
Chevron Oil Stop[3]	2009 El Camino Real	572-8000			O	F					
Firestone Store[3]	2180 S. El Camino Real	345-3535			O	F					
Jiffy Lube[3]	2517 S. El Camino Real	349-7222			O	F					
Jiffy Lube[3]	407 S. Delaware St.	344-8242			O	F					
Kragen Auto Parts[3]	2640 S. El Camino Real	349-1275		B	O	F					
Kragen Auto Parts[3]	400 S. Norfolk St.	344-2448		B	O						
Mark Morris Tires[3]	2160 El Camino Real	341-8225	A		O	F					
Reed's Service Center	1641 Palm Ave.	341-6675	A	B	O	F					
San Mateo Auto Care	1471 E. Third St.	343-6651			O						
San Mateo City Hall	330 W. 20th Ave.	522-7346						H			
So. San Francisco[4]											
Blueline Transfer	500 E. Jamie Ct.	589-5511	A	B	O	F	T	H	L	P	C
Firestone Store[3]	190 El Camino Real	583-2848	A	B	O	F	T				
First Automotive Distrib.[3]	273 E. Harris Ave.	333-8871			O						
Kragen Auto Parts[3]	1059 El Camino Real	589-8102		B	O	F					
Kragen Auto Parts[3]	3541 Callan Blvd.	827-9081			O	F					
Meehan Battery	1139 Airport Blvd.	583-6735		B							
Shiva Auto Repair	118 S. Spruce Ave.	225-0600		B	O	F					
Stevens Bay Area Diesel[3]	480 Littlefield Ave.	872-3656			O						
Woodside											
Skylonda Fire Station	17290 Skyline Blvd.	851-1860			O	F		H			

1. Both fluorescent tubes and compact fluorescents are recyclable
2. Alkaline, NiCd, Li, NiMH
3. State Certified Collection Centers
4. Household batteries are collected curbside at single-family dwellings

2007-2008
IPM STORES - 22 stores

Store Name	Contact	Address	City	08 Spring visit	07 Fall visit
Ace Hardware	Oras	700 Santa Cruz Ave.	Menlo Park	6/20/2008	10/18/2007
Al's Nursery (closed wed.)	John Wu	900 Portola Rd	Portola Valley	4/1/2008	10/25/2007
Brisbane Hardware	Bill Del Chiaco	1 Visitacion Av	Brisbane	5/25/2008	10/5/2007
Carlmont Ace Hardware	Cliff Walters/Ron Baum	1029 Alameda De Las Pulgas	Belmont	6/5/2008	10/11/2007
Carlmont Nursery	Ray Tyler	2029 Ralston	Belmont	6/4/2008	10/11/2007
Golden Nursery	Chris and George	1122 2nd Ave	San Mateo	4/7/2008	2/26/2008
Half Moon Bay Nursery	Brad Kuhlman (Chris & Ron owners)	11691 San Mateo Rd.	HMB	5/8/2008	10/22/2007
Home Depot	Gloria/ Flash	2 Colma Blvd	Colma	5/25/2008	10/31/2007
Home Depot	Roberto Alvarado	303 E. Lake Merced Blvd.	Daly City	5/26/2008	10/30/2007
Home Depot	Alec Gonzales & Daneil Rwas	1781 East Bayshore Road	East Palo Alto	5/30/2008	10/24/2007
Home Depot	Scott Kubiak	1125 Old County Rd	San Carlos	5/5/2008	10/18/2007
Home Depot	Derrik	2001 Chess Drive	San Mateo	4/29/2008	10/25/2007
Linda Mar Hardware	Dave Reed or Kate Romero	560 San Pedro Ave	Pacifica	5/26/2008	10/22/2007
Ocean Shore Hardware	Betsy Marstall	111 Main Street	HMB	5/8/2008	10/23/2007
Orchard Supply Hardware	Jeffrey	1010 Metro Center Blvd	Foster City	4/7/2008	8/21/2007
Orchard Supply Hardware	Joseph Conroy or Bill in Gardening	900 El Camino Real	Millbrae	5/1/2008	10/9/2007
Orchard Supply Hardware	Kirk Anderson	2110 Middlefield Road	Redwood City	6/24/2008	10/24/2007
Orchard Supply Hardware	Ray Martinez/Ruben Chang	2245 Gellert Blvd	SSF	5/26/2008	10/29/2007
Roger Reynolds Nursery	Dwayne	133 Encinal Ave	Menlo Park	6/20/2008	10/16/2007
Sloats Garden Center	Charlie Paulson	675 El Camino Real	San Bruno	4/3/2008	10/29/2007
The Garden Shed	Daniel Yoshida	1136 El Camino Real	San Carlos	6/24/2008	10/16/2007
Wegman's Nursery	Marc and Erhard Wegman	492 Woodside Rd	Redwood City	6/24/2008	10/11/2007

San Mateo Countywide Water Pollution Prevention Program

Reducing Pollutants in our Watersheds

Sarah Pratt
Environmental Health
Phone: 650-599-1325
Email: spratt@co.sanmateo.ca.us

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Water Pollution Prevention

San Mateo County Water Pollution Prevention Program (SMCWPPP) is a program that aims to partner with the county's residents and businesses to prevent pollution of our local water bodies; such as creeks, the San Francisco Bay and the Pacific Ocean.

www.flowstobay.org

We All Live Downstream: Watersheds

- A watershed is the area of land that water flows across on its way to a creek, river, lake, bay, or ocean.
- In urban settings water travels more quickly across pavement than in a natural setting.
- Rain and hosing down carries pollutants into local waterways.

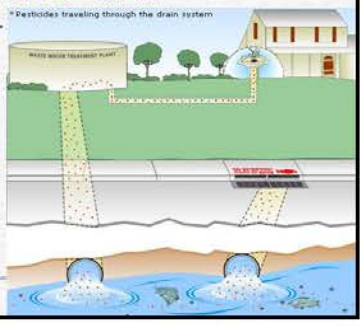
The Quality of Our Local Creeks is Linked to Land Cover

- In a forest, rain soaks into the ground where it is either taken up by tree roots or continues to move down through the soil and into the groundwater.
- When rain falls on impervious cover, rain cannot soak into the ground and becomes stormwater runoff
- Impervious cover produces 16 times more stormwater runoff than forest.

"First Flush"

Down the Drain: Where Your Water Goes

- Sanitary Sewer
- Stormdrain



Urban runoff pollution

- 1987 amendments to Clean Water Act
- Regional Water Quality Control Boards enforce clean water laws
- San Francisco Bay Regional Water Quality Control Board issue NPDES permit to San Mateo Countywide Water Pollution Prevention Program's agencies

The Solution To Pollution

The best solution to pollution is to keep it out of our water in the first place!

Pollutants of Concern in our Water Bodies

- Mercury
- Automotive: leaking motor oil, gasoline, and antifreeze, copper dust from brake pads, rubber tire dust.
- Trash
- Pesticides

Mercury Containing Items

- Thermometer Exchange & Fluorescent Tube Retail Take-Back

Household Hazardous Waste and Used Motor Oil/Filters

RECYCLE USED OIL

Best Management Practices Business Pollution Prevention

- Food Facilities
- Construction Industry
- Automotive Maintenance
- Industrial
- Mobile Cleaner & Power Washing
- Municipal
- Storm Drain Stenciling

Litter Reduction & Education

CALIFORNIA COASTAL COMMISSION

The Journey from Garden to Waterways

- Pesticides runoff lawns and gardens.
- Improper disposal through sanitary sewar
- Treated wastewater doesn't remove all pesticides

Our Water Our World
Less Toxic Pest control

Diazinon and chlorpyrifos

- 1990s most commonly used pesticides
- Organophosphates
- Killing water creatures at bottom of food chain.
- Bay area creeks found to be "Impaired"
- Taken off store shelves

Pyrethroids: New Threat to Water Quality

- Ant sprays, Termiticides
- Insect foggers and sprays
- Flea dips and sprays for cats and dogs
- Ornamental garden & turf products
- Lice shampoos
- Mosquito coils

Ingredient name end in "thrin"

Exception is "Pyrethrin" natural pesticide

Bay Friendly Gardening

Alternatives to Toxic Pesticides: The "Our Water Our World" program

The OWOW Program Uses Integrated Pest Management Concepts

Examples of how to control pests the less toxic way…

Snails and Slugs

Physical Controls…

Ants…

Aphids...

Biological Control: Beneficial Insects are your Allies

In Store Help for Gardeners

Resources

- Water Pollution Prevention www.flowstobay.org
- IPM Websites: www.ourwaterourworld.org & www.ipm.ucdavis.edu & www.epa.gov/greenscapes
- Ask The Expert
- Bay-Friendly Gardening guidelines, and UC Statewide IPM Project books
- Fact sheets
- Less Toxic Product lists

2007 California Coastal Cleanup Day

CCD Coordinator Report Form

People, Pounds, and Miles

Please return completed form to **Eben Schwartz** at the California Coastal Commission NO LATER THAN October 31, 2007.
California Coastal Commission, 45 Fremont Street, Suite 2000, San Francisco, CA 94105, (415) 904-5210, (415) 904-5216 FAX, eschwartz@coastal.ca.gov

State/County or Region: San Mateo County **Coordinator Name:** Sarah Pratt

				Cleanup Information			
Site Name	**Coastal or Inland?**	**Site Captain**	**Phone/E-mail Address**	Number of People	Weight of Trash Collected	Weight of Recyclables Collected	Distance Cleaned
Belmont Creek	Inland	Jozi Plut	650) 595-7425 jplut@belmont.gov	30	197	65	4
Brisbane Lagoon	Inland	Russ Carmick	(415) 508-2143 rcarmick@ci.brisbane.ca.us	71	2000	20	4
Burlingame Bayfront and Mills Creek, Millbrae	Inland	Donna Allen	(650) 342-3727 Donna.Allen@veoliawaterna.com	232	2100	500	8
Laurel Creek	Inland	Dirk Jensen	(650) 4962 DJensen@co.sanmateo.ca.us	3	180	0	1
Thornton State Beach	Coastal	David & Shelly Sondergeld	(650) 756-4530 dsonder@mindspring.com	100	800	250	5.5
San Francisquito Creek	Inland	Ryan Navratil	(650) 961-1035 x310 Ryan@SanFrancisquito.org	79	900	550	1.25
Pillar Point Harbor	Coastal	Aaron Tinker	364-2760x16, Aaron@sfbaymsi.org	42	50	35	2.5
Shelter Cove	Coastal	Aaron Tinker	364-2760x16, Aaron@sfbaymsi.org	8	10	5	1
San Gregorio State Beach	Coastal	Neil Panton	(650) 726-2499 Sgerc@sanmateo.org	127	272	119	4
Pomponio State Beach	Coastal	Neil Panton	(650) 726-2499 Sgerc@sanmateo.org	8	32	5	1.5
Roosevelt / Dunes State Beach	Coastal	Jennifer Bueno	(650) 404-3301 jbueno@kpmg.com	130	336	150	1
Francis State Beach	Coastal	Jenine Beecher	(650) 508-2330 jbeeche@rei.com	181	200	220	3
Pistachio Beach	Coastal	Rose Blackburn	650-726-8804 x 4 rblackburn@parks.ca.gov	14	245	19	1
Tunitas Creek	Coastal	Steve Harman	650-291-9428, Steven.Harman@surfriderSMC.org	31	610	28	2
Mirada Surf West	Coastal	Park Ranger Steve Kraemer	(650) 879-0238 Skraemer@co.sanmateo.ca.us	120	650	50	2

State/County or Region: San Mateo County **Coordinator Name:** Sarah Pratt

				Cleanup Information			
Site Name	**Coastal or Inland?**	**Site Captain**	**Phone/E-mail Address**	Number of People	Weight of Trash Collected	Weight of Recyclables Collected	Distance Cleaned
Montara State Beach	Coastal	Kevin & Wendy Stokes	Kevin@montarabeach.com	42	500	120	4
Esplanade Beach	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	33	420	450	1
Lake Side Way	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	5	175	0	1
Sharp Park Beach	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	77	700	30	2.5
Pacifica State Beach/ Linda	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	107	315	45	2.5
Rockaway Beach	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	33	270	75	3
San Pedro Creek Watershed	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	42	980	210	1
West Sharp Park	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	77	345	105	1
Vallemar Beach	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	1	40	0	1
Mussel Rock Beach	Coastal	Lynn Adams	(650) 355-1668 Lynn4promos@aol.com	33	954	450	1
Pescadero State Beach	Coastal	Gregory Bahr	(650) 879-0299, Gbahr@sjcoe.net	30	88	22	1
Bair Island	Inland	Jocelyn Gretz	(510) 452-9261 x119 or 109 jgretz@savesfbay.org	12	196	32	2
Cordilleras Creek	Inland	Barbara Patterson	(650) 701-0630 babaloupat@yahoo.com	10	200	20	0.5
Pulgas Creek and Brittain C	Inland	Barbara Patterson	(650) 701-0630 babaloupat@yahoo.com	17	250	30	0.5
San Mateo Bayfront & San	Inland	Roxanne Murray	(650) 522-7346 RMurray@cityofsanmateo.org	330	6000	450	1
South San Francisco Bayfront	Inland	Gus Vellis	(650) 875-6973 gus.vellis@ssf.net	158	500	100	0.5
			Totals	**2,183**	**20,483**	**4,150**	**63.75**

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

CALIFORNIA COASTAL CLEANUP DAY

When? Sat. September 15th, 2007
9am—12pm

Where? 27 beach & creek locations in San Mateo County

What? Pick a site. Show up. Clean up your watershed.
(All materials are supplied)

Visit www.flowstobay.org for a list of beach and creek locations

The Benefits are in the Bag!

The Plastic Problem:

- Most plastics are made from petroleum—a non-renewable resource.
- Plastics are everywhere! The average consumer uses 300 plastic bags per year.
- Plastics create litter problems—easily blowing out of the trash and into parks, yards, and waterways.
- Plastics never biodegrade. They just break down into smaller pieces.
- Plastics in our waterways & oceans kill 100,000 marine animals each year.

Alternatives:

- Bring your own *reusable* bag when you shop!
- Reuse your old plastic and paper bags as trash liners or car litter bags.
- Recycle clean plastic bags at local grocery stores.
- Use no bags! Do not take a bag for fruits or veggies or for a few small items.

Remember your bags!

- Store your bags in your car.
- Hang them around your front or garage door knob.
- Leave them near your keys.

www.flowstobay.org

CASQA 2007 Awards

CASQA 2007 Awards

2007 OUTSTANDING STORMWATER NEWS, INFORMATION, OUTREACH, AND MEDIA PROJECT AWARD

CASQA

PRESENTED TO

SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM

FOR THE

ELIMINATING TRASH IN OUR WATERWAYS PROJECT: COASTAL CLEANUP DAY IN SAN MATEO COUNTY - 2006

Project Objectives

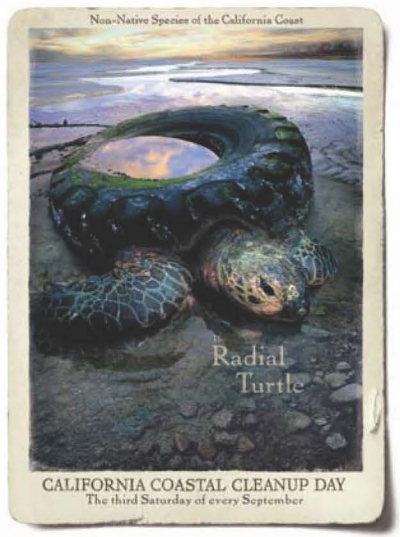
- Get resid directly involv
  eff nizing bea
-
-

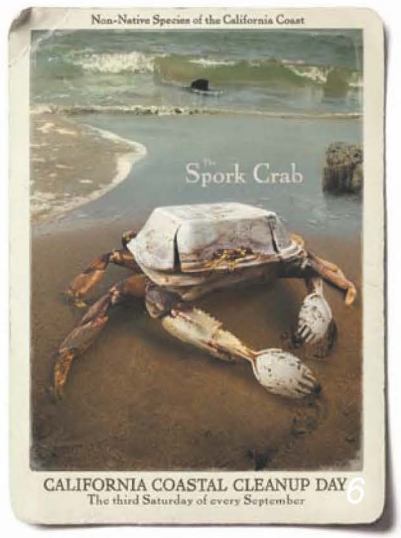
Outstanding Project Features

- 3000 Reusable Recycled-P
  Mesh
  given out wi

Outstanding Project Features

Publicity efforts included poster, brochure, and postcard distribution. C
page website with
cleanu





Outstanding Project Features

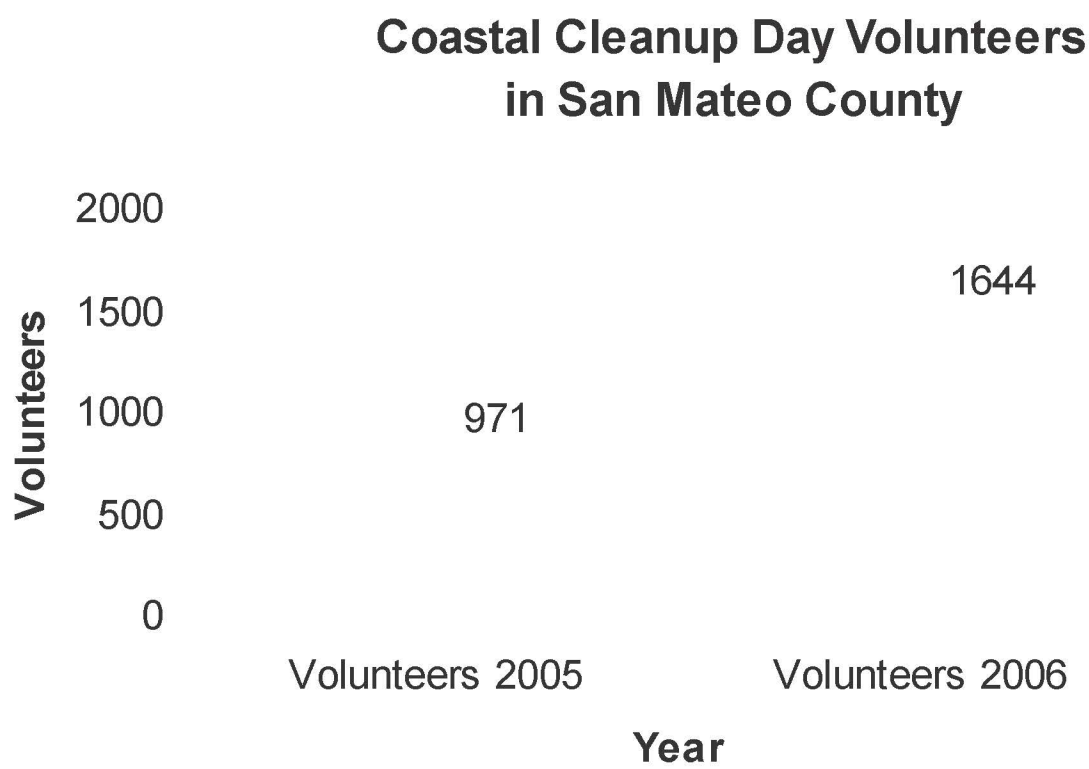
- Coordinated 27 beach & cr
  clean ecruiting site

Project Results

- *Increased Volunteer Participati*

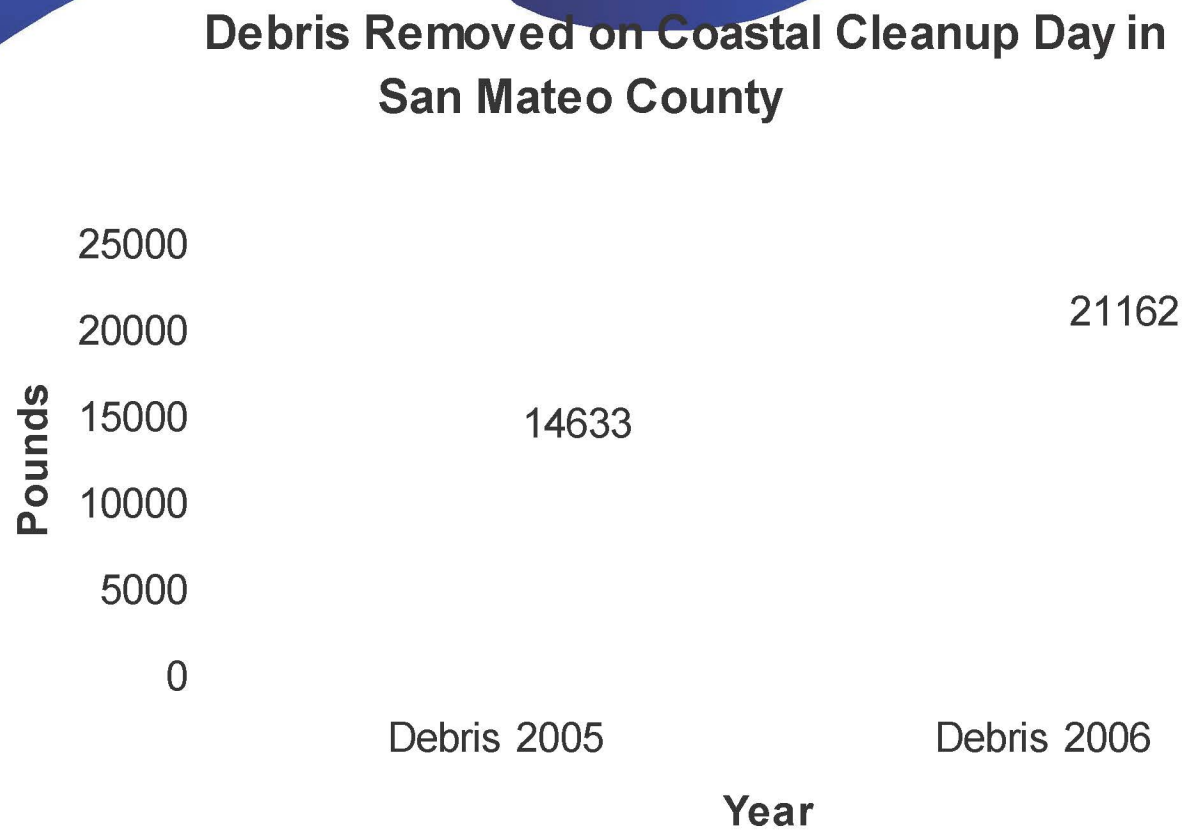
2005: 97 *nteers*

20



Project Results

- *Debris Diverted from Waterways: 21,162 lbs trash & recyclables picked up*



Project Results

- Reusable Bag outreach events in San Mateo County Whole Foods Stores
  Fo ng the mai
-

WHOLE FOODS MARKET

CASQA 2007 Awards

San Mateo Countywide Water Pollution Prevention Program

Project Contributors

- [illegible]

SAN MATEO COUNTY

Partnering with Business for a Healthy Community

ENVIRONMENTAL HEALTH
SAN MATEO COUNTY

Protecting Our Health and Environment

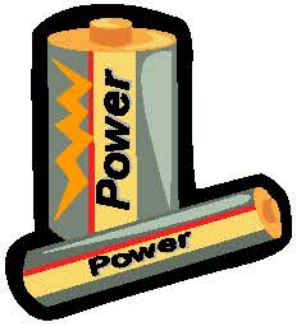
Boost Your Business
by becoming a
Take Back Partner

Free Benefits for Your Business:

- In store promotional materials
- Listings to help eco-minded customers find you on-line
- Recognition through press releases, County website, and more
- Handy information for customers seeking to recycle or dispose of other materials
- Extra points on your Green Business application
- Personalized assistance with take-back issues at your site
- Increased foot traffic and associated sales

For Your Customers :

- A convenient, "drop-while-you-shop" location for their household batteries and fluorescent bulbs.
- A local business that shares their values and concerns.
- A new reason to walk through your door.



Your Contribution:

- Storage of your customers' returned materials.
- Periodic delivery of collected materials to the County HHW facility.

Why Do Customers Want to Bring Used-Up Fluorescent Bulbs and Household Batteries Back to their Retailers?

- They know that the California Universal Waste Rule prohibits anyone from putting these materials in the trash.
- They care about their communities, and want to make sure these recyclable materials are handled safely and properly.
- Bringing them to local stores while they shop is much more convenient than taking them to an HHW site.

SAN MATEO COUNTY

Take Back Coordinator

Mary Bell Austin
650-599-1549
maustin@co.sanmateo.ca.us

COUNTY FAIR COUNT COMPARISONS
CONTACTS AT SMCWPPP BOOTH

2005 SAN MATEO COUNTY FAIR STORMWATER BOOTH AUGUST 12 - 21, 2005		Participating Co-Permittees & Contractor	2006 SAN MATEO COUNTY FAIR STORMWATER BOOTH AUGUST 11 - 20, 2006		Participating Co-Permittees	2007 SAN MATEO COUNTY FAIR STORMWATER BOOTH AUGUST 10 - 19, 2007		Participating Co-Permittees
Friday 12	98	CCC	FRIDAY - 11	170	*Redwood City San Mateo County*	FRIDAY - 10	209	*Redwood City San Mateo County*
Saturday 13	236	San Carlos Redwood City/Parks CCC	SATURDAY - 12	284	*San Carlos Redwood City*	SATURDAY - 11	634	*San Carlos Redwood City*
Sunday 14	326	Redwood City CCC	SUNDAY - 13	417	*Redwood City Belmont*	SUNDAY - 12	665	*Redwood City Belmont*
Monday 15	232	Pacifica County of San Mateo Atherton	MONDAY - 14	267	*Pacifica San Mateo County Redwood City*	MONDAY - 13	605	*Pacifica San Mateo County Atherton*
Tuesday 16	292	Hillsborough Foster City City of San Mateo	TUESDAY - 15	202	*Hillsboroug Foster City San Mateo*	TUESDAY - 14	303	*Hillsborough Portola Valley San Mateo*
Wednesday 17	159	East Palo Alto Burlingame Brisbane	WEDNESDAY - 16	244	*East Palo Alto Burlingame Brisbane*	WEDNESDAY - 15	399	*East Palo Alto Burlingame Brisbane*
Thursday 18	345	Millbrae* Daly City Colma	THURSDAY - 17	294	*Millbrae Daly City Colma Atherton*	THURSDAY - 16	377	*Millbrae Daly City Colma*
Friday 19	106	Half Moon Bay San Bruno Portola Valley	FRIDAY - 18	103	*Half Moon Bay Menlo Park San Bruno Portola Valley Atherton*	*FRIDAY - 17	85	*Half Moon Bay San Bruno Foster City*
Saturday 20	287	So San Francisco Redwood City CCC	SATURDAY - 20	406	*South San Francisco Redwood City Menlo Park*	SATURDAY - 18	402	*South San Francisco Redwood City*
Sunday 21	244	Belmont CCC Redwood City/Parks	SUNDAY - 21	410	*Atherton Woodside Redwood City*	SUNDAY - 19	381	*Woodside Redwood City*
TOTAL CONTACTS	**2,325**		**TOTAL CONTACTS**	**2,797**		**TOTAL CONTACTS**	**4,060**	
** Free entry to Fair until 3pm*			*Percentage Change from 2005*	**20.3%**		*Percentage Change from 2006*	**45.2%**	
			No of Contacts over/(under) 2005	**472**		*No of Contacts over/(under) 2006*	**1,263**	
						Average Daily Attendance	**406**	

*Footnote: *Appears that Half Moon Bay & San Bruno did not report contacts, figure shown is for Foster City only*

010463

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program

New Information

Aliquam erat volutpat.Proin consequat, leo vitae condimentum convallis, diam diam ullamcorper tellus, eu pulvinar est mi a justo. Vivamus in est iaculis justo tincidunt posuere.

Nullam a tellus non dui pretium rhoncus. Praesent ut nibh. Nulla et lorem. Morbi ligula quam, gravida et, lacinia at, iaculis sit amet, enim. Sed semper, neque

Eget commodo volutpat, tellus nulla rhoncus mi, sit amet volutpat leo mi sit amet enim. Aenean a felis ac velit fermentum dignissim.

Nullam a tellus non dui pretium rhoncus. Praesent ut nibh. Nulla et lorem.

MORE...

Community

Find all the information you need for both in the house and around the neighborhood.

Business

Access all iregulations and forms water use in the county, as well as useful resource listings.

Municipalities

Access all important policy documents and links to state and federal information.

Clean Water. Healthy Community.

Welcome to the San Mateo County Anti Water Pollution Website. Aliquam erat volutpat. Proin consequat, leo vitae condimentum convallis, diam diam ullamcorper tellus, eu pulvinar est mi a justo. Vivamus in est iaculis justo tincidunt posuee. Nullam a tellus non dui pretium rhoncus.

Feature Topic

Spring has Sprung in San Mateo County

Aliquam erat volutpat .Proin consequat, leo vitae condimentum convallis, diam diam ullamcorper tellus, eu pulvinar est mi a justo. Vivamus in est iaculis justo tincidunt posuere. Proin consequa, leo vitae condimentum convallis, diam diam ullamcorper tellus, eu pulvinar est mi a justo. Vivamus in est iaculis justo tincidunt posuere.

MORE...

Calendar

Wednesday June 25	**Aliquam erat volutpat.** Proin consequat, leo vitae condimentum convallis, diam diam ullamcorper tellus, eu pulvinar est mi a justo.
Friday June 27	**Nullam a tellus non** dui pretium rhoncus. Praesent ut nibh. Nulla et lorem. Morbi ligula quam, gravida et, lacinia at.
Monday June 30	**Eget commodo volutpat**, tellus nulla rhoncus mi, sit amet volutpat leo mi sit amet enim.

SEARCH

APPENDIX D: TABLE OF CONTENTS

New Development Subcommittee FY 2007/08 Meeting Attendance

Updated Project Applicant Checklist for NPDES Permit Requirements

Appendix I of C.3 Technical Guidance – Operation and Maintenance Document Templates (cover sheet)

Soil Guidelines for Stormwater Treatment Measures

New Development Subcommittee Report for April 1 field trip

2008 New Development Workshop: "Implementing Permanent Stormwater Controls"

- *Agenda*
- *Attendance list*
- *Summary of evaluation forms*

Construction Site Compliance Workshop for Local Government Inspectors:

- *Agenda*
- *Summary of evaluation forms*

SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM

New Development Subcommittee FY 2007/08 Meeting Attendance

Representing	Name	Phone Number	Meetings Attended					
			Aug	Oct	Dec	Feb	Apr[1]	June
Atherton	Michael Wasmann	650/752-0518	✓					
Belmont	Gilbert Yau	650/595-7467	✓	✓	✓	✓		✓
Brisbane	Matt Fabry (Program Coordinator)	415/508-2134	✓	✓	✓	✓	✓	✓
Burlingame	Eva Justimbaste	650/342-3727	✓	✓	✓	✓	✓	✓
Colma	Lisa Whitman	650/558-7257	✓		✓	✓		✓
	Muneer Ahmed	650/757-8894		✓	✓	✓		
	Joshua Rawley						✓	
Daly City	Jeanne Naughton	650/991-8033	✓	✓		✓		✓
East Palo Alto	Brad Tarr	650/853-3100						
EOA	Laura Prickett	510/832-2852 x 123	✓		✓	✓	✓	✓
	Fred Jarvis	510/832-2852 x 111		✓			✓	
	Christina Hovland	510/832-2852 x 126						✓
Foster City	Norm Dorais	650/286-3279						✓
	Elena Lee (resigned)		✓					
Half Moon Bay	Michelle Tangunan	650/726-8253						
Hillsborough	Jen Chen	650/375-7488				✓		✓
	Catherine Chan	650/579-3353						✓
	Maggie Cmejla (resigned)		✓		✓			
Menlo Park	Jennifer Ng	650/330-6743		✓	✓	✓		✓
	Virginia Parks		✓					
Millbrae	Khee Lim							
	Florian Ebo	650/259-2446	✓	✓			✓	
Pacifica	Lizzie Claycomb	650/738-7361						✓
	Christina Horrisberger	650/738-7444	✓	✓	✓	✓		✓
Portola Valley	Leslie Lambert	650/851-1700 x12	✓		✓	✓		✓
Redwood City	Jon Lynch	650/780-7371	✓		✓	✓		
	Susan Wheeler	650/780-7245				✓		✓
San Bruno	Laura Russell	650/616-7038	✓		✓	✓		✓
San Carlos	Serena Ponzo	650/802-4267		✓	✓	✓		
San Mateo	Martin Quan	650/522-7330			✓	✓		
County of	Camille Leung	650/353-1826		✓	✓			✓
San Mateo	Joe Camicia	650/599-1537	✓			✓	✓	✓
	Melissa Ross	650/599-1559						
South S.F.	Cassie Prudhel	650/829-3840	✓	✓		✓		
	Craig Lustenberger							✓
	Daniel Fulford							✓
	Frank Mandola	650/829-3880			✓		✓	
Woodside	Eunejune Kim	650/851-6790		✓	✓	✓		

[1] The April meeting was a field trip to view stormwater treatment measures in San Francisco.

Project Applicant Checklist for NPDES Permit Requirements
SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM

I. PROJECT DATA

Project Name_____ **Project Address**_____

APN_____ - _____ - _____

Applicant Name _____ **Applicant Phone** _____

Applicant Address _____

Type of Development

- ☐ Residential
- ☐ Commercial
- ☐ Industrial
- ☐ Mixed-Use
- ☐ Streets, Roads, Highways, Freeways, etc.
- ☐ Significant Redevelopment Project (as defined by SMCWPPP's NPDES permit Provision C.3.c.i.3)

- ☐ Site Area _____ (sq. ft.)
- ☐ Disturbed Area _____ (sq. ft.)*
- ☐ Existing Impervious Surface_____ (sq. ft.)
- ☐ New Impervious Surface (created, added and/or replaced) _____ (sq. ft.)**

* If ≥ 1 acre (43,560 sq. ft.) of soil disturbance, please refer to Section III.

** If ≥ 1 acre (43,560 sq. ft.) of impervious surface is added and/or replaced, please refer to Sections IV and V. (This threshold is reduced to projects that are 10,000 sq. ft. or larger starting August 15, 2006.)

II. MINIMUM REQUIREMENTS FOR ALL PROJECTS – All projects must incorporate as many of the following measures as practical (check boxes that apply).

A. SITE DESIGN MEASURES. Project must incorporate the following measures to the maximum extent practicable:

- ☐ Protect sensitive areas and minimize changes to the natural topography.
- ☐ Minimize impervious surface areas.
- ☐ Minimize impervious areas from being directly connected to the storm drain system (e.g. direct roof downspouts to vegetated areas where feasible).
- ☐ Maximize permeability by preserving open space.
- ☐ Use permeable pavement surfaces where feasible.
- ☐ Use landscaping to treat stormwater.
- ☐ Use "Bay Friendly" landscape design, as indicated in "Bay-Friendly Landscape Guidelines - Sustainable Practices for the Landscape Professional".

B. SOURCE CONTROL MEASURES.

- ☐ Incorporate all applicable source control measures in [enter municipality name] Local Source Control Measures List.

C. PERMANENT STORMWATER TREATMENT CONTROL MEASURES. *Project must consider incorporating the following measures:*

- ☐ Vegetated swale
- ☐ Extended detention basin (dry)
- ☐ Wet pond
- ☐ Media filter (sand, organic matter)
- ☐ Vortex separator (commercially available in-line treatment unit)
- ☐ Bioretention area
- ☐ Vegetated buffer strip
- ☐ Constructed wetland
- ☐ Manufactured drain insert (may not be used unless part of a multi-step treatment process)
- ☐ Infiltration trench
- ☐ Other _____

Continued ⇒

D. EROSION and SEDIMENTATION CONTROL. ***If the project involves any land disturbance, project plans must incorporate all of the following requirements:***

1. Stabilize all denuded areas and install and maintain all temporary erosion and sediment controls continuously between October 15th and April 15th of each year, until permanent erosion control have been established.
2. Provisions for diverting on-site runoff around exposed areas and diverting off-site runoff around the site (e.g., swales and dikes).
3. Provisions for preventing erosion and trapping sediment on-site, such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, storm drain inlet protection, soil blankets or mats, covers for soil stock piles, and/or other measures.
4. Provide notes, specifications, or attachments describing the following:
   a) Construction, operation and maintenance of erosion and sediment control measures, including inspection frequency;
   b) Methods and schedule for grading, excavation, filling, clearing of vegetation, and storage and disposal of excavated or cleared material;
   c) Specifications for vegetative cover and mulch, including methods and schedules for planting and fertilization;
   d) Provisions for temporary and/or permanent irrigation.

E. CONSTRUCTION BMPs. ***Project plans must incorporate all of the following BMPs as project notes. Additionally, project plan set must include SMCWPPP's Construction BMP page, available for download at (enter municipality website address).***

1. Store, handle, and dispose of construction materials and wastes properly, so as to prevent their contact with stormwater.
2. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, and non-stormwater discharges to storm drains and watercourses.
3. Use sediment controls or filtration to remove sediment when dewatering site and obtain all necessary permits.
4. Avoid cleaning, fueling, or maintaining vehicles on-site, except in a designated area where washwater is contained and treated.
5. Delineate with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.
6. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
7. Perform clearing and earth moving activities only during dry weather.
8. Limit and time applications of pesticides and fertilizers to prevent polluted runoff.
9. Limit construction access routes and stabilize designated access points.
10. Avoid tracking dirt or other materials off-site; clean off-site paved areas and sidewalks using dry sweeping methods.
11. The Contractor shall train and provide instruction to all employees and subcontractors regarding the construction BMPs.

III. CONSTRUCTION PROJECTS THAT DISTURB ≥ 1 ACRE OF AREA — *For all projects with 1 acre or more of disturbed area, applicants must file a Notice of Intent (NOI) with the State Water Resources Control Board to obtain coverage under the State General Construction Activity NPDES Permit, and must prepare and implement a Storm Water Pollution Prevention Plan (SWPPP).* ***Note: Completion of this checklist does not imply certification of the adequacy of the SWPPP by the municipality.***

1. A copy of the project's NOI and SWPPP shall be submitted to the planning, building, or engineering department prior to issuance of a grading or building permit.
2. A copy of the project's NOI and SWPPP shall be kept on-site and make available for review by the municipal inspector upon request.

Continued ⇒

IV. GROUP 1 PROJECTS: PROJECTS THAT ADD AND/OR REPLACE ≥ 1 ACRE OF IMPERVIOUS SURFACE- *- The following requirements apply to projects that add and/or replace 1 acre (43,540 sq. ft.) or more of impervious surface, and are therefore subject to the requirements of Provision C.3 of SMCWPPP's amended NPDES permit. If the project consists of a single-family residence that is not part of a larger plan of development, the project will be considered in compliance with Provision C.3, regardless of amount of impervious surface added and/or replaced, with the incorporation of appropriate pollutant source control and site design measures, and the use of landscaping to appropriately treat runoff from the roof and house-associated impervious surfaces (e.g., runoff from roofs, patios, driveways, sidewalks, and similar surfaces).*

1. Incorporate site design measures, as listed in Section II.A above.
2. Incorporate all applicable source control measures listed in municipality's Local Source Control Measures List.
3. Incorporate pesticide-reduction measures, such as using Integrated Pest Management.
4. Enter into an agreement of responsibility and funding for ongoing implementation and maintenance of stormwater treatment control measures, as appropriate for the control measure.
5. Treatment control measure design must be consistent with Vector Control Plan requirements.
6. Use of a hydraulically sized, permanent stormwater treatment control, as follows (see http://www.flowstobay.org/pdfs/bmp/Construction%20Series/SMCWPPP_c3_handbook_final.pdf for more information):

   ☐ A flow-based treatment control hydraulically sized to manage the flow of runoff produced by a rain event equal to at least [0.16 or 0.2,] inches per hour; or

   ☐ A volume-based treatment control hydraulically sized to capture 80 percent or more of the volume of annual runoff, using local rainfall data.

More hydraulic sizing information can be found at http://www.cabmphandbooks.com/Documents/Development/Section_5.pdf.

V. HYDROMODIFICATION MANAGEMENT – *In addition to the requirements under Section IV, the following requirement applies to applicable** Group 1 projects located in areas subject to hydromodification management. See figure 3-1 of SMCWPPP's Hydromodification Management Plan for exempted and non-exempted areas (generally, lands east of Alameda de las Pulgas are exempt and lands west are subject to hydromodification management requirements). The HMP is available at* http://www.flowstobay.org/pdfs/bmp/Construction%20Series/SMCWPPP_c3_handbook_final.pdf.

1. Use a flow duration stormwater control measure designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations. For sizing information, please consult the HMP. (In the future, include reference to Bay Area Hydrology Model (BAHM) download information.)

**The following types of projects are exempt from the requirements for hydromodification management:

- The construction of a single-family residence that is not part of a larger plan of development.
- A redevelopment project that does not increase the amount of impervious surface and the time of concentration of stormwater runoff.
- A transit type of development within ¼ to ½ mile of a transit station and/or intermodal facility.
- A project within a "Redevelopment Project Area" that redevelops an existing brownfield site or creates housing units affordable to persons of low or moderate income.

Reviewed by:

Planning: _____ date / /

Engineering: _____ date / /

Building: _____ date / /

Appendix

I

Operation & Maintenance Document Templates

Templates are provided to help you prepare documents that municipalities typically require with your stormwater treatment measure maintenance agreement. **Microsoft Word files of the templates** may be downloaded from the online version of the C.3 Technical Guidance that allows for downloading individual chapters and appendices (go to www.flowstobay.org, click on Business Pollution Prevention, then C.3 Stormwater Technical Guidance). Please insert project-specific information where the templates include prompts such as: [[== insert name of property address ==]]. Remember to **contact the local jurisdiction** for information on municipality-specific requirements. This appendix includes the following templates:

- **Standard Treatment Measure O&M Report Form** – This form is typically included as an exhibit to the project's maintenance agreement, which requires this form to be completed and submitted annually to the applicable municipality.

- **Maintenance Plan Templates** – for preparing maintenance plans for the stormwater treatment measures included in your project. Templates are provided for the following types of stormwater treatment measures:
  - Vegetated swales,
  - Vegetated buffer strips,
  - Tree well filters,
  - Non-proprietary media filters,
  - Flow-through planters,
  - Bioretention areas,
  - Infiltration trenches,
  - Extended detention basins, and
  - Manufactured stormwater treatment measures.

  In some cases, a treatment measure may be sized to function as both a treatment and hydromodification management (HM) measure, as described in Chapter 7. If your project includes treatment and/or HM measures that are not listed above, but have been approved by the municipality, you may customize one of the maintenance plan templates with information specific to your treatment/HM measure(s). Be sure to attach to your maintenance plan a **legible, letter-size (8.5-by-11-inch) site plan** showing the location(s) of the treatment/HM measure(s).

www.flowstobay.org

SOIL GUIDELINES FOR STORMWATER TREATMENT MEASURES

The New Development Subcommittee of the San Mateo Countywide Clean Water Program (SMCWPPP) is providing these guidelines to its member municipalities for use in non-proprietary, landscaped-based stormwater treatment measures. The purpose of these guidelines is to help project applicants specify soils that will provide suitable growing conditions for appropriate plantings and meet the percolation guidelines identified in Chapter 6 of SMCWPPP's C.3 Stormwater Technical Guidance (March 2007) for the specific types of landscape-based treatment measures proposed in their projects. SMCWPPP's member municipalities are not required to use these guidelines, and the municipalities may modify the guidelines as needed to address local concerns. Before using these guidelines, project applicants should check with the jurisdiction having authority over the project regarding local considerations.

The guidelines refer specifically to treatment measures for which technical guidance is included in the SMCWPPP's C.3 Stormwater Technical Guidance. The guidelines identify planting soils to be used (Section I), guidelines for compost amendments in the planting soils (Section II), and a top dressing layer of mulch (Section III).

I. PLANTING SOILS

Planting soil is to be placed for the purpose of providing a soil for plants to be established in the treatment measure. One of two types of planting soils shall be used: dewatering soils or treatment soils.

Dewatering soils (moderate percolation planting soils, such as sandy loam) shall be used for dewatering of treatment measures such as vegetated swales, vegetated buffer strips and extended detention basins. These treatment measures remove pollutants from runoff by filtering the runoff through both plants and surface features, or holding a volume of water for a duration of time and then releasing runoff to a storm drain system. These treatment measures do not rely on a percolation rate for treatment. Dewatering planting soils percolate runoff that has been trapped in the treatment measure.

Treatment Soils (high percolation planting soils, such as loamy sands) shall be used for filtering of a volume of water in the treatment measures, such as flow-through planters and bioretention areas. These treatment measures shall treat runoff by passing it through the surface layer of high percolation planting soil, then saturating a zone of crushed drain rock and finally in most cases, entering a perforated sub-drain.

A. IMPORTED MATERIAL FOR DEWATERING (SANDY LOAM)

Planting soil material for surface dewatering shall consist of soil (no gravel) with a moderate percolation rate (2 to 10 inches per hour), supplied from previously tested and approved sources, and shall conform to the following guidelines:

1. All material shall be free of trash and debris, expansive clays or any other deleterious materials, and shall be subject to the approval and acceptance of the Authority Having Jurisdiction.
2. The contractor shall designate their proposed import sources in advance and shall provide source samples of material to the jurisdiction having authority.
3. Material shall be free of seeds.
4. The dewatering planting soil material shall have documentation from the supplier showing conformance to the following gradation guidelines:

Screen Information	Percentage
a. Maximum particle size	2 millimeters (0.078 inch)
b. Percent passing No. 10 screen (2mm)	100 (coarse sand or finer)
c. Percent passing No. 200 screen (0.074mm)	15 to 50%

   d. The 15 to 50% percent passing #200 sieve is silt, clay and organics, with a range of silt from 5-35% and a clay content of 5-20%.

5. The above screened dewatering planting soil shall have 4 to 6% by dry weight organic compost mixed in (see section II). Final dry weight per unit volume mixed in may be lowered by the jurisdiction having authority for varying plant species in the treatment measure. Native in-situ sandy loam soils can be used, with 4 to 6% by weight of organic compost mixed in, if approved by the jurisdiction having authority. This native soil used must be certified to meet the imported planting soil guidelines. Organic compost shall meet the guidelines stated in Section II – Organic Compost Amendment. The soil shall have a salt concentration less than 500 mg/L. The pH shall be between 5.5 and 7, unless directed otherwise by the jurisdiction having authority.
6. One test shall be conducted by the supplier per each 500 cubic yards supplied. Testing shall be conducted for the above gradation requirements, salt contents and pH range.
7. Contractor shall demonstrate the in-situ percolation of each treatment measure for design storm flows through the installed soil to the satisfaction of the Authority Having Jurisdiction. The material shall have an onsite tested percolation rate of 2 to 10 inches per hour. In-field percolation test shall consist of a 1-foot diameter pipe, 2.5 feet long pipe, driven 1.5 feet deep into dewatering soils, as shown in Figure 1 attached. Pipe shall be filled with 1 foot of water after the treatment measure has been wetted. The pipe should empty 1 foot of water above the wetted soil layer in no less than 1 hour and 12 minutes, and no longer than 6 hours. Contractor shall provide records of percolation tests to city inspector.
8. Standard compaction of a minimum of 85 percent shall be used when placing the mixed material. Complete inundation of the soil shall be used to reach this compaction.
9. Soil shall be placed in lifts of 8-10 inches.

Note: Lower percolation rate of dewatering soil may be allowed by the local jurisdiction.

B. IMPORTED MATERIAL FOR TREATMENT (LOAMY SAND)

Planting soil material for treatment shall consist of high organics soil (no gravel) with a high percolation rate, supplied from previously tested and approved sources, and shall conform to the following guidelines:

1. All material shall be free of trash and debris, expansive clays or any other deleterious materials, and shall be subject to the approval and acceptance of the Authority Having Jurisdiction.
2. The contractor shall designate their proposed import sources in advance and shall provide source samples of material to the jurisdiction having authority.
3. Material shall be free of seeds.
4. The treatment planting soil shall have documentation from the supplier showing conformance to the following gradation guidelines:

Screen Information	Percentage
a. Maximum particle size	2 millimeters (0.078 inch)
b. Percent passing No. 10 screen (2mm)	100 (coarse sand or finer)
c. Percent passing No. 200 screen (0.074mm)	10 to 15%

   d. The overall dry weight percentages shall be 85-90% sand, less than 5% clay, and less than 5% silt. The range of clay and silt and organics should be 10-15% of total volume.

5. The treatment planting soil shall have 4 to 6% by dry weight organic compost mixed in. Organic compost percentage may be lowered by the jurisdiction of authority for varying plant species in the treatment measure. Native in-situ loamy sand soils can be used, with 4 to 6% of organic compost mixed in. This mixed soil must be certified to meet the imported planting soil guidelines. Organic compost shall meet the guidelines stated in Section II – Organic Compost Amendment. The soil shall have a salt concentration less than 500 mg/L. The pH shall be between 5.5 and 7, unless directed otherwise by the jurisdiction of authority.
6. One test shall be conducted by the supplier per each 500 cubic yards supplied. Testing shall be conducted for the above gradation requirements, salt contents and pH range.
7. Contractor shall demonstrate the in-situ percolation of each treatment measure for design storm flows through the installed soil to the satisfaction of the Authority Having Jurisdiction. The material shall have an onsite tested percolation rate of 5 to 10 inch per hour. In-field percolation test shall consist of a 1-foot diameter pipe, 2.5 feet long pipe, driven 1.5 feet deep into treatment soils. Pipe shall be filled with 1 foot of water after the treatment measure has been wetted. The pipe should empty 1 foot of water above the wetted soil layer in no less than 1 hour and 12 minutes, and no longer than 2

hours and 24 minutes. Contractor shall provide records of percolation tests to city inspector.

8. Soil shall be placed in lifts of 8-10 inches.
9. Standard compaction to a minimum of 85 percent shall be used when placing the mixed material. The method to achieve 85% compaction shall be approved by the local jurisdiction before the soil is placed in the treatment measure.

II. ORGANIC COMPOST AMENDMENT

An organic amendment per Attachment 1 is to be mixed into the planting soil for the purpose of providing organic material to be utilized by plantings placed within the treatment measure. The following guidelines are for amendments used in bioretention areas, flow through planters, vegetated buffer strips, vegetated swales, and extended detention basins only.

A. COMPOST GUIDELINES

Organic compost shall meet the requirements of the Alameda County Bay-Friendly Landscape program. Provide a lab analysis of proposed material performed by either: (1) a certified US Composting Council Compost Analysis Program (CAP) laboratory or (2) a laboratory approved by the local jurisdiction, using approved Test Methods for the Evaluation of Composting and Compost (TMECC). Verifying current participation in CAP can be achieved by visiting www.compostingcouncil.org. The TMECC methods are explained at www.tmecc.org/tmecc. Check with local jurisdiction for a list of approved laboratories.

See the attached Friendly Landscaping (BFL) Soil Preparation Specifications, Part 2.1.B.1, Section 02920: Soil Preparation for approved testing ranges of attributes for compost amendments.

Organic content may be lowered by the jurisdiction having authority for varying plant species in the treatment measure. This mixed soil must be certified by the laboratory to meet the imported planting soil guidelines.

III. TOP DRESSING MULCH

A three-inch thick layer of top dressing mulch shall be placed in all designated planting areas for the purpose of retaining moisture, preventing erosion and minimizing weed growth. Keep top dressing six inches away from tree trunks for tree health except where approved by the jurisdiction having authority. The following guidelines are for top dressing soils used in bioretention areas, flow through planters, vegetated buffer strips, vegetated swales, and extended detention basins only.

A. MULCH GUIDELINES

Any of the following materials may be used as top dressing for any of the treatment measures listed above, subject to the jurisdiction of authority's approval. Options for top dressing material include:

Arbor Mulch: Arbor Mulch shall be wood waste from tree trimming and not contain eucalyptus. Local tree companies may have material available free of charge. Submit a minimum one-quart sample of proposed material to be used, to jurisdiction with authority.

Wood Chip Mulch: Wood Chip Mulch shall be a coarse wood mulch made from salvaged kiln dried lumber and be color enhanced with mineral pigments that have a demonstrated color longevity of one year. Mulch material shall pass a two inch screen.

Organic Compost: Organic Compost may be used as mulch as determined by the jurisdiction having authority. Organic compost shall meet the guidelines stated above in Section II – Organic Compost Amendment.

The following are guidelines for the above dressing materials:

1. The top dressing soil material shall not float when three inches or more of water has ponded in the treatment measure.

2. Natural compaction is adequate for top dressing layer soil.

3. The 3 inches of top dressing mulch shall be placed in a single lift.

IV. SOURCES/ACKNOWLEDGEMENTS

SMCWPPP gratefully acknowledges the Alameda Countywide Clean Water Program (ACCWP), for its preparation of Soil Specifications for Stormwater Treatment Measures, which formed the basis for these soil guidelines; and Stopwaste.org, for its preparation of the Bay-Friendly Landscaping Soil Preparation Specifications, included as Attachment 1.

V. DEFINITIONS

1. Lift – Depth of soil placed before compaction is necessary

2. Expansive clay soils – are in-situ clay soils. These soils must be amended to be used in the treatment measures.

3. Stormwater treatment measure – Any engineered system designed to remove pollutants from stormwater by simple gravity settling of particle pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process. Sometimes called a treatment control, treatment control measure, treatment best management practice (BMP), or treatment facility.

4. Wetted soil – soil that has been irrigated until the water has penetrated soil to a minimum of 4 inches.

Attachment 1
BFL Soil Preparation Specifications Part 2.1.B.1 **Section 02920: Soil Preparation**

1. Organic Amendment
Compost shall be a well decomposed, stable, weed free organic matter source. The product shall be certified through the US Composting Council's (USCC) Seal of Testing Assurance Program (STA) Program (a compost testing and information disclosure program). It shall be derived from agricultural or food waste or yard trimmings. The product shall contain no substances toxic to plants, shall possess no objectionable odors and shall not resemble the feedstock (the original materials from which it was derived.

Before delivery of the compost, the supplier shall submit a copy of lab analysis performed by a laboratory that is enrolled in the US Composting Council's CAP and using the approved Test Methods for the Evaluation of Composting and Compost (TMECC). The lab report shall verify:

A. Feedstock Materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.

B. Organic Matter Content: 50% - 60% by dry wt. preferred, 35-70% acceptable

C. Carbon and Nitrogen Ratio: C:N < 25:1 plus at least one measure of stability and at least one measure of toxicity.

D. Maturity/Stability: shall have a dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120F) upon delivery or rewetting is not acceptable. In addition any one of the following is required to indicate stability

a. Oxygen Test < 1.3 O_2/ *unit TS / hr*
b. Specific oxy. Test < 1.5 O_2/ *unit BVS / hr*
c. Respiration test < 8 *C / unit VS / day*
d. Dewar test < 20 *Temp. rise* (^oC)
e. Solvita® > 5 *Index value*

E. Toxicity: any one of the following measures is sufficient to indicate non-toxicity.

a. NH_4- : NO_3-N < 3
b. Ammonium < 500 *ppm, dry basis*
c. Seed Germination > 80 *% of control*
d. Plant Trials > 80*% of control*
e. Solvita® > 5 *Index value*

F. Nutrient Content: provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.

a. Total Nitrogen content 0.9% or above preferred.
b. Boron: Total shall be <80 ppm; Soluble shall be <2.5 ppm

G. Salinity: Must be reported; may vary but < 4.0 mmhos/cm preferred. Soil should also be tested: <2.5 mmhos/cm is preferred for soil/compost blend but may vary with plant species.

H. pH: pH shall be between 6.5 and 8. May vary with plant species.

I. Particle size: 95% passing a 1/2" screen.

J. Bulk density: shall be between 500 and 1100 dry lbs/cubic yard

K. Moisture Content shall be between 35% - 55% of dry solids.

L. Inerts: compost shall be relatively free of inert ingredients, including glass, plastic and paper, < 0.1 % by weight or volume.

M. Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.

N. Select Pathogens: Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <10000 MPN/gram.

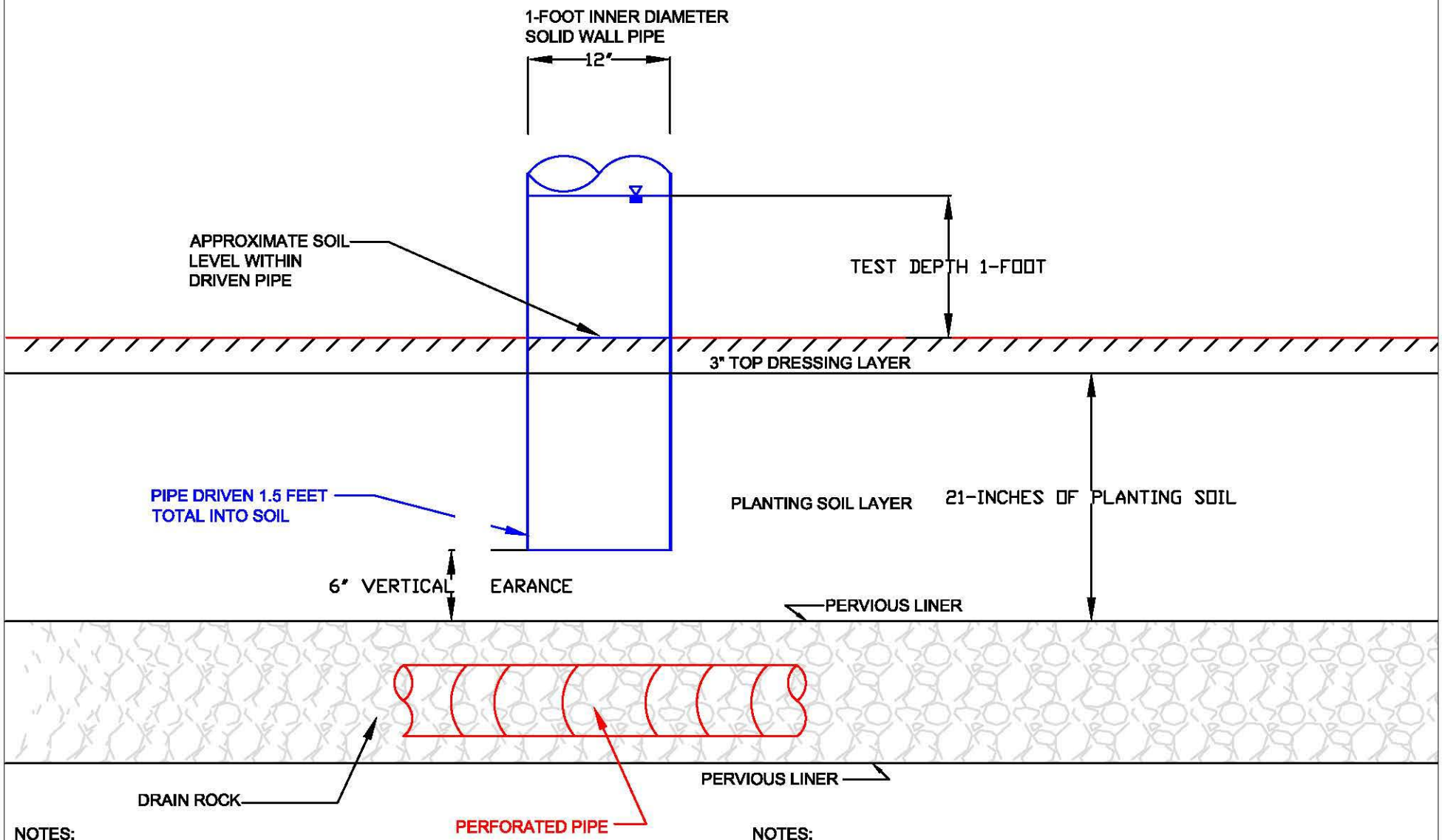
O. Trace Contaminants Metals (Lead, Mercury, Etc.) Product must meet US EPA, 40 CFR 503 regulations.

2. Additional amendments and/or fertilizers as required in the soils report.

a. Additional amendments and fertilizers that are approved for use by the Organics Materials Research Institute (OMRI) for use in crop production are approved for use. See www.omri.org. Fertilizers that are not approved or are restricted for use by OMRI shall be applied only after review and written approval by the Owner.

Notes:

1) Solvita is a registered trademark test. Please see http://solvita.com/
2) TS is Total Solids, BVS is Biological Volatile Solids, VS is Volatile Solids, MPN/gram is Most Probable Number per gram, ppm is parts per million.



NOTES:
THE USE OF GEOFABRIC IS SUBJECT TO THE PROJECT'S GEOTECHNICAL ENGINEER'S DISCRETION. THE PURPOSE OF GEOFABRIC IS TO KEEP FINE PARTICLES OUT OF STORMWATER. THE GEOTECHNICAL ENGINEER SHOULD ADVISE WHETHER TO USE GEOFABRIC DEPENDING ON THE SUITABILITY OF PROJECT-SPECIFIC CONDITIONS THAT, IF NOT AVAILABLE, MAY LEAD TO CLOGGING AND THE NEED FOR PREMATURE REMOVAL AND REPLACEMENT OF GEOFABRIC.

NOTES:
TYPICAL CROSS SECTION OF TREATMENT AREA, FACILITY CROSS SECTIONS MAY DIFFER
SOLID WALL TEST PIPE IS 2.5 FEET LONG
IN HIGH PERCOLATION SOIL 1 FOOT OF WATER SHOULD EMPTY WITHIN 2 HOURS
IN MODERATE PERCOLATION SOIL 1 FOOT OF WATER SHOULD EMPTY WITHIN 9.5 HOURS

Source: ACCWP

FIGURE 1
PERCOLATION TEST SETUP
ACCWP

BkF

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

New Development Subcommittee Report

Date: April 1, 2008

In lieu of its regular meeting, the Subcommittee took a field trip to view stormwater treatment measures at two recent projects in San Francisco: Sunset Circle Parking Lot, and Old Mint Plaza.

Sunset Circle Parking Lot
Rosey Jenks, of the San Francisco Public Utilities Commission staff, and Koa Pickering, of the San Francisco Department of Public Works, gave presentations at this site. The Sunset Circle Parking Lot is a 3.5-acre surface parking area at the intersection of Sunset Boulevard and Lake Merced Boulevard, along the east shore of Lake Merced, San Francisco's largest natural surface water body, which San Francisco's Natural Areas Program has deemed an area of significant habitat. This area is not connected to San Francisco's combined stormwater/wastewater sewer system. Before the project, runoff from the parking lot discharged directly to Lake Merced with no treatment.

There was no requirement to install stormwater treatment measures at this site; however, San Francisco has begun to prioritize low impact development (LID) techniques to reduce impacts of developed areas on water resources. This site was selected based on its direct discharge to Lake Merced, gentle slopes that are conducive to vegetated swales, available funding, and an opportunity to combine the LID improvements with San Francisco's planned relocation of a statue to the parking lot. LID features include vegetated swales that also function as parking islands, and a landscaped infiltration basin that features the relocated statue of Juan Bautista de Anza. Landscaping consists of native and drought-tolerant plants, which will require little or no irrigation once they are established. Treatment measures were sized for a 25-year storm; higher flows discharge to Lake Merced without treatment. High percolation rates of the native soil and a relatively low water table contributed to the feasibility of the infiltration basin. An interpretive sign explains the site's LID features and the benefits of LID.

Old Mint Plaza
Ken Kortkamp, of Sherwood Design Engineers, gave the presentation at this site. The Old Mint Plaza was formerly a block of Jessie Street, adjacent to San Francisco's Old Mint Building, between Fifth Street and Mint Street. This is a transitional area between the upscale Westfield Mall (just east of the plaza) and a rough, economically depressed area west of the plaza. The plaza project was undertaken by a public-private partnership between the City and adjacent landowners, funded, in part, by a grant from San Francisco's Public Utilities Commission, and through tax mechanisms allowed by the State's Mello-Roos Act. The adjacent landowners viewed their investment in constructing and maintaining the plaza as a means of improving their property values.

Low impact development features at this site include pervious pavers, bioretention areas, and a subsurface infiltration gallery. Some runoff is directed to relatively small bioretention areas, which contain drought-tolerant plantings. Most of the runoff enters the subsurface infiltration gallery by way of a ½-inch-wide grate that runs down much of the length of the plaza, and some water seeps in between the unsealed pavers. The extremely narrow grate blends unobtrusively into the visual design of the pavers. Frequent, attentive maintenance prevents the grate from becoming clogged with trash and debris. Stormwater from frequent small storms is handled by the bioretention areas and infiltration gallery. A high-flow bypass directs stormwater from larger storms to the combined wastewater/ stormwater sewer main in Fifth Street.

Dates of Next Meetings: New Development Workshop on May 8. Next regular meeting on June 3.

Infiltration Basin at Sunset Circle Parking Lot

Vegetated swale at Sunset Circle Parking Lot

Mint Plaza: ½-inch slot drain (center); bioretention area (far end of plaza)

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2008 New Development Workshop

Implementing Permanent Stormwater Controls

Green Building Exchange
305 Main Street, Redwood City
Thursday, May 8, 2008

Agenda

Registration and Refreshments	8:00 – 8:30
Welcoming Remarks Matt Fabry, *San Mateo Countywide Water Pollution Prevention Program*	8:30 – 8:45
Water Board Staff's Perspective on Implementing Permanent Stormwater Controls Habte Kifle, *San Francisco Bay Regional Water Quality Control Board*	8:45 – 9:00
Overview of the Countywide C.3 Stormwater Technical Guidance Laura Prickett, *EOA, Inc.*	9:00 – 9:30
Using Site Designs and Low Impact Development to Protect Water Quality Ken Kortkamp, *Sherwood Design Engineers*	9:30 – 10:15
BREAK	10:15 – 10:30
Implementing Stormwater Treatment Measures Ed Boscacci, *BKF Engineers*	10:30 – 11:15
Implementing Hydromodification Management Requirements Arleen Feng, *Alameda Countywide Clean Water Program*	11:15 – 12:00
LUNCH (provided on-site) *During lunch an informal computer demonstration of Bay Area Hydrology Model is available*	12:00 – 1:00
Planting Guidance for Landscape-Based Stormwater Treatment Measures Sarah Sutton, *Design, Community and Environment*	1:00 – 1:45

Case Study: Implementing Permanent Stormwater Controls at Genentech's South San Francisco Campus 1:45 – 2:30
Paul Matuszewski, *Genentech, Inc.*
Mark Emerson, *Genentech, Inc.*
Jeff Peterson, *Wilsey Ham*
Jon Kawamoto, *Genentech, Inc.*

BREAK 2:30 – 2:40

Operation and Maintenance Requirements and Case Study 2:40 – 3:25
Christina Hovland, *EOA, Inc.*
Jon Lynch, *City of Redwood City*

Closing Remarks 3:25 – 3:30
Matt Fabry, *San Mateo Countywide Water Pollution Prevention Program*

Adjourn 3:30

San Mateo Countywide Water Pollution Prevention Program
2008 New Development Workshop
Sign-In Sheet

Last Name	*First Name*	*Agency*	*Sign-In*	*Guidance? (1=Yes, 0 = No)*
Boscacci	**Ed**	**BKF**		**1**
Chan	Catherine	Town of Hillsborough		1
Chen	Jen	Town of Hillsborough		2
Chen	Tzuhui	City of East Palo Alto		0
Chuck	Dennis	City of South San Francisco		1
Corpus	Dalia	City of Belmont		1
Dahu	Nader	City of San Bruno		1
Diaz	Lee	City of Pacifica		1
Ebo	Florian	City of Millbrae		1
Emerson	**Mark**	**Genentech**		**1**
Etchebehere	Gratien	Town of Woodside		1
Fabry	Matt	City of Brisbane		0
Farbstein	Kathryn	City of Pacifica		1
Feng	**Arleen**	**Alameda County**		**1**
Feske	Matthew	Foster City, Community Dev.		1
Fulford	Daniel	City of South San Francisco		1
Gomery	Jane	City of Burlingame		1
Hathaway	Mark	City of San Mateo		1
Hirsch	Rick	City of Millbrae		1
Horrisberger	Christina	City of Pacifica		1
Hovland	**Christina**	**EOA, Inc.**		
Hurin	Ruben	City of Burlingame		1
Justimbaste	Eva	City of Burlingame		0
Kawamoto	**Jon**	**Genentech**		**1**
Kholaifat	Ayad	City of Pacifica		1
Kifle	**Habte**	**Water Board**		**1**
Kim	Eunegune	Town of Woodside		1
Kortkamp	**Ken**	**Sherwood Engineers**		**1**
Lambert	Leslie	Town of Portola Valley		1
Latu	John	City of East Palo Alto		1
Lim	Lily	City of Pacifica		1
Lo	Jason	City of Pacifica		1
Lu	Quan	EOA, Inc.		
Lustenberger	Craig	City of South San Francisco		1
Lynch	**Jon**	**Redwood City**		**1**
Mallison	Deborah	Town of Woodside		1
Mandola	Frank	City of South San Francisco		1
Mao	Shaun	City of Menlo Park		1

San Mateo Countywide Water Pollution Prevention Program
2008 New Development Workshop
Sign-In Sheet

Last Name	*First Name*	*Agency*	*Sign-In*	*Guidance? (1=Yes, 0 = No)*
Matuszewski	**Paul**	**Genentech**	X	**1**
Muneer	Ahmed	Town of Colma	X	1
Naughton	Jeannie	City of Daly City	X	0
Neuebaumer	Matt	City of San Bruno		1
Ng	Jennifer	City of Menlo Park	X	0
Parks	Virginia	City of Menlo Park		1
Patterson	Barbara	Friends of ~~Codoleras~~ Creek		1
Peterson	**Jeff**	**Wilsey Ham Engineers**	X	**1**
Ponzo	Serena	Town of Hillsborough	X	1
Prickett	**Laura**	**EOA, Inc.**	X	
Prudhel	Cassie	City of South San Francisco		1
Quan	Martin	City of San Mateo	X	1
Rawley	Joshua	Town of Colma	X	1
Russell	Laura	City of San Bruno	X	1
Sorenson	Mark	Underwood & Rosenblum, Inc.	X	**1**
Sutton	**Sarah**	**Design, Community & Environmt**	X	**1**
Tune	Tim	City of Brisbane	X	0
Turner	Andrew	Civil Engineering Associates		1
Valley	Chris	City of San Carlos		1
Wheeler	Susan	City of Redwood City	X	1
Won	Denise	Peninsula Habitat for Humanity	X	1
Yau	Gilbert	City of Belmont	X	1

San Mateo Countywide Water Pollution Prevention Program
New Development Workshop, May 8, 2008

Summary of Workshop Evaluations

Total Number of Evaluations: 26 (67% Response) Total Number of Attendees: 39[1]

I. **Water Board Staff's Perspective on Implementing Permanent Stormwater Controls**
Habte Kifle, *San Francisco Bay Regional Water Quality Control Board*

1-Very Useful 20-Useful 5-Not Useful 0-No Answer

Should define technical terms or measures referenced in presentation for staff not familiar.

Good to hear the regulating angle – hard to understand speaker.

II. **Overview of the Countywide C.3 Stormwater Technical Guidance**
Laura Prickett, *EOA, Inc.*

20-Very Useful 7-Useful 0-Not Useful 0-No Answer

Great presentation and tips on what not to forget during process. Going through manual was helpful. Thank you!
Great speaker (animated) and great info!

III. **Using Site Designs and Low Impact Development to Protect Water Quality**
Ken Kortkamp, *Sherwood Design Engineers*

16-Very Useful 8-Useful 1-Not Useful 0-No Answer

Loved seeing examples of successful projects: local & out of state. Great presentation!
Very good presentation!

IV. **Implementing Stormwater Treatment Measures**
Ed Boscacci, *BKF Engineers*

12-Very Useful 14-Useful 0-Not Useful 0-No Answer

Lots of info but great explanations and tips for successful veg. buffers, swales, etc.

[1] Does not include workshop speakers and staff.

V. **Implementing Hydromodification Management Requirements**
Arleen Feng, *Alameda Countywide Clean Water Program*

12-Very Useful 13-Useful 1-Not useful 0-No Answer

Explained HMP very well & gave great examples.

VI. **Planting Guidance for Landscape-Based Stormwater Treatment Measures**
Sarah Sutton, Design, Community and Environment

20-Very Useful 6-Useful 0-Not useful 0-No Answer

Presentation brought a great balance to the technical info.
Good speaker. I enjoy her enthusiasm.

VII. **Case Study: Implementing Permanent Stormwater Controls at Genentech's South San Francisco Campus**
Paul Matuszewski, *Genentech, Inc.;* Mark Emerson, *Genentech, Inc.;* Jeff Peterson, Wilsey Ham; and Jon Kawamoto, *Genentech, Inc.*

7-Very Useful 15-Useful 2-Not useful 0-No Answer

Nice to see large local example that I can visit.

VIII. **Operation and Maintenance Requirements and Case Study**
Christina Hovland, EOA, Inc., and Jon Lynch, *City of Redwood City*

13-Very Useful 8-Useful 1-Not useful 0-No Answer

1st Overview I have seen on O & M = very helpful.

1. **Which Topics were most beneficial?**
Planting Guidance (VI): 8
Treatment Measures (IV): 7
Technical Guidance Overview (II): 6
Site Design and LID (III): 3
Operation & Maintenance (VIII): 2
Hydromodification Management (V): 2
C.3 Binder: 2
All: 1
Discussion of why we need this: 1

2. **Which Topics were the least beneficial?**
   Water Board Staff Perspective (I) – 4
   Case Study (VII) – 3
   Hydromodification Management: (V) – 2
   Operation and Maintenance (VIII) – 1
   The regulating aspect in first presentation was very negative. The beginning Genentech presentation talked about Genentech way too much!

3. **Would you be interested in attending another workshop on construction site management?**
   Yes: 12
   Sure, especially when/if new permit is adopted. MRP – Yikes!

4. **Suggestion for future topics?**
   Examples for cost effective designs.
   Field visits.
   New MRP requirements for New Development.
   Make sure presentations are viewable from the rear of the room.
   More examples of treatment measures. Maybe one from each city in the County of San Mateo.
   Detail for project submittal to employ C3.
   Great workshop. Well organized! Appreciated the handouts in advance so I could add notes to the specific presentation, for my future reference. Good Job!
   Green roofs (local area) – experience, maintenance, dos & don'ts.
   Additional information on "New technologies" such as green roofs – options not often seen here. Also, please expand on the planting guidance. This was very helpful.
   Commercial & manufacturing facilities and how C3 & MRP requirements are implemented & maintained.

5. **Comments?**
   Keep the seminars coming.
   Need discussion on why we need this. I'm a consultant and I need to increase my fees to account for C3. More Kent Kortcamp type of examples would be nice.
   Overall, useful.
   It is great being informed of local projects that have successfully implemented these measures.
   Glad you had food for breakfast, breaks & lunch!
   Thanks!
   Too bad more people don't attend!
   Great job!
   Good mix of private/public topics. Set out cold cuts, no need for paper bags and such waste for the green building.
   Too much info about Genentech as a company.

End of Evaluations

Construction Site Compliance Workshop for Local Government Inspectors October 31, 2007 Green Building Exchange

8:00 AM	**Registration and Continental Breakfast**
8:30	**Welcome and Introduction** Matt Fabry, Program Coordinator, San Mateo Countywide Water Pollution Prevention Program
8:40	**Overview and Compliance with State Regulations, Update on Pending Regulatory Changes, including Municipal Regional Permit** Cecil Felix and Keith Lichten, San Francisco Regional Water Quality Control Board
9:25	**Compliance with State Construction Site Regulations: SWPPPs, NOIs, COIs, NOTs & other acronyms** Scott Taylor, RBF Consulting
10:10	**BREAK**
10:25	**Issues in the Field: Effective Sediment Control; Housekeeping, Sampling, Groundwater, Existing Improvements** Scott Taylor, RBF Consulting
12:00 PM	**Lunch** (To be provided) **& Vendor Exhibition**
12:15	**Videos "Hold Onto Your Dirt" and "Keep It Clean" (shown during lunch)**
1:00	**Question & Answer**
1:15	**Test Your Knowledge**
1:45	**Demonstration Site Visit** (Attendees provide own transportation – please carpool! Directions in workshop folder)
3:00	**Adjourn**

Revised October 25, 2007

Construction Site Compliance Workshop for
Local Government Inspectors
October 31, 2007

Summary of Workshop Evaluations

Total Number of Evaluations: 27 (81% Response) Total Number of Attendees: 33*

I. **Welcome and Introduction –**
Matt Fabry, SMCWPPP Coordinator

15-Very Useful	11-Useful	1-Not Useful	0-No Answer

II. **Overview and Compliance with State Regulations, Update on Pending Regulatory Changes, including Municipal Regional Permit –**
Cecil Felix and Keith Lichten San Francisco Bay Regional Water Quality Control Board

15-Very Useful	12-Useful	0-Not Useful	0-No Answer

III. **Compliance with State Construction Site Regulations: SWPPPs, NOIs, COIs, NOTs and Other Acronyms –**
Scott Taylor, RBF Consulting

21-Very Useful	6-Useful	0-Not Useful	0-No Answer

IV. **Issues in the Field: Effective Sediment Control; Housekeeping, Sampling, Groundwater, Existing Improvements –**
Scott Taylor, RBF Consulting

21-Very Useful	5-Useful	1-Not Useful	0-No Answer

V. **Videos: "Hold Onto Your Dirt" and "Keep it Clean" –**

8-Very Useful	12-Useful	2-Not Useful	5-No Answer

VI. **Vendor Exhibition –**

6-Very Useful	16-Useful	4-Not useful	1-No Answer

VII. **Question and Answer –**

8-Very Useful	12-Useful	4-Not useful	3-No Answer

*** Does not include vendors, speakers and staff**

Construction Site Compliance Workshop for Local Government Inspectors

October 31, 2007

VIII. **Test Your Knowledge –**

10-Very Useful	13-Useful	2-Not useful	2-No Answer

IX. **Demonstration Site Visit –**

10-Very Useful	5-Useful	1-Not useful	11-No Answer

1. **Which Topics were most beneficial?**
   No Answer (17)
   All were beneficial (5)
   Current regulations (2)
   Site Visits (2)
   "Bio-retention"
   "Issues in the field"
   "Demos and Pictures"

2. **Which Topics were the least beneficial?**
   No Answer (20)
   "None" (4)
   Videos
   Slides
   "Info on specific fabrics/vendors. etc."

3. **Would you be interested in attending another workshop on construction site management?**
   No Answer (13)
   Yes (14)

4. **Suggestion for future topics?**
   No Answer (21)
   None (3)
   "MRP"
   "More useful printouts for public"
   "Include BAHM, show use of modeling for all BMP's and major developments and small developments in or within close proximity to endangered species habitat, wetlands, watersheds, creeks and streams."

Construction Site Compliance Workshop for Local Government Inspectors
October 31, 2007

5. **Comments?**
   No Answer (20)
   "Good presentations, informative"
   "Thank you, reminder was helpful"
   "Good Job SMCWPP"
   "Matt you were awesome!!!"
   "More sample pictures are good and useful"
   "Very informative, looking forward to next year's session"
   "Glad the handbooks aren't provided every year. I'd rather bring a lunch and have better coffee in the morning…I think it would help if scenarios (recent scenarios) were discussed. Perhaps ask participants to bring scenarios with pictures if possible to discuss. Rain-4-Rent is great, but I'd like to see other vendors/methods do demonstrations. I think the venue last year was better. There were a lot of interruptions, noise, distractions during the presentations, sort of inconsiderate to the speakers and audience."

End of Evaluations

APPENDIX E: TABLE OF CONTENTS

Watershed Assessment and Monitoring Subcommittee FY 2007/08 Attendance.

Unified Stream Assessment in Seven Watersheds in San Mateo County, California, August 2008 (cover page and summary).

The Unified Stream Assessment: Potential Uses for Stormwater Programs, San Francisco Bay Area Examples, July 2008 (cover page and summary).

FY 2007/08 Trash Assessments in Urban Creeks in San Mateo County, California, August 2008.

Review of San Francisquito Creek Sediment TMDL and Habitat Enhancement Plan Preliminary Project Report, August 2008.

SMCWPPP Watershed Assessment and Monitoring Subcommittee Attendance - FY 2007/08

Agency	Representative	AUG	NOV	FEB	JUN*
Atherton					
Belmont	Rosemary Field	√		√	
	Karen Borrmann		√		
	Gilbert Yau				√
Brisbane	Matt Fabry (SMCWPPP Coordinator)	√	√	√	√
Burlingame	Eva Justimbaste	√	√	√	√
Colma					
Daly City	Cynthia Royer	√	√		
East Palo Alto					
Foster City					
Half Moon Bay					
Hillsborough					
Menlo Park					
Millbrae					
Pacifica	Elizabeth Claycomb		√		
	Christina Horrisberger	√			
Portola Valley					
Redwood City					
San Bruno	Jim Shannon				√
San Carlos					
San Mateo (city)	Kacey Karmendy	√	√		
	Vern Bessey				√
	Rob Lecel				√
	Alan Atwater				√
SSF	Frank Mandola (Chair)	√	√	√	√
Woodside					
San Mateo County	Dermot Casey	√	√	√	√
	Mark Chow			√	
	Ana Clayton				√
EOA	Jon Konnan	√	√	√	√
	Paul Randall		√		√
Urban Creeks Council	Josh Bradt		√		
	Kristen Quay		√		

*Annual field trip.

Unified Stream Assessment in Seven Watersheds in San Mateo County, California

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
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A Program of the City/County Association of Governments

August 2008

SUMMARY

Introduction

During fall 2007, the San Mateo Countywide Water Pollution Prevention Program (the Program) performed creek walks in seven watersheds in San Mateo County – the Atherton, Redwood, Burlingame, Sanchez, Easton, Mills, and Millbrae Creek watersheds. The primary objective was to characterize physical conditions and features of creek channels and riparian corridors as part of the Program's screening-level water quality monitoring activities.

Methods

The creek walks were conducted using the Unified Stream Assessment (USA) protocol developed by the Center for Watershed Protection. The USA is a rapid assessment tool used to collect data on instream and riparian habitat conditions and identify possible influencing factors and opportunities for improvement. Each study creek was delineated into reaches. Each reach represented a relatively uniform set of conditions within the creek corridor. Factors that contributed to delineating a reach included land use in the immediate vicinity, elevation, creek order, access, and total length. The study reaches were typically less than one mile long, began and ended at major creek crossings or grade changes, and reflected the general condition of the area adjacent to the creek. Tributaries were generally considered separate reaches. Creek sections were not assessed if inaccessible (e.g., due to culverts or dense vegetation) or if little apparent urban influence was present.

A single overall assessment was conducted for each reach. This reach level assessment qualitatively evaluated characteristics such as base flow, dominant substrate, water clarity, biota, shading, and active channel dynamics. Each reach was ranked for overall stream condition and overall buffer and floodplain condition based on eight subcategories: in-stream habitat, vegetative protection, bank erosion, floodplain connection, vegetated buffer width, floodplain vegetation, floodplain habitat, and floodplain encroachment. Each subcategory was given a score on a 20-point scale (in general, a score of zero to 5 is designated as poor condition, 6 to 10 is marginal, 11 to 15 is suboptimal and 16 to 20 is optimal). The subcategory scores were summed to give a total reach score ranging from zero to 160.

The USA protocol was also used to identify eight potential creek impacts: channel modification, erosion, utilities, outfalls, creek crossings, trash/debris, recreation sites, and miscellaneous features. The location, extent and general characteristics of each impact were documented.

Findings

Reach Level Assessment

In the larger study watersheds (i.e., Atherton and Redwood Creek), overall creek condition scores generally increased in the upstream direction with decreasing urbanization. The scores were largely driven by improved instream habitat and increased buffer widths and floodplain connection in the upper parts of the larger watersheds. In the smaller study watersheds (i.e., Burlingame, Sanchez, Easton and Mills Creek), overall creek condition was generally marginal or suboptimal in all reaches due to extensive urbanization throughout the watershed. Impacts were typically associated with low buffer widths (e.g., homes constructed very close to the creek) or highly impacted riparian corridor due to culverting beneath roads and driveways and extensive channel armoring, often to protect the backyards of residential properties.

Channel Modification

Construction of bank revetments along homes and yards was the most common type of channel modification observed. Culverted sections of creek, typically below roads or driveways, were also common. Some of the channel modifications identified appeared to be failing and/or causing erosion. Older revetments were especially vulnerable to scour and undercutting by increased peak flows associated with urbanization.

Erosion

The majority of erosion observed was in the form of bank scour, especially at meander bends and revetments. Bank failure was also common, especially the failure of steep banks within highly incised channels. Channel incision in the study watersheds generally appeared to be associated with historical land use changes and may no longer be active (i.e., the watersheds have likely been developed for a long enough period of time for the channel to have adjusted to change in the hydrograph and reached a new equilibrium). The channel bed in many of the reaches appeared to be clay, which is relatively resistant to erosion. In some cases grade control structures appeared to further stabilize the channel bed.

Utilities

In most cases, utilities in the study watersheds did not appear to have much impact on the creeks. The majority of utilities observed consisted of small pipes crossing over the creek high above the channel bed without any apparent impact on the creek. In some cases, utilities were located near the channel bed and were associated with bank erosion, apparently during high flow events. In areas that had major utilities such as a San Francisco Public Utilities Commission water supply pipeline, grade control structures and bank armoring had often been constructed to protect the facility.

Outfalls

The assessments were carried out during the dry season and few dry weather flows were observed. Only a small fraction of the outfalls with discharge showed any indications of illicit discharge (e.g., discoloration, odor). All suspicious discharges were reported to a municipal illicit discharge coordinator. Some outfall pipes were associated with erosion, either immediately downstream from the outfall or head cuts perpendicular to the creek.

Creek Crossings

The most common type of creek crossing observed was road crossings. Other types of crossings identified include houses, yards and driveways. In addition to habitat alteration impacts, creek crossings can potentially impact upstream passage for fish. The study watersheds are not expected to support anadromous fish (e.g., steelhead); however, native warm water fish, primarily stickleback, were observed in several reaches. These fish need to migrate to search for spawning habitat and refuge during summer low flow conditions. Conversely, creek crossings can be beneficial by serving as grade controls. When the bottoms of creek crossings are hardened, creek bed erosion may be prevented from migrating upstream.

Trash/Debris

Trash is deposited in creeks through several possible means including illegal dumping and/or littering at the site, windborne transport from adjacent land uses, and waterborne transport from upstream sources. Littering and illegal dumping are typically problematic when urban creeks are adjacent to areas that receive high vehicle and/or foot traffic (e.g., shopping centers) or locations with good public access (e.g., parks and schools). The study area was predominately comprised of residential land uses west of major transportation corridors, such as El Camino Real or Alameda de las Pulgas. As a result, littering or dumping in creeks occurred in only a limited number of locations.

Trash impacts in the study area were often associated with the dumping of yard waste into creek channels behind residential properties. Impacted sites also included areas where trash accumulated due to obstructions in the channel, such as dense vegetation or utilities. Other impacted sites occurred where creeks passed through parks or vacant lands that were in close proximity to schools. SMCWPPP (2008a) describes the application of an additional protocol, the Urban Rapid Trash Assessment (URTA), which was used to further characterize selected locations in the study watersheds with relatively high levels of trash.

Recreation

Evidence of recreation in the study watersheds was limited to two sites located within one creek reach in a public park (Stulsaft Park in Redwood City). Both of these sites had rope swings over the creek with excellent public access. However, the potential for

water contact recreation appeared limited at the time of the assessment due to low flow conditions and the lack of deep-water pools.

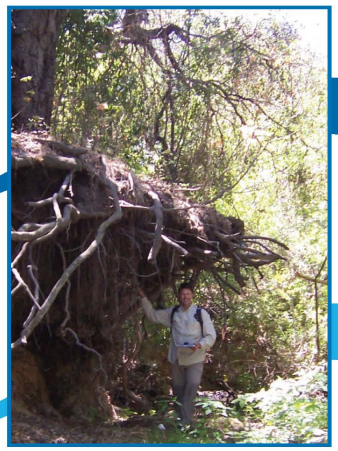
Potential Uses of USA Data

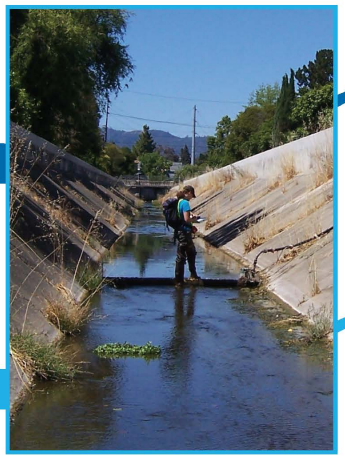
Data generated through USA surveys can address multiple stormwater program monitoring-related objectives. USA survey uses include establishing baseline data, identifying the types and locations of potential impacts to water quality, identifying potential beneficial uses to protect and threats to such uses, and refining monitoring program objectives and design. USA survey data can assist stormwater programs to better understand creek conditions and threats to water quality upstream and downstream of existing monitoring sites, thereby assisting in the interpretation of existing monitoring data and the identification of appropriate stormwater BMPs and potential restoration activities. The Program, in collaboration with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), recently prepared a guidance document for municipal stormwater programs and other interested agencies on the potential uses of the USA based on recent experience in the Bay Area (SCVURPPP and SMCWPPP 2008).

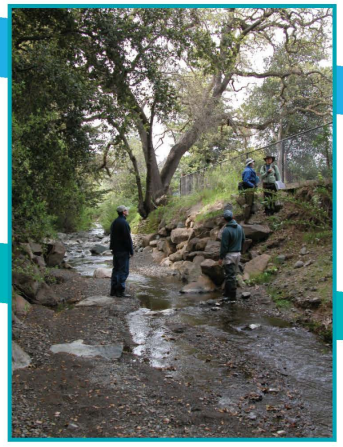
Many of the impacts observed during the Program's USA surveys are associated with efforts by individual private property owners to control bank instability on their properties. Education and outreach could help landowners understand the impacts of such actions on creeks and potentially lead to the use of better practices in the future. The Program is currently exploring developing an outreach and support program similar to the Urban Creeks Council's Stream Management Program for Landowners (SMPL). This program is funded by the Contra Costa Clean Water Program and provides free advice about creek care to Contra Costa County property owners. The data from the Program's USA surveys could assist San Mateo County property owners to target and optimize creek management and restoration efforts initiated through this type of creek management program. However, a funding source to implement a program similar to SMPL in San Mateo County has not been identified. SMCWPPP (2008b) has prepared a memo that further discusses the SMPL program and the potential development of a creek management program in San Mateo County.

The Unified Stream Assessment: Potential Uses for Stormwater Programs

San Francisco Bay Area Examples







Prepared for:

Santa Clara Valley Urban Runoff Pollution Prevention Program

San Mateo Countywide Water Pollution Prevention Program
Clean Water. Healthy Community.
www.flowstobay.org

Prepared by:

EOA, Inc.
1410 Jackson St.
Oakland, CA 94612

May 2008

Summary

The USA protocol is a relatively rapid and inexpensive tool that has been used successfully in the San Francisco Bay area to meet a wide range of monitoring program objectives, including guiding the development of monitoring plans; assisting in the interpretation of existing physical, chemical, and biological monitoring data; identifying potential water quality impacts and relevant BMPs; and identifying potential rehabilitation and restoration sites. In future years, Phase I municipal stormwater programs in the Bay Area will likely be required to conduct stream surveys using the USA or an equivalent method. Once a program's monitoring objectives have been established, the USA protocol can be tailored to efficiently meet the type and level of data collection required to achieve those objectives. The flexibility inherent in this assessment tool, together with its relatively low cost for the diversity and depth of information it can provide, makes it a valuable component of stormwater program toolkits.

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FY 2007/08
TRASH ASSESSMENTS IN URBAN CREEKS IN SAN MATEO COUNTY, CALIFORNIA

Prepared for the
San Mateo Countywide Water Pollution Prevention Program by
EOA, Inc., 1410 Jackson St., Oakland, CA

1.0 INTRODUCTION

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) conducts Watershed Assessment and Monitoring (WAM) component activities in compliance with its municipal stormwater NPDES permit. A current emphasis is collecting screening-level biological, physical and chemical water quality data from creeks in representative urban watersheds in San Mateo County. These creeks are typically receiving waters for urban runoff discharges from municipal storm drain systems. SMCWPPP collects environmental indicator data from the creeks (e.g., via creek walks, trash assessments, bioassessments and water column toxicity testing) to help evaluate current creek health and water quality conditions. These data also help establish a baseline for future evaluations of long-term trends and thereby inform SMCWPPP's efforts to improve the effectiveness of its Best Management Practices (BMPs) to prevent or reduce stormwater runoff impacts.

As part of the WAM program, SMCWPPP conducted creek walks and trash assessments in urban creeks in San Mateo County during FY 2006/07 (SMCWPPP 2007) and FY 2007/08. This report documents the results of the FY 2007/08 trash assessments. The primary objectives were:

- Identifying sites in San Mateo County urban creeks where trash accumulates;
- Evaluating the status and condition of selected urban creek trash accumulation sites, including establishing a baseline against which to track future trends; and
- Collecting data that will help identify primary trash sources and transport pathways associated with the selected trash accumulation sites and inform development of BMPs to address trash in urban creeks.

2.0 BACKGROUND

SMCWPPP has initiated a program to begin identifying and addressing trash accumulation areas in urban waterways in San Mateo County. SMCWPPP (2008a) discusses typical trash management activities currently conducted by SMCWPPP's municipalities, SMCWPPP's efforts to characterize trash in urban waterways in the county, SMCWPPP's progress in beginning to identify new BMPs to address trash accumulation areas, and the proposed general future direction of SMCWPPP's trash program. It should be noted that staff of the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) is currently developing specific

trash-related provisions for a Bay Area stormwater NPDES Municipal Regional Permit (MRP). The MRP will replace existing countywide municipal stormwater NPDES permits held by SMCWPPP and other San Francisco Bay Area Phase I stormwater programs. It is anticipated that these provisions will require a variety of trash-related activities, including assessing trash in urban creeks using similar methods to those applied in this study.

3.0 METHODS

3.1 Identification of Trash Accumulation Sites in Urban Creeks

SMCWPPP (2008b) conducted creek walks during fall 2007 in seven San Mateo County watersheds using the Unified Stream Assessment (USA) creek walk protocol (CWP 2005). The USA was conducted within urban reaches of the Atherton, Redwood, Burlingame, Sanchez, Easton, Mills and Millbrae Creek watersheds. One component of the USA is to document creek sites where trash accumulates. General characteristics of each identified trash site were documented including major types of trash, readily apparent sources (i.e., littering,[1] illegal dumping,[2] and accumulation from upstream sources) and adjacent land uses. GPS coordinates of each site were recorded and digital photographs were taken.

3.2 Trash Assessments at Accumulation Sites

The Urban Rapid Trash Assessment (URTA)[3] protocol (Version 1.0) was used to further characterize trash conditions at a subset of the trash accumulation sites identified during the fall 2007 USA creek walks. URTAs were performed at a total of seven of the 27 trash accumulation sites identified during the creek walks - two sites in the Redwood Creek watershed, two sites in the Mills Creek watershed, two sites in the Millbrae Creek watershed and one site in the Burlingame Creek watershed. The URTA was conducted twice at each site, once during fall 2007 and a second time during spring 2008, for a total of 14 assessments. The remaining USA trash accumulation sites were not assessed using the URTA because only a relatively small quantity of trash was present, yard waste was the only type of trash observed, and/or site access was poor.

It is important to note that the sites selected for the more detailed URTA assessments were not intended to represent trash conditions throughout a watershed. Instead, relatively impacted and accessible sites were selected to begin identifying and prioritizing major trash sources and potential BMPs to reduce levels of trash.

The URTA was applied at defined 100-foot sections of creek. Where possible, the starting or end point of the assessment reach was marked by an easily identifiable landmark (e.g., bridge crossing, storm drain culvert). Each trash item at the site was categorized by type (e.g.,

[1] Littering refers to when individual(s) leave trash behind in the course of other activities at a creek site (e.g., walking, picnicking).
[2] Dumping refers to when individual(s) in a premeditated action dispose of a relatively large quantity of trash onto the creek bank or bed, often using a vehicle.
[3] During FY 2005/06, the SCVURPPP revised the Regional Water Board's Rapid Trash Assessment protocol (SFBRWQCB 2007) to increase its utility in evaluating trash conditions at typical impacted sites in urban watersheds. The revisions were intended to enhance the utility of this tool in assisting municipal staff to identify, prioritize and evaluate trash management activities in urban creeks. The revised protocol is referred to as the Urban Rapid Trash Assessment (URTA).

plastics, metals, biohazards, construction materials) and the total number of items found in each category was recorded. Also recorded was whether the trash was found above the high water line on the bank or below the high water line, either on the bank or in the creek channel. All of the trash observed at each site was removed to facilitate determination of trash accumulation rates during subsequent URTAs.

In addition to enumerating the total number of trash pieces, a score was assigned to each of six condition parameters that relate to a range of issues associated with trash and water quality:

1. Level of Trash - reflects a qualitative "first impression" of the site after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the water body and where trash is evident in very large amounts. Sites that score in the "optimal" range appear to have little or no trash.

2. Actual Number of Trash Items Found - based on the tally of trash pieces found at the 100-foot creek site, a score within the appropriate condition category is selected based on the number of tallied items.

3. Transportable, Persistent, Buoyant Trash - based on the presence of trash items that are persistent in the environment, buoyant (floatable), and relatively small, can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. All of these factors are considered in this parameter.

4. Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use - based on the presence of trash items that are dangerous to people who wade or swim in the water and/or wildlife, including medical waste, diapers, human or pet waste and toxic substances. Site accessibility and use are also scored by this parameter.

5. Illegal Dumping and Littering - reflects the direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations.

6. Accumulation of Trash - reflects the accumulation of trash from upstream locations as distinguished from dumped trash by indications of age and transport.

Each parameter is scored from 0 to 20, with higher parameter scores indicating better conditions. The six parameter scores are summed for a total assessment score of 0 to 120. The Appendix contains further documentation on the URTA methodology and the field forms used to record the results of each assessment.

4.0 RESULTS AND DISCUSSION

4.1 Location and Characteristics of Trash Accumulation Sites in Creeks

Table 1 lists the 27 trash accumulation sites identified during the fall 2007 USA creek walks, including the seven sites further assessed using the URTA. Figures 1 and 2 show the locations of these trash sites.

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Table 1. Location and general characteristics of 27 creek sites with trash accumulation documented during fall 2007 USA creek walks. The seven indicated sites were further assessed using the URTA.

Site ID	Water Body	Location	URTA Site	Trash Source	Adjacent Land Use
A1	Atherton Creek	Behind homes near Valley Rd.		TA	Residential
RW1	Redwood Creek	Downstream end of Menlo Country Club golf course	X	L	Golf Course
RW2	Redwood Creek	Upstream end of Menlo Country Club golf course		D	Golf Course
RW3	Redwood Creek	Behind homes at Woodside Rd.		TA	Residential
RW4	Redwood Creek	Below outfall from Woodside Rd.		TA	Open Space
RW5	Redwood Creek	Downstream of I-280 culvert	X	TA	Transportation
RW6	Redwood Creek	Upstream of I-280 culvert		TA	Transportation
OA1	Arroyo Ojo de Agua	Stulsaft Park trail along unnamed tributary		L	Urban Park
OA2	Arroyo Ojo de Agua	Stulsaft Park		TA	Urban Park
OA3	Arroyo Ojo de Agua	Upper end of Stulsaft Park below outfall		TA	Urban Park
T1	Terrace Creek	Upstream of El Camino Real	X	L	Institutional
T2	Terrace Creek	Downstream of Sharon Ave.		D	Residential
R1	Ralston Creek	Downstream of Eucalyptus Ave.		D	Residential
R2	Ralston Creek	Adjacent to Ralston Ave.		L	Residential
S1	Sanchez Creek	Upstream of Forest View Ave.		D	Residential
S2	Sanchez Creek	Upstream of Geri Ln.		D	Residential
S3	Sanchez Creek	Upstream of Geri Ln.		D	Residential
S4	Sanchez Creek	Downstream of Fern Ct.		D	Residential
E1	Easton Creek	At Benito Ave.		TA	Residential
E2	Easton Creek	Adjacent to Canyon Rd.		D	Residential
E3	Easton Creek	Below Canyon Rd. culvert		L	Residential
M1	Mills Creek	Upstream of El Camino Real	X	TA	Residential
M2	Mills Creek	At tributary confluence		D	Residential
M3	Tributary to Mills Cr.	Below outfall at Martinez Dr.	X	TA	Residential/school
MB1	Millbrae Creek	Palm and Millbrae Ave. at park	X	L	Park/school
MB2	Millbrae Creek	Above Ashton in vacant parcel	X	L	Vacant
MB3	Millbrae Creek	Downstream Minorca Way		L	Residential

Trash source categories identified during the USA: L - Littering, ID - Illegal Dumping, TA - Trash Accumulation.
URTA - Urban Rapid Trash Assessment.

The greatest number of trash accumulation sites occurred in the Redwood Creek watershed (n=9), followed by the Burlingame and Sanchez Creek watersheds (n=4), Mills, Millbrae and Easton Creek watersheds (n=3) and Atherton Creek watershed (n=1). The sites were distributed across a variety of land uses, including residential areas, transportation corridors, parks, schools and a golf course. Three general trash source categories identified during the USA were approximately equally represented: trash accumulation (n=10), litter (n=9) and illegal dumping (n=8). Trash accumulation sites were typically below large outfalls and/or areas with dense vegetation or other obstructions that capture trash as it moves downstream. Litter sites were generally in high traffic areas with good public access (i.e., schools and/or public parks). The illegal dumping sites observed were all in residential areas, with the exception of one site at a private golf course.

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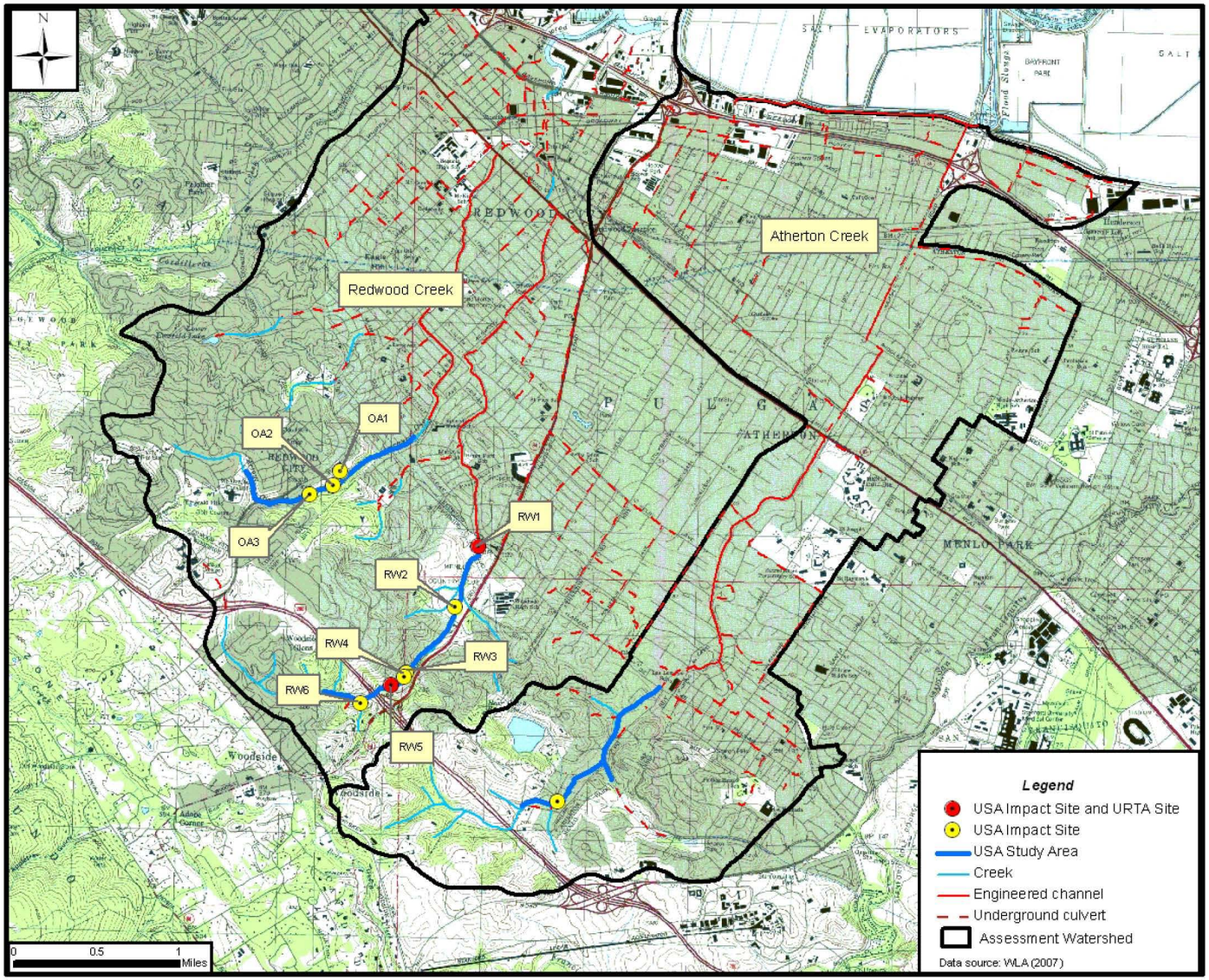

Figure 1. Location of USA and URTA trash sites in the Atherton and Redwood Creek watersheds.

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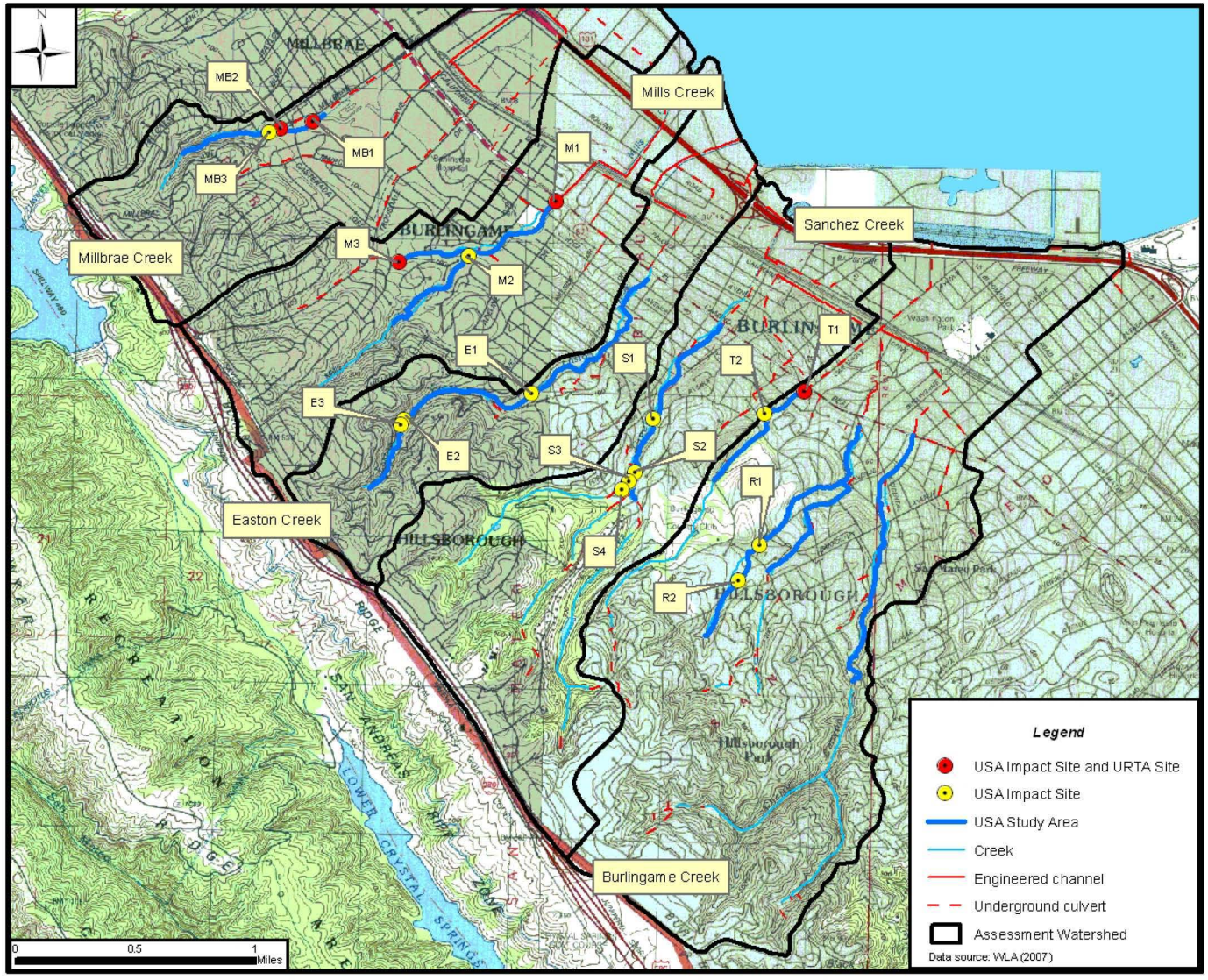

Figure 2. Location of USA and URTA trash sites in the Burlingame, Sanchez, Easton, Mills and Millbrae Creek watersheds.

4.2 Urban Rapid Trash Assessments

4.2.1 Overall Status and Condition of Trash Accumulation Sites

Total URTA scores ranged between 31 and 71 (higher scores indicate less trash impacts and better conditions) (Table 2). The three lowest scores occurred during fall season assessments at a site in the tributary to Mills Creek (31), a site in Redwood Creek (42) and a site in Millbrae Creek (45). These three sites also had the highest total number of trash items, 607, 1,278 and 542, respectively.

Figure 3 is a frequency histogram of the URTA scores for both fall and spring season assessments. Spring 2008 assessment scores were generally higher than fall 2007 scores.

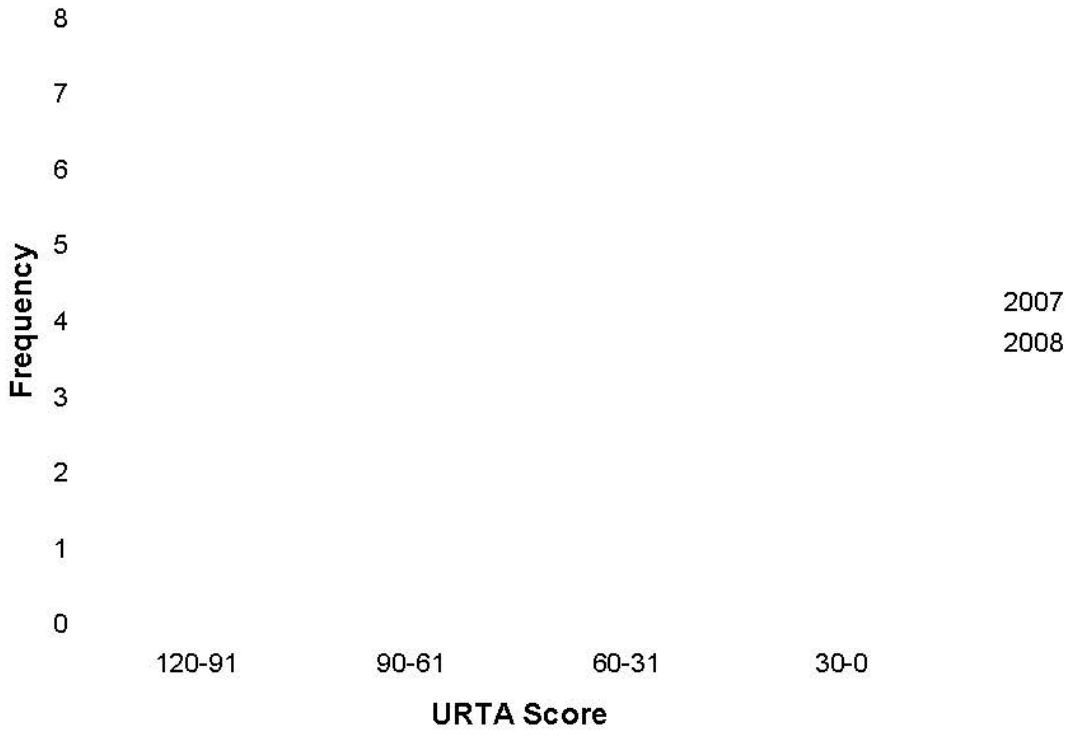

Figure 3. Distribution of Urban Rapid Trash Assessment (URTA) scores conducted during fall 2007 and spring 2008 at seven sites. Higher scores indicate less trash impacts and better conditions.

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Table 2. Total and individual parameter scores and total number of trash items documented during URTAs conducted at seven creek locations in four watersheds during fall 2007 and spring 2008.

Water Body	Site ID	Site	Date	1 Qual-itative	2 Quant-itative	3 Trans-portable Items	4a Hazard-ous Items	4b Access	5a Dumping	5b Litter	6 Accum-ulation	Total Score	Total Trash Items
Mills Creek	M1	Upstream El Camino Real	Oct-07	6	7	4	6	6	10	8	0	47	383
			Mar-08	9	12	6	10	6	10	8	4	65	211
Tributary to Mills Creek	M3	Below outfall at Martinez Drive	Oct-07	4	4	3	2	9	1	6	2	31	607
			Mar-08	10	8	3	9	9	6	9	3	57	395
Redwood Creek	RW1	Menlo Country Club golf course	Nov-07	11	11	5	10	4	10	3	6	60	230
			Mar-08	12	14	8	9	4	10	6	8	71	133
Redwood Creek	RW5	Downstream end I-280 culvert	Nov-07	5	0	0	8	9	10	10	0	42	1,278
			Mar-08	9	6	2	7	9	10	9	5	57	461
Terrace Creek	T1	Upstream El Camino Real	Oct-07	10	10	7	4	5	10	6	7	59	259
			Mar-08	7	11	7	9	5	6	3	15	63	236
Millbrae Creek	MB1	Palm and Millbrae Avenue at park	Oct-07	10	9	5	2	1	4	4	14	49	329
			Mar-08	14	9	9	2	1	9	6	6	56	327
Millbrae Creek	MB2	Upstream Ashton in vacant land	Oct-07	7	5	5	0	1	10	1	16	45	542
			Mar-08	6	7	8	1	1	9	1	12	45	406

Note: higher scores indicate less trash impacts and better conditions. See the Appendix for more information.
URTA – Urban Rapid Trash Assessment.

4.2.2 Trash Characteristics

The total number of trash items per URTA ranged between 133 and 1,278, with a total of 5,797 pieces of trash observed and collected during the 14 assessments (Table 3). In general, a smaller number of trash items was found at each site in the spring compared to the fall. Plastic was the most common item found during the assessments, representing about 65% of all the trash observed. Miscellaneous, glass, biodegradable and metal items were the next most common trash items, collectively representing about 33% of the trash found (Figure 4).

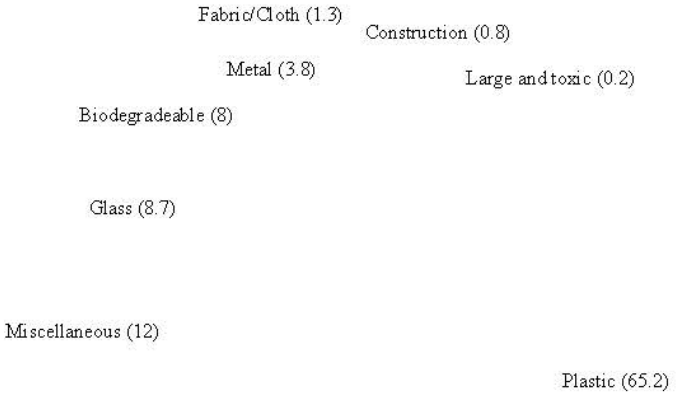

Figure 4. Relative proportions of trash types enumerated using the Urban Rapid Trash Assessment at seven creek sites over two seasons.

URTA Parameters 3 and 4 provide an indication of potential impacts that trash items at the site may have on water quality and beneficial uses. The Parameter 3 score reflects the amount of transportable, persistent, buoyant litter at the assessment site. Trash in this category can be transported over long distances and may impact wildlife through ingestion and entanglement (see Section 3.2 and the Appendix). The number of plastic items (e.g., bags, wrappers, bottles) and miscellaneous items (e.g., cigarette butts, rubber balls) found during an assessment was totaled to determine that assessment's Parameter 3 score (see the Appendix for more information). The average Parameter 3 score for the 14 URTAs conducted was 5 out of a total of 20 possible points (higher scores indicate less trash impacts and better conditions). Over 75% of the trash that was identified during the URTAs was categorized as transportable, persistent, buoyant litter.

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Table 3. Total number and type of trash items documented at seven sites assessed using the URTA during fall 2007 and spring 2008.

Trash Category[1]	Redwood Cr. Golf Course		Redwood Cr. below I-280		Terrace Cr. El Camino		Mills Cr. El Camino		Mills Cr. Tributary Outfall		Millbrae Cr. Park		Millbrae Cr. Vacant Land		Total Items
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	
Biodegradable	0	1	20	11	62	49	2	4	9	39	32	27	117	90	463
Biohazard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	4	3	0	12	0	11	8	3	2	3	0	46
Fabric/Cloth	1	1	15	5	0	1	4	4	30	7	5	0	2	0	75
Glass	0	0	4	5	1	1	0	1	8	1	57	155	138	136	507
Large	0	0	1	1	0	0	0	0	3	1	0	1	0	0	7
Metal	2	4	19	14	33	10	8	4	43	10	6	12	26	30	221
Miscellaneous	187	74	102	52	15	24	47	16	44	28	19	25	40	22	695
Plastic	40	53	1,117	369	145	151	310	182	459	301	206	104	213	128	3,778
Toxic	0	0	0	0	0	0	0	0	0	0	1	1	3	0	5
Total Items	230	133	1,278	461	259	236	383	211	607	395	329	327	542	406	5,797

[1]See the Appendix for more information on the trash categories.
URTA – Urban Rapid Trash Assessment.

The Parameter 4a score reflects the amount of trash items at the assessment site that are a biohazard, toxic, or sharp, (e.g., broken glass, metal shards, medical waste, diapers, pet waste and batteries). Trash in this category is potentially dangerous to wildlife and to people who wade or swim in the water (see Section 3.2 and the Appendix). The number of trash items found in this category during an assessment was totaled to determine that assessment's Parameter 4a score (see the Appendix for more information). The average Parameter 4a score for the 14 URTAs conducted was 6 out of a total of 10 possible points (higher scores indicate less trash impacts and better conditions). About 13 percent of the trash that was identified during the URTAs was categorized as hazardous (biohazard, toxic, or sharp). Most items in this category were glass and metal objects; biohazardous items were not observed and toxic items were relatively uncommon.

The URTA Parameter 4b score (site accessibility/use) for five of the seven URTA sites averaged 6.6 out of 10 possible points (a score of 10 points indicates that a site is inaccessible to the public), indicating that on average these sites had limited access and use. This contrasted with the results for the other two URTA sites, which were both located in Millbrae Creek. Four URTAs were performed in Millbrae Creek (two assessments at each of the two sites). The Parameter 4b score for each of the four assessments was 1.0, indicating that these sites are readily accessible by people. In addition, the Millbrae Creek sites had relatively low scores (lower scores indicate more trash impacts and worse conditions) for URTA parameter 4a (biohazard, toxic, or sharp trash items), ranging from zero to two, mainly due to a high number of pieces of broken glass.[4]

4.2.3 Trash Sources and Pathways at URTA Sites

URTA Parameters 5 and 6 evaluate potential trash sources/pathways. On average, the most common trash pathway identified during the 14 URTAs was accumulation from upstream sources with an average score of seven out of 20 possible points (a score of 20 points indicates no accumulation). The lowest scores for trash accumulation (score 0.0) occurred in two locations: Redwood Creek downstream of the I-280 culvert and Mills Creek, upstream of an SFPUC pipeline below El Camino Real. Another site with high accumulation (score 2.0) was located in the upper end of a tributary to Mills Creek just below an outfall at Martinez Drive (Table 2).

The littering source/pathway was slightly less common than trash accumulation at URTA sites, with an average score of 5.7 (a score of 10 points indicates no littering at a site). The lowest score for littering (1.0) occurred in Millbrae Creek at an undeveloped vacant parcel near to a high school. Other sites where littering was important included a golf course in Redwood Creek (i.e., golf balls in the creek) and an overflowing dumpster in a parking lot adjacent to Terrace Creek.

Dumping was relatively uncommon at URTA sites, with an average score of 8.2 (a score of 10 points indicates no dumping at site). The lowest score (1.0) for dumping occurred below an outfall at the upper end of tributary to Mills Creek. It was unclear how large materials (e.g.,

[4]Sometimes items are broken into two or more pieces. Transportable, persistent, and buoyant fragments such as plastics are individually counted, while paper and broken glass, with lower persistence and/or mobility, are counted based on the parent item(s). Broken glass pieces that are scattered, with no recognizable original shape, are counted individually.

construction materials, shopping cart) entered this site as public access was limited by a fence. Dumping was also identified at the downstream site on Millbrae Creek, which had good public access along Millbrae Drive.

In general, high levels of trash in the creek channel generally originated from upstream sources and accumulated at the assessment sites due to dense vegetation or instream structures (e.g., a pipeline) that captured it during conveyance downstream. Littering from adjacent land uses was the predominant source of trash at sites that had larger proportions of trash on the banks compared to the creek channel. These sites usually had good public access. Larger trash items (construction materials, furniture) were found on both banks and in creek channels.

5.0 REFERENCES

CWP 2005. *Urban Subwatershed Restoration Manual Series, No. 10. Unified Stream Assessment: A User's Manual.* Version 2.0. Center for Watershed Protection. Ellicot City, Maryland. February 2005.

SMCWPPP 2007. *Trash Assessments in Six Watersheds in San Mateo County, California.* Prepared for the San Mateo Countywide Water Pollution Prevention Program by EOA, Inc. August 2007.

SMCWPPP 2008a. *Addressing Trash in Urban Waterways in San Mateo County, California.* Fact Sheet prepared for the San Mateo Countywide Water Pollution Prevention Program by EOA, Inc. August 2008.

SMCWPPP 2008b. *Unified Stream Assessment in Seven Watersheds in San Mateo County, California.* Prepared for the San Mateo Countywide Water Pollution Prevention Program by EOA, Inc. August 2008.

APPENDIX

URBAN RAPID TRASH ASSESSMENT PROTOCOL
Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)

Adapted from the San Francisco Bay Regional Water Quality Control Board Rapid Trash Assessment Protocol, Version 8.

Monitoring Design:
The urban rapid trash assessment can be used for a number of purposes, such as ambient monitoring, evaluation of management actions, determination of trash accumulation rates, or comparing sites with and without public access. Ambient monitoring efforts should provide information at sites distributed throughout a waterbody, and may be conducted several times a year to characterize spatial and temporal variability. Additionally, the ambient sampling design should document the effects of episodes that affect trash levels such as storms or community cleanup events. Pre- and post-project assessments can assist in evaluating the effectiveness of management practices ranging from public outreach to structural controls, or to document the effects of public access on trash levels in waterbodies (e.g., upstream/downstream). Trash accumulation rates may be determined by conducting trash assessments before and after the summer or dry weather index (to capture rates of littering) and the winter or rainy index (to capture rates of accumulation from upstream sources). This method was developed for sections of wadeable streams, but can be adapted to shorelines of lakes, beaches, or estuaries. This adapted version of the San Francisco Bay Regional Water Quality Control Board Rapid Trash Assessment Protocol, Version 8 was developed by SCVURPPP to more effectively assess trash problem areas and to detect changes in trash conditions over time as a result of management actions.

Site Definition:
A team of two people or more defines or verifies a 100-foot section of the stream or shoreline to analyze. When a site is first established, it is recommended that the 100-foot distance be accurately measured. The length should be measured not as a straight line, but as 100 feet of the actual stream or shore length, including sinuous curves. Where possible, the starting and ending points of the stream section should be easily identified landmarks, such as an oak tree or boulder, and noted on the worksheet ("Upper/Lower Boundaries of Reach"), or documented using a global positioning system (GPS), so that future assessments are made at the same location. The team should confer and document the upper boundary of the banks to be surveyed, based on evaluation of whether trash can be carried to the waterbody by wind or water (e.g., an upper terrace in the stream bank). The team documents the location of the high water line based on site-specific physical indicators, such as a debris line found in the riparian vegetation along the stream channel. If the high water line cannot be determined, it is suggested that bankfull height be documented, noting that the high water line could not be determined. Trash located below the high water line can be expected to move into the streambed or to be swept downstream during the next winter season. Visually extend all boundaries in order to encompass the 100' section. Defining site characteristics will facilitate the comparison of trash assessments conducted at the same site at different times of the year.

Survey:
It is highly recommended that all trash items within an assessed site be picked up, so that the site can be re-assessed to evaluate usage patterns, trash return rates, and management actions. A survey, including notes and scoring, will take approximately one to two hours based on how trash-impacted the site is and how many people are working together. The first time a reach is assessed, the process will generally take longer than on subsequent visits. Begin the survey at the downstream end of the selected reach so that trash can be seen in the undisturbed stream channel. Tasks can be divided according to the number of team members. If there are two team members, one team member begins walking along the bank or in the water at the edge of the stream or shore, looking for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either above or below the high water line based on the previously determined boundary. The other person walks in the streambed and up and down the opposite bank, picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line, for the tally person to mark down appropriately on the

trash assessment sheet. All team members pick up the trash items as they are found. All team members should wear gloves to avoid injuries.

The person tallying the trash indicates on the sheet whether the trash was found above the high water line on the bank, or below the high water line either on the bank or in the stream (i.e., tally dots or circles (•) for above high water line, tally lines (|) for below). If it is evident that items have been littered, dumped, or accumulated via downstream transport, make a note in the designated rows near the bottom of the tally sheet - this will help when assessing scores. A trash grabber, metal kitchen tongs, or a similar tool should be used to help pick up trash. Be sure to look under bushes, logs, and other plant growth to see if trash has accumulated underneath. The ground and substrate should be inspected to ensure that small items such as cigarette butts and pieces of broken glass or Styrofoam are picked up and counted. The tally count is an important indicator of trash impairment and should be used in conjunction with the total score to assist in site comparisons.

Sometimes items are broken into many pieces. Transportable, persistent, and buoyant, fragments such as plastics should be individually counted, while paper and broken glass, with lower persistence and/or mobility, should be counted based on the parent item(s). Broken glass pieces that are scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, or to waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

Once the team is finished with the tallying, use the tally sheet margins to count up two totals for each trash item line: one total for items found above the high water line, and one total for items found below the high water line. Now sum the totals of above and below for each trash category, and write in next to each trash category. Complete the worksheets before leaving the site in order to remember pertinent details. The team should discuss each parameter and agree on a score based on a discussion of the condition categories. Discuss and document possible influential factors affecting trash levels at the site, such as a park, school, or nearby residences or businesses. Within each trash parameter, narrative language is provided to assist with choosing a condition category. The worksheet provides a range of numbers within some of the categories, allowing for a range of conditions encountered in the field. Note that trash located in the water leads to lower scores than trash above the high water line. Not all specific trash conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., "site frequently used by people"), nor do the narratives describe all possible conditions. Scores of "0" should be reserved for the most extreme conditions. Once the scores are assigned for the six categories, sum the final score and include specific notes about the site at the end of the sheet. To characterize the variability, persistence, and return rate of trash it is necessary to assess a site three to four times, bracketing different seasons.

Trash Assessment Parameters:

The rapid trash assessment includes a range of parameters that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters characterize trash levels of certain types of trash that may affect water quality, and the last two parameters estimate sources of trash (adjacent land use-related littering, dumping or upstream sources).

1. **Level of Trash.** This assessment parameter is intended to reflect a qualitative "first impression" of the site, after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the waterbody and where trash is evident in very large amounts. Sites that score in the "optimal" range appear to have little or no trash. This parameter should be assessed prior to the collection and enumeration of trash done for subsequent parameter.

2. **Actual Number of Trash Items Found.** Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 500 items have been tallied, assign the following scores: 5: 501-600 items; 4: 601-700 items; 3: 701-800 items; 2: 801-

900 items; 1: 901-1000 items; 0: over 1000 items. Use similar guidelines to assign scores in other condition categories.

3. **Transportable, Persistent, Buoyant Trash.** As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. **Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use.** This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment. Medical waste, diapers, and human or pet waste could potentially adversely affect water quality. Site accessibility and site use is considered in the scoring of this condition category. Sites with very difficult or restricted human access and no evidence of recreational use will receive higher scores due to reduced risk of human exposure at the site.

5. **Illegal Dumping and Littering.** This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. **Accumulation of Trash.** Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

Technical Notes on Trash and Water Quality:
Trash is a water pollutant that has a large range of characteristics of concern. Not all litter and debris delivered to streams are of equal concern to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to aquatic life in the form of ingestion or entanglement. Some elements of trash can negatively affect water quality such as discarded medical waste, and human or pet waste. Also, some household and industrial wastes may contain toxic substances that may influence water quality, such as batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Sharp glass and metal objects are potential puncture and laceration hazards. Larger trash such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistence and accumulation of trash in a waterbody are of particular concern and signify a priority area for prevention of trash discharges. Also of concern are trash "hotspots" where illegal dumping, littering, and/or accumulation of trash occur in very large amounts.

Rapid Trash Assessment. Trash assessment includes a visual survey of the waterbody (e.g., streambed and banks) and adjacent areas from which trash elements can be carried to the waterbody by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet is designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the Clean Water Act and the California Water Code. The worksheet also provides a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations.

Trash Characteristics of Concern. Buoyant (floatable) elements tend to be more harmful to water quality than settleable elements, due to their ability to be transported throughout the waterbody and ultimately to the marine environment. Elements such as plastics, synthetic rubber and synthetic cloth, because of their persistence, have a more adverse effect on water quality than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002).

Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. Larger plastic elements such as plastic grocery bags are also harmful to larger aquatic life such as sea turtles, which can mistake the trash for floating prey and ingest it, leading to starvation or suffocation. Floating debris that is not trapped and removed will eventually end up on the beaches or in the ocean, repelling visitors and residents from the beaches and degrading coastal and open ocean waters.

Leaf litter is trash when there is evidence of intentional dumping. Leaves and pine needles in streams provide a natural source of food for organisms, but excessive levels due to human influence can cause nutrient imbalance and oxygen depletion in streams, to the detriment of the aquatic ecosystem. Clumps of leaf litter and yard waste from trash bags should be treated as trash in the water quality assessment, and not confused with natural inputs of leaves to streams. If there is a question in the field, check the type of leaf to confirm that it comes from a nearby riparian tree. In some instances, leaf litter may be trash if it originates from dense ornamental stands of nearby human planted trees that are overloading the stream's assimilative capacity for leaf inputs. Other biodegradable trash, such as food waste, also exerts a demand on dissolved oxygen, but aquatic life is unlikely to be adversely affected unless the dumping of food waste is substantial and persistent at a given location.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion. Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food (i.e., plastic bags look like jellyfish, a prey item of sea turtles). Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Larger settleable items such as automobiles, shopping carts, and furniture can redirect stream flow and destabilize the channel.

In conclusion, trash in water bodies can adversely affect humans, fish, and wildlife. Not all water quality effects of trash are equal in severity or duration, thus the trash assessment methodology was designed to reflect a range of trash impacts to aquatic life, public health, and aesthetic enjoyment. When considering the water quality effects of trash while conducting a trash assessment, remember to evaluate individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. Utilize the narratives in the worksheet, refer to the technical notes and trash parameter descriptions in the text as needed, and select your scores after careful consideration of actual conditions.

References:

U.S. Environmental Protection Agency, 2001. Draft Assessing and Monitoring Floatable Debris.

U.S. Environmental Protection Agency, 2002. The Definition, Characterization and Sources of Marine Debris. Unit 1 of Turning the Tide on Trash, a Learning Guide on Marine Debris.

Urban Rapid Trash Assessment Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

WATERSHED/STREAM: _____ DATE/TIME: _____
MONITORING GROUP, STAFF: _____ STATION ID _____
STATION NAME /LOCATION: _____

	CONDITION CATEGORY			
Trash Assessment Parameter	**Least Disturbed (Optimal Urban)**	**Sub optimal Urban**	**Marginal Urban**	**Poor**
1. Level of Trash	On first glance, little or no trash visible. Little or no trash evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.	On first glance, trash is evident in low levels. After close inspection small levels of trash evident in stream bank and streambed.	Trash is evident in medium on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.	Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Actual Number of Trash Items Found	0 to 100 trash items found based on a trash assessment of a 100-foot stream reach.	101 to 250 trash items found based on a trash assessment of a 100-foot stream reach.	251 to 500 trash items found based on a trash assessment of a 100-foot stream reach.	Over 500 trash items found based on a trash assessment of a 100-foot stream reach.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Transportable, Persistent, Buoyant Litter	Little or no (< 25 pieces) transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Low to medium presence (26-75 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Medium prevalence (76-200 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Large amount (>200 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, balloons, styrofoam, cigarette butts;
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Biohazard, Toxic and Sharp Objects	B: Trash contains no medical waste, diapers, pet or human waste. No evidence of toxic substances such as chemical containers or batteries. Only 1 piece of broken glass or metal debris, if any, is present.	B: No toxic substances, but small presence (2-10 pieces) of sharp objects such as broken glass and metal debris.	Presence of **any one** of the following: hypodermic needles or other medical waste; used diaper, pet waste, or human feces; any toxic substance such as chemical containers, batteries, or fluorescent light bulbs. Medium to high prevalence (11-50 pieces) sharp objects.	Presence of **more than one** of the items described in the marginal condition category, and/or high prevalence of (> 50) sharp objects.
Site Accessibility	A: Access is difficult, restricted by locked gate or some other physical barrier like steep banks or thick riparian veg. Site reach does not appear to be used by people. Might be private property or protected watershed.	A: Access is limited and site reach does not appear to be used by people. No trails down to creek.	A: Public access to reach is fair to good but site does not appear to be used frequently, **or** private access is good without any public access.	A: Excellent reach access including trails down to and adjacent creek and creekside space for sitting down. Some evidence that reach is used frequently by the public (e.g. rope swings, many beer/soda cans and food wrappers left on the banks, etc.).
B SCORE	10 9	8 7 6	5 4 3	2 1 0
A SCORE	10 9	8 7 6	5 4 3	2 1 0

Urban Rapid Trash Assessment Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

	CONDITION CATEGORY			
Trash Assessment Parameter	**Least Disturbed (Optimal Urban)**	**Sub optimal Urban**	**Marginal Urban**	**Poor**
5. Illegal Dumping	D: No evidence of illegal dumping. No bags of trash, no yard waste, no household items placed at site to avoid proper disposal, no shopping carts.	D: Some evidence of illegal dumping. Limited vehicular access limits the amount of potential dumping, or material dumped is diffuse paper-based debris.	D: Presence of **one** of the following: furniture, appliances, shopping carts, bags of garbage or yard waste, coupled with vehicular access that facilitates in-and-out dumping of materials to avoid landfill costs.	D: Evidence of chronic dumping, with **more than one** of the following items: furniture, appliances, shopping carts, bags of garbage, or yard waste. Easy vehicular access for in-and-out dumping of materials to avoid landfill costs.
Illegal Littering	L: Any trash is incidental litter or carried downstream from another location.	L: Some evidence of litter within creek and banks originating from adjacent land uses	L: Prevalent in-stream or shoreline littering that appears to originate from adjacent land uses.	L: Large amountof litter within creek and on banks that appears to originate from adjacent land uses.
D-SCORE	10 9	8 7 6	5 4 3	2 1 0
L-SCORE	10 9	8 7 6	5 4 3	2 1 0
6. Accum-ulation of Trash	There does not appear to be a problem with trash accumulation from downstream transport. Trash, if any, appears to have been directly deposited at the stream location.	Some evidence that litter and debris have been transported from upstream areas to the location, based on evidence such as silt marks, faded colors or location near high water line.	Evidence that trash is carried to the location from upstream, as evidenced by its location near high water line, siltation marks on the debris, or faded colors.	Trash appears to have accumulated in substantial quantities at the location based on delivery from upstream areas, and is in various states of degradation based on its persistence in the waterbody. A large percentage of trash items have been carried to the location from upstream.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Total Score _____

SITE DEFINITION:

UPPER/LOWER BOUNDARIES OF REACH: _____

HIGH WATER LINE: _____

UPPER EXTENT OF BANKS OR SHORE: _____

_____

NOTES:

_____

_____

_____

_____

_____

_____

_____

Trash Item Talley Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

TRASH ITEM TALLY (Tally with (•) if found above high water line, and (|) if below)

PLASTIC # Above___ # Below____	**METAL** # Above___ # Below____
Plastic Bags	Aluminum Foil
Plastic Bottles	Aluminum or Steel Cans
Plastic Bottle Caps	Bottle Caps
Plastic Cup Lid/Straw	Metal Pipe Segments
Plastic Pipe Segments	Auto Parts (specify below)
Plastic Six-Pack Rings	Wire (barb, chicken wire etc.)
Plastic Wrapper	Metal Object
Soft Plastic Pieces	**LARGE (specify below)** # Above___ # Below____
Hard Plastic Pieces	Appliances
Styrofoam cups pieces	Furniture
Styrofoam Pellets	Garbage Bags of Trash
Fishing Line	Tires
Tarp	Shopping Carts
Other (write-in)	Other (write-in)
BIOHAZARD # Above___ # Below____	**TOXIC** # Above___ # Below____
Human Waste/Diapers	Chemical Containers
Pet Waste	Oil/Surfactant on Water
Syringes or Pipettes	Spray Paint Cans
Dead Animals	Lighters
Other (write-in)	Small Batteries
CONSTRUCTION DEBRIS#Above___#Below__	Vehicle Batteries
Concrete (not placed)	Other (write-in)
Rebar	**BIODEGRADABLE** # Above___ # Below____
Bricks	Paper
Wood Debris	Cardboard
Other (write-in)	Food Waste
MISCELLANEOUS # Above___ # Below____	Yard Waste (incl. trees)
Synthetic Rubber	Leaf Litter Piles
Foam Rubber	Other (write-in)
Balloons	**GLASS** # Above___ # Below____
Ceramic pots/shards	Glass bottles
Hose Pieces	Glass pieces
Cigarette Butts	**FABRIC AND CLOTH** # Above___ # Below____
Golf Balls	Synthetic Fabric
Tennis Balls	Natural Fabric (cotton, wool)
Other (write-in)	Other (write-in)
Total pieces Above: **Below:**	**Grand total:**
Tally all trash in above rows; make notes below as needed to facilitate scoring.	
Littered:	
Dumped:	
Downstream Accumulation:	

SPECIFIC DESCRIPTION OF ITEMS FOUND:_____

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Water Pollution Prevention Program
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August 27, 2008

Ms. Sandy Potter
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Review of San Francisquito Creek Sediment TMDL and Habitat Enhancement Plan Preliminary Project Report

Ms. Potter:

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) appreciates this opportunity to comment on a report prepared by San Francisco Bay Regional Water Quality Control Board (Regional Water Board) staff entitled *San Francisquito Creek Sediment TMDL and Habitat Enhancement Plan Preliminary Project Report* (Project Report) (dated June 30, 2007). Our comments are also based on review of relevant existing studies on the San Francisquito Creek watershed, including a sediment budget (SFCJPA 2004) and limiting factors analysis (Jones and Stokes 2006). We also reviewed a similar project, the *Sediment TMDL and Habitat Enhancement Plan* developed for the Napa River (SFBRWQCB 2007).

SMCWPPP recognizes the importance of the San Francisquito Creek watershed as one of the few remaining creek systems in the southern Bay Area that supports anadromous steelhead populations. Since 1996, the creek has been on the Clean Water Act 303(d) list for impairment by excess fine sediment. Excess sedimentation is thought to have contributed to the decline of habitat conditions and steelhead populations in the watershed. About 80% of the San Francisquito Creek watershed is located within San Mateo County, and municipalities, resource agencies, and other stakeholders within the county will have an important role in developing and implementing a strategy for recovery of steelhead populations.

The Project Report proposes TMDL requirements to help reduce sediment production in the watershed, including a load allocation of 125% of the natural background sediment load and specific sediment-related numeric targets related to fish habitat factors such as pool filling and embeddedness. In addition, Regional Water Board staff strongly recommends that stakeholders in the watershed collaborate to implement habitat enhancement and restoration actions (e.g., fish barrier removal). The Project Report acknowledges that existing data sources have a degree of uncertainty (i.e., the sediment budget) or do not adequately describe existing conditions of creeks in San Mateo County (i.e., the limiting factors analysis). Thus an adaptive approach is needed to allow changes in the TMDL strategy as new information becomes available.

We understand that due to resource constraints Regional Water Board staff will not be able to work on further development of this TMDL for the next year or two. At this time, SMCWPPP would like to provide the following preliminary comments on the Project Report. We look forward to providing additional input as this process continues.

- The Project Report describes 1) a sediment TMDL, and 2) a habitat enhancement plan. When the project moves forward, a clear separation should be made between pollutant-

based TMDL requirements (i.e., sediment load allocations and numeric targets) and habitat enhancement actions (i.e., non-pollutant based habitat enhancement or restoration).

- The targets/allocations and source areas should be linked, i.e., the targets/allocations should be applied to specific impacted habitat areas at or downstream of the anthropogenic sediment source areas. Existing information suggest that the Los Trancos Creek subwatershed would be the most appropriate area to establish targets/allocations since it is reported to have the greatest proportion of controllable sediment sources (an estimated 37% of total sediment production is human-related). In addition, Los Trancos Creek has the greatest amount of steelhead production. The Corte Madera Creek subwatershed has high sediment production; however, most of the sediment is from natural sources and majority of sediment is trapped behind the Searsville Dam. In addition, steelhead have no access to creek areas above the dam.

- The Project Report indicates sediment-related fish habitat numeric targets established in the Los Trancos Creek watershed (based on existing data) will also be used in the Bear and San Francisquito Creek subwatersheds unless additional data become available that demonstrate the targets are already met in these watersheds. SMCWPPP does not support use of data collected in Los Trancos Creek to generate targets for the other subwatersheds, especially where other factors not related to sediment (e.g., low summer base flows in Bear Creek) may be more important to address. Similarly, the San Francisquito Creek subwatershed is primarily urbanized with hardened banks, contributes a relatively low sediment load, and is unlikely to provide suitable rearing habitat for steelhead. It may therefore be inappropriate to apply sediment-related targets in these subwatersheds. Data from additional field studies would be needed to determine whether excess sediment is a limiting factor in the Bear and San Francisquito Creek subwatersheds, and if so, what sediment-related numeric targets would be appropriate.

- The TMDL should clearly identify the responsible party and regulatory tool or authority for each sediment source category. Table 4 of the Project Report is incomplete and sometimes misleading. For example, Table 4 implies that municipal stormwater (MS4) permits are the appropriate regulatory tool for implementing erosion controls on lands managed by the Midpeninsula Regional Open Space District (MROSD). However, as stated on p.14 of the Project Report, MROSD lands are not regulated under a MS4 permit. Other important stakeholders that own and/or manage property in the watershed but are not regulated under MS4 permits include the Peninsula Open Space Trust (POST) and the National Park Service. Table 4 should include all such entities and clearly specify the appropriate regulatory tools or authorities for implementation of TMDL-related management activities. MS4 permits are limited to regulation of facilities owned and operated by municipalities.

- The Bay Area Phase I municipal stormwater NPDES permits are being reissued as one Municipal Regional Permit (MRP). The MRP will replace SMCWPPP's current NPDES permit and the other Bay Area Phase I permits. A Tentative Order for the MRP was released for public comment in December 2007 and a hearing to take testimony from the public on the Tentative Order took place in March 2008. Any actions specified in the TMDL's implementation plan that would be regulated under a MS4 NPDES permit should be consistent with the adopted MRP's requirements.

- As with the implementation of other TMDLs, it is important to maintain a reasonable balance between resources expended on monitoring activities and those expended for actual pollutant control measures.

We look forward to continuing to work with you during the development of this important TMDL. Please call me if you have any questions or comments.

Sincerely,

Matthew Fabry
SMCWPPP Coordinator

cc: Sue Ma, Regional Water Board staff

References:

Jones and Stokes 2006. *Lower San Francisquito Creek Watershed Aquatic Habitat Assessment and Limiting Factors Analysis* (J&S 04262.04). Prepared for Santa Clara Valley Water District. San Jose, CA.

San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) 2007. *Napa River Watershed Sediment TMDL and Habitat Enhancement Plan Staff Report*. Oakland, CA.

San Francisquito Creek Joint Powers Authority (SFCJPA) 2004. *San Francisquito Creek Watershed Analysis and Sediment Reduction Plan Final Report.* Prepared by Northwest Hydraulic Consultants Inc., and Jones and Stokes. Palo Alto, CA.

APPENDIX F: TABLE OF CONTENTS

Template for First Half-Year Deliverables FY 2007/08

Template for Second Half-Year Deliverables FY 2007/08

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
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First Half -Year Deliverables
(July-December 2007)
Due by January 15, 2008

Municipality:

Contact Person: Phone:

(Please complete the following report and submit, along with a statement of certification, to Matt Fabry by the January 15, 2008 TAC meeting.)

Submittal Checklist ☑

1. Certification Letter (signed by an authorized representative from your municipality).....

2. Municipal Government Maintenance Monthly Record Keeping Forms (Attachment A)
   Check if data submitted electronically. ……..

	Street/Leaf	Storm/Litter
July 2007		
August 2007		
September 2007		
October 2007		
November 2007		
December 2007		

   * For maintenance activities not conducted, please fill in zeros on the forms.

3. Stormwater Inspections & Violations Summary (for this reporting period - Attachment B)

4. Illicit Discharge Quarterly Summary Report: First Quarter .....
   (Attachment C) Second Quarter.....
   * Please complete one form for each quarter (do not combine quarters).

5. Operations and Maintenance Information for Stormwater Treatment Measures
   form for each new and redevelopment project where post-construction, stormwater treatment controls have been implemented this reporting period (Attachment D) .....

6. Summary of Pre-Wet Season Erosion Control Inspections Form (Attachment E).....

7. Table of New Development Projects (Attachment F).....

To assist us in compiling information from all the municipalities, please also:

EOA, Inc.

- *Do not remove page breaks (start each component at the top of a new page).*
- *Write your municipality's name at the top of every page.*

COMPONENT 2. MUNICIPAL GOVERNMENT MAINTENANCE ACTIVITIES

I. Tasks described in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit

1. Describe assistance provided to the Municipal Maintenance Subcommittee during July through December 2007. (Do not list the subcommittee meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report).

2. Check that your agency has fully completed Municipal Government Maintenance Activities monthly record-keeping forms (Attachment A) for July through December 2007. Submit completed forms if <u>not</u> entered electronically.

   ☐ Paper forms for July 1 through December 31, 2007 maintenance activities are attached.

   ☐ Electronic files on webpage for July 1 through December 31, 2007 maintenance activities are complete.

   Please be sure to include estimates of the amount of leaves and litter collected by your agency, including parks and public works personnel, volunteers and/or court-referred crews.

3. Describe assistance provided to the Parks Maintenance and IPM Work Group during July through December 2007. (Do not list the work group meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report).

COMPONENT 3. INDUSTRIAL AND ILLICIT DISCHARGE CONTROLS

Performance standards contained in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit

1. Submit completed Stormwater Inspections & Violations Summary forms (Attachment B).
   a. How many businesses were inspected between July and December 2007?

   b. How many inspected businesses had one or more violations using definition on the Summary Inspections & Violation Summary form?

   c. How many businesses had a violation that was pending correction as of end of day on December 31, 2007?

2. Complete the attached forms: *Illicit Discharge Inspection Quarterly Summary Report: 1st Quarter 2007/08* and *Illicit Discharge Inspection Quarterly Summary Report: 2nd Quarter 2007/08 (Attachment C).* **NOTE: For each illicit discharge found please fill out the Illicit Discharge Source Identification Form (Attachment C) and retain copies of these forms at your municipality (don't submit with deliverables). The completed forms must be made available if requested in the future by the Water Board staff or its representatives.**

3. Describe assistance provided to the CII Subcommittee and its Educational Outreach Work Group during July through December 2007. (Do not list the subcommittee meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report).

4. Describe your municipality's use of SMCWPPP's business educational outreach materials, such as the Vehicle Service Facility booklets, restaurant posters, and any other educational outreach activities for businesses.

COMPONENT 4. PUBLIC INFORMATION AND PARTICIPATION

I. Tasks described in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit

Describe your public information and participation activities during the reporting period. Topics that shall be addressed, in as specific a manner as possible, include the following:

1. Stenciling/signage conducted;

2. Community outreach events held or participated in; (Remember that the performance standards state that municipalities over 50,000 in population will participate in five community outreach events annually, municipalities between 5,000 and 50,000 in population will participate in four activities annually, and municipalities less than 5,000 in population will participate in three activities annually.)

3. Educational material developed and/or distributed;

4. Describe assistance provided to the PIP subcommittee during July through December 2007. (Do not list the subcommittee meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report.)

COMPONENT 5. NEW DEVELOPMENT AND CONSTRUCTION SITE CONTROLS

I. Tasks described in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit.

1. Describe assistance provided to the New Development Subcommittee during July through December 2007. (Do not list the subcommittee meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report).

2. List workshops attended **other than SMCWPPP-sponsored workshops**. (EOA will track and include information about your municipality's attendance at SMCWPPP-sponsored workshops in SMCWPPP's Annual Report).

3. How many municipal staff members have received a certificate of completion from a Construction Site Stormwater Compliance workshop offered by SMCWPPP, the San Francisco Estuary Project, or the Santa Clara Valley Urban Runoff Pollution Prevention Program during Fall 2007 or during Fiscal Year 2006/07? _____

II. Compliance with the Performance Standards.

1. Please include in your deliverables the 2007 Certification letter that all active construction sites have been inspected prior to the wet season. Check this box if the letter is attached or enclosed. ☐

   Also, be sure to complete and attach a copy of the Summary of Pre-Wet Season Erosion Control Inspections Form (Attachment E).

III. ***Tasks required by Provision C.3 of SMCWPPP's NPDES permit amended on February 19, 2003.***

1. Attach a copy of the completed Operations and Maintenance Information for Stormwater Treatment Measures form (Attachment D) for each new and redevelopment project where treatment measures have been implemented during this reporting period.

2. As required by Provision C.3.e.iii of SMCWPPP's amended NPDES permit, provide the following details about your municipality's Operation and Maintenance (O&M) Verification Program:

   - Provide a list or summary of O&M verification inspections conducted between July 1, 2007 and December 31, 2007. Include a summary of inspection results.

- Describe any inspection follow-up.

- Evaluate your municipality's O&M Verification Program's effectiveness.

- Summarize any planned improvements to the O&M Verification Program.

- Describe the organization structure of your O&M Verification Program.

3. Complete the Table of New Development Projects (Attachment F) for all Group 1 and 2 projects being planned or constructed during July through December 2007. **NOTE: Include information on hydromodification management for any projects that create and/or replace one acre or more of impervious surface and are located in susceptible areas.**

ATTACHMENT A

MUNICIPAL MAINTENANCE REPORTING FORMS

SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM
Municipal Government Maintenance Activities
FY 2007/08 Monthly Record Keeping Form **Month of**:_____

Municipality: _____

Completed by: _____ **Date**: _____

STREET CLEANING 1. Sweeping	Volume of material collected (cubic yards)	Miles swept (curb miles)
Residential Areas:	_____	_____
Commercial Areas:	_____	_____
Industrial Areas:	_____	_____
Other Areas Swept: (e.g., parking lots, major arterials, etc.)	_____	_____
TOTAL	_____	_____

2. Have you implemented any changes in your street sweeping program. (changed sweeping frequency, new equipment, etc.)

_____
_____
_____
_____
_____

LEAF REMOVAL

Volume of leaves removed by City crews._____ cubic yards

Leaves bagged by residents and picked up by City. _____ bags.

Check box if you do not have a leaf removal program other than routine street sweeping. ☐

* Report total miles covered by sweepers including areas operated in tandem or repeated.

EOA, Inc.
September 2003

SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM
Municipal Government Maintenance Activities
FY 2007/08 Monthly Record Keeping Form **Month of**:_____

Municipality: _____

Completed by: _____ **Date**: _____

MAINTENANCE OF STORM DRAINAGE FACILITIES

	Inspected		Cleaned	
Number of storm drain inlets or curb inlets/outlets (convey storm water around street corners)	_____		_____	
V ditches	_____	miles	_____	miles
Storm drain lines	_____	miles	_____	miles
Channels	_____	miles	_____	miles
Creeks	_____	miles	_____	miles
Culverts, cross-culverts, pipes	_____	linear feet	_____	linear feet
Number of junction boxes	_____		_____	
Number of pump stations	_____		_____	

Other (please specify) _____

_____

Total volume of material removed _____ cubic yards or _____ tons

Describe any observed illegal discharges or illicit connections below or check the box if activities Are included in the Illicit Discharge Quarterly Summary Form. ☐

_____

_____

_____

_____

Have you responded to complaints or noticed areas which should be targeted for more frequent cleaning?

Yes _____ No _____ If yes, explain _____

_____

_____

_____

LITTER CONTROL

	Areas Targeted	**Volume Removed**
City/County Personnel (include receptacles)	_____	_____
Court Referred Crews	_____	_____
Other (weed and rubbish Abatement removal, etc.)	_____	_____
Total (specify cubic yards or pounds)		_____

EOA, Inc.

ATTACHMENT B

STORMWATER INSPECTIONS & VIOLATIONS SUMMARY

STORMWATER INSPECTIONS & VIOLATIONS SUMMARY (Attachment B)

Municipality:
Period Covered By This Report: July 1, 2007 through December 31, 2007
Period Covered by the Previous Report:
Date:

Total Number of Inspections:
Total Number of Violations:
Total Follow-up Actions:
Total Violations Corrected:
Total Violations Pending:

NAME ADDRESS TYPE OF BUSINESS	VIOL DATE	TYPES OF VIOLATION		DESCRIPTION OF VIOLATION, including whether violating flow reached a creek or other waterbody (name waterbody)	ENFORCEMENT ACTIONS						FOLLOW-UP ACTIONS	VIOLATIONS CORRECTED (YES/NO)	DATE CORRECTED
		PEX	NSW		NONE	VN	WN	IN	FN	LA			

Type of Violation

PEX	**Pollutant Exposure**	**Discharge of pollutants to storm drain system because pollutants are exposed to stormwater runoff.**
NSW	**Non-Stormwater Discharge**	**Discharge of non-stormwater materials to storm drain system. Non-stormwater discharges allowed by SMCWPPP's NPDES permit as conditionally exempted should not be identified as a NSW violation.**

Enforcement Actions

NONE	No Action taken	IN	Informal Notice
VN	Verbal Notice	FN	Formal Notice
WN	Warning Notice	LA	Legal Notice

version dated July 16, 2002

ATTACHMENT C

ILLICIT DISCHARGE QUARTERLY SUMMARY REPORT FORMS
AND
ILLICIT DISCHARGE SOURCE IDENTIFICATION FORM

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community.

Attachment C) Illicit Discharge Inspection Quarterly Summary Report

1st Quarter 2007/08
(July-September 2007)

Municipality:

Contact:

I. Field Activities

1. *Describe field surveys.*

	Industrial Areas	Commercial Areas	Residential Areas
Number of established locations visited:			
Outfalls			
Inlets			
Manholes			
other (describe)			
Channel miles visited:			

2. *List how many discharges were identified by the following methods.* Include only discharges that could have been prevented by BMPs. Do not include fluid releases associated with minor traffic accidents.

a. During field surveys at established locations:
- identified by maintenance crews
- identified by illicit discharge inspectors

b. Calls from:
- maintenance crews
- other agencies
- public

3. *List the number of times the following materials were identified.*

- Sewage
- Used Motor Oil
- Antifreeze
- Fuels
- Paint
- Concrete
- Construction Debris
- Wall Compound
- Food Wastes
- Yard Wastes
- Sediment and/or silt
- Concrete Cutting Slurry/Washwaters
- Vehicle Cleaning Washwaters
- Building/Sidewalk Washwaters
- Other Washwaters
- Industrial Wastes (solvents, metals, corrosives, cooling tower blowdown, etc)
- Other (describe):

II. Follow-up Activities

1. *Describe whether sources of discharges were identified.*

Number of sources that were identified
Number of incidents when source of discharge was not identified

2. *Describe whether discharges were abated.*

Number of discharge incidents that were abated
Number of new discharge incidents where discharge is continuing, as of the end of the reporting period; Attach the inspection report
Number of continuing discharges that have already been reported in previous quarter(s).

3. *Describe enforcement activities conducted.*

_____ Warning Notice (verbal warning)
_____ Informal Violation
_____ Formal Violation
_____ Legal Action

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Attachment C) Illicit Discharge Inspection Quarterly Summary Report

2nd Quarter 2007/08
(October-December 2007)

Municipality:

Contact:

I. Field Activities

1. *Describe field surveys.* Industrial Areas Commercial Areas Residential Areas

   Number of established locations visited:
   - Outfalls
   - Inlets
   - Manholes
   - other (describe)

   Channel miles visited:

2. *List how many discharges were identified by the following methods.* Include only discharges that could have been prevented by BMPs. Do not include fluid releases associated with minor traffic accidents.

   a. During field surveys at established locations:
   - identified by maintenance crews
   - identified by illicit discharge inspectors

   b. Calls from:
   - maintenance crews
   - other agencies
   - public

3. *List the number of times the following materials were identified.*

Sewage	Yard Wastes
Used Motor Oil	Sediment and/or silt
Antifreeze	Concrete Cutting Slurry/Washwaters
Fuels	Vehicle Cleaning Washwaters
Paint	Building/Sidewalk Washwaters
Concrete	Other Washwaters
Construction Debris	Industrial Wastes (solvents, metals, corrosives,
Wall Compound	cooling tower blowdown, etc)
Food Wastes	Other (describe):

II. Follow-up Activities

1. *Describe whether sources of discharges were identified.*

   Number of sources that were identified
   Number of incidents when source of discharge was not identified

2. *Describe whether discharges were abated.*

   Number of discharge incidents that were abated
   Number of new discharge incidents where discharge is continuing, as of the end of the reporting period; Attach the inspection report
   Number of continuing discharges that have already been reported in previous quarter(s).

3. *Describe enforcement activities conducted.*

   _____ Warning Notice (verbal warning)
   _____ Informal Violation
   _____ Formal Violation
   _____ Legal Action

Retain copies of these completed forms at
your municipality's office

(Attachment C)
Illicit Discharge Source Identification Form

Date: _____

Municipality: _____

Agency: _____

Inspector(s): _____

I. Source of Discharge

1. Describe reason for conducting the investigation.
   - ☐ Conducting regularly scheduled field screening.
   - ☐ Responding to report from the public, staff, another agency, etc.
2. Describe location of source of discharge (address, cross streets, physical features, etc.) _____
   - ☐ Business ☐ Resident ☐ Other _____
3. Name of Contact: _____
4. Phone: _____

II. Discharge Summary

1. Illegal Dumping
   - ☐ Illicit Connection
   - ☐ Poor Management Practices
   - ☐ Describe cause of discharge further, if appropriate. _____
2. Describe frequency of discharge.
   - ☐ Continuous Discharge
   - ☐ Intermittent Discharge
   - ☐ One time incident
3. Volume, if quantifiable: _____
4. Describe material discharged.
   - ☐ Sewage
   - ☐ Used Motor Oil
   - ☐ Antifreeze
   - ☐ Fuels
   - ☐ Paint
   - ☐ Concrete
   - ☐ Construction Debris
   - ☐ Wall Compound
   - ☐ Food Wastes
   - ☐ Yard Wastes
   - ☐ Sediment and/or silt
   - ☐ Concrete Cutting Slurry/Washwaters
   - ☐ Vehicle Cleaning Washwaters
   - ☐ Building/Sidewalk Washwaters
   - ☐ Other Washwaters
   - ☐ Industrial Wastes (solvents, metals, corrosive, cooling tower blowdown, etc.)
   - ☐ Other (describe): _____

III. Follow-up Activities

1. Describe action to be taken by discharger.
   - ☐ Discharge has been stopped.
   - ☐ Discharge cannot be stopped immediately. Describe corrective actions that will be taken by the discharger.
2. Describe informational, educational, or BMP information distributed. _____
3. Describe enforcement action.
   - ☐ None
   - ☐ Warning Notice
   - ☐ Informal Violation (including verbal notice)
   - ☐ Formal Violation
   - ☐ Legal Action
4. Comments (did discharge reach water of state, e.g. a creek or bay?):

ATTACHMENT D

OPERATION AND MAINTENANCE INFORMATION FOR STORMWATER TREATMENT MEASURES

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
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Operation and Maintenance Information for Stormwater Treatment Measures (Attachment D)

Complete and submit for municipal stormwater NPDES permit reporting the following information for each new and redevelopment project where treatment measures have been implemented this reporting period.

This section to be completed by Applicant

Background Information

Location or Address:_____

Type of Land Use: ☐ Commercial ☐ Industrial ☐ Residential ☐ Public Agency

Property Owner's Name:_____

Parcel/Tract No.:_____ Lot No.:_____APN #_____

Type of treatment measures implemented:_____

Describe locations of each treatment measure or attach map showing locations on the property:

_____

Stormwater Treatment Measure Owner or Operator's Information:

Name:_____

Address:_____

Phone:_____ Fax:_____ Email:_____

Numeric hydraulic sizing criteria used to design each stormwater treatment measure:

☐ San Mateo Countywide Stormwater Pollution Prevention Program's NPDES permit's Provision C.3.d

☐ Other, describe:_____

_____ _____ _____

Applicant's Name Signature Date

This section to be completed by Agency staff

More Detailed Information about Access Assurance and O&M Responsibilities:

Describe how access permission is assured for O&M verification by public agencies or their representatives (e.g., municipality, Regional Water Quality Control Board, and Mosquito Abatement District):

_____

_____

Indicate how responsibility for O&M is assured. Check all that apply:

☐ Signed statement from private entity accepting responsibility for O&M until responsibility is legally transferred.

☐ Signed statement from public entity assuming O&M and that the treatment measures meet all local design standards.

☐ Written conditions in the sales or lease agreement requiring the buyer or lessee to assume O&M (in the case of purchase and sale agreements, conditions shall survive the close of escrow).

☐ Written text in project conditions, covenants and restrictions for residential properties assigning O&M responsibilities to the home owners association.

☐ Any other legally enforceable agreement or mechanism that assigns responsibility and describe below.

_____

Local Agency O&M Verification Program

Name of municipality or Flood Control District responsible under the NPDES permit for verifying O&M.

_____

Describe where information documenting responsibility for O&M is kept and updated.

_____

ATTACHMENT E

SUMMARY OF PRE-WET SEASON EROSION CONTROL INSPECTIONS FORM

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community.

Attachment E
Summary of Pre-Wet Season Erosion Control Inspections Form
Municipality Name _____

Directions: A copy of this completed form documenting your municipality's pre-wet season erosion control inspections should be included with your municipality's 2007 letter that certifies that each active construction site has been stabilized to minimize erosion and the discharge of sediment from disturbed areas prior to the FY 2007/08 wet season.

Project Name	Project Address	Project Type r= residential (units) c=commercial i=industrial g=governmental[1]	Does Project Have Coverage Under Statewide Construction General Permit?	Was Site Inspected by Municipal Staff? If so, provide inspection date(s)	Were Erosion and Sedimentation Control Measures Undertaken Acceptable?[2]	Describe Corrections Made NN= none needed
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN

[1] Select one or more of the code letters that are applicable to the project site
[2] If no inspection was done, provide explanation in the certification letter about how the acceptability of the erosion and sedimentation control measures was determined.

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
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Attachment E
Summary of Pre-Wet Season Erosion Control Inspections Form
Municipality Name _____

Project Name	Project Address	Project Type r= residential (units) c=commercial i=industrial g=governmental[1]	Does Project Have Coverage Under Statewide Construction General Permit?	Was Site Inspected by Municipal Staff? If so, provide inspection date(s)	Were Erosion and Sedimentation Control Measures Undertaken Acceptable?[2]	Describe Corrections Made NN= none needed
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN
		r (_____ units) c i g	Yes No	Yes date_____ No	Yes No	NN

ATTACHMENT F

TABLE OF NEW DEVELOPMENT PROJECTS

Table of New Development Projects[1]

[[== Enter Name of Municipality ==]]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Acreage**	**New or Replaced Impervious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**HMP[5]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impractic-ability**	**Alternative Compliance Measures**	
Private Projects															
EXAMPLE: Nirvana Estates; Property bounded by Paradise Lane, Serenity Drive, and Eternity Circle; Waterville, CA	**EXAMPLE:** Heavenly Homes; Phase 1; Construction of 156 single-family homes and 45 townhomes with commercial shops and underground parking.	**EXAMPLE:** Application submitted 12/29/03 and approved 6/06/04; Grading began 10/31/04; Construction began 5/12/06 and completed 11/30/06.	**EXAMPLE:** Mixed use: residential and commercial	**EXAMPLE:** 25 acres	**EXAMPLE:** 20 acres	**EXAMPLE:** Stenciled inlets, street sweeping, covered parking, car wash pad drains to sanitary sewer	**EXAMPLE:** Pervious pavement for all driveways, sidewalks, and commercial plaza	**EXAMPLE:** vegetated swales, detention basins,	**EXAMPLE:** WEF Method	**EXAMPLE:** Homeowners Association CCRs require implemenation of approved maintenance plan. Annual O&M report will be submitted to City.	**EXAMPLE:** Yes	**EXAMPLE:** Pest-resistant landscaping, pervious paving to reduce impervious surface, incorporate stormwater detention			**EXAMPLE:** Extended detention basin
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[1] List on this table information for all Group 1 and Group 2 Projects, e.g, those that create and/or replace at least 10,000 square feet of impervious surface. Projects that create and/or replace less than 10,000 square feet of impervious surface are not required to be reported.

[2] If a project is being constructed in Phases, each Phase should have a separate entry.

[3] Indicate project type, based on NPDES Permit Provision C.3.c categories: Commercial, Industrial, Residential, Streets/Road/Highways/Freeways, Significant Redevelopment.

[4] If a project was granted Alternative Compliance (Provision C.3.g), report required information on the Interim Alternative Compliance Form (Attachment __).

[5] If hydromodification (HM) control is not required, state why not. If HM control is required, describe the control method used and attach the pre- and post-project hydrographs.

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Second Half-Year Deliverables
(January – June 2008)
Due by July 15, 2008

Municipality:

Contact Person: Phone:

(Please complete the following report and submit, along with a statement of certification, to Matt Fabry by the July 15, 2008 TAC meeting.)

Submittal Checklist ☑

1. Certification Letter (signed by an authorized representative from your municipality).....

2. Municipal Government Maintenance Monthly Record Keeping Forms (Attachment A)
   Check if data submitted electronically. ……..

	Street/Leaf	Storm/Litter
January 2008		
February 2008		
March 2008		
April 2008		
May 2008		
June 2008		

   * For maintenance activities not conducted, please fill in zeros on the forms.

3. Stormwater Inspections & Violations Summary (for this reporting period - Attachment B)

4. Illicit Discharge Quarterly Summary Report: Third Quarter.....
   (Attachment C) Fourth Quarter .....
   * Please complete one form for each quarter (do not combine quarters).

5. Operations and Maintenance Information for Stormwater Treatment Measures
   form for each new and redevelopment project where post-construction, stormwater treatment controls have been implemented this reporting period (Attachment D) .....

6. Table of New Development Projects (Attachment E).....

To assist us in compiling information from all the municipalities, please also:

EOA, Inc.

- *Do not remove page breaks (start each component at the top of a new page).*
- *Write your municipality's name at the top of every page.*

COMPONENT 2. MUNICIPAL GOVERNMENT MAINTENANCE ACTIVITIES

I. Tasks described in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit

1. Describe assistance provided to the Municipal Maintenance Subcommittee during January through June 2008. (Do not list the subcommittee meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report).

2. Check that your agency has fully completed Municipal Government Maintenance Activities monthly record-keeping forms (Attachment A) for January through June 2008. Submit completed forms if <u>not</u> entered electronically.

   ☐ Paper forms for January 1 through June 30, 2008 maintenance activities are attached.

   ☐ Electronic files on webpage for January 1 through June 30, 2008 maintenance activities are complete.

   Please be sure to include estimates of the amount of leaves and litter collected by your agency, including parks and public works personnel, volunteers and/or court-referred crews.

3. Describe assistance provided to the Parks Maintenance and IPM Work Group during January through June 2008. (Do not list the work group meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report).

COMPONENT 3. INDUSTRIAL AND ILLICIT DISCHARGE CONTROLS

Performance standards contained in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit

1. Submit completed Stormwater Inspections & Violations Summary forms (Attachment B).
   a. How many businesses were inspected between January and June 2008?

   b. How many inspected businesses had one or more violations using definition on the Summary Inspections & Violation Summary form?

   c. How many businesses had a violation that was pending correction as of end of day on June 30, 2008?

2. Complete the attached forms: *Illicit Discharge Inspection Quarterly Summary Report: 3rd Quarter 2007/08* and *Illicit Discharge Inspection Quarterly Summary Report: 4th Quarter 2007/08 (Attachment C)*. **NOTE: For each illicit discharge found please fill out the Illicit Discharge Source Identification Form (Attachment C) and retain copies of these forms at your municipality (don't submit with deliverables). The completed forms must be made available if requested in the future by the Water Board staff or its representatives.**

3. Describe assistance provided to the CII Subcommittee and its Educational Outreach Work Group during January through June 2008. (Do not list the subcommittee meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report).

4. Describe your municipality's use of SMCWPPP's business educational outreach materials, such as the Vehicle Service Facility booklets, restaurant posters, and any other educational outreach activities for businesses.

COMPONENT 4. PUBLIC INFORMATION AND PARTICIPATION

I. Tasks described in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit

Describe your public information and participation activities during the reporting period. Topics that shall be addressed, in as specific a manner as possible, include the following:

1. Stenciling/signage conducted;

2. Community outreach events held or participated in; (Remember that the performance standards state that municipalities over 50,000 in population will participate in five community outreach events annually, municipalities between 5,000 and 50,000 in population will participate in four activities annually, and municipalities less than 5,000 in population will participate in three activities annually.)

3. Educational material developed and/or distributed;

4. Describe assistance provided to the PIP subcommittee during January through June 2008. (Do not list the subcommittee meetings attended because EOA will track and include information about meeting attendance in SMCWPPP's Annual Report.)

COMPONENT 5. NEW DEVELOPMENT AND CONSTRUCTION SITE CONTROLS

I. Tasks described in the Stormwater Management Plan and which are therefore enforceable requirements of the NPDES permit.

1. Who is the designated person responsible for overseeing the implementation of these performance standards and for acting as a liaison with the SMCWPPP New Development Subcommittee?

_____

_____

II. ***Tasks required by Provision C.3 of SMCWPPP's NPDES permit.***

1. Attach a copy of the completed Operations and Maintenance Information for Stormwater Treatment Measures form (Attachment D) for each new and redevelopment project where treatment measures have been implemented during this reporting period.

2. As required by Provision C.3.e.iii of SMCWPPP's amended NPDES permit, provide the following details about your municipality's Operation and Maintenance (O&M) Verification Program:

   - Provide a list or summary of O&M verification inspections conducted between January 1, 2008 and June 30, 2008. Include a summary of inspection results.

   - Describe any inspection follow-up.

   - Evaluate your municipality's O&M Verification Program's effectiveness.

   - Summarize any planned improvements to the O&M Verification Program.

- Describe the organizational structure of your O&M Verification Program.

3. Complete the Table of New Development Projects (Attachment E) for all Group 1 and 2 projects being planned or constructed during January through June 2008. **NOTE: Include information on hydromodification management for any projects that create and/or replace one acre or more of impervious surface and are located in susceptible areas.**

4. **Alternative Certification of Adherence to Design Criteria for Stormwater Treatment Measures.** During this reporting period, did your municipality use this ***optional*** approach for allowing projects to be certified in writing by someone other than an employee of your municipality as meeting the hydraulic sizing design criteria for stormwater treatment?

   If yes, please list the projects certified by someone other than an employee of your municipality.

5. **Site Design Standards and/or Guidance Development.** List any actions that your municipality has taken during the reporting period from July 2007 through June 2008 to implement the Draft Review and Analysis and Proposed Revisions of Local Site Design Standards and Guidance, which was submitted to the Regional Water Board on November 15, 2004 (Provision C.3.j). You may also list actions taken prior to this reporting period that were not previously reported.

6. **Source Control Measures Guidance Development.** Summarize any changes made during the reporting period from July 2007 through June 2008 to the contents or use of your municipality's Local Source Control Measures list, which is based on SMCWPPPP's Model Source Control Measures Guidance Document, submitted to the Regional Water Board on August 15, 2004 (Provision C.3.k).

ATTACHMENT A

MUNICIPAL MAINTENANCE REPORTING FORMS

SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM
Municipal Government Maintenance Activities
FY 2007/08 Monthly Record Keeping Form **Month of**:_____

Municipality: _____

Completed by: _____ **Date**: _____

STREET CLEANING 1. Sweeping	Volume of material collected (cubic yards)	Miles swept (curb miles)
Residential Areas:	_____	_____
Commercial Areas:	_____	_____
Industrial Areas:	_____	_____
Other Areas Swept: (e.g., parking lots, major arterials, etc.)	_____	_____
TOTAL	_____	_____

2. Have you implemented any changes in your street sweeping program. (changed sweeping frequency, new equipment, etc.)

_____
_____
_____
_____
_____

LEAF REMOVAL

Volume of leaves removed by City crews._____ cubic yards

Leaves bagged by residents and picked up by City. _____ bags.

Check box if you do not have a leaf removal program other than routine street sweeping. ☐

EOA, Inc.
September 2003

* Report total miles covered by sweepers including areas operated in tandem or repeated.

SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM
Municipal Government Maintenance Activities
FY 2006/07 Monthly Record Keeping Form **Month of**:_____

Municipality: _____

Completed by: _____ **Date**: _____

MAINTENANCE OF STORM DRAINAGE FACILITIES

	Inspected		Cleaned	
Number of storm drain inlets or curb inlets/outlets (convey storm water around street corners)	_____		_____	
V ditches	_____	miles	_____	miles
Storm drain lines	_____	miles	_____	miles
Channels	_____	miles	_____	miles
Creeks	_____	miles	_____	miles
Culverts, cross-culverts, pipes	_____	linear feet	_____	linear feet
Number of junction boxes	_____		_____	
Number of pump stations	_____		_____	

Other (please specify) _____

_____

Total volume of material removed _____ cubic yards or _____ tons

Describe any observed illegal discharges or illicit connections below or check the box if activities Are included in the Illicit Discharge Quarterly Summary Form. ☐

_____

_____

_____

_____

Have you responded to complaints or noticed areas which should be targeted for more frequent cleaning?

Yes _____ No _____ If yes, explain _____

_____

_____

_____

LITTER CONTROL

	Areas Targeted	**Volume Removed**
City/County Personnel (include receptacles)	_____	_____
Court Referred Crews	_____	_____
Other (weed and rubbish Abatement removal, etc.)	_____	_____
Total (specify cubic yards or pounds)		_____

EOA, Inc.

ATTACHMENT B

STORMWATER INSPECTIONS & VIOLATIONS SUMMARY

STORMWATER INSPECTIONS & VIOLATIONS SUMMARY (Attachment B)

Municipality:
Period Covered By This Report: January 1, 2008 through June 30, 2008
Period Covered by the Previous Report:
Date:

Total Number of Inspections:
Total Number of Violations:
Total Follow-up Actions:
Total Violations Corrected:
Total Violations Pending:

NAME ADDRESS TYPE OF BUSINESS	VIOL DATE	TYPES OF VIOLATION		DESCRIPTION OF VIOLATION, including whether violating flow reached a creek or other waterbody (name waterbody)	ENFORCEMENT ACTIONS						FOLLOW-UP ACTIONS	VIOLATIONS CORRECTED (YES/NO)	DATE CORRECTED
		PEX	NSW		NONE	VN	WN	IN	FN	LA			

Type of Violation

PEX	**Pollutant Exposure**	**Discharge of pollutants to storm drain system because pollutants are exposed to stormwater runoff.**
NSW	**Non-Stormwater Discharge**	**Discharge of non-stormwater materials to storm drain system. Non-stormwater discharges allowed by SMCWPPP's NPDES permit as conditionally exempted should not be identified as a NSW violation.**

Enforcement Actions

NONE	No Action taken	IN	Informal Notice
VN	Verbal Notice	FN	Formal Notice
WN	Warning Notice	LA	Legal Notice

version dated July 16, 2002

ATTACHMENT C

ILLICIT DISCHARGE QUARTERLY SUMMARY REPORT FORMS
AND
ILLICIT DISCHARGE SOURCE IDENTIFICATION FORM

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community.

Attachment C) Illicit Discharge Inspection Quarterly Summary Report

3rd Quarter 2007/08
(January - March 2008)

Municipality:

Contact:

I. Field Activities

1. *Describe field surveys.* Industrial Areas Commercial Areas Residential Areas

Number of established locations visited:
- Outfalls
- Inlets
- Manholes
- other (describe)

Channel miles visited:

2. *List how many discharges were identified by the following methods.* Include only discharges that could have been prevented by BMPs. Do not include fluid releases associated with minor traffic accidents.

a. During field surveys at established locations:
- identified by maintenance crews
- identified by illicit discharge inspectors

b. Calls from:
- maintenance crews
- other agencies
- public

3. *List the number of times the following materials were identified.*

- Sewage
- Used Motor Oil
- Antifreeze
- Fuels
- Paint
- Concrete
- Construction Debris
- Wall Compound
- Food Wastes
- Yard Wastes
- Sediment and/or silt
- Concrete Cutting Slurry/Washwaters
- Vehicle Cleaning Washwaters
- Building/Sidewalk Washwaters
- Other Washwaters
- Industrial Wastes (solvents, metals, corrosives, cooling tower blowdown, etc)
- Other (describe):

II. Follow-up Activities

1. *Describe whether sources of discharges were identified.*

Number of sources that were identified
Number of incidents when source of discharge was not identified

2. *Describe whether discharges were abated.*

Number of discharge incidents that were abated
Number of new discharge incidents where discharge is continuing, as of the end of the reporting period; Attach the inspection report
Number of continuing discharges that have already been reported in previous quarter(s).

3. *Describe enforcement activities conducted.*

_____ Warning Notice (verbal warning)
_____ Informal Violation
_____ Formal Violation
_____ Legal Action

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(Attachment C) Illicit Discharge Inspection Quarterly Summary Report

4th Quarter 2007/08
(April - June 2008)

Municipality:

Contact:

I. Field Activities

1. *Describe field surveys.* Industrial Areas Commercial Areas Residential Areas

Number of established locations visited:
- Outfalls
- Inlets
- Manholes
- other (describe)

Channel miles visited:

2. *List how many discharges were identified by the following methods.* Include only discharges that could have been prevented by BMPs. Do not include fluid releases associated with minor traffic accidents.

a. During field surveys at established locations:
- identified by maintenance crews
- identified by illicit discharge inspectors

b. Calls from:
- maintenance crews
- other agencies
- public

3. *List the number of times the following materials were identified.*

- Sewage
- Used Motor Oil
- Antifreeze
- Fuels
- Paint
- Concrete
- Construction Debris
- Wall Compound
- Food Wastes
- Yard Wastes
- Sediment and/or silt
- Concrete Cutting Slurry/Washwaters
- Vehicle Cleaning Washwaters
- Building/Sidewalk Washwaters
- Other Washwaters
- Industrial Wastes (solvents, metals, corrosives, cooling tower blowdown, etc)
- Other (describe):

II. Follow-up Activities

1. *Describe whether sources of discharges were identified.*

Number of sources that were identified
Number of incidents when source of discharge was not identified

2. *Describe whether discharges were abated.*

Number of discharge incidents that were abated
Number of new discharge incidents where discharge is continuing, as of the end of the reporting period; Attach the inspection report
Number of continuing discharges that have already been reported in previous quarter(s).

3. *Describe enforcement activities conducted.*

_____ Warning Notice (verbal warning)
_____ Informal Violation
_____ Formal Violation
_____ Legal Action

Retain copies of these completed forms at
your municipality's office

(Attachment C)
Illicit Discharge Source Identification Form

Date: _____

Municipality: _____

Agency: _____

Inspector(s): _____

I. Source of Discharge

1. Describe reason for conducting the investigation.
   - ☐ Conducting regularly scheduled field screening.
   - ☐ Responding to report from the public, staff, another agency, etc.
2. Describe location of source of discharge (address, cross streets, physical features, etc.) _____
   - ☐ Business ☐ Resident ☐ Other _____
3. Name of Contact: _____
4. Phone: _____

II. Discharge Summary

1. Illegal Dumping
   - ☐ Illicit Connection
   - ☐ Poor Management Practices
   - ☐ Describe cause of discharge further, if appropriate. _____
2. Describe frequency of discharge.
   - ☐ Continuous Discharge
   - ☐ Intermittent Discharge
   - ☐ One time incident
3. Volume, if quantifiable: _____
4. Describe material discharged.
   - ☐ Sewage
   - ☐ Used Motor Oil
   - ☐ Antifreeze
   - ☐ Fuels
   - ☐ Paint
   - ☐ Concrete
   - ☐ Construction Debris
   - ☐ Wall Compound
   - ☐ Food Wastes
   - ☐ Yard Wastes
   - ☐ Sediment and/or silt
   - ☐ Concrete Cutting Slurry/Washwaters
   - ☐ Vehicle Cleaning Washwaters
   - ☐ Building/Sidewalk Washwaters
   - ☐ Other Washwaters
   - ☐ Industrial Wastes (solvents, metals, corrosive, cooling tower blowdown, etc.)
   - ☐ Other (describe): _____

III. Follow-up Activities

1. Describe action to be taken by discharger.
   - ☐ Discharge has been stopped.
   - ☐ Discharge cannot be stopped immediately. Describe corrective actions that will be taken by the discharger.
2. Describe informational, educational, or BMP information distributed. _____
3. Describe enforcement action.
   - ☐ None
   - ☐ Warning Notice
   - ☐ Informal Violation (including verbal notice)
   - ☐ Formal Violation
   - ☐ Legal Action
4. Comments (did discharge reach water of state, e.g. a creek or bay?):

ATTACHMENT D

OPERATION AND MAINTENANCE INFORMATION FOR STORMWATER TREATMENT MEASURES

SAN MATEO COUNTYWIDE Water Pollution Prevention Program
Clean Water. Healthy Community.

Operation and Maintenance Information for Stormwater Treatment Measures (Attachment D)

Complete and submit for municipal stormwater NPDES permit reporting the following information for each new and redevelopment project where treatment measures have been implemented this reporting period.

This section to be completed by Applicant

Background Information

Location or Address: _____

Type of Land Use: ☐ Commercial ☐ Industrial ☐ Residential ☐ Public Agency

Property Owner's Name: _____

Parcel/Tract No.: _____ Lot No.: _____ APN # _____

Type of treatment measures implemented: _____

Describe locations of each treatment measure or attach map showing locations on the property:

_____

Stormwater Treatment Measure Owner or Operator's Information:

Name: _____

Address: _____

Phone: _____ Fax: _____ Email: _____

Numeric hydraulic sizing criteria used to design each stormwater treatment measure:

☐ San Mateo Countywide Water Pollution Prevention Program's NPDES permit's Provision C.3.d

☐ Other, describe: _____

Applicant's Name	Signature	Date

This section to be completed by Agency staff

More Detailed Information about Access Assurance and O&M Responsibilities:

Describe how access permission is assured for O&M verification by public agencies or their representatives (e.g., municipality, Regional Water Quality Control Board, and Mosquito Abatement District):

_____

Indicate how responsibility for O&M is assured. Check all that apply:

☐ Signed statement from private entity accepting responsibility for O&M until responsibility is legally transferred.

☐ Signed statement from public entity assuming O&M and that the treatment measures meet all local design standards.

☐ Written conditions in the sales or lease agreement requiring the buyer or lessee to assume O&M (in the case of purchase and sale agreements, conditions shall survive the close of escrow).

☐ Written text in project conditions, covenants and restrictions for residential properties assigning O&M responsibilities to the home owners association.

☐ Any other legally enforceable agreement or mechanism that assigns responsibility and describe below.

_____

Local Agency O&M Verification Program

Name of municipality or Flood Control District responsible under the NPDES permit for verifying O&M.

_____

Describe where information documenting responsibility for O&M is kept and updated.

_____

ATTACHMENT E

TABLE OF NEW DEVELOPMENT PROJECTS

Table of New Development Projects[1]

[[== Enter Name of Municipality ==]]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Name; Location (cross streets); Street Address	**Name of Developer; Project Phase No.[2]; Project Description**	**Status of Project**	**Project Type[3]**	**Site Acreage**	**New or Replaced Impervious Surface Area**	**Source Control Measure BMPs**	**Site Design Measure BMPs**	**Post-Construction Treatment BMPs**				**Pesticide Reduction Measures Included in Project**	**Alternative Compliance[4]**		**Hydrograph Modification Management[5]**
								Treatment BMPs Used	**Hydraulic Sizing Criteria Used**	**Operation & Maintenance Responsibility Mechanism**	**Referred to O&M Inspection Team (y/n)?**		**Basis of Impracticability**	**Alternative Compliance Measures**	
Private Projects															
EXAMPLE: Nirvana Estates; Property bounded by Paradise Lane, Serenity Drive, and Eternity Circle; Waterville, CA	**EXAMPLE:** Heavenly Homes; Phase 1; Construction of 156 single-family homes and 45 townhomes with commercial shops and underground parking.	**EXAMPLE:** Application submitted 12/29/03 and approved 6/06/04; Grading began 10/31/04; Construction began 5/12/06 and completed 11/30/06.	**EXAMPLE:** Mixed use: residential and commercial	**EXAMPLE:** 25 acres	**EXAMPLE:** 20 acres	**EXAMPLE:** Stenciled inlets, street sweeping, covered parking, car wash pad drains to sanitary sewer	**EXAMPLE:** Pervious pavement for all driveways, sidewalks, and commercial plaza	**EXAMPLE:** vegetated swales, detention basins,	**EXAMPLE:** WEF Method	**EXAMPLE:** Homeowners Association CCRs require implemenation of approved maintenance plan. Annual O&M report will be submitted to City.	**EXAMPLE:** Yes	**EXAMPLE:** Pest-resistant landscaping, pervious paving to reduce impervious surface, incorporate stormwater detention			**EXAMPLE:** Extended detention basin
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EXAMPLE: Waterville Downtown Plaza; Rushing Road and Bubbling Blvd; 123 Rushing Road, Waterville, CA	**EXAMPLE:** City of Waterville; Capital improvement project to build plaza on roof of existing parking structure.	**EXAMPLE:** Negative Declaration adopted 1/15/06. Advertised for construction bids 6/26/06. Construction scheduled to begin 9/06.	**EXAMPLE:** Redevelop-ment	**EXAMPLE:** 1.5 acres	**EXAMPLE:** 1 acre	**EXAMPLE:** Roofed trash enclosure. Fountain designed to recirculate water-no discharge to storm drain.	**EXAMPLE:** Down-spouts connected to land-scaping. Pervious pavement for entire plaza area	**EXAMPLE:** tree wells with bioretention; planter boxes with bioretention	**EXAMPLE:** WEF Method	**EXAMPLE:** Signed statement from Waterville Public Works assuming post-construction responsibility for treatment BMP maintenance.	**EXAMPLE:** No	**EXAMPLE:** Pest-resistant landscaping, pervious paving to reduce impervious surface, incorporate stormwater detention			**EXAMPLE:** Not Required: Site located in exempt area

[1] List on this table information for all Group 1 and Group 2 Projects, e.g, those that create and/or replace at least 10,000 square feet of impervious surface. Projects that create and/or replace less than 10,000 square feet of impervious surface are not required to be reported.

[2] If a project is being constructed in Phases, each Phase should have a separate entry.

[3] Indicate project type, based on NPDES Permit Provision C.3.c categories: Commercial, Industrial, Residential, Streets/Road/Highways/Freeways, Significant Redevelopment.

[4] If a project was granted Alternative Compliance (Provision C.3.g), report required information on the Interim Alternative Compliance Form (contact SMCWPPP staff for details).

[5] If hydromodification (HM) control is not required, state why not. If HM control is required, describe the control method used and attach the pre- and post-project hydrographs.

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program

FY 2007/08
TRASH ASSESSMENTS IN URBAN CREEKS IN SAN MATEO COUNTY, CALIFORNIA

Prepared for the
San Mateo Countywide Water Pollution Prevention Program by
EOA, Inc., 1410 Jackson St., Oakland, CA

1.0 INTRODUCTION

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) conducts Watershed Assessment and Monitoring (WAM) component activities in compliance with its municipal stormwater NPDES permit. A current emphasis is collecting screening-level biological, physical and chemical water quality data from creeks in representative urban watersheds in San Mateo County. These creeks are typically receiving waters for urban runoff discharges from municipal storm drain systems. SMCWPPP collects environmental indicator data from the creeks (e.g., via creek walks, trash assessments, bioassessments and water column toxicity testing) to help evaluate current creek health and water quality conditions. These data also help establish a baseline for future evaluations of long-term trends and thereby inform SMCWPPP's efforts to improve the effectiveness of its Best Management Practices (BMPs) to prevent or reduce stormwater runoff impacts.

As part of the WAM program, SMCWPPP conducted creek walks and trash assessments in urban creeks in San Mateo County during FY 2006/07 (SMCWPPP 2007) and FY 2007/08. This report documents the results of the FY 2007/08 trash assessments. The primary objectives were:

- Identifying sites in San Mateo County urban creeks where trash accumulates;
- Evaluating the status and condition of selected urban creek trash accumulation sites, including establishing a baseline against which to track future trends; and
- Collecting data that will help identify primary trash sources and transport pathways associated with the selected trash accumulation sites and inform development of BMPs to address trash in urban creeks.

2.0 BACKGROUND

SMCWPPP has initiated a program to begin identifying and addressing trash accumulation areas in urban waterways in San Mateo County. SMCWPPP (2008a) discusses typical trash management activities currently conducted by SMCWPPP's municipalities, SMCWPPP's efforts to characterize trash in urban waterways in the county, SMCWPPP's progress in beginning to identify new BMPs to address trash accumulation areas, and the proposed general future direction of SMCWPPP's trash program. It should be noted that staff of the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) is currently developing specific

trash-related provisions for a Bay Area stormwater NPDES Municipal Regional Permit (MRP). The MRP will replace existing countywide municipal stormwater NPDES permits held by SMCWPPP and other San Francisco Bay Area Phase I stormwater programs. It is anticipated that these provisions will require a variety of trash-related activities, including assessing trash in urban creeks using similar methods to those applied in this study.

3.0 METHODS

3.1 Identification of Trash Accumulation Sites in Urban Creeks

SMCWPPP (2008b) conducted creek walks during fall 2007 in seven San Mateo County watersheds using the Unified Stream Assessment (USA) creek walk protocol (CWP 2005). The USA was conducted within urban reaches of the Atherton, Redwood, Burlingame, Sanchez, Easton, Mills and Millbrae Creek watersheds. One component of the USA is to document creek sites where trash accumulates. General characteristics of each identified trash site were documented including major types of trash, readily apparent sources (i.e., littering,[1] illegal dumping,[2] and accumulation from upstream sources) and adjacent land uses. GPS coordinates of each site were recorded and digital photographs were taken.

3.2 Trash Assessments at Accumulation Sites

The Urban Rapid Trash Assessment (URTA)[3] protocol (Version 1.0) was used to further characterize trash conditions at a subset of the trash accumulation sites identified during the fall 2007 USA creek walks. URTAs were performed at a total of seven of the 27 trash accumulation sites identified during the creek walks - two sites in the Redwood Creek watershed, two sites in the Mills Creek watershed, two sites in the Millbrae Creek watershed and one site in the Burlingame Creek watershed. The URTA was conducted twice at each site, once during fall 2007 and a second time during spring 2008, for a total of 14 assessments. The remaining USA trash accumulation sites were not assessed using the URTA because only a relatively small quantity of trash was present, yard waste was the only type of trash observed, and/or site access was poor.

It is important to note that the sites selected for the more detailed URTA assessments were not intended to represent trash conditions throughout a watershed. Instead, relatively impacted and accessible sites were selected to begin identifying and prioritizing major trash sources and potential BMPs to reduce levels of trash.

The URTA was applied at defined 100-foot sections of creek. Where possible, the starting or end point of the assessment reach was marked by an easily identifiable landmark (e.g., bridge crossing, storm drain culvert). Each trash item at the site was categorized by type (e.g.,

[1] Littering refers to when individual(s) leave trash behind in the course of other activities at a creek site (e.g., walking, picnicking).
[2] Dumping refers to when individual(s) in a premeditated action dispose of a relatively large quantity of trash onto the creek bank or bed, often using a vehicle.
[3] During FY 2005/06, the SCVURPPP revised the Regional Water Board's Rapid Trash Assessment protocol (SFBRWQCB 2007) to increase its utility in evaluating trash conditions at typical impacted sites in urban watersheds. The revisions were intended to enhance the utility of this tool in assisting municipal staff to identify, prioritize and evaluate trash management activities in urban creeks. The revised protocol is referred to as the Urban Rapid Trash Assessment (URTA).

plastics, metals, biohazards, construction materials) and the total number of items found in each category was recorded. Also recorded was whether the trash was found above the high water line on the bank or below the high water line, either on the bank or in the creek channel. All of the trash observed at each site was removed to facilitate determination of trash accumulation rates during subsequent URTAs.

In addition to enumerating the total number of trash pieces, a score was assigned to each of six condition parameters that relate to a range of issues associated with trash and water quality:

1. Level of Trash - reflects a qualitative "first impression" of the site after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the water body and where trash is evident in very large amounts. Sites that score in the "optimal" range appear to have little or no trash.

2. Actual Number of Trash Items Found - based on the tally of trash pieces found at the 100-foot creek site, a score within the appropriate condition category is selected based on the number of tallied items.

3. Transportable, Persistent, Buoyant Trash - based on the presence of trash items that are persistent in the environment, buoyant (floatable), and relatively small, can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. All of these factors are considered in this parameter.

4. Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use - based on the presence of trash items that are dangerous to people who wade or swim in the water and/or wildlife, including medical waste, diapers, human or pet waste and toxic substances. Site accessibility and use are also scored by this parameter.

5. Illegal Dumping and Littering - reflects the direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations.

6. Accumulation of Trash - reflects the accumulation of trash from upstream locations as distinguished from dumped trash by indications of age and transport.

Each parameter is scored from 0 to 20, with higher parameter scores indicating better conditions. The six parameter scores are summed for a total assessment score of 0 to 120. The Appendix contains further documentation on the URTA methodology and the field forms used to record the results of each assessment.

4.0 RESULTS AND DISCUSSION

4.1 Location and Characteristics of Trash Accumulation Sites in Creeks

Table 1 lists the 27 trash accumulation sites identified during the fall 2007 USA creek walks, including the seven sites further assessed using the URTA. Figures 1 and 2 show the locations of these trash sites.

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Table 1. Location and general characteristics of 27 creek sites with trash accumulation documented during fall 2007 USA creek walks. The seven indicated sites were further assessed using the URTA.

Site ID	Water Body	Location	URTA Site	Trash Source	Adjacent Land Use
A1	Atherton Creek	Behind homes near Valley Rd.		TA	Residential
RW1	Redwood Creek	Downstream end of Menlo Country Club golf course	X	L	Golf Course
RW2	Redwood Creek	Upstream end of Menlo Country Club golf course		D	Golf Course
RW3	Redwood Creek	Behind homes at Woodside Rd.		TA	Residential
RW4	Redwood Creek	Below outfall from Woodside Rd.		TA	Open Space
RW5	Redwood Creek	Downstream of I-280 culvert	X	TA	Transportation
RW6	Redwood Creek	Upstream of I-280 culvert		TA	Transportation
OA1	Arroyo Ojo de Agua	Stulsaft Park trail along unnamed tributary		L	Urban Park
OA2	Arroyo Ojo de Agua	Stulsaft Park		TA	Urban Park
OA3	Arroyo Ojo de Agua	Upper end of Stulsaft Park below outfall		TA	Urban Park
T1	Terrace Creek	Upstream of El Camino Real	X	L	Institutional
T2	Terrace Creek	Downstream of Sharon Ave.		D	Residential
R1	Ralston Creek	Downstream of Eucalyptus Ave.		D	Residential
R2	Ralston Creek	Adjacent to Ralston Ave.		L	Residential
S1	Sanchez Creek	Upstream of Forest View Ave.		D	Residential
S2	Sanchez Creek	Upstream of Geri Ln.		D	Residential
S3	Sanchez Creek	Upstream of Geri Ln.		D	Residential
S4	Sanchez Creek	Downstream of Fern Ct.		D	Residential
E1	Easton Creek	At Benito Ave.		TA	Residential
E2	Easton Creek	Adjacent to Canyon Rd.		D	Residential
E3	Easton Creek	Below Canyon Rd. culvert		L	Residential
M1	Mills Creek	Upstream of El Camino Real	X	TA	Residential
M2	Mills Creek	At tributary confluence		D	Residential
M3	Tributary to Mills Cr.	Below outfall at Martinez Dr.	X	TA	Residential/school
MB1	Millbrae Creek	Palm and Millbrae Ave. at park	X	L	Park/school
MB2	Millbrae Creek	Above Ashton in vacant parcel	X	L	Vacant
MB3	Millbrae Creek	Downstream Minorca Way		L	Residential

Trash source categories identified during the USA: L - Littering, ID - Illegal Dumping, TA - Trash Accumulation.
URTA - Urban Rapid Trash Assessment.

The greatest number of trash accumulation sites occurred in the Redwood Creek watershed (n=9), followed by the Burlingame and Sanchez Creek watersheds (n=4), Mills, Millbrae and Easton Creek watersheds (n=3) and Atherton Creek watershed (n=1). The sites were distributed across a variety of land uses, including residential areas, transportation corridors, parks, schools and a golf course. Three general trash source categories identified during the USA were approximately equally represented: trash accumulation (n=10), litter (n=9) and illegal dumping (n=8). Trash accumulation sites were typically below large outfalls and/or areas with dense vegetation or other obstructions that capture trash as it moves downstream. Litter sites were generally in high traffic areas with good public access (i.e., schools and/or public parks). The illegal dumping sites observed were all in residential areas, with the exception of one site at a private golf course.

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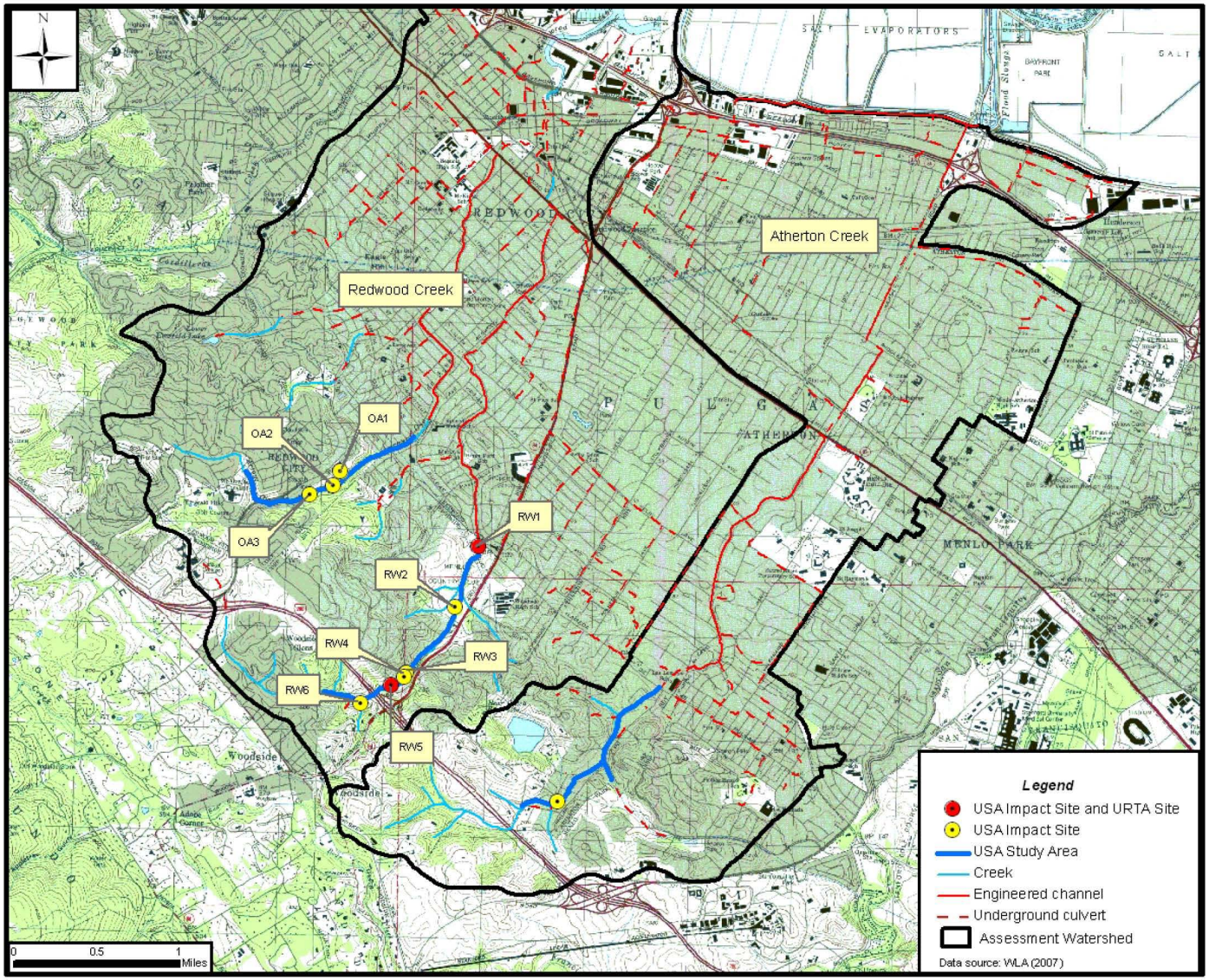

Figure 1. Location of USA and URTA trash sites in the Atherton and Redwood Creek watersheds.

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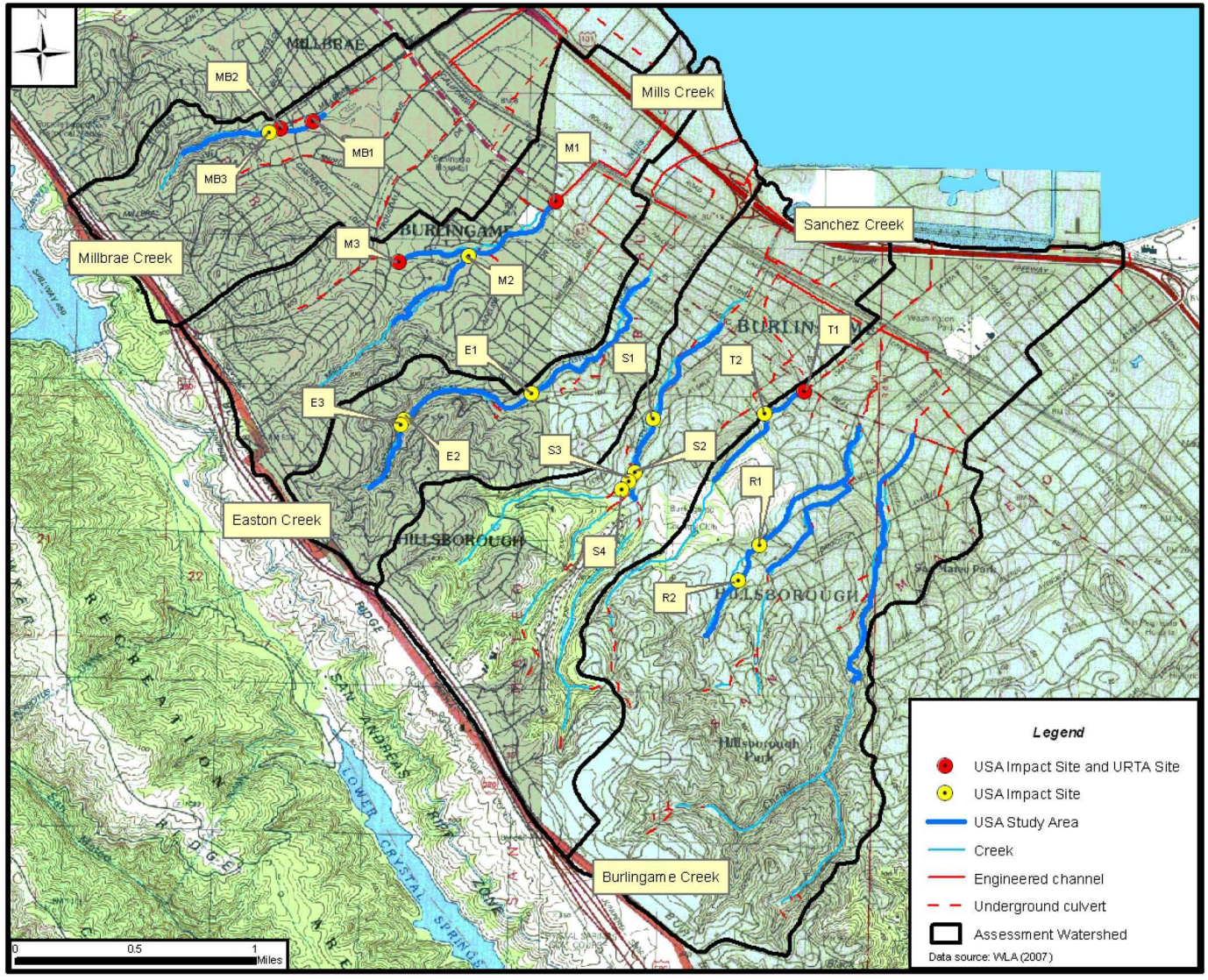

Figure 2. Location of USA and URTA trash sites in the Burlingame, Sanchez, Easton, Mills and Millbrae Creek watersheds.

4.2 Urban Rapid Trash Assessments

4.2.1 Overall Status and Condition of Trash Accumulation Sites

Total URTA scores ranged between 31 and 71 (higher scores indicate less trash impacts and better conditions) (Table 2). The three lowest scores occurred during fall season assessments at a site in the tributary to Mills Creek (31), a site in Redwood Creek (42) and a site in Millbrae Creek (45). These three sites also had the highest total number of trash items, 607, 1,278 and 542, respectively.

Figure 3 is a frequency histogram of the URTA scores for both fall and spring season assessments. Spring 2008 assessment scores were generally higher than fall 2007 scores.

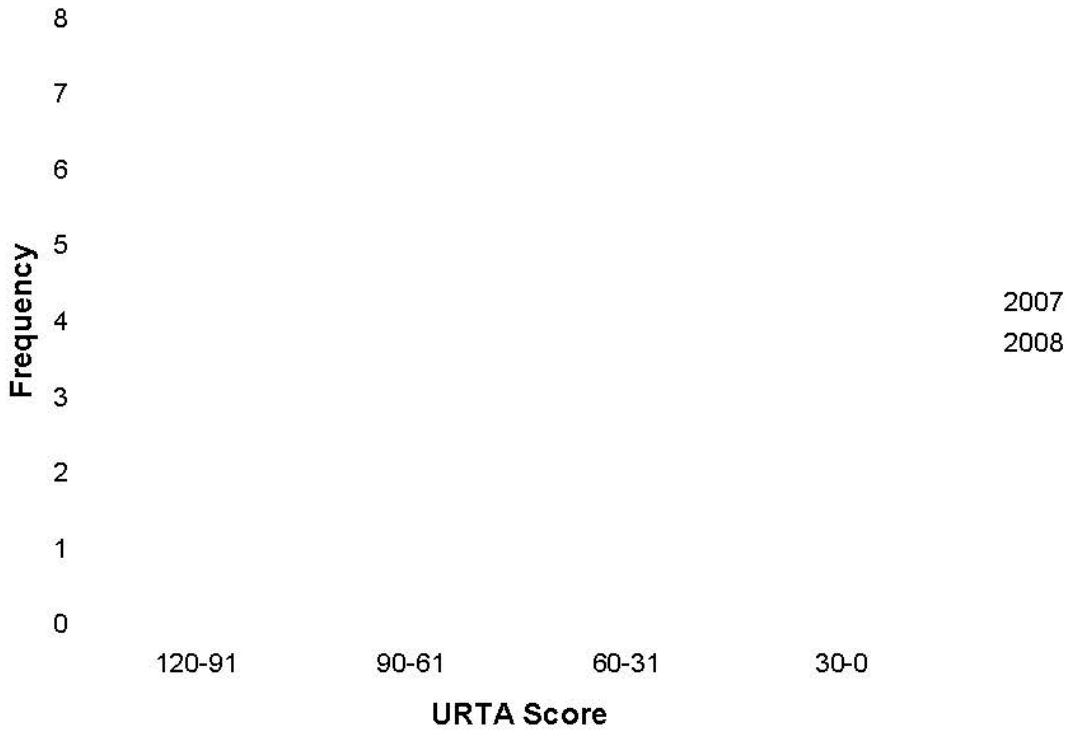

Figure 3. Distribution of Urban Rapid Trash Assessment (URTA) scores conducted during fall 2007 and spring 2008 at seven sites. Higher scores indicate less trash impacts and better conditions.

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Table 2. Total and individual parameter scores and total number of trash items documented during URTAs conducted at seven creek locations in four watersheds during fall 2007 and spring 2008.

Water Body	Site ID	Site	Date	1 Qual-itative	2 Quant-itative	3 Trans-portable Items	4a Hazard-ous Items	4b Access	5a Dumping	5b Litter	6 Accum-ulation	Total Score	Total Trash Items
Mills Creek	M1	Upstream El Camino Real	Oct-07	6	7	4	6	6	10	8	0	47	383
			Mar-08	9	12	6	10	6	10	8	4	65	211
Tributary to Mills Creek	M3	Below outfall at Martinez Drive	Oct-07	4	4	3	2	9	1	6	2	31	607
			Mar-08	10	8	3	9	9	6	9	3	57	395
Redwood Creek	RW1	Menlo Country Club golf course	Nov-07	11	11	5	10	4	10	3	6	60	230
			Mar-08	12	14	8	9	4	10	6	8	71	133
Redwood Creek	RW5	Downstream end I-280 culvert	Nov-07	5	0	0	8	9	10	10	0	42	1,278
			Mar-08	9	6	2	7	9	10	9	5	57	461
Terrace Creek	T1	Upstream El Camino Real	Oct-07	10	10	7	4	5	10	6	7	59	259
			Mar-08	7	11	7	9	5	6	3	15	63	236
Millbrae Creek	MB1	Palm and Millbrae Avenue at park	Oct-07	10	9	5	2	1	4	4	14	49	329
			Mar-08	14	9	9	2	1	9	6	6	56	327
Millbrae Creek	MB2	Upstream Ashton in vacant land	Oct-07	7	5	5	0	1	10	1	16	45	542
			Mar-08	6	7	8	1	1	9	1	12	45	406

Note: higher scores indicate less trash impacts and better conditions. See the Appendix for more information.
URTA – Urban Rapid Trash Assessment.

4.2.2 Trash Characteristics

The total number of trash items per URTA ranged between 133 and 1,278, with a total of 5,797 pieces of trash observed and collected during the 14 assessments (Table 3). In general, a smaller number of trash items was found at each site in the spring compared to the fall. Plastic was the most common item found during the assessments, representing about 65% of all the trash observed. Miscellaneous, glass, biodegradable and metal items were the next most common trash items, collectively representing about 33% of the trash found (Figure 4).

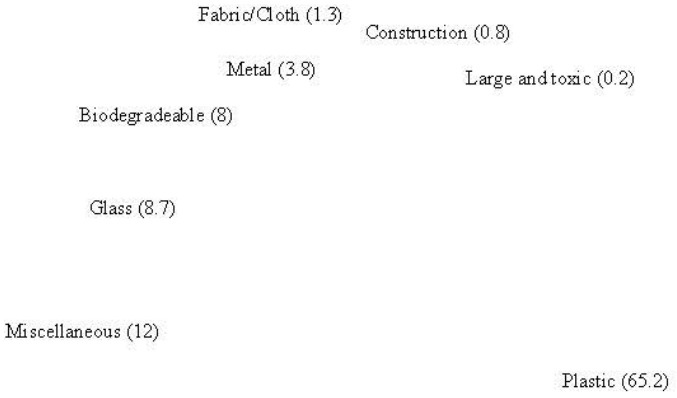

Figure 4. Relative proportions of trash types enumerated using the Urban Rapid Trash Assessment at seven creek sites over two seasons.

URTA Parameters 3 and 4 provide an indication of potential impacts that trash items at the site may have on water quality and beneficial uses. The Parameter 3 score reflects the amount of transportable, persistent, buoyant litter at the assessment site. Trash in this category can be transported over long distances and may impact wildlife through ingestion and entanglement (see Section 3.2 and the Appendix). The number of plastic items (e.g., bags, wrappers, bottles) and miscellaneous items (e.g., cigarette butts, rubber balls) found during an assessment was totaled to determine that assessment's Parameter 3 score (see the Appendix for more information). The average Parameter 3 score for the 14 URTAs conducted was 5 out of a total of 20 possible points (higher scores indicate less trash impacts and better conditions). Over 75% of the trash that was identified during the URTAs was categorized as transportable, persistent, buoyant litter.

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Table 3. Total number and type of trash items documented at seven sites assessed using the URTA during fall 2007 and spring 2008.

Trash Category[1]	Redwood Cr. Golf Course		Redwood Cr. below I-280		Terrace Cr. El Camino		Mills Cr. El Camino		Mills Cr. Tributary Outfall		Millbrae Cr. Park		Millbrae Cr. Vacant Land		Total Items
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	
Biodegradable	0	1	20	11	62	49	2	4	9	39	32	27	117	90	463
Biohazard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	4	3	0	12	0	11	8	3	2	3	0	46
Fabric/Cloth	1	1	15	5	0	1	4	4	30	7	5	0	2	0	75
Glass	0	0	4	5	1	1	0	1	8	1	57	155	138	136	507
Large	0	0	1	1	0	0	0	0	3	1	0	1	0	0	7
Metal	2	4	19	14	33	10	8	4	43	10	6	12	26	30	221
Miscellaneous	187	74	102	52	15	24	47	16	44	28	19	25	40	22	695
Plastic	40	53	1,117	369	145	151	310	182	459	301	206	104	213	128	3,778
Toxic	0	0	0	0	0	0	0	0	0	0	1	1	3	0	5
Total Items	230	133	1,278	461	259	236	383	211	607	395	329	327	542	406	5,797

[1]See the Appendix for more information on the trash categories.
URTA – Urban Rapid Trash Assessment.

The Parameter 4a score reflects the amount of trash items at the assessment site that are a biohazard, toxic, or sharp, (e.g., broken glass, metal shards, medical waste, diapers, pet waste and batteries). Trash in this category is potentially dangerous to wildlife and to people who wade or swim in the water (see Section 3.2 and the Appendix). The number of trash items found in this category during an assessment was totaled to determine that assessment's Parameter 4a score (see the Appendix for more information). The average Parameter 4a score for the 14 URTAs conducted was 6 out of a total of 10 possible points (higher scores indicate less trash impacts and better conditions). About 13 percent of the trash that was identified during the URTAs was categorized as hazardous (biohazard, toxic, or sharp). Most items in this category were glass and metal objects; biohazardous items were not observed and toxic items were relatively uncommon.

The URTA Parameter 4b score (site accessibility/use) for five of the seven URTA sites averaged 6.6 out of 10 possible points (a score of 10 points indicates that a site is inaccessible to the public), indicating that on average these sites had limited access and use. This contrasted with the results for the other two URTA sites, which were both located in Millbrae Creek. Four URTAs were performed in Millbrae Creek (two assessments at each of the two sites). The Parameter 4b score for each of the four assessments was 1.0, indicating that these sites are readily accessible by people. In addition, the Millbrae Creek sites had relatively low scores (lower scores indicate more trash impacts and worse conditions) for URTA parameter 4a (biohazard, toxic, or sharp trash items), ranging from zero to two, mainly due to a high number of pieces of broken glass.[4]

4.2.3 Trash Sources and Pathways at URTA Sites

URTA Parameters 5 and 6 evaluate potential trash sources/pathways. On average, the most common trash pathway identified during the 14 URTAs was accumulation from upstream sources with an average score of seven out of 20 possible points (a score of 20 points indicates no accumulation). The lowest scores for trash accumulation (score 0.0) occurred in two locations: Redwood Creek downstream of the I-280 culvert and Mills Creek, upstream of an SFPUC pipeline below El Camino Real. Another site with high accumulation (score 2.0) was located in the upper end of a tributary to Mills Creek just below an outfall at Martinez Drive (Table 2).

The littering source/pathway was slightly less common than trash accumulation at URTA sites, with an average score of 5.7 (a score of 10 points indicates no littering at a site). The lowest score for littering (1.0) occurred in Millbrae Creek at an undeveloped vacant parcel near to a high school. Other sites where littering was important included a golf course in Redwood Creek (i.e., golf balls in the creek) and an overflowing dumpster in a parking lot adjacent to Terrace Creek.

Dumping was relatively uncommon at URTA sites, with an average score of 8.2 (a score of 10 points indicates no dumping at site). The lowest score (1.0) for dumping occurred below an outfall at the upper end of tributary to Mills Creek. It was unclear how large materials (e.g.,

[4]Sometimes items are broken into two or more pieces. Transportable, persistent, and buoyant fragments such as plastics are individually counted, while paper and broken glass, with lower persistence and/or mobility, are counted based on the parent item(s). Broken glass pieces that are scattered, with no recognizable original shape, are counted individually.

construction materials, shopping cart) entered this site as public access was limited by a fence. Dumping was also identified at the downstream site on Millbrae Creek, which had good public access along Millbrae Drive.

In general, high levels of trash in the creek channel generally originated from upstream sources and accumulated at the assessment sites due to dense vegetation or instream structures (e.g., a pipeline) that captured it during conveyance downstream. Littering from adjacent land uses was the predominant source of trash at sites that had larger proportions of trash on the banks compared to the creek channel. These sites usually had good public access. Larger trash items (construction materials, furniture) were found on both banks and in creek channels.

5.0 REFERENCES

CWP 2005. *Urban Subwatershed Restoration Manual Series, No. 10. Unified Stream Assessment: A User's Manual.* Version 2.0. Center for Watershed Protection. Ellicot City, Maryland. February 2005.

SMCWPPP 2007. *Trash Assessments in Six Watersheds in San Mateo County, California.* Prepared for the San Mateo Countywide Water Pollution Prevention Program by EOA, Inc. August 2007.

SMCWPPP 2008a. *Addressing Trash in Urban Waterways in San Mateo County, California.* Fact Sheet prepared for the San Mateo Countywide Water Pollution Prevention Program by EOA, Inc. August 2008.

SMCWPPP 2008b. *Unified Stream Assessment in Seven Watersheds in San Mateo County, California.* Prepared for the San Mateo Countywide Water Pollution Prevention Program by EOA, Inc. August 2008.

APPENDIX

URBAN RAPID TRASH ASSESSMENT PROTOCOL
Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)

Adapted from the San Francisco Bay Regional Water Quality Control Board Rapid Trash Assessment Protocol, Version 8.

Monitoring Design:
The urban rapid trash assessment can be used for a number of purposes, such as ambient monitoring, evaluation of management actions, determination of trash accumulation rates, or comparing sites with and without public access. Ambient monitoring efforts should provide information at sites distributed throughout a waterbody, and may be conducted several times a year to characterize spatial and temporal variability. Additionally, the ambient sampling design should document the effects of episodes that affect trash levels such as storms or community cleanup events. Pre- and post-project assessments can assist in evaluating the effectiveness of management practices ranging from public outreach to structural controls, or to document the effects of public access on trash levels in waterbodies (e.g., upstream/downstream). Trash accumulation rates may be determined by conducting trash assessments before and after the summer or dry weather index (to capture rates of littering) and the winter or rainy index (to capture rates of accumulation from upstream sources). This method was developed for sections of wadeable streams, but can be adapted to shorelines of lakes, beaches, or estuaries. This adapted version of the San Francisco Bay Regional Water Quality Control Board Rapid Trash Assessment Protocol, Version 8 was developed by SCVURPPP to more effectively assess trash problem areas and to detect changes in trash conditions over time as a result of management actions.

Site Definition:
A team of two people or more defines or verifies a 100-foot section of the stream or shoreline to analyze. When a site is first established, it is recommended that the 100-foot distance be accurately measured. The length should be measured not as a straight line, but as 100 feet of the actual stream or shore length, including sinuous curves. Where possible, the starting and ending points of the stream section should be easily identified landmarks, such as an oak tree or boulder, and noted on the worksheet ("Upper/Lower Boundaries of Reach"), or documented using a global positioning system (GPS), so that future assessments are made at the same location. The team should confer and document the upper boundary of the banks to be surveyed, based on evaluation of whether trash can be carried to the waterbody by wind or water (e.g., an upper terrace in the stream bank). The team documents the location of the high water line based on site-specific physical indicators, such as a debris line found in the riparian vegetation along the stream channel. If the high water line cannot be determined, it is suggested that bankfull height be documented, noting that the high water line could not be determined. Trash located below the high water line can be expected to move into the streambed or to be swept downstream during the next winter season. Visually extend all boundaries in order to encompass the 100' section. Defining site characteristics will facilitate the comparison of trash assessments conducted at the same site at different times of the year.

Survey:
It is highly recommended that all trash items within an assessed site be picked up, so that the site can be re-assessed to evaluate usage patterns, trash return rates, and management actions. A survey, including notes and scoring, will take approximately one to two hours based on how trash-impacted the site is and how many people are working together. The first time a reach is assessed, the process will generally take longer than on subsequent visits. Begin the survey at the downstream end of the selected reach so that trash can be seen in the undisturbed stream channel. Tasks can be divided according to the number of team members. If there are two team members, one team member begins walking along the bank or in the water at the edge of the stream or shore, looking for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either above or below the high water line based on the previously determined boundary. The other person walks in the streambed and up and down the opposite bank, picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line, for the tally person to mark down appropriately on the

trash assessment sheet. All team members pick up the trash items as they are found. All team members should wear gloves to avoid injuries.

The person tallying the trash indicates on the sheet whether the trash was found above the high water line on the bank, or below the high water line either on the bank or in the stream (i.e., tally dots or circles (•) for above high water line, tally lines (|) for below). If it is evident that items have been littered, dumped, or accumulated via downstream transport, make a note in the designated rows near the bottom of the tally sheet - this will help when assessing scores. A trash grabber, metal kitchen tongs, or a similar tool should be used to help pick up trash. Be sure to look under bushes, logs, and other plant growth to see if trash has accumulated underneath. The ground and substrate should be inspected to ensure that small items such as cigarette butts and pieces of broken glass or Styrofoam are picked up and counted. The tally count is an important indicator of trash impairment and should be used in conjunction with the total score to assist in site comparisons.

Sometimes items are broken into many pieces. Transportable, persistent, and buoyant, fragments such as plastics should be individually counted, while paper and broken glass, with lower persistence and/or mobility, should be counted based on the parent item(s). Broken glass pieces that are scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, or to waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

Once the team is finished with the tallying, use the tally sheet margins to count up two totals for each trash item line: one total for items found above the high water line, and one total for items found below the high water line. Now sum the totals of above and below for each trash category, and write in next to each trash category. Complete the worksheets before leaving the site in order to remember pertinent details. The team should discuss each parameter and agree on a score based on a discussion of the condition categories. Discuss and document possible influential factors affecting trash levels at the site, such as a park, school, or nearby residences or businesses. Within each trash parameter, narrative language is provided to assist with choosing a condition category. The worksheet provides a range of numbers within some of the categories, allowing for a range of conditions encountered in the field. Note that trash located in the water leads to lower scores than trash above the high water line. Not all specific trash conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., "site frequently used by people"), nor do the narratives describe all possible conditions. Scores of "0" should be reserved for the most extreme conditions. Once the scores are assigned for the six categories, sum the final score and include specific notes about the site at the end of the sheet. To characterize the variability, persistence, and return rate of trash it is necessary to assess a site three to four times, bracketing different seasons.

Trash Assessment Parameters:

The rapid trash assessment includes a range of parameters that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters characterize trash levels of certain types of trash that may affect water quality, and the last two parameters estimate sources of trash (adjacent land use-related littering, dumping or upstream sources).

1. **Level of Trash.** This assessment parameter is intended to reflect a qualitative "first impression" of the site, after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the waterbody and where trash is evident in very large amounts. Sites that score in the "optimal" range appear to have little or no trash. This parameter should be assessed prior to the collection and enumeration of trash done for subsequent parameter.

2. **Actual Number of Trash Items Found.** Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 500 items have been tallied, assign the following scores: 5: 501-600 items; 4: 601-700 items; 3: 701-800 items; 2: 801-

900 items; 1: 901-1000 items; 0: over 1000 items. Use similar guidelines to assign scores in other condition categories.

3. **Transportable, Persistent, Buoyant Trash.** As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. **Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use.** This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment. Medical waste, diapers, and human or pet waste could potentially adversely affect water quality. Site accessibility and site use is considered in the scoring of this condition category. Sites with very difficult or restricted human access and no evidence of recreational use will receive higher scores due to reduced risk of human exposure at the site.

5. **Illegal Dumping and Littering.** This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. **Accumulation of Trash.** Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

Technical Notes on Trash and Water Quality:
Trash is a water pollutant that has a large range of characteristics of concern. Not all litter and debris delivered to streams are of equal concern to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to aquatic life in the form of ingestion or entanglement. Some elements of trash can negatively affect water quality such as discarded medical waste, and human or pet waste. Also, some household and industrial wastes may contain toxic substances that may influence water quality, such as batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Sharp glass and metal objects are potential puncture and laceration hazards. Larger trash such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistence and accumulation of trash in a waterbody are of particular concern and signify a priority area for prevention of trash discharges. Also of concern are trash "hotspots" where illegal dumping, littering, and/or accumulation of trash occur in very large amounts.

Rapid Trash Assessment. Trash assessment includes a visual survey of the waterbody (e.g., streambed and banks) and adjacent areas from which trash elements can be carried to the waterbody by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet is designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the Clean Water Act and the California Water Code. The worksheet also provides a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations.

Trash Characteristics of Concern. Buoyant (floatable) elements tend to be more harmful to water quality than settleable elements, due to their ability to be transported throughout the waterbody and ultimately to the marine environment. Elements such as plastics, synthetic rubber and synthetic cloth, because of their persistence, have a more adverse effect on water quality than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002).

Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. Larger plastic elements such as plastic grocery bags are also harmful to larger aquatic life such as sea turtles, which can mistake the trash for floating prey and ingest it, leading to starvation or suffocation. Floating debris that is not trapped and removed will eventually end up on the beaches or in the ocean, repelling visitors and residents from the beaches and degrading coastal and open ocean waters.

Leaf litter is trash when there is evidence of intentional dumping. Leaves and pine needles in streams provide a natural source of food for organisms, but excessive levels due to human influence can cause nutrient imbalance and oxygen depletion in streams, to the detriment of the aquatic ecosystem. Clumps of leaf litter and yard waste from trash bags should be treated as trash in the water quality assessment, and not confused with natural inputs of leaves to streams. If there is a question in the field, check the type of leaf to confirm that it comes from a nearby riparian tree. In some instances, leaf litter may be trash if it originates from dense ornamental stands of nearby human planted trees that are overloading the stream's assimilative capacity for leaf inputs. Other biodegradable trash, such as food waste, also exerts a demand on dissolved oxygen, but aquatic life is unlikely to be adversely affected unless the dumping of food waste is substantial and persistent at a given location.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion. Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food (i.e., plastic bags look like jellyfish, a prey item of sea turtles). Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Larger settleable items such as automobiles, shopping carts, and furniture can redirect stream flow and destabilize the channel.

In conclusion, trash in water bodies can adversely affect humans, fish, and wildlife. Not all water quality effects of trash are equal in severity or duration, thus the trash assessment methodology was designed to reflect a range of trash impacts to aquatic life, public health, and aesthetic enjoyment. When considering the water quality effects of trash while conducting a trash assessment, remember to evaluate individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. Utilize the narratives in the worksheet, refer to the technical notes and trash parameter descriptions in the text as needed, and select your scores after careful consideration of actual conditions.

<u>References:</u>

U.S. Environmental Protection Agency, 2001. Draft Assessing and Monitoring Floatable Debris.

U.S. Environmental Protection Agency, 2002. The Definition, Characterization and Sources of Marine Debris. Unit 1 of Turning the Tide on Trash, a Learning Guide on Marine Debris.

Urban Rapid Trash Assessment Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

WATERSHED/STREAM: _____ DATE/TIME: _____
MONITORING GROUP, STAFF: _____ STATION ID _____
STATION NAME /LOCATION: _____

	CONDITION CATEGORY			
Trash Assessment Parameter	**Least Disturbed (Optimal Urban)**	**Sub optimal Urban**	**Marginal Urban**	**Poor**
1. Level of Trash	On first glance, little or no trash visible. Little or no trash evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.	On first glance, trash is evident in low levels. After close inspection small levels of trash evident in stream bank and streambed.	Trash is evident in medium on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.	Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Actual Number of Trash Items Found	0 to 100 trash items found based on a trash assessment of a 100-foot stream reach.	101 to 250 trash items found based on a trash assessment of a 100-foot stream reach.	251 to 500 trash items found based on a trash assessment of a 100-foot stream reach.	Over 500 trash items found based on a trash assessment of a 100-foot stream reach.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Transportable, Persistent, Buoyant Litter	Little or no (< 25 pieces) transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Low to medium presence (26-75 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Medium prevalence (76-200 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Large amount (>200 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, balloons, styrofoam, cigarette butts;
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Biohazard, Toxic and Sharp Objects	B: Trash contains no medical waste, diapers, pet or human waste. No evidence of toxic substances such as chemical containers or batteries. Only 1 piece of broken glass or metal debris, if any, is present.	B: No toxic substances, but small presence (2-10 pieces) of sharp objects such as broken glass and metal debris.	Presence of **any one** of the following: hypodermic needles or other medical waste; used diaper, pet waste, or human feces; any toxic substance such as chemical containers, batteries, or fluorescent light bulbs. Medium to high prevalence (11-50 pieces) sharp objects.	Presence of **more than one** of the items described in the marginal condition category, and/or high prevalence of (> 50) sharp objects.
Site Accessibility	A: Access is difficult, restricted by locked gate or some other physical barrier like steep banks or thick riparian veg. Site reach does not appear to be used by people. Might be private property or protected watershed.	A: Access is limited and site reach does not appear to be used by people. No trails down to creek.	A: Public access to reach is fair to good but site does not appear to be used frequently, **or** private access is good without any public access.	A: Excellent reach access including trails down to and adjacent creek and creekside space for sitting down. Some evidence that reach is used frequently by the public (e.g. rope swings, many beer/soda cans and food wrappers left on the banks, etc.).
B SCORE	10 9	8 7 6	5 4 3	2 1 0
A SCORE	10 9	8 7 6	5 4 3	2 1 0

Urban Rapid Trash Assessment Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

	CONDITION CATEGORY			
Trash Assessment Parameter	**Least Disturbed (Optimal Urban)**	**Sub optimal Urban**	**Marginal Urban**	**Poor**
5. Illegal Dumping	D: No evidence of illegal dumping. No bags of trash, no yard waste, no household items placed at site to avoid proper disposal, no shopping carts.	D: Some evidence of illegal dumping. Limited vehicular access limits the amount of potential dumping, or material dumped is diffuse paper-based debris.	D: Presence of **one** of the following: furniture, appliances, shopping carts, bags of garbage or yard waste, coupled with vehicular access that facilitates in-and-out dumping of materials to avoid landfill costs.	D: Evidence of chronic dumping, with **more than one** of the following items: furniture, appliances, shopping carts, bags of garbage, or yard waste. Easy vehicular access for in-and-out dumping of materials to avoid landfill costs.
Illegal Littering	L: Any trash is incidental litter or carried downstream from another location.	L: Some evidence of litter within creek and banks originating from adjacent land uses	L: Prevalent in-stream or shoreline littering that appears to originate from adjacent land uses.	L: Large amountof litter within creek and on banks that appears to originate from adjacent land uses.
D-SCORE	10 9	8 7 6	5 4 3	2 1 0
L-SCORE	10 9	8 7 6	5 4 3	2 1 0
6. Accum-ulation of Trash	There does not appear to be a problem with trash accumulation from downstream transport. Trash, if any, appears to have been directly deposited at the stream location.	Some evidence that litter and debris have been transported from upstream areas to the location, based on evidence such as silt marks, faded colors or location near high water line.	Evidence that trash is carried to the location from upstream, as evidenced by its location near high water line, siltation marks on the debris, or faded colors.	Trash appears to have accumulated in substantial quantities at the location based on delivery from upstream areas, and is in various states of degradation based on its persistence in the waterbody. A large percentage of trash items have been carried to the location from upstream.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Total Score _____

SITE DEFINITION:

UPPER/LOWER BOUNDARIES OF REACH: _____

HIGH WATER LINE: _____

UPPER EXTENT OF BANKS OR SHORE: _____

_____

NOTES:

_____

_____

_____

_____

_____

_____

_____

Trash Item Talley Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

TRASH ITEM TALLY (Tally with (•) if found above high water line, and (|) if below)

PLASTIC # Above___ # Below____	**METAL** # Above___ # Below____
Plastic Bags	Aluminum Foil
Plastic Bottles	Aluminum or Steel Cans
Plastic Bottle Caps	Bottle Caps
Plastic Cup Lid/Straw	Metal Pipe Segments
Plastic Pipe Segments	Auto Parts (specify below)
Plastic Six-Pack Rings	Wire (barb, chicken wire etc.)
Plastic Wrapper	Metal Object
Soft Plastic Pieces	**LARGE (specify below)** # Above___ # Below____
Hard Plastic Pieces	Appliances
Styrofoam cups pieces	Furniture
Styrofoam Pellets	Garbage Bags of Trash
Fishing Line	Tires
Tarp	Shopping Carts
Other (write-in)	Other (write-in)
BIOHAZARD # Above___ # Below____	**TOXIC** # Above___ # Below____
Human Waste/Diapers	Chemical Containers
Pet Waste	Oil/Surfactant on Water
Syringes or Pipettes	Spray Paint Cans
Dead Animals	Lighters
Other (write-in)	Small Batteries
CONSTRUCTION DEBRIS#Above___#Below__	Vehicle Batteries
Concrete (not placed)	Other (write-in)
Rebar	**BIODEGRADABLE** # Above___ # Below____
Bricks	Paper
Wood Debris	Cardboard
Other (write-in)	Food Waste
MISCELLANEOUS # Above___ # Below____	Yard Waste (incl. trees)
Synthetic Rubber	Leaf Litter Piles
Foam Rubber	Other (write-in)
Balloons	**GLASS** # Above___ # Below____
Ceramic pots/shards	Glass bottles
Hose Pieces	Glass pieces
Cigarette Butts	**FABRIC AND CLOTH** # Above___ # Below____
Golf Balls	Synthetic Fabric
Tennis Balls	Natural Fabric (cotton, wool)
Other (write-in)	Other (write-in)
Total pieces Above: **Below:**	**Grand total:**
Tally all trash in above rows; make notes below as needed to facilitate scoring.	
Littered:	
Dumped:	
Downstream Accumulation:	

SPECIFIC DESCRIPTION OF ITEMS FOUND:_____

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MEMORANDUM

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto • San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

TO: **Trash Ad Hoc Task Group**

FROM: **Paul Randall and John Fusco (Program Staff)**

DATE: **February 28, 2006 (Draft)**
March 13, 2006 (Final)

SUBJECT: **Development of Urban Rapid Trash Assessment Protocol**

INTRODUCTION

During FY 04-05, Co-permittee staff and volunteers from watershed stakeholder groups conducted trash evaluations at thirty-five wadeable creek sites that were previously identified as trash problem areas. The evaluations were conducted using the San Francisco Bay Regional Water Quality Control Board's (Water Board) Rapid Trash Assessment (RTA) Protocol (Version 7.0). The primary objectives for conducting trash evaluations were to establish a baseline condition of trash at known trash problem areas; identify potential sources of trash and potential management actions, where feasible; and to monitor the condition of trash over time to evaluate effectiveness of management actions. Co-permittees are planning to conduct a second year of trash evaluations at selected sites during FY 05-06.

To improve the effectiveness of the Water Board RTA Protocol (Version 7.0), the Program's Trash Ad Hoc Task Group (Trash AHTG) agreed that refinements were necessary to better address trash problem areas located in urban creeks. The Water Board RTA Protocol (Version 7.0) was developed to assess a range of trash conditions in urban and rural creeks. As a result, the protocol was not designed to evaluate conditions of trash-impacted sites in urban streams, especially downstream reaches of a watershed. To evaluate trash problem areas in urban creeks, the Trash AHTG requested that a separate "Urban RTA" be developed to identify, prioritize and evaluate trash management activities over time. The Urban RTA is intended to be used by Co-permittee staff to evaluate and monitor trash problem areas in urban creeks within the Santa Clara Basin. However, this protocol may also be used by other agencies and/or stormwater Programs within the San Francisco Bay area. The purpose of this memorandum is to document the approach and results of the analysis used to develop the Urban RTA.

BACKGROUND

Limitations of Water Board RTA at Trash Impacted Sites

The Water Board developed a memorandum entitled *Evaluation of the Rapid Trash Assessment Methodology* (dated October 20, 2003) that stated that the Water Board RTA Protocol (Version 7.0) is "less sensitive at the low end of the scoring range, corresponding to conditions commonly observed in the lower watersheds of urbanized areas." Furthermore, "it is difficult (for the RTA) to distinguish conditions at trash hotspots." Since these trash problem areas are of most interest to cleanup programs sponsored by local organizations and agencies, "a separate hotspot evaluation methodology may need to be developed." In addition, this urban method "may be necessary to demonstrate progress at the most impacted sites."

Previous Modifications to the Water Board RTA

Prior to the development of the Urban RTA, Program staff actively contributed to modifying and improving the Water Board's RTA (Version 6.0). In September 2002, EOA, Inc. pilot implemented and tested Water Board RTA Version 6.0 at nine stream locations in Santa Clara and San Mateo Counties. In March 2003, Program staff developed a technical memorandum providing an assessment of the protocol. Some of the key findings from pilot implementation and testing include the following:

- The threshold values used to identify conditions for some of the assessment parameters may be too conservative and may not adequately represent the range of conditions typically found in urban streams. As a result, most urban creek segments are likely to fall into the poor or marginal categories. Ubiquitous low scores for all urban creeks would not provide adequate resolution to distinguish spatial or temporal variation in trash conditions;

- There is no clear linkage between the type and number of trash items in a reach to impairment of aquatic life use. As a result, the number of specific types of trash items is not a good basis for an assessment of relative impairment;

- The threat to human health ranking does not take into account the potential level of public exposure. Exposure to contaminated water or sharp objects (e.g., glass and metal) is dependent on the level of accessibility to a creek (e.g., fences limit access to creeks) and creek conditions (e.g., depth of water);

- A distinction between litter and illegal dumping is needed to better assist managers in the identification of appropriate BMPs to reduce the trash;

- The recommended modifications to the RTA protocols could be incorporated as an "urban management version" of the protocols.

In March 2003, Water Board staff developed Version 7.0 of the RTA to incorporate some of the Program recommendations described above. In summary, these changes included:

- Slight increase to the scoring ranges for parameters dependent on trash item enumerations;
- Numeric guidelines were added to provide a more objective scoring system;
- The "illegal dumping and littering" parameter was broken into two separate sub-parameters with distinct scoring systems.

In Water Board RTA (Version 8.0) dated November 12, 2004, the Water Board modified the time spent counting and collecting trash at each site. The Water Board RTA was originally designed to be rapid (i.e., conducted within a 20 to 30 minute time period). As a result, not all trash items within a 100-foot section of stream would necessarily be counted during an assessment (Terri Fashing, former Water Board staff, personal communication, 2005). The number of trash items used to define some of the RTA condition categories were developed under the assumption that assessments would be completed within 20 to 30 minutes. During FY 03-04, Water Board staff started to emphasize the enumeration and pickup of *all* trash items at each site. This change typically increased assessment time to 1 to 2 hours and resulted in higher numbers of trash getting counted. The increase in assessment time and trash numbers did not result in any change to the ranges of trash items used to rank some of the RTA trash parameters.

The Urban RTA was developed to incorporate the recommendations from the Program's memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (dated March 1, 2003), adjust the number of trash items associated with RTA condition categories and enhance the overall assessment of trash impacted sites.

APPROACH

Program staff compiled RTA data collected by Water Board staff between 2001 and 2004. The data, which was collected as part of the Surface Water Ambient Monitoring Program (SWAMP), consists of results from 85 monitoring events (at 27 stream locations) over a range of seasonal time periods. In addition to SWAMP data, Program staff compiled Co-permittee RTA data collected during one monitoring event at 35 sites. The combined data set included RTA scores and number and type of trash items for 120 trash assessments conducted at 69 stream locations in 23 watersheds within the San Francisco Bay area. Both urban (n = 17) and non-urban (n = 103) assessment results were represented in the combined data set. The majority of Program RTA sites were conducted at trash problem areas (there were two exceptions on Stevens Creek). SWAMP conducted assessments at sites with a variety of trash conditions.

New scoring ranges for three of the six RTA trash assessment parameters were developed for several categories of trash items. The trash categories and corresponding assessment parameter (in parentheses) include: 1) total number of trash pieces (Actual Number of Trash Items); 2) total number of combined plastic and miscellaneous trash items (Threat to Aquatic Health); 3) total number of biohazard trash items (Threat to Human Health); and 4) total number of combined glass and metal objects (Threat to Human Health). The distribution of values was plotted and a frequency histogram was calculated for each trash category to determine scoring

ranges and associated ranking scores for three condition categories (i.e., "suboptimal urban", "marginal urban" and "poor").

The scoring range for ranking the trash assessment parameters as "least disturbed" (formerly the "optional" condition category) were determined using data collected at non-urban sites. Non-urban site results were used because the number of items collected at these sites was usually very low when compared to urban site results. The "least disturbed" category represents sites with very little trash. Non-urban sites represented creek locations that were typically the highest elevation sites containing park and open space land uses in the upstream drainage area. Trash conditions at non-urban sites were assumed to be reasonable targets for trash management in urban stream locations. "Least disturbed" scoring ranges for each of the trash item categories were determined by calculating and summing the mean and standard deviation.

Qualitative revisions to two of the trash assessment parameters were made, including name changes, to address the some of the key findings presented in Program's memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (dated March 1, 2003). These include the following: 1) linkage between trash condition and threat to aquatic life use not well established or documented; and 2) assessment of threat to human health from selected hazardous and toxic trash items should include an assessment of potential public access and/or evidence of use. Additional revisions were made to selected trash parameters to emphasize more subjective scoring system by eliminating the use of trash enumeration.

RESULTS AND DISCUSSION

The revisions made to each of the six RTA trash assessment parameters are described below and summarized within Table 1. The Urban RTA protocol is provided in Attachment A. A protocol summary for use in the field is provided in Attachment B.

Assessment Parameter #1: "Level of Trash"

To base scoring upon a visual "first impression" of the site, the scoring ranges for the total number of trash items was removed from the "Level of Trash" parameter. The quantitative component of this parameter was removed to eliminate redundancy since Parameter #2 already assesses the total number of trash items collected at the site. This revision would provide an assessment parameter in the Urban RTA that focuses on the aesthetic quality of the site. To reduce any influence from enumeration of trash items, scoring for this parameter should be done prior to tallying and collecting trash.

Assessment Parameter #2: "Actual Number of Trash Items Found"

The "Actual Number of Trash Items Found" (Number of Items) parameter is scored based on the total number of trash items counted at the site. The total number of trash pieces counted during each of the 120 trash assessment events ranged from 3 - 1133 pieces (mean of 307). When using the Water Board RTA Protocol (Version 7.0), 75 percent of the sites were assigned a condition of "poor" (Figure 1). The percentage of sites ranked "poor" for this parameter was higher (83%) for urban sites. Thus, all sites that contained between 101 and 1133 trash items are considered "poor" when scored with the Water Board RTA (Version 7).

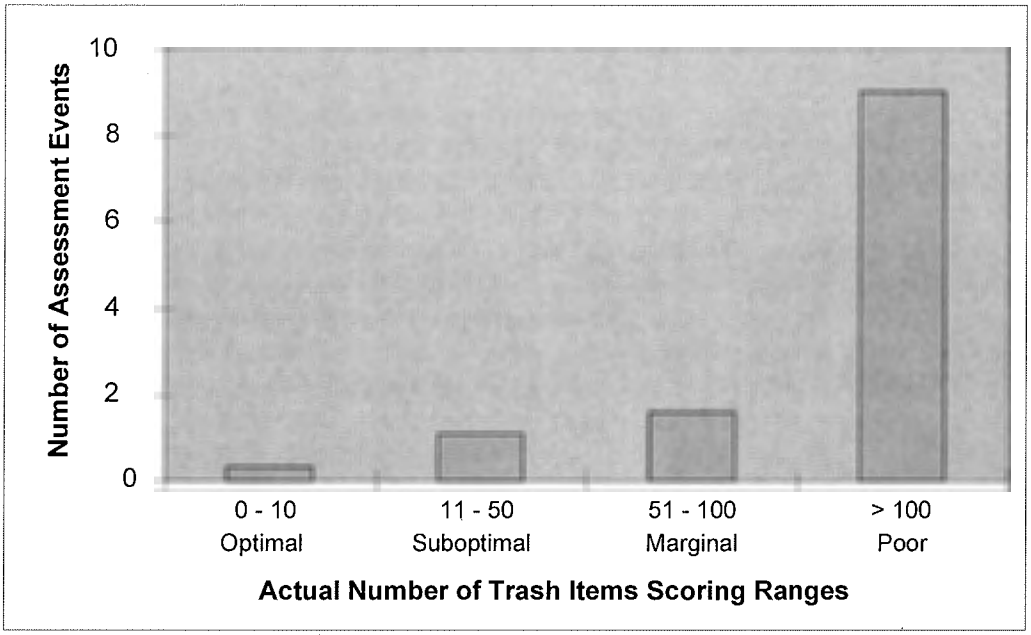

Figure 1. Frequency histogram of the total number of trash items and corresponding rank scores using the Water Board RTA Protocol.

To reflect the distribution of total trash items documented in the combined SWAMP and Program RTA data set, the scoring ranges were changed for the "Number of Items" parameter in the Urban RTA. The condition categories were renamed in the Urban RTA to (ranging from better to worse) "least disturbed", "suboptimal urban", "marginal urban" and "poor". The scoring ranges for each of these categories were defined by calculating quartiles for the combined RTA data. The higher bound for the "least disturbed" category was determined using results from the non-urban sites (n=17). The upper limit defining "least disturbed" was calculated by adding the mean and standard deviation for the total number of trash items collected at the non-urban sites. Total trash items from non-urban sites ranged from 3 – 290 pieces. All data points more than three standard deviations away from the mean were removed as outliers (Stevens Creek at Moss Rock). The mean (56) and standard deviation (52) was calculated and summed for a total of 108 trash pieces. A range of 100 pieces or less was selected to define the upper bound for the "least disturbed" scoring range for the "Number of Items" parameter. Figure 2 shows a frequency histogram of the total number of trash items collected from all RTA assessment sites and new corresponding rank score for parameter #2 using the Urban RTA. As shown in Figure 2, there is a wider distribution in the number of trash items for each ranking score (when compared to Figure 1). This increases the ability to evaluate trash problem areas in urban sites over time.

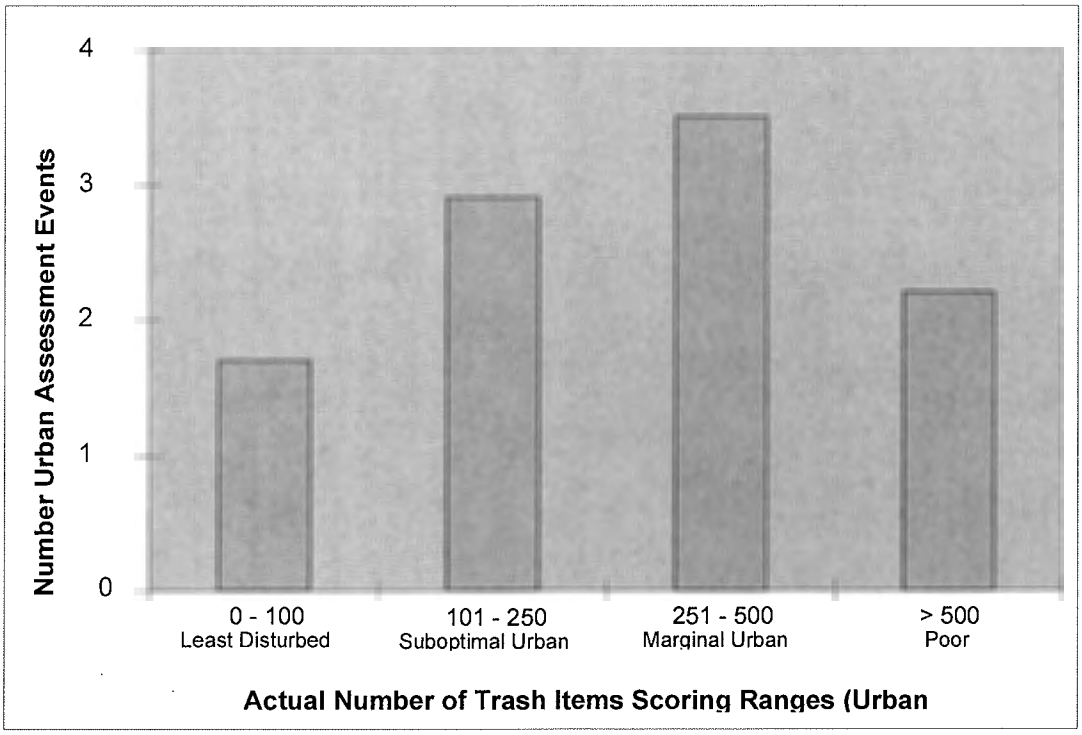

Figure 2. Frequency histogram of the total number of trash items collected at urban sites and corresponding rank scores using Program Urban RTA Protocol.

Assessment Parameter #3: "Transportable, Persistent, Buoyant Litter"

One key finding from the Program's memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (dated March 1, 2003) was that the linkage between trash condition and threat to aquatic life use in creeks is not well established or documented. To eliminate the suggestion of impairment to aquatic life use with the type or number of trash items, the Water Board RTA Protocol trash assessment parameter entitled "Threat to Aquatic Life" was renamed to "Transportable, Persistent, Buoyant Trash" within the Urban RTA. The revised trash assessment parameter is intended to better assist Program staff in assessing the condition of problematic trash items (i.e., plastic and miscellaneous trash items). As a result, site scores for this parameter can help guide management actions in the future. To accurately describe the new parameter, all reference to biodegradable, metal, glass and toxic trash was removed.

Similar to the approach used in Parameter #2, new scoring ranges of total transportable, persistent, buoyant trash items were derived using the combined RTA data set. The scoring ranges for each of the condition categories of the "Transportable, Persistent, Buoyant Trash" parameter were defined by calculating quartiles for RTA data collected at urban sites. The higher bound for the "least disturbed" category was determined using results from the non-urban sites. The mean and standard deviation of combined plastic and miscellaneous (includes cigarette butts) trash items collected at the non-urban creek sites was calculated and summed for a total of 37 pieces. All outliers more than three standard deviations greater than the mean were removed from the analysis. A more conservative range of 25 or less pieces was used to define the range for the "least disturbed" category. Figure 3 shows the new scoring ranges and the number of assessment events that fit into each condition category based on the total number of plastic and miscellaneous trash items.

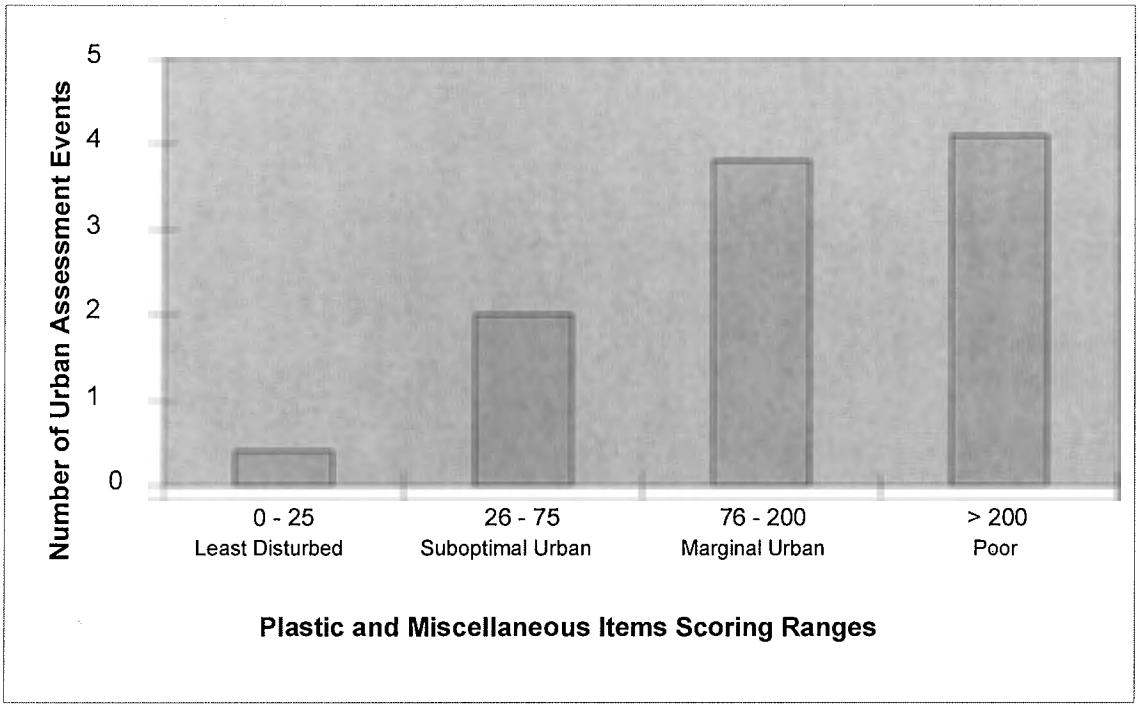

Figure 3. Existing RTA assessment event data is applied to the new scoring system for the "Transportable, Persistent, Buoyant Litter" assessment parameter.

Assessment Parameter #4: "Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use"

The Program's memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (dated March 1, 2003) found that assessment of threat to human health from selected hazardous and toxic trash items should also include an assessment of potential public access and/or evidence of use. To eliminate the linkage between human health risk with the type or number of trash items identified, the original trash assessment parameter entitled "Threat to Human Health" was renamed "Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use" within the Urban RTA. Furthermore, this parameter was divided into two sub-parameters: "Biohazard, Toxic and Sharp Objects" and "Site Accessibility" to allow an independent assessment of the potential risk of public exposure from these types of trash items. Exposure to contaminated water or sharp objects (e.g., glass and metal) is dependent on the level of accessibility to a creek (e.g., fences limit access to creeks) and creek conditions (e.g., depth of water). As a result, a site's accessibility or use now affects the final score for the new "Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use" parameter.

The method used to derive new scoring ranges for the total number of metal and glass trash items within the Urban RTA was slightly different than described above. For example, the sum of the mean and standard deviation for sharp items resulted in a number that was too high to define the upper limit of the "least disturbed" condition category. Instead, an iterative process of creating frequency histograms using different condition category ranges resulted in a set of scoring ranges for total glass and sharp object pieces that best fit the existing data set. A frequency histogram of the total number of glass and metal objects and corresponding rank score for the Urban RTA is provided within Figure 4. Similar analysis of the biohazard and toxic

data suggested that the established scoring ranges used in the Water Board RTA Protocol were consistent with the distribution of these trash items found in the existing data. As a result, the established scoring ranges used in the Water Board RTA Protocol were not changed.

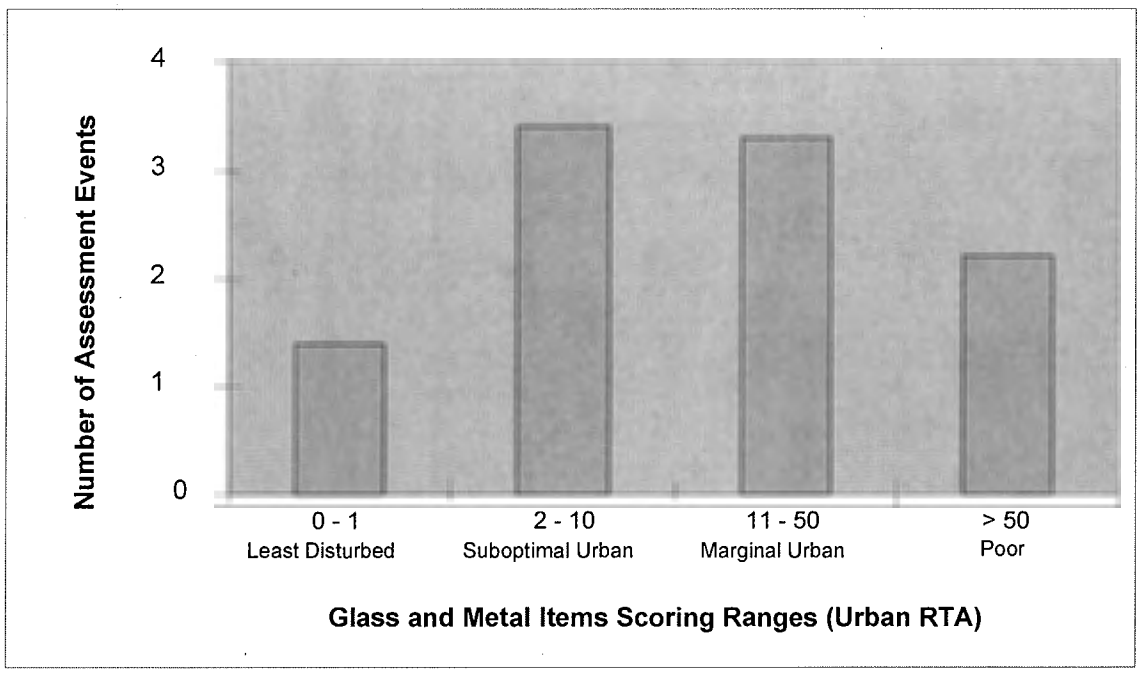

Figure 4. Existing RTA assessment event data is applied to the new scoring ranges for total metal and glass trash items (sharp objects)

Assessment Parameters #5 and #6: "Illegal Dumping and Littering" and "Accumulation of Trash"

To emphasize a more subjective scoring system, additional revisions were made to selected trash parameters by eliminating the use of trash enumeration. In the Water Board RTA Protocol, the number of item ranges used to score each condition category under the "Illegal Dumping and Littering" and the "Accumulation of Trash" parameters are presented to help guide score assignment in the field. However, the Water Board RTA Protocol does not require the enumeration of items that were dumped, littered or accumulated. Therefore, no data exists to analyze how well the existing ranges are suited to each condition category. The process of determining the number of collected items that originated from adjacent land use littering versus upstream accumulation is subjective unless enumerated as the assessment is being conducted.

Table 1. Revisions to trash assessment parameters made in the development of the Urban RTA.

Parameter	Type of Revision		Rationale	Comments
	Quantitative	Qualitative		
(1) Level of Trash Assessment	Remove numerical thresholds of trash items	No change	Considered redundant with "Actual Trash Item" parameter; keep as qualitative parameter	Assess prior to enumeration to prevent trash enumeration from influencing score
(2) Actual Number of Trash Items	Use new scoring ranges based on distribution of existing data	No change	-Number of trash items more representative of trash problem areas in urban streams -Enhance ability to distinguish changes in trash condition over time	Consider future documentation of estimated number of trash bags collected (i.e., volume) for potential use as another "subparameter" to score
(3) Threat to Aquatic Life	Use new scoring ranges based on distribution of existing data (i.e., plastic and miscellaneous items)	-Change parameter name to "*Transportable, Persistent, Buoyant Trash Items*" -Remove reference to biodegradable, metal, glass and toxic trash	-See rationale for "Actual Number of Trash Items" -No documented linkage between magnitude of transportable and persistent trash items to aquatic life use impairment in freshwater streams;	-Parameter is intended to assess condition of sites based on problematic trash items; these data can influence management actions
(4) Threat to Human Health	Use new scoring ranges based on distribution of existing data (i.e., biohazards, glass and metal)	-Change parameter name to "*Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use*" -Remove reference to mosquito production - Add new subparameter that addresses potential for public access and create four condition categories	-See "Actual Number of Trash Items" -No documented linkage between the magnitude of hazardous and toxic trash items to human health - Relative risk of exposure is critical for understanding potential impacts to human health	-Parameter is intended to assess condition of sites based on problematic trash items; these data can influence management actions
(5) Illegal Dumping and Illegal Littering	Remove numerical thresholds of trash items	No change	No existing data to support using numerical thresholds (i.e., source of trash items are not tallied)	-The condition categories are typically assessed by best professional judgment - Tally types of trash sources
(6)Accumulation of Trash	Remove numerical thresholds of trash items	No change	No existing data to support using numerical thresholds (i.e., source of trash items are not tallied)	-The condition categories are typically assessed by best professional judgment - Tally types of trash sources

CONCLUSION AND RECOMMENDATIONS

Conclusions and recommendations for the development of the Urban RTA include:

- New scoring ranges for assessment parameters #2, #3 and #4 were developed using existing RTA data. These new scoring ranges provide a more evenly distributed range of trash conditions (compared to the Water Board RTA Protocol) in urban creeks and increase the resolution of the Urban RTA to better evaluate changes at trash impacted sites.

- Qualitative descriptions for parameters #3 and #4 were modified to remove any potential linkage between the type or number of trash items in a reach to the impairment of aquatic life use and/or human health. These changes were intended to focus the assessment on problematic trash items (e.g., persistent, floatable trash) and to assist in identifying potential management actions to address potential sources of trash.

- Qualitative descriptions were added to parameter #4 to better assess potential public exposure to trash items that are potentially biohazardous, toxic or physically harmful (i.e., metal and glass).

- Scoring ranges were removed from parameter #1. Scoring is now based on visual "first impression" or aesthetic quality of the site. Scoring ranges were removed from parameters #5 and #6 since no existing data was available to support the numerical thresholds used in the Water Board RTA Protocol.

- Document total volume of trash collected at each site (i.e., number of trash bags using standard bag size). Following one year of data collection, develop condition categories for new subparameter entitled "Volume of Trash" to supplement existing parameter entitled "Number of Items".

- Estimate relative number and type of trash source (i.e., litter from adjacent land use, litter accumulation from upstream sources and illegal dumping) for the trash collected at each site. Following one year of data collection, develop condition categories using distribution of existing data for parameters #5 and #6.

- Review Urban RTA protocol methods prior to field visit to promote standardization of data collection procedures. Use summary protocol for additional guidance of methodology in the field. Coordinate with other agencies and organizations to leverage existing staff resources in conducting RTAs; and collecting and disposing of trash.

NEXT STEPS

1. Co-permittees begin implementing the Urban RTA Protocol for trash evaluations planned during FY 05-06.
2. Modify RTA scores from trash assessments conducted during FY 04-05 based on the scoring system defined in the Urban RTA Protocol.

ATTACHMENT A

URBAN RAPID TRASH ASSESSMENT PROTOCOL
Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)

Adapted from the San Francisco Bay Regional Water Quality Control Board Rapid Trash Assessment Protocol, Version 8.

Monitoring Design:
The urban rapid trash assessment can be used for a number of purposes, such as ambient monitoring, evaluation of management actions, determination of trash accumulation rates, or comparing sites with and without public access. Ambient monitoring efforts should provide information at sites distributed throughout a waterbody, and several times a year to characterize spatial and temporal variability. Additionally, the ambient sampling design should document the effects of episodes that affect trash levels such as storms or community cleanup events. Pre- and post-project assessments can assist in evaluating the effectiveness of management practices ranging from public outreach to structural controls, or to document the effects of public access on trash levels in waterbodies (e.g., upstream/downstream). Trash accumulation rates may be determined by conducting trash assessments before and after the summer or dry weather index (to capture rates of littering) and the winter or rainy index (to capture rates of accumulation from upstream sources). This method was developed for sections of wadeable streams, but can be adapted to shorelines of lakes, beaches, or estuaries. This adapted version of the San Francisco Bay Regional Water Quality Control Board Rapid Trash Assessment Protocol, Version 8 was developed by SCVURPPP to more effectively assess trash problem areas and to detect changes in trash conditions over time as a result of management actions.

Site Definition:
A team of two people or more defines or verifies a 100-foot section of the stream or shoreline to analyze. When a site is first established, it is recommended that the 100-foot distance be accurately measured. The length should be measured not as a straight line, but as 100 feet of the actual stream or shore length, including sinuous curves. Where possible, the starting and ending points of the stream section should be easily identified landmarks, such as an oak tree or boulder, and noted on the worksheet ("Upper/Lower Boundaries of Reach"), or documented using a global positioning system (GPS), so that future assessments are made at the same location. The team should confer and document the upper boundary of the banks to be surveyed, based on evaluation of whether trash can be carried to the waterbody by wind or water (e.g., an upper terrace in the stream bank). The team documents the location of the high water line based on site-specific physical indicators, such as a debris line found in the riparian vegetation along the stream channel. If the high water line cannot be determined, it is suggested that bankfull height be documented, noting that the high water line could not be determined. Trash located below the high water line can be expected to move into the streambed or to be swept downstream during the next winter season. Visually extend all boundaries in order to encompass the 100' section. Defining site characteristics will facilitate the comparison of trash assessments conducted at the same site at different times of the year.

Survey:
It is highly recommended that all trash items within an assessed site be picked up, so that the site can be re-assessed to evaluate usage patterns, trash return rates, and management actions. A survey, including notes and scoring, will take approximately one to two hours based on how trash-impacted the site is and how many people are working together. The first time a reach is assessed, the process will generally take longer than on subsequent visits. Begin the survey at the downstream end of the selected reach so that trash can be seen in the undisturbed stream channel. Tasks can be divided according to the number of team members. If there are two team members, one team member begins walking along the bank or in the water at the edge of the stream or shore, looking for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either above or below the high water line based on the previously determined boundary. The other person walks in the streambed and up and down the opposite bank, picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line, for the tally person to mark down appropriately on the

trash assessment sheet. All team members pick up the trash items as they are found. All team members should wear gloves to avoid injuries.

The person tallying the trash indicates on the sheet whether the trash was found above the high water line on the bank, or below the high water line either on the bank or in the stream (i.e., tally dots or circles (•) for above high water line, tally lines (|) for below). If it is evident that items have been littered, dumped, or accumulated via downstream transport, make a note in the designated rows near the bottom of the tally sheet - this will help when assessing scores. A trash grabber, metal kitchen tongs, or a similar tool should be used to help pick up trash. Be sure to look under bushes, logs, and other plant growth to see if trash has accumulated underneath. The ground and substrate should be inspected to ensure that small items such as cigarette butts and pieces of broken glass or Styrofoam are picked up and counted. The tally count is an important indicator of trash impairment and should be used in conjunction with the total score to assist in site comparisons.

Sometimes items are broken into many pieces. Transportable, persistent, and buoyant, fragments such as plastics should be individually counted, while paper and broken glass, with lower persistence and/or mobility, should be counted based on the parent item(s). Broken glass pieces that are scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, or to waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

Once the team is finished with the tallying, use the tally sheet margins to count up two totals for each trash item line: one total for items found above the high water line, and one total for items found below the high water line. Now sum the totals of above and below for each trash category, and write in next to each trash category. Complete the worksheets before leaving the site in order to remember pertinent details. The team should discuss each parameter and agree on a score based on a discussion of the condition categories. Discuss and document possible influential factors affecting trash levels at the site, such as a park, school, or nearby residences or businesses. Within each trash parameter, narrative language is provided to assist with choosing a condition category. The worksheet provides a range of numbers within some of the categories, allowing for a range of conditions encountered in the field. Note that trash located in the water leads to lower scores than trash above the high water line. Not all specific trash conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., "site frequently used by people"), nor do the narratives describe all possible conditions. Scores of "0" should be reserved for the most extreme conditions. Once the scores are assigned for the six categories, sum the final score and include specific notes about the site at the end of the sheet. To characterize the variability, persistence, and return rate of trash it is necessary to assess a site three to four times, bracketing different seasons.

Trash Assessment Parameters:

The rapid trash assessment includes a range of parameters that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters characterize trash levels of certain types of trash that may affect water quality, and the last two parameters estimate sources of trash (adjacent land use-related littering, dumping or upstream sources).

1. **Level of Trash.** This assessment parameter is intended to reflect a qualitative "first impression" of the site, after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the waterbody and where trash is evident in very large amounts. Sites that score in the "optimal" range appear to have little or no trash. This parameter should be assessed prior to the collection and enumeration of trash done for subsequent parameter.

2. **Actual Number of Trash Items Found.** Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 500 items have been tallied, assign the following scores: 5: 501-600 items; 4: 601-700 items; 3: 701-800 items; 2: 801-

900 items; 1: 901-1000 items; 0: over 1000 items. Use similar guidelines to assign scores in other condition categories.

3. **Transportable, Persistent, Buoyant Trash.** As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. **Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use.** This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment. Medical waste, diapers, and human or pet waste could potentially adversely affect water quality. Site accessibility and site use is considered in the scoring of this condition category. Sites with very difficult or restricted human access and no evidence of recreational use will receive higher scores due to reduced risk of human exposure at the site.

5. **Illegal Dumping and Littering.** This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. **Accumulation of Trash.** Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

Technical Notes on Trash and Water Quality:
Trash is a water pollutant that has a large range of characteristics of concern. Not all litter and debris delivered to streams are of equal concern to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to aquatic life in the form of ingestion or entanglement. Some elements of trash can negatively affect water quality such as discarded medical waste, and human or pet waste. Also, some household and industrial wastes may contain toxic substances that may influence water quality, such as batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Sharp glass and metal objects are potential puncture and laceration hazards. Larger trash such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistence and accumulation of trash in a waterbody are of particular concern and signify a priority area for prevention of trash discharges. Also of concern are trash "hotspots" where illegal dumping, littering, and/or accumulation of trash occur in very large amounts.

Rapid Trash Assessment. Trash assessment includes a visual survey of the waterbody (e.g., streambed and banks) and adjacent areas from which trash elements can be carried to the waterbody by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet is designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the Clean Water Act and the California Water Code. The worksheet also provides a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations.

Trash Characteristics of Concern. Buoyant (floatable) elements tend to be more harmful to water quality than settleable elements, due to their ability to be transported throughout the waterbody and ultimately to the marine environment. Elements such as plastics, synthetic rubber and synthetic cloth, because of their persistence, have a more adverse effect on water quality than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002).

ATTACHMENT A

Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. Larger plastic elements such as plastic grocery bags are also harmful to larger aquatic life such as sea turtles, which can mistake the trash for floating prey and ingest it, leading to starvation or suffocation. Floating debris that is not trapped and removed will eventually end up on the beaches or in the ocean, repelling visitors and residents from the beaches and degrading coastal and open ocean waters.

Leaf litter is trash when there is evidence of intentional dumping. Leaves and pine needles in streams provide a natural source of food for organisms, but excessive levels due to human influence can cause nutrient imbalance and oxygen depletion in streams, to the detriment of the aquatic ecosystem. Clumps of leaf litter and yard waste from trash bags should be treated as trash in the water quality assessment, and not confused with natural inputs of leaves to streams. If there is a question in the field, check the type of leaf to confirm that it comes from a nearby riparian tree. In some instances, leaf litter may be trash if it originates from dense ornamental stands of nearby human planted trees that are overloading the stream's assimilative capacity for leaf inputs. Other biodegradable trash, such as food waste, also exerts a demand on dissolved oxygen, but aquatic life is unlikely to be adversely affected unless the dumping of food waste is substantial and persistent at a given location.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion. Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food (i.e., plastic bags look like jellyfish, a prey item of sea turtles). Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Larger settleable items such as automobiles, shopping carts, and furniture can redirect stream flow and destabilize the channel.

In conclusion, trash in water bodies can adversely affect humans, fish, and wildlife. Not all water quality effects of trash are equal in severity or duration, thus the trash assessment methodology was designed to reflect a range of trash impacts to aquatic life, public health, and aesthetic enjoyment. When considering the water quality effects of trash while conducting a trash assessment, remember to evaluate individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. Utilize the narratives in the worksheet, refer to the technical notes and trash parameter descriptions in the text as needed, and select your scores after careful consideration of actual conditions.

<u>References:</u>

U.S. Environmental Protection Agency, 2001. Draft Assessing and Monitoring Floatable Debris.

U.S. Environmental Protection Agency, 2002. The Definition, Characterization and Sources of Marine Debris. Unit 1 of Turning the Tide on Trash, a Learning Guide on Marine Debris.

Urban Rapid Trash Assessment Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

WATERSHED/STREAM: _____ DATE/TIME: _____
MONITORING GROUP, STAFF: _____ STATION ID _____
STATION NAME /LOCATION: _____

	CONDITION CATEGORY			
Trash Assessment Parameter	**Least Disturbed (Optimal Urban)**	**Sub optimal Urban**	**Marginal Urban**	**Poor**
1. Level of Trash	On first glance, little or no trash visible. Little or no trash evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.	On first glance, trash is evident in low levels. After close inspection small levels of trash evident in stream bank and streambed.	Trash is evident in medium on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.	Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Actual Number of Trash Items Found	0 to 100 trash items found based on a trash assessment of a 100-foot stream reach.	101 to 250 trash items found based on a trash assessment of a 100-foot stream reach.	251 to 500 trash items found based on a trash assessment of a 100-foot stream reach.	Over 500 trash items found based on a trash assessment of a 100-foot stream reach.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Transportable, Persistent, Buoyant Litter	Little or no (< 25 pieces) transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Low to medium presence (26-75 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Medium prevalence (76-200 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, styrofoam, balloons, cigarette butts.	Large amount (>200 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, balloons, styrofoam, cigarette butts;
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Biohazard, Toxic and Sharp Objects	B: Trash contains no medical waste, diapers, pet or human waste. No evidence of toxic substances such as chemical containers or batteries. Only 1 piece of broken glass or metal debris, if any, is present.	B: No toxic substances, but small presence (2-10 pieces) of sharp objects such as broken glass and metal debris.	Presence of **any one** of the following: hypodermic needles or other medical waste; used diaper, pet waste, or human feces; any toxic substance such as chemical containers, batteries, or fluorescent light bulbs. Medium to high prevalence (11-50 pieces) sharp objects.	Presence of **more than one** of the items described in the marginal condition category, and/or high prevalence of (> 50) sharp objects.
Site Accessibility	A: Access is difficult, restricted by locked gate or some other physical barrier like steep banks or thick riparian veg. Site reach does not appear to be used by people. Might be private property or protected watershed.	A: Access is limited and site reach does not appear to be used by people. No trails down to creek.	A: Public access to reach is fair to good but site does not appear to be used frequently, **or** private access is good without any public access.	A: Excellent reach access including trails down to and adjacent creek and creekside space for sitting down. Some evidence that reach is used frequently by the public (e.g. rope swings, many beer/soda cans and food wrappers left on the banks, etc.).
B SCORE	10 9	8 7 6	5 4 3	2 1 0
A SCORE	10 9	8 7 6	5 4 3	2 1 0

Urban Rapid Trash Assessment Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

	CONDITION CATEGORY			
Trash Assessment Parameter	**Least Disturbed (Optimal Urban)**	**Sub optimal Urban**	**Marginal Urban**	**Poor**
5. Illegal Dumping	D: No evidence of illegal dumping. No bags of trash, no yard waste, no household items placed at site to avoid proper disposal, no shopping carts.	D: Some evidence of illegal dumping. Limited vehicular access limits the amount of potential dumping, or material dumped is diffuse paper-based debris.	D: Presence of **one** of the following: furniture, appliances, shopping carts, bags of garbage or yard waste, coupled with vehicular access that facilitates in-and-out dumping of materials to avoid landfill costs.	D: Evidence of chronic dumping, with **more than one** of the following items: furniture, appliances, shopping carts, bags of garbage, or yard waste. Easy vehicular access for in-and-out dumping of materials to avoid landfill costs.
Illegal Littering	L: Any trash is incidental litter or carried downstream from another location.	L: Some evidence of litter within creek and banks originating from adjacent land uses	L: Prevalent in-stream or shoreline littering that appears to originate from adjacent land uses.	L: Large amountof litter within creek and on banks that appears to originate from adjacent land uses.
D-SCORE	10 9	8 7 6	5 4 3	2 1 0
L-SCORE	10 9	8 7 6	5 4 3	2 1 0
6. Accum-ulation of Trash	There does not appear to be a problem with trash accumulation from downstream transport. Trash, if any, appears to have been directly deposited at the stream location.	Some evidence that litter and debris have been transported from upstream areas to the location, based on evidence such as silt marks, faded colors or location near high water line.	Evidence that trash is carried to the location from upstream, as evidenced by its location near high water line, siltation marks on the debris, or faded colors.	Trash appears to have accumulated in substantial quantities at the location based on delivery from upstream areas, and is in various states of degradation based on its persistence in the waterbody. A large percentage of trash items have been carried to the location from upstream.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Total Score _____

SITE DEFINITION:

UPPER/LOWER BOUNDARIES OF REACH: _____

HIGH WATER LINE: _____

UPPER EXTENT OF BANKS OR SHORE: _____

_____

NOTES:

_____

_____

_____

_____

_____

_____

_____

Trash Item Talley Worksheet

Santa Clara Valley Urban Runoff Pollution Prevention Program

TRASH ITEM TALLY (Tally with (•) if found above high water line, and (|) if below)

PLASTIC # Above___ # Below___	**METAL** # Above___ # Below___
Plastic Bags	Aluminum Foil
Plastic Bottles	Aluminum or Steel Cans
Plastic Bottle Caps	Bottle Caps
Plastic Cup Lid/Straw	Metal Pipe Segments
Plastic Pipe Segments	Auto Parts (specify below)
Plastic Six-Pack Rings	Wire (barb, chicken wire etc.)
Plastic Wrapper	Metal Object
Soft Plastic Pieces	**LARGE (specify below)** # Above___ # Below___
Hard Plastic Pieces	Appliances
Styrofoam cups pieces	Furniture
Styrofoam Pellets	Garbage Bags of Trash
Fishing Line	Tires
Tarp	Shopping Carts
Other (write-in)	Other (write-in)
BIOHAZARD # Above___ # Below___	**TOXIC** # Above___ # Below___
Human Waste/Diapers	Chemical Containers
Pet Waste	Oil/Surfactant on Water
Syringes or Pipettes	Spray Paint Cans
Dead Animals	Lighters
Other (write-in)	Small Batteries
CONSTRUCTION DEBRIS#Above___ #Below___	Vehicle Batteries
Concrete (not placed)	Other (write-in)
Rebar	**BIODEGRADABLE** # Above___ # Below___
Bricks	Paper
Wood Debris	Cardboard
Other (write-in)	Food Waste
MISCELLANEOUS # Above___ # Below___	Yard Waste (incl. trees)
Synthetic Rubber	Leaf Litter Piles
Foam Rubber	Other (write-in)
Balloons	**GLASS** # Above___ # Below___
Ceramic pots/shards	Glass bottles
Hose Pieces	Glass pieces
Cigarette Butts	**FABRIC AND CLOTH** # Above___ # Below___
Golf Balls	Synthetic Fabric
Tennis Balls	Natural Fabric (cotton, wool)
Other (write-in)	Other (write-in)
Total pieces Above: **Below:**	**Grand total:**
Tally all trash in above rows; make notes below as needed to facilitate scoring.	
Littered:	
Dumped:	
Downstream Accumulation:	

SPECIFIC DESCRIPTION OF ITEMS FOUND:_____

_____

ATTACHMENT B

URBAN RAPID TRASH ASSESSMENT – PROTOCOL SUMMARY
Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)

Note: All field teams should read the Urban Rapid Trash Assessment Protocol before conducting trash assessments. This summary should be used as a tool in the field. It provides the key points from the protocol that should be considered in the field before starting conducting a survey.

Site Definition:

- Establish or confirm 100-foot sampling reach and identify the downstream starting point, (Lower Reach Boundary), and the upstream ending point, (Upper Reach Boundary).
- Confer and document the upper bank boundary of the survey area, taking the entire 100-foot reach into account. The boundary should include the area where trash can be carried to the waterbody by wind or water.
- Confer and document the high water line. Trash below this line should be expected to move into the streambed or downstream during next winter season (use bankfull height if unsure).
- Detailed site definition will facilitate data comparison from the same sampling reach over time.

Conducting a Trash Survey:

- Select a score from within the condition categories for the first Trash Assessment Parameter, Level of Trash. Do this before picking up any trash so that the score represents a true first impression (see Trash Assessment Parameter #1).
- Remove all trash from the 100-foot Reach (note items that physically cannot be removed so that trash accumulation rate analyses can be performed accurately).
- Wear protective clothing including waders and gloves. Use tongs or grabbers to help pick up trash items.
- Divide tasks between team members, designating one person to tally the trash items.
- During the survey all team members should make mental and written notes about apparent trash item sources (Did an item originate from upstream sources? Was it littered or dumped?). The person recording should use the space provided under the trash item categories on the Trash Item Tally Worksheet to record rough tallies of trash item sources.
- Trash collectors should call out trash items based on the items listed under the trash categories in the Trash Tally Worksheet. Specify whether a trash item was collected from above or below the high water line.
- Tally dots or circles (•) for above high water line, tally lines (|) for below.
- Look for trash under bushes, logs, and other plant growth for accumulated trash. Inspect ground and substrate for items such as cigarette butts, pieces of broken glass or Styrofoam.
- For items broken into many pieces: paper and broken glass should be counted based on the parent item(s). Broken glass pieces that are scattered, with no recognizable original shape, should be counted individually.
- For each trash item, count tallies and record totals in the margins of the Trash Tally Worksheet. Record separate totals for items collected above and below the high water

mark. Record above and below totals for trash categories in the spaces provided on the Trash Tally Worksheet.

- Team members should discuss and agree on a condition category score for each Trash Assessment Parameter based on results from the Trash Tally Worksheet and on impressions about trash sources and adjacent and upstream land uses.
- Read narrative descriptions to help guide condition category score selection.

Trash Assessment Parameters:

1. **Level of Trash.** Reflects qualitative "first impression" of the site after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the waterbody and where trash is evident in very large amounts. Sites that score in the "optimal" range appear to have little or no trash.

2. **Actual Number of Trash Items Found.** Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Note that trash located in the water leads to lower scores than trash above the high water line. Where more than 500 items have been tallied, assign the following scores: 5: 501-600 items; 4: 601-700 items; 3: 701-800 items; 2: 801-900 items; 1: 901-1000 items; 0: over 1000 items. Use similar guidelines to assign scores in other condition categories.

3. **Transportable, Persistent, Buoyant Trash.** As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. **Biohazards, Toxic Items, Sharp Objects and Site Accessibility/Use.** This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment. Medical waste, diapers, and human or pet waste could potentially adversely affect water quality. Site accessibility and site use is considered in the scoring of this trash assessment parameter. Sites with very difficult or restricted human access and no evidence of recreational use will receive higher scores due to reduced risk of human exposure at the site.

5. **Illegal Dumping and Littering.** This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. **Accumulation of Trash.** Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

FY 03-04 Draft Work Plan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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Certification

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____

Submitted on behalf of the
Santa Clara Valley Urban Runoff Pollution Prevention Program
March 1, 2003

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

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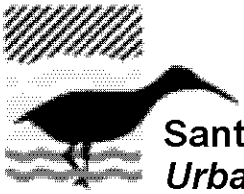

Santa Clara Valley
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Hand Delivered on February 28, 2003

February 28, 2003

Ms. Loretta K. Barsamian
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Ms. Barsamian,

I am pleased to submit a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2003-2004. This Work Plan, which consists of Volumes I and II fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order:

- Provides the Program's Trash Work Plan, which identifies a strategy for addressing trash problem areas that occur in urban streams and waterways;
- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement the Watershed Education and Outreach Campaign and other local PI/P activities (Provision C.4.)
- Contains the Program's FY 03-04 Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 03-04 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Provides the Program's Dioxin-like Compounds Actions Plan (Provision C.9.e.iii), which begins to identify control measures and/or management practices to eliminate or reduce discharges of dioxin-like compounds conveyed by urban runoff conveyance systems;

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- Contains the Program's Pesticide Management Work Plan tasks for FY 03-04 (Provision C.9.d);
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 02-03 activities and actions, in order to plan FY 03-04 activities.

Most importantly, this Work Plan demonstrates the Program's dedication to the process of continuous review and improvement, which includes seeking new opportunities to control storm water pollution to the "maximum extent practicable". Thus, the Work Plan includes a discussion of continuous improvement tasks that were identified through the individual Co-permittee performance reviews and the joint working relationships between the Program and the Santa Clara Basin Watershed Management Initiative (SCBWMI) and other groups.

The Management Committee is extremely concerned about the availability of resources to conduct all FY 03-04 tasks because of the uncertain State budget condition and repercussions on the local agency budgets. As the resource issue becomes clearer, the Management Committee may have to revisit the priorities and resources assigned to the collaborative tasks.

We look forward to working with you and your staff to implement the actions contained in the attached plans.

Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: Trish Mulvey, CLEAN South Bay
Waterkeepers
Beau Goldie (SCVWD), SCVURPPP Management Committee Chair
SCVURPPP Management Committee Members
Robert Falk, Morrison & Foerster

Attachments: FY 2003-2004 Draft Work Plan (including Co-permittee Work Plans) - three (3) hard copies

FY 2003-2004 Draft Work Plan (excluding the Co-permittee Work Plans) - three (3) compact disks

INTRODUCTION

This document comprises a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2003-2004. This Work Plan fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order:

- Provides the Program's Trash Work Plan, which identifies a strategy for addressing trash problem areas that occur in urban streams and waterways;
- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement the Watershed Education and Outreach Campaign and other local PI/P activities (Provision C.4.)
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- Provides the Program's Dioxin-like Compounds Actions Plan (Provision C.9.e.iii), which begins to identify control measures and/or management practices to eliminate or reduce discharges of dioxin-like compounds conveyed by urban runoff conveyance systems;
- Contains the Program's Pesticide Management Work Plan tasks for FY 03-04 (Provision C.9.d);
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

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Most importantly, this Work Plan demonstrates the Program's dedication to the process of continuous review and improvement, which includes seeking new opportunities to control storm water pollution to the "maximum extent practicable". Thus, the Work Plan includes a discussion of continuous improvement tasks that were identified through the individual Co-permittee performance reviews and the joint working relationships between the Program and the Santa Clara Basin Watershed Management Initiative (SCBWMI) and other groups.

The Work Plan is comprised of ten sections, as follows:

1. **Program Continuous Improvement Tasks:** Section 1 provides continuous improvement tasks identified during FY 02-03 and a schedule for their completion.

2. **Performance Standard Revisions:** Section 2 describes the Program's recent revisions to the Rural Public Works Maintenance and Support and New Development-Planning Procedures Performance Standards; steps initiated regarding the development of guidance for implementing the Program' s Mercury Pollution Prevention Plan; and a schedule for additional revisions or development of new performance standards in accordance with the NPDES permit.

3. **Public Involvement and Participation:** The Program's PI/P Work Plan (Section 3) includes a list and description of projects planned for FY 03-04 and the process used to select them. A Pollutant Matrix is included which illustrates how on-going and planned PI/P efforts are directly linked to pollutants of concern.

4. **Monitoring Program:** The Program's FY 03-04 Annual Monitoring Plan is presented in Section 4. The monitoring strategy describes how monitoring projects are linked to Program goals, SCBWMI goals and permit requirements. The section identifies those on-going projects that are related to permit requirements along with a description and tentative schedule for FY 03-04 projects. The Monitoring Plan includes watershed management measures.

5. **Pesticide Management Work Plan:** Section 5 contains a status report on the Program's pesticide management tasks, as identified in the Program's Pesticide Management Plan (2/15/02), and planned tasks for FY 03-04.

6. **Mercury Pollution Prevention Work Plan:** Section 6 contains the Program's mercury pollution prevention tasks for FY 03-04, as identified in the Program's Mercury Pollution Prevention Work Plan (3/1/02). The status of Mercury Pollution Prevention Plan tasks is also provided.

7. **New and Redevelopment Work Plan:** Section 7 describes the Program's progress in assisting Co-permittees in preparing to implement the requirements for new and redevelopment control measures (Provision C.3.) and the Program tasks planned for FY 03-04, as identified in the Program's C.3. Work Plan (3/1/02).

8. **FY 03-04 Program Budget:** The Program's Final FY 03-04 Budget Report, as approved by the Program's Management Committee, is included in Section 8. The Management Committee is extremely concerned about the availability of resources to conduct all FY 03-04 tasks because of the uncertain State budget condition and repercussions on the local agency budgets. As the resource issue becomes clearer, the Management Committee may have to revisit the priorities and resources assigned to the collaborative tasks.

9. **Co-permittee Performance Reviews:** Performance reviews during FY 02-03 focused on the effectiveness of existing New Development Control Programs (to determine how individual Co-permittees are preparing to implement Permit Provision C.3 requirements); and the implementation of the revised Construction Inspection Performance Standard. A summary of the review meetings and continuous improvement items identified in the meetings is contained in Section 9.

10. **Co-permittee Work Plan Summary Tables:** Section 10 contains the individual Co-permittee Work Plans for FY 03-04 developed consistent with the FY 00-01 Work Plan format approved by Regional Board staff.

SECTION 1

PROGRAM CONTINUOUS IMPROVEMENT TASKS

1. PROGRAM CONTINUOUS IMPROVEMENT WORK PLAN

INTRODUCTION

The 1997 URMP commits the Program and Co-permittees to a process of continuous improvement. The concept of continuous improvement acknowledges that the definition of "maximum extent practicable" evolves over time. Through continuous improvement, the Program will continue to develop and implement reasonable control measures to help advance the goal of achieving water quality objectives in South San Francisco Bay.

The continuous improvement process is described on pages 31-35 of the Program URMP. As shown in Figure 3 (page 35 of the URMP), areas for continuous improvement are identified through the Program and Co-permittees' participation in the Santa Clara Basin Watershed Management Initiative (SCBWMI) and the Program and Co-permittees' annual evaluations and annual reports.

Regional Board staff and representatives of interested parties (including CLEAN South Bay) review the Program and Co-permittee annual reports and work plans, and participate in Co-permittee performance review meetings (see Section 9). Comments from these reviews and meetings help to identify specific continuous improvement (CI) tasks. The Program's FY 03-04 Budget (Section 8) includes a line item allocating funds to perform CI tasks.

FY 03-04 CONTINUOUS IMPROVEMENT WORK PLAN

FY 03-04 Program Continuous Improvement Items

Table 1-1 includes a list of Program CI tasks for FY 03-04 and an approach and schedule for their implementation by Program staff. These tasks were identified in the FY 02-03 performance review meetings conducted in November and December 2002. Identified CI items involve suggestions on improving the implementation of New and Redevelopment Controls (Provision C.3.). No specific comments from Regional Board staff have been received on the FY 01-02 Annual Report, so no additional CI tasks have been identified from this source. Regional Board staff comments on the *FY 02-03 Work Plan* were addressed in the document entitled *Response to Regional Board Staff Comments- 06/19/02- FY 2002-2003 Work Plan* (submitted to the Regional Board on September 13, 2002). Table 1-2 within Attachment 1-1 provides an update on the status of ongoing continuous improvement tasks identified in previous fiscal years.

Program Data Management Improvements

Various projects are underway to improve the management of Program data and to enhance Co-permittee and public access to Program data. These projects include:

1. Using a Microsoft® Access Database to house enhanced reporting of IND and ICID data. Co-permittees have been requested to submit raw IND and IC/ID data on a quarterly basis. By February 2003, most Co-permittees had submitted raw data for the first half of FY 02-03. Raw data was reviewed and preliminary summary reports were created showing required data categories. This process has enhanced data quality;

2. Improving the mechanism used to track Program staff attendance at meetings. A revised written procedure has been implemented requiring Program Staff to provide pertinent meeting information on a monthly basis;
3. Creating a Microsoft® Access Database to house pertinent meeting information. Queries may be conducted to obtain meeting information.
4. Maintaining the Program's files of electronic data and links to other data sources used by the Program. Maintenance tasks completed include data transfers, conversions, backups, storage and organization.
5. Updating the Program's work product inventory (Table 4-2) on a routine basis. Relevant Work Product information is housed with a Microsoft® Access Database. Queries may be conducted to obtain work product inventory information. Reports are available detailing the Program's Work Products;
6. Continually updating and improving the entire structure and content of the Program's web site.

Trash Assessment Planning Activities

The Program is well underway with activities which begin identifying a strategy for municipalities and agencies (within the Program's jurisdiction) to address trash problem areas that occur in urban streams and waterways. A Trash Work Plan was developed and submitted (within Section 4 of the FY 03-04 Work Plan) to fulfill a Program FY 01-02 CI item and actions identified within the Program's Multi-Year Receiving Waters Monitoring Plan. The results and implementation efforts over the next two years will be documented and provided within the Program's and Co-permittee's Annual Reports.

Table 1-1
FY 03-04 Program Continuous Improvement (CI) Tasks

Tasks	Updated Schedule	Status	Evaluation of Effectiveness
FY 03-04 CI Tasks – New Development and Redevelopment			
1. Develop written tools to be used to train staff on Provision C.3 requirements (in case of staff turnover)	December 2003	**In Progress** – Program staff are working on C.3. guidance for the Co-permittees. Upon completion, staff will obtain feedback from the C3PO AHTG and the MC as to whether additional training products are needed.	Cannot be evaluated at this stage.
2. Hold future training workshops on multiple days to increase the chances staff will be able to attend.	June 2003 and ongoing consideration	**In Progress** – Program staff were requested by the C3PO AHTG to hold the Spring 2003 New Development Workshop on two consecutive days, to accommodate municipal staff schedules as well as to allow engineers and consultants to attend.	Cannot be evaluated at this stage. Evaluation forms will be used to get feedback from participants at the workshops.
3. Develop brochures/handouts to provide to developers containing information on Provision C.3 with reference to resources containing ideas.	December 2003	**In Progress** – Program staff distributed the Regional Board's C.3. fact sheet to the Co-permittees for their use. Additional fact sheets will be developed in FY 03-04 based on direction from the C3PO AHTG.	Cannot be evaluated at this stage.
4. Develop design guidance containing stormwater control opportunities for small road modifications.	June 2003	**In Progress** – This will be included in the Program's C.3. guidance.	Cannot be evaluated at this stage.
5. Follow-up on pesticide reduction guidance to ensure effectiveness. Research conflicts between water conservation and pest resistance/pesticide reduction.	June 2004	**To Be Done** – An evaluation of the effectiveness of the Program's pesticide reduction guidance will be performed as part of the FY 02-03 and FY 03-04 Annual Reports.	Cannot be evaluated at this stage.

Attachment 1-1

Attachment 1-1

ON-GOING CONTINUOUS IMPROVEMENT ITEMS

Table 1-2 provides an update on the status of ongoing continuous improvement tasks identified in previous fiscal years. Items that were noted as completed or on-going in Table 2-6 of the FY 01-02 Annual Report have been removed from the list, and any schedule changes are noted on the table. Work will continue on these remaining improvement tasks and the results reported in the FY 02-03 Annual Report.

The Program's focus during FY 02-03 was on implementing new requirements of its NPDES permit and less on continuous improvement of existing Program elements. For clarification, no new continuous improvement items were identified for FY 02-03 (see Section 1 of *FY 02-03 Work Plan*).

Table 1-2
Status of Ongoing
Program Continuous Improvement (CI) Tasks

Task	Updated Schedule[1]	Status	Evaluation of Effectiveness
Remaining FY 99-00 CI Tasks – Program Management			
6. Send letter to contractors who received Construction General Permit Binder, explaining that the binder is being revised and contractors should reference the Regional Board's Erosion Control Field Manual. (Priority- Medium)	December 2003	**In Progress** –In the near term, the Program will focus on outreach to developers regarding Provision C.3., but this will be followed by completing the guidance to contractors. The Program will send letters to contractors in its database, plus any additional names provided by the Co-permittees, about availability of completed Program guidance materials.	Cannot be evaluated at this stage. Will obtain feedback from contractors as to the usefulness of the binder through an evaluation form or survey following distribution of the binder.
9. Consider developing, with the help of an ad hoc task group, a fact sheet addressing common construction BMP problems, like drain inlet protection and dewatering. (Priority – Medium)	June 2003	**In Progress** – Management Committee approved having the Program adapt an existing brochure on dewatering (created by Palo Alto, Mountain View and San Jose) for the other Co-permittees' use. Program staff are in the process of arranging for the adaptation and printing.	Cannot be evaluated at this stage.
11. Investigate the issue of maintenance and durability of porous paving materials. (Priority – Medium)	June 2003	**Update** -- Program staff will collect information on experience with these materials, including effectiveness of Co-permittee "pilot projects". This information will be made available to the Co-permittees as part of the guidance developed by the Program to meet the C.3. provisions for new and redevelopment controls.	Cannot be evaluated at this stage.
12. Work with Regional Board staff to provide guidance on: 1) approaches to plan review; and 2) requirements and acceptable alternatives for post-construction controls. (Priority – High)	June 2003	**Update** – Program staff will present guidance on plan review and information on post-construction controls as part of the guidance developed to meet the C.3. provisions.	Cannot be evaluated at this stage. Was discussed during performance reviews this fall (see FY 03-04 CI tasks)..

[1] See *FY 01-02 Annual Report for* previous version.

Table 1-2
Status of Ongoing
Program Continuous Improvement (CI) Tasks

Task	Updated Schedule[1]	Status	Evaluation of Effectiveness
15. Look into providing storm water training to building officials through the Peninsula Chapter of Building Officials monthly training sessions. (Priority –Low)	June 2004	**Update** – This item is low priority, and has been delayed due to Program staff's focus on higher priority items. It is now more appropriate to provide training following completion of the C.3. guidance.	Cannot be evaluated at this stage.
Remaining FY 99-00 CI Tasks – PI/P			
Independent Pool and Spa Service Association Presentations – investigate alternatives to the filter backwash BMP in the Program's pool brochure, and consider developing a bill insert for educating pool owners.	June 2003	**In Progress** – This item will be completed as part of the Pool Pump Magnet Project, which is now focused on reprinting the brochure instead of developing a magnet. Language in the brochure was changed to address the filter backwash BMP. The distribution plan has not yet been developed.	Cannot be evaluated at this stage. Will obtain feedback from pool service contractors and pool owners following distribution of the brochure.
Remaining FY 00-01 CI Tasks – Program Management			
2. Work with Co-permittees to finalize the draft Section 6.7.2, "Comparison of Development Policies" of the SCBWMI Watershed Characteristics Report (WCR) and provide guidance for strengthening local land use policies. (Priority – High)	January 2003	**Completed** – The Development Policies Comparison Project, which consisted of reviews of Co-permittee policies, codes, and ordinances and comparison to a checklist of desirable element for watershed protection (and compliance with C.3.), was completed in January 2003. The draft sections were distributed to individual Co-permittees for review, and their comments incorporated. It is now being reviewed by the WMI LUS.	**Effective** – Responses from Co-permittees involved in review meetings have indicated that this review process has been useful in helping them identify changes that need to be made in local policies, codes, and ordinances to meet the Provision C.3. requirements.

Table 1-2
Status of Ongoing
Program Continuous Improvement (CI) Tasks

Task	Updated Schedule[1]	Status	Evaluation of Effectiveness
3. Provide guidance to Co-permittees on requirements for temporary non-stormwater discharges to storm drains.	pending	**Update** – Co-permittees have requested assistance from the RWQCB staff with determining under what conditions temporary non-stormwater discharges are allowed to flow to storm drains. To date, RWQCB have only provided guidance in individual letters to contractors.	Cannot be evaluated at this stage. Waiting for direction from RWQCB staff.
6. Conduct a workshop for municipal staff based on the municipal training protocols being developed by an ad hoc task group. (Priority – Medium)	June 2004	**In Progress**- – Four municipal training protocols have been developed. One additional protocol on Mercury Pollution Prevention to be developed. Upon completion and approval of funding Co-permittees, planning will begin for the workshop. The workshop will be held during FY 03-04. (The workshop is a lower priority than those for needed for new development topics.)	Cannot be evaluated at this stage.
Remaining FY 01-02 CI Tasks – Program Management			
3. Develop formal mechanism with RWQCB to distribute NOI lists. (Priority - Low)	Ongoing	**Ongoing** – Program staff are downloading and converting the databases into useful spreadsheets with NOI information. The spreadsheets are posted on the SCVURPPP website (www.scvurppp.org) for Co-permittee review and use. The NOI lists are updated on a quarterly basis.	**Effective** – This has been a useful service to the Co-permittees.
4. At the completion of the performance review meetings, compile list of continuous improvement items that relate to restaurant inspections and meet with County Department of Environmental Health staff to discuss. (Priority – Medium)	December 2003	**In Progress** – Program staff plan to conduct a meeting with County DEH, restaurant inspectors and Co-permittee staff to reinforce inspection expectations, improve communication and coordination, and discuss their use of Program outreach materials.	Cannot be evaluated at this stage.

Table 1-2
Status of Ongoing
Program Continuous Improvement (CI) Tasks

Task	Updated Schedule[1]	Status	Evaluation of Effectiveness
5. Provide guidance to co-permittees on recommended education approach and BMPs for targeted industries identified in IND-2 final report. Determine whether additional steps should be taken per the Copper Action Plan. (Priority – Medium)	December 2003	**Update** – City of San Jose staff have the lead. Program staff will work with City of San Jose staff to prepare guidance as part of follow-up to the IND-2 outreach project (SC25.12). Due to significant City of San Jose (CSJ) staff changes over the past year, the project has been delayed. New CSJ staff has been assigned and the work rescheduled (see CSJ Work Plan).	Cannot be evaluated at this stage.
6. Conduct follow-up to Mobile Polluter Database Feasibility Study. (Priority - Low)	December 2003	**Update** -- Program staff will address this as part of ICID data management and continuous improvement tasks.	Cannot be evaluated at this stage.
9. Explore mechanisms to provide outreach and BMP information to concrete workers and saw cutters in Santa Clara County (private and municipal). [Added per RWQCB comments on FY 99-00 Annual Report, 3/27/01]	March 2003	**Completed** – The Program worked with the BASMAA New Development Committee to implement the Regional Construction Education Program III, which is focused on outreach to subcontractors, specifically concrete workers, saw cutters and painters. Products developed include: construction BMP plan sheet, water quality protection language for municipal contracts, illicit discharge prevention cards, and a brochure on proper saw cutting techniques. A mailing of the information to the problem subcontractors was completed. The final products have been received on CD and will be distributed to the Co-permittees.	Cannot be evaluated at this stage.

Table 1-2
Status of Ongoing
Program Continuous Improvement (CI) Tasks

Task	Updated Schedule[1]	Status	Evaluation of Effectiveness
Remaining FY 01-02 CI Tasks – PI/P			
2. Review and update the review process established for the Watershed Education and Outreach Campaign.	March 2002; Next update: June 2003	**Completed** in FY 01-02. However, the table listing review required for each product needs to be updated as part of development of each year's work plan.	**Effective** – The established process has been useful for guiding the levels of review needed for campaign products. **Needs Improvement** – as described under "Status".
3. Support Co-permittees efforts to document and assess the reach of existing schools outreach programs.	September 2003; Ongoing	**Completed/Ongoing** – Regional Board staff requested Co-permittees to document existing outreach to schools on watershed awareness and pollution prevention, which schools were receiving the outreach, and which schools were missed, and include it in their annual reports. Tables with information on Co-permittee efforts are provided in Section 9 of the Program's FY 01-02 Annual Report. A work group is currently working with the City of San Jose to develop GIS map layers to show the distribution of existing outreach.	Cannot be evaluated at this stage.

Table 1-2
Status of Ongoing
Program Continuous Improvement (CI) Tasks

Task	Updated Schedule[1]	Status	Evaluation of Effectiveness
Remaining FY 01-02 CI Tasks – Data Management			
7. Follow up on monitoring project results and recommendations.	Ongoing (New projects incorporated as part of Annual Work Plans);	**Ongoing** –Results and recommendations from Program monitoring projects are incorporated into the continuous improvement items list, where progress made can be tracked. Table 4-1 (contained in each Annual Report) is used to update and track monitoring projects. Table 4-2 is used to track all projects, including monitoring projects and products. All major reports and work products are on the SCVURPPP website.	**Effective** – This process has been effective for tracking the progress and completion of monitoring projects. **Needs Improvement** – A process (e.g., a table containing a summary of recommendations from completed projects) is needed to prioritize follow-up monitoring projects.
Remaining FY 01-02 CI Tasks – Trash			
1. Conduct trash assessment planning activities.	Ongoing	**Completed**– Trash Work Plan was submitted in FY 03-04 Work Plan (as an attachment in Section 4) **Ongoing**- Program staff will complete relevant Trash Work Plan tasks; continue to plan and organize Trash AHTG meetings to facilitate review and approval of Program work products; and attend one to two "Pick-Up San Jose" Technical Advisory Committee meetings each year.	**Effective** – The Trash Work Plan provides the Program's strategy for investigating the extent of the trash problem and possible solutions (prior to permit requirements being established for trash management).

SECTION 10

CO-PERMITTEE FY 03-04 WORK PLANS

Electronic Copies Not Available

SECTION 2

PERFORMANCE STANDARD REVISIONS

2. PERFORMANCE STANDARD REVISIONS

Background

The Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) developed model Performance Standards (PSs) in 1996. The model PSs were accepted by the Regional Board in June 1997. Each Co-permittee adopted the model PSs or tailored them to their local community characteristics and conditions. The PSs were incorporated into the Program's September 1, 1997 *Urban Runoff Management Plan* (URMP) and the Co-permittees' local URMPs which is currently part of the NPDES permit (Provision C.2).

The URMP also contains the Program's commitment to a process of continuous improvement. One component of this process is to review an existing PS, or create a new PS, each year. Decisions as to which PS will be created or revised in a given year are made based on requirements in the Program's NPDES permit, comments by Regional Board staff on Annual Reports, and/or continuous improvement items identified as part of annual performance reviews.

Revisions to Rural Public Works Performance Standards

In fulfillment of Permit Provision C.5, the Program's Management Committee approved, and submitted to the Regional Board on June 21, 2002, the Performance Standard for Rural Public Works Maintenance and Support. The Performance Standard was accompanied by a transmittal letter discussing its background and the Program's responses to Regional Board staff comments during the development process. Regional Board staff provided comments on the Performance Standard, in a letter dated September 26, 2002. The letter required the Performance Standard and associated documents to be revised in response to the Regional Board comments by December 20, 2002.

On November 25, 2002, the Rural Public Works Performance Standard Ad Hoc Task Group (AHTG) met with Regional Board staff to review the Regional Board comments and discuss revisions to the Performance Standard. Based on discussions at that meeting, a revised Performance Standard was sent to the AHTG for final review and approval. The revised Performance Standard was approved by the AHTG and sent to the Management Committee for approval at their December 19, 2002 meeting. On December 20, 2002, the approved Performance Standard was submitted to the Regional Board, accompanied by a transmittal letter and table listing the Program's responses to the Regional Board's letter *Comments on the Rural Public Works Performance Standard* dated September 26, 2002. Comments received from the Santa Clara Valley Transportation Agency, Santa Clara County Vector Control District, Santa Clara County Open Space Authority and Mid-Peninsula Open Space District was also incorporated in the second revision of the Performance Standard. The Program is currently awaiting further response from Regional Board staff.

The second revision of the Rural Public Works Maintenance and Support Performance Standard is provided in Attachment 2-1. A summary of major changes is presented below:

- The word "paved" was deleted from the entire BMP section;
- The phrase "erosion control" was replaced throughout the Performance Standard and BMP section with "erosion prevention and sediment control"; and

- Comments and/or suggested language received from the Regional Board letter *Comments on the Rural Public Works Performance Standard* dated September 26, 2002 were copied verbatim (in most instances) to the revised Performance Standard.

Mercury Pollution Prevention: Guidelines for Reduction and Management of Mercury-Containing Products

To address Provision C.9.c. of the Program's NPDES permit, the Mercury Pollution Prevention Plan (Mercury Plan) was submitted to the Regional Board on March 1, 2002, as part of the Program's FY 02-03 Work Plan. Permit Provision C.9.c. requires the implementation of a Mercury Plan which includes:

- The development and adoption of policies, procedures, and/or ordinances requiring the virtual elimination of mercury from controllable sources in urban runoff, including the identification of mercury-containing products used by the Dischargers and a schedule for their timely phase out.

A performance standard for Mercury Pollution Prevention is not specifically required in Permit Provision C.9.c. However, to move in the direction of establishing clear procedures for improved management and reduction of mercury-containing products used by Co-permittees, the Program is developing guidance for Co-permittees to implement the Mercury Plan.

In December 2002, the Mercury Pollution Prevention Plan Ad Hoc Task Group (Mercury P2 Plan AHTG) and Program staff began developing guidelines for the reduction and management of mercury-containing products identified for virtual elimination. A final draft of the guidelines will be submitted to the Management Committee in March 2003. The goal of the guidelines is to work towards the virtual elimination of mercury from controllable sources in urban runoff; and to establish proper recycling and disposal methods for products that cannot be eliminated due to technological or economic factors. Co-permittees will begin implementation in FY 03-04. Any additional tasks identified by Co-permittees (or found within the guidelines) will be incorporated in future annual work plans. Co-permittees decided not to update their local URMPs (to incorporate the Mercury Plan or guidelines) since both are not performance standards.

New Development - Planning Procedures

As part of its C.3. Implementation Work Plan (March 1, 2002), the Program has revised the 1997 model *Planning Procedures Performance Standard* (PPPS) to be consistent with the requirements of Permit Provision C.3. Provision C.3.k. specifically requires that the Program submit a model enhanced performance standard for source control measures in new and redevelopment projects by March 1, 2003. It made sense to Program staff and the Program's C3PO AHTG to combine the source control measures requirements with the PPPS revisions; and include the *Draft Model List of Source Control Measures* (submitted to the Regional Board on September 15, 2002, per Provision C.3.k. and the C.3. Table 1) as an attachment to the PPPS. The draft revised PPPS went through several rounds of review (by the C3PO AHTG) and was approved by the AHTG on January 27, 2003. The Management Committee approved the revised PPPS on February 20, 2003 for submittal to the Regional Board. The final draft revised PPPS is provided in Attachment 2-2.

Enhanced Annual Reporting Requirements- Industrial/Commercial Discharger Control

In a letter dated June 5, 2002, Regional Board staff commented on the procedures described for the Program's enhanced reporting of the industrial/commercial (IND) inspections. This description was provided within Program's *Continuous Improvement of Industrial Reporting*

Technical Memorandum dated September 7, 2001. This technical memorandum was included as an attachment within the Program's *FY 00-01 Annual Report.* Regional Board staff determined that permit requirements to propose categories of businesses to inspect and frequencies for inspection had not been met. Although the Program's September 7, 2001 memorandum proposes categories, Regional Board staff did not believe Co-permittees were committed to these categories and requested that Co-permittees submit additional information on their inspection programs.

Program staff worked with individual Co-permittees to compile requested information and submitted a response to the Regional Board entitled *Response to Regional Board Staff Comments 6/5/02, Industrial and Commercial Facility Inspection Enhanced Reporting* on September 5, 2002. The Program is currently implementing IND reporting procedures consistent with the Program's *Continuous Improvement of Industrial Reporting Technical Memorandum* dated September 7, 2001. On February 24, 2003, Jan O'Hara, Regional Board staff contacted Program staff with verbal comments regarding the Program's IND Summary Reports provided within the FY 01-02 Annual Report Jan commented that the Program was not reporting the nature of follow-up relating to actual or threatened non-compliance and providing an evaluation of effectiveness of Co-permittee IND inspection programs. Program staff will work with the Co-permittees to better address these items as part of the FY 02-03 Annual Report. The Industrial Reporting Ad Hoc Task Group will draft a memorandum (for the Management Committee) recommending what changes are necessary to improve current IND reporting procedures. In accordance with information provided within the Program's *Continuous Improvement of Industrial Reporting Technical Memorandum* dated September 7, 2001, the Program's full implementation of IND reporting procedures is expected by September 15, 2003. Model language for updating the IND performance standards will be developed, reviewed and approved (by the Management Committee) during FY 03-04.

Enhanced Annual Reporting Requirements- Illicit Connection/Illegal Dumping Elimination

In a letter dated June 5, 2002, Regional Board staff commented on the procedures described for the Program's enhanced reporting of Illicit Connection/Illegal Dumping (IC/ID). This description was provided within the Program's *Continuous Improvement of Illicit Connection/Illegal Dumping Reporting Technical Memorandum* dated September 7, 2001. This technical memorandum was included as an attachment within the Program's *FY 00-01 Annual Report.* Regional Board staff determined the reporting procedures to be acceptable. Initial IC/ID summary tables for each Co-permittee were included within the Program's *FY 01-02 Annual Report* submitted to the Regional Board on Monday, September 16, 2002. Model language for updating the IC/ID performance standards will be developed, reviewed and approved (by the Management Committee) during FY 03-04.

Future Efforts- FY 03-04 Activities

Priorities for recent efforts to revise or create new performance standards have been driven by the requirements in the Program's reissued NPDES permit (Order No. 01-024). By the end of FY 02-03 (pending Regional Board staff review and approval), all new or revised PS required by the permit will be completed. Future efforts to revise or update existing PS will be identified through the process of continuous improvement (see Section 1).

The Water Utility Operation and Maintenance Performance Standard has been selected as the next performance standard to be revised during FY 03-04. This PS has not been critically reviewed since 1997. Issues which include changes in methods of disinfection of potable water supplies and the appropriate BMPs for discharges of these waters to storm drains will be

addressed. A work group with significant participation from SCVWD and other Co-permittees with water utilities will be formed for this purpose.

Program staff is developing a municipal employee training curriculum with modules to address various municipal activities that have potential impacts to stormwater. The training curricula will provide education on stormwater pollution, technical training on the use of BMPs and examples of practical BMP application. Generic modules have been developed that can be customized for each agency. In addition, a "Train the Trainer" workshop will be held to introduce and explain the applicability of the training modules to designated trainers from each Co-permittee.

Training modules relating to BMPs for corporation yards, storm drain operation and maintenance, streets, roads and highway maintenance and pest management have been developed by Program staff. Currently, a Co-permittee work group is reviewing them. A fifth training module relating to mercury pollution prevention will be developed during FY 02-03. Once the work group approves the modules, the workshop will schedule and held in FY 03-04.

A list of performance standard-related tasks and a schedule for completion is provided below:

Performance Standard	Action	Due Date
Industrial Commercial Discharger Control Program – Enhanced Annual Reporting Requirements	Revise existing PS	Draft December 1, 2003[1, 2] Final March 1, 2004
Illicit Connection/Illegal Dumping Elimination -- Enhanced Annual Reporting Requirements	Revise existing PS	Draft December 1, 2003[1] Final March 1, 2004
Mercury Pollution Prevention Activities	Develop Guidance[3]	Final March 2003
New Development - Planning Procedures	Revise existing PS	Draft November 26, 2002 Final March 1, 2003
Water Utility Operation and Maintenance	Revise existing PS	Draft March 2004 Final June 2004

[1] The Enhanced Annual Reporting Requirements for IND and ICID were submitted to the Regional Board on September 15, 2001 as required by Permit Provisions C.6.a.i. and C.6.a.ii., and are being implemented by the Program and Co-permittees. This task will revise the existing IND and ICID PS to reflect these enhanced reporting requirements.
[2] Schedule depends on timely receipt of Regional Board staff comments.
[3] A performance standard for Mercury Pollution Prevention Activities is not required in the NDPES Permit Provision C.9.c. The Program has developed draft guidance (December 20, 2002) for the Mercury Pollution Prevention Program to assist Co-permittees in incorporating the Mercury Pollution Prevention Work Plan tasks into their local URMPs.

Attachment 2-1

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for

Rural Public Works Maintenance and Support Activities

(December 19, 2002[1])

I. Introduction

The goal of the Rural Public Works Performance Standard is to minimize the water quality impacts resulting from public works maintenance and support activities in rural areas. This performance standard is intended to aid Co-permittees in ensuring that required control measures are implemented while performing maintenance activities adjacent to streams to prevent the degradation of stream functions. Santa Clara County contains habitat for the threatened Central California Coast Steelhead. Maintenance Activities in watersheds that support steelhead habitat are subject to Limit No. 10, Routine Road Maintenance, of the Endangered Species Act (ESA) Section 4(d) Rules to Protect Threatened Salmon and Steelhead, signed on June 20, 2000. This limit finds routine road maintenance activities must "not impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward [a properly functioning condition] (PFC)"[2][3] This Performance Standard is consistent with the goal of Limit No. 10.

The Rural Public Works Performance Standard defines the level of implementation that each Co-permittee in the Santa Clara Valley Urban Runoff Pollution Prevention Program will attain to demonstrate that water quality is protected to the maximum extent practicable.

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[1] Approved by the SCVURPPP Management Committee at its December 19, 2002 meeting.

[2] *A Citizen's Guide to the 4(d) Rule for Threatened Salmon Steelhead on the West Coast*, National Marine Fisheries Service Northwest and Southwest Regions, June 20, 2000.

[3] NMFS is not requiring states, local governments or private parties to change their practices to conform to any of the take limits described in the final rule. The limits provide one way to be sure an activity or program does not risk violating the take prohibitions. Simply because a program is not within a limit does not mean that it automatically violates the ESA or the 4(d) rule. However, it does mean that any program or jurisdiction would risk ESA penalties if the activity in question takes a listed fish. By receiving a limit, governments and individuals receive assurance that their activities do not violate the take prohibitions and will not be subject to enforcement. (NMFS, June 20, 2000).

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PERFORMANCE STANDARD

1) The Co-permittee will implement and require contractors to implement appropriate best management practices (BMPs) when performing maintenance activities in or adjacent to a stream channel unless required to do otherwise by emergency flood control procedures. During emergency flood control activities, water quality will be protected to the maximum extent practicable

2) The Co-permittee will plan for proper erosion prevention and sediment control measures in designing rural roads.

3) During construction, the Co-permittee will inspect the construction site, and maintain construction erosion prevention and sediment control BMPs to ensure that they are working properly and that problems are corrected as soon as they develop.

4) Maintenance staff will properly store, use, and dispose of materials, chemicals and wastes during and after the performance of activities. Mechanical equipment will be stored and operated properly as well.

5) Co-permittees will provide annual training and technical assistance to maintenance staff in the use of appropriate BMPs.

6) Co-permittees will obtain the correct permits for maintenance activities taking place in or adjacent to stream channels. The "correct permits" are defined on page 14 herein.

7) The Co-permittee will provide outreach materials to contractors, developers, and staff on Rural Public Works Maintenance and Support Activities BMPs and permitting requirements.

8) The Co-permittee will evaluate and report on the implementation of the rural public works performance standards as part of the individual Co-permittee annual reports. Annual reporting and inspections are not required under the following special cases: levees that are inspected frequently under another program (i.e. SCVWD levees inspected for flood protection and control) and levees where captured runoff would be under another NPDES permit (i.e. City of Sunnyvale treatment pond levees).

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DEFINITIONS

Berm — An elevated area constructed of asphalt materials, base rock, soils, sandbags or other materials to divert runoff. Typically located along roadway shoulders.

Brush — Vegetative material smaller in length/diameter than large woody debris. May consist of cuttings of native vegetation intended for use in slope stabilization BMPs such as brushlayering, brushpacking, willow wattles, etc.

Cut and Plug — The practice of cutting woody debris in streams that may become lodged in downstream obstructions into small pieces and/or short lengths. (culverts, log jams, etc.)

Emergency — An emergency consists of circumstances creating a substantial risk of loss, damage, interruption of essential services, or threat to public health or safety that could not have been reasonably foreseen. "Emergency" includes any man-made or natural event or circumstances causing or threatening loss of life, injury to person or property, including but not limited to fire, explosion, flood, severe weather, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, actual or imminent loss of transportation facilities, civil disturbance, riot, sabotage and war.

The distinction must be made as to when the emergency is over and cleanup begins. An emergency ends when threats of loss of life or injury are mitigated and pre-emergency service is restored. Examples of emergency operations include, but are not limited to, modification of large woody debris/log jams in streams, streambank/slope stabilization, flood response and emergency road opening measures.

Habitat — An area used by a species for migration, breeding, spawning, foraging, shelter, etc. May refer to generic types of habitat, such as riparian (near water bodies), upland (above riparian habitat), etc.

Diversion Potential Occurs at a stream crossing having one approach that slopes away from the stream bed so as to potentially divert flow reaching the road surface away from the channel.

Large Woody Debris Large pieces of woody material 6 inches and larger in diameter and at least 10 feet long. Also includes root wads and stumps. Typically refers to woody debris in water bodies.

Revegetation The placement, planting and/or fostering of growth of beneficial plant species.

Rural Road A public paved or unpaved road that is:

a) in an area having average lot sizes of 1 acre net or greater or zoned as open space under Co-permittee jurisdiction; and
b) not served by an integrated municipal storm drain system;
c) not served by curbs and gutters; and
d) intended to be passable to a maintenance vehicle.

This definition does not include hiking and equestrian trails, unless they are intended to be passable to a maintenance vehicle.

Sensitive Area Any area in which plant or animal life or their habitats are rare or especially valuable, including any area in the following categories:

1. habitats containing or supporting "rare and endangered" species as defined by the State Fish and Game Commission as well as "threatened and endangered" species and their associated critical habitat, as defined under the Federal Endangered Species Act;
2. perennial and intermittent streams and their tributaries that support aquatic habitat;
3. lakes, ponds and adjacent shore habitat;
4. wetlands, marshes and coastal tide lands;
5. coastal and offshore areas containing breeding or nesting sites or used by migratory and resident water –associated birds for resting areas and feeding;
6. areas used for scientific study and research concerning fish and wildlife;
7. existing game and wildlife refuges and reserves; and
8. sand dunes and sea cliffs.

Sidecast Material placed on or within the banks of any water body; the practice of placing material on or within the banks of any water body.

Slipout A shallow slope failure, typically involving the shoulder of a road or trail. May be caused by high groundwater, falling trees (windthrow), etc.

Washout A slope or bank failure, typically involving the shoulder of a road or trail. May be caused by high flows in streams, concentrated runoff, etc.

Watercourse Bank The slope of land that adjoins a watercourse, the top of which shall be the topographic line roughly parallel to the watercourse center line where the side slopes intersect the plane of the ground adjacent to that traversed by the watercourse. Where banks do not distinguishably end, the surrounding land being extensions of the banks, the top of such banks shall be determined by the Santa Clara Valley Water District Community Project Review Unit, Unit Manager.

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 1
WORK PLAN IMPLEMENTATION

This section describes the activities to be conducted by the co-permittee, and described in the co-permittee's local Urban Runoff Management Plan (URMP) to implement the performance standard, along with an implementation schedule.

Example Contents of the Work Plan

- Develop (or review and revise) standard operating procedures for rural public works activities.
- Develop or adapt BMPs and control measures.
- Ensure adequate legal authority, including chain of command, used to conduct and enforce the use of rural public works maintenance BMPs by others, if necessary, as documented by reference in Attachment 2.
- Obtain or develop educational materials for training maintenance staff and for outreach to contractors.
- Develop an annual training program for maintenance staff.
- Annually conduct an evaluation of the effectiveness of the rural public works program, report the results of the evaluation in the Annual Report, and identify items for continuous improvement.
- Identify the rural public works facilities that are under the agency's jurisdiction.

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
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Attachment 2
LEGAL AUTHORITY TO IMPLEMENT

This section contains a demonstration of the co-permittee's legal authority to implement the performance standard, or a time schedule for developing and obtaining additional authority.

The co-permittee should provide references to municipal codes or ordinances that demonstrate adequate legal authority to require contractors to conduct O&M activities in a manner that eliminates or reduces water quality impacts. These include:

- Storm water discharge ordinance.
- Other ordinance or section(s) of municipal code that apply to maintenance activities.
- Standard Operating Procedures (see Attachment 4)
- Standard contract language (see model language below).

Model Standard Contract Language[4]

Storm water runoff flows directly to creeks and San Francisco Bay without treatment. Allowing pollutants (including sediment) to directly or indirectly enter the storm drain system is prohibited by federal, state and local regulations. The operation and maintenance of public streets, roads, and highways can cause storm water pollution in numerous ways. For example, storm water pollution can be caused by wastes from street or equipment cleaning, by improper storage of products or wastes, or inadequate clean up of left-over or spilled products or wastes. These pollutants can either enter storm drains directly or be transported by storm water runoff.

The Contractor shall take all measures necessary to prevent pollutants (including sediment) from entering storm drains or watercourses. For the purpose of eliminating storm water pollution, the contractor shall implement effective Best Management Practices (BMPs). BMPs include general good housekeeping practices, appropriate scheduling of activities, operational practices, maintenance procedures and other measures to prevent the discharge of pollutants directly or indirectly to the storm drain system. These BMPs shall be maintained for the duration of the Contractor's work. The Contractor shall also be responsible for proper disposal of all waste materials, including wastes generated by the implementation of BMPs.

The following BMPs shall be implemented to prevent storm water pollution: (add appropriate BMPs from Section 3 here).

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[4] Based on language in *Modifications to the Standard Specifications for Public Works Construction*, 1994, City of Oakland, *Pollution Prevention Language for Construction Contractors,* 1995, City of Palo Alto, and *Supplemental General Provisions,* 1994, City of Sunnyvale.

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 3
WORK PLAN BMPS AND CONTROL MEASURES

This section contains the list of Model Best Management Practices to be used as guidance for compliance in the implementation of the performance standard. Each Co-permittee will adopt specific BMPs applicable to their agencies in order to implement the Performance Standards. For consistency, each co-permittee should maintain the entire list of Model BMPs. Co-permittees may agree to implement the Model BMPs or propose modifications or alternatives to those that apply as long as justification of why the modifications are effective in reducing pollutants in storm water to the maximum extent practicable and in eliminating illicit discharges is provided. If a group of BMPs does not apply, Co-permittees should provide an explanation as to why they are not applicable under their jurisdiction. This will be documented in the Co-permittees URMP.

Some of the BMPs in this document can also be found in the previously adopted Santa Clara Valley Urban Runoff Pollution Prevention Program's Model BMPs for Public Streets, Roads and Highway Operation and Maintenance. Those portions of Sections II. Street/Road/Highway Repair and Maintenance and V. Median and Road Embankment Maintenance, of the Public Streets, Roads, and Highways Operation and Maintenance Model BMPs that address the prevention of road-related erosion are restated in this document. In addition, the report entitled "Effects of County Land Use Policies and Management Practices on Anadromous Salmonids and their Habitats" prepared for the FishNet 4C Program was reviewed in development of the BMPs contained within, in order to include BMPs considered effective for protection of fish habitat. For further information and guidance on the implementation of the BMPs recommended, co-permittees should consult the references listed below.

References for Model BMPs

California Regional Water Quality Control Board San Francisco Bay Region, 1999. *Erosion and Sediment Control Field Manual, Third Edition.*

Camp Dresser and McKee, December 2000. *Alameda Countywide Clean Water Program Unpaved Road BMP Guide.*

Camp Dresser & McKee, et. al., 1993. *California Storm Water Best Management Practice Handbook (Municipal).* Prepared for the State Stormwater Quality Task Force.

County of San Mateo Department of Public Works, 2001. *Endangered Species and Watershed Protection Program, Volume 1: Maintenance Standards.*

Fifield, Jerald, 2002, *Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors*, Forester Press, publisher

Keith Guenther, Wildland Solutions, PO Box 710 Brewster, WA 98812. *Low Maintenance Roads for Ranch, Fire and Utilities Access Wildland Solutions Field Guide Series*

Harris, Richard R., Susan D. Kocher, and Kallie Marie Kull, Jaunuary 2001. *Effects of County Land Use Policies and Management Practices on Anadromous Salmonids and their Habitats: Sonoma, Marin, San Mateo, Santa Cruz and Monterey Counties, California.*

Santa Clara Valley Nonpoint Source Pollution Control Program, 1994. *Best Management Practices for the Construction Industry* (7 tri-fold brochures)

Weaver, William E. and Danny K Hagans, Pacific Watershed Associates, *Handbook for Forest and Ranch Roads: A guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads,* June 1994.

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 3, continued
MODEL BMPs

a) Management and/or Removal of Large Woody Debris and Live Vegetation from Stream Channels

1. Do not remove or physically alter any large woody debris in any body of water except under the following emergency conditions:

   A. Material backing up flows at a bridge or culvert during a storm may be modified to halt damage or flooding.

   B. Large woody debris/log jams on public property that are damaging or immediately threatening the integrity or roads, bridges, other public facilities or private developments during high flows may be modified to reduce or halt damage and direct flow toward a more desirable path.

   C. Logs and debris shall only be removed from streams as a "last resort" (i.e. failure to remove them will most likely cause the loss of an essential facility or in order to maintain channel capacity).

   D. Non-emergency debris maintenance will only be undertaken after the appropriate permits have been obtained.

2. Crews should take precautions when modifying log or debris jams in order to prevent damage downstream. "Cut and plug" practices should be avoided, when possible.
3. Emergency modifications and/or removal shall be limited to materials higher than approximately 2' above the streambed (i.e. above knee height) to preserve some instream habitat features unless the log or debris jam is immediately upstream of a culvert or bridge, or if permit conditions require otherwise. Secure root wads should be left in place, when possible.
4. Reusable large woody debris such as root balls and sizeable logs shall be transported, when logistically feasible to a storage facility. These materials can be used at a later date for erosion repair, mitigation projects or ground up to be used as ground cover. Trees, logs and/or stumps shall be left in the longest lengths/diameters practicable for removal and hauling. When uprooted trees must be cut, leave at least 8' of trunk attached to the root ball. All other logs should be left at least 12' long (to stockpile for future use).

b) Streambank Stabilization Projects

1. When areas adjacent to water bodies wash or slip out resulting in a reduction of the width of the traveled way, Co-permittees shall consider responding by:

   A. Temporary one-way traffic controls

   B. Temporary closure of the road if adequate alternate route(s) exist

   C. Rerouting road into cut slope (This is acceptable if the impacts to the slope and road are minimal, if the additional cut is within the existing right of way or if written approval can be obtained from the owner of the property impacted by the cut slope.)

   D. Emergency stabilization using large wood materials (root wads, log cribbing, etc.)

   E. Placement of asphalt concrete or cutback berms to divert runoff away from the damaged area.

2. Potential impacts to upstream and downstream banks, structures and facilities should be identified before performing maintenance.
3. Slide debris shall not be sidecast. Reuse of slide debris shall be allowed for use in berms if the debris are free of organic materials and if the reuse is approved by a licensed engineer.
4. Notify proper regulatory agencies (e.g., Santa Clara Valley Water District, California Department of Fish and Game, and Regional Water Quality Control Board) about material that has naturally fallen into a watercourse due to a substantial slide.
5. In the case of an unexpected slide, use temporary erosion prevention and sediment control measures, such as sediment basins, silt fences, hay bales, erosion control mats, blankets or wattles, if necessary, to protect the slope until repairs have been completed. (Hay bales should not be used as filters alone)
6. Denuded slopes shall be revegetated. Perform hand seeding and/or hydroseeding and watering to allow germination of the seed prior to the first rains. Erosion control mats and mulching are necessary in the first wet season following revegetation.
7. Slide debris shall be removed to the nearest suitable area for temporary storage and shall be enclosed or contained after the emergency to prevent erosion. Slide debris removed by maintenance crews should not be allowed to erode into any water body. Slide debris shall be removed to the nearest permanent, stable storage or recycling location at the earliest opportunity, or may be used as backfill in permanent repair projects, except where such material is prohibited from use, as described in item 3 above.
8. Whenever possible, brush and garbage shall be sorted and stored separately from soils.
9. Rip rap shall only be used on stream banks for emergency stabilization of roads that have no alternate access, where one or more of the following conditions apply:

   A. Rip rap previously existed, and is to be replaced in the same quantity and location and is immediately reported to agencies specified in Section d) Environmental Permitting for Rural Public Works Activities.

B. Rip rap is to be placed only below the ordinary high water line to halt scour at the toe of a slope or bank supporting a public road, and is immediately reported.

C. Large wood materials (root wads, logs, etc.) are not available or are not considered to be effective.

10. Rip rap may be used to protect bridge support structures (abutments, embankments, etc.) that are actively being undermined and are at imminent risk of failure.

11. Wherever possible, key trenches shall be dug prior to placing rip rap.

12. Rip rap may be used for non-emergency stabilization only after applicable permits have been obtained. Proposals for non-emergency rip rap use shall include mitigation and avoidance measures such as incorporating large woody debris, revegetation, etc. into the bank stabilization.

13. Monitor finished streambanks to ensure stability and vegetative growth. Consult original design engineer as necessary for adjustments and modifications.

c) Road Construction, Maintenance, and Repairs in Rural Areas to Prevent and Control Road-Related Erosion

Note: This section is applicable to work performed on all "rural roads", paved and unpaved, as defined in the Definition Section on page 4.

1. From the previously adopted Public Streets, Roads and Highways Operation and Maintenance Performance Standards, the following apply:

A. Road Construction/Maintenance

1. General Road Construction/Maintenance Practices

a. Schedule construction and maintenance activities for dry weather. Minimize the exposed area and the duration of exposure. Stabilize disturbed areas as quickly as possible.

b. Protect downslope drainage courses, streams, and storm drains with wattles, sand bags, earth dikes, or temporary drainage swales to divert or trap and filter runoff.

c. Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, prevent transport of materials in runoff. Possible methods include covering stockpiles and excavated soil with secured tarps or plastic sheeting, or surrounding stockpiles and excavated soils with berms.

d. Prevent excess material from entering streets or storm drain inlets. Designate an area for clean up and properly dispose of excess materials

e. Use only as much water as necessary for dust control, to avoid runoff.

f. If it rains unexpectedly, take appropriate action to prevent pollution of storm water runoff. (e.g., divert runoff around work areas)

g. When designing roads for construction, consider incorporating ditches, berms, dikes and swales in order to intercept runoff from surfaces and convey it to stabilized watercourses, drainage pipes, or channels.

h. During construction, inspect and maintain all BMPs daily to ensure that they are working properly and to ensure that problems are corrected as soon as they develop.

i. Road drainage systems and stream crossings should be maintained by annual and storm period inspections to prevent small problems from growing into large failures.

j. Consider replacement of stream crossing structure, when ongoing maintenance does not mitigate any associated problems. See Section e. Road Planning and Design BMPs for specific design considerations.

2. Asphalt/Concrete Removal

a. After breaking up old pavement, sweep up materials thoroughly to avoid contact with rainfall and storm water runoff. Recycle as much material as possible, and properly dispose of non-recyclable materials.

b. During saw cutting and grinding operations, use as little water as possible. Block or place berms around nearby storm drain inlets, in drainage channel (if no inlet is nearby), or around work area (when bordering watercourse) using sand bags or an equivalent appropriate barrier, or absorbent materials such as Wet Vac, pads, pillows and socks to contain slurry. If slurry enters the storm drain system, remove material immediately.

c. Remove saw-cut slurry (e.g., with a shovel or vacuum, or sweep up when dry) as soon as possible.

3. Concrete Installation and Repair

a. Avoid mixing excess amounts of fresh concrete or cement mortar on-site.

b. Wash out concrete transit mixers only in designated washout areas where the water will flow into drums or settling ponds or onto dirt or stockpiles of aggregate base or sand. Pump water from settling ponds to the sanitary sewer, where allowed. Whenever possible, recycle washout by pumping back into mixers for reuse. Never dispose of washout into the street, storm drains, drainage ditches, or creeks.

c. Whenever possible, return leftover materials in the mixer barrel to the yard for recycling. Dispose of small amounts of excess concrete, grout, and mortar in the trash.

4. Patching, Resurfacing, and Surface Sealing

a. Sweep up as much material as possible and dispose of properly. Only wash down streets if runoff is controlled or contained.

5. Traffic Detector Loop Installation and Repair

a. Protect nearby storm drain inlets prior to cutting or flushing slot for traffic detector loops. Block or berm around nearby storm drain inlets using sand bags or an equivalent barrier, or use absorbent materials such as pads, pillows and socks to contain slurry.

b. Clean up residues by sweeping up as much material as possible, and dispose of material properly.

B. Road Embankment and Median Maintenance

1. Erosion Prevention and Sediment Controls

a. Maintain vegetative cover on medians and road embankments to prevent soil erosion, trap pollutants and slow the rate of storm water runoff. Plant and/or retain native vegetation as much as possible. Adjust mowing heights to allow substantial stubble. Leave clippings in place or apply mulch as additional cover.

b. Use measures that break the slopes to reduce the problems associated with concentrated flow volumes and runoff velocities.

c. Avoid moving large quantities of earth, except where regrading is necessary to repair or reconfigure an embankment. Disking may be used to manage vegetation on slopes less than 20%. It shall be performed parallel to the contour to prevent rills and gullies from forming during rain events. Disking shall not be performed in areas that support endangered species such as ground burrowing owls, harvest mice, beetles, etc.

d. Inspect drainage facilities, including cross drains, on a regular basis to ensure that sufficient drainage is provided during storm periods, so that runoff diverted onto slopes does not cause erosion. Report and remediate any observed erosion problems as soon as possible.

e. Ensure that erosion prevention and sediment control is provided for storm drain outfalls.

2. Vegetation Controls

a. Manual and Mechanical Vegetation Removal

i. Preserve existing vegetation to the maximum extent practicable within the riparian corridor in order to provide erosion prevention and sediment control, watershed protection, habitat protection, landscape beautification, dust control, pollution control and shade cover. Existing vegetation may

be modified if restoring the riparian corridor with native vegetation species.

ii. Keep removed vegetation, including clippings, chips, and pruning debris, away from storm drain inlets and watercourses.

iii. When loading or chipping brush into a parked truck, do not leave leaves, twigs, chips, or other debris in the gutter or shoulder.

iv. When working on a slope, avoid loosening soil that could erode into drainage systems. Loosen only the amount of soil needed to remove the vegetation.

v. Avoid loosening soil or removing vegetation when rain is expected.

vi. Avoid using mechanical machinery on slopes greater than 30% whenever possible.

vii. Minimize the use of heavy equipment on saturated soils.

2. Maintenance Activities Unique to Unpaved Rural Roads

A. Perform regular inspection to determine if grading is needed to maintain smooth drivable surfaces that are adequately sloped to drain water from the surface without creating erosion problems. Choose appropriate grading, crowning, inslope or outslope, and drainage for road sections.
B. Consider using additional road surface drainage such as rolling dips, water bars, water bars/breaks or open-top culverts, to safely remove runoff that consistently builds up on the road surface or inside ditch.
C. Monitor for soft spots or areas of poor subsurface drainage in subgrade. Fill and re-compact holes in subgrade. Provide subsurface drainage if needed.
D. Monitor and re-grade rolling dips if needed.
E. Clean ditch and re-build berm for water bars, as needed.
F. Monitor open-top culverts after storms and clean as needed.
G. Monitor for potholes, washboarding, and areas of poor surface drainage on gravel surface roads. Re-slope, smooth, and compact where necessary.
H. Water, fertilize, re-seed and mow vegetative surface treatments when necessary.
I. Re-apply mulches and fabric surface treatments as needed.
J. Monitor fords after storms. Repair as needed. See Section C.1.A.1.j for replacement options when ongoing maintenance does not mitigate associated problems.

d) Environmental Permitting for Rural Public Works Activities

1. Permits or written exemptions are required for work involving any of the following:

A. Discharge or placement of any structure or within the banks of the stream or channel (including rip rap, concrete or asphalt, and woody material)

B. Dredging, removal or modification of any structure, fill, sediment, large woody debris or vegetation within the banks of the stream or channel

C. Any work that potentially alters the habitat of any endangered species (including streams, tributaries, lakes, ponds, certain ditches, beaches, wetlands, marshes, banks, and riparian areas, and upland areas).

2. The jurisdictions of the various agencies that must be contacted in response to work performed in areas identified in item 1 above are as follows:

A. Regional Water Quality Control Board

1. Certification under Section 401 of the Clean Water Act is required whenever project activities require a Federal permit (such as an Army Corps of Engineers nationwide permit or individual permit issued under Section 404 of the Clean Water Act fora discharge to waters of the U.S. Discharges may included landfill, rip rap slope protection, bridge piers, outfall structures, etc.
2. Waste Discharge Requirements (WDR's) are required for all proposed discharges above and below ordinary high water, that may impact beneficial uses of Waters of the State. For some discharges, it is possible to obtain waiver of WDR. "Fill", and thus structures, are considered discharges.

B. U.S. Army Corps of Engineers

1. Certification under Section 404 of the Clean Water Actis required for discharges of dredge or fill material into waters of the U.S.
2. Certification under Section 10 of the Rivers and Harbors Act is required for structures or work affecting navigable waters of the U.S.

C. California Department of Fish and Game

1. Section 1600 Streambed Alteration Agreements are required for work in any riparian corridor, even if no actual work is performed in the stream channel.

D. Santa Clara Valley Water District

1. Encroachment permits are required for any work within 50 feet of a watercourse in Santa Clara County, or for work that will resulting the discharge of water to a watercourse.[5]

E. Bay Conservation and Development Commission (BCDC)

1. Approval is required for all work in or within 100 feet of the San Francisco Bay.
2. Permits or written exemptions shall be obtained prior to performing planned work such as culvert replacements, slide repairs, bank stabilization, etc. Maintenance

[5] The District's Ordinance 83-2 is being revised and an increase in the width of the corridor within which encroachment permits are required is being considered.

supervisors shall keep in their possession copies of permits for work being performed under their supervision.

3. Emergency conditions may require that work be performed prior to obtaining written permits or exemptions. Maintenance managers and/or supervisors shall complete report forms for emergency work involving any of the elements described in a-c above. Forms shall document that emergency work was performed in response to valid conditions and should be submitted to the proper regulatory agencies. The Co-permittee is subject to enforcement action by one or more of the environmental agencies if work performed is found to be unnecessary. Forms shall be forwarded to the appropriate internal authority at the earliest opportunity and not more than three working days after completion of work.

e) Road Planning and Design BMPs[6]

1. General
   A. Road junctions on steep slopes should be located far upslope from watercourses to protect against erosion.
   B. Where feasible, replace fords that have maintenance problems with an overpass stream crossing.

2. When designing road drainage, the Co-permittee will consider the following:
   A. Outslope roads to minimize flows in the inside ditch and reduce the potential for erosion and sediment delivery to the next culvert.
   B. Insloped roads should be constructed where road surface drainage discharged over the fill slope would cause unacceptable erosion or discharge directly into stream channels, where fill slopes are unstable or where outsloping would create unsafe conditions for use.
   C. Insloped roads should be built with an inside drainage ditch to collect and remove road surface runoff.
   D. Inside ditches should be drained at intervals sufficient to prevent ditch erosion or outlet gullying, and at locations where water and sediment can be filtered before entering a watercourse (filtering accomplished by thick vegetation, gentle slopes, settling basins, or filter windthrows of woody debris and mulches placed and secured on the slope).
   E. Ditch relief culverts should be designed and installed at intervals along the road that are close enough to prevent erosion of the ditch, gullying or sliding of the slope below the culvert outlet of a cross-drain, direct transport of sediment along

[6] Language in Section e) is based on recommendations in Weaver, William E. and Danny K Hagans, Pacific Watershed Associates, *Handbook for Forest and Ranch Roads: A guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads,* June 1994. See reference for more details.

an inside ditch to a watercourse, and loss of capacity of culvert cross-drains due to filling with sediment.

F. Ditches should not discharge directly into the inlet of a watercourse crossing culvert, and ditch relief culverts should not discharge into a watercourse without first directing flow through an adequate filter strip when possible.

G. Where possible, replacement culverts should have a grade at least 2% greater than the ditch, which feeds it to prevent sediment build-up and blockage. Where possible, ditch relief culverts should be installed at the gradient of the original ground slope so that the outlet of the culvert will emerge on the ground surface beyond the base of the fill. (if not, fill below the culvert should be armored by rocks, or the culvert should be fitted with an anchored downspout to carry erosive flow past the base of the fill)[7]

[7] Depending upon site conditions, culvert grades may deviate from this recommendation upon the professional opinion of the project engineer.

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 4
STANDARD OPERATING PROCEDURES

This section should contain the co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Description of Rural Public Works Maintenance Program

- Which departments will be performing the various components of rural public works maintenance and support activities and what is the chain of command?
- How will contractors be instructed to conduct rural public works maintenance and support activities with regards to water quality?
- Who is responsible for maintaining the BMPs implemented?
- Where will maintenance staff store and dispose of wastes from rural pubic works activities?
- How is mechanical equipment to be stored and operated?
- Annual training on the use of appropriate BMPs will be provided to maintenance staff.
- How will technical assistance needs be met?
- How will permit requirements for work to be performed be coordinated amongst the differing agencies?
- What outreach materials will be provided for contractors, developers and staff on BMPs and permitting requirements?
- How will activities performed under emergency conditions be documented and who will they be submitted to?
- Which specific agencies and/or persons should be notified when emergency stabilization of roads is needed?

Attachment 2-2

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM
NEW DEVELOPMENT AND CONSTRUCTION ACTIVITIES CONTROL MEASURES

Performance Standard and Supporting Documents for Planning Procedures

Introduction

The goal of new development and construction activities control measures is to minimize the water quality impacts of land development, both during and after construction. These control measures apply to both private development projects and municipal capital improvement projects. ~~Municipal agencies can require these types of control measures as part of their development plan review procedures and policies.~~ The Planning Procedures performance standard defines the level of implementation that municipal agencies in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) must attain in order to demonstrate that their land use planning, development plan review and approval processes control storm water quality impacts to the maximum extent practicable. This performance standard ~~will be~~is used ~~as the basis~~ for measuring the effectiveness of each municipal agency's planning procedures activities.

The Planning Procedures Performance Standard ~~is~~ was based~~, primarily~~originally, on the San Francisco Bay Regional Water Quality Control Board's April 1994 *Staff Recommendations for New and Redevelopment Controls for Storm Water Programs* (*Recommendations*). The *Recommendations* incorporate the mandates of EPA's storm water regulations as well as the *Coastal Zone Act Reauthorization Amendments.* The performance standard is also consistent with the goals and objectives of the New Development and Construction Activities Component of the Program's *Storm Water Management Plan*. The performance standard has since been updated to meet the requirements in Provision C.3 of the Program's NPDES permit, amended per Regional Board Order No. 01-119, October 17, 2001.

Control of impacts on stormwater quality from construction activities is addressed under a separate Construction Inspection Performance Standard.

Performance Standard and Supporting Documents for
Planning Procedures

PERFORMANCE STANDARD

1) The municipal agency (Co-permittee) ~~has~~ shall have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures.

2) ~~Developers are provided~~The municipal agency shall provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for storm water pollution prevention early in the application process, as appropriate for the type of project.

3) The municipal agency shall ensure that e~~E~~nvironmental documents required for those projects that fall under CEQA or NEPA review~~, such as EIRs, negative declarations, and initial study checklists, will~~ address both significant and cumulative storm water quality impacts during the life of the project, ~~(both significant and cumulative),~~ and relevant permit requirements.~~required permits, and specific mitigation measures related to storm water quality.~~ These documents include EIRs, negative declarations and initial study checklists.

4) The municipal agency shall require developers of Group 1 and Group 2 projects[1] to design and implement stormwater treatment measures, including site design and source control measures as appropriate, to reduce stormwater pollution to the maximum extent practicable[2]. Treatment measures shall be designed in accordance with the numeric design criteria in Provision C.3.d. Increases in peak runoff flow and volume shall be managed for appropriate projects by implementing the guidance in the Program's Hydromodification Management Plan for the specific stream receiving the discharge. ~~Developers of projects with significant storm water pollution potential[3] are required by the municipal agency to mitigate storm water quality impacts to the maximum extent practicable, through proper site planning and design techniques and/or addition of permanent storm water quality control measures.~~

5) ~~Developers~~ The municipal agency shall require developers of projects that disturb a land area of ~~five acres~~one acre or more ~~are required by the municipal agency~~ to demonstrate coverage under the State General ~~Construction Activity Storm Water~~ Permit for Storm Water Discharges Associated with Construction Activity.

6) ~~Developers~~ The municipal agency shall require developers of projects with potential for significant erosion and planned construction activity during the wet season[1] ~~are required~~

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[1] Definitions are provided at the end of this section (page 3).
[2] Unless an alternative method of compliance is approved by the municipal agency in accordance with its alternative compliance program.
[3] ~~Definitions are provided in Attachment 1, Work Plan Implementation~~

~~by the municipal agency~~ to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season.

7) The municipal agency shall implement an operation and maintenance (O&M) verification program that includes:

a) Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;

b) Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;

c) Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

~~Developers of projects that include installation of permanent structural storm water controls are required by the municipal agency to establish and provide a method for operation and maintenance of such structural controls.~~

8) The municipal agency shall ensure~~s~~ that municipal capital improvement projects include storm water quality control measures during and after construction, as appropriate for each project, and that contractors comply with storm water quality control requirements during construction and maintenance activities.

9) The municipal agency shall provide~~s~~ training at least annually to its planning, building, and public works staffs on planning procedures, policies, design guidelines, and BMPs for storm water pollution prevention.

Definitions

Group 1 Projects – Beginning July 15, 2003, municipal agencies must begin to implement permit Provision C.3. requirements for new development or significant redevelopment projects that create, add, or replace one acre (43,560 square feet) or more of impervious surface[4]. These include commercial, industrial, and residential developments, and streets, roads and highways being constructed under the municipal agency's jurisdiction (see Provision C.3.c.i.). Where a significant redevelopment project results in an increase or replacement of more than 50 percent of the impervious surface of the existing development, and the existing development was not subject to stormwater treatment measures, the entire project must be included in the treatment measure design. Otherwise, only the redeveloped portion must be included in the treatment measure design. Excluded from this category are interior remodels and routine maintenance or repair, including roof or exterior surface replacement and repaving.

Group 2 Projects – Same as the Group 1 definition, except that beginning October 15, 2004, the size threshold of impervious area will be reduced from one acre to 5,000 square feet (unless an alternative minimum size is proposed by the Program and accepted by the Regional Board).

[4] Provision C.3. requirements do not apply to projects for which a privately-sponsored development application has been "deemed complete" (as defined by the Co-permittee) prior toJuly 15, 2003, or with respect to public projects, for which funding has been committed and for which construction is scheduled by October 15, 2003.

Wet season -- As defined by local ordinance (typically October 15 to April 15).

Performance Standard and Supporting Documents for
Planning Procedures

Attachment 1
WORK PLAN IMPLEMENTATION

This section should describe the activities to be conducted by the ~~c~~Co-permittee ~~during the remaining three years of the storm water permit~~ to achieve the performance standard, along with an implementation schedule. Specific tasks for implementation of Provision C.3. are enumerated in Co-permittee work plans dated March 1, 2002 and September 15, 2002.

[Insert Co-permittee work plan here]

~~**Example Contents of the Work Plan**~~

~~- Take steps to obtain adequate legal authority, including revising General Plan language and adopting and/or amending ordinances as needed.~~

~~- Revise planning procedures to incorporate consideration of storm water quality impacts and control measures at each stage of the process.~~

~~- Develop and/or adopt site planning and design guidelines which incorporate water quality protection measures.~~

~~- Obtain or develop educational materials for project applicants on requirements for storm water quality control measures.~~

~~- Develop an annual training program for planning and engineering staffs, as well as a mechanism for educating upper management staff and elected officials.~~

~~- Develop and/or adapt BMPs and control measures identified in Section 3.~~

~~Note: Guidance on incorporating storm water controls into the planning process, General Plan and environmental assessment language, ordinances and standards, pre-application materials, and conditions of approval is provided in the Program document entitled *Planning Procedures for Private Projects* (June 1996).~~

~~**Suggested Definitions**~~

~~**Projects with significant storm water pollution potential** - A project which causes substantial or potentially substantial adverse change in the quantity and/or quality of storm water runoff generated from the site. (Note: This is consistent with the CEQA definition of significance. Professional judgement will be required in evaluation of project impacts, as specific thresholds for significance have not yet been adopted by the Program.)~~

~~**Wet season** - As defined by local ordinance (typically October 15 to April 15).~~

Performance Standard and Supporting Documents for
Planning Procedures

Attachment 2
LEGAL AUTHORITY TO IMPLEMENT

This section should contain a demonstration that the co-permittee has the legal authority to implement the performance standard, and/or provides a time schedule for developing and obtaining additional authority.

Provide citations for or excerpts from the following documents that demonstrate adequate legal authority:

- General Plan policies and implementation measures which help preserve and enhance water quality.
- Local ordinances and supporting guidelines that provide the municipal agency with an adequate expression of legal authority to fully implement General Plan policies, conduct discretionary reviews of development projects, and require storm water pollution control measures per Permit Provision C.3. (e.g., zoning ordinances, administrative orders, development review guidelines, conditions of approval or other documents or procedures).
- Erosion and sediment control ordinance.
- Storm water discharge ordinance.
- Authority under CEQA to require mitigation measures for environmental impacts.

Note: Guidance on General Plan and environmental assessment language, ordinances and standards is provided in the ~~Program document entitled *Planning Procedures for Private Projects* (June 1996)~~ following documents:

- Permit Provision C.3.I.
- BASMAA *Start at the Source* and *Start at the Source Tools*.
- SCVURPPP Development Policies Comparison
- SCVURPPP *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects*

Performance Standard and Supporting Documents for
Planning Procedures

Attachment 3
~~WORK PLAN~~ BMPS AND CONTROL MEASURES

This section should contain the best management practices and control measures that co-permittees will employ or use as a standard for compliance in the implementation of the performance standard, as well as any design criteria, procedures, or methods that would assist in the use of the BMPs or control measures.

Example BMPs and Control Measures

- Design guidelines and practices which incorporate storm water quality control measures.
- Contract specifications for municipal capital improvement projects which address storm water quality controls.
- Minimum standards or conditions of approval for construction and post-construction BMPs.
- Mechanisms for requiring operation and maintenance of structural controls, and example language.
- Mechanisms to discourage pesticide use at new development sites, such as proper design of landscaping, as appropriate for the site.
- Source control measures, such as the model conditions of approval provided in Attachment 4.

~~Note: Guidance on conditions of approval and permit conditions is provided in the Program document entitled *Planning Procedures for Private Projects* (June 1996). Guidance on site planning/design practices to mitigation storm water quality impacts is provided in the BASMAA document entitled *Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality* (Tom Richman and Associates, November, 1996).~~

References:

- *Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality* (BASMAA, 1999
- SCVURPPP, *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects* (under development)
- SCVURPPP, *Model Conditions of Approval for Pesticide Reduction in Landscaping Plans*, 9-30-02
- California BMP Handbooks, revised 2003

Attachment 4

SOURCE CONTROL MEASURES

INTRODUCTION

This section contains a model list of source control measures to control sources of pollutants associated with the post-construction phase of new development and redevelopment projects. These measures may be required at various stages of the development plan review process, e.g., as application submittal requirements or checklists, conditions of approval, plan check comments, etc., depending on the particular process used by each Co-permittee. These measures should be imposed as requirements rather than as recommended best management practices, to meet the intent of Permit Provision C.3.k.

The list relates the source control measures to significant sources of potential pollutants that may be present on the developed site, rather than to a general type of development project. Each identified source of pollutants may have one or more appropriate control measures. The model list is intended to be a menu of measures from which Co-permittees may select appropriate measures to apply to specific projects. (Co-permittees do not have to use the exact wording of a source control measure as long as the intent of the measure is preserved.)

STRUCTURAL CONTROL MEASURES

A. Illegal Dumping to Storm Drain Inlets and Waterways

1) On-site storm drain inlets shall be clearly marked with the words "No Dumping! Flows to Bay," or equivalent, using methods approved by the [Co-permittee].

2) It is unlawful to discharge any wastewater into storm drains, gutters, creeks, or the San Francisco Bay. Unlawful discharges to storm drains include, but are not limited to, discharges from toilets; sinks; industrial processes; cooling systems; boilers; fabric cleaning; equipment cleaning; or vehicle cleaning.

3) It is unlawful to cause hazardous domestic waste materials to be deposited in such a manner or location as to constitute a threatened discharge into storm drains, gutters, creeks or San Francisco Bay.

B. Interior Floor Drains

1) Interior floor drains shall be plumbed to the sanitary sewer system and shall not be connected to storm drains.

C. Parking Lots

1) Interior level parking garage floor drains shall be connected to [a water treatment device approved by the (Co-permittee) prior to discharging to] the sanitary sewer system. The

applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

D. Pesticide/Fertilizer Application

1) Landscaping shall be designed to minimize irrigation and runoff, promote surface infiltration where appropriate, and minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.

2) Structures shall be designed to discourage the occurrence and entry of pests into buildings, thus minimizing the need for pesticides. For example, dumpster areas should be located away from occupied buildings, and building foundation vents shall be covered with screens.

3) Additional requirements are covered in the "Model Conditions of Approval for Pest Resistant Landscaping" (August 19, 2002).

E. Pool, Spa, and Fountain Discharges

1) Pool (including swimming pools, hot tubs, spas and fountains) discharge drains shall not be connected directly to the storm drain or sanitary sewer system. [Exception: Public pool discharge drains must be connected to the sanitary sewer system, per County Department of Environmental Health requirements.]

2) When draining is necessary, a hose or other temporary system shall be directed into a sanitary sewer clean out. The clean out shall be installed in a readily accessible area [example: within 10 feet of the pool]. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

F. Food Service Equipment Cleaning

1) Food service facilities (including restaurants and grocery stores) shall have a sink or other area for cleaning floor mats, containers, and equipment, that is connected to a grease interceptor prior to discharging to the sanitary sewer system. The cleaning area shall be large enough to clean the largest mat or piece of equipment to be cleaned. The cleaning area shall be indoors or in a covered area outdoors; both areas must be plumbed to the sanitary sewer.

G. Refuse Areas

1) New buildings [such as food service facilities and/or multi-family residential complexes or subdivisions] shall provide a covered or enclosed area for dumpsters and recycling containers. The area shall be designed to prevent water run-on to the area and runoff from the area.

2) Areas around trash enclosures, recycling areas, and/or food compactor enclosures shall not discharge to the storm drain system. Any drains installed in or beneath dumpsters, compactors, and tallow bin areas serving food service facilities shall be connected [to a grease removal device prior to discharging] to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

H. Outdoor Process Activities/Equipment[5]

1) Process activities shall be performed either indoors or outdoors under cover. If performed outdoors, the area shall be designed to prevent run-on to and runoff from the site.

2) Process equipment areas shall drain to the sanitary sewer system. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

I. Outdoor Equipment/Materials Storage

1) All outdoor equipment and materials storage areas shall be covered [and bermed], or shall be designed to limit the potential for runoff to contact pollutants [or a storm drain inlet valves shall be provided on exterior drains in the area].

2) Storage areas containing non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners or vaults. . The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

3) All hazardous materials and wastes, as defined [or regulated] by [cite ordinance or regulation], on the site must be used and stored in compliance with the [Co-permittee's] Hazardous Materials Ordinance and Hazardous Materials Management Plan for the site approved by the [Co-permittee department].

J. Vehicle/Equipment Cleaning

1) Wastewater from vehicle and equipment washing operations shall not be discharged to the storm drain system. [Optional, e.g. for car dealerships: If water only (without soap or other cleaning agent) is used for rinsing of vehicle exterior surfaces for appearance purposes, the runoff may be discharged to the storm drain system.]

2) Commercial/industrial facilities having vehicle/equipment cleaning needs [and new residential complexes of 25 units or greater] shall either provide a covered, bermed area

[5] Examples of businesses that may have outdoor process activities and equipment include machine shops and auto repair shops, and industries that have pretreatment facilities.

for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. Vehicle/equipment washing areas shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

3) Commercial car wash facilities shall be designed and operated such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer [or a wastewater reclamation system shall be installed]. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

K. Vehicle/Equipment Repair and Maintenance

1) Vehicle/equipment repair and maintenance shall be performed in a designated area indoors, or if such services must be performed outdoors, in an area designed to prevent the run-on and runoff of stormwater.

2) Secondary containment shall be provided for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.

3) Vehicle service facilities shall not contain floor drains unless the floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer, for which an industrial waste discharge permit has been obtained. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

4) Tanks, containers or sinks used for parts cleaning or rinsing shall not be connected to the storm drain system. Tanks, containers or sinks used for such purposes may only be connected to the sanitary sewer system if allowed by an industrial waste discharge permit. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

L. Fuel Dispensing Areas

1) Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.

[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

2) Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area, as defined below[1].] The canopy [or cover] shall not drain onto the fueling area.

M. Loading Docks

1) Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

2) Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.

3) Door skirts between the trailers and the building shall be installed to prevent exposure of loading activities to rain.

N. Fire Sprinkler Test Water

1) Sanitary sewer connections shall be provided to drain fire sprinkler test water.

O. Miscellaneous Drain or Wash Water

1) Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.

2) [Air compressor or air conditioner] condensate drain lines may not discharge to the storm drain system.

3) Roof drains shall discharge and drain away from the building foundation to an unpaved area wherever possible.

4) Roof top equipment shall drain to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

Performance Standard and Supporting Documents for
Planning Procedures

OPERATIONAL BMPS

A. Paved Sidewalks and Parking Lots

2) Sidewalks and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris resulting from pressure washing shall be trapped and collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and shall not be discharged to a storm drain. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

B. Private Streets

1) Owner of private streets and storm drains shall prepare and implement a plan for street sweeping of paved private roads and cleaning of all storm drain inlets.

C. Vehicle/Equipment Repair and Maintenance

5) No person shall dispose of, nor permit the disposal, directly or indirectly, of vehicle fluids, hazardous materials, or rinsewater from parts cleaning operations into storm drains.

6) No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.

7) No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

D. Fueling Areas

1) The property owner shall dry sweep the fueling area routinely.

REFERENCES

- BASMAA "Start at the Source Tools Handbook" (June 2000);
- Alameda Countywide Clean Water Program (ACCWP) Model Conditions of Approval (1999);
- City of Palo Alto Municipal Code Chapter 16.09, and revisions to Chapter 16.09 approved July 22, 2002;
- City of San Jose standard conditions;
- City of Cupertino, Guidance for Selecting BMPs for Development Projects;
- Example source control measures provided by Regional Board staff in Provision C.3.k. of the SCVURPPP NPDES Permit (October 2001).

Performance Standard and Supporting Documents for
Planning Procedures

Attachment 45
STANDARD OPERATING PROCEDURES

This section should contain the ~~c~~Co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Examples of Types of SOPs ~~Required~~Needed

- A general description of the municipal agency's plan review process, including ~~and~~ how Group 1 and Group 2 projects[7] are identified as well as how storm water quality control measures are incorporated into the planning and design stages of development. ~~(see " New Development and Construction Planning Process Chart" in Program's Planning Procedures Manual)~~.
- ~~Include a d~~Description of which staff positions are responsible for ~~reviews for storm water impacts and when in the process these reviews are performed.~~reviewing the project's storm water impacts, the effectiveness with which the control measures mitigate these impacts, and when in the process these reviews are performed.
- Description of process for allowing independent qualified expert review and certification of stormwater treatment measure designs, if applicable.
- Mechanism to include storm water quality controls in plans and contract specifications for municipal capital improvement projects.
- Guidance on who to give pre-application materials to and when.
- Use of a revised CEQA initial study checklist and/or other plan review checklist that specifically addresses storm water quality impacts.
- Mechanism for recording the treatment control, site design and source control measures used, and the sizing criteria used
- Identification of department/persons responsible for implementing the treatment measure O&M verification program.

~~Note: Guidance on incorporating storm water controls into the planning process is provided in the Program document entitled *Planning Procedures for Private Projects* (June 1996).~~ See SCVURPPP *C.3. Handbook*, "Summary of Major Changes to the Development P~~p~~roject Review Process" for those additional steps in the development review process necessary in implementing Provision C.3 requirements.

[7] Definitions of Group 1 and Group 2 projects are provided on page 3 of the Performance Standard.

Attachment ~~5~~ 6
REPORTING REQUIREMENTS

Co-permittee's will demonstrate implementation of this Performance Standard and the additional requirements of Provision C.3. by providing in their annual reports the information described below[8].

- The name or other identifier, type of project, site acreage or square footage, and square footage of new impervious surface on all new development and significant redevelopment projects which meet the Group 1 and Group 2 definitions of C.3.c.[9] For significant redevelopment projects, the square footage of land disturbance will be reported.

- The treatment BMPs used and numeric sizing criteria employed, the operation and maintenance responsibility mechanism including the responsible party, site design measures used, and source control measures required for projects that must implement treatment measures.

- A summary of the types of pesticide reduction measures required for those new development and significant redevelopment projects to be addressed under C.3.c and the percentage of such new development and significant redevelopment projects for which pesticide reduction measures were required.

Model reporting forms are provided on the next two pages.

[8] From Permit Provision C.3.n.
[9] Definitions of Group 1 and Group 2 projects are provided on page 3 of the Performance Standard.

ATTACHMENT ~~5~~6

[Co-permittee Name]
Reporting Form for Planning Procedures Performance Standard
and Provision C.3.n. Reporting Requirements

Part 1

Significant Development Projects[10]
Reviewed and/or Approved During _____

Project Name	Project Type[11]	Site Size (ac. or s.f.)	New Impervious Surface (s.f.)[12]	Area of Land Disturbed (Ac.)[13]	Project Status	Storm Water Control Measures Included in Project
Private Projects						
Public Projects						

[10] List all projects with new impervious surface area greater than 5,000 s.f. (Group 1 and 2 projects – see definition on page 3 of the performance standard).
[11] Describe project type, as defined in Provision C.3.c.
[12] "New" is defined as impervious surface created, added or replaced.
[13] If the site is a "significant redevelopment", list the area of land disturbance.

[Co-permittee Name]
Reporting Form for Planning Procedures Performance Standard and Provision C.3.n. Reporting Requirements

Part 2

Stormwater Control Measures for Group 1 and Group 2 Projects[14] Reviewed and/or Approved During _____

Project Name	Treatment BMPs	Numeric Sizing Criteria Used	O&M Responsibility Mechanism and Responsible Party	Site Design Measures	Source Control Measures	Pesticide Reduction Measures
Private Projects						
Public Projects						

[14] Beginning July 15, 2003 and before October 15, 2004, list all projects with new impervious surface area greater than 43,560 s.f. (1 acre). Beginning October 15, 2004, list all projects with new impervious surface area greater than 5,000 s.f. See SCVURPP "C.3. Handbook: Guidance for Implementation of Stormwater Requirements for New and Redevelopment Projects".

SECTION 3

PUBLIC INFORMATION/PARTICIPATION WORK PLAN

3. PUBLIC INFORMATION/PARTICIPATION WORK PLAN

INTRODUCTION

The goals of the Public Information/Participation (PI/P) element of the Program are to change specific behaviors which adversely affect water quality and to increase the understanding and appreciation of streams and the Bay, leading to a change in values. To accomplish these goals, Co-permittees pursue PI/P activities jointly through the Program, on a county-wide basis, and individually in their own jurisdictions. In order to identify the Program's joint PI/P activities, the Program developed a PI/P Strategy dated March 1, 1999 (later renamed "Operational Guidelines for Developing Work Plans " -- see *FY 00-01 Work Plan*, Section 3). In FY 03-04, a continuous improvement item for the Program staff will be to update the guidelines to reflect the new NPDES permit requirements.

Each year Program staff has worked with the PI/P Ad Hoc Task Group (AHTG) to identify, prioritize and select projects to be recommended for funding. Table 3-1 presents the updated Pollutant Matrix, developed as part of the Program's Operational Guidelines for Developing Work Plans, which links past, current, and future PI/P projects with pollutants of concern. The projects are developed and implemented each year by work groups consisting of Program staff, consultants, and the contributing Co-permittees.

FY 03-04 PI/P WORK PLAN

Program PI/P Projects

Program specific projects from FY 02-03 will continue to be funded in FY 03-04 (see Table 3-2). These include the Watershed Watch Campaign, and the Pesticide User Outreach and Mercury Pollution Prevention Outreach Projects.

The campaign continues to be the primary PI/P focus for the Program. The Watershed Watch Campaign will be in its fourth year during FY 03-04 (see Attachment 3-1). A survey and other forms of evaluation will be conducted by September 2003 to evaluate effectiveness of the Campaign. The feedback from these evaluation methods may be used to modify messages, advertising, promotions and other Campaign strategies. Campaign advertising and activities will be coordinated with pesticide and mercury outreach efforts. Messages used in outreach efforts by the campaign will include pesticide and mercury themes. The Program will also continue to participate in and contribute to BASMAA.

Collaborative PI/P Projects

Only one collaborative project was proposed for FY 03-04. It was the proposal for developing a "stream trash clean-up fact sheet", proposed by the Trash Ad Hoc Task Group. A description is included in Attachment 3-2.

Table 3-2 lists all of the PI/P projects to be funded in FY 03-04. Preliminary descriptions ("Development Review Checklists") of the projects (with the exception of the Watershed Watch Campaign) are provided in Attachment 3-2. The scopes of work will be finalized in more detail by Program staff and the contributing Co-permittees prior to implementation of the projects.

ATTACHMENTS

Attachment 3-1	Watershed Outreach and Education Campaign (Watershed Watch) Fourth Year (FY 03-04) Work Plan, March 1, 2003
Attachment 3-2	Development Review Checklists (Project Descriptions for FY 03-04 PI/P Projects)

Table 3-1
Pollutant Matrix for FY 03-04 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 03-04 Projects and Continuing Projects	Existing Program PI/P Materials and Programs
Diazinon and pesticides in general	Pesticides (residential, commercial and municipal use)	• Home gardeners • Pest control professionals • Landscapers • Municipal Employees • Residents who hire pest control professionals	Watershed Education & Outreach Campaign (potential topic), IPM Store Partnership Program (regional and local), Pesticide User Outreach Project, Annual Workshop potential topic, Considering restaurant brochure "Don't set a Table for Pests".	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "When Ants Invade" Self-Mailer, "Landscaping, Gardening and Pool Maintenance" tri-fold, IPM Store Partnership Program Fact Sheets, "Clean It", HHW programs, BASMAA Media Relations Campaign topic
Sediment	Erosion from new construction, grading, road wear	• Construction companies/contractors • Architects/engineers • Municipal inspectors • Residents (home improvement projects, remodels)	Watershed Education and Outreach Campaign (potential topic), BASMAA Media Relations Campaign (potential topic), Outreach to developers	Construction BMP Tri-folds, "Blueprint for a Clean Bay", "Start at the Source" Manual, Construction Site Management workshops;
Mercury	Tailpipe emissions (i.e., diesel-powered vehicles), consumer products (thermometers, fluorescent lighting)	• Residents (auto use, general awareness, proper selection and disposal of products) • Industry (fleet use) • Commercial (fleet use)	Watershed Education and Outreach Campaign, BASMAA Media Relations Campaign topic, Mercury P2 Outreach (Residential fluorescent light recycling)	"Spare the Air and Water Too" campaign press release and public service announcements, bill stuffers, local co-permittee fact sheets (e.g., Palo Alto)

Table 3-1, continued
Pollutant Matrix for Prioritizing PI/P Projects

Pollutant of Concern	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 03-04 Projects and Continuing Projects	Existing Program PI/P Materials and Programs
Copper	Brake pads, industrial discharge, copper algaecides, coolant leaks, illegal dumping	• Industry (scrubbers, roofs, cooling towers, piping) • Residents (illegal dumping, pools and spas) • Commercial business (pool, spa, fountain maintenance) • Municipal maintenance staff	BASMAA Media Relations Campaign (potential topic), Watershed Education and Outreach Campaign (potential topic), Residential Swimming Pool Outreach Project, support of Brake Pad partnership	Brake Pad Partnership, Pool and Spa Brochure, "Keeping It All In Tune", Industrial General Permit Compliance Handbook, Industrial BMPs, storm drain stencils, Pool BMP brochure and sticker
Nickel	Industrial discharges, tailpipe emissions, construction-related erosion	• See sediment and mercury target audiences	See sediment and mercury projects	See sediment and mercury projects
Trash	Intentional littering (cigarette butts, throwing objects from automobiles, illegal dumping), trucks hauling poorly secured materials, uncovered or overflowing garbage cans	• General public • Children • Drivers • Smokers	BASMAA media relations campaign potential topic, Watershed Education and Outreach Campaign (potential topic), Stream Trash Education brochure (proposed discretionary PIP project).	"The Bay Begins at Your Front Door" brochure, Watershed Watch magnets, Watershed Watch Kit brochure

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.

Table 3-2
FY 03-04 PI/P Projects

Project Title	Project Description	Budget	Comments
Program PI/P Projects			
1. Watershed Education and Outreach Campaign (Year 4)	Funding for approved multi-year watershed education and outreach campaign. Includes: • Funding for educational programs at the Alviso Ed Center coordinated with the WE&O campaign; • Funding for ZunZun to perform a watershed –themed show at 50 schools in Santa Clara Valley.	$455,000[1]	Proposed Budget breakdown is as follows: • Campaign budget - $223,580[2] • Alviso Ed Center - $75,700 • ZunZun Contract - $25,000 • Campaign Evaluation - $ 43,900 • EOA 10% Markup - $36,818 • Program staff support - $50,000
2. Pesticide User (PU) Outreach (Year 3)	Project combines cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Scope to include items in Program's Pesticide Management Plan for outreach to residents, commercial businesses, and pest control operators.	$40,000	SCVURPPP will continue to support the Regional IPM Partnership and consider supporting other pesticide related projects through its participation in BASMAA. Additional outreach will be made locally to pesticide users, potentially residential and commercial users, residents hiring pest control professionals, and/or other audiences.
3. Mercury Pollution Prevention Outreach (Year 2)	This project encompasses several tasks in the Program's Mercury Pollution Prevention Plan (3/1/02). It involves public education regarding the effects of mercury on the environment, products containing mercury, and proper disposal of such products.	$25,000	The proposed project is to be funded at $25,000 per year for two years.
4. Regional Collaboration	Funding for SCVURPPP contribution to BASMAA's baseline budget, including Regional IPM and Media Relations projects.	$65,000	
5. Program Supplies	Estimated budget for reprints of materials for Program use and other Program supplies.	$5,000	

[1] Part of the campaign budget will be funded as a discretionary PI/P project. (See next page)
[2] See FY 03-04 WE&O Work Plan

Table 3-2
FY 03-04 PI/P Projects

Project Title	Project Description	Budget	Comments
Total FY 03-04 Collaborative PI/P Project Budget		**$590,000**	
Collaborative PI/P Projects			
1. Trash Fact Sheet	Develop a fact sheet for providing guidance on how to conduct a stream trash clean up.	$ 8,000	Proposed by Trash Ad Hoc Task Group and approved by the PI/P Ad Hoc Task Group.
2. WEO Campaign	This project involves developing and conducting the Spring 2004 media advertising campaign.	$125,300	The Watershed Watch media advertising campaign has been split into a Summer 2003 campaign (non-discretionary) and a Spring 2004 campaign (discretionary).
3. CASQA Dues	Payment of CASQA dues.	$25,000	CASQA (formerly SWQTF) dues are now $15,000 per year. This includes $10,000 for FY 02-03 and $15,000 for FY 03-04.
Total FY 03-04 Collaborative PI/P Project Budget		**$158,300**	

Attachment 3-1

Santa Clara Valley Urban Runoff Pollution Prevention Program

Task 13 Watershed Watch Campaign Work Plan Year Four, FY 2003-2004

Prepared By: TRG & Associates

Introduction

The Santa Clara Valley Urban Runoff Pollution Prevention Program (Program), together with the Watershed Management Initiative (WMI) will be embarking on Year Four of the Watershed Education and Outreach (WE&O) campaign known as "Watershed Watch" at the start of FY 2003/2004. Year Three of the campaign, FY 2002-2003, in progress, is the second full year of implementation of the campaign. The first year (FY 00-01) involved development of the Three Year Plan, First Year Work Plan, the Latino Characterization Study and campaign materials. Year Two (FY 01-02) was launched in September 2001, with the media advertising campaign and other approved campaign elements.

In this current fiscal year, the campaign continues to focus on media advertising, a presence at numerous events, school education outreach assemblies, developing and implementing partner resources, and other tasks described below.

FY 02-03 Progress to Date

The following is a list of tasks completed to date (or ongoing where noted) during the first half of Year Three (FY 2002-2003).

- **Task 2 - Develop Materials** – Coupons have been printed and inserted into Watershed Watch Kits distributed through the school education assembly program. Coupons for admission to programs at the Don Edwards San Francisco Bay National Wildlife Refuge and for the Guadalupe River Park & Gardens have been inserted and are being distributed to students. (Ongoing)

- **Task 3 - Partner Coordination -** Continued development of the partner database and conducted numerous meetings with new potential partners. New partners this fiscal year include Guadalupe River Park & Gardens, United Neighborhoods of Santa Clara County, County Household Hazardous Waste, San Jose Chamber of Commerce, Hispanic Chamber of Commerce, Aquatic Outreach Institute, MEEA and RAFT. (Ongoing)

- **Task 4 - School Education Outreach –** Forty ZunZun assemblies have been funded for this fiscal year and 36 assemblies have been scheduled to date. The assembly program has been revised to focus more on watersheds and impacts to our creeks and Bay. A teacher evaluation post card has been developed and provided to ZunZun for distribution to

teachers whose students experience the assembly. Twenty-eight teacher surveys have been returned. A mid-point and year-end evaluation will be submitted during the year. (Ongoing)

- **Task 5** – **Donor Advised Fund –** The Donor Advised Fund was established through the Rose Foundation. A "wish list" of potential funded activities has been submitted to the Program for review and approval. A packet of materials has also been developed. (Ongoing)

- **Task 7** – **Events** – Developed and updated the events calendar on a monthly basis; organized and attended numerous events; coordinated materials and supplies for media partner events. (Ongoing)

- **Task 8** – **Research and Develop Media Advertising –** Launched radio, print and transit advertising campaign with media partners that will run in two flights during the year; developed scripts for English and Spanish radio commercials; designed transit and print ads (both English and Spanish); continuing to assist media partners with potential third party sponsor promotions. Developed draft mercury advertising campaign plan and submitted to the Program for review and approval. (Ongoing)

- **Task 9** – **Communications Networks** – Continued development of communications database and have submitted to the Program for review, three articles related to the campaign (mercury, automotive and litter). Another article was developed specifically for the San Jose Chamber of Commerce. (Ongoing)

- **Task 11** – **Develop Web Site –** Continued to maintain, revise and add information to the web site, including IPM pages, Spanish translations and partner links. (Ongoing)

- **Task 12 - Reports and Meetings –** Attended meetings with WEO PI/P Ad Hoc Task Group and other committees; submitted monthly reports; developed Watershed Watch Campaign Update (one completed and second in production); frequent communication with Program staff. (Ongoing)

- **Task 13 - Develop 2003-2004 Work Plan** – Submitted draft work plan outline to Program on November 8th for review and received comments on November 25th.

- **Latino Focus Groups** – Selected a Latino focus group firm to organize, facilitate and make recommendations regarding the media campaign, Watershed Watch materials and general public outreach. Two focus groups were held and a final report was submitted. TRG & Associates utilized recommendations to modify media messages and to help target Latino communities through partnerships and the school education program. (Final)

- **Asian/Pacific Islander Characterization Study –**The study has been initiated in December after approval from the Ad Hoc Work Group. (Ongoing)

FY 2003-2004 Campaign Strategy Summary

Year Four of the campaign will focus on continued implementation of public outreach activities to help achieve the WE & O objectives. It is recommended the campaign continue with the tactics that have proven successful (gauged through number of participants, value added, responses to web site, etc.) and continue to reinforce the watershed/pollution prevention messages using the tools already developed and in progress including advertising, partnering, events, school education, web site, material distribution, newsletter articles and the information hot line. Use of the Watershed Watch pledge card and discount card has been minimal – through some new efforts with media partners in FY 2002-3, the consultants are hoping to increase the use through new promotions. A public opinion survey and/or other means of evaluating the campaign will occur in Fall 2003. The feedback from these evaluation methods may be used to modify messages, advertising, promotions and other campaign strategies.

These tactics will be broadened and built upon through strategies such as adding new partners, finding grant funding for the donor-advised fund; increasing the number of school assemblies to include new schools; broadening the web site; and creating new promotions and activities through the media and partners. It is recommended that messages in the media and other communications begin focusing on very specific behaviors and perhaps an emphasis that "it's the law".

Some new avenues are currently in development, and if proven successful, can be continued and expanded in Year Four. These include:

- Development of a community workshop with partners to educate the public about nontoxic gardening, pest control (IPM methods), and safe disposal of household hazardous wastes. The consultants are currently in discussion with Guadalupe River Park & Gardens and other partners to implement a Spring 2003 workshop. If successful, it is recommended that another workshop or workshops be conducted in FY 03-04. Efforts will be coordinated with Master Gardeners and individual co-permittees
- Another tactic in development is working with other IPM efforts in local hardware stores to set up tables and displays promoting pollution prevention in gardening, household activities and automotive care. Through IPM meetings, this concept will be further pursued.
- An environmental educators' roundtable at Children's Discovery Museum is being discussed for Spring 2003. The purpose of the roundtable is to better coordinate and share resources so that watershed messages are integrated into other science-based programs, and to more efficiently promote these programs. If there is interest, new partnerships may develop that can expand the Watershed Watch school program or other elements of the campaign.
- The consultants are working with the Alviso Education Center to broaden the scope of International Migratory Bird Day and help attract more visitors to the event. If successful, the effort to further expand and promote the event in FY 03-04 would be worthwhile.

Campaign Messages

The Watershed Watch campaign will continue to utilize the key messages adopted in the Watershed Education and Outreach Strategy. Messages will focus on four pollutants: automotive fluids, litter, mercury and pesticides, and will include more specific information about what the public can do to reduce these pollutants. Through the Latino focus groups, it was recommended there also be a message stating that "it's the law", to prevent pollutants from entering storm drains.

The primary messages for adults, school-aged children and Latinos include:

- A watershed is a land area that drains water into a creek, river, lake, wetland, bay or groundwater aquifer. In the Santa Clara Valley, all the water from rain and irrigation which flows over the land surface (called runoff) goes into storm drains, creeks and rivers that flow directly into San Francisco Bay.
- You live in a watershed that flows to a local creek, and all of the runoff from your home, yard and neighborhood flows to that creek. Your actions affect local creeks and the Bay.
- Be a watershed steward.
- By protecting the watershed, creeks and the Bay, you are protecting the environment for yourself, your children and future generations.

Secondary messages for adults, school-aged children and Latinos include:

- Protection of the natural resources in our watershed is essential to maintain the health and well-being of all living things.
- Participate in activities that protect or enhance the watershed, creeks and the Bay. [Provide information regarding opportunities].
- You help protect the watershed, creeks and the bay when you handle and dispose of pollutants correctly. [Pollutants to be addressed include, but are not limited to, pesticides, mercury, trash/litter, pet waste and household hazardous waste.]
- Choose behaviors that benefit the watershed and protect natural resources. [Take your car to a commercial carwash, recycle oil, take household hazardous waste to your local collection facility, use pesticides only as a last resort, and clean up after your pet.]
- Don't dispose of anything into a storm drain. It's the law!

The consultants may also work with Program staff to integrate or promote other PIP outreach activities. These activities can be supported through use of the Watershed Watch web site, use of the logo on materials, news stories, events and some promotions as they develop. The consultants will also continue to coordinate with BASMAA's regional advertising campaign and its media relations efforts.

FY 2003-2004 Work Plan Tasks

The FY 2003-2004 campaign includes the following tasks:

- Task 2 – Develop Materials
- Task 3 – Partner Coordination and Promotions
- Task 4 – School Education and Outreach
- Task 5 – Donor Advised Fund
- Task 7 – Events and Event Calendar

- Task 8 - Media Advertising
- Task 11 - Web Site
- Task 12 - Reports and Meetings
- Task 13 - Develop 04-05 Work Plan
- Task 14 - Plan For Public Opinion Survey

Description of Tasks

Task 2 Develop Materials

Purpose:

The purpose of creating collateral materials is to have adequate tools that help communicate the WE & O messages.

Description of Tasks:

At its January 13, 2003 meeting, the WEO/PIP AHTG decided to eliminate the budget under this task for developing and printing new Watershed Watch brochures and kits. The remaining budget for this task will be used for development and insertion of coupons and/or flyers into the Watershed Watch Kits.

Targeted Audiences:

Santa Clara Basin Adults
School Aged Children
Latino Community

Goal:

To provide information about other resources that support the campaign messages.

Co-permittee/Program Staff Responsibilities:

Review and approve copy of coupons/flyers according to the review process developed by the Program.

Budget:

$3,825

Deliverables:

- Two coupons/flyers for insertion into WW Kits

Completion Date:

June 30, 2004

Task 3 Partner Coordination and Promotions

Purpose:

To seek partners from the business, environmental, government, media and community/nonprofit sectors that will help augment campaign funding and resources, and demonstrate widespread support for the campaign.

Description of Tasks:

Developing partners has proven successful to augment campaign resources. Partners have published newsletter articles, distributed Watershed Watch Kits through educational and promotional activities and events, offered web site links and shared other resources. It is recommended that partner development continue, with further emphasis on businesses, other government programs and nonprofits, especially in the Latino and Asian communities and with youth. The consultants will seek new publicity and promotional opportunities (discount cards, contests, etc.) that will occur as partners are secured. The consultant will identify new potential partners, arrange meetings and coordinate any resulting partnership arrangements. The consultant will also continue to work with past and existing partners so that the list of partners continues to grow each year.

Work with the Alviso Education Center will continue. Activities and events related to the 'Watershed Watchers: Keeping Our Waterways Clean" project will be promoted. This project is being implemented in cooperation with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso. The general focus of the project is to increase public awareness of urban runoff pollution and how to reduce its harmful effects through behavior changes. Sharon Miyako, Interpretive Specialist for the San Francisco Bay Wildlife Society, implements this project with funding from the Program. Work plan for FY 03-04 is yet to developed. It will be similar to the FY 02-03 work plan and will implement the programs/ activities described in Attachment A.

Targeted Audiences:

Community Leaders/Nonprofits
Business and Industry
Co-permittees
Other Regulatory Agencies

Goal:

To secure partners who can bring additional resources to the campaign.

Co-permittee/Program Staff Responsibilities:

Co-permittees and staff may be asked to attend some partner meetings if there is a need for more technical/regulatory information.

Budget:

$18,950

Deliverables:

- 20 partner meetings, ongoing promotions with existing partners
- Seven new partners
- Implement new promotions as they occur
- Continue working with Alviso Education Center
- Partner matrix updated on a monthly basis with value of partnership and description of activities

Completion Date:

June 30, 2004

Task 4 School Education Outreach

Purpose:

The purpose of school outreach is to reach school aged children, one of the targeted audiences, with messages about watersheds and how to protect them; to promote watershed stewardship; and change behaviors that negatively impact creeks and the bay.

Description of Tasks:

The school education program consists of assemblies presented by ZunZun, a post-assembly teacher evaluation; distribution of the Watershed Watch Kits to all participating schools; insertions of coupons to Don Edwards National Wildlife Sanctuary and Guadalupe River Park & Gardens into the Kits; developing, printing and distributing teacher evaluations; ongoing coordination with ZunZun; and mid and final reports. The coupons invite families to visit both locations and participate in workshops and events. If more opportunities arise to promote environmental education, the consultants will develop new coupons for insertion into the Kits. It is recommended and budgeted to increase ZunZun assemblies to 50 performances.

It is recommended that the web site be expanded to include activities for students and resources for teachers. As mentioned in the Summary, partnerships with other environmental education programs may result in additional activities and means of promoting Watershed Watch messages in the schools. In addition, outside funding sources will be investigated to fund specific field trips for the classes that view the ZunZun assembly, either as an incentive for returning their evaluation or to reinforce watershed education.

To continue to expand the Watershed Watch campaign into schools, the consultant will look into watershed-related class video projects for students. Several high schools have televisions in every room that can broadcast video. We can develop a letter that outlines a video project idea and through discussions with partners, the consultants may be able to find funding for this project.

Targeted Audiences:

School Aged Children
Educators
Latino Communities (schools residing in predominantly ethnic communities)

Goal:

To build long-term understanding of watersheds and teach students how to prevent pollution.

Co-permittee/Program Staff Responsibilities:

Review and comment on mid-point and end of the year evaluation of surveys. The schools work group will be involved in this evaluation, and provide direction for the ZunZun assemblies.

Budget:

$12,050

Deliverables:

- Fifty (50) ZunZun assemblies (funding is directly from Program)
- Mid-point and end of year evaluations based on teacher evaluation post cards
- Field trip investigation and recommendations
- Develop school web pages as resources for teachers and students
- Identify a watershed-related class video project and try to obtain funding for one through partners

Completion Date:

June 2004

Task 7 Events Calendar/Planning & Coordination

Purpose:

To reach wide audiences at various events to build watershed awareness, promote campaign messages and disseminate information and materials.

Description of Tasks:

Development of the events calendar, with TRG-staffed events and partner events would continue and potentially be expanded. It is also recommended that the concept of community workshops dealing with gardening and pesticides reduction be further pursued, depending on the outcome of the consultant's effort in FY 02-03. The consultants will continue to seek partners (media and others) who will distribute Watershed Watch Kits at events. The consultants will meet and work with the Alviso Education Center staff to help promote and expand center events.

Targeted Audiences:

Santa Clara Valley Adults
School Aged Children
Latino Communities

Goal:

To reach out to large groups of people in order to disseminate information and educate about watersheds and watershed issues.

Co-permittee/Program staff responsibilities:

Co-permittees will inform consultant of events occurring within their jurisdictions and request materials as needed. Program staff will work with consultant to develop new events and staff events as necessary.

Budget:

$34,600

Deliverables:

- Coordination of materials distribution and related promotions at a minimum of 20 events
- Staffing, coordination and planning at four events (out of the 20)
- Coordination of a community IPM workshop as budget allows
- Brief listing of attended and upcoming events as part of the monthly campaign reports
- For each event attended by the consultant and/or Program staff, an event summary sheet will be completed with the types and numbers of materials distributed, target audiences reached, and approximate number of attendees.

Task 8 Media Advertising Campaign

Purpose:

Implement a media advertising campaign that provides high visibility to the watershed message, increases awareness and eventually influences behavior change with the targeted audiences.

Description of Tasks:

Due to budget considerations, $117,000 of the media budget has been moved into the "discretionary" budget for FY 03-04. The remaining budget, $100,475 will be utilized to develop a Summer 2003 media advertising campaign. This will be followed by an evaluation (public opinion survey and/or other evaluation methods) of the campaign by a selected market research firm. Co-permittees will decide whether to participate in a Spring 2004 media advertising campaign based on the evaluations and other criteria.

The Summer 2003 media advertising campaign will be developed at the end of FY 02-03 and will most likely be a mix of radio and print (English and Spanish).

The consultants will continue to request "value added" resources from media partners and work to bring in third party sponsors; however these resources will be less than in previous years because the consultants will not be able to negotiate for more than one quarter of advertising.

Media relations in the form of press releases, interviews and stories will continue to be pursued through media partners. A Request for Proposal (in FY 02-03) will be distributed to appropriate media outlets to determine optimal schedules, coverage, and value-added resources. The consultant will work with the media buyer to recommend media for FY 03-04, and will continue to track invoices, meet with media partners as necessary and provide mid and end of the year media evaluations. The FY 03-04 media plan will be completed at the end of FY 02-03.

Tasks:

- Develop creative, scripts and graphic design of advertising (Summer '03)
- Monitor invoices for accuracy of billing and evaluate value-added resources
- Meet as necessary with media partners to encourage and develop third party sponsors and other promotions
- Track and report responses to the hot line, web site, and other promotional calls to action and report in mid and final media reports
- Coordinate with BASMAA and co-permittees as opportunities arise with media relations and advertising
- Develop 04-05 Media Plan

Targeted Audiences:

Santa Clara Basin Adults
School Aged Children
Latino Communities

Goal:

Continue to implement media advertising that increases watershed awareness and educates the public about specific pollution prevention actions they can take.

Co-permittee/Program staff Responsibilities:

Co-permittees and Program staff will review and approve all scripts and print advertising prior to publication, and review the mid-year and final media reports.

Budget:

$100,475 (includes media buys) – the remaining $117,000 will be placed in a discretionary budget

Deliverables:

- Scripts, print advertising and any other materials needed to support the media advertising campaign
- Mid-year and final media reports
- Implementation of third party promotions
- FY 04-05 Media Plan by June 2004

Completion Date:

June 30, 2004

Task 11 Web Site Development

Purpose:

To provide up-to-date information in an easily accessible format regarding the campaign, watersheds, pollution prevention practices, upcoming events, promotions and contests and partner-related activities. To encourage and increase public participation in activities and behaviors that protect, preserve, and improve the watershed.

Description of Tasks:

The web site has continued to draw strong numbers of viewers seeking more information about watersheds, therefore it is recommended that consultants continue to modify and add new information to the site to attract repeat viewers. As mentioned in Task 4, it is recommended that a kids' page and teacher resources page be fully developed and promoted through the assembly program. A Public Participation Opportunities page will also be developed and posted. Community workshops and other events will be promoted, and partners will continue to be added. The web site will also be expanded to include information on best management practices for restaurants and other types of businesses with specific information that can be easily downloaded. A Plan for updating the site will be submitted to the WEO PI/P AHTG for review and approval before new pages are added.

Targeted Audiences:

Santa Clara Basin Adults
School Aged Children
Latino Communities

Goal:

To provide additional and more detailed resources and information, and to continue to develop new resources to maintain viewer interest.

Co-permittee and Program Staff Responsibilities:

Program staff and a small work group of co-permittees will review web site content. Co-permittees may suggest links and other resources.

Budget:

$24,050

Deliverables:

- Development of a minimum of 10 new pages and ongoing upkeep and maintenance
- Monthly reporting of web statistics

- Web Site Update Plan

Completion Date:

June 30, 2004

Task 12 Reports & Meetings

Purpose:

To maintain and improve ongoing communications with Program staff and WEO PI/P Ad Hoc Task Group members regarding campaign progress.

Description of Tasks:

Monthly activity, partner and event reports will continue to be produced monthly, and the Campaign Update will be published quarterly as an internal document to keep co-permittees and various committees informed. The consultants will participate in WEO PI/P Ad Hoc Task Group meetings and other presentations as requested.

Targeted Audiences:

Program Staff
Co-Permittees
WEO PI/P Ad Hoc Task Group

Goal:

To ensure smooth communications between Program staff, the WEO PI/P Ad Hoc Task Group and the consultants.

Co-permittee and Program Staff Responsibilities:

Attendance at WEO PI/P Ad Hoc Task Group meetings, Program staff review of progress reports, invoices and progress with deliverables.

Budget:

$11,950

Deliverables:

- 12 monthly reports
- Three Campaign Updates
- Meetings with WEO PI/P Ad Hoc Task Group and Program staff
- Three presentations (as requested by Program staff and the WEO PI/P Ad Hoc Task Group)
- Mid-year and end of year reports on the effectiveness of the campaign, including Kits distributed, hot line calls, web site hits, events attended and other relevant statistics

Completion Date:

Mid-year Report – January 15, 2004
Final Report – June 30, 2004

Task 13 Develop 2004-2005 Work Plan

Purpose:
To have a Work Plan that describes tasks, activities, budgets and timeline for FY 2004-2005.

Description of Tasks:
The consultant will develop a FY 2004-2005 Work Plan that includes target audiences, key messages, media advertising strategies, event participation, partner participation, and other activities and tasks. The Plan will also include a budget and timeline, and methods for evaluating effectiveness, such as a public opinion survey.

Targeted Audiences:
WEO PI/P AHTG
Budget Ad Hoc Task Group
Management Committee

Goal:
To develop a 2004-2005 Work Plan that meets the WE & O campaign goals and objectives

Co-permittee and Program Staff Responsibilities:
Program staff, WEO PI/P Ad Hoc Task Group and Management Committee will review and approve the Work Plan.

Budget:
$11,330

Deliverables:
- FY 04-05 Work Plan, Budget and Timeline

Completion Date:
Draft Work Plan: December 15, 2003
Final Draft: February 15, 2004
Final Work Plan: July 1, 2004

Task 14 Plan for Public Opinion Survey

Purpose:
To help measure campaign effectiveness at creating understanding of watersheds and gauge the public's willingness to utilize pollution prevention measures.

Description of Tasks:
The consultant will work with the selected market research firm to help to develop an approach to conducting a follow-up survey to the survey conducted in 1999 and other evaluation tools and help to evaluate the effectiveness of the campaign. The survey will be conducted in Fall 2003. The consultant will meet with the selected firm to determine the format, questions asked and select the most effective period of time to conduct the survey.

Targeted Audiences:
N/A

Goal:
To effectively measure campaign effectiveness and to adjust campaign tactics if necessary.

Co-permittee and Program Staff Responsibilities:
Program staff and the WEO PI/P Ad Hoc Task Group will be responsible for preparation of the Request for Proposal, and the selection process. Funding for a public research firm will be the responsibility of the Program.

Budget:
$6,350 (does not include market research firm)

Deliverables:
- Consultant assistance with survey and evaluation tool development, reporting of evaluation results, and application of results to campaign.

Completion Date:
December 2003

Campaign Budget Summary:

TRG/Vendor Budget	$ 223,580
Alviso Education Center Funding	$75,700
ZunZun Funding	$25,000
Campaign Survey (new consultant)	$ 43,900
Subtotal	**368,180**
EOA markup (10%)	$36,818
EOA Staff Support	$50,000
Total Campaign Budget	**$454,998**
Value Added Resources	TBD
Total Campaign Resources	TBD

Attachment A: "Watershed Watchers: Keeping Our Waterways Clean" Program with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso.

Funding from SCVURPPP supports an interpretive specialist position at the Alviso Education Center to conduct the Watershed Watchers Program. The program includes the following elements:

Watershed Watchers: Puppet show introducing the concept of watershed and urban runoff performed on-site and off-site (typically 4 times per year).

Watershed Watchers Off-Site: Puppet show introducing the concept of watershed and urban runoff performed off-site.

Watershed Watchers Map Adventure: Visitors trace the path of a storm drain to the Alviso Marina, returning to the storm drain to stencil with "No Dumping, Flows to the Bay."
Wildlife in Our Watershed Depends On You: Interpretive programs focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed. Examples include children's bird walks, salt marsh mud studies, twilight walks, and general nature hikes followed by chemical demonstration of eutrophication.

Gardening Without Chemicals Workdays: Garden work days emphasizing chemical-free gardening techniques.

Gardening Without Chemicals Workshops: Workshops guiding visitors through various native plants in EEC demonstration gardens while discussing chemical-free gardening techniques used in the gardens and implementation methods for the home garden.

Help Save the Bay This Holiday: Guided nature tours in Bay habitats based on a holiday theme. The program addresses how individual behaviors cause urban runoff pollution affecting wildlife habitat in the watershed.

Our Role in Preventing Urban Runoff: Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. Usually done with groups that make reservations, like Scouts and Lyceum.

Special Events: These events are designed to attract at least 200 people to the EEC for various activities including games and crafts educating about urban runoff pollution prevention.

Watershed Clean-Up: A concentrated effort to remove litter from watershed areas like creeks and sloughs.

Informal Indoor Visitor Contact: Includes interaction at the Center, answering visitor questions over phone.

Distribution of Specified Programs to Local Media: Includes contacting Bay Area Parent, Mercury News, and Metro and creating appropriate descriptions/press releases.

Developing and Maintaining Partnerships with Local Community Organizations: phone calls and e-mails to groups such as San Jose Community Gardens, the San Francisco Bay Bird Observatory, volunteer coordinators at local companies such as Intel and Sony, etc.

Coordinating Refuge Volunteers for Interpretive Programs/Gardens: Contacting volunteers to lead programs, training, and maintaining relationships with volunteers. Scheduling volunteers for special events.

Alviso Summer Camp: This includes acting as a leader and assisting in program planning for the one-week annual camp targeting Alviso residents.

Attachment 3-2

FY 03-04 Development Strategy Checklist
Pesticide User Outreach

1. **Project Title:** **Pesticide User (PU) Outreach**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:**
   Toxicity due to organophosphate pesticides (diazinon and chlorpyrifos) in local creeks and San Francisco Bay. Selection, use and disposal of pesticides by residential and commercial users, pest control operators, and pesticide retailers.

4. **General Project Description:**
   This project combines the best elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements in the SCVURPPP NPDES permit. The approach will be coordinated with other pollution prevention programs funded by co-permittees, such as the County's Household Hazardous Waste Program. Scope to be developed based on the Program's Pesticide Management Work Plan and the results of the FY 02-03 outreach work. Activities may include: continued outreach to retailers and point-of sale promotion of less toxic pest control methods; outreach to PCOs/landscapers; and coordination with County programs in outreach to the public on proper disposal of pesticides. SCVURPPP will continue to support the regional IPM Partnership effort and some outreach to pest control operators through its participation in BASMAA.

5. **Outreach/Activity Areas and Communication Goals:**
   PI/P Outreach/Area to be further determined. PI/P Communication Goal will include Increasing Awareness and Changing Behavior, particularly with respect to pesticide use and disposal.

6. **Target Audience:** To be determined, may include:
   (X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools,
   ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education,
   ( ) Other_____

7. **Distribution Strategy:**
   To be determined.

8. **Describe how the success of the project will be measured:**
   To be determined.

9. **Have similar projects been done by other agencies?**
   To be determined.

10. **Schedule:**
    FY 03-04

11. **Budget:**

    $40,000

FY 03-04 Development Strategy Checklist
Pesticide User Outreach

12. Identify the evaluation criteria that the project meets:

(X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
(X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
(X) County-wide implementation will be more cost-effective than local implementation.
(X) The project supplements a regional project and/or program.
(X) The success of the project is measurable.
(X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. Implementer(s): (X) Work Group, (X) Program Staff, ( ) Consultant, ( ) Other:_____

FY 03-04 Development Strategy Checklist
Mercury Outreach

1. **Title:** Mercury Pollution Prevention

2. **Project Proposer:** SCVURPPP Mercury Pollution Prevention Ad Hoc Task Group

3. **Specific Pollutant or Behavior Project Addresses:** Mercury

4. **General Project Description:** The reissued NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedance of water quality standards for mercury.

Mercury has been found in sediment from the South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires a mercury pollution prevention plan that includes public education regarding mercury, products containing mercury and proper disposal. The Program completed a Mercury Pollution Prevention Plan and submitted it to the Regional Board on March 1, 2002. The outreach tasks in this Plan are the basis for the FY 02-03 (Phase I) and FY 03-04 (Phase II) work plans. The focus of outreach in FY 02-03 was residential fluorescent lamps disposal. In FY 03-04, this outreach will be extended to small businesses and conditionally exempt small quantity generators. It will also be coordinated with municipal inspectors for integrating mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.

5. **Outreach/Activity Areas and Communication Goal:** Develop a fluorescent light recycling outreach program to educate commercial users and coordinate efforts with municipal inspectors

6. **Target Audience:**
   (X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools, ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education, ( ) Other_____

7. **Distribution Strategy:** To be determined.

8. **Describe how the success of the project will be measured:** Survey of public bringing in mercury wastes to household hazardous waste collection events, number or amount of mercury-containing products (i.e. fluorescent lamps, thermometers) collected by household hazardous waste facilities; description of outreach methods used; number of outreach materials distributed.

9. **Have similar projects been done by other agencies?** City of Palo Alto has conducted a FLT recycling program. Smaller projects (i.e. thermometer take-back programs) have been conducted by other agencies.

10. **Schedule:** FY 03-04 (Phase II)

11. **Budget:** $25,000 for FY 03-04

FY 03-04 Development Strategy Checklist
Mercury Outreach

12. Identify the evaluation criteria that the project meets:

(X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
(X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
(X) County-wide implementation will be more cost-effective than local implementation.
( ) The project supplements a regional project and/or program.
(X) The success of the project is measurable.
(X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. Implementer(s): SCVURPPP Mercury Pollution Prevention Outreach Work Group for FLT recycling in coordination with the Watershed Watch campaign and the SCVURPPP PIP Ad Hoc Task Group

FY 03-04 Development Strategy Checklist
Program Supplies

1. **Project Title:** **Program Supplies**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:** Varies

4. **General Project Description:**
   To provide a budget to support requests by the public and co-permittees for Program materials and supplies. This budget allows Program staff to reprint materials and reorder supplies as needed.

5. **Outreach/Activity Areas and Communication Goal:** N/A

6. **Target Audience:** To be determined, as needed.
   (X) Residential, (X) General Public, (X) Industrial, (X) Commercial, (X) Schools, (X) Municipal Employee Training, (X) Public Officials, (X) Multi-cultural Education, (X)
   Other_____

7. **Distribution Strategy:**
   Program staff will coordinate material reprints, reordering supplies and distribution to co-permittees as appropriate. Program staff distributes materials at public events and in response to telephone, e-mail or web site requests.

8. **Describe how the success of the project will be measured:** The Program logs all requests for materials and tracks the amount of materials distributed. The need for reprints is based on successful distribution of existing stock.

9. **Have similar projects been done by other agencies?** N/A

10. **Schedule:** As needed.

11. **Budget:** $5,000

12. **Identify the evaluation criteria that the project meets:** N/A

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    ( ) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. **Implementer(s):** Program Staff

FY 03-04 Development Strategy Checklist
Stream Trash Clean-up Fact Sheet

1. **Project Title:** Stream Trash Clean-up Fact Sheet

2. **Proposer:** SCVURPPP Trash AHTG

3. **Specific Pollutant or Behavior Project Addresses:** Litter and/or illegal dumping in creeks.

4. **General Project Description:** Develop a fact sheet for providing guidance on how to conduct a stream trash clean-up.

5. **Background:** Citizen groups have had difficulty obtaining guidance on how to conduct trash clean up events in local streams, especially for sites that are not owned by SCVWD or are not in the District's right of way. Additionally, the Program's "pollutant matrix" for planning PI/P projects (Table 3-1 in PI/P Work Plan) identifies trash as a pollutant of concern. The Program does not have any existing PI/P materials that focus on how to clean up trash in streams.

6. **Scope of Work:**

- Review existing outreach materials available from SCVURPPP agencies like the District's "Why do people dump trash in creeks", "Adopt a Creek ", "Adopt a creek permit application", and materials being developed by San Jose and the Creek Connection Action Group.
- Identify and provide the following information in the fact sheet
  - Contacts at the Water District and all other public agencies including CDFG for obtaining permits and guidance on clean up events.
  - Information on stream trash cleaning procedures. This will include information on permits, liability, safety, access, jurisdiction, disposal issues, useful equipment, publicity, volunteer recruitment, event day supplies and site supervision.
  - Guidance on removal of large items that exceed volunteer capability.
  - Other existing clean up events, responsible organizations and contact information.
- Design fact sheet. Develop a web-version that can be downloaded and printed for use. Print a limited number of copies for Program use.

7. **Outreach/Activity Areas and Communication Goal:** General outreach to public for increasing awareness about procedures involved in conducting stream trash clean ups. Targeted outreach to citizen group, individuals, schools and other organizations that are interested in conducting trash cleanup.

8. **Target Audience:**

(X) Residential, (X) General Public, ( ) Industrial, ( ) Commercial, (X) Schools, ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education, (X) Other <u>Citizen Groups</u>

9. **Distribution Strategy:** The fact sheet will be made available in electronic format on the Watershed Watch website and individual co-permittee websites. It will also be distributed to local agencies for providing to individuals, organizations, and schools that are interested in conducting stream trash clean up.

10. **Describe how the success of the project will be measured:** The number of participants involved in stream trash clean-up events (other than the events sponsored by CCAG), that referred to the fact sheet as a source of information will be tracked. Page views/ downloads of the fact sheet on the websites will also be tracked.

FY 03-04 Development Strategy Checklist
Stream Trash Clean-up Fact Sheet

11. Have similar projects been done by other agencies: SCVWD Adopt-a-Creek brochure, "Why do People Dump Trash in Creeks" brochure, "Pick-Up San Jose" anti-litter program, CCAG.

12. Schedule: July 2003 – June 2004

13. Budget: $8,000

14. Identify the evaluation criteria that the project meets:

(X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
(X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
(X) County-wide implementation will be more cost-effective than local implementation.
( ) The project supplements a regional project and/or program
(X) The success of the project is measurable.
(X) The targeted audience is consistent with targeted PI/P activities and audiences.

15. Implementer(s): Work group consisting of Trash AHTG and PI/P AHTG representatives, Program Staff.

Attachment 4-1

Attachment 4-1
FY 2003-2004 Programmatic Monitoring Indicators

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Trash Work Plan	MP#2 & 3c	303d Threatened Listing	Begin implementation of Trash Work Plan (see Attachment 4-6 including separate project scope in Attachment 4-2). FY 03-04 tasks include: Further Inventorying and document existing trash management practices into summary report; Documenting and mapping municipal and agencies known trash problem areas; Conducting literature review of existing trash management practices and monitoring efforts used worldwide and incorporate into technical memorandum; Further developing RWQCB trash assessment methodology worksheet and evaluate utility of KAB litter index; Conducting trash evaluation training workshop; Developing standardized reporting and documentation format and procedures which detail and evaluate trash management practices; Organizing and managing Trash AHTG meetings; and participating in San Jose "Pick-Up San Jose" TAC meetings.	Technical memoranda; Standardized Reporting Format, Summary Report, Maps, Trash Management Survey Instruments	July 2003 - June 2004
Dioxin Plan Implementation	MP#1 Provision C.9.e.	NPDES permit and 303d listing	Implement Work Plan (see Attachment 4-5 Including separate project scope in Attachment 4-2).	Technical Review Memo(s) Participation in CEP – PCB Committee	Tied to CEP & BASMAA Time Schedule
PAH and Chlorinated Pesticides Activites	MP#1	303d Monitoring listing	See separate project scope in Attachment 4-2.	Technical Review Memo(s)	Tied to CEP & BASMAA

[1] Monitoring Priorities (updated at Monitoring AHTG meeting November 8, 1999):

1) New projects needed to implement the results, and achieve the goals, of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
   a) Investigate Beneficial Uses and Causes of Impairment (including field work)
   b) Review and Compile Environmental Data and Make it Accessible
   c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
   d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4) Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA

Attachment 4-1
FY 2003-2004 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
				Participation in CEP – PCB Committee	Time Schedule
Continued Implementation of Enhanced IC/ID and IND Tracking and Reporting	Follow-up/ Continuous Improvement MP#2 Provision 6.a.i.	SEIDP #21	⇒ Continue Implementation and Reporting of Enhanced Reporting ⇒ Revise IC/ID and IND Performance Standards	Database and annual report summary	September 2003
Metals Control Measures Plan	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.a & b	NPDES permit	Participate in discussions and reporting associated with implementation of baseline control measures and data analysis of triggers for copper and nickel. Partial support for clearinghouse	BMM technical assistance & status report	TBD
PCB Action Plan – Year 4	Follow-up MP#1,2 Provision C.9.e.	NPDES permit and 303d listing	Perform follow-up work on identifying and evaluating controllable sources Collaborative efforts with various technical work groups including the CEP, RMP, and BASMAA work groups. (See separate discussion for more details)	Year 4 Work Plan and Final Year 3 Report	Based on results of Year 3 work efforts
Pesticide Plan Coordination, Implementation, and Reporting	Follow-up/Continuous Improvement MP#1,2	Implement URMP Pesticide Manage-ment Efforts	Coordinate implementation of Program's Pesticide Plan. (See separate FY03-04 Work Pan)	Status Report and internal guidance	See Plan for details

Attachment 4-1
FY 2003-2004 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Compile, Maintain and Share Program/ Watershed Data	Follow-up MP#1	Continuation of Project SC22.63	Data management for the SCVURPPP Program. Coordinate data collected and analyzed by Program-sponsored projects. Insure that data is quality-assured, comparable across projects and comparable across watersheds (where possible). Make data accessible to Co-permittees and to the public. Maintain and update website. Summarize available information on the background, purpose, and activities of planned and ongoing studies of the physical, chemical and biological characteristics of creeks and wetlands in the Santa Clara Basin.	Updated inventory of data and metadata generated by the Program and by Program-sponsored studies.	Ongoing
Evaluate Assessment Review Report & Develop Plan of Action	WMI Beneficial Use Assessment MP#1,3a Provision C.10.	Follow-up to Coyote Pilot Asst	Consider the results of the assessment review report expected to be available in June 2003 and develop a plan of action for additional watershed assessment work efforts.	Plan of Action	October 2003
Support for Land Use Subgroup	WMI Subgroups MP# 1, 3c, 3d Provision C.10.	Continue WMI support	Provide administrative support and leadership for the Land Use Subgroup. Maintain the subgroup mailing list; prepare and distribute agendas; chair meetings; edit and distribute meeting summaries; liaison to, and correspond with, the SCBWMI Core Group other subgroups as needed; update workplans; facilitate interaction between consultants and the subgroup; summarize, compile, and convey subgroup products.	Meeting agendas and summaries, Work Plans and other products as directed by the subgroup.	July 2003 – June 2004
Copper and Nickel Baseline Activities	MP#3a Provision 9	BMM/RS Follow-up project Permit	Support FY02-03 Baseline Activities	See Attachment 4-3	FY02-03
Finalize WQ Monitoring Plan	Provision C.7.	Permit	Develop final draft 02-03 sampling (site selection) and QA plan	Sampling and QA plan	Coyote – July 2002 Others – Sept. 2002

Attachment 4-2

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Implement Trash Work Plan

Purpose: Begin implementing Trash Work Plan.

Background: This project is identified in Tasks 1 - 4 of the Program's Trash Work Plan. The Work Plan was prepared to fulfill a Program FY 01-02 Continuous Improvement item and actions within the Program's Multi-Year Receiving Waters Monitoring Plan. The Work Plan was developed in response to the November 14, 2001 San Francisco Bay Regional Water Quality Control Board (RWQCB) 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on a preliminary or "monitoring" list due to the threat of trash impairment to water quality. The State Water Resources Control Board adopted this recommendation in the final version of the 2002 Clean Water Act 303 (d) list.

The RWQCB Staff Report states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by stormwater agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information and developing a program of action to address the principle sources. Regional Board staff has indicated that it will review this specific information in the next listing cycle; determine whether specific water bodies warrant a 303(d) listing for trash and note the existence of relatively clean urban streams.

In a proactive response to the 303(d) Staff Report, the Program developed a Work Plan to identify a strategy for addressing trash problem areas that occur in urban streams and waterways. The Work Plan includes the following objectives: 1) Document existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in creeks; 3) Assist municipalities to identify high priority trash problem areas and sources of trash; 4) Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas; and 5) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

The tasks identified in the Work Plan will be completed over the next 2 years. The FY 03-04 tasks focus on developing guidance and tools to evaluate trash problem areas, implement management practices and document, report and evaluate the results of assessments and implementation actions. The FY 04-05 tasks focus on the development of a monitoring strategy and implementation of trash evaluations and management practices.

Scope Summary:

- Inventory and document existing and planned trash management practices and known trash problem areas found in urban streams within the Program's jurisdiction;
- Develop guidance document that identifies and evaluates trash management practices and monitoring efforts being implemented worldwide;
- Modify RWQCB trash assessment methodology and conduct trash assessment training workshop; and
- Develop and implement standard documentation and reporting format

Products: Summary Report (Existing Management Practices) and Maps (Known Trash Problem Areas); Technical Memorandum (Management Practices and Monitoring Literature Review); Modified RWQCB Rapid Trash Assessment Methodology; Trash Assessment Training Workshop; and Standard Reporting format and database.

Schedule: July 2003 – June 2004

Program Staff: John Fusco and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Sediment Assessment: Conduct Limiting Factor Analysis and Management Practice Assessment in Stevens Creek

Purpose: To determine if Stevens Creek is being impaired by sediment production from erosion due to anthropogenic activities by conducting a limiting factors analysis and sediment management practice assessment.

Background: In fulfillment of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) NPDES Permit Order No. 01-024 Provision C.9.f.iii paragraph two, the SCVURPPP submitted a sediment assessment work plan to RWQCB staff on August 30, 2002. The sediment assessment in Stevens Creek project was identified as Tasks 1 –3 of the SCVURPPP Work Plan "Conduct Watershed Analysis and Sediment Management Practice Assessment in Other Creeks Potentially Impaired by Sediment from Anthropogenic Activities". The Stevens Creek sediment assessment work plan identifies an approach to conduct watershed analyses and management practice assessments for portions of the Stevens and Coyote Creek watersheds within the next four years. These creeks were identified as high priority creeks in the SCVURPPP report "Identification of Creeks Potentially Impaired by Sediment from Anthropogenic Activities", which was submitted to the Regional Board in fulfillment of SCVURPPP NPDES Permit Provision C.9.f.iii paragraph one.

The sediment assessment work plan contains two separate phases. Phase I is scheduled for FY 03-04 and includes conducting a limiting factors analysis and sediment management practices assessment. Phase II includes conducting a rapid sediment budget and is scheduled for the subsequent year. Phase II will only be conducted if Phase I study results indicate that excessive sediment from anthropogenic sources is impairing beneficial uses in the watershed. The Watershed Analysis AHTG will review products developed in Phase I and make recommendations for Phase II or other future studies, as well as potential management actions. Watershed Analysis AHTG recommendations will be reviewed and approved by the Management Committee.

Scope Summary:

1. Conduct limiting factors analysis on Stevens Creek. Task include:
   - Compile and review existing watershed and biological data and information
   - Identify target species for limiting factors analysis
   - Identify and assess potential limiting factors and develop initial hypotheses
   - Conduct focused studies
   - Data analysis
2. Inventory, document and evaluate effectiveness of existing sediment management practices
3. Plan, organize and facilitate meetings with consultants and Watershed Analysis AHTG members.
4. Assist the AHTG to identify potential studies and management practices to be implemented in the future (approval by Management Committee)

Products: Technical Report (Limiting Factors Analysis); Summary Report (Sediment Management Assessment); Technical Memorandum (Implementation Recommendations)

Schedule: July 2003 – June 2004

Program Staff: Chris Sommers and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

PCBs Activities

Purpose: Assist the SCVURPPP in complying with Permit Provision C.9.e (PCB requirements) of the Program's NPDES permit.

Background: San Francisco Bay is listed as impaired by PCBs in the 2002 303(d) list. Permit Provision C.9.e of the Program's NPDES permit requires the SCVURPPP to develop a control program for PCBs. During the past three years, the SCVURPPP has provided leadership to Bay area stormwater programs in addressing PCBs. This has included coordinating efforts to characterize the distribution of PCBs concentrations in Bay area watersheds. The SCVURPPP has also performed PCBs case studies in selected areas with elevated concentrations of PCBs and coordinated similar efforts by other Bay area stormwater agencies. The case studies are aimed at identifying PCBs sources and developing controls. As part of these efforts, the SCVURPPP has led a work group of representatives from the BASMAA Monitoring Committee and Regional Board staff. The work group has met periodically to facilitate information sharing, coordination of field activities and regional planning. The SCVURPPP's overall goal has been to work with other stakeholders to develop data needed for the San Francisco Bay PCBs TMDL. The SCVURPPP continues to perform activities in support of the PCBs TMDL. Currently, the SCVURPPP is performing PCBs case studies in two new areas known to have elevated PCBs in embedded storm drain sediments and follow-up work in a third area (Leo Avenue in San Jose), coordinating similar case studies by other Bay area storm water programs, and performing a feasibility study on PCBs stormwater control measures.

Scope Summary: During FY 03-04, the SCVURPPP will continue to perform activities in support of the PCBs TMDL.[1] Program staff will:

- Perform follow-up work emphasizing continuing the process of identifying and addressing controllable sources of PCBs in urban runoff, if any. This work will be scoped after the results of the FY 02-03 case study work and stormwater control measures feasibility study become available, and may be performed in collaboration with other Bay area stormwater agencies.
- Continue to attend PCBs TMDL-related stakeholder, CEP, RMP and work group meetings and represent BASMAA on the CEP PCBs work group. As appropriate, review and comment on related documents prepared by the CEP, RMP and Regional Board staff.

Products: To Be Determined

Schedule: July 2003 – June 2004

Program Staff: Jon Konnan and Adam Olivieri

[1] The SCVURPPP is also testing bedded sediment samples from the bottom of the Lower Silver and Lower Penitencia Creek watersheds for PCBs and other pollutants of concern during its FY 02-03 surface water monitoring program. Similar sediment samples from the bottom of Adobe and San Thomas Aquino Creek watersheds will be tested for PCBs and other pollutants of concern during FY 03-04.

Santa Clara Valley
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MONITORING PROJECT SUMMARY

Dioxins, PAHs and Chlorinated Pesticides Activities

Purpose: Assist the SCVURPPP in addressing Regional Board requirements related to dioxins, PAHs and chlorinated pesticides.

Background: Dioxins and chlorinated pesticides are on the 2002 303(d) list for San Francisco Bay, though there is some controversy regarding these listings. PAHs are currently on the 2002 Monitoring List for the Bay. Regional Board staff believes that urban runoff discharges may be a contributing factor and are requiring assistance from stormwater programs to address these pollutants of concern. The SCVURPPP previously participated in a regional study that tested embedded storm drain sediment samples for chlorinated pesticides (and mercury and PCBs). The SCVURPP has also reviewed data on concentrations of dioxins in stormwater runoff and surface waters found in the Bay area and other areas, and are currently collaborating with other stormwater agencies to prepare a "synthesis" document on dioxins. The synthesis document will summarize the current state of knowledge regarding dioxin-like compounds in relation to stormwater runoff, and will include a discussion of the controversy surrounding the potential threats to the environment and human health in the Bay area by dioxins.

Scope Summary: During FY 03-04, program staff will perform the following activities related to these pollutants:[1]

- Work with the BASMAA Monitoring Committee to establish BASMAA's strategy for addressing these pollutants of concern and present this information to the CEP Technical Committee.

- Attend relevant stakeholder, CEP, RMP and work group meetings. As appropriate, review and comment on any related documents prepared by the CEP, RMP and Regional Board staff.

Products: To be determined.

Schedule: July 2003 – June 2004.

Program Staff: Jon Konnan and Adam Olivieri.

[1] The SCVURPPP is also testing bedded sediment samples from the bottom of the Lower Silver and Lower Penitencia Creek watersheds for PAHs, chlorinated pesticides and other pollutants of concern during its FY 02/03 surface water monitoring program. Similar sediment samples from the bottom of Adobe and San Thomas Aquino Creek watersheds will be tested for PAHs, chlorinated pesticides and other pollutants of concern during FY 03-04.

Attachment 4-3

Attachment 4-3

COPPER/NICKEL ACTION PLANS FY 02-03 UPDATE AND PROPOSED FY 03-04 WORKPLAN APPROACH

FY 2002-2003 UPDATE

The Program presented a summary of SCVURPPP Copper and Nickel Action Plan (CAP) FY01-02 activities in an appendix to the September 15, 2002 FY 2000 – 2001 Annual Report. That document outlined the Program's intent, consistent with the adaptive management structure of the CAP, to refine and streamline CAP reporting, and to help work towards developing a coordinated Bay-wide approach for appropriate CAP special studies and activities. Additional discussions about how to best move towards a Bay-wide CAP approach were conducted at meetings held on September 24, 2002 and November 18, 2002.

The Program has taken the lead on developing a revised baseline activity reporting form that was reviewed by the BMM/RS on 11/18/02. Requested changes will be made and a draft set of forms completed during March 2003. Key baseline activities will be reorganized and listed by topic. Special studies and investigations to track and encourage will be individually listed with information on how they are to be tracked/encouraged, who is responsible, the type of work products expected, and when work products are expected. The forms will be structured so that both historic and current actions/accomplishments will be sequentially listed for each activity.

During 2002, BACWA and BASMAA funded $205,000 for the Copper Nickel Impairment Assessment Step 2 Phase 1 work to prepare copper and nickel action plans and metals translators for the Bay north of the Dumbarton Bridge. To date, surveys of POTW baseline activities have been compiled (by BACWA/BASMAA contractors) along with a draft translator analysis. The draft north of Dumbarton CAPs are targeted for completion by June 2003.

The Program has been coordinating with the north of Dumbarton effort with the intent that the revised and streamlined South Bay baseline reporting formats be applicable as templates for the other stormwater programs (and POTWs) north of Dumbarton. Furthermore, it is anticipated that work products previously developed (or being developed) under the South Bay CAP could be used with minor modifications elsewhere around the Bay. Some examples would include corrosion reduction outreach materials for plumbers, the SCVWD format for tracking copper sulphate use by water suppliers, and education and outreach materials to control copper discharges from pools and spas. The Program has previously committed to preparing a summary of the most effective measures to control copper in discharges of stormwater from targeted industrial sources (targeted by July 2003) for distribution to BASMAA and other Bay Area stormwater programs.

Step 2 Phase 2 of the north of Dumbarton copper nickel work is also modeled after the SSO work conducted for the South Bay. That work consists of 1) a formal request for SSOs pursuant to the SIP section 5.2, 2) an Impairment Assessment Report, 3) derivation of one or more SSOs, and 4) assistance with preparation of a Basin Plan amendment package. A conceptual scope of work for this work was presented to and approved by the CEP Technical Committee on February

12, 2003. The CEP Administrative Committee and Executive Management Board (EMB) are preparing a detailed scope and budget for review and likely approval in March. The work is projected to take 12 – 15 months to complete at an estimated cost of $225,000.

There is a certain amount of actual and potential overlap between activities and reporting required under the CAP, under other Provisions of the Stormwater NPDES permit, and under WMI related activities. As part of the streamlining of the CAP, the Program believes it makes sense to focus the CAP on activities that are most specifically copper related and that are not already being reported on in another forum. As an example, there are several actions under the CAP general action CB-8 "Measures to classify and assess watersheds" that are being conducted by the SCBWMI and pursuant to SCVURPPP's permit provision C.3. It appears duplicative addressing or at least reporting on watershed assessment measures through the WMI, the Program, and the CAP. The Program will be completing its review of various assessment approaches by July 1, 2003 and developing recommendations relative to conducting future assessments.

During 2002 – 2003 the Program has been tracking proposed amendments to and reissuances of other stormwater program NPDES permits. These permits contain Provisions similar to those in the SCVURPPP permit with the same potential for overlap with an independent CAP. Or conversely, the stormwater permits could be construed to already require the equivalent of the key CAP activities. The Alameda Countywide NPDES Municipal Stormwater Permit, for example, contains requirements for:

- Illicit and Commercial Discharge Controls Program (potentially covering CB-1, 2, 3, 12)
- Monitoring Program (in part pollutant concentrations and mass loadings)
- Multi-year Monitoring and Assessment Plan (RMP participation)
- **Control Program for Copper** (runoff monitoring, BMPs, annual reporting)
- Control Program for Sediment (part of CB-15)
- Watershed Management (potentially covering CB-4, 8, 10 type activities)

Additional potential overlaps exist in POTW source control, pollution prevention, and pollutant minimization programs to the extent these programs are targeting and/or inspecting some of the same commercial and industrial sites.

As part of it's CAP streamlining efforts, the Program will be attempting to identify areas of duplication among programs and making recommendations as appropriate for changes to clarify responsibilities and to consolidate reporting (e.g., reporting by reference).

Program staff have continued to track activities related to CB-17 and 18 copper impairment uncertainty reduction and fate and transport studies while efforts continue to develop a strategy for how to most efficiently and effectively track and/or encourage these studies Bay-wide.

An interesting paper by Jassby et al. documented a 43% decrease in delta wide primary productivity from 1975 – 1995 due in part to invasion of the clam *Potamocorbula amurensis* in 1986. The paper also noted explanations for apparent trends can be tenuous since different variability mechanisms have different frequencies of occurrence, and more mechanisms play a

role as the monitoring duration increases (Annual primary production: Patterns and mechanisms of change in a nutrient-rich tidal ecosystem, *Limnology and Oceanography*, 47(3), 2002, 698-712).

Some more recent data from 1999-2001 documented increases in chlorophyll-a in October 2000 and April of 2000 and 2001 to near pre-*Potamocorbula* peak levels in Suisun, San Pablo, and Central Bays. This was monitoring conducted by the SFSU Romberg Tiburon Center as part of an EPA-funded project to develop indicators of ecosystem condition. It began in November 1999 with monthly routine cruises and added weekly cruises to track the spring and fall blooms. (Interagency Ecological Program Newsletter, Vol. 14, No. 4, Fall 2001).

The cyanobacterium *Synechococcus*, a genus present in the South Bay (Palenik and Jassby, RMP, 1999), was reported to be relatively copper resistant across a range of environments in the Sargasso sea compared to a closely related cyanobacterium *Prochlorococcus*. Specimens from shallow mixed layers were less sensitive to copper and were probably members of a copper resistant high-light ecotype. Large eukaryotic cells such as *Skeleonema costatum* were much less copper sensitive (~10 times) than small size and high surface to volume cells such as *Synechococcus*, perhaps explaining the prevalence of larger size species in areas with free copper ion concentrations over 100 pM (Copper toxicity and cyanobacteria ecology in the Sargasso Sea, Mann et al, *Limnology and Oceanography*, 47(4), 2002, 976-988).

The Program will update participants on the status of these streamlining and coordination activities, along with the status of each baseline stormwater and POTW activity, and the semi-annual CAP/NAP review in mid to late April 2003.

FY 2003 – 2004 WORKPLAN APPROACH

During FY 2003 - 2004 the Program intends to continue to implement the CAP baseline activities and to continue the efforts begun during FY 2002 – 2003 to:

1. More closely coordinate and integrate C/NAP baseline activities with related Program NPDES permit mandated activities.
2. Update and streamline reporting methods and formats to provide easier access to and tracking of current and historical actions and accomplishments.
3. Work with the South Bay POTWs to help the other Bay Area stormwater programs and entities develop North of Dumbarton Bridge C/NAPs based on the updated and integrated baseline activities and streamlined reporting methods and formats.
4. Identify special studies related to reducing the uncertainties identified during the copper/nickel impairment assessment effort that are not unique to the South Bay and would be most efficiently and effectively implemented Bay-wide.
5. Develop a process using the resources and knowledge of SFEI/RMP and the CEP to more comprehensively identify, track, and encourage investigations being conducted by others in the Bay-Delta region that will provide information useful to improving our understanding of copper/nickel impacts in the Bay.

Attachment 4-3

The Program views 2003 – 2004 as an important transition year for extending what have previously been South Bay only CAP activities to coordinated Bay-wide CAP activities. The Program intends to take an active role in transferring the South Bay CAP knowledge and experience to the other stormwater management entities around the Bay. To help make this happen, the Program will be proposing that the BASMAA Monitoring Committee add Bay-wide CAP development and implementation as a standing item to its agenda. This Committee is already the focal point for many of the relevant monitoring programs and TMDL and CEP efforts being conducted Bay-wide and in individual watersheds.

The Program envisions the process unfolding in the following manner. During the remainder of FY 2002-2003 the Program will take the lead on completing the updating and streamlining of the CAP activities tracking and reporting as described above. The Program will take the lead on presenting the proposed changes to the BMM/RS and incorporating their comments into final templates for reporting FY 2002 – 2003 CAP results and for guiding FY 2003 – 2004 activities.

The Program will assist the Step 2 Phase 1 contractors (EOA, LWA) in presenting the templates to the BASMAA Monitoring Committee and obtaining the Committee member's input on the baseline activities already being conducted, or proposed to be conducted, within their respective jurisdictions. The Program will also assist as needed with presenting this information to the North of Dumbarton Coordinating Committee (CC), to obtain broader based input into other, not specifically stormwater or South Bay based CAP activities. This CC will be serving as the CEP workgroup for the proposed Step 2 Phase 2 copper nickel effort that includes development of an Impairment Assessment Report, one or more SSOs, and a Basin Plan amendment package.

Another CAP item that appears appropriate for the Monitoring Committee to assist with is an appropriate ambient monitoring programs for copper and nickel. The Program will assist in two areas. The Program will present the approach used for developing ambient trigger concentrations and the monitoring program needed to assess compliance with the triggers to assist in developing and appropriate Bay-wide monitoring program and associated triggers. Input will be solicited from RMP staff to evaluate the extent to which the redesigned RMP monitoring can fulfill this need. A related issue that would appear appropriate for this forum is what if any additional copper and nickel monitoring is needed to address the 2002 303(d) program Monitoring List requirements and for development of future Reasonable Potential Analyses and NPDES permit effluent limitations.

Another area where the Program will provide Bay-wide CAP development assistance is with recommendations on potential watershed assessments that would be deemed appropriate to be conducted under the auspices of CAP activities. The Program will be completing by July 1, 2003 its review of various assessment approaches being conducted in the Bay area and nationally. As part of this effort input will be solicited on the progress and results of other pilot projects aimed at identifying and quantifying pollutants of concern such as being conducted through the RMP Sources Pathways and Loadings Work Group and the SWRCB Surface Water Ambient Monitoring Program (SWAMP) and RWQCB Regional Monitoring and Assessment Strategy (RMAS). The intent is to avoid redundant efforts and to put resources to their most effective use in the process of identifying what to study and how.

Another area where the Program will provide Bay-wide CAP development assistance is to help develop and implement a program to more comprehensively identify, track, and encourage investigations being conducted by others in the Bay-Delta region that will provide information useful to improving our understanding of copper/nickel impacts in the Bay. The Program will provide its revised template list of uncertainties to be addressed and investigations to be tracked as a starting point. The Program believes that tracking of these various investigations and their on-going results would be most effectively conducted with assistance from SFEI/RMP.

The RMP itself is conducting monitoring and special studies of relevance to copper such as attempting to develop improved sediment toxicity testing methods, ambient and sediment toxicity testing, and projects conducted by their various workgroups. The RMP is a member of the Interagency Ecological Program (IEP), that in turn has members or associations with many of the agencies and researchers conducting studies in the Bay-Delta region of relevance to CAP issues such as phytoplankton monitoring. The RMP has tasks in its current workplan directed towards improved data integration from other entities, and improved data dissemination.

The IEP is undergoing a comprehensive programmatic review with a final draft synthesis report from its Science Advisory Group expected in early 2003. One recommendation was that IEP Environmental Monitoring Program (EMP) data be "more rapidly and reliably turned into more useful products through increases human intellectual investment." The Bay-Delta Science Consortium (that includes most IEP members as well as several local universities and non-profit organizations) has an overall goal to "enhance cooperation and collaboration among researchers working in the Bay-Delta." As noted in the Winter 2002 IEP Newsletter, "CALFED intends to allocate one million dollars per year for the next few years to the Consortium to help sponsor activities that will help increase collaboration and cooperation." The Consortium also indicated their intent to sponsor an on-line technical journal and to "investigate ways of sharing digital information among the many data holders and increasing its utility for synthetic analyses."

The Program will work with the Monitoring Committee and the RMP to help develop a mechanism where relevant information from sources such as those noted above can be efficiently tracked and reported as part of the Bay-wide CAP. The Program will also work with the Monitoring Committee and the Coordinating Committee to evaluate the extent to which the copper conceptual model and associated fate and transport understanding needs to be updated.

Attachment 4-4

Attachment 4-4

Table 4-1. FY 03-04 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 03-04				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Adobe Creek	***Chemical***						
	Contaminants-Water [3]	S (2)		S (2)	S (2)	• Baseline: No existing data sources identified. • FY 03-04: Conduct screening level monitoring of receiving waters for suite of pesticides (organophosphates) for three seasonal time periods at two sites. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	Contaminants-Sediment[4]	S (1)				• Baseline: SCVURPPP conducted screening level monitoring of PCB, mercury and chlorinated pesticides at two locations in FY 01-02: just upstream Highway 101 and in headwaters at the confluence of the West Fork. SCVWD conducted bedded sediment chemistry sampling (total and dissolved metals, pesticides) in FY 01-02 at Highway 101 as part of sediment removal project. • FY 03-04: Conduct screening level monitoring of metals (total and dissolved), PCBs, mercury, PAHs and chlorinated pesticides in sediment at lower end of watershed. • Future: Conduct monitoring of contaminants in sediments to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality[5]	S (3)		S (3)	S (3)	• Baseline: SCVWD conducted general water quality sampling (turbidity, DO and pH) in October 2001 at Highway 101 as part of sediment removal project • FY 03-04: Collect general water quality parameters during each sampling event at three sites. • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity-Water Quality[6]	S (2)		S (2)		• Baseline: No existing data sources identified. • FY 03-04: Water toxicity testing will be conducted at two sites for wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Conventional Water Chemistry[7]	S (3)		S (3)	S (3)	• Baseline: No existing data sources identified. • FY 03-04: Conduct monitoring of conventional water quality parameters during three seasons at three locations to investigate potential sources of nutrients. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP

Attachment 4-4

Watershed Area	Data Type[2]	Quarter in FY 03-04				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Pathogens (Indicator Organisms)[8]	S (3)		S (3)	S (3)	• Baseline: No existing data sources identified. • FY 03-04: Conduct monitoring of bacterial indicators for 3 seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Bioassessment – Macroinvertebrates[9]				S (4)	• Baseline: No existing data sources identified. • FY 03-04: Conduct benthic macroinvertebrate bioassessment at four sites. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment – Fish[10]				S (3)	• Baseline: No existing data sources identified. • FY 03-04: Conduct fish bioassessment at three sites. Coordinate with SCVWD. • Future: Conduct fish bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP/ SCVWD
	Physical						
	Physical Habitat[11]				S (4)	• Baseline: No existing data sources identified. • FY 03-04: Conduct visual habitat assessment, concurrent with macroinvertebrate sampling, at four sites • Future: Conduct visual habitat assessment to determine status and trends.	SCVURPPP
	Sediment Characterization[12]				S (4)	• Baseline: No existing data sources identified. • FY 03-04: Sample sediment composition and embeddedness, concurrent with visual habitat assessment, at four sites. • Future: Conduct sediment sampling to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3 Provision. • FY 03-04: Specific monitoring objectives have not been identified at this time. • Future: Conduct monitoring to evaluate BMP effectiveness and status and trends.	SCVURPPP/ SCVWD
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 03-04: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP

Attachment 4-4

Watershed Area	Data Type[2]	Quarter in FY 03-04				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Trash[13]					• Baseline: SCVURPPP compiled and mapped trash removal locations as a first step to identify trash problem areas. • FY 03-04: Trash assessments will be conducted by Co-permittee agencies using strategy identified in Trash Work Plan (i.e., identify problem areas and potential sources and evaluate effectiveness of trash control measures). • Future: Conduct trash surveys in future to continue identifying problem areas, evaluate effectiveness of trash control measures and identify status and trends.	SCVURPPP
San Thomas Aquino	***Chemical***						
	Contaminants – Water Quality	S (3)		S (3)	S (3)	• Baseline: No baseline data sources identified. • FY 03-04: Conduct screening level monitoring of receiving waters for suite of pesticides (organophosphates) at three seasonal time periods at two sites on Saratoga Creek and one site on San Thomas Creek. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	Contaminants - Sediment	S (1)				• Baseline: SCVWD conducted sediment chemistry sampling (total and dissolved metals, pesticides) in FY 02-03 below Highway 101 as part of sediment removal project. • FY 03-04: Conduct screening level monitoring of metals (total and dissolved), PCBs, mercury, PAHs and chlorinated pesticides in lower San Thomas. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (7)		S (7)	S (7)	• Baseline: SCVWD conducted general water quality sampling (turbidity, DO and pH) in FY 02-03 below Highway 101 as part of sediment removal project. • FY 03-04: Collect general water quality parameters during each sampling event at all sites in Saratoga and San Thomas Creeks. • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality	S (2)		S (2)		• Baseline: No baseline data sources identified. • FY 03-04: Toxicity of water will be conducted at mouth of San Thomas Creek and lower Saratoga Creek for wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP

Attachment 4-4

Watershed Area	Data Type[2]	Quarter in FY 03-04				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Conventional Water Chemistry	S (7)		S (7)	S (7)	• Baseline: No baseline data sources identified. • FY 03-04: Conduct monitoring of conventional water quality parameters for three seasons at all sites to investigate potential sources of nutrients. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Pathogens (Indicator Organisms)	S (7)		S (7)	S (7)	• Baseline: No baseline data sources identified. • FY 03-04: Conduct monitoring of bacterial indicators for 3 seasonal time periods at all sites. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (7)	• Baseline: Benthic macroinvertebrate data collected at 6 sites on Saratoga Creel in 1997 by USGS. • FY 03-04: Conduct benthic macroinvertebrate bioassessment at six sites in Saratoga and one site in San Thomas Creeks. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment - Fish				S (4)	• Baseline: No baseline data sources identified. Saratoga Creek contains resident rainbow trout population • FY 03-04: Conduct fish bioassessment at four sites. Coordinate with SCVWD. • Future: Conduct fish bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Physical						
	Physical Habitat				S (7)	• Baseline: No baseline data sources identified. • FY 03-04: Conduct visual habitat assessment synoptically with macroinvertebrate bioassessment. • Future: Visual habitat assessment will be conducted in the future, concurrent with macroinvertebrate sampling, to determine status and trends	SCVURPPP

Attachment 4-4

Watershed Area	Data Type[2]	Quarter in FY 03-04				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Sediment Characterization				S (7)	• Baseline: No baseline data sources identified. • FY 03-04: Sample sediment composition and embeddedness, concurrent with visual habitat assessment, at four sites. • Future: Monitoring design to test hypotheses of sediment impacts to salmonid fish habitat will be implemented in conjunction with work identified in watershed assessment and sediment management practices workplan. Investigative monitoring in the future may include measuring concentrations of fine sediment during and following storm events and measuring spawning gravel permeability to determine potential impacts to salmonid fish populations.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3 Provision. The specific creeks in which to compile baseline data have not been selected at this time. • FY 03-04: Specific monitoring objectives have not been identified at this time. • Future: Conduct monitoring to evaluate BMP effectiveness and status and trends.	SCVURPPP/ SCVWD
	Riparian Vegetation					• Baseline: No baseline data sources identified. • FY 03-04: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Trash					• Baseline: SCVURPPP compiled and mapped trash removal locations as a first step to identify trash problem areas. • FY 03-04: Trash assessments will be conducted by Co-permittee agencies using strategy identified in Trash Work Plan (i.e., identify problem areas and potential sources and evaluate effectiveness of trash control measures). • Future: Conduct trash surveys in future to continue identifying problem areas, evaluate effectiveness of trash control measures and identify status and trends.	SCVURPPP

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) detailed investigation, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. Sampling locations are described in separate table and figure attached to Plan.

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology. Adjustments will be made, if necessary, when SWAMP QAPP becomes available in September 2002.

3 Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se) and organophosphate pesticides; sampling conducted for three seasonal time periods.

4 Sediment chemistry: Metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As), PCB, mercury, PAHs and organochlorine pesticides; bedded sediment sampling conducted in the dry season only. Sediment samples taken only at integrator sites. Sediment characterization includes collecting sediment grain size (full analysis)

Attachment 4-4

5 General water quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted for three seasonal time periods.

6 Toxicity testing of water on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted at wet and dry season. Frequency of toxicity was reduced (RMAS/SWAMP conducts 3 samples/year at each site) to cut costs and to increase the number of sites.

7 Conventional water chemistry: Major anions: ortho-phosphate, nitrate, nitrite, chloride, sulfate; total phosphate, boron, TKN, TDS, SSC, ammonia, chlorophyll-a, alkalinity, hardness, TOC and DOC; sampling conducted for three seasonal time periods.

8 Indicator organisims: total and fecal coliform and *enterococcus*; sampling conducted for three seasonal time periods.

9 Bioassessment: following CSBP methodology and conducted in the spring season.

10 Rapid bioassessment of fish communities will be done using methods established in the SEIDP or by other standardized methods utilized by the SCVWD or other Co-permittee agencies.

11 Habitat survey physical habitat assessment using CSBP methodology.

12 Bedload sediment composition and embeddedness is estimated using pebble counts during bioassessment and habitat survey.

13 Trash assessment methodology will include implementing modified RWQCB rapid trash assessment protocols for wadeable streams. SCVURPPP will onsider using the Keep America Beautiful (KAB) litter index.

Attachment 4-4

Table 4-2. Sampling locations and data types for SCVURPPP's FY 03-04 Monitoring Plan.

Stat Id	Station Name	Potential Impacts/ pollutant sources	Water Chem	Sed Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Bioass Fish	Bioass Macro-Invert	Habitat/ Sed
Adobe Creek											
A-1	Adobe Creek at Middlefield Road	Integrator site above tidal zone	3	1	3	2	3	3			
A-2	Adobe Creek at Terman Park	Residential land use; cemetery, park			3		3	3		1	1
A-3	Adobe Creek at Edith Ave	Residential land use; downstream bank erosion	3		3	2	3	3	1	1	1
A-4	Adobe Creek at Foothill College	New development; college campus							1	1	1
A-5	Adobe Creek at Moody Road, near Youth Hostel	Undeveloped open space							1	1	1
San Thomas Aquino											
STA-1	San Thomas at Scott Blvd	Integrator site above tidal zone	3	1	3	2	3	3			
STA-2	San Thomas at Saratoga Ave	Residential and commercial land uses			3		3	3			
STA-3	San Thomas at Westmont High School	Residential land use; high school			3		3	3		1	1
S-1	Saratoga Creek at Cabrillo	Residential and commercial land uses;	3		3	2	3	3			
S-2	Saratoga Creek at Bollinger Rd	Residential land use			3		3	3		1	1
S-3	Saratoga Creek at Prospect Ave	Residential and commercial land uses;							1	1	1
S-4	Saratoga Creek at Via Monte Ave	Residential land use	3		3		3	3	1	1	1
S-5	Saratoga Creek at Alta Vista Ave	Residential and commercial land uses;								1	1
S-6	Saratoga Creek at Congress Springs and Gate Road	Undeveloped open space			3		3	3	1	1	1
S-7	Saratoga Creek at Congress Springs and Pierce Road	Open Space							1	1	1
Total Number of Sampling Events			15	2	30	8	30	30	7	11	11

Attachment 4-4

Table 4-3. Analytical methods used in SCVURPPP FY 02-03 and Multiyear Monitoring Plan.

Description of data parameters	Analytical Methods
Pesticides (water) - Organophosphate suite	EPA 8141A
Pesticides (sediment) - Organochlorine suite	EPA 8081A
PCB congeners	EPA 8082
PAH congeners	EPA 8270
ICPMS metals suite (sediment) (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As--all costs)	EPA 6020
ICPMS metals suite (water)--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	EPA 200.8
ICPMS metals suite (water)--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--al costs)	EPA 200.8
Total mercury (sediment)	EPA 245.7/1631M
Major anions nutrient scan: ortho-phosphate, nitrate, nitrite, chloride, sulfate	EPA 365.2, EPA 300
Total Phosphate	EPA 365.2
Boron	EPA 200.8
TKN	EPA 351.3
TDS	EPA 160.1
Suspended Sediment Concentration (SSC)	ASTM D3977-97
Ammonia	EPA 350.3
Chlorophyll-a	SM 10200H/EPA 445.0
Alkalinity	EPA 310.1
Hardness	EPA 130.2
TOC	EPA 415.1
DOC	EPA 415.1
Sediment grain size - full analysis (phi scale)	Plumb/PSEP
Total coliform	SM 9221B
Fecal coliform	SM 9221B
enterococcus	SM 9230B
Ceriodaphnia 7-day Survival & Reproduction	EPA 1002.0 (WET)
Pimephales (fathead minnow) 7 - day	EPA 1000.0 (WET)
Selenastrum (algae) test	EPA 1003.0 (WET)

(WET) Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants (October 16, 1995)

Attachment 4-4

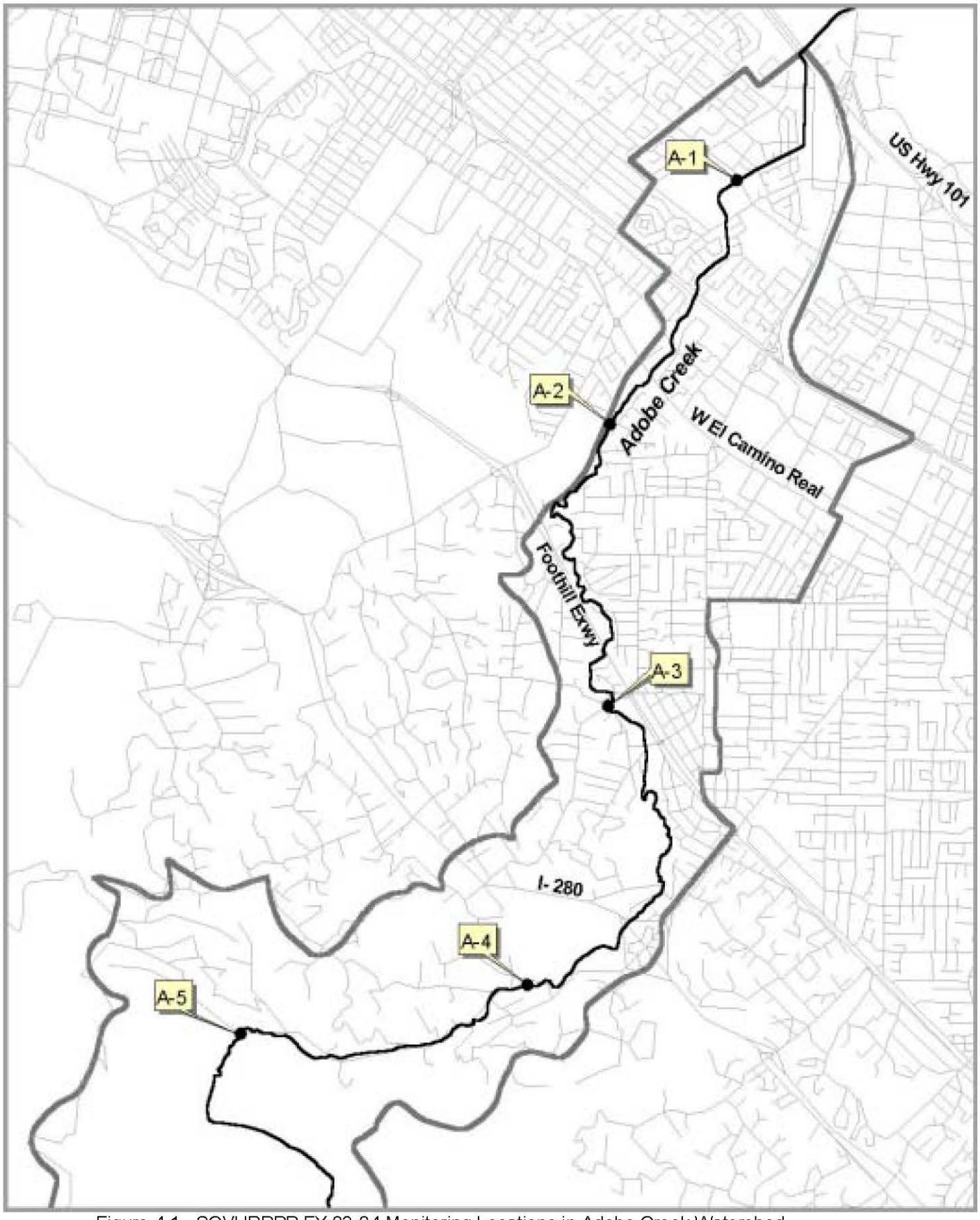

Figure 4-1. SCVURPPP FY 03-04 Monitoring Locations in Adobe Creek Watershed.

Attachment 4-4

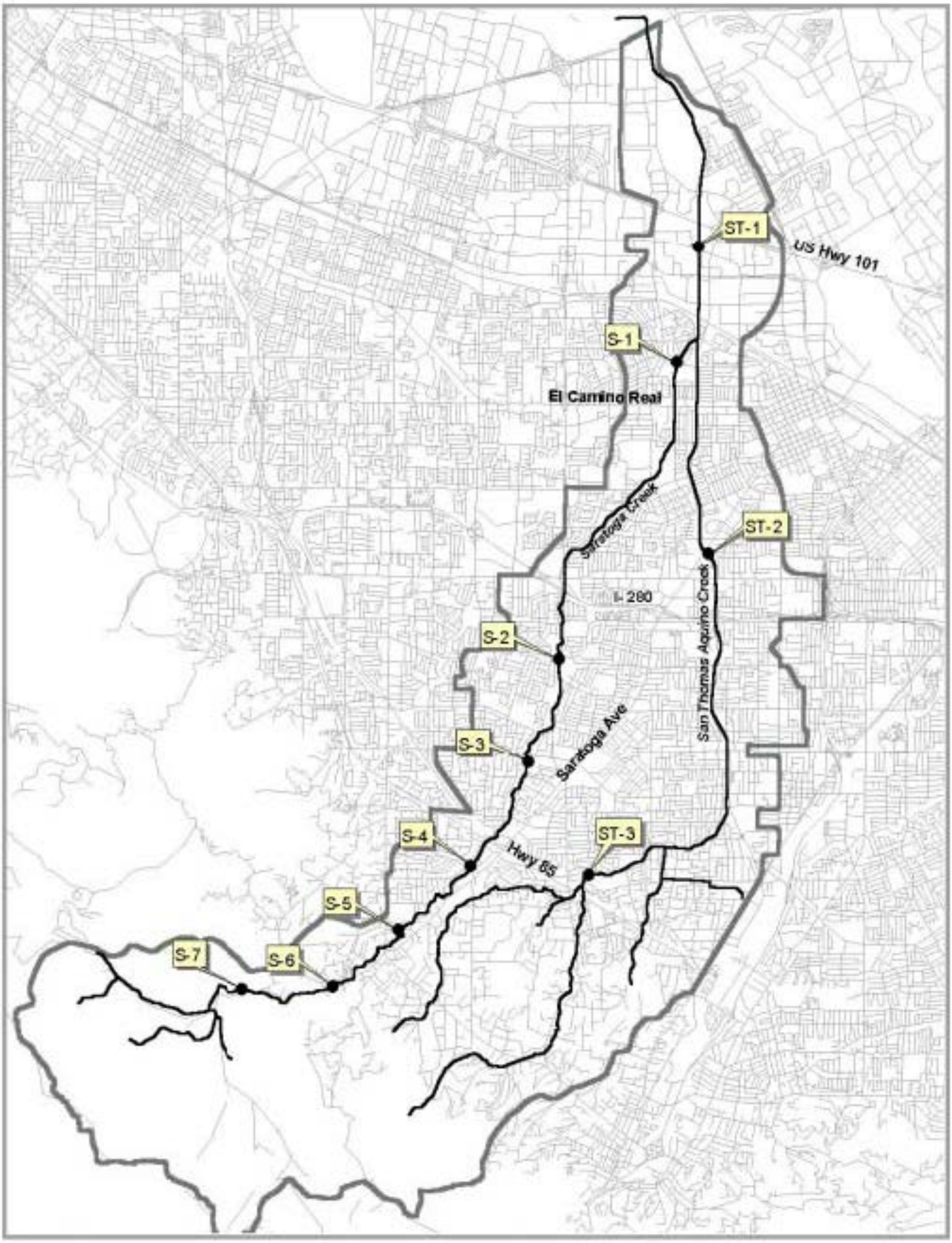

Figure 4-2 SCVURPPP FY03-04 Monitoring Locations in San Thomas Aquino Watershed.

August 30, 2002

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Workplan for Conducting Watershed Analysis and Management Practice Assessment in Other Creeks Potentially Impaired by Sediment from Anthropogenic Activities

Submitted in fulfillment of NPDES Permit Provision C.9.f.iii

Milpitas
Palo Alto
Cupertino
Los Altos
San Jose
Sunnyvale
Santa Clara
Los Altos Hills
Mountain View
Santa Clara County
Santa Clara Valley Water District
West Valley Communities – Campbell, Los Gatos, Monte Sereno, Saratoga

August 30, 2002

WORKPLAN FOR CONDUCTING WATERSHED ANALYSIS AND MANAGEMENT PRACTICE ASSESSMENT IN OTHER CREEKS POTENTIALLY IMPAIRED BY SEDIMENT FROM ANTHROPOGENIC ACTIVITIES

INTRODUCTION

This Workplan is submitted in fulfillment of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) NPDES Permit Order No. 01-024 Provision C.9.f.iii paragraph 2. This provision requires a workplan and time schedule to "conduct a watershed analysis and management practice assessment in the other creeks which may be impaired by excessive sediment production from erosion due to anthropogenic activities."

The goals of this Workplan are to identify an approach to conduct watershed analyses and assess sediment management practices for those creeks previously identified by SCVURPPP as high priority for potentially being impaired by sediment production from erosion due to anthropogenic activities. The Workplan includes a number of objectives to assess sediment-related impacts to beneficial uses, including:

- Collect available existing data to characterize the watershed and identify issues of concern;
- Develop hypotheses to understand potential impacts of sediment to species that are sensitive to excess sediment;
- Conduct focused studies to test hypotheses;
- Implement a limiting factors analysis to determine to what degree sediment impacts are key factors;
- Conduct rapid evaluation of sediment budget; and
- Assess and evaluate sediment management practices.

In addition, the Workplan objectives include Program specific activities:

- Evaluate information generated from the assessments to identify and prioritize information needs and management recommendations;
- Review existing information to re-evaluate priority watersheds for future assessments; and
- Evaluate the current assessment framework, along with approaches being used in other watersheds.

BACKGROUND

Potentially Sediment Impaired Creek Report

The report "Identification of Creeks Potentially Impaired by Sediment from Anthropogenic Activities" was submitted to the Regional Board as part of the SCVURPPP FY 02-03 Draft Workplan in fulfillment of SCVURPPP NPDES Permit Provision C.9.f.iii paragraph one. The report identified creeks in the SCVURPPP jurisdictional area, other than San Francisquito Creek, which may be impaired by sediment from anthropogenic sources. The Potentially Sediment Impaired Creek Report had several objectives, which included: 1) collecting existing available data that was associated with key factors related to sediment and erosion; 2) developing a methodology to summarize and analyze available data to identify creeks with potential water quality impacts associated with sediment from erosion due to anthropogenic activities; and 3) prioritizing the potentially impacted creeks for future investigations and/or assessments. This

Workplan identifies steps for conducting watershed analyses and management practice assessments for the high priority creeks that were identified in the previous report.

The high priority creeks include reaches 3 and 4 of Stevens Creek and reaches 4 and 5 of Coyote Creek. The reaches in Stevens Creek correspond to an 8-mile stretch from approximately 1 mile upstream of Highway 82 to Stevens Creek Dam and the reaches in Coyote Creek were defined as a 14-mile stretch of Coyote Creek mainstem from Ford Road to Anderson Dam. The Stevens Creek reach flows through the Cities of Mountain View, Sunnyvale, Cupertino and Los Altos. The Coyote Creek reach flows through primarily Santa Clara County land, and portions are within the City of San Jose. Both reaches were identified as potentially supporting both steelhead and trout in warm water conditions, as well as Chinook salmon in Coyote Creek. The report also identified segments of five additional creeks in the Santa Clara Basin as medium priority for further investigation of potential impairment by sediment from anthropogenic activities. These include Alamitos, Arroyo Calero, Guadalupe, Permanente and Upper Penitencia Creeks.

The Regional Board staff submitted comments on the sediment report as part of their July 8, 2002 letter to SCVURPPP stating the report was conditionally acceptable to the NPDES Permit Provision C.9.f.iii (see Attachment A). The conditions stated in the letter included: 1) the entire Stevens Creek watershed downstream of reservoir should be given a high priority because sediment removal is an important issue in the lower reaches; 2) analysis of Coyote Creek reaches must include an evaluation of the influence on Anderson Dam to downstream sediment supply and transport capacity; and 3) Saratoga Creek and Upper Penitencia Creek should be added to list of high priority streams for analysis. The staff letter also indicated that they would support adopting a watershed analysis that was conducted within the framework of a limiting factors analysis. SCVURPPP's Program staff, Regional Board staff and Santa Clara Valley Water District (SCVWD) staff met on July 17, 2002 to discuss their comments and conditions and general objectives for developing the watershed assessment workplan. The minutes for that meeting are included in Attachment B of this Workplan and were distributed to the SCVURPPP Management Committee on August 29, 2002.

This Workplan addresses the Regional Board's conditions and concerns expressed in the July 8, 2002 letter and subsequent meeting. The SCVURPPP's written response to the Board's comments is included in Attachment C. Watershed analyses and sediment management practice assessment will initially be conducted in Stevens and Coyote Creek watersheds, which were identified as high priority watersheds in the SCVURPPP sediment report. The assessments will address the areas downstream of reservoirs and assess any impacts related to these reservoirs. Stevens Creek was selected as the initial watershed to be assessed because of its smaller size, with Coyote Creek to follow. Upper Penitencia Creek, one of the medium priority watersheds listed in SCVURPPP sediment report, is the next highest priority for future assessment of sediment-related impacts. Where possible, early data collection and evaluation will begin on Upper Penitencia Creek. Other medium priority creeks, which include tributaries to Guadalupe River and Permanente Creek, will be re-evaluated as more information from ongoing watershed studies becomes available. In addition, Saratoga Creek, a watershed identified by Regional Board and Department of Fish and Game agencies as sensitive to excessive sediment, will be evaluated for potential impairment from sediment as more information becomes available. As part of the SCVURPPP monitoring program, salmonid habitat data will be collected from Saratoga Creek that will be useful to assess sediment-related impacts.

San Francisquito Creek Watershed Assessment

This Workplan adopts elements of a watershed assessment approach proposed for San Francisquito Creek, which is listed as impaired by sedimentation under Section 303(d) of the Clean Water Act and requires the development of a Total Maximum Daily Load (TMDL) for sediment. The co-permittees for the SCVURPPP and San Mateo Countywide Pollution Prevention Program (SM-STOPPP), along with other agencies and organizations in the San Francisquito watershed, are actively participating in a stakeholder process to develop an approach to determine sediment loadings and impacts in the watershed, and assess management practices to reduce sediment impairment. A workplan for conducting a watershed analysis for San Francisquito Creek was submitted to the Regional Board on August 31, 2001 by SCVURPPP and SM-STOPPP consistent with SCVURPPP NPDES Permit Provision 9.f.i. and SM-STOPPP NPDES Permit Provision C.10., respectively. In addition, a workplan to assess sediment management practices was submitted to the Regional Board on March 1, 2002 by SCVURPPP consistent with SCVURPPP NPDES Permit Provision 9.f.ii. Separate Regional Board staff comments on the Sediment Management Plan that were received in the letter sent on July 8, 2002 are being addressed by Program staff and SCVWD staff on that particular workplan.

The objectives for the two plans includes: (1) a quantitative characterization of sediment and water inputs to the creek; (2) evaluation of the relative roles of sediment associated with natural and anthropogenic land use discharges; (3) characterization of sediment conveyance from headwaters to the Bay, (4) development of a rapid sediment budget, and (5) assessment of both currently and proposed management practices implemented to prevent or reduce excess sediment impairment in urban creeks. A Proposition 13 Phase I grant was awarded to the stakeholder group to conduct the watershed analyses and produce a sediment reduction plan for the watershed.

In addition, a workplan was developed by SCVWD as part of the San Francisquito Creek sediment TMDL, to assess aquatic habitat condition and conduct a limiting factors analysis for steelhead and other sensitive species in the San Francisquito Creek watershed. The limiting factors analyses is anticipated to produce information that will assist the Regional Board staff to confirm or reject the validity of the sediment impairment listing and help to identify other causes of impairment to aquatic species and their habitat. The assessments and analyses described in these workplans are currently scheduled for completion in December 2003.

Napa River Watershed Assessment

This Workplan also utilizes elements of an approach used in a watershed analysis of the Napa River administered by the Regional Board and California State Coastal Conservancy. The Napa River is also listed as impaired by sedimentation under Section 303(d) of the Clean Water Act and requires the development of a TMDL for sediment. A Limiting Factors Analysis was conducted by the University of California, Berkeley and Stillwater Sciences on the Napa River watershed to help answer the following questions: 1) what are the primary factors causing the decline of native fishes and aquatic biota; 2) how important is sediment in causing these declines or limiting populations of target species and 3) what actions are needed to conserve or restore these target species?

According to the Limiting Factors Analysis Technical Report, the results of the Phase I studies serve the following objectives: 1) help inform the Regional Board's sediment TMDL process; 2) improve the understanding of current conditions in the Napa River, develop and test hypotheses related to impairment of salmonids by sediment and other factors, and develop plan for additional

studies to define cause-and-effect relationships between human land use activities and their impacts on water quality and beneficial uses; and 3) make recommendations regarding planning and implementation of restoration actions to protect and restore aquatic ecosystem functions and beneficial uses in the Napa River. Hypotheses testing of sediment-related impacts on salmonid habitat involved conducting several focused studies, including: turbidity impacts to juvenile feeding and growth, spawning gravel permeability study, bed mobility and redd scour, and pool filling and juvenile rearing habitat. Results of the low spawning gravel permeability was one piece of evidence the Regional Board used to determine sediment was impacting salmonid habitat and to recommend a Phase II assessment to obtain additional information.

The Phase II studies proposed for the Napa River study by the assessment consultants were to assess the potential impacts of physical processes that limit target species (e.g., conducting a sediment source analysis using a rapid evaluation of sediment budget, large woody debris assessment, physical barriers, base flow reduction, temperature modeling). In addition, mechanistic studies, life history assessments and population dynamics of target species were proposed for the Phase II studies. No funding for the Phase II studies has been obtained at this time (Mike Napolitano, RWQCB, personal communication, 2002).

INFORMATION RESOURCES

There are several existing data sources that will be useful for a watershed assessment of Stevens and Coyote Creeks, as well as other watersheds in the Santa Clara Basin. Information from some of these studies was used in the SCVURPPP sediment report that identified creeks that may be impaired from sediment due to anthropogenic sources. Additional information from these watersheds is expected to be available for the assessment identified in this Workplan.

SCVWD Fisheries and Aquatic Habitat Collaborative Effort

The Fisheries and Aquatic Habitat Collaborative Effort (FAHCE), is a multi-agency endeavor convened by the SCVWD and the Department of Fish and Game to develop an interim fisheries and aquatic habitat management plan. FAHCE participants include the SCVWD, the Department of Fish and Game, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Natural Heritage Institute, the Guadalupe-Coyote Resource Conservation District and the City of San Jose. The goals for FAHCE include: 1) identify the contribution of SCVWD facilities and operations to existing fishery habitat conditions within the context of the variety of factors impacting salmon and steelhead populations; and 2) identify reasonable flow and non-flow measures that will improve habitat conditions for such fish populations within the context of competing water and land use demands.

The study objectives were to identify and evaluate alternative management actions based in part on the above studies and on the following:

- Improve habitat conditions to maintain fish populations in good condition;
- Protect, maintain, and improve habitat conditions for species listed under the State and Federal Endangered Species Acts or identified as California Species of Special Concern; and
- Improve the availability and suitability of stream corridor and channel habitat for a diversity of species of fish and wildlife.

The FAHCE project quantified the following factors: 1) diversity, abundance, and condition of existing salmon and steelhead resources; 2) habitat quantity and quality that may limit these target fish populations; 3) types and locations of non-flow measures that could change existing

conditions; and 4) alternative flow regimes that could change the conditions that limit the target fish populations.

The FAHCE study area included Coyote Creek (below reservoir), Upper Penitencia Creek, Stevens Creek below reservoir, and Guadalupe River and its major tributaries (Los Gatos, Guadalupe Creek, Alamitos, and Arroyo Calero Creeks). Analysis of the results from the study have not been released due to ongoing litigation, with the exception of the salmonid habitat survey database, which was used in the Potentially Sediment Impaired Creek Report to prioritize reaches that may be impaired by sediment. The location and description of potential anadromous fish barriers and the results from temperature modeling analyses were made available to Program staff in 2002. Program staff understands that additional information is forthcoming and will be valuable in conducting a limiting factors analysis in Stevens, Coyote and Guadalupe River watersheds.

SCVURPPP Coyote Watershed Pilot Assessment

The SCVURPPP's Pilot Watershed Assessment of Coyote Creek is utilizing mostly existing data, but some new data, to characterize and assess the physical and biological condition of the watershed. The assessment includes: 1) the development of a stream classification to characterize stream functions and geomorphic processes, 2) evaluation of stream functions (e.g., maintenance of aquatic habitat and hydrological regime and channel dynamics) and how future and potential management actions will affect these functions, 3) identification of information gaps and research opportunities, and 4) prioritization of management actions that will improve the physical and biological functions in the watershed. The assessment focused on the mainstem Coyote (downstream of reservoir) and Upper Penitencia Creek. Evaluating sediment impacts to fish habitat and aquatic health of streams is one component of the assessment. The Pilot Coyote Watershed Assessment Report is scheduled for release in September 2002.

Santa Clara Basin Watershed Management Initiative (WMI) Pilot Watershed Assessment

The WMI is completing pilot watershed assessments of Upper Penitencia Creek, Guadalupe River and San Francisquito Creek. The assessment framework was developed to provide a procedure for using environmental indicators, based on existing data to conduct a watershed assessment. Threshold values were identified for quantifiable parameters and were used when possible to evaluate the ability of a waterbody to support a primary use/interest. The stakeholder group identified five primary beneficial uses/interests as the basis of the assessment. Logic diagrams were developed to systematically determine the level of support of a primary use/interest through a "weight of evidence" approach. Creeks within each of the watersheds were classified into stream segments and each segment was assessed to determine support, non-support or unknown due to insufficient data.

The results of the assessment included an identification of limiting factors, which focused on physical, chemical and biological conditions in the stream and the riparian corridor that caused non support or partial support of primary uses. The limiting factors consist of the indicators that did not meet the threshold criteria specified in the assessment framework. It is the Program staff's understanding that specific limiting factors within each stream segment and the suspected cause, when identifiable, will be described in the WMI Watershed Assessment Report (WAR), scheduled to be released in Fall 2002. The WMI limiting factors analysis will be useful to the SCVURPPP watershed assessment approach identified in this Workplan.

Hydromodification Management Plan (HMP)

The HMP is a requirement in Provision C.3.f. of the SCVURPPP NPDES Permit. The plan will focus on developing guidance to manage the hydrologic effects of new development and significant re-development on stream stability and geomorphology. The HMP Workplan includes tasks to characterize existing stream conditions; identify the sensitivity of channels to hydromodification; and develop guidance for selecting, sizing, monitoring and maintaining flow management practices. Current and historical channel information, supplemented with stream surveys, will be compiled and reviewed to characterize stream reaches in terms of hydrologic and geomorphic conditions. The characterization will likely include watershed geology, soil type, and topography; sediment sources, erosional and depositional zones; and stream channel slope, stream type, flow magnitude, and bed material. Impacts to stream channel from natural events (e.g., fires) and anthropogenic activities (e.g., mining and grazing) will be identified to the maximum extent possible.

The guidance for management practices will address requirements and recommendation for Best Management Practices (BMP) selection and design with the objective of protecting stream channel downstream of a development area. BMP selection and design may include site planning, on-site planning, on-site hydrologic (and water quality) controls, in-stream controls, and regional facilities to accommodate the future development conditions.

The HMP is schedule for release in March 2003.

Surface Water Ambient Monitoring Program/Regional Monitoring and Assessment Strategy (SWAMP/RMAS)

The goal of the SWAMP/RMAS program is to monitor and assess all waterbodies of the San Francisco Bay Region in order to identify reference sites and waterbodies or sites that are impaired, based on data and information that provide a weight-of-evidence assessment of water quality. Objectives of the program include: (1) assessing the physical, chemical, and biological condition of waterbodies in the region in order to determine if waterbodies are impaired and beneficial uses are being protected; (2) measuring environmental indicators of stressors (e.g., pollutants or other water quality parameters), laboratory exposure/effects measurements (e.g., toxicity tests), and ecological response (e.g., benthic macroinvertebrate community analyses) from the same location and/or season; (3) generating data and information during different seasonal conditions; (4) generating data and information that is somewhat evenly distributed across a waterbody to provide a screening level of assessment; (5) determining if impacts are associated with specific stressors or land uses; and (6) evaluating monitoring tools in the watershed in order to develop a program that uses the best environmental indicators to achieve the purposes of the program.

Six San Francisco Bay watersheds were monitored in FY 00-01 (none were located in Santa Clara Basin). An additional five watersheds were monitored in FY 01-02, including two in the Santa Clara Basin (Stevens and Permanente Creeks). Some of the data collected in Stevens Creek (e.g., bioassessment, physical habitat assessment, suspended sediment concentrations) will be useful to assess the health of the aquatic biota and condition of the physical habitat for salmonid fish.

SCVURPPP Multiyear Monitoring Plan

A Multi-Year Receiving Waters Monitoring Plan was submitted to the Regional Board as part of the SCVURPPP FY 02-03 Draft Workplan in fulfillment of SCVURPPP NPDES Permit

Provision C.7 and specifically Provision 7b of SCVURPPP's NPDES Permit Order adopted February 21, 2001 by the Regional Board. The Plan identifies monitoring activities in Santa Clara Basin Watersheds over an eight-year period and contains the following information: watershed location (prioritized based on WMI and SCVURPPP assessment priorities), data type (chemical, biological, physical, and trash), number and frequency of sampling events, FYs (8 years starting with FY02-03 through FY09-10), rationale, and lead agency. The information on data type utilizes a tiered monitoring approach discussed by the RWQCB staff in its RMAS memo (February 8, 2001 Draft Monitoring Design in Regional Board-lead Pilot Watersheds, Spring 2001) that includes the following monitoring categories: screening level, detailed investigation, and status and trends. Implementation of detailed investigations will be determined from the results of screening level monitoring, as well as from the data gaps identified in the watershed assessments and other studies described above.

The Multi-Year Monitoring Plan identified special sediment-related studies to be implemented in Stevens, Coyote and Upper Penitencia Creek Watersheds in coordination with the focused studies developed in accordance with this Workplan. The Plan addresses data gaps, such as aquatic habitat survey data in Saratoga and Permanente Creek, which were identified in the Potentially Sediment Impaired Creek Report. The Plan also includes monitoring activities that will be identified in the Hydromodification Management Plan (HMP), which is being developed to satisfy Provision C.3 of the SCVURPPP NPDES permit. Monitoring efforts for the HMP will include identifying baseline conditions of stream channels, as well as evaluating the effectiveness of control measures that are implemented to reduce the hydrologic effects of land development on stream stability and geomorphology. These activities will be clearly identified each year as part of SCVURPPP's Annual Monitoring Plan.

SCVWD Flood Protection Projects

The SCVWD is currently involved in several projects to increase channel capacities to allow for a 100-year flow event. These projects typically require baseline data collection to identify existing channel and flow conditions. These data include geological characterization, sediment loading and transport capacities, flow frequency and flood hydrographs, and surface water profiles, and floodplain access. This information can be used to assess potential impacts of sediment to aquatic habitat. The District is currently involved in several flood protection projects in the streams that were identified in SCVURPPP sediment report as high and medium priority for future watershed assessments. These watersheds include Coyote Creek mainstem, Upper Penitencia Creek and Guadalupe River. The Guadalupe River flood control projects are near the construction phase and provide existing data useful for a watershed analysis. The other projects are still in the planning stages and have less data available; however, they may provide opportunities to collect valuable data using available resources.

SCVWD Stream Maintenance Program (SMP)

The SMP describes routine stream and channel maintenance on facilities of the Santa Clara Valley Water District (District) throughout Santa Clara County. These activities include sediment removal projects, vegetation management and bank protection. Location and volume of sediment removal in streams within District jurisdiction were used in the SCVURPPP sediment report as a factor to prioritize stream reaches that may be impaired by sediment. Additional analyses on sediment size and accumulation rate at these sites can be useful in future sediment analyses. In addition, bank protection projects provide information indicating where instream sources of sediment may occur.

WORKPLAN

The Workplan includes conducting sediment assessments for the high priority creeks previously identified in the SCVURPPP Potentially Sediment Impaired Creek Report (discussed above), which are Stevens Creek (reaches 3 and 4) and Coyote Creek (reaches 4 and 5). Stevens Creek was selected as the first watershed to assess because of its smaller size and fewer current projects.

The Workplan identifies tasks to conduct a sediment assessment in Stevens Creek beginning in FY 03-04 and continuing for 1-2 years, depending on the first year's results of Task 1 Limiting Factors Analysis. If sediment is determined to be an important limiting factor, then Task 4 Rapid Sediment Budget will be conducted for Stevens in the second year. If the analysis results determine sediment is not a significant limiting factor, then SCVURPPP will not conduct Task 4 in Stevens Creek and instead, begin Task 1 Limiting Factors Analysis in Coyote Creek in FY 04-05. If SCVURPPP does conduct Task 4 in Stevens Creek then the sediment assessment for Coyote Creek will begin in FY 05-06.

In addition, the Workplan addresses the Regional Board staff concerns that Upper Penitencia Creek and Saratoga Creek also be identified as high priority and addressed in this Workplan, Specific tasks are included in this Workplan to address the Regional Board staff comment. In FY 03-04, the Program will collect data (Task 5.1) generated from SCVWD Capital Improvement Projects in Upper Pentiencia Creek and from Saratoga Creek as part of the SCVURPPP Multiyear Receiving Water Monitoring Plan. These data will be compiled and used to re-evaluate watershed assessment priorities (see Task 5.2) and incorporated into the SCVURPPP Annual Workplan (see Task 5.3). In addition, the Program will re-evaluate assessment approaches once the San Francisquito Creek Sediment Assessment has been completed (Task 5.4).

Approach

The SCVURPPP Watershed Analysis and Management Practice Assessment Workplan has three major components with several elements identified to address Regional Board staff concerns and improve the process when possible.

- *Component 1* - Conduct limiting factors analysis that is largely based on the approach used in the Napa River and the San Francisquito Creek watershed assessments.

- *Component 2* - Conduct rapid sediment budget when necessary, using approach implemented in San Francisquito Creek and proposed for Napa River. The schedule of this component is based on the Napa River watershed assessment approach and the sediment TMDL process. The rapid sediment budget component will be completed after the limiting factors analysis if sediment is shown to be the limiting factor or a rapid sediment budget is recommended based on the analysis.

- *Component 3* – Conduct sediment management practice assessment. This is also based on the San Francisquito Creek watershed assessment approach. The schedule of this component is designed so the start of the project is not based on the completion of the other two components; however, the final assessment and recommendations use the results of the completed limiting factors analysis and rapid sediment budget.

Two important elements of this Workplan relate to the scheduling of these tasks. One element is to review the results of the San Francisquito Creek watershed assessment approach. The San Francisquito Creek watershed assessment approach was developed in a stakeholder process and is

the model for this Workplan. The Workplan schedule is designed to begin the first critical watershed analysis task after the equivalent San Francisquito Creek task has been completed. This will allow for an evaluation of the approach so the analysis task can be revised to address any deficiencies or problems in the approach for the next watershed.

Another important element of this Workplan is that some tasks have been identified as independent and do not rely on the completion and/or start of other tasks. These tasks were identified so progress can be made on specific tasks in different watersheds concurrently. It also allows SCVURPPP to take advantage of opportunities related to other projects and programs.

Specific Workplan tasks are described in the following section. A schedule for the tasks and deliverables is followed by the timeline for completion. The timeline also includes steps in the SCVURPPP process (e.g. AHTG and Management Committee review) to complete the watershed analysis, including identification and implementation of management controls.

The Workplan also includes a task (Task 5) to re-evaluate and update the identification of high and medium priority creeks based on the availability of new data. The intent is to update the list once every two years starting with the first update to be conducted during the first half of FY 03-04. This re-evaluation and update will take advantage of a significant body of new data that should become available during FY 02-03 (e.g., FACHE, current assessments, SCVWD internal monitoring program data, SCVURPPP monitoring data, HMP data). The intent is to provide a Program -wide update and evaluation of data from ongoing monitoring and assessment efforts in high priority creeks (and reaches) and the other medium priority creeks in the Potentially Sediment Impaired Creek Report (Guadalupe River and Permanente Creek) and to identify future assessments, timing and resource requirements. This task also allows for review and coordination of management issues with individual Co-permittees involved within specific creeks as well as the overall Management Committee in order to identify potential early control and long-term control measures.

SCOPE OF WORK

Task 1. Conduct Watershed Assessment Using Limiting Factors Analysis Approach

Task 1.1 Compile and review existing data and information

Compile and review relevant existing data and information, including interviews of local experts, to characterize the general physical and biological attributes of the watershed. The characteristics include the hydrology, geology, geomorphic processes, land use, vegetation cover, and aquatic biota in the watershed. Compile historical information on channel condition and composition of biological communities to help define reference conditions of the watershed. In addition, compile and review information collected by SCVURPPP and SCVWD as part of the Hydromodification Management Plan (HMP) and District's regional study. Compile existing information that describes condition of aquatic habitat and population of steelhead and other aquatic species of special concern. Identify existing and future management actions that may impact sensitive species and aquatic habitat including, but not limited to, regulation of flows, flood control projects, mining activities, and affects to downstream channels by reservoirs. (An inventory of sediment related management activities will be addressed in Task 2.1, described below). Review published literature that describes impacts of reservoirs on downstream sediment supply, transport capacity and channel conditions. Task will include compilation and development of Geographic Information System (GIS) layers that identify a variety of factors influencing stream

functions, which will provide a basis to characterize streams to assist in the development of hypotheses and study site selection.

Task 1.2 Identify target species for limiting factors analysis

Identify the aquatic species that are generally sensitive to overall watershed conditions and likely represent the requirements for multiple species within the system. Salmonid fishes are the primary target species that will be used in the limiting factors analysis; however, other sensitive species (e.g., native warm water fish communities, foothill yellow-legged frog) whose distributions and requirements overlap with salmonids may also be evaluated. Assessing the life histories and habitat requirements for these species provides the basis for conducting the limiting factors analysis. Compile existing information to identify the critical habitat areas of these species (e.g., location of salmonid spawning and rearing habitat).

Task 1.3 Identify and assess potential limiting factors and develop initial hypotheses

Identify the potential limiting factors for the selected target species (e.g., excessive sedimentation, channel alterations, fish migration barriers, water temperature, stream flow levels). Supplement analysis of existing information with reconnaissance surveys to assess and prioritize potential limiting factors. Factors relevant to sediment will be given the highest priority to help determine their relative importance in controlling target species populations and habitat conditions. Describe the factors excluded from consideration and provide rationale. Generate hypotheses and develop focused studies to investigate the importance of the priority limiting factors on the target species. In addition, use the reference and current watershed conditions to describe changes to aquatic habitat and associated impacts and the factors causing these impacts.

Task 1.4 Conduct focused studies

Conduct studies to test hypotheses that relate sedimentation (or lack of sediment, e.g., spawning gravel for salmonids) to key factors limiting target species. Evaluate sediment-related study approaches used in limiting factors analyses in Napa River and San Francisquito Creek. These studies include 1) turbidity following storm events and impacts to juvenile feeding and growth; 2) spawning gravel permeability; 3) bed mobility and redd scour; and 4) pool filling and impacts to juvenile rearing habitat. Evaluate implementation of non-sediment related studies, including 1) impacts of physical barriers on fish passage; 2) water quality, including temperature affects on sensitive species; and 3) impacts of dry-season surface flow patterns on juvenile salmonid growth rates. Utilize GIS data layers that identify significant changes in stream channel (e.g., channel gradient and modifications, substrate size) and critical habitat areas to help select study site locations.

Task 1.5 Data analysis and recommendations

Evaluate results of focus studies to determine relative importance of sediment-related factors in relation to other factors. Identify potential studies that would be useful to increase understanding of cause-and-effect relationships between impacts and limiting factors. Recommend future management actions to reduce impacts to key factors and enhance habitat conditions for sensitive species. Compile information on existing conditions, hypotheses development, data results and analyses from focused studies, and recommendations into technical report. Report will be reviewed/approved by Ad Hoc Task Group and Management Committee.

Task 2. Assess Sediment Management Practices

Task 2.1 Inventory and document sediment management practices

Survey jurisdictions, agencies and large landowners within each watershed to determine current and planned erosion control measures and sediment management practices. Document types of management practices, lead agency, regulatory/management driver, purpose and scope, location and extent, and time period of projects for each watershed. Management practices may include planning activities and regulatory actions taken to reduce non-point sources of sediment. In addition, sediment control measures, such as sediment removal projects, management of large woody debris and in-channel vegetation, streambank stabilization, trail and rural road erosion control and prevention, new and redevelopment construction, and livestock management will be documented. Inventory of management activities will be conducted by reviewing available project reports, interviewing agency staff, and searching available records and databases.

Task 2.2 Evaluate the effectiveness of sediment management practices

Using data gathered from Task 1, evaluate available information to qualitatively evaluate to the extent possible, the ability of management practices and policies and existing and planned sediment control measures to reduce impairment or minimize future degradation of the water quality and impacts on beneficial uses due to anthropogenic sources of sediment. Incorporate available information from sediment assessments and watershed analyses being conducted to assist in the evaluation of management practices and sediment control measures. Assess the FishNet 4C Program model for evaluating sediment management practices. Include an evaluation of flow management control measures that are identified in the HMP. Develop criteria to evaluate effectiveness of management practices and erosion and sediment control measures with emphasis on cost-effectiveness. Consider adequacy of project monitoring and maintenance, reporting, training, and education and outreach. Identify information gaps associated with evaluating the effectiveness of sediment management practices.

Task 2.3 Develop report that summarize results of inventory and evaluation of sediment management practices

Prepare a draft and final report that identifies the results from Tasks 2.1 and 2.2. Report will be reviewed/approved by Ad Hoc Task Group and Management Committee.

Task 3. Evaluate results from watershed assessment and sediment management practice assessment and make recommendations for further analysis

Task 3.1 Identify potential studies to be implemented in the future

Program staff will evaluate information from the limiting factors analysis to determine if sediment is a significant limiting factor and is likely causing impairment to beneficial uses. If the determination is made that beneficial uses are being impaired by sediment, conduct sediment source analysis (see Task 4). Assess and prioritize all potential studies described in limiting factors analysis report and, if needed, recommend studies for the future. Identify additional data needed to evaluate effectiveness of proposed sediment management practices.

Task 3.2 Identify potential management practices to be implemented in the future

Incorporate available information from the limiting factors analysis and sediment management assessment to identify sediment problem areas impacting sensitive species. Identify sediment problem areas where management actions are not effective or have not been implemented. Recommend management practices to address sediment problem areas, including improvements to current management practices. Incorporate flow management measures that are recommended in the HMP. Identify non-sediment related impacts and recommend management practices to reduce these impacts.

Task 3.3 Develop a technical memorandum that summarizes recommendations

Prepare a draft and final technical memorandum that identifies the recommendations from Tasks 3.1 and 3.2. An Ad Hoc Task Group, comprised of Co-permittees whose jurisdictions overlaps with the watersheds that are being addressed, will review and comment on all recommendations developed by Program staff. AHTG recommendations will be reviewed/approved by Program's Management Committee. The Management Committee will make the decision to either recommend Co-permittees implement management practices or direct the AHTG to develop and/or revise appropriate performance standards.

Task 4. Sediment source analysis

Task 4.1 Conduct rapid evaluation of sediment budget

Inventory and quantify sediment sources using existing approaches (e.g., Reid and Dunne 1996, Dietrich et al. 1982) utilizing digital orthophotos and digital terrain models available for Santa Clara Basin watersheds. Task includes determining active processes that are delivering sediment from upslope areas to channels; quantifying process rates and grain-size distributions; determining which processes are natural and which are caused by or accelerated by anthropogenic activities; and determining appropriate sediment transport rates through channels. Above information will be combined with information on existing channel condition (see Task 1.1) to evaluate impacts of excess sediment supply and peak runoff to aquatic habitat, bank stability, and flood conveyance.

Task 4.2 Identify management actions to reduce anthropogenic sources of sediment

Incorporate information from sediment source study to identify areas producing excessive sediment due to anthropogenic activities. Identify and prioritize management practices to address sediment problem areas. Compile data results with analyses and recommendations into a technical report. Report will be reviewed/approved by Ad Hoc Task Group and Management Committee.

Task 5. Evaluate Prioritization of Watersheds and Assessment Approach

Task 5.1 Evaluate watersheds for future assessments

Obtain available information relevant to assessing sediment-related impacts to Santa Clara Basin watersheds and use the information to re-evaluate the priority of watersheds for potential impairment by sediment from anthropogenic activities. In addition, identify available funding resources from planned projects whose activities may include monitoring and assessment of sediment processes and associated impacts to beneficial uses. These projects can provide opportunities to leverage resources to assess sediment impacts to sensitive species and therefore may warrant higher prioritization for future assessments. Program staff will incorporate existing

information, identify additional funding resources (e.g., grants) and make recommendations to the Ad Hoc Task Group for selecting watersheds for future assessments.

Task 5.2 Prepare Technical Memorandum on the Re-evaluation of Assessment Priorities

Consistent with the urban runoff permit, the SCVURPPP prepared a listing of creeks in the SCVURPPP jurisdictional area, other than San Francisquito Creek, which may be impaired by sediment from anthropogenic sources. The initial list is based on a clear set of ranking criteria and utilizes all available data to develop a list that address the original question posed in the permit. It is obvious that more data will become available over the next several years, thus, updating the original list along with a review and update of the ranking criteria is necessary.

This task calls for summarizing the results of Task 5.1 and 5.2 which include collecting and reviewing all available data during FY 02-03 and producing an updated list during the first quarter of FY03-04. The data collected during FY02-03 will be used to update develop the FY03-04 Annual Monitoring relative to sediment data needs. The updated list produced during FY03-04 will also include an update of the long-term SCVURPPP and individual Co-permittee priorities and resource needs for conducting creek sediment assessments. The results of the update will also be used during FY 03-04 to update the SCVURPPP Multi-Year Monitoring Plan as well as assist develop the FY 04-05 Annual Monitoring Plan.

Task 5.3 Continuous Improvement

The results of Task 5.3 will be reviewed by individual Co-permittees and the overall MC to identify both specific Co-permittee and SCVURPPP Annual Workplan tasks. The overall objective is to get Co-permittees directly involved, as early as possible, in the decision-making process relative to local data needs and the review and implementation of short and long-term management control measures. The SCVURPPP will coordinate with and seek input from the Watershed Management Initiative (via the Watershed Assessment Subgroup) as part of developing guidance and recommendations for Management Committee consideration. Another objective of the SCVURPPP's approach is to provide the Regional Board with a logical process and technical basis to update the 303(d) lists.

Task 5.4 Evaluate watershed assessment approach

Examine lessons learned from limiting factors analysis used in current study. Incorporate information on sediment assessment approaches used in other watershed analyses (e.g., San Francisquito Creek). Evaluate utility of the different approaches for assessing sediment impacts to beneficial uses and make recommendations to Ad Hoc Task Group for using approaches in future assessments. Develop technical memorandum that reports the results of the analysis and lists recommendations.

SCHEDULE

Activity	**Deliverable**	**Projected Duration**	**Comments**
Develop budget and workplan for each Co-permittee and Program		4 months	Nov 02 – Mar 03
Identify entity to complete task 1		3 months	March – June 03
Task 1.1 Compile and review existing data and information		4 months	Starting July 03
Task 1.2 Identify target species for limiting factors analysis		1 month	Dependent on previous task
Task 1.3 Identify and assess potential limiting factors and develop initial hypotheses		1 month	Dependent on previous task
Task 1.4 Conduct focused studies		4 months	Dependent on previous task
Task 1.5 Data analysis and recommendations	Report, data	2 months	Dependent on previous task
Task 2.1 Inventory and document sediment management practices		4 months	Starting July 03
Task 2.2 Evaluate the effectiveness of sediment management practices		2 months	Dependent on previous task
Task 2.3 Develop a report that summarizes recommendations	Report	2 months	Dependent on completion of tasks 2.1 and 2.2.
Task 3.1 Identify potential studies to be implemented in the future		2 months	Dependent on completion of tasks 1.5 and 2.2.
Task 3.2 Identify potential management practices to be implemented in the future		2 months	Dependent on completion of tasks 1.5 and 2.2.
Task 3.3 Develop a tech memo that summarizes recommendations	Tech memo	2 months	Dependent on completion of tasks 3.1 and 3.2.
Task 4.1 Conduct rapid evaluation of sediment budget		4 months	Start June 04, dependent on Task 3.1
Task 4.2 Identify management actions to reduce anthropogenic sources of sediment	Report, data	2 months	Dependent on previous task
Task 5.1 Collect existing data to help evaluate watersheds for future assessments		6 months	Dec – Jun 03
Task 5.2 Develop tech memorandum that re-evaluates assessment priorities.	Tech memo	2 months	Complete Sept 03
Task 5.3 Continuous Improvement		2 months	Complete Dec 03
Task 5.4 Evaluate watershed assessment approach	Tech memo	3 months	March – June 04

Timeline for Workplan

Task	9/02	12/02	3/03	6/03	9/03	12/03	3/04	6/04	9/04	12/04	3/05	6/05	9/05
Submit workplan	→												
Develop SCVURPPP budget and workplan		→	→			→	→			→	→		
Identify entity to complete tasks 1 and 4			→	→	(Stevens)								(Coyote)
Task 1.1				→	→							→	→
Task 1.2					→	→							
Task 1.3					→	→							
Task 1.4						→	→						
Task 1.5							→	*					
Task 2.1				→	→							→	→
Task 2.2					→	→							
Task 2.3						→	*						
Task 3.1								→					
Task 3.2								→					
Task 3.3									#				
Task 4.1									→	→			
Task 4.2										→	*		
Task 5.1	→	→	→	→					→	→	→	→	
Task 5.2				→	*							→	*
Task 5.3					→	→	#						
Task 5.4							→	*					
HMP	→	→	→										
San Francisquito Assessment	→	→	→	→	→	→							
Upper Penitencia Flood Protection			→	→	→	→	→						
SCVURPPP Monitoring Plan Saratoga Creek				→	→	→	→	→					

\# Management Committee reviews recommendations by Ad Hoc Task Group (Task 6)

* Deliverables are submitted to Ad Hoc Task Group

Attachment A

Regional Board Staff Written Comments on
"Potentially Sediment Impairment Creeks Report"
Submitted to SCVURPPP in July 8, 2002 Letter

California Regional Water Quality Control Board
San Francisco Bay Region

Winston H. Hickox
Secretary for Environmental Protection

Internet Address: http://www.swrcb.ca.gov
1515 Clay Street, Suite 1400, Oakland, California 94612
Phone (510) 622-2300 • FAX (510) 622-2460

Gray Davis
Governor

Date: JUL 0 8 2002
File No.: 2182.05 (JBO)

Mr. Beau Goldie
Management Committee Chair-SCVURPPP
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3614

SUBJECT: **REGIONAL BOARD STAFF REVIEW OF "SEDIMENT IMPAIRMENT REPORT" IN FY 2002-03 WORK PLAN**

Dear Mr. Goldie:

We have reviewed the Santa Clara Valley Urban Runoff Pollution Prevention Program's (Program) Sediment Impairment Report (report) contained in the FY 2002-2003 Draft Work Plan. We find the report conditionally acceptable provided the following issues are addressed in development of the work plan and schedule due on September 1, 2002:

1) The entire Stevens Creek watershed, downstream of reservoir, should be given a high priority because, in addition to steelhead, sediment removal is an important issue in lower Stevens Creek. The influence of the reservoir on downstream sediment supply, transport capacity, and channel condition must be considered.

2) Analysis of Coyote Creek (Reaches 4 and 5) must include an evaluation of the influence of Anderson Dam on downstream sediment supply, transport capacity, and channel condition.

3) Saratoga Creek (upstream of the San Jose Water Company diversion) and Upper Penitencia Creek (entire watershed) should be added to the list of high priority streams for analysis.

Background and Specific Rationale

A key issue driving development of sediment TMDLs for Bay Area streams is implied degradation of salmonid habitat. Other issues include: 1) protection of other rare or threatened aquatic species (e.g., river lamprey, hardhead, foothill yellow-legged frog, western pond turtle, etc.); 2) increased flooding for which streambed aggradation may be a contributing factor; and 3) the fate and transport of particle bound contaminants (e.g., Hg, PCBs, DDT, etc.). Provision C.9.f.iii of the Program's permit (Order 01-024) reads as follows:

> *"Submit a report acceptable to the Executive Officer by March 1, 2002 that identifies the other creeks that may be impaired by excessive sediment production from erosion due to anthropogenic activities. Submit a plan and time schedule for implementation acceptable to the Executive Officer by September 1, 2002 to conduct a watershed analysis and management*

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at http://www.swrcb.ca.gov.

practice assessment in the other creeks which may be impaired by excessive sediment production from erosion due to anthropogenic activities."

The Program's report presents (1) a brief summary of existing data for streams in the Santa Clara Valley that were reviewed to evaluate impairment of salmonid habitat by sediment, and (2) the approach for prioritizing stream reaches for watershed analysis and evaluation of management practices. The report does not provide a conclusion regarding sediment impairment (or lack there of) for any stream within the Program's jurisdictional boundaries, as we had expected in accordance with the permit provision. The report does identify two reaches of Stevens Creek and two reaches of Coyote Creek as high priority reaches for subsequent watershed analysis and review of management practices.

In 1998, the California Department of Fish and Game (CDFG) requested that the Regional Board list Stevens Creek, Guadalupe River, Upper Penitencia Creek (as well as other Bay Area streams) as impaired by too much sediment under Section 303(d) of the federal Clean Water Act because: a) these streams have the potential to support self-sustaining runs of steelhead and/or fall-run chinook salmon; and b) current and former Area Fishery Biologists concur that habitat in these streams is impaired by too much sediment. Regional Board did not list the above streams because we did not receive or identify watershed specific data or have the opportunity to interview other local experts (for above streams) in the brief period between receipt of the petition from CDFG and the development of the list, and because we were assured by stormwater program representatives that these streams would receive watershed analysis and management attention in the very near future. It is our understanding that all of the above streams remain high priorities for CDFG in its efforts to recover steelhead and/or salmon runs in the South Bay, with one caveat for Guadalupe River tributaries that are impaired by mercury[1].

Although we have questions and/or concerns regarding methods, defensibility, and completeness of the report, we would concur that Stevens Creek be given a high priority for watershed analysis and evaluation of management practices based on the opinion and previous petition by the CDFG. We would clarify that sediment management for salmonid habitat enhancement in Reaches 3 and 4 of Stevens Creek will require that the entire watershed be analyzed because the dam influences downstream sediment supply, transport capacity, and channel form and condition. Such an integrated approach may be attractive to SCVWD and other stakeholders in light of the FAHCE study and management effort that is underway, and the potential opportunity to reduce downstream sediment removal costs and stormwater pollutant loads through source assessment and control.

We also propose that Saratoga Creek (upstream of the San Jose Water Company diversion) be added to the list of high priority streams for subsequent watershed analysis because Saratoga Creek:

1) currently supports a large rainbow trout population and likely provides high quality habitat for several other rare or threatened species including western pond turtle and foothill yellow-legged frog;

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[1]It is our understanding that CDFG has subsequently delayed implementation of steelhead migration barrier remediation projects in Guadalupe Creek and Alamitos Creek tributaries of the Guadalupe River, based on the concerns that mercury contamination issues need to be resolved first in those streams. Sediment quality and quantity issues in the Guadalupe River and its tributaries are also receiving attention through flood control projects along its mainstem and the mercury Total Maximum Daily Limit project.

2) has high Ephemeroptera, Plecoptera, and Tricoptera (EPT) richness scores; and
3) appears to have very little existing data relating sediment to habitat.

Similarly, Upper Penitencia Creek is believed to have a very high potential to support a self-sustaining run of steelhead trout (*Jerry Smith, San Jose State University, Personal communication, 2001*). In the absence of additional information, and based on the opinion of CDFG (presented above), we would conclude that Upper Penitencia Creek should be given a high priority for watershed analysis and evaluation of management measures.

The report also proposes that Coyote Creek, in Reaches 4 and 5 (those immediately downstream of Anderson Dam and identified by Jerry Smith as providing habitat for steelhead), be given a high priority for watershed analysis and evaluation of management measures for sediment. We agree that there is value in developing a focused watershed analysis for Coyote Creek (Reaches 4 and 5), provided that the watershed analysis includes an evaluation of the influence of Anderson Dam on channel condition as well as sediment supply and transport capacity in Reaches 4 and 5.

We agree with the staff of EOA, Inc., who prepared the report (*Paul Randall, personal communication, June 2002*), that the watershed analysis should be conducted within the framework of a limiting factors study to determine whether or not sediment is an important control on steelhead and/or rainbow trout populations, and if so to determine its significance relative to other factors that also shape habitat (e.g., habitat complexity, stream temperature, flow regime, migration barriers, etc.). To facilitate submittal of an acceptable work plan and time schedule for watershed analysis and management practice assessment for sediment (required by 9/1/02), we have scheduled a meeting with your staff and EOA staff for July 17, 2002 to discuss objectives, analytical approach, budget, and schedule. We are prepared to present examples of acceptable approaches to such a study.

Please contact Mike Napolitano at 622-2397 or mbn@rb2.swrcb.ca.gov and/or Jan O'Hara at 622-5681 or jbo@rb2.swrcb.ca.gov if you have any questions regarding this correspondence.

Sincerely,

Loretta K. Barsamian

Loretta K. Barsamian
Executive Officer

cc: Adam Olivieri, EOA, Inc.
Jill Bicknell, EOA, Inc. *for distribution to Co-permittees*
Laura Young, SCVWD
Trish Mulvey, CLEAN South Bay

Attachment B

Minutes from Watershed Analysis Workplan RWQCB Meeting

Santa Clara Valley Urban Runoff Pollution Prevention Program

Watershed Analysis Workplan RWQCB Meeting

Internal Organization (IO) Meeting Summary Report

Date/Time: July 17, 2002 1 pm – 3 pm

Place: RWQCB, 1515 Clay St, Oakland

Who Attended: Adam Olivieri, Paul Randall and Kristin Kerr (SCVURPPP Program staff); Trish Mulvey (CLEAN South Bay); Richard McMurtry, Paul Amato, Tom Mumley and Mike Napolitano (RWQCB); Beau Goldie, Laura Young and Brett Calhoun (SCVWD);

Key Issues Discussed:

- Regional Board staff requested a meeting with the SCVWD and Program staff to: a) Discuss potential opportunities (for improving our understanding of sediment input, transport, and storage; and channel condition and habitat) that are presented by FAHCE, WMI studies, Guadalupe Hg TMDL, and on-going and future flood management project studies. Ability to substantially reduce cost of sediment removal projects, through identification and control of principal sources of sediment production to streams also should motivate sediment budget information gathering. b) Discuss potential common ground (RWQCB, SCVWD, and SCVURPPP) regarding information needs: sediment budget, channel condition and dynamics information. c) present and discuss RWQCB objectives for sediment work plan, suggested analytical approaches and acceptable level of accuracy and/or uncertainty, and potential schedule for sediment work plan due on 9/1/02.

- Regional Board staff did not want to focus on the Identification Report (submitted March 1, 2002) and their comments on this report (July 8, 2002 letter). They did not believe the report completely addressed the permit provision and wanted the report to identify creeks that are impaired due to sediment. SCVWD and Program staff pointed out that the permit provision requirement states that the SCVURPPP was to identify creeks that may be impaired due to sediment and that the next provision in the permit was to schedule the watershed analysis to determine if the creek is actually impaired.

- The Napa River approach (endorsed by RWQCB) was to first conduct a limiting factors analysis as supporting info to reject or accept impairment listing. This is the approach we are proposing for the other creeks study, which seems acceptable by the Board.

- Mike expressed we need to focus sediment impacts beyond just salmonid fishes (used in the identification report). Mike is concerned about warm water natives (e.g., in Coyote mainstem) as well as other species. Program staff said that they were not aware of a methodology for a warm water habitat limiting factors analysis.

- The RWQCB staff noted that while the San Francisquito Creek sediment study is being done to satisfy permit requirements, it may not be best model for using on other creeks approach. The SFC approach includes a sediment budget concurrently with limiting factors analysis, which is very costly. It may provide the background for adopting an assessment approach in the future, however the Board feels there is enough science available to begin to assess other watersheds concurrently with the San Francisquito Creek project. Trish Mulvey thought the San Francisquito Creek study was supposed to be the pilot sediment study. The District and

Program staff also made this comment, and noted that they were interested in approaches that result in cost effective assessments.

- Mike Napolitano believes information for a limiting factors analysis is already being collected in watersheds.

- Richard McMurtry stated a subset of the FACHE reports were submitted to the WMI. Richard indicated that he would request that the data and information be released to the WMI and SCVURPPP.

- The Regional Board staff expressed the concern that the watershed assessments would follow a linear schedule after the San Francisquito Creek project is completed. SCVWD and Program staff pointed out that not everything can be first priority and that many activities were underway by the Co-permittees already, that resources were being stretched to cover these many areas, that the permit was written to build on previous steps, and that part of the next phase of the sediment work was to get Co-permittees directly involved with understanding the required work and funding it so that implement in the future would be easier. Tom Mumley acknowledged that he understood our comments and concerns. He noted that additional information in the workplan including: interim milestones, clarification regarding current and future schedules, identification of Management Committee review and actions, coordination with other ongoing efforts such as the Multi-year Monitoring Plan, and clarification about how Co-permittees would identify and implement early actions as well as long-term actions would go along way to alleviate RWCQB staff concerns.

- The SCVWD discussed the need for framework questions when embarking on different projects, data synthesis and reevaluation of management questions. The important aspect of the San Francisquito Creek study is it was developed in a stakeholder process.

- The SCVWD and Program staff invited Mike Napolitano to participate in the Watershed Analysis Workplan AHTG. Program staff will continue to work with Regional Board staff during the development of the workplan.

Attachment C

Response to Regional Board Staff Review of
"Potentially Sediment Impairment Creeks Report"

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

August 29, 2002

Mr. Dale C. Bowyer, Chief
Southeast Bay Section
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Response to Regional Board Staff Review of "Potentially Sediment Impairment Creeks Report" in FY 2002-03 Work Plan July 8, 2002 Letter

Dear Mr. Bowyer,

This is a response to your July 8, 2002 comments on the report *Identification of Creeks Potentially Impaired by Sediment from Anthropogenic Activities* submitted in the SCVURPPP FY 2002-03 Work Plan in fulfillment of Permit Provision C.9.f.iii. We appreciate your staff comments and their meeting with District and Program on June 17, 2002. Regional Board staff comments are numbered and in bold. Our response follows these specific comments.

The report *Identification of Creeks Potentially Impaired by Sediment from Anthropogenic Activities* (Potential Sediment Impaired Creek Report) was submitted in fulfillment of Permit Provision C.9.f.iii which required a report by March 1, 2002 that "identifies the other [not San Francisquito Creek] creeks that may be impaired by excessive sediment production from erosion due to anthropogenic activities". The Regional Board July 8, 2002 letter finds the report conditionally acceptable provided several issues are addressed in development of the Workplan.

The Workplan referred to is being developed in fulfillment of Permit Provision C.9.f.iii which also requires a workplan and time schedule by September 1, 2002 to "conduct a watershed analysis and management practice assessment in the other creeks which may be impaired by excessive sediment production from erosion due to anthropogenic activities".

1. "The entire Stevens Creek watershed, downstream of reservoir, should be given a high priority because, in addition to steelhead, sediment removal is an important issue in lower Stevens Creek. The influence of the reservoir on downstream sediment supply, transport capacity, and channel condition must be considered."

Regional Board staff stated this issue needs to be addressed in development of the Workplan. Only Stevens Creek reach 3 & 4 were given high priority in the Potential Sediment Impaired Creek Report due to the factors and weighting system developed. Specifically, beneficial uses of creeks for cold water habitat (i.e. salmonid fish habitat) is given a higher weighting than problem sediment removal sites (reaches where excessive sediment accumulation is decreasing channel capacity and increasing flood potential). We believe this weighting is appropriate.

However, the Workplan for the watershed assessment will address the influence of the reservoir on downstream sediment supply, transport capacity, and channel condition. Although only reaches 3 & 4 in Stevens Creek were identified as high priority for assessment, the entire Stevens Creek watershed, downstream of the reservoir, will be included in the watershed characterization and sediment budget assessments. Also, we recognize the sediment processes within reach 3 & 4 are affected by the processes throughout the watershed.

2. "Analysis of Coyote Creek (reaches 4 & 5) must include an evaluation of the influence of Anderson Dam on downstream sediment supply, transport capacity, and channel condition."

As stated previously, we recognize the sediment processes within specific reaches are affected by the processes throughout the watershed. The Workplan for the watershed assessment will include a watershed characterization and sediment budget assessment. The influence of Anderson Dam on downstream sediment supply, transport capacity, and channel conditions will be discussed and evaluated in these sections.

3. "The report does not provide a conclusion regarding sediment impairment (or lack there of) for any stream within the Program's jurisdictional boundaries, as we had expected in accordance with the permit provision."

The permit provision states the report must identify other creeks "that may [underline added for emphasis] be impaired by excessive sediment production from erosion due to anthropogenic activities". The permit does not state that creeks must be identified that are impaired due to sediment. Given the series of sediment provisions and associated permit deadlines it is clear that not everything is expected to be done all at once. Further, a determination of impairment due to sediment could not be made for every creek in the SCVURPPP program area (over 100 creeks) in such a short time. In addition there was insufficient evidence from existing data sources to develop conclusions regarding sediment impairment for every creek. Research into previous case studies involving assessment of data for 303(d) listing required two conditions be met to recommend listing: (1) weight of evidence that sediment impaired salmonid fish habitat; and (2) excess sediment was from anthropogenic sources. The current available data for Santa Clara Basin streams did not provide evidence for either condition. It was clear that more data would need to be collected to adequately assess impairment by sediment. As a result, we collected

available data and used a "weight of evidence" approach to prioritize watersheds for future assessments. Given the permit provision also required a workplan and time schedule for a future watershed analysis for specific creeks identified in the previous report, we believe our approach is consistent with the permit provision.

4. "Regional Board did not list the above streams [Stevens Creek, Guadalupe River, Upper Penitencia Creek] because we did not receive or identify watershed specific data or have the opportunity to interview other local experts (for above streams) in the brief period between receipt of the petition from CDFG and the development of the list, and because we were assured by stormwater program representatives that these streams would receive watershed analysis and management attention in the very near future."

A footnote in the Regional Board letter states "Sediment quality and quantity issues in the Guadalupe River and its tributaries are also receiving attention through flood control projects along its mainstem and the mercury Total Maximum Daily Limit project". Although Guadalupe River was not a high priority in our Potential Sediment Impaired Creek Report, it is receiving watershed analysis and management attention through the mercury TMDL process and SCVWD capital projects. Creeks in the Guadalupe River watershed did receive a medium priority rating and will be reevaluated for watershed analysis priority with available data from these projects and studies.

Upper Penitencia Creek was not a high priority in our Potential Sediment Impaired Creek Report, however, it is receiving watershed analysis and management attention through several studies and activities. The studies and activities taking place in the Upper Penitencia Creek include the FACHE Habitat Study (1999), a City of San Jose Alum Rock restoration project, SCVWD Flood Control Project, WMI Assessment of Upper Penitencia and the Coyote Watershed Assessment.

Stevens Creek was a high priority in our report and will be addressed in the Workplan required by Permit Provision 9.C.f.iii.

5. "We would clarify that sediment management for salmonid habitat enhancement in Reaches 3 and 4 of Stevens Creek will require that the entire watershed be analyzed because the dam influences downstream sediment supply, transport capacity, and channel form and condition."

The Workplan will address this point, and as stated previously, the entire watershed will be included in the watershed characterization and sediment budget assessments. The entire watershed will be evaluated for sediment management to address the affects in the two reaches identified.

6. "We also propose that Saratoga Creek … be added to the list of high priority streams for subsequent watershed analysis…"

The three reasons given in the RWQCB letter for justifying an increase of Saratoga Creek to high priority were factors that were used in the Potential Sediment Impaired Creek Report analysis.

The lack of information on habitat condition prevented a potential higher rating, as it did other streams (e.g., Permanente Creek). As a result, we identified salmonid habitat survey data as an information gap that needs to be addressed for this creek. The prioritization ranking was designed to remove individual bias for which streams should be high priorities, which could change with each individual reviewing the report, and make the results reproducible. We think it is more beneficial to explain how our approach (selection and weight assigned to factors) could be changed to enhance the defensibility of the results. For example, streams with data gaps should receive higher weight. The prioritization ranking could then be recalculated to determine which streams are high priorities.

However, the Workplan will address Saratoga Creek and identify tasks for further analysis. Specifically, as part of the SCVURPPP multi-year monitoring program, salmonid habitat data are planned for collection from Saratoga Creek. As stated above, the lack of information on habitat condition prevented a potential higher rating in the Identification Report. The report identified salmonid habitat survey data as an information gap that needs to be addressed for this creek and SCVURPPP will be collecting information to fill this data gap. Once this information is available its priority assessment for watershed analysis can be reevaluated.

7. "Similarly, Upper Penitencia Creek is believed to have a very high potential to support a self sustaining run of steelhead trout…In the absence of additional information, and based on the opinion of CDFG .. we would conclude that Upper Penitencia Creek should be given a high priority for watershed analysis and evaluation of management measures."

Upper Penitencia Creek did receive the highest ranking in the "potential salmonid" category. However, due to its rankings in the other factors used for our analysis it was calculated as a medium priority. As stated previously, the prioritization ranking was designed to remove individual bias for which streams should be high priority, which could change with each individual reviewing the report, and make the results reproducible. We think it is more beneficial to explain how our approach (selection and weight assigned to factors) could be changed to enhance the defensibility of the results. For example, include existing professional opinion (CDFG) and the absence of additional information as factors with high weights. The prioritization ranking could then be recalculated to determine which streams are high priority.

Tasks for Upper Penitencia Creek will be included in the Workplan to address Regional Board staff's concerns. These tasks will leverage current projects to collect data and information required to perform a limiting factors analysis.

8. "We agree that there is value in developing a focused watershed analysis for Coyote Creek (Reaches 4 and 5), provided that the watershed analysis includes an evaluation of the influence of Anderson Dam on channel condition as well as sediment supply and transport capacity in Reaches 4 and 5."

We agree this is an important aspect and the Workplan for the watershed analysis will address the influence of Anderson Dam.

We appreciate the opportunity to discuss the Workplan and time schedule for watershed analysis and management practice assessment for sediment with your staff before the submittal deadline. We had already started on the process of the Workplan development before the meeting date. A Watershed Analysis Workplan AHTG was convened (June 26, 2002) and they agreed on the Workplan approach presented. This approach was modeled after the Napa River limiting factors analysis and San Francisquito Creek watershed analysis approach which was developed in a stakeholder process. We have included tasks in the workplan which will review how the San Francisquito Creek process went and allow for any adjustments or improvements as necessary.

Based on your comments in the July 8, 2002 letter and our meeting on July 17, 2002 we will present the Watershed Analysis Workplan AHTG with a Draft Workplan that also incorporates the Regional Boards concerns. The Draft Workplan will address Saratoga Creek, Upper Penitencia Creek and a schedule that also allows for taking advantage of opportunities to make progress in future tasks sooner where possible. We encourage the Regional Board staff to participate in the AHTG meetings. We look forward to working with Regional Board staff as the AHTG develops and implements the workplan.

Please contact either Beau Goldie at 408-265-2600, or Adam Olivieri at 510-832-2852, if you have any questions.

Sincerely,

Beau Goldie
Management Committee Chair
SCVURPPP

Adam W. Olivieri, Dr.PH, P.E.
Program Manager
SCVURPPP

Cc: Jan O'Hara, RWQCB
Mike Napolitano, RWQCB
SCVURPPP Management Committee

Attachment 4-6

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Trash Work Plan

March 1, 2003

INTRODUCTION

This Work Plan is submitted to fulfill a Program FY01-02 Continuous Improvement item and actions identified within the Program's Multi-Year Receiving Waters Monitoring Plan. The Work Plan was developed in response to the November 14, 2001 San Francisco Bay Regional Water Quality Control Board (RWQCB) 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on the 2002 303(d) "monitoring" list due to the threat of trash impairment to water quality. The State Water Resources Control Board (SWRCB) adopted the 2002 Clean Water Act section 303(d) list of water quality limited segments (which included this recommendation) at its February 4, 2003 Board Meeting.

The goal of the Work Plan is to identify a strategy for Co-permittee municipalities and agencies to address trash problem areas that occur in urban streams and waterways. The Work Plan includes the following objectives:

- Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction;
- Develop a strategy to conduct trash evaluations in creeks;
- Assist municipalities to identify high priority trash problem areas and sources of trash;
- Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas;
- Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

The results and implementation efforts over the next two years will be documented and provided within the Program's and Co-permittee's Annual Reports. The information is intended to assist Regional Board staff in their assessment of creeks and more specifically, stream reaches (for potential trash impairment) by the next 303 (d) listing cycle; which is expected to begin in the Spring of 2005.

BACKGROUND

The November 14, 2001 Regional Board 303(d) Staff Report proposes changes to the 1998 303(d) list of impaired water bodies within the San Francisco Bay area. The Staff Report states there "are excessive levels of trash in virtually all urbanized waterways of

the San Francisco Bay Region." However, listing these waterways was not proposed due to a lack of consistent assessment methodology for trash "impairment".

Instead, the Staff Report proposes placing all Bay area urban creeks, lakes and shorelines on the 2002 303(d) "monitoring" list due to the threat of trash to impair water quality. It states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by stormwater agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information and developing a program of action to address the principle sources. Regional Board staff has indicated that it will review this specific information in the next listing cycle; determine whether specific water bodies warrant a 303(d) listing for trash and note the existence of relatively clean urban streams.

In a proactive response to the 303(d) Staff Report, the Program developed a Work Plan to identify a strategy for addressing trash problem areas that occur in urban streams and waterways. In addition, the Program has completed several tasks to determine procedures that will efficiently and effectively define trash problem areas and identify trash sources through monitoring or existing information. A more detailed description of the methods and results of each task are provided in Attachment A. These tasks include: 1) forming a Trash Ad Hoc Task Group (see Attachment B for a list of attendees); 2) completing a technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (June 24, 2002); 3) completing a technical memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of RWQCB Rapid Trash Assessment (*March 1, 2003) (Attachment C); 4) developing and distributing an *Existing Trash Management Practices Survey Form* (November 2002) to individual Co-permittee staff (Attachment D); 5) completing a preliminary report that documents Co-permittee existing trash management practices (Attachment E); and 6) completing a technical memorandum entitled *Update of the 1999 Catch Basin Retrofit Feasibility Study* (June 26, 2002).

The preliminary report documenting Co-permittees existing trash management practices and policies identified a wide range of municipal and agency departments and programs that are responsible for trash management and code enforcement. These agencies perform the following activities to reduce trash:

- Household hazardous waste collection;
- Solid waste and curb-side recycling programs;
- Response to trash complaints/incidents;
- Litter pick-up and trash removal;
- Street sweeping;
- Storm drain operations and maintenance;
- Incentive programs (free trash pick-up/drop-off days; reduced fees for low income residents);
- Removal of homeless encampments;
- Anti-litter campaigns; and
- Volunteer creek clean-up programs and events.

Several agencies responsible for trash management reported that they currently document trash management activities and/or enforcement actions; and evaluate effectiveness of these activities. Mechanisms used to determine effectiveness include the number of routine inspections and tracking the number of complaints or work orders. Some agencies have developed specific performance measures to evaluate their programs. Several Co-permittees have indicated that the strict enforcement of anti-litter laws and increased level of outreach would most likely improve their agency's ability to manage litter and illegal dumping. The Program will continue to work with Co-permittees to fill in data gaps; and obtain additional information useful in evaluating the effectiveness of existing trash management practices and policies.

In effort to promote a regional approach in addressing trash problems, the Program coordinated and collaborated with BASMAA during the development and review of products associated with the tasks described above.

TRASH WORK PLAN

The goal of the Trash Work Plan is to identify a strategy for municipalities and agencies to address trash problems in urban streams within the Program's jurisdiction. Five major objectives have been identified for the Work Plan. They include the following:

- Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction;
- Develop a strategy to conduct trash evaluations in creeks;
- Assist municipalities in identifying the high priority trash problem areas and sources of trash;
- Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas;
- Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

The Program places a higher priority on specific urban areas of special concern (identified trash problem areas and creek segments that are visible and/or accessible to the general public). Thus, the Program will focus on implementing trash control measures within these areas and documenting the effectiveness of management activities. The FY 03-04 tasks focus on further documentation and evaluation of existing management practices; the identification of potential management actions; the further development of trash evaluation tools and the development of standardized format for reporting and evaluating trash management practices. The FY 04-05 tasks focus on the development of a monitoring strategy; implementation of trash evaluations and the identification and implementation of trash management practices.

Evaluation results and implementation efforts will be documented and provided within the Program and Co-permittee's Annual Reports. The information is intended to assist Regional Board staff in their assessment of creeks or more specifically, creek reaches (for potential trash impairment) by the next 303 (d) listing cycle; which is expected to begin in the spring of 2005.

APPROACH

The Work Plan uses a three-prong approach to address trash problems in urban creeks. This approach involves conducting trash evaluations; identifying trash problem areas; and developing and implementing a strategy to address trash problem areas.

Conduct Trash Evaluations

Trash evaluations will primarily be used to assist municipalities and agencies in identifying trash problem areas and potential sources of trash; selecting and implementing appropriate control measures; and measuring the effectiveness of trash-related management actions over time.

The Program will use a modified version of the Regional Board's *Rapid Trash Assessment Methodology*, which was designed to assess wadeable streams. The Work Plan includes a task to modify the RWQCB assessment methodology in accordance with the recommendations provided in the document entitled *SCVURPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (Attachment A). To maintain consistency and enhance data analysis of trash evaluations being conducted within the Bay area, modifications will be coordinated with other stormwater agencies.

The Program will also investigate the utility of Keep America Beautiful's litter index (as an evaluation tool) to measure the effectiveness of management actions over time. Municipal and agency staff and/or volunteers will conduct trash evaluations within their respective jurisdictions. Program staff will provide the necessary training and guidance to implement evaluations. Trash evaluation results will be compiled and documented in the Program's annual reports.

Identify Trash Problem Areas and Trash Sources

The Work Plan includes a task to compile information (from municipalities and agencies), which identifies known trash problem areas and suspected sources of trash (e.g., litter or illegal dumping). These locations will be geo-referenced and mapped. To determine the range of trash conditions at identified trash problem areas, Co-permittee staff and/or volunteers will conduct trash evaluations at these locations. In addition, stream segments suspected of having trash problems (e.g., drainage areas with observed trash or land uses suspected of creating trash problems) will be assessed. Trash evaluation results from creeks will assist stormwater managers in prioritizing their efforts in addressing trash problem areas, identifying potential upstream sources of trash and providing baseline data for evaluating the effectiveness of potential implementation of trash controls.

The Program will also focus trash evaluation efforts in stream segments that are visible and/or accessible to the general public. These evaluation results may be used to assist stormwater managers in evaluating the effectiveness of existing trash controls implemented in areas where trash is considered a nuisance or aesthetically unpleasing to the general public.

Implement Trash Control Measures

The Program will focus its implementation of trash management practices and policies in three primary areas: eradication of trash; public outreach and participation; and enforcement of litter laws. The Work Plan identifies tasks to document and evaluate existing trash management practices and policies for municipalities and agencies within the Program's jurisdiction. It also contains a task to identify potential trash management actions and monitoring strategies conducted by other programs and agencies not part of the SCVURPPP NPDES permit. Co-permittee staff will identify and implement reasonable management actions to remedy high priority trash problem areas. To address the source and cause of trash in creeks, the Program will establish long-term management actions and policy changes as information becomes available.

The Work Plan identifies tasks to develop standardized procedures and reporting formats used to document control measures and management practices. Program staff will assist Co-permittee staff in developing a standardized reporting format for detailing trash eradication efforts, public involvement and enforcement actions. Trash evaluations will also be implemented to identify changes in trash conditions at problem areas over time. This information will be used to evaluate the effectiveness of the Program's trash control efforts.

Roles of Program and Co-permittee Agency Staff

The Work Plan identifies tasks for both Program staff and Co-permittee staff to develop and implement a strategy that addresses trash problems in urban creeks and waterways.

Program Tasks

- Further inventory, document and evaluate existing trash management practices into a summary report.
- Document and map Co-permittees' known trash problem areas.
- Conduct literature review of existing trash management practices and monitoring efforts used worldwide and incorporate into technical memorandum.
- Further develop RWQCB Rapid Trash Assessment Methodology and evaluate utility of KAB litter index.
- Conduct trash evaluation training workshop.
- Develop standardized reporting and documentation format and procedures that detail and evaluate trash management practices.
- Provide guidance to Co-permittee staff for developing a strategy to monitor trash in urban creeks.
- Compile and document trash evaluation results.
- Compile and document Co-permittee implementation of trash management practices.
- Organize and manage Trash AHTG meetings.
- Collaborate and coordinate Program activities related to trash with the City of San Jose anti-litter campaign ("Pick-Up San Jose") and the BASMAA Monitoring Committee.

Municipal/Agency Tasks

- Support Program staff to further identify municipality's existing trash management practices.
- Provide Program staff with documentation regarding trash complaints/incidents and eradication efforts and a list of trash "hot spots" or trash problem areas within their jurisdiction.
- Participate in trash evaluation methodology field training.
- Use Program's monitoring strategy guidance to develop a monitoring strategy for conducting trash evaluations
- Conduct trash evaluations at known and suspected trash problem areas.
- Identify and implement trash control measures at high priority trash problem areas.
- Evaluate effectiveness of implementing trash control measures and management practices.
- Provide Program staff with trash evaluation results and information on the implementation and evaluation of trash management activities.

The Co-permittees will include designated tasks in their Annual Work Plans submitted to the Regional Board each March. The Work Plan schedule identifies Program and Co-permittee roles and responsibilities, along with expected completion dates.

SCOPE OF WORK

Task 1: Inventory, Document and Evaluate Existing Trash Management Practices

To supplement information gathered from the *Existing Trash Management Practices Survey Form* (November 2002) of municipalities and agencies (Attachment E), the Program and Co-permittees will further identify and document existing trash management practices and policies. Tasks include the following:

- Identify and fill information gaps from the November 2002 Trash Survey;
- Develop additional survey instruments that ask Co-permittees for additional information which is useful in evaluating the effectiveness of existing trash management practices and policies;
- Program staff will conduct interviews and/or survey Co-permittee staff to update and further document existing trash management practices;
- Compile, summarize and evaluate existing trash management practices and policies information.

Work Products: Report that further documents and evaluates existing trash management practices and policies within the Program's jurisdiction.

Task 2: Identify and Document Known Trash Problem Areas

To supplement information gathered from the SCVURPPP technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (June 24, 2002), the Program and Co-permittees will further identify and document known trash problem areas. Tasks include:

- Compiling information and data sources (from municipality and agency staff) to identify known trash problem areas that occur in creeks, streets, parks and other land uses within urban areas. Data sources may include, but not be limited to, trash complaints databases, maintenance and operations records, existing list of trash hot spots (e.g., "Pick-Up San Jose's" 100 trash hot spots) and creek clean-up locations;
- Converting and mapping location information of trash problem areas into coordinates using Geographic Information System (GIS).

Work Products: Maps and electronic files identifying the location of known trash problem areas.

Task 3: Identify and Document Trash Management Practices and Monitoring Efforts Implemented Worldwide.

The Program will conduct a literature review of trash management practices and monitoring approaches used throughout the United States and internationally. Tasks include:

- Reviewing trash management efforts implemented by other programs outside the Program's jurisdiction, including, but not limited to municipalities involved with the Los Angeles River Watershed trash TMDL and those cities in partnership with Keep America Beautiful.
- Documenting criteria used by other programs to evaluate the effectiveness of trash control measures and management practices.

Work Product: Technical memorandum summarizing potential management actions and monitoring activities associated with the control and reduction of trash.

Task 4: Develop Protocols for Trash Evaluations; Conduct Training Workshop

Program staff will further develop and test methodologies to conduct trash evaluations and train municipal staff to implement these methods. Tasks include:

- Modifying the Regional Board's Rapid Trash Assessment Methodology to assess trash in wadeable streams, in accordance with the recommendations provided in the document entitled *SCVURPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (Attachment C).
- Evaluating and testing Keep America Beautiful's (KAB) litter index. The use of the KAB index will maintain consistency with "Pick-Up San Jose's" efforts in evaluating trash control measures.
- Training and providing guidance (to Co-permittee staff and volunteer groups) on how to implement the RWQCB methodology and KAB litter index.

Work Products: Develop modified version of the Regional Board's Rapid Trash Assessment Methodology and conduct trash evaluation training workshop.

Task 5: Develop Standardized Documentation and Reporting Format

To ensure a consistent trash assessment approach among Co-permittees, the Program will assist Co-permittees in developing standardized procedures for documenting, reporting and evaluating control measures and monitoring activities used for trash management. Standardized procedures may include:

- Consistent documentation of the location, quantity, type and potential source of trash removed;
- The level of effort exerted (by Co-permittee or volunteer staff) while conducting trash monitoring and removal;
- The number of brochures and materials distributed;
- The number of presentations given which contain an anti-litter message;
- Tracking municipal staff responses to trash complaints and enforcement actions.

The standardized procedures will be used by Program staff to evaluate the effectiveness of trash management practices and policies.

> **Work Products**: Develop reporting format and relational database to document trash management activities in Annual Reports.

Task 6: Develop Monitoring Strategy

The Program will assist Co-permittee staff in developing a monitoring strategy to conduct trash evaluations (including criteria for selecting appropriate sites and using evaluation tools). Program staff will coordinate and collaborate with existing municipal and agency programs and volunteer efforts to develop a monitoring program. Objectives for conducting trash evaluations in creeks include:

- Collecting baseline condition of trash;
- Identifying trash problem areas;
- Investigating trash sources;
- Measuring trends of trash conditions over time;
- Evaluating the effectiveness of trash control measures.

Trash evaluations will initially be conducted at high priority problem areas (creeks identified in Task 1) and stream segments suspected of having trash problems. Suspected trash problem areas within creeks will be identified using mapped locations of municipalities' trash problem areas (e.g., streets, storm drain inlets and parks) and by evaluating creeks in land uses where trash is likely to accumulate.

Trash evaluations can also be used to determine potential causes of trash (e.g., litter, illegal dumping, accumulation, etc.) and trash sources within a drainage area (i.e.,

linkage to upstream land uses). Identifying trash sources is an important step in developing strategies used in the implementation of control measures and management actions. In addition, trash evaluations can be used after implementation of control measures to evaluate the effectiveness of management actions.

Program staff will also coordinate with Regional stormwater programs and Regional Board trash assessment activities to determine patterns between trash accumulation and trash sources (e.g., problematic land use types).

Work Products: Develop guidance document that assists Co-permittees in identifying and prioritizing creek segments for conducting trash evaluations.

Task 7: Implement Trash Evaluations

- Municipalities, agencies, and/or other Co-permittee programs (and their designated volunteers) will implement trash evaluations in accordance with the monitoring strategy identified in Task 6. The entities responsible for conducting evaluations will submit copies of completed evaluation forms to Program staff.

Work Product: Completed trash evaluation forms.

Task 8: Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

Program staff will assist municipalities identify high priority areas by conducting the following tasks:

- Evaluating survey results from Co-permittee staff and entering relevant data into database;
- Mapping locations of trash evaluations into a GIS;
- Developing criteria to prioritize and rank trash problem areas. Factors used in prioritization include the total score of trash evaluations, public access to a creek, presence of aquatic life and/or recreational uses, constraints associated with land ownership, and existing or planned trash management practices;
- Distinguishing type of trash sources associated with problem areas (e.g., litter, illegal dumping, accumulation from upstream sources, or a combination of all three);
- Identifying suspected land uses or behaviors associated with trash problem areas.

Work Products: Develop maps showing location and ranking of trash problem areas; Prepare technical memorandum that summarizes evaluation results, prioritizes problem areas and provides recommendations for identifying and implementing potential management actions.

Task 9: Identify and Implement Trash Management Practices

The Program will assist Co-permittees with identifying and implementing potential management practices to address trash problem areas in the Program's jurisdiction. The first step will be to identify reasonable control measures and trash management

practices which address high priority trash problem areas identified in Tasks 6, 7 and 8. Potential management measures will be identified in three major areas: 1) eradication of trash; 2) public outreach and participation; and 3) enforcement of litter laws. Measures may include, but not be limited to, the following:

- Anti-litter campaigns (local and nationwide);
- Incentive-based programs (e.g., expanding redemption values for trash items);
- Expanding trash control ordinances and enforcement actions;
- Improving documentation and reporting;
- Enhancing interagency coordination of tracking and enforcing trash violations;
- Implementing structural controls in trash areas of concern.

The second part of this task will be for municipal and agency staff to implement control measures and best management practices to address trash problem at high priority areas. Municipal and agency staff will report their implementation of trash management practices and enforcement actions to Program staff.

Work Product: Report detailing trash problem areas, management practices implemented and the monitoring strategy used to determine effectiveness.

Task 10: Organize and Manage Trash Ad Hoc Task Group Meetings

Program staff will plan and organize Trash AHTG meetings to facilitate review and approval of Program products identified in this Work Plan. Program staff will attend "Pick-Up San Jose" Technical Advisory Committee meetings to coordinate trash-related activities identified in the Work Plan. Program staff will also attend BASMAA Monitoring Committee meetings to coordinate Program's efforts in addressing trash with other stormwater agencies.

Work Product: Trash AHTG meeting minutes

Task 11: Review and Update Performance Standards Relevant to Trash Management

Program staff will assist Co-permittees in the review of existing performance standards (which address BMPs or control measures relevant to trash management); and identify potential revisions to existing performance standards. The Trash AHTG will develop recommendations for potential revisions to existing performance standards. Recommendations will be reviewed and approved by the Management Committee. Program staff will make recommendations regarding the development of a performance standard for trash management. If necessary, Program staff will initiate the development of this performance standard.

Work Product: Revise or develop performance standards, as appropriate.

Trash Work Plan Schedule			
Task Description	**SCVURPPP**	**Municipality**	**Completion Date**
Task 1: Inventory, Document and Evaluate Existing Trash Management Practices (Work started in November 2002)			
1.a: Determine data gaps from initial survey; Develop additional trash survey questions; Coordinate with Co-permittees to facilitate documentation and evaluation of existing trash management practices.	X	A	October 2003
1.b: Compile Co-permittee data/information; Develop report summarizing and evaluating existing trash management practices.	X	A	December 2003
Task 2: Document and Map Known Trash Problem Areas (Work started in June 2002)			
2.a: Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/incidents and eradication efforts).	A	X	October 2003
2.b: Compile data/information; Convert location information of trash problem areas into coordinates; Develop maps in GIS.	X	A	December 2003
Task 3: Identify and Document Trash Management Practices and Monitoring Efforts Implemented Worldwide.			
3.a: Conduct literature search to identify and document trash management practices used in trash control programs outside SCVURPPP; Develop technical memorandum summarizing information.	X	N	February 2004
Task 4: Develop Protocols for Trash Evaluations and Implement Training Workshop (Work started in September 2002)			
4.a: Modify RWQCB Rapid Trash Assessment Methodology.	X	N	March 2004
4.b: Evaluate utility of KAB litter index.	X	N	March 2004
4.c: Plan, organize and conduct training workshops for municipal staff.	X	A	May 2004
Task 5: Develop Standardized Documentation and Reporting Format			
5.a: Based on results from Tasks 1-3, identify standardized procedures to document and evaluate the effectiveness of trash management practices and policies.	X	N	April 2004
5.b: Develop reporting format and relational database to document trash management activities in Annual Reports.	X	A	June 2004

Legend:
"X" = Will implement at this level
"N" = Not being implemented at this level
"A" = Assist with or develop guidance for implementation

Trash Work Plan Schedule			
Task Description	**SCVURPPP**	**Municipality**	**Completion Date**
Task 6: Develop Monitoring Strategy			
6.a: Evaluate results from tasks 1-3; Develop guidance for Co-permittees to identify and prioritize creek segments to conduct trash evaluations.	X	N	July 2004
6.b: Select monitoring locations and trash evaluation methodology to implement (e.g., collect baseline data at trash problem areas in creeks)	N	X	August 2004
Task 7: Implement Trash Evaluations			
7.a: Identify which entities will conduct trash evaluations (e.g., Municipal staff, volunteer groups, etc.)	A	X	July 2004
7.b: Conduct trash evaluations and submit results to Program staff.	N	X	October 2004
Task 8: Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas			
8.a: Document and analyze trash evaluation results	X	A	December 2004
8.b: Identify high priority trash problem areas using trash evaluation results	A	X	December 2004
Task 9: Identify and Implement Trash Management Practices			
9.a: Identify reasonable trash management practices to address high priority areas, initially focusing on known trash problem areas.	N	X	Ongoing (Start July 2004)
9.b. Implement trash management practices at high priority areas to the maximum extent practicable.	N	X	Ongoing (Start July 2004)
9.b: Document and report implementation of trash management actions	A	X	June 2005
Task 10: Manage Trash Ad Hoc Task Group Meetings and Coordinate with other Programs			
10.a: Plan and Organize Trash AHTG meetings	X	A	Ongoing
10.b: Attend quarterly meetings of the Pick-Up San Jose TAC	X	N	Ongoing
10.c: Attend BASMAA Monitoring Committee meetings to coordinate Program's efforts to address trash with other stormwater agencies.	X	N	Ongoing

Legend:
"X" = Will implement at this level
"N" = Not being implemented at this level
"A" = Assist with or develop guidance for implementation

Trash Work Plan Schedule			
Task Description	**SCVURPPP**	**Municipality**	**Completion Date**
Task 11: Review and Update Performance Standards Relevant to Trash Management			
11.a: Review existing standards that address BMPs or control measures relevant to trash management			April 2005
11.b. Develop recommendations for the Management Committee regarding potential revisions to existing standards or development of new standards.			June 2005

Legend:
"X" = Will implement at this level
"N" = Not being implemented at this level
"A" = Assist with or develop guidance for implementation

Attachment 4-7

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Control Program for Dioxin-like Compounds per Permit Provision C.9.e.*iii.*
March 1, 2003

Dioxin-like compounds are included in Provision C.9.e. of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's) NPDES permit issued by the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board). This provision requires that the SCVURPPP ultimately develop a control program to eliminate or reduce discharge of dioxin-like compounds from urban runoff conveyance systems from controllable sources (if any). The first steps in this process are described by Provision C.9.e.*i.*, *ii. and iii*, which include the following language:

Characterize the representative distribution of PCBs and dioxin-like compounds in the urban areas of the Santa Clara basin to determine if: a) PCBs and dioxin-like compounds are present in urban runoff, b) if any such PCBs or dioxin-like compounds are distributed relatively uniformly in urban areas, and c) whether storm drains or other surface drainage pathways are sources of PCBs or dioxin-like compounds themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PCBs or dioxin-like compounds to San Francisco Bay via urban runoff conveyance systems;

Provide information to allow calculation of PCBs and dioxin-like compound loads to San Francisco Bay from urban runoff conveyance systems;

Identify control measures and/or management practices to eliminate or reduce discharges of PCBs or dioxin-like compounds conveyed by urban runoff conveyance systems...for dioxin-like compounds: submit plan with implementation schedule by March 1, 2003; begin implementation by July 1, 2003.

The SCVURPPP prepared this work plan to address the above requirements for dioxin-like compounds. As stated in our past work plans, the SCVURPPP's program to address dioxin-like compounds excludes dioxin-like polychlorinated biphenyls (PCBs).[1]

Background

The several hundred compounds often referred to as dioxin-like compounds are generally members of three closely related families: the polychlorinated dibenzo-p-dioxins (referred to as dioxins hereinafter), polychlorinated dibenzofurans (referred to as furans hereinafter) and certain PCBs referred to as dioxin-like PCBs. The United States Environmental Protection Agency listed San Francisco Bay as impaired by certain compounds from each of these three families in the 1998 and 2002 303(d) lists. Both 303(d) lists designate the TMDL priority for dioxins and furans as low, and a schedule for performing a TMDL has not been determined by Regional Board staff.

[1] Potential sources of releases to the environment of PCBs, including dioxin-like PCBs, differ from dioxins and furans. The SCVURPPP is therefore addressing PCBs, including dioxin-like PCBs, in a separate program.

There is considerable controversy regarding the potential threats to the environment and human health in the Bay area by dioxins and furans. It is our understanding that the California State Water Resources Control Board (SWRCB) and the Regional Board opposed the 1998 listing of dioxins and furans. More recently, a letter dated December 6, 2002 to the SWRCB from the Bay Area Clean Water Agencies (BACWA) requested that the SWRCB move dioxins and furans from the 303(d) list to the "Monitoring List". BACWA believes the original rationale for listing dioxins and furans in San Francisco Bay was inadequate, and that new information developed since 1999 further supports removal of these compounds from the 303(d) list. This new information includes studies on pollutant concentrations in San Francisco Bay fish and local fish consumption, and data associated with the California Toxics Rule and the State Implementation Policy.

Previous Work

One year ago, the SCVURPPP submitted a work plan to address dioxins and furans (*Control Program for Dioxin-like Compounds, March 1, 2002 Submittal per Provision C.9.e.i. and ii. of SCVURPPP's NPDES Permit*). The work plan specified reviewing readily available data on methods used to characterize dioxin-like compounds in stormwater runoff and surface waters and concentrations typically found in the Bay area and other areas. The results of the review were documented in a technical memo submitted to the Regional Board (*Dioxins Information Review, October 1, 2002*). The review found that dioxins and furans have been found in urban runoff in the Bay area and other locations, and in sediments in the Bay and other estuaries. It was concluded, however, that existing data are not sufficient to characterize the distribution in urban runoff among Bay area land uses or calculate loadings to the Bay. In the Bay area, combustion-related air emissions may currently be the major source of dioxins and furans to the environment and stormwater runoff. Reservoirs of dioxins and furans associated with activities no longer practiced in the Bay area (i.e., medical waste incineration and municipal garbage burning) may also exist.

Current Work

In accordance with the recommendations of the October 1, 2002 information review, the SCVURPPP had planned to analyze archived embedded storm drain and creek sediment samples for dioxins and furans. These samples were archived during last year's regional survey for mercury, PCBs and chlorinated pesticides. However, an internal communication error at the project laboratory resulted in inadvertent disposal of the samples before analysis could be performed. It should be noted that the Alameda County Clean Water Program is currently analyzing similar archived sediment samples collected in Alameda County for dioxins and furans. The SCVURPPP intends to look at the possibility of extrapolating the Alameda County data to other parts of the Bay area to develop rough characterization and loading estimates.

The SCVURPPP is currently collaborating with other Bay area stormwater management programs to develop a "synthesis" document on dioxin-like compounds. The synthesis document will summarize the current state of knowledge regarding dioxin-like compounds in relation to stormwater runoff, and will include the following elements:

- Chemical description, sources and environmental fate.
- Impacts to the environment and human health.

- A summary of existing relevant monitoring data, including water quality and biological data.[2]

- A more detailed description of the regulatory background, including the controversy surrounding the potential threats to the environment and human health in the Bay area by dioxins and furans and the 303(d) listing.

- A preliminary identification, comparison and evaluation of potential control measures to address dioxins and furans in urban runoff.

- Recommendations for follow-up work, if any.

The SCVURPPP anticipates that the synthesis document will be completed by the end of FY 02-03.

Future Work - FY 03-04 Activities

In general, the SCVURPPP will work with other Bay area dischargers and Regional Board staff through the Clean Estuary Partnership (CEP) and Regional Monitoring Program (RMP) to coordinate and plan any future TMDL-related dioxins and furans monitoring activities. Agreed upon activities will be incorporated into the SCVURPPP's work plans as appropriate. During FY 03-04, the SCVURPPP will:

- Work with the BASMAA Monitoring Committee to establish BASMAA's strategy for addressing dioxins and furans and present this information to the CEP Technical Committee.

- Attend relevant stakeholder, CEP, RMP and work group meetings. As appropriate, review and comment on any related documents prepared by the CEP, RMP and Regional Board staff.

[2] The results of the SCVURPPP's October 1, 2002 information review (which was previously submitted to the Regional Board) will be incorporated into this section.

SECTION 4

FY 03-04 ANNUAL MONITORING PLAN & WATERSHED MANAGEMENT MEASURES

4. MONITORING PROGRAM

INTRODUCTION

The Annual Monitoring Plan contains two main elements: 1) Summary of Programmatic Monitoring Indicators (PMIs) and 2) Summary of Environmental Monitoring Measures (EMMs). The goals of the Program's monitoring program are provided within the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) Multi-Year Receiving Waters Monitoring Plan[1].

SUMMARY OF PROGRAMMATIC MONITORING INDICATORS (PMIS)

The PMIs are used to gauge how well Performance Standards are being met and control measures are being implemented. The summary (see Attachment 4-1) illustrates all existing commitments and priorities established by the Program, including ongoing activities meant to fulfill Regional Board Order Provisions C.9. "Water Quality-Based Requirements for Specific Pollutants of Concern" and C.10. "Watershed Management" of the NPDES permit. A brief capsule scope is provided for each project along with the anticipated products and expected timeframe for completion. For some projects, specifically those that are being conducted to directly respond to a specific pollutant of concern referenced in the NPDES permit, a separate one-page scope was developed and is contained in Attachment 4-2. Attachment 4-3 contains an update of the FY03-04 Copper/Nickel baseline activities planned by the Program.

SUMMARY OF ENVIRONMENTAL MONITORING MEASURES (EMMS)

The purposes of the Environmental Monitoring Measures (EMMs) are to: 1) assist the Regional Water Quality Control Board (RWQCB) in characterizing receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the SCVURPPP; 2) identify where and what type of status and trend type monitoring is appropriate; 3) recognize the need for site-specific water quality investigations to address questions that might arise during screening-level monitoring efforts; and 4) determine if control measures are having the intended effect. The main EMM activities that the Program will conduct during FY 03-04 are described in the following sections.

FY 03-04 Annual Receiving Water Monitoring Plan

The Annual Receiving Water Monitoring Plan is contained in Attachment 4-4. Table 4-1 in Attachment 4-4 was prepared consistent with the MY-RWMP[2]. Table 4-1 includes and identifies planned receiving water monitoring activities for FY 03-04, the proposed schedule (by fiscal year quarter) to conduct the work, the rationale for the proposed item and the lead party. The information on data type utilizes a tiered monitoring approach. The approach is discussed by the RWQCB staff in its RMAS memo (February 8, 2001 Draft Monitoring Design in Regional

[1] SCVURPPP's Multi-Year Receiving Waters Monitoring Plan (MY-RWMP) was revised to respond to RWQCB staff comments a resubmitted to the RWQCB on August 5, 2002. The MY-RWMP covers a period of eight years starting with FY 02-03. Each SCVURPPP Annual Monitoring Plan is developed consistent with the framework on MY-RWMP.

[2] As part of the FY 02-03 work effort, the SCVURPPP is conducting a brief technical evaluation of four to five major watershed assessment approaches being used statewide and plans to discuss the feasibility and utility implementation within the SCVURPPP. Based on the evaluation, the Program intends to identify a watershed assessment approach that could be implemented in major SCVURPPP watersheds. It is the intent of the Program to closely link implementation of the assessment approach with the ongoing implementation of My-RWMP. It is the Program's intent to consider the results of the evaluation of the various assessment approaches and the linkage with MY-RWMP as part of developing the FY 04-05 Annual Monitoring Plan.

Board-lead Pilot Watersheds, Spring 2001) and includes the following monitoring categories: screening level, detailed investigation, and status and trends.

The locations and frequencies of sampling events scheduled during FY 03-04 are shown in Table 4-2 of Attachment 4-4. Site maps detailing sampling locations in the Adobe Creek and San Thomas Aquino Creek watersheds are provided in Figures 4-1 and 4-2 of Attachment 4-4. Table 4-3 of Attachment 4-4 provides a description of data parameters and analytical methods to be used in the monitoring plan.

Sediment Assessment

Beginning in FY 03-04, the Program will be conducting a limiting factors analysis and sediment management practice assessment in Stevens Creek watershed to determine if the creek is impaired by sediment production from anthropogenic activities. The Work Plan (Attachment 4-5) was previously submitted to RWQCB staff on August 30, 2002 in fulfillment of the SCVURPPP NPDES Permit Order No. 01-024 Provision C.9.f.iii paragraph two.

The Sediment Assessment work plan contains two separate phases. Phase I is scheduled for FY 03-04 and includes conducting a limiting factors analysis and sediment management practices assessment. Phase II includes conducting a rapid sediment budget and is scheduled for the subsequent year. Phase II will only be conducted if Phase I study results indicate that excessive sediment from anthropogenic sources is impairing beneficial uses in the watershed.

A Watershed Analysis Ad Hoc Task Group (Watershed Analysis AHTG), which was previously established to develop the work plan, will review products developed in Phase I and make recommendations for Phase II (or other future studies) and potential management actions. The Watershed Analysis AHTG recommendations will be reviewed and approved by the Management Committee.

Trash Work Plan

To fulfill a FY 01-02 Continuous Improvement item and actions within the Program's Multi-Year Receiving Waters Monitoring Plan, the Program prepared a Trash Work Plan (Attachment 4-6) that identifies a strategy for addressing trash problem areas that occur in urban streams and waterways. The Work Plan was developed in response to the November 14, 2001 RWQCB 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on a preliminary or "monitoring" list due to the threat of trash impairment to water quality.

The results and implementation efforts over the next two years will be documented and provided within the Program's and Co-permittee's Annual Reports. The information is intended to assist Regional Board staff in their assessment of creeks and more specifically, stream reaches (for potential trash impairment) by the next 303 (d) listing cycle; which is expected to begin in the Spring of 2005.

The Trash Work Plan includes the following objectives: 1) Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in creeks; 3) Assist municipalities in identifying the high priority trash problem areas and sources of trash; 4) Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas; and 5) Develop a standardized reporting format for documenting and evaluating

trash management and monitoring activities. The FY 03-04 tasks focus on further documentation and evaluation of existing management practices; the identification of potential management actions; the further development of trash evaluation tools and the development of standardized format for reporting and evaluating trash management practices. The FY 04-05 tasks focus on the development of a monitoring strategy; implementation of trash evaluations and the identification and implementation of trash management practices.

Monitoring Program Activities- PCBs

The United States Environmental Protection Agency (USEPA) listed San Francisco Bay as impaired by PCBs in the 1998 and 2002 303(d) lists. Both 303(d) lists designate the TMDL priority for PCBs (in San Francisco Bay) as high. Provision C.9.e of the Program's NPDES permit requires the Program to develop a control program for PCBs.

Previous Work

During the past three years, the Program has provided leadership to Bay area stormwater programs in addressing PCBs. This has included coordinating efforts to characterize the distribution of PCBs concentrations in Bay area watersheds. The Program has also performed PCBs case studies in selected areas with elevated concentrations of PCBs and coordinated similar efforts by other Bay area stormwater agencies. The case studies are aimed at identifying PCBs sources and developing controls. As part of these efforts, the Program has led a work group of representatives from the BASMAA Monitoring Committee and Regional Board staff. The work group has met periodically to facilitate information sharing, coordination of field activities and regional planning. All of the Program's efforts have been outlined in periodic work plans. The overall goal has been to work with other stakeholders to develop data needed for the San Francisco Bay PCBs TMDL.

Watershed Characterization

Under the Program's leadership, several Bay area stormwater management agencies collaborated to characterize the distribution of PCBs and other pollutants in stormwater conveyance embedded sediment in Bay area watersheds. The second year of work was completed during FY 01-02 (*Final Report, Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides, Kinnetic Laboratories, Inc.*, April 2002). An analysis of both years of data revealed that median PCBs concentrations normalized to fines (less than 62.5 microns) were over 100 times higher in samples from urban sites compared to open space sites. Significant differences in normalized concentrations of PCBs were not found between industrial and residential/commercial sites. Planning-level estimates of urban runoff PCBs loads from the surrounding watersheds to San Francisco Bay were developed. The two-year study provided important data on the distribution of PCBs among land uses in Bay area watersheds and identified elevated areas.

PCBs Case Study

The Program and the City of San Jose performed a PCBs case study during FY 01-02 (*Case Study Investigating Elevated Levels of PCBs in Storm Drain Sediments in San Jose, California*, April 15, 2002). The investigation consisted of a field sampling program, researching stormwater-related violations and researching current and historical land uses in four industrial/commercial areas in San Jose. One of these areas, the Leo Avenue drainage, had

consistently high levels of PCBs in storm drain sediments. A composite sediment sample from an adjacent railroad track right of way contained PCBs, suggesting that the right of way may be a source area. Other potential sources of PCBs were historical activities at the properties adjacent to Leo Avenue. The case study work was an effective first step in identifying PCBs sources and developing control measures.

PCBs Work Plans and PCBs Case Study Guidance

The Program prepared two PCBs work plans during FY 01-02. The first work plan (*Control Program for PCBs, March 1, 2002 Submittal Per Provision C.9.e.iv. of SCVURPPP's NPDES Permit*) includes a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County and a preliminary table summarizing PCBs control options. The second work plan (*Control Program for PCBs, July 1, 2002 Work Plan*, July 1, 2002) included a refined table summarizing PCBs control options, a schedule for continued case study work at the Leo Avenue drainage and two new areas in Santa Clara County, and a list of potential tasks for the project work group. The Program also recently prepared an updated guidance to assist stormwater agencies performing PCBs case studies during FY 02-03 (*Guidance for Performing FY 02-03 San Francisco Bay Area Stormwater Program PCBs Case Studies,* September 20, 2002). The guidance outlines case study objectives, tasks, locations and schedules.

Current Activities

The Program continues to perform activities in support of the PCBs TMDL. Currently, the Program is:

- Performing PCBs case studies in two new areas known to have elevated PCBs in embedded storm drain sediments and follow-up work in the Leo Avenue area;
- Coordinating similar case studies by other Bay area storm water programs; and
- Performing a feasibility study on PCBs storm water control measures in parallel with the case studies.

It should also be noted that the Program is testing sediment samples from the bottom of the Lower Silver and Lower Penitencia Creek watersheds for PCBs and other pollutants of concern during its FY 02-03 surface water monitoring program. Similar bedded sediment samples from the bottom of Adobe and San Thomas Aquino Creek watersheds will be tested for PCBs and other pollutants of concern during FY 03-04.

FY 03-04 Activities

During FY 03-04, the Program will continue to perform activities in support of the PCBs TMDL.[3] Program staff will:

- Perform follow-up work which emphasizes continuing the process of identifying and

[3] The Program is also testing sediment samples from the bottom of the Lower Silver and Lower Penitencia Creek watersheds for PCBs and other pollutants of concern during its FY 02-03 surface water monitoring program. Similar bedded sediment samples from the bottom of Adobe and San Thomas Aquino Creek watersheds will be tested for PCBs and other pollutants of concern during FY 03-04.

addressing controllable sources of PCBs in urban runoff, if any. This work will be scoped after the results of the FY 02-03 case study work and stormwater control measures feasibility study (once they become available). This work may be performed in collaboration with other Bay area stormwater management agencies and specific Co-permitees.

- Continue to attend PCBs TMDL-related stakeholder, Clean Estuary Partnership (CEP), Regional Monitoring Program (RMP) and work group meetings; and represent BASMAA on the CEP PCBs work group. As appropriate, the Program will review and comment on related documents prepared by the CEP, RMP and Regional Board staff.

Monitoring Program Activities – Polynuclear Aromatic Hydrocarbons

Polynuclear Aromatic Hydrocarbons (PAHs) are not 303(d) listed, but are on the 2002 "Monitoring List" for San Francisco Bay. The Program had planned to analyze archived embedded storm drain and creek sediment samples for PAHs. These samples were archived during last year's regional survey for mercury, PCBs and chlorinated pesticides. However, an internal communication error at the project laboratory resulted in inadvertent disposal of the samples before analysis could be performed. It should be noted that the Alameda County Clean Water Program has analyzed PAHs in similar sediment samples collected over a two-year period in Alameda County. This data could be extrapolated to other parts of the Bay area to develop rough characterization and loading estimates.

The Program is testing sediment samples from the bottom of the Lower Silver and Lower Penitencia Creek watersheds for PAHs and other pollutants of concern during its FY 02-03 surface water monitoring program.

FY 03-04 Activities

During FY 03-04, sediment samples from the bottom of Adobe and San Thomas Aquino Creek watersheds will be tested for PAHs and other pollutants of concern. The Program will also work with other Bay area dischargers and RWQCB staff through the CEP and RMP to coordinate and plan any future PAHs monitoring activities. Agreed upon activities will be incorporated into the Program's work plans as appropriate.

Monitoring Program Activities – Chlorinated Pesticides

USEPA listed San Francisco Bay as impaired by dieldrin, chlordanes and DDTs in the 1998 and 2002 303(d) lists. Both 303(d) lists designate the TMDL priority for dieldrin, chlordanes and DDTs in San Francisco Bay as low. A letter dated December 6, 2002 to the State Water Resources Control Board (SWRCB) from the Bay Area Clean Water Agencies (BACWA) requested that the SWRCB move dieldrin, chlordanes and DDTs from the 303(d) list to the "Monitoring List". BACWA believes that the original rationale for listing these chlorinated pesticides in San Francisco Bay was inadequate, and that new information developed since 1999 further supports removal of these compounds from the 303(d) list. This new information includes studies on pollutant concentrations in San Francisco Bay fish (1997 data) and local fish consumption; and data associated with the California Toxics Rule and the State Implementation Policy. At a recent conference held in Sacramento (California Water Institute, December 12 and 13, 2002), Dr. Jay Davis of the San Francisco Estuary Institute (SFEI) presented a comparison of more recent data on concentrations of pollutants in fish tissue (2000 data) to screening

values. Concentrations of chlordanes never exceeded screening values. Only nineteen percent of samples analyzed for dieldrin and four percent of samples analyzed for DDTs exceeded screening values.

The Program previously participated in a regional study that tested embedded storm drain and creek sediment samples for chlorinated pesticides (and mercury and PCBs). It should also be noted that the Alameda County Clean Water Program has analyzed similar sediment samples collected in Alameda County for chlorinated pesticides.

The Program is also testing sediment samples from the bottom of the Lower Silver and Lower Penitencia Creek watersheds for chlorinated pesticides and other pollutants of concern during its FY 02-03 surface water monitoring program.

FY 03-04 Activities

Sediment samples from the bottom of Adobe and San Thomas Aquino Creek watersheds will be tested for chlorinated pesticides and other pollutants of concern during FY 03-04. The Program will also work with other Bay area dischargers and RWQCB staff through the CEP and RMP to coordinate and plan any future TMDL-related chlorinated pesticides monitoring activities. Agreed upon activities will be incorporated into the Program's work plans as appropriate.

Monitoring Program Activities – Dioxin-like Compounds

The United States Environmental Protection Agency listed San Francisco Bay as impaired by certain dioxin-like compounds from each of the three closely related families in the 1998 and 2002 303(d) lists. Both 303(d) lists designate the TMDL priority for dioxins and furans as low, and a schedule for performing a TMDL has not been determined by Regional Board staff.

There is considerable controversy regarding the potential threats to the environment and human health in the Bay area by dioxins and furans. It is our understanding that the California State Water Resources Control Board (SWRCB) and the Regional Board opposed the 1998 listing of dioxins and furans. More recently, a letter dated December 6, 2002 to the SWRCB from the Bay Area Clean Water Agencies (BACWA) requested that the SWRCB move dioxins and furans from the 303(d) list to the "Monitoring List". BACWA believes the original rationale for listing dioxins and furans in San Francisco Bay was inadequate, and that new information developed since 1999 further supports removal of these compounds from the 303(d) list. This new information includes studies on pollutant concentrations in San Francisco Bay fish and local fish consumption, and data associated with the California Toxics Rule and the State Implementation Policy.

Previous Work

One year ago, the Program submitted a work plan to address dioxins and furans (*Control Program for Dioxin-like Compounds, March 1, 2002 Submittal per Provision C.9.e.i. and ii. of SCVURPPP's NPDES Permit*). The work plan specified reviewing readily available data on methods used to characterize dioxin-like compounds in stormwater runoff and surface waters and concentrations typically found in the Bay area and other areas. The results of the review were documented in a technical memorandum submitted to the Regional Board (*Dioxins Information Review, October 1, 2002*). The review found that dioxins and furans have been found in urban runoff in the Bay area and other locations, and in sediments in the Bay and other

estuaries. It was concluded, however, that existing data is not sufficient to characterize the distribution in urban runoff among Bay area land uses or calculate loadings to the Bay. In the Bay area, combustion-related air emissions may currently be the major source of dioxins and furans to the environment and stormwater runoff. Reservoirs of dioxins and furans associated with activities no longer practiced in the Bay area (i.e., medical waste incineration and municipal garbage burning) may also exist.

Current Activities

In accordance with the recommendations of the October 1, 2002 information review, the Program had planned to analyze archived embedded storm drain and creek sediment samples for dioxins and furans. These samples were archived during last year's regional survey for mercury, PCBs and chlorinated pesticides. However, an internal communication error at the project laboratory resulted in inadvertent disposal of the samples before analysis could be performed. It should be noted that the Alameda County Clean Water Program is currently analyzing similar archived sediment samples collected in Alameda County for dioxins and furans. The Program intends to look at the possibility of extrapolating the Alameda County data to other parts of the Bay area to develop rough characterization and loading estimates.

The Program is currently collaborating with other Bay area stormwater management programs to develop a "synthesis" document on dioxin-like compounds. The synthesis document will summarize the current state of knowledge regarding dioxin-like compounds in relation to stormwater runoff. The Program anticipates that the synthesis document will be completed by the end of FY 02-03.

In accordance with Permit Provision C.9.e.iii, the Program has prepared a Dioxin-Like Compounds Action Plan (provided within Attachment 4-7). The Plan begins to identify control measures and/or management practices to eliminate or reduce discharges of dioxin-like compounds conveyed by urban runoff conveyance systems.

FY 03-04 Activities

During FY 03-04, the Program will work with other Bay area dischargers and Regional Board staff (through the CEP and RMP) to coordinate and plan any future TMDL-related dioxins and furans monitoring activities. Agreed upon activities will be incorporated into the Program's work plans as appropriate. In addition, the Program will work with the BASMAA Monitoring Committee to establish BASMAA's strategy for addressing dioxins and furans and present this information to the CEP Technical Committee; attend relevant stakeholder, CEP, RMP and work group meetings; and review and comment on any related documents prepared by the CEP, RMP and Regional Board staff (as appropriate).

Regional Collaborative Monitoring Efforts

Regional Monitoring Program for Trace Substances

In accordance with the Program's NPDES permit, the Program contributes approximately $156,000 annually to the Regional Monitoring Program for Trace Substances (RMP), which monitors contaminant concentrations in water, sediments, and fish and shellfish tissue in San Francisco Bay and the Delta. The San Francisco Estuary Institute (SFEI) administers the RMP. This funding is in addition to funding provided by the three South Bay POTWs, who are also Co-

permittees, to the SFEI. Program staff participates on the RMP Steering Committee, Technical Review Committee and Sources, Pathways and Loading Work Group.

Bay Area Stormwater Management Agencies Association (BASMAA)

The Program is a member of BASMAA, a consortium of seven San Francisco Bay Area municipal storm water programs. The goal of BASMAA is to promote regional collaboration on developing consistent monitoring and watershed assessment methodologies and to facilitate efficient use of public resources. The Program participates in the following BASMAA activities: Executive Board, Monitoring Committee, New Development Committee, Public Information/Participation Committee and Operational Permits Committee.

Clean Estuary Partnership

On August 6, 2001, a Memorandum of Understanding (MOU) regarding development of: 1) a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries and 2) TMDLs for 303(d) pollutants (including mercury), was entered into by the Regional Board, BACWA and BASMAA. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program assisted in developing and funding potential projects for the Bay TMDLs. During FY 02-03, Program staff has been participating in CEP Executive Board and CEP technical committee meetings.

FY 03-04 Activities

The Program will continue to participate in various RMP committees and work groups; participate in the CEP depending on the availability of resources; and collaborate with BASMAA on regional stormwater issues.

SECTION 5

PESTICIDE MANAGEMENT WORK PLAN

5. PESTICIDE MANAGEMENT WORK PLAN

INTRODUCTION

The goals and objectives of the SCVURPPP Urban Runoff Management Plan (URMP) include: effectively prohibiting non-storm water discharges to storm drains and watercourses; reducing pollutants in storm water discharges to the "maximum extent practicable" (MEP); and not causing or contributing to violations of water quality standards, as required by the Program's NPDES permit. The Program's approach to meeting these goals and objectives focuses on the use of best management practices (BMPs) for source control and pollution prevention.

The Program's approach to pesticide management has a similar focus on source control and pollution prevention. Program BMPs for pesticide management have included significant outreach efforts to residents, businesses and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide issues; and development of performance standards and local pest management plans.

BACKGROUND

Diazinon and chlorpyrifos have been identified in recent studies as causing toxicity in local creeks and wastewater treatment plant effluent. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA). The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies. The San Francisco Bay Regional Board developed a draft TMDL work plan which calls for an urban creeks diazinon TMDL to be developed by June 2002, followed by an Implementation Plan by June 2003.

The Program's reissued NPDES permit (Order No. 01-024, February 21, 2001) includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticides by others within municipal jurisdictions. The Program will also continue to work with the Urban Pesticide Committee and the California Stormwater Quality Association Pesticide Work Group to assess impacts of pesticide use and encourage actions by other state and federal agencies.

As required by Permit Provision C.9.d., the Program developed a Pesticide Management Plan and submitted it to the Regional Board by July 1, 2001 (June 26, 2001). The submittal to the Regional Board included a preliminary draft Pest Management Performance Standard as well as municipal pesticide use surveys completed by each Co-permittee. The Pesticide Management Plan was revised in response to Regional Board staff comments dated August 15, 2001 and December 21, 2001, and the revised version (dated February 15, 2002) submitted to the Regional Board as Attachment 5-1 to the Program's *FY 02-03 Work Plan*. The Pest Management Performance Standard was also revised based on Regional Board Staff comments emailed in November 2001. The final performance standard was submitted to the Regional Board as Attachment 2-2 of the Program's *FY 02-03 Work Plan*.

The purpose of the Pesticide Plan is to control pesticide-related toxicity in urban runoff, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Plan identifies the goals of each work plan element, actions, monitoring mechanisms, and schedules. The Plan also identifies whether actions will be implemented at the Program level, municipality level, or both. Program-level actions in the Plan form the basis of this FY 03-04 Pesticide Management Work Plan. The details of municipality actions and schedules were provided in individual Co-permittee pest management plans submitted with the Co-permittees' FY 00-01 annual reports. Future tasks are provided in the Co-permittees' FY 03-04 work plans (Section 10 of this *FY 03-04 Work Plan*).

PAST PESTICIDE MANAGEMENT ACTIVITIES

The Program has, since its inception, actively participated in a number of activities aimed at understanding water quality problems in creeks and San Francisco Bay and reducing pollutants, including pesticides, to the MEP. The Program's FY 99-00, FY 00-01, FY 01-02 and FY 02-03 Work Plans presented the history of the Program's and Co-permittee's pesticide-related activities in the areas of monitoring and science, outreach and education, and URMP implementation.

All of the Program tasks in the Pesticide Plan were scheduled to be completed or to begin by FY 02-03. Table 5-1 presents the status of these tasks. The FY 02-03 Pesticide User Outreach Work Plan is provided in Attachment 3-2 within Section 3.

FY 03-04 PESTICIDE MANAGEMENT TASKS

Table 5-2 presents the list of tasks (from the Pesticide Plan) that are currently in progress and will be implemented in FY 03-04. (Ongoing tasks from FY 02-03 (Table 5-1) are not repeated in Table 5-2).

Table 5-1
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
I. Municipal Pesticide Use		
I.A.1 Develop and implement a process for tracking pesticide use on municipally owned property (PS#8). Include in the process reporting and justification for the use of OP pesticide and BMPs employed during OP pesticide use.	Ongoing	The Pest Management Performance Standard includes a suggested reporting process which, for FY 01-02, is focused on reporting use of organophosphate pesticides, particularly chlorpyrifos and diazinon. All Co-permittees submitted information on pesticide use in their FY 01-02 annual reports (9/02). Program staff will work with the Co-permittees to review and improve the reporting process as needed.
I.A.3 Assist Co-permittees to develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM policy. (PS #3). BMPs will include special precautions to reduce water quality impacts when applying pesticides.	Done	Program guidance completed as part of Model Pest Management Performance Standard, submitted to Regional Board March 1, 2002. Guidance to Co-permittees included a packet of example IPM policies and practices.
I.A.4. Assist Co-permittees to update local URMPs to incorporate/adapt the model Pest Management Performance Standard, including a description of the legal authority (IPM policy/ordinance, contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done	See notes for Action I.A.3. The Program held a workshop on March 20, 2002 on how to implement the performance standard.
I.B.4. Conduct a workshop for municipal staff on least-toxic pest control methods and pesticide management BMPs.	Done	Workshop held March 20, 2002. Program also co-sponsored ACCWP IPM Symposium held on 2/5/03.
II. Public Education and Outreach		
II.A.1 Implement the Watershed Education & Outreach (WE&O) Campaign, which will target the general public and include messages about less-toxic pest control and proper disposal. The Campaign will include extensive media campaign with South Bay English- and Spanish-language radio stations, newspapers, and bus posters.	Ongoing	An article on impacts of pesticide use to water quality and less toxic pest control was written and sent through the campaign distribution list. Pesticides are listed as a concern in the campaign brochure and the Watershed Watch song. Media ads and public service announcements with less toxic pest management messages are under development and will be run in Spring 2003. The campaign web site added several new pages on IPM and IPM fact sheets are available to download.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action		Status	Notes
II.A.2	Develop simple, effective, targeted messages regarding proper pesticide use and disposal, effects on water quality, and IPM.	Done/Ongoing	See above for Watershed Watch activities. The Program continues to participate in regional IPM partnership and media relations efforts. The regional IPM partnership committee develops new fact sheets each year.
II.A.3	Prepare appropriate outreach materials (e.g., fact sheets or a consumer guide regarding pest control services) to address target groups.	In Progress	Program developed landscape maintenance fact sheet. PCO fact sheet being developed through BASMAA participation -- a draft of a consumer fact sheet for hiring pest control professionals who practice IPM is currently being reviewed.
II.A.4	Identify and attend community events and distribute outreach materials. (Program will attend events strategic to the WE&O campaign.)	Done/Ongoing	Program staff and Watershed Watch consultant staff attend 4-5 events each year. Brochures such as "Grow It!" guide, "Pests Bugging You?", and "Backyard Bugs" distributed.
II.A.6.	Create, update, and publicize web sites to promote IPM and reduce pesticide use.	Done/Ongoing	The Watershed Watch website was launched in September 2001 and is continually updated. The website directs browsers to call the toll-free number to the Program office for information on less-toxic pest control. A web page specifically for IPM was completed in June 2002 and is updated regularly. The web page also includes links to other sites with information on IPM.
II.A.7	Coordinate with the Master Gardeners program and use their services to train residents. Provide IPM training and information on water quality impacts of pesticide use to Master Gardeners as needed.	Done	The Program funded a proposal by Master Gardeners and San Jose Community Gardens staff to conduct an IPM training program for community gardeners. Four workshops were conducted and training materials were purchased with SCVURPPP funds. The Program is waiting to receive the final report on the project.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action		Status	Notes
II.A.8	Create and/or publicize existing IPM demonstration gardens (such as the garden at the San Francisco Bay Wildlife Refuge in Alviso).	Done/Ongoing	The Watershed Watch campaign has partnered with the Don Edwards San Francisco Bay Wildlife Refuge at Alviso. The Alviso site has a pesticide-free native plant demonstration garden. Garden workshops at this garden are promoted on the Watershed Watch website. Additionally, the Watershed Watch consultant is working with Don Edwards staff to develop page on the website specific to the demonstration garden. Program staff are looking into possibilities for sponsoring/publicizing other demonstration gardens.
II.A.9	Continue to fund BASMAA Regional Media Relations Campaign featuring pitches to Bay Area media and responses to breaking news on pesticide-related topics.	Ongoing	SCVURPPP funds this campaign as part of its BASMAA baseline dues. Program staff participate in meetings of the work group and review draft products.
II.A.11	Identify consumer and business publications that could include articles about IPM or less toxic pest management, submit articles or letters to the editor, and encourage them to print them.	In Progress	An article regarding impacts of pesticide use to water quality and containing hints for pesticide-free pest control was written and sent through the WEO campaign distribution list; however, it was difficult to confirm whether the article was published. A new strategy will be pursued in FY 03-04.
II.A.12	Develop a work plan for and implement a "Pesticide User Outreach" project targeting residential and commercial users, which will include continuing the IPM Store Partnership Program and selected Household Chemical Management project tasks. Include an evaluation component in the work plan.	Done for FY 02-03; Complete Annually	A work plan for FY 02-03 was recently completed which includes: an expanded IPM Store Partnership Program with on-site employee training; coordination with County HHW; a pesticide media advertising plan for Spring 2003; contribution to the BASMAA Pesticide Distributor Project; participation in community events; sponsorship of the ACCWP IPM Symposium; and other elements (see Attachment 3-2 of this FY 03-04 Work Plan)..
II.A.13	Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	In Progress	VTA and open space and vector control district staff were invited to the Program's IPM Workshop in March 2003 and provided copies of the Program's Pest Management Performance Standard. These groups will be addressed in the Pesticide User Outreach Plan for FY 03-04.
II.B.1	Continue to fund and participate in the BASMAA Regional IPM Partnership	Ongoing	SCVURPPP annually funds this program as part of its BASMAA baseline dues. These funds cover the

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
IPM Partnership.		BASMAA baseline dues. These funds cover the Program's supply of IPM Fact Sheets. Program staff participate in meetings of the work group and review draft products..
II.B.2 Continue to implement cost-effective elements of the IPM Store Partnership Program. Create and provide fact sheets and other materials to pesticide retailers to facilitate point-of-purchase outreach. Visit stores as necessary to ensure ongoing participation.	Ongoing	**See Action Items II.A.12 and II.B.1.**
II.B.3 Offer IPM training opportunities to pesticide retailer employees through coordination with Master Gardener-taught educational programs.	Task Eliminated (covered under Action Item II.A.12.)	It was not possible to arrange for Master Gardeners to train store employees due to staff shortages within the Master Gardener program. The Program has contracted with Annie Joseph to provide training to pesticide retailers, as she has been successful in getting store participation (see Action Item II.A.12). The Community Gardeners project has been a successful way to work with the Master Gardener program and may be repeated if there is sufficient demand and resources available.
III. Pest Control Operators (PCOs)		
III.A.1 Develop a database of licensed structural and landscape maintenance PCOs.	Done/Ongoing	The list will be updated prior to next PCO workshop.
III.A.2. Identify active PCO and landscape maintenance organizations in the South Bay and conduct awareness-raising presentations at their meetings	To Be Done in FY 02-03	The Program plans to contract with Bart Brandenburg, consultant, to plan a PCO Workshop and conduct outreach to PCOs prior to the workshop to increase attendance.
III.A.3. Develop and conduct accredited workshops for PCOs that focus on IPM techniques.	To Be Done in FY 03-04	See III.A.2. above.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
III.A.4 Require PCOs contracted for municipal applications to use pest control methods consistent with the municipality's IPM policy (through contract specifications). Specifically, municipalities will require contractors to: a) follow the agency's IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on agency property to the agency in a timely manner (PS#5).	Program Guidance Done	Guidance was completed in December 2001 as part of the Pest Management Performance Standard. Co-permittees are beginning or continuing to implement the guidance. The IPM workshop on March 20, 2002 included a section on contracting for IPM services from professional pest control businesses.
III.B.1. Identify and work with PCO trade organizations to develop industry standards for BMPs to protect water quality, through participation in UPC and BASMAA.	To Be Done in FY 03-04	Program will work with the UPC to accomplish this task.
IV. Commercial Businesses		
IV.A.1 Research reports and surveys of commercial business pesticide use and other stormwater programs' and POTWs' efforts to address this issue. Develop recommendations and a work plan (including an evaluation component) to provide outreach on less toxic pest control to target businesses in the South Bay, as appropriate and cost-effective.	In Progress – Complete in FY 02-03	SCVURPPP staff surveyed Co-permittees, BASMAA members, and Monterey County programs for IPM materials specific to restaurants. Very little IPM restaurant outreach material was found. Several programs reported using San Francisco's "Don't Set a Table for Pests" poster. The Program's IPM Work Group supported customizing and printing copies of this poster for distribution in Santa Clara County. This item will be discussed with County health inspectors to obtain input from them as to the usefulness of the item and the most effective method of distribution to restaurants.
IV.A.2. Develop and implement education programs that target commercial businesses, per recommendations from Action IV.A.1.	To Be Done in FY 03-04	A distribution plan will be developed and implemented for commercial businesses.
V. Household Hazardous Waste Collection		
V.A.3 Work with HHW collection agencies to support, enhance, and help publicize programs for proper pesticide disposal (PS #7).	Ongoing	The Program is working closely with County HHW staff this year to coordinate pesticide reduction outreach.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
VI. County Agricultural Commissioners		
VI.A.1 Keep County Agricultural Commissioners informed of Program goals and activities and regional water quality issues through periodic meetings.	Ongoing	Agricultural commissioner was involved in the development and review of the pest management performance standards. Contact is ongoing.
VI.A.2 Involve County Agricultural Commissioners in education and outreach efforts targeting PCOs.	Ongoing	Program staff will involve County Ag in planning the PCO workshop, and helping promote the workshop and recruit PCOs to attend.
VII. New Development		
VII.A.1. Coordinate with municipal arborists or other relevant municipal staff to identify landscaping techniques less likely to attract pests, including a list of pest-resistant plants, and develop model conditions of approval for pest resistant landscaping features and practices.	Done	Program completed model conditions of approval, a landscape maintenance fact sheet, guidance on landscaping techniques for stormwater treatment, and a draft pest-resistant plant list. The plant list proved not to be a useful tool, as plant resistance depends highly on local planting conditions.
VII.A.2. Assist Co-permittees to consider pest-resistant landscaping and design features in the design, landscaping, and environmental reviews of proposed development projects.	Done	Model conditions of approval provided to Co-permittees, and a form developed to track projects for which education or conditions of approval were required.
VII.A.3. Assist Co-permittees to train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval (see Actions VII.A.1. and VII.A.2.) and the importance of minimizing pesticide use in runoff from development sites.	Done	The topic was presented at the December 11, 2002 New Development workshop.
VII.A.4. Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites.	Done	A section for documenting pesticide reduction measures required of project applicants is included in the Program's model data collection form for collecting other development project data prior to implementing C.3. (i.e., impervious surface area) and the Planning Procedures PS Reporting Form.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
VIII. Monitoring and Science		
VIII.A.1. Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP advisory and technical committees to focus RMP resources on 303(d) problem pollutants, including OP pesticides.	Ongoing	The Program annually contributes its share to the RMP. Program staff attend the RMP Technical Review Committee meetings and prepare meeting summaries for Management Committee.
VIII.A.2. Work with Regional Board staff to refine the problem statement for the diazinon TMDL and determine data needs.	Ongoing	Program staff attend the Urban Pesticide Committee meetings, at which the diazinon TMDL has been discussed. Staff are also working on the TMDL with Regional Board staff as part of the Clean Estuary Program (CEP).
VIII.A.3. Participate in a coordinated regional plan to collect data for the diazinon TMDL.	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX. Regional, State, and Federal Coordination		
IX.A.1. Support actions by the California Stormwater Quality Association (CASQA) Pesticide Work Group to comment on and assist with USEPA's pesticide risk assessments and to assist USEPA in development of a scope for a diazinon TMDL case study.	Ongoing; Case study TBD	SCVURPPP provides funding to the CASQA's consultant contract, which funded Geoff Brosseau and Kelly Moran's efforts to review risk assessments and provide comments on behalf of the CASQA member agencies. The EPA case study has not yet been planned or discussed.
IX.A.2. Through participation in the UPC and CASQA, work with the U.S.EPA, the California Department of Pesticide Regulation, and the pesticide industry to eliminate uses of pesticides likely to enter surface water from those listed on product labels.*	Ongoing	Program staff regularly participate in the UPC and CASQA, and support efforts to eliminate uses of pesticides that cause risk to water quality.
IX.B.1. Participate in the activities of BASMAA, CASQA, and UPC, and communicate Program efforts.	Ongoing	Program staff regularly attend BASMAA, the CASQA and its Executive Committee, and the UPC and communicate Program efforts.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
IX.B.2. Collaborate in technical studies to support TMDL development and implementation. (See Action VIII.A.3.)	As Needed.	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX.B.3. Continue to participate in the BASMAA Pesticide Work Group to evaluate implementation of and continuously improve the Pesticide Strategy and report on the results of the evaluation.	Task Eliminated	The BASMAA Pesticide Work Group is no longer active, as each municipal stormwater program has its own pesticide plan in place of the Pesticide Strategy.
X. Review and Revision of Work Plan		
X.A.1. Review and continuously improve the goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Regional Board staff and other interested parties, and results of local performance review meetings if any.	Ongoing (Annually)	The Pesticide Plan was revised twice in FY 01-02 based on comments from Regional Board staff and interested parties (specifically RWQCB letters dated 8/15/01 and 12/21/01) and submitted to the RWQCB on October 15, 2001 and March 1, 2002, respectively. The Plan will continue to be evaluated and improved each year.

Table 5-2
Schedule and Deliverables for FY 03-04 Pesticide Management Tasks

Task	Schedule	Deliverables
Public Education and Outreach		
II.A.3. Prepare appropriate outreach materials (e.g., fact sheets or a consumer guide regarding pest control services) to address target groups.	June 2004	• PCO Consumer Guide (from BASMAA) • Distribution Plan
II.A.11 Identify consumer and business publications that could include articles about IPM or less toxic pest management, submit articles or letters to the editor, and encourage them to print them.	June 2004	• List of publications • Articles for submittal
II.A.12. Develop a work plan for and implement a "Pesticide User Outreach" project targeting residential and commercial users, which will include continuing the IPM Store Partnership Program and selected Household Chemical Management project tasks. Include an evaluation component in the work plan.	June 2004 (Work Plan December 2003)	• Work Plan • IPM Fact Sheets (from BASMAA) • Ads, PSAs, supplemental materials
II.A.13 Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	June 2004	• Plan for contacts with districts and distribution of materials
Pest Control Operators (PCOs)		
III.A.3. Develop and conduct accredited workshops for PCOs that focus on IPM techniques.	December 2003	• Workshop materials (work with Bart Brandenburg, consultant)
III.B.1. Identify and work with PCO trade organizations to develop industry standards for BMPs to protect water quality, through participation in UPC and BASMAA.	June 2004	• PCO-accepted BMP Document (work with UPC and consultant)
Commercial Businesses		
IV.A.2. Develop and implement education programs that target commercial businesses, per recommendations from Action IV.A.1.	June 2004	• Educational materials • Distribution plan

SECTION 6

MERCURY POLLUTION PREVENTION WORK PLAN

6. MERCURY POLLUTION PREVENTION WORK PLAN

INTRODUCTION

The Program's reissued NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Provision C.9.c. of the SCVURPPP permit requires the Program to address the impairment by developing and implementing a mercury pollution prevention plan. The SCVURPPP developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with the permit provisions. The Mercury Plan was submitted to the Regional Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan. This section of the FY 03-04 Work Plan summarizes Mercury Plan tasks completed during FY 02-03 and describes the tasks that will be developed, continued, or completed during FY 03-04.

SUMMARY OF MERCURY POLLUTION PREVENTION PLAN

The Mercury Plan is based on the premise that a Bay area-wide approach (and coordination) in addressing mercury pollution prevention will be most successful. For this reason, many of the actions identified in the Plan are for Program-level participation in regional efforts. These efforts are supplemented by countywide and local efforts.

The Mercury Pollution Prevention Plan addresses five general goals:

I. **Municipal Use of Mercury-Containing Products** – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

II. **Household Hazardous Waste Collection** – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

III. **Monitoring and Science** – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

IV. **Regional, State, and Federal Coordination** – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

V. **Public Education and Outreach** –Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

The Mercury Plan identifies actions that will be implemented at the Program level, municipality level, or both, as well as the schedule for initiation and/or completion of Program-level actions. The details of municipality actions and schedules are included in the individual Co-permittee Work Plans and/or Annual Reports, as appropriate.

STATUS OF FY 02-03 MERCURY POLLUTION PREVENTION ACTIVITIES

The status of Program tasks in the Mercury Plan is presented in Table 6-1. Highlights of Program accomplishments during FY 02-03, as developed and/or implemented by the Mercury Pollution Prevention Plan Ad Hoc Task Group (Mercury P2 Plan AHTG), Mercury Pollution Prevention Outreach Work Group, Program staff and municipalities are provided below.

Grant Proposals

In FY 02-03, Program staff assisted the County Household Hazardous Waste Program (CoHHW) to apply for grant funding from the California Integrated Waste Management Board (CIWMB), which is available under the California Oil Recycling Enhancement Act of 1991 and the California Integrated Waste Management Act. The CoHHW Program submitted a Mercury Reduction Grant to the CIWMB on April 5, 2002. The grant proposed to: 1) Develop an aggressive mercury reduction education and collection campaign for residents and municipal employees in partnership with water resource, solid waste and hazardous waste agencies, and 2) Expand mercury collection opportunities by increasing service at HHW facilities, conducting work-site thermometer collections, and establishing a pilot retail take-back program, and 3) Measure and compare effectiveness of outreach and collection mechanisms and prepare recommendations for other HHW programs expanding mercury collections[1]. The CoHHW was notified in October 2002 that their submittal was not awarded grant funding.

Monitoring and Science

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is serving as the stakeholder forum for the development of the Guadalupe River TMDL Report. The Guadalupe River Watershed encompasses parts of San Jose, Los Gatos, Campbell, Monte Sereno and Santa Clara. SCVURPPP is a stakeholder in the Guadalupe River TMDL process. The Santa Clara Valley Water District (SCVWD) and the City of San Jose are taking the lead in representing SCVURPPP in the TMDL development process.

The Program continued to provide financial support to the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study funded by the City of San Jose. In addition, Program and Co-permittee staffs actively participate in RMP Technical Review Committee (TRC) and Steering Committee (SC) meetings and provide meeting summaries to the Management Committee. Staff reviewed available reports and provided comments on the proposed 2003 RMP Draft Monitoring Plan.

To assess sediment mercury concentrations and percentage of fine material, the Program provided financial and staff support for the Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides. During FY 01-02, the Program prepared and submitted (to the Regional Board) the *Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides (Final Report-Year 2)* on April 15, 2002.

1. Memorandum to SCVURPPP Management Committee, from Rob D'Arcy, Santa Clara Household Hazardous Waste Program, re Existing Capabilities of the Santa Clara County Household Hazardous Waste Program and Potential Impacts of Regional Efforts to Collect and Recycle Mercury-Containing Devices, June 19, 2002.

A Memorandum of Understanding (MOU) regarding development of a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries was entered into by the Regional Board, Bay Area Clean Water Agencies (BACWA), and Bay Area Stormwater Management Agencies Association (BASMAA) on August 6, 2001, and includes the development of TMDLs for 303(d) pollutants including mercury. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, SCVURPPP is involved in the development and funding of potential projects for the mercury TMDL. Program staff has been participating in the CEP technical committee meetings and CEP Board meetings.

Mercury-Containing Product Survey

In FY 02-03, the Mercury P2 Plan AHTG and Program staff developed a survey to determine the types of mercury-containing products used by municipalities. The objective of the survey is to assess the municipal mercury-containing products being used, their locations, and waste disposal and purchasing routes; identify the level of awareness of product alternatives and proper disposal methods. The Program's Management Committee reviewed and approved the survey in October 2002. The survey was emailed on November 5, 2002 to municipal staff contacts identified by the Management Committee, and most surveys have been completed and submitted to the Program.Survey responses will be provided in the Program's FY 02-03 Annual Report (submitted to the Regional Board by September 15, 2003).

Guidelines for Reduction and Management of Mercury-Containing Products

In December 2002, the Mercury P2 Plan AHTG and Program staff began developing guidelines for the reduction and management of mercury-containing products identified for virtual elimination. A final draft of the guidelines will be submitted to the Management Committee in March 2003. Co-permittees will begin implementation in FY 03-04.

Mercury Virtual Elimination Policy

In January 2002, Mercury P2 Plan AHTG and Program staff began developing a model mercury virtual elimination policy. Co-permittees will review and use the model policy to adapt a mercury virtual elimination policy or ordinance, as appropriate. The model policy, which requires the virtual elimination of mercury from controllable sources in urban runoff, is scheduled for adoption by Co-permittees in FY 03-04.

Mercury PI/P Workgroup

In December 2002, Program staff established a new Work Group called the Mercury Pollution Prevention Outreach Work Group. This Work Group will implement the Public Education and Outreach element of the Mercury Pollution Prevention Plan by organizing a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products The focus of their efforts will be to collaborate with the CoHHW on a two-year, two-phase fluorescent light tube (FLT) recycling campaign. The first phase will target residents and the second phase will target small businesses. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of fluorescent light tubes.

The Mercury P2 Outreach Work Group recently completed the work plan for phase 1 of the FLT recycling campaign (FY 02-03). The work plan is provided in Section 3, Attachment 3-3.

NEXT STEPS FOR MERCURY PLAN IN FY 03-04

Since the establishment of the Mercury Pollution Prevention Plan, Mercury P2 Plan AHTG and Mercury Pollution Prevention Outreach Work Group, it is anticipated that FY 03-04 will see continued Mercury Pollution Prevention Plan implementation activities. A summarized list of Mercury Plan tasks that will be implemented during FY 03-04 include:

Mercury-Containing Product Survey: The Mercury P2 Plan AHTG and Program staff will report the survey responses in the Program's FY 02-03 Annual Report (submitted to the Regional Board by September 15, 2003).

Guidelines for Reduction and Management of Mercury-Containing Products: Co-permittees will begin planning for the implementation of the Program's guidelines for reduction and management of mercury-containing products identified for virtual elimination.

Mercury Virtual Elimination Policy: Co-permittees will review and use the Program's model policy to develop and adopt a mercury virtual elimination policy or ordinance, as appropriate.

Mercury Pollution Prevention Outreach: The Mercury Pollution Prevention Outreach Work Group will continue implementing a two-year, two-phase fluorescent light tube recycling campaign. The second phase will target small businesses on the negative health and environmental impacts of mercury, and the methods available for properly disposing of their fluorescent light tubes. In addition, the three Co-permittees with industrial wastewater inspection programs (San Jose, Sunnyvale and Palo Alto) will integrate, into their existing routine pretreatment, source control, and/or hazardous materials inspection processes, mercury outreach for industrial businesses.

Coordination efforts with regional organizations (Clean Estuary Partnership TMDL): In addition to attending CEP meetings, Program Staff will continue to attend Regional Monitoring Program (RMP) Steering Committee and Technical Review Committee meetings.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

I. Municipal Use of Mercury-Containing Products **Goal I.** Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated. **Actions –**		SCVURPPP	Municipality	Completion Date
I.A.	Develop a process to survey the types of mercury-containing products used by municipal departments. Identify appropriate municipal personnel to conduct survey. For those products with a potential to enter stormwater runoff, identify possible alternatives or proper disposal procedures.	X	A	**Completed**- the Management Committee approved the survey on October 17, 2002. Surveys were distributed to Co-permittees on November 5, 2002.
I.B.	Complete and report results of survey of mercury-containing products used by municipal departments.	A	X	All surveys are expected by February 2003. (original deadline December 2002); Survey results will be included in FY 02-03 Annual Report (September 2003)
I.C.	Develop guidelines for a mercury policy or ordinance requiring the virtual elimination of mercury from controllable sources in urban runoff from agency operations. (The word "virtual" acknowledges that total elimination of mercury-containing products may be impossible due to technological or economic factors.)	X	N	June 2003
I.D.	Adopt a mercury policy or ordinance requiring the virtual elimination of mercury from controllable sources in urban runoff from agency operations.	N	X	FY03-04
I.E.	Develop guidelines for mercury-containing products reduction and management. These guidelines will include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	X	A	Development of draft Guideline document began in December 2002; Final March 2003
I.F.	Implement guidelines developed under Action I.E.	N	X	FY03-04
Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines (to be developed under Action I.E).		A	X	Annually (beginning in FY 02- 03 Annual Report)

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**		SCVURPPP	Municipality	Completion Date
II.A.	Assist HHW collection agencies with preparation of a technical memorandum summarizing infrastructure and budgetary concerns regarding the anticipated increase in fluorescent bulbs and other mercury-containing products to be recycled.	X	N	**Completed**--The technical memorandum was completed by HHW in June 2002 and distributed (as an informational item) at the July 18, 2002 Management Committee meeting. The memorandum describes the existing capabilities of the Santa Clara County HHW Program and discusses the potential financial impacts on the HHW Program due to SCVURPPPP outreach efforts.
II.B.	Provide mercury-containing products disposal services for residents and small businesses.	X	X	Ongoing
II.C.	Develop guidelines for documenting and reporting quantities of mercury-containing products disposed of by city.[1]	X	A	Draft December 2002; Final March 2003
II.D.	Implement guidelines developed under Action II.C.	X	TBD	FY03-04
II.E.	Assist HHW collection agencies in developing a Prop 13 Program grant proposal for a HHW fluorescent light recycling program (Action II.F).			**Completed** -- CoHHW submitted a Mercury Reduction Grant to CIWMB on April 5, 2002. The Program submitted a concept proposal to the SWRCB on February 1, 2002. Both submittals were not selected to receive grant funding.
	• Submit concept proposal	X	N	**Completed**-February 2002
	• Submit full proposal	X	N	Proposal not advanced in Prop 13 grant process
	• Decision deadline			Not applicable- Proposal not advanced in Prop 13 grant

[1] Guidelines for documenting and reporting quantities of mercury-containing products disposed of by city will developed, taking into consideration whether it is possible to separate mercury from other waste streams and whether it is possible to track mercury-containing product disposal by municipality.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
			process
II.F. Work with HHW collection agencies to develop and help publicize fluorescent light recycling program.[2]	X	X	FY03-04
Monitoring Mechanism II.A. Evaluate whether household hazardous waste collection programs adequately serve residents and businesses.	X	N	FY03-04 (periodic review)
Monitoring Mechanism II.B. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities (see Action II.C). [1]	X	N	Annually (beginning in FY 03-04 Annual Report)

III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment. **Actions –**	SCVURPPP	Municipality	Completion Date
III.A. Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee.	X	A	Ongoing
• Supported completion of the San Francisco Bay Atmospheric Deposition Pilot Study Part 1: Mercury	X	A	**Completed**- submitted August 2001
• The City of San Jose will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San Jose.	N	O[3]	Ongoing, through 2004
III.B. Provide financial and staff support for a coordinated regional plan to collect data for the mercury TMDL, as defined in the RWQCB/BACWA/BASMAA MOU. (Now called the Clean Estuary Program, or CEP)	X	A	Ongoing SCVURPPP participation in the CEP

[2] Action II.F may be conducted in conjunction with Public Education and Outreach Actions (see Section V of this Work Plan). Completion date for Action II.F is contingent upon award of a Prop 13 Program grant.
[3] Participation in this action by municipalities is limited to the City of San Jose.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment. **Actions –**	SCVURPPP	Municipality	Completion Date
III.C. Continue financial and staff support for the Joint Stormwater Agency Project to Study Urban Sources of Mercury to assess sediment mercury concentrations and percentage of fine material.	X	A	**Completed**
• Completed the Work Plan Joint Stormwater Agency Project – Year Two Investigation of Urban Sources of Mercury, PCBs and Organochlorine Pesticides	X	A	**Completed** - Report submitted June 1, 2001
• Preparing the Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides - Year Two Report.	X	A	**Completed**- Report submitted on April 15, 2002
III.D. Develop and implement a five-year program of monitoring efforts.	X	N	**Completed**- Draft completed March 2002; implementa-tion began July 2002
Monitoring Mechanism III. Submit monitoring data and reports to the Regional Water Quality Control Board and other interested parties (such as USEPA). Review monitoring data and reports and develop follow-up recommendations.	X	N	Ongoing, when available

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
IV.A. Participate in the activities of the Bay Area Stormwater Management Agencies Association, the California Storm Water Quality Task Force, and the San Francisco Estuary Institute and communicate Program efforts.	X	N	Ongoing
IV.B. Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup.	X	O[4]	Ongoing
IV.C. Support and participate in development of the WMI Watershed Action Plan.	X	O[5]	Ongoing

[4] The City of San Jose and the Santa Clara Valley Water District are participating in the development of the Guadalupe River Mercury TMDL.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
IV.D. Submit the SCVURPPP draft Mercury Pollution Prevention Plan to the WMI to ensure that efforts are coordinated.	X	N	**Completed** -- Plan was submitted to WMI Guadalupe Mercury TMDL Work Group in July 2002 (original deadline was March 2002).
IV.E. Support, participate in, and advocate increased regional collaboration with the RWQCB and the Bay Area Air Quality Management District (BAAQMD).	X	N	Ongoing
IV.F. Support and track the progress of the U.S. Department of Energy (DOE) Office of Building Technology's Vision 2020 Lighting Technology Roadmap.[6]	X	N	In Progress -- DOE is moving forward on their Vision 2020 Roadmap, with 7 strategies to address the challenges of transforming the lighting marketplace and developing new technologies that enhance lighting quality, efficiency, and cost effectiveness
Monitoring Mechanism IV. Document participation of Program staff in collaborative efforts and progress of these efforts.	X	N	Annually (beginning in FY 02-03 Annual Report)

[5] The Cities of San Jose, Sunnyvale, and Palo Alto, SCVWD, and SCVURPPP (on behalf of the other co-permittees) are signatories to the WMI and participate in the Core Group and subgroups.
[6] DOE's Vision 2020 Lighting Technology Roadmap includes the following as one of its goals for the year 2020, "Highly efficient, reduced-mercury fluorescent sources will come to market." Sustainable Conservation's September 27, 2000 report entitled "Reducing Mercury Releases From Fluorescent Lamps: Analysis of Voluntary Approaches," concluded that " we do not believe that starting a new collaborative approach with manufacturers to create mercury-free fluorescent lamps is the most effective use of resources at this time." Instead, Sustainable Conservation recommends focusing on voluntary recycling of mercury-containing lamps.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
V.A. Develop various outreach programs to educate target audiences about proper disposal of mercury-containing products and alternative non-mercury containing products. Outreach programs will include, but may not be limited to, the following:	X	A	TBD
• Develop and begin to implement a fluorescent light recycling outreach program to educate residential users and encourage proper disposal of fluorescent lights.	X	A	Workgroup formed in FY 02-03 and work plan developed for implementation in Spring 2003.
• Develop and begin to implement a fluorescent light recycling outreach program to educate small businesses and conditionally exempt small quantity generators and encourage proper disposal of fluorescent lights. (For example, the small business outreach program might include coordination with local chapters of the Building Owners and Managers Association [BOMA] or the National Association of Industrial and Office Properties [NAIOP].)	X	A	Begin FY 03-04
• Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	A	X	Begin FY 03-04
• Develop and distribute "tailgate safety meeting cards" about mercury to inspectors and other municipal employees. (The Program will first review the product developed by the Fairfield-Suisin Sewer District when it is made available to the Bay Area Pollution Prevention Group [BAPPG].)	X	X	TBD
V.B. Develop or adapt existing mercury outreach materials, as needed, for outreach programs.	X	A	Materials to be developed as part of outreach work plan for Action V.A.
V.C. Attend community events and distribute outreach materials.	X	X	Periodically (beginning FY 02-03)
Monitoring Mechanism V.A. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities. (See Monitoring Mechanism II.B.)	X	N	Annually (beginning FY 02-03)

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
Monitoring Mechanism V.B. In the Annual Report, document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	X	X	Annually (beginning FY 02-03)
Monitoring Mechanism V.C. Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages (coordinate survey with Watershed Watch Campaign Survey).	X	A	FY 03-04

Legend:

"X" = will implement at this level (SCVURPPP or municipality)
"N" = not being implemented at this level
"A" = assist with or develop guidance for implementation
"R" = coordinate with regional effort
"O" = optional
"FY" = fiscal year
"TBD" = to be decided

SECTION 7

NEW AND REDEVELOPMENT WORK PLAN

7. NEW AND REDEVELOPMENT (C.3.) WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 03-04 which continue to assist Co-permittees in controlling the impacts of development on stormwater quality and flow through the development project planning, review and approval process.

BACKGROUND

On October 17, 2001, the Regional Board adopted Order 01-119 which amended the Program's Permit Provision C.3. (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharges from new or redevelopment sites that may increase erosion in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

Provision C.3. also required the Program and Co-permittees to submit specific work plans for: 1) modifications to the development project review process (C.3.b.); 2) implementation of Group 1 requirements (C.3.c.); and 3) site design standards review and revision (C.3.j.). In response, the Program and Co-permittees submitted work plans for implementing all C.3. requirements to the Regional Board on March 1, 2002 (as part of the Program's *FY 02-03 Work Plan*, Volume II.

To guide this effort, Program staff prepared a separate document entitled "Guidance for Work Plan Tasks Related to Implementation of Permit Provision C.3. (New and Redevelopment Requirements)" (referred to herein as C3 Work Plan Guidance) which identifies proposed actions to meet the requirements of Provision C.3. and whether the actions will be implemented at the Program level, Co-permittee level or both. The Program tasks for FY 03-04 listed in the C.3 Work Plan Guidance are the basis of this work plan section.

PAST AND CURRENT ACTIVITIES TO IMPLEMENT C.3.

Section 8 of the Program's *FY 01-02 Annual Report* described the Program's progress of (up to September 15, 2002) completing Program tasks (in the C.3 Work Plan) and assisting

Co-permitees in preparing to implement C.3 requirements. Additional tasks accomplished since September 15, 2002 include the following:

- The Program conducted a workshop for municipal staff on December 11, 2002 to present Program guidance developed to date. Presentations included information on the numeric sizing criteria (Part 1), the manual "Using Start at the Source to Comply with Development Standards", and several design examples using data on real development projects. Over 130 municipal staff participated in the workshop.
- Program staff completed revisions to the Program's model Planning Procedures Performance Standards to incorporate the C.3. requirements and the model source control measures list (see Section 2).
- The Program formed and began meetings with two new work groups, the Site Design Work Group and the BMP O&M Work Group, to start developing guidance on those elements of C.3.
- The Program's consultant team completed a technical memorandum on the Hydromodification Management Plan (HMP) assessment approach, and conducted the assessment on a test watershed (Thompson Creek/Lower Silver Creek Watershed in San Jose). A draft report on this assessment will be submitted to the Regional Board as a separate document.
- Program staff and consultant team made two presentations on the HMP, one to the SCBWMI FMS/WAS Subgroups on November 18 and one to BASMAA NDC and Regional Board staff on December 5, as part of the public outreach component of the HMP Work Plan.

FY 03-04 C.3. TASKS

Table 7-1 presents the list of tasks from the C.3. Work Plan that will be implemented in FY 03-04. Program staff will also provide general support to Co-permittees as questions arise during implementation. In addition, several continuous improvement items for the Program were identified during the FY 02-03 performance review meetings that relate to C.3. implementation:

1. Develop written tools to be used to train staff on Provision C.3 requirements (in case of staff turnover).
2. Hold future training workshops on multiple days to increase the chances staff will be able to attend.
3. Develop brochures/handouts to provide to developers containing information on Provision C.3 with reference to resources containing ideas.
4. Develop design guidance containing stormwater control opportunities for small road modifications.
5. Follow-up on pesticide reduction guidance to ensure effectiveness. Research conflicts between water conservation and pest resistance/pesticide reduction.

Table 1-1 in Section 1 lists the status of and schedule for completing these five items.

SECTION 8

FINAL BUDGET REPORT: FISCAL YEAR 2003-2004

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 2003-2004 Work Plan

SCVURPPP budget reviewed by Budget Ad Hoc Task Group on January 13 and 28, 2003 and approved on January 28, 2003
SCVURPPP submitted to Management Committee on February 10, 2003 (revised and resubmitted February 13, 2003)
Approved by the Management Committee on February 20, 2003

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Final Budget Report:

Fiscal Year 2003-2004

Final February 28, 2003

Final Budget Report for FY 03-04

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Attachment 1: November 26, 2002 Program Manager Memo to BATG re. NPDES Fee Options

TOTAL PROGRAM FY 03-04 BUDGET

Budget Summary

Item	Staff Hours	Total Cost
Operational Group		
1. Program Management/Administration (EOA)	3,766	$427,009
2. Permit Management (EOA)	3,206	$476,125
3. Technical Program Management (EOA)	941	$148,068
4. Legal Services (MOFO)	0	$66,000
5. Fiscal Agent (SCVWD)	0	$15,000
6. RMP Contribution (SFEI)	0	$156,000
Sub-total : Operational Group	7,913	**$1,288,202**
Projects Group		
7. Monitoring Projects (EOA/Subs)	3840	$738,492
8 NDC Technical Assistance/Guidance	560	$200,000
9. PI/P & WEO budget	855	$590,000
10 Project Monitoring Special Study (10 % per MOA – moved to Collaborative Group)	0	0
Sub-total : Project Group	5,255	**$1,528,492**
Collaborative Group		
A. Public Information/Participation Projects (estimated)		$15,000
B. Project Monitoring Special Study Items		$100,000
C. WE&O – PI/P Work Plan Tasks		$125,300
D. CASQA Dues		$25,000
E. TMDL CEP Participation		$97,000
F. NPDES Fee		$108,500
Subtotal: Collaborative Group		**$470,800**
TOTAL FY 03-04 PROGRAM BUDGET	13,168	**$3,287,494**

TOTAL PROGRAM FY03-04 BUDGET

Budget Detail

Item	Staff Hours	Total Cost
Operational Group		
1. Program Management/Administration (EOA)		
a. Administrative Assistance	1,300	$99,313
b. Management Committee and Task Group Support		
i. Management Committee	850	$73,495
ii. Task Groups	790	$99,345
c. Program Budget Administration		
i. Develop Budgets	122	$16,711
ii. Prepare Expenditure Reports[1]	202	$30,404
d. Coordinate with Legal Consultant	128	$20,853
e. Develop and Manage PI/P Program (see Attachment 1 - C4)	374	$48,423
f. Performance Evaluation	0	$0
g. Expenses	0	$38,466
Subtotal	**3,766**	**$427,009**
2. Permit Management (EOA)		
a. Report Preparation and Submittal		
i. Annual Report	360	$49,191
ii. Work Plans	336	$45,427
b. Internal Co-permittee Liaison		
i. Develop Guidance	140	$18,971
ii. Local Program Reviews (delay until FY 04-05)	0	$0
iii. Conduct Training (4 Workshops)	360	$48,759
c. External Organization Meetings[2]	960	$134,465
d. NDC Implementation Assistance, Tracking & Reporting	340	$45,449
e. Implement Continuous Improvement Items	340	$45,838
f. TMDL Program Tracking, Review & Reporting	370	$45,135
g. Expenses	0	$42,890
Subtotal	**3,206**	**$476,125**

[1] Includes coordination with Fiscal Agent.

[2] Includes Program representation at selected BASMAA (Board, New Development Committee, PI/P Committee, and Monitoring Committee), California Stormwater Quality Association, Regional Monitoring Program/SFEI, WMI (Core Group, Watershed Assessment, Regulatory and Bay Monitoring/Modeling Subgroups), Urban Pesticide Committee, and Regional and State Board meetings, and meetings with environmental/public interest groups.

3. Technical Program Management (EOA)		
a. Prepare RFPs, Technical Project Management	398	$56,752
b. Technical Review of Work Products	323	$46,460
c. Develop/Revise Performance Standards	220	$31,518
d. Expenses	0	$13,338
Subtotal	**941**	**$148,068**
4. Legal Services	**0**	**$66,000**
5. Fiscal Agent	**0**	**$15,000**
6. Fees		
a. NPDES Permit Fee (SWRCB) (Moved to Collaborative)	0	---
b. Regional Monitoring Program Contribution	0	$156,000
Subtotal	**0**	**$156,000**
Operational Group Total		**$1,288,202**
Projects Group		
7. Monitoring Projects [1]	3,000	$738,492
8. NDC Technical Assistance/Guidance	560	$200,000
9. PI/P & WEO budget[2]		
a. Watershed Education and Outreach Campaign	371	$455,000
b. Pesticide User (PU) Outreach		$40,000
c. Mercury Pollution Prevention Outreach		$25,000
d. Regional Collaboration (BASMAA)		$65,000
e. Program Supplies		$5,000
11. Project Monitoring Special Study (10% per MOA – see Collaborative Group)		---
Projects Group Total		**$1,528,492**

[1] Scope is based on the Program's Multi-Year (8-year) Monitoring Plan and the following Management Committee monitoring priorities:

1) New projects needed to implement the results and achieve the goals of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
   a) Investigate beneficial uses and causes of impairment (including field work);
   b) Review and compile environmental data and make it accessible;
   c) Develop strategies for controlling impacts of land use on beneficial uses;
   d) Facilitate and support WMI subgroups (including coordination with other agencies).
4) Projects identified through participation in regional monitoring collaborative efforts, including the RMP and BASMAA.

[2] On February 15, 2001 the MC approved the Budget Adhoc Task Groups recommendation to incorporate certain elements of the PI/P budget into the Projects Group budget.

TOTAL PROGRAM FY03-04 BUDGET

Budget Detail

Item	Staff Hours	Total Cost
Collaborative Group		
A. Public Information/Participation Projects		$15,000
B. Program Monitoring Special Studies		$100,000
C. WE&O – PI/P Work Plan Tasks		$125,300
D. CASQA Dues		$25,000
E. TMDL CEP Participation		$97,000
F. NPDES Fee		$108,500
Sub total: Collaborative Group		**$470,800**
TOTAL PROGRAM FY 03-04 BUDGET		**$3,287,494**

TOTAL PROGRAM FY 03-04 BUDGET
Backup Information

OPERATIONAL GROUP

A summary of tasks to be performed by EOA, based on EOA's current contract with the Santa Clara Valley Water District (on behalf of the SCVURPPP), is provided in Items (1.), (2.), and (3.) below. The resource requirements for FY 03-04 are based, in part, on the new and/or enhanced requirements contained in the RWQCB Order No. 01-024 adopted February 21, 2001 and Order No. 01-119 adopted October 17, 2001 (new and redevelopment requirements).

The Budget Ad Hoc Task Group met twice to develop the FY 03-04 budget. The first meeting was held on January 13, 2002 and the BATG reviewed the draft budget developed by Program staff dated December 23, 2002. The BATG met on January 28, 2003 to review a number budget options. At that meeting the BATG agreed on the basic budget assumptions and developed a draft FY 03-04 budget. The BATG developed a budget to accomplish the following objectives:

- Maintain the overall FY 03-04 budget consistent with the FY 02-03 budget;
- Reduce the total Operational and Projects Group budget by ten percent (10%) from the FY 02-03 budget;
- Maintain the Co-permittee FY 03-04 assessments approximately equivalent to the FY 02-03 assessments (this objective is based on the assumption that the Collaborative Group budget is funded by all Co-permittees using the MOA participation formula); and
- Include the estimated (based on a doubling of FY 02-03 fees) annual NPDES permit fees as a separate line item in the Collaborative Group budget and distribute the fees to the individual Co-permittees based on what each Co-permittee would be expected to be billed by the SWRCB[1].

A summary of the key budget assumptions is shown below and additional detail that defines the basis for the budget are identified in the following sections.

- Labor rate costs increased by 4% above FY 02-03 labor rates.
- The RMP contribution remained in Operational Group budget without any increase.
- No increase in Legal Assistance is included (it is assumed that the majority of resources will be used to assist with C3 implementation issues, potential TMDL compliance issues, and other potential permit compliance issues. A small percentage will be used to follow appeals and provide briefings and guidance to Co-permittees on the appeal status and issues.)
- The Projects Group WE&O campaign budget was reduced by roughly $125,300 and the reduction was included in the Collaborative Group budget.
- The Projects Group WE&O Work PLAN includes a public opinion survey.
- Interest accrued is available to be used as needed for projects approved by the BATG and MC

[1] Attachment 1 contains a preliminary estimate of the NPDES fees. The BATG reviewed several options for possible payment as contained in the attached summary table (November. 26, 2002). The BATG recommendation was to continue to include payment of the FY 02-03 fees in the Program budget consistent with the MOA/Bylaws. The Management Committee on December 19, 2002 concurred with this recommendation. The BATG discussed the various options at its January 28, 2003 meeting and recommended that the fees be included in the budget as a separate line and that the assessments include the estimated fee that would be billed to each Co-permittee.

- Assume no new full-scale watershed assessments are initiated until FY04-05.
- Co-permittee performance reviews delayed until FY 04-05
- Include approximately 60% ($97,000) of the requested ($163,000) contribution for participation in the Clean Estuary Program as part of a separate Collaborative Group budget.
- Include resources to assist with implementing the draft Trash Work Plan (work plan is based on implementation over two years).
- Include resources to conduct the work the Sediment Assessment Work Plan previously approved by the MC (Assumes that the SCVWD and other Co-permittees that are part of the San Francisquito JPA continue to conduct the permit efforts related to sediment assessments in San Francisquito.)
- Include resources to assist with finalizing guidance for implementation of C3 tasks and assist with implementation (Assumes that additional resources contributed by the City of San Jose and the SCVWD to assist with conducting the hydrograph management plan (HMP) will continue to be available.)

1. Program Management/Administration

a. Administrative Assistance

- General administrative assistance
- Maintain Program 800 number
- Distribute PIP and other materials
- Develop partnerships with external organizations

b. Management Committee (MC) and Ad-Hoc Task Group (AHTG) Support

- Monthly MC meetings (up to 12) - develop, distribute, and post agendas; prepare and mail meeting materials; facilitate meetings; draft and finalize minutes; and conduct follow-up activities
- AHTG meetings (up to 40) - support groups formed to address specific tasks (meeting number and times vary)

c. Program Budget Administration

- Develop, draft, and finalize FY 2004-2005 budget; organize and facilitate quarterly Budget AHTG meetings
- Coordinate with Fiscal Agent, track expenditures, and prepare quarterly status reports

d. Coordinate with Legal Consultant

- Communicate with and assist Program legal counsel as needed (up to 5 meetings and 10 extended telephone discussions) on General Program issues.

e. Develop and Manage Program PI/P Program

- Conduct long-range planning for Program PI/P activities
- Manage development of PI/P work plan for FY 2004-2005
- Provide support, as needed, to Co-permittee's requests for public education assistance

- Manage the WE&O subcontractors
- Coordinate and work with the WMI Communications Subgroup and various other adhoc and work groups to address numerous new people and "pollutants of concern".[1].

f. Performance Evaluation

- No budget in FY 03-04.

g. Expenses

- Approximately 10 percent of labor cost

2. Permit Management

a. Report Preparation and Submittal

- Prepare annual report for FY 2002-2003 and submit to Regional Board by September 15, 2003 (includes preparation of 1 draft for MC review, reproduction/distribution of 15 copies)
- Review results of Program activities and recommend improvements
- Prepare Program Work Plan (or equivalent) for FY 2004-2005 (includes 2 drafts for MC review, response to Regional Board comments, reproduction and distribution of 15 copies)
- Provide guidance for Co-permittees' work plans
- Review all Co-permittee Work Plans and Annual Reports for completeness and consistency.

b. Internal Co-permittee Liaison

- Develop guidance on permit requirements
- Conduct focused local program review meetings for all Co-permittees, summarize meetings, make recommendations for improvements
- Conduct up to four training workshops for co-permittee staff

c. External Organization Liaison

- Represent Program at Regional Board, State Board, BASMAA, Regional Monitoring Program, Stormwater Quality Task Force, Urban Pesticide Committee, SCBWMI core and relevant subgroups, environmental group/public (up to 88 meetings)
- Obtain and transmit updates to state NOI database

d. New NDC Permit Compliance Issues

- Meet with Regional Board staff, Program legal counsel, Program ad hoc task group and/or environmental groups as needed
- Prepare responses to comments and supplementary documentation as needed.
- Conduct the projects to comply with permit provision C.3.

[1] Over the next several years PI/P will be a key element of the SCVURPPP. As the WMI and Program proceed to define and implement various outreach efforts, additional time will be required to work with the Ad Hoc, work groups and subgroups. As TMDL programs move forward to address new "pollutants of concern" Program staff will need to work with the regulatory agencies and Co-permittees to address these new concerns.

e. Implement Continuous Improvement Items

- Investigate, develop implementation plans, and implement items for Program continuous improvement identified in Co-permittee reviews, work plan, and annual report within the allocated resources
- Summarize for Program annual report

f. Expenses

- Approximately 10 percent of labor cost

3. Technical Program Management

a. Prepare RFPs, Technical Project Management

- Develop up to 4 RFPs for technical services
- Assist implement Multi-Year Monitoring Plan including selection of subcontractors
- Oversee contractors' work
- Coordinate with BATG/MC/Monitoring Ad Hoc Group and hold up to four Monitoring Ad Hoc meetings annually (quarterly basis)

b. Technical Review of Work Products

- Provide technical review of contractor work products
- Make recommendations to BATG/MC/Monitoring Ad Hoc Task Group regarding quality of work and any modifications needed for improvement.

c. Develop/Revise Performance Standards

- Assist MC in development of one new performance standard, or substantially improve one or more existing performance standards at the same level of effort.

d. Expenses

- Approximately 10 percent of labor cost

4. Legal Services

This assumes that the Program will retain the services of Morrison and Foerster (Robert Falk, Esq.) to provide legal advice. The working assumption is that the majority of the legal budget is earmarked for assistance with implementing the C3 provisions of the new permit and other permit conditions where potential compliance issues may arise. Some minor time will be spent following the pending appeals and briefing the Co-permittees. The estimated budget does not anticipate a significant expenditure of either Program staff time or legal time on the pending appeals.

5. Fiscal Agent

The Santa Clara Valley Water District is the treasurer and contracting agent for the Program. This item represents the amount to be reimbursed to the District (or other co-permittee) for the staff time involved in carrying out this task. It is assumed that the budget for this item will be the same as previous years. All Program staff time required to coordinate with the Fiscal Agent is included under Budget Item 1.c.

6. Fees

a. NPDES Permit Fee

This is the annual fee imposed by the State Water Resources Control Board for NPDES municipal storm water permits in the San Francisco Bay area. It was increased by the SWRCB during FY 02-03. The FY 03-04 fee is not available and thus is based on the assumption that the SWRCB will double the FY 02-03 fees. The annual fees are shown as a separate line item in the Collaborative Group budget.

b. Regional Monitoring Program (RMP) Fee

The RMP is a program initiated by the Regional Board to monitor the water quality of San Francisco Bay. The San Francisco Estuary Institute has a contract to conduct sampling in the Bay and administer the program with oversight from the Regional Board. The Program is one of a number of dischargers contributing to the cost of the program. It is expected that the Program will continue to fund the RMP at about the same level for each fiscal year for the term of the permit.

PROJECTS GROUP

7. Monitoring Projects

The purpose of this item is to fund technical consultant services for projects that satisfy the monitoring requirements of the Program's NPDES permit. The estimate of the resource requirements are based on implementation of the Multi-Year Monitoring Plan (MY-RWMP) submitted to the RWQCB by the MC on August 5, 2002 and consistent with Program implementation during the first year of the MY-RWMP. In addition, the budget estimate includes resources to cover the following tasks/projects: SCVURPPP data management, copper & nickel baseline actions and reporting, participation in the LUS, fourth year of the PCB, Hg, dioxin and chlorinated pesticide monitoring efforts (other pesticide monitoring consistent with the permit will be conducted to the extent that budget allows), sediment assessments consistent with the MC September 1, 2002 Work Plan, resources for assisting the Co-permittees implementation a two-year Trash Work Plan and investigating and reporting on trash as a "pollutant of concern" within the urban boundary, resources for updating and developing the necessary annual sampling plans, QA plans and reporting the surface water monitoring results (as defined within the MY-RWMP), and limited resources to assist the ad hoc mercury work group.

8. TMDL MOU Contribution

These resources are used to fund the participation (i.e, technical participation annual cost) in the Clean Estuary Program (TMDL MOU between the RWQCB, BASMAA and BACWA). The resources are

included as part of the Collaborative Group budget at a level of 60% ($97,000) of the total annual CEP request made to the Program.

9. NDC Technical Assistance/Guidance

Resources needed to assist the Co-permittees with completing the implementation guidance for C3c, C3f, and assistance on coordinating/developing a consistent approach/system for tracking and reporting O&M (C3e) status and compliance. The estimated budgets are based on and consistent with the C3 Work Plan.

10. PI/P and WEO Budget

a. Watershed Education and Outreach Campaign

Funds will be used for year four of an approved multi-year watershed education and outreach campaign. Budget includes:

- Funding for educational programs at the Alviso Ed Center coordinated with the WE&O campaign;
- Funding for the ZunZun performances troupe to perform a watershed –themed show at schools in Santa Clara Valley.
- Funding for a campaign evaluation (public opinion survey and other techniques) by an outside consultant.

Proposed Budget breakdown:

- Campaign consultant budget - $223,580 included in the Projects Group budget and $125,300 included as part of Collaborative Group budget.*
- Alviso Ed Center - $75,700 (Project Group)
- ZunZun Contract - $25,000 (Project Group)
- Campaign evaluation consultant budget - $43,900 (Project Group)
- Program staff support and subcontractor markup- $50,000 and $36,818 (non-discretionary.

* See Draft FY 03-04 WE&O Work Plan (12-02, revised Feb. 12, 2002)

b. Pesticide User (PU) Outreach

This project combines cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Project scope will include items in Program's Pesticide Management Plan (2-15-02), based on provision C.9.d. of the permit, for outreach to residents, commercial businesses, and pest control operators.

c. Mercury Pollution Prevention Outreach

This project encompasses several tasks in the Program's Mercury Pollution Prevention Plan

(3-1-02), provision C.9.c. of the permit. It involves public education regarding the effects of mercury on the environment, products containing mercury and proper disposal of such products. The proposed project is the second year of the MC approved budget of $25,000 per year.

d. Regional Collaboration

Total amount is for BASMAA's baseline budget. It includes an estimated BASMAA baseline budget contribution of $65,000 and CASQA contribution of $25,000 (included in the Collaborative Group budget).

e. Program Supplies

Estimated budget for reprints of materials for Program use and other Program supplies.

11. Project Monitoring Special Studies

The line item covers any necessary changes in scope of the projects requiring consultant services. The amount has been set at 10 percent of the total budget of the Projects Group (excluding the PI/P tasks) as per the MOA. The BATG recommended for FY 03-4 that the item be included in the Collaborative Group budget.

Attachment 1
Estimated FY 03-04 Permit Fee

Jurisdiction	% Share	Pre FY 02-03 Fee: Current Annual Fee	Est. Population	FY 03-04: Est. Total New Annual Fee
		$10,000		
Campbell	1.88	$188	25000	$5,000
Cupertino	2.46	$246	44000	$7,500
Los Altos	1.59	$159	27000	$2,000
Los Altos Hills	0.43	$43	8000	$2,000
Los Gatos	1.74	$174	30000	$5,000
Milpitas	2.75	$275	60000	$7,500
Monte Sereno	0.14	$14	20000	$2,000
Mountain View	3.91	$391	75000	$7,500
Palo Alto	4.06	$406	60000	$7,500
Santa Clara	6.23	$623	100000	$12,500
Saratoga	1.59	$159	30000	$5,000
Sunnyvale	7.25	$725	130000	$12,500
Santa Clara Co.	5.94	$594	110000	$12,500
San Jose	30.01	$3,001	1000000	$20,000
SCVWD	30.02	$3,002		$0
TOTAL		$10,000	1,719,000	$108,500

SECTION 9

CO-PERMITTEE PERFORMANCE REVIEWS

9. CO-PERMITTEE PERFORMANCE REVIEWS

BACKGROUND

As part of the Program's continuous improvement process (as described in the 1997 Urban Runoff Management Plan), the Program, Regional Board staff and interested outside parties conduct on-site performance reviews of the Co-permittees' local urban runoff management programs. Performance reviews in recent years have focused on one element of the Co-permittees' local programs in detail; however, this year Regional Board staff chose to review two elements.

During FY 02-03, the performance reviews focused on the effectiveness of existing New Development Control Programs (to determine how individual Co-permittees are preparing to implement Permit Provision C.3 requirements); and the implementation of the revised Construction Inspection Performance Standard. To facilitate the incorporation of "continuous improvement" items (determined from the reviews) into the FY 03-04 Work Plan, Regional Board staff conducted the reviews during November through December 2002. Program staff attended and provided support for the reviews.

SUMMARY OF REVIEW MEETINGS

The performance review meetings focused on the Regional Board staff's desire to learn how Co-permittees are implementing New Development Controls and Construction Inspection measures. The Regional Board staff's (Jan O'Hara's) goal of reviewing New Development Controls was to (1) gain a better understanding of the steps municipalities are taking to implement the new requirements; (2) learn who is responsible for implementing the new requirements at each municipality; and (3) determine if implementation has serious impediments, and if so, are there any steps Regional Board staff can assist with improving implementation. The goal of reviewing existing Construction Inspection programs was to evaluate the Co-permittees' implementation of the revised Construction Inspection Performance Standard. This review was prompted by the release of an Audubon Society report entitled *Stormwater and Sediment: An Evaluation of San Jose's Construction-Site Monitoring and Enforcement Program*. The report calls attention to the pollution potential of inappropriately maintained construction sites. The review also helped the Regional Board's new construction site inspector for Santa Clara County, Jolanta Uchman, to become familiar with the Co-permittees' construction inspection programs.

In general, Regional Board staff appeared to be satisfied with the level of effort and the direction Co-permittees are taking to implement New Development Controls and Construction Inspection requirements. Regional Board staff is preparing and will soon distribute highlights of the review meetings detailing the implementation successes of and agreed upon improvements for both program elements. As a result, it appears that everyone (Regional Board staff, Program and Co-permittee staff) understands the current and expected implementation requirements pertaining to New Development Controls and Construction Inspection measures.

CONTINUOUS IMPROVEMENT

Continuous improvement of New Development Controls and Construction Inspection programs will occur at the Program and local levels. A list of continuous improvement items

identified during each performance review is presented in Table 9-1. Co-permittees have included tasks in their FY 03-04 Work Plans which address the improvements identified for their programs. Program tasks are included in the list of continuous improvement tasks for FY 03-04 (Table 1-1) and in the Program's New and Redevelopment Work Plan (Section 7).

Table 9-1
FY 02-03 Performance Reviews for New Development and Construction Site Inspection Programs
List of Continuous Improvement Items

Co-permittee (Review Date)	Suggested Improvements
Campbell (12/03/02)	West Valley Communities: • Improve data collection process for enhanced reporting requirements.
Cupertino (12/10/02)	• Enhance internal communication regarding proposed changes to operations.
Los Altos (11/19/02)	• Set up binder with sample NOI and SWPPP. • Improve communication with Regional Board Inspectors if help is required in getting schools to cooperate. • Enhanced record keeping (pesticide reduction measures, locations of O&M agreements). • Provide outreach to private sector on numeric sizing criteria.
Los Altos Hills (11/21/02)	• Enhanced reporting requirements (per Provision C.3).
Los Gatos (12/03/02)	• See Campbell (West Valley Communities' items).
Milpitas (11/12/02)	• Enhanced record keeping (pesticide reduction measures). • Enhanced reporting requirements (per Provision C.3). • Verify timeframe necessary to resolve inspection infractions. • Improve inspection tracking of public projects.
Monte Sereno (12/03/02)	• See Campbell (West Valley Communities' items).
Mountain View (12/03/02)	• Revise Standard Conditions to incorporate sizing criteria.
Palo Alto (11/19/02)	• Fine tune means of identifying applicable C.3 projects during the development review process. • Work with Utilities Water Conservation and Public Works Environmental Compliance staff

FY 02-03 Performance Reviews for New Development and Construction Site Inspection Programs
List of Continuous Improvement Items

Co-permittee (Review Date)	Suggested Improvements
	to finalize pesticide reduction requirements/guidance for land development projects. • Review City's CEQA project checklist to verify that all of the C.3 issues are adequately addressed. • Develop improved mechanism for Environmental Compliance inspector to identify construction sites to inspect for potential water quality violations. • Revise Illicit/ Illegal Dumping reporting form to better track Construction-related storm water quality violations. • Verify that staff at the City Welcome Desk knows where to refer callers reporting illegal dumping incidents.
San Jose (12/4/02)	• Improve tracking of inspection information with the "AMANDA" data management system. • Train building inspectors to observe and report potential erosion control and storm water pollution problems. • Investigate the feasibility of increasing the number of people who have authority to issue administrative citations.
Santa Clara (12/12/02)	• Amend conditions of approval and procedures related to NOI sites to include sites with disturbed area of 1 acre or greater. • Improve information sharing between Street Department and Planning/Building Inspection Department on smaller sites (< 5 acres) with erosion potential.
Saratoga (12/03/02)	• See Campbell (West Valley Communities' items)
Sunnyvale (11/12/02)	• Enhance construction inspection specifications to include more enforceable provisions.
Santa Clara County (12/19/02)	• Update Construction Inspection Performance Standard. • Look into special use permits for vineyards. • Hold focus training for building inspectors.

FY 02-03 Performance Reviews for New Development and Construction Site Inspection Programs
List of Continuous Improvement Items

Co-permittee (Review Date)	Suggested Improvements
	• Take more aggressive action in issuing grading violations (i.e. issue more formal enforcement actions at earlier stages in the development process).
SCVWD (12/04/02)	• Improve and implement the District's enforcement/fine procedures. • Increase the frequency of construction site inspections. • Improve mechanism for confirming that observed construction sites issues have been resolved (e.g., add space on inspection form to indicate whether follow-up action or inspection was done).
SCVURPPP	1. Develop written tools to be used to train staff on Provision C.3 requirements (in case of staff turnover). 2. Hold future training workshops on multiple days to increase the chances staff will be able to attend. 3. Develop brochures/handouts to provide to developers containing information on Provision C.3 with reference to resources containing ideas. 4. Develop design guidance containing stormwater control opportunities for small road modifications. 5. Follow-up on pesticide reduction guidance to ensure effectiveness. Research conflicts between water conservation and pest resistance/pesticide reduction.

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F. PALO ALTO
G. SAN JOSE
H. SANTA CLARA
I. SUNNYVALE
J. WEST VALLEY COMMUNITIES (CAMPBELL, LOS GATOS, MONTE SERENO, SARATOGA)
K. SANTA CLARA COUNTY
L. SANTA CLARA VALLEY WATER DISTRICT

ATTACHMENT A

PROGRAM TASKS COMPLETED IN 2002 TO ADDRESS TRASH

The following is a detailed summary of tasks completed by the Program to determine procedures that will efficiently and effectively define trash problem areas and identify trash sources through monitoring or existing information. These include: 1) forming a Trash Ad Hoc Task Group; 2) completing a technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (June 24, 2002); 3) completing a technical memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of RWQCB Rapid Trash Assessment*-March 1, 2003; 4) developing and distributing an *Existing Trash Management Practices Survey Form* (November 2002) to individual Co-permittee staff; 5) completing a preliminary report that documents Co-permittee existing trash management practices; and 6) completing a technical memorandum entitled *Update of the 1999 Catch Basin Retrofit Feasibility Study* (June 26, 2002).

Trash Ad Hoc Task Group (Trash AHTG) Meetings

To effectively address trash issues, a Trash AHTG was formed by the Program's Management Committee. Since May 2002, seven AHTG meetings have been conducted (see Attachment B for a list of attendees). AHTG members include persons extremely knowledgeable about integrated waste management and the enforcement of litter laws. The initial meeting provided background of existing trash management practices implemented by the City of San Jose and Santa Clara Valley Water District (SCVWD). In addition, Regional Board staff (Steve Moore) discussed the Regional Board's position on trash for the 303(d) list and described their Rapid Trash Assessment Methodology. Later meetings contained presentations by SCVWD staff describing their Creek Clean-up activities and Santa Clara County staff providing a background on their trash enforcement activities. Since May 2002, the Trash AHTG has identified the major issues pertaining to trash assessment and trash management practices; developed technical memoranda on the preliminary identification of trash problem areas and pilot testing and implementation of the Regional Board's Rapid Trash Assessment Methodology; developed and completed the existing trash management practices survey form and commented on the preliminary results of the survey. This information was critical in the development of the Trash Work Plan. Documentation of all meetings has been distributed and is available upon request.

Pilot Investigation of Trash Hot Spots

Program staff identified potential trash "hot spots" areas using existing data from the City of San Jose, SCVWD and Santa Clara County. The term "hot spot" was not used to denote impairment but to indicate "potential areas of concern" for possible improvement or documentation of trash management practices. Data sources used for preliminary identification of trash areas of concern included data collected by the Creek Connections Action Group (CCAG), the SCVWD's Good Neighbor Program and the Santa Clara County Department of Environmental Health database that documents complaints of litter and illegal dumping on County lands. The results of this study were presented in a technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (SCVURPPP, June 24, 2002).

The memorandum concluded that the available data or information from the programs was inadequate to draw definitive conclusions due to either

inconsistencies with data collection or scarcity of data. Interpretation and data collection are important not only to identify trash "hot spots" but also to identify the effectiveness of current management practices and the potential need for improvement of management practices. The memorandum also recommended identifying trash types and possible trash sources (for data collection) as a method of characterizing potential trash problem areas.

Implementation and Development of Trash Assessment Methodology

Program staff implemented and tested the Regional Board staff's Rapid Trash Assessment Methodology at nine stream locations in Santa Clara and San Mateo Counties. The results of the study were incorporated in a technical memorandum entitled *SCVURPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (Attachment C). The study was a collaborative effort between SCVURPPP and San Mateo Countywide Pollution Prevention Program (STOPPP) to determine the utility of the approach for performing the following functions: 1) Document baseline levels of trash in creeks; 2) Identify sources of trash and appropriate control measures to reduce trash; 3) Evaluate effectiveness of trash management practices; 4) Assess all creeks in the SCVURPPP jurisdiction for trash; and 5) Assess impairment of beneficial uses from trash.

The Trash AHTG reviewed the results of pilot assessments and identified the following recommendations for future implementation of the assessment methodology:

- The RWQCB assessment methodology may be useful for measuring baseline levels of trash, identifying and prioritizing trash problem areas and evaluating the effectiveness of targeted BMPs in future assessments. In addition, the assessment may be useful for identifying potential sources of trash and appropriate BMPs. It is important to note that the RWQCB methodology can rapidly estimate trash quantity and quality in a creek for a particular index period (e.g., dry season). However, the methodology does not provide an estimate for the total amount of trash entering and being transported through receiving waters.
- The RWQCB methodology is limited in its ability to link assessment results with potential impairment to aquatic life uses. More studies are needed to link trash with degraded water quality conditions and impacts to aquatic life. The methodology does provide a direct measure of aesthetic quality of trash, which can potentially be used to evaluate impairment of recreational beneficial uses.
- It is not feasible to implement the methodology to assess all urban creeks. Trash levels in creeks will be highly variable due to changes in land use and public access. As a result, the extrapolation of trash assessments (to the entire waterbody) is difficult which may lead to the potential misinterpretation of results.
- To improve the interpretation of results in urban streams and the identification of trash sources and potential management actions, it is recommended that the methodology be revised. Recommended revisions include the development of additional categories and parameters (within the "trash tally sheet") that enhance the distinction of trash sources (e.g., recyclables versus Non-recyclables, illegal dumping versus litter, etc.) and modifying numeric ranges used in condition categories for certain trash parameters (to better represent urban stream conditions).

Program staff presented pilot trash assessment results at the October 2 and November 6, 2002 BASMAA Monitoring Committee meetings. Comments from BASMAA Monitoring Member members were compiled and considered for final revision of the technical memorandum. The final draft *entitled SCVURPPP and SMSTOPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* was approved by at the February 4, 2003 Trash AHTG meeting.

Documentation of Existing and Planned Trash Management Practices

Working collaboratively with the Trash AHTG and Co-permittee staff, Program staff developed and distributed an existing trash management practices survey form to individual Co-permittee staff (Attachment D). The main purpose of the survey was to document existing trash management practices and policies for each Co-permittee. The survey responses were compiled and entered into a Microsoft Access® database. Preliminary reports were generated from the database to document existing trash management practices and policies implemented by the Co-permittees (Attachment E). The Trash AHTG reviewed the reports and commented on the utility of this information.

The preliminary report documenting Co-permittees existing trash management practices and policies identified a wide range of municipal and agency departments and programs that are responsible for trash management and code enforcement. These agencies perform a wide range of activities to reduce trash, including:

- Household hazardous waste collection;
- Solid waste and curb-side recycling programs;
- Response to trash complaints/incidents;
- Litter pick-up and trash removal;
- Street sweeping;
- Stormdrain operations and maintenance;
- Incentive programs (free trash pick-up/drop-off days; reduced fees for low income residents);
- Removal of homeless encampments;
- Anti-litter campaigns;
- Volunteer creek clean-up programs and events.

Several of the agencies responsible for trash management reported that they currently document both trash management activities and/or enforcement actions and evaluate effectiveness of these activities, either by routine inspections or tracking the number of complaints or work orders. Some of the agencies have developed specific performance measures to evaluate their programs. Several Co-permittee municipal staff identified stricter enforcement of anti-litter laws and increased level of outreach as additional management activities that would most likely improve their agency's ability to manage litter and illegal dumping.

A concerted effort to address trash is being implemented as part of the City of San Jose's Anti-Litter Campaign entitled "Pick-Up San Jose". This campaign was started in April 2002 and is modeled after the City's successful anti-graffiti campaign. It is a collaborative effort between several city and county agencies. The Anti-litter

Campaign's goal is to make San Jose one of the cleanest, trash-free cities in the country.

The Anti-Litter Campaign has the following three key components: 1) eradication of litter, 2) community involvement and 3) enforcement of litter laws. The eradication efforts have included identifying 100 trash "hot spots", which were based on complaints from residents and city staff observations, and implementing the Keep America Beautiful's (KAB) Litter Index to evaluate effectiveness of targeted management practices. Volunteers have adopted many identified hot spots for periodic trash removal and plan on re-assessing problem areas (using KAB's litter index) on an annual basis. The California Department of Transportation (Caltrans) and Weekend Offender Program are also involved in the clean up of identified hot spots.

Community involvement efforts have included the development of anti-litter brochure and video entitled *Climb the Litter Ladder*. The Anti-Litter Campaign has organized volunteers and obtained necessary supplies to conduct trash clean-up events (including a major event planned for Earth Day 2003). Enforcement agencies are involved in conducting school outreach to promote anti-litter behavior in kids. In addition, enforcement agencies have reviewed existing ordinances and increased their issuance of citations relating to trash violations. Additional activities conducted by local police and the Santa Clara County District Attorney's Office include the outreach and enforcement of tarpaulin ordinances (for solid waste haulers) and the development of form letters (sent to fast food restaurants) to promote proper litter clean-up.

The Anti-litter Campaign has formed a Technical Advisory Committee (TAC), which meets on a quarterly basis to discuss accomplishments and milestones. Each agency or program involved in the Anti-Litter Campaign has identified performance measures (e.g., number of volunteers or creek cleanup events). The SCVURPPP will continue to coordinate its activities with programs associated with Anti-litter Campaign. Several members of the TAC have regularly attended Trash AHTG meetings. Program staff (Paul Randall) attended the January 6, 2003 TAC meeting.

The Trash AHTG agreed that it was difficult to evaluate effectiveness of existing trash management practices due to the lack of detailed information. Several agencies reported a high variability of frequencies for certain existing management practices (e.g., street sweeping frequency depends on land use and/or district). The surveys were not designed to gather the range of efforts for each practice due to the difficulty of evaluating the effectiveness of management practices between Co-permittees. In addition, the severity of trash varies among municipalities, requiring different levels of management efforts. As a result, a comparison of existing trash management practices between municipalities is less informative. Additional information from Caltrans or the Santa Clara Valley Transportation Authority (VTA) is needed to provide the "complete picture" of existing trash management practices implemented within the Program's jurisdiction.

Another difficulty in evaluating the survey results was the lack of available information to identify existing trash problem areas in creeks. Knowledge of trash problem areas is useful in identifying where existing trash control measures appear to be ineffective. The Program's technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (dated June 24, 2002) concluded that available data were either

too inconsistent or sparse to identify trash problem areas in creeks. SCVWD Operation and Maintenance Departments and creek cleanup organizations have recently started documenting trash removal efforts in a more consistent manner. Municipalities primarily focus trash management efforts within streets and parks, which is the jurisdiction for the majority of departments responsible for trash control. The City of San Jose has identified 100 trash "hot spots" as part of its "Pick-Up San Jose" anti-litter campaign. In addition, the City of Palo Alto has developed a trash hot spots program, which entails routine patrol of roadside areas identified as trash problem areas. This information can be useful in determining potential sources of trash. However, it will not necessarily identify or describe trash condition within creeks.

Update of the 1999 Catch Basin Retrofit Feasibility Study

To address specific recommendations raised in July 12, 1999 Catch Basin Retrofit Feasibility Study Technical Memorandum, the Program updated specific recommendations regarding inlet screen inserts; investigated the status of model designs for pit traps and modified catch basins; and tracked the availability and municipal experience with litter control devices, especially in-line deflection separator units (continuous deflection separator units). Based on review and analysis of the information listed, specific recommendations regarding storm drain litter control devices were made. In addition to a data review, promising designs and devices were analyzed for their effectiveness, technical feasibility, ease of operation and maintenance and potential costs. The results of the review are described in the technical memorandum entitled *An Update of the 1999 Catch Basin Retrofit Feasibility Study* (dated June 26, 2002). This review will assist Co-permittees in selecting the potential BMPs necessary to control trash discharges.

ATTACHMENT B – SCVURPPP TRASH AHTG MEETING ATTENDANCE LIST

Name	Affiliation	Meeting Date						
		May	June[1]	July	Sept	Nov	Dec	Feb
Alan Jones	Santa Clara County Roads and Airports	x						
Arleen Feng	Alameda County Cleanwater Program				x	x		
Bill Grimes	Sr. Env. Compliance Spec. @ Parks & Rec	x						
Brett Calhoun	Santa Clara Valley Water District	x		x	x		x	
Carrie Wright	San Jose - Transportation						x	
Cheri Donnelly	West Valley Communities							x
Chris Rummel	DEH. Solid Waste and LEA Section	x	x	x		x		x
Dave Staub	Santa Clara				x	x	x	x
Ed Morales	Santa Clara Valley Water District	x	x	x				
Elizabeth Neves	Creek Connections Action Group	x						
Irene Salazar	Anti-Graffitti and Litter Program	x		x				
Jack Judkins	San Jose – ESD	x		x	x	x	x	x
James Downing	San Jose – ESD			x	x	x		
Jan O'Hara	RWQCB	x	x					
Jeff Daniels	San Jose	x						
Jim Ervin	San Jose	x	x					
Jim Letiner	San Jose – Transportation	x						
Josephine Byer	Santa Clara County Roads and Airports				x		x	x
Kathy Wells	Santa Clara County DA's Office	x				x	x	
Kay Moss	Santa Clara Valley Water District	x		x			x	
Kristin Kerr	SCVURPPP Program Staff	x	x	x				
Kristy McCumby-Hyland	Sunnyvale	x	x	x	x	x	x	x
Lisa Fleming	Santa Clara Valley Water District				x			x
Lisa Rose	San Jose Graffitti Abatement & Anti-Trash Campaign	x		x	x		x	
Margaret Rands	County Integrated Waste Mgmt. Program Mgr	x						
Mondy Lariz	RPMC - FFF	x	x				x	x
Mary Morse	San Jose - ESD						x	
Paul Randall	SCVURPPP Program Staff			x	x	x	x	x
Phil Bobel	Palo Alto	x	x	x		x	x	x
Randy Turner	Creek Connections Action Group	x						
Rene Eyerly	West Valley Communities	x						
Rob Boyles	AGLP						x	

Name	Affiliation	Meeting Date						
		May	June[1]	July	Sept	Nov	Dec	Feb
Roberto Medina	Palo Alto				x			
Roger Lee	Santa Clara	x						
Roger Narsim	Santa Clara Valley Water District						x	
Sandra Dutra	San Jose	x		x				
Skip Lacaze	San Jose, ESD/IWM	x	x	x	x	x	x	x
Steve Homan	Santa Clara County	x	x	x	x			
Steve Moore	RWQCB	x						
Tom Mumley	RWQCB	x						
John Fusco	SCVURPPP Program Staff	x		x	x	x	x	x
Trish Mulvey	CLEAN South Bay	x	x	x	x	x	x	

[1] Not all attendees were reported in meeting minutes

ATTACHMENT C

SCVURPPP AND SMSTOPPP PILOT IMPLEMENTATION AND TESTING OF RWQCB RAPID TRASH ASSESSMENT

March 1, 2003

INTRODUCTION

Program staff implemented and tested the Regional Water Quality Control Board's (RWQCB) *Rapid Trash Assessment Worksheet* at nine stream locations in Santa Clara and San Mateo Counties. Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and San Mateo Countywide Pollution Prevention Program (SMSTOPPP) are collaborating to determine the utility of the approach for performing the following functions:

- Document baseline levels of trash in creeks
- Identify sources of trash and appropriate control measures to reduce trash
- Evaluate effectiveness of trash management practices
- Assess all creeks in the SCVURPPP and SMSTOPPP jurisdiction for trash
- Assess impairment of beneficial uses by trash

Results of the pilot assessment were presented by Program staff at the September 25th SCVURPPP Trash Ad Hoc Task Group (AHTG) and at the October 2, 2002 BASMAA Monitoring Committee meeting. Comments from the Trash AHTG were compiled and incorporated into the discussion section of this memorandum. The current draft of the trash assessment technical memorandum was approved by the AHTG at the November 4, 2002 Trash AHTG meeting.

Development and implementation of trash assessment protocols is one component of the SCVURPPP and SMSTOPPP Trash Work Plans. SCVURPPP and SMSTOPPP will consider the recommendations included in this memorandum and comments from Regional Board staff and members of the BASMAA Monitoring Committee for future implementation of trash assessments.

BACKGROUND

A November 2001 Regional Board staff report proposes changes to the 1998 303(d) list of impaired water bodies in the Bay area. The staff report states there "are excessive levels of trash in virtually all urbanized waterways of the San Francisco Bay Region." However, listing these waterways as impaired by trash is not proposed due to a lack of consistent assessment methodology.

Instead, the staff report proposes placing all Bay area urban creeks, lakes, and shorelines on a preliminary or "monitoring" list due to the threat of trash to impair water quality. It states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by storm water agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information, and developing a program of action to address the principle sources. Regional Board staff will review this specific information in the next listing cycle and determine whether specific water bodies warrant 303(d) listing for trash, and note the existence of relatively clean urban streams.

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METHODS

The RWQCB Rapid Trash Assessment Version 6.0 was released to the public on September 25, 2002. The assessment was designed for several purposes, including ambient monitoring, evaluation of management actions, and evaluation of the effects of public access to trash condition of creeks. The RWQCB began implementing the trash assessment in summer of 2002 as part of their Surface Water Ambient Monitoring Program (SWAMP).

The assessment protocol includes identification and enumeration of all trash items that occur below high water line and along stream banks within a 100-foot section of stream. The second part of the RWQCB protocol includes determination of condition for six assessment parameters (scores 0-20, higher score = less trash) using the narrative parameter descriptions provided in the assessment worksheet. Program staff attended a training session on these protocols given by RWQCB staff. In addition to implementing the assessment approach, Program staff took digital photographs at each site to determine if photo documentation could accurately depict level of trash and potential impairment.

The pilot testing of the RWQCB's approach did not include implementing the assessment during different seasons to determine temporal variation of trash condition at individual sites. The pilot assessment was conducted in the fall to capture levels of trash in the creeks prior to winter rains, and before the national trash cleanup event that occurred on September 21st 2002.

Assessments were completed over a two-day period in September 2002 at five stream locations within San Pedro Creek (Figure 1), a coastal watershed in San Mateo County, and four stream locations in Coyote Creek watershed (Figure 2), which is located in the eastern portion of the Santa Clara Valley and drains into the South Bay. The assessment locations were selected based on several factors including known problem areas, land use type (residential, commercial, open space) and stream size. Creek segments in Upper Penitencia (total =3) and San Pedro Creek (total = 5) were selected at different points in each respective watershed to represent varying degrees of urbanization, i.e., sites at the lower, middle and upper sections of the urbanized portion were surveyed within each watershed. One site on Coyote Creek was sampled to identify the feasibility of this assessment approach in larger streams.

RESULTS

Individual parameters scores, total scores and the number of major trash item types for each assessment site are provided in Tables 1 and 2. Major findings include:

1) Known problem areas had the worst scores within each watershed. The flea market site, although not previously identified as a problem area, had low trash scores (more trash) with an apparent chronic trash problem and should be considered a problem area. The two highest scores (less trash) were at the upper sites of each watershed, toward the edge of the urban boundary.

2) Total scores (parameter scores combined) decreased and total trash items increased in the downstream direction. Most of the individual assessment parameter scores also decreased in the downstream direction, with the exception of the human health parameter, which was consistently rated as sub-optimal at all but two sites.

ATTACHMENT C

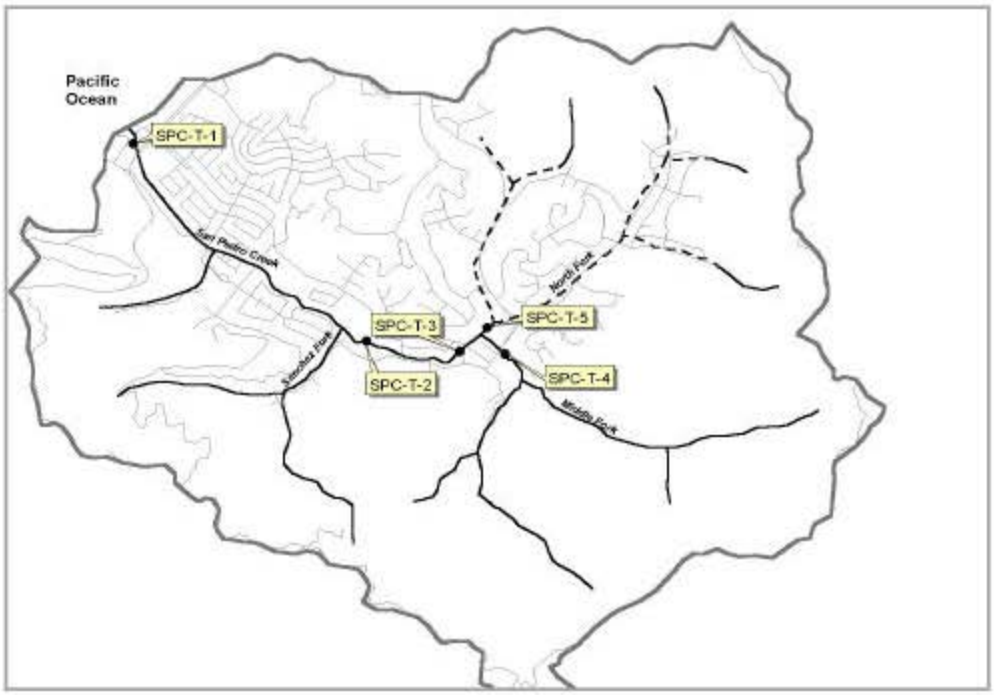

Figure 1. Location of pilot trash assessments conducted in San Pedro Creek.

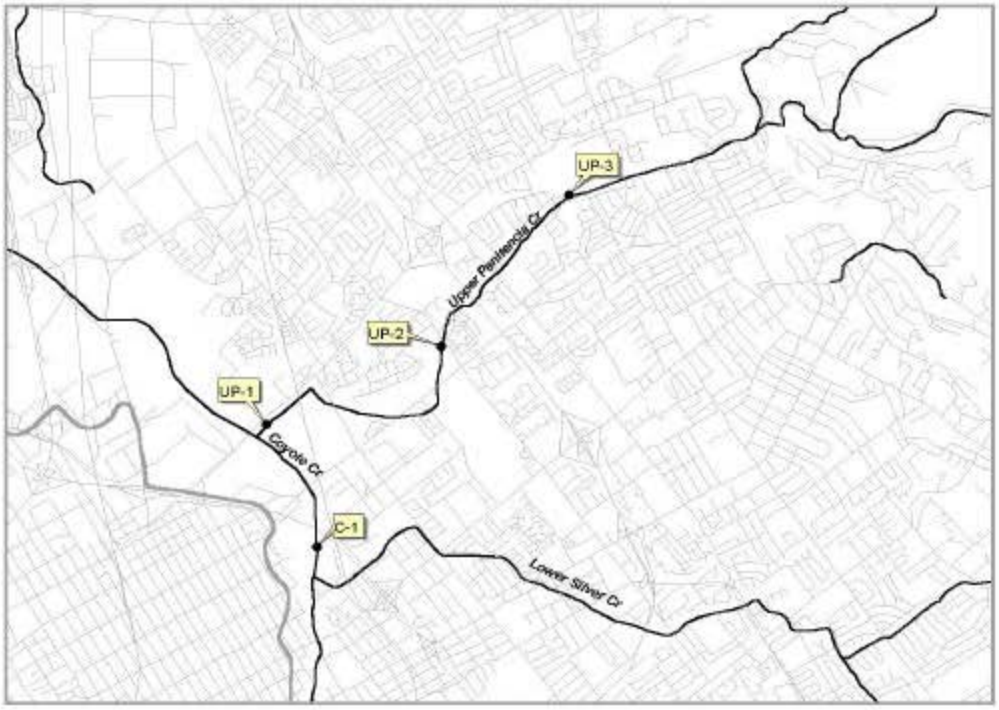

Figure 2. Location of pilot trash assessments conducted in Upper Penitencia and Coyote Creek.

3) The survey worked best in Upper Penitencia and San Pedro Creeks because all areas of the stream habitat were accessible and generally visible. The assessment at the site on Coyote Creek was less effective because the creek was too deep in some areas and the visibility too poor to accurately identify all trash items. There were generally no problems identifying trash along the stream banks, although there was difficulty in some instances of identifying the upper boundary (see # 5).

4) Digital photographs provided insufficient details to identify level of trash, estimate threats to water quality, or potential sources of trash. The relative number of trash items and types of trash are not clearly distinguishable. These results were consistent with earlier RWQCB evaluation. The photos may be useful for identifying benchmarks that define site boundaries and for documenting the general conditions of the site.

5) Using slightly different definitions for the stream bank boundary can have significant impact on the results. Incorporating trash items along the edge of upper right bank adjacent to a parking lot (at lowest site in San Pedro Creek) resulted in decreasing the total score from 74 to 30. Integrating trash for the upper section of streambank was questionable in this case because dense riparian vegetation appeared to prevent trash from entering the creek. There was minimal evidence of trash in the creek.

6) The lower site of San Pedro Creek and Upper Penitencia Creek (flea market) were cleaned up for trash shortly after the assessment. If the assessment had been repeated after the cleanup, the trash scores would have been much improved.

7) Eight of nine sites were rated poor for quantity of trash. In contrast, half of these eight sites were qualitatively rated sub-optimal (visual estimation of trash problem). As a result, conditions for qualitative and quantitative parameters were not very well correlated.

8) The most common trash items for all sites were plastic (primarily bags, bottles and wrappers), biodegradable (mostly paper), and metal (aluminum foil wrappers and cans). Trash items were more prevalent below the water line, with the exception of paper, cigarette butts and glass bottles, which were more common on the stream banks.

9) The trash items found that were considered potential threats to aquatic organism health were typically plastic (bags, bottles, wrappers) and other buoyant items (styrofoam and cigarette butts). The condition rating for aquatic health parameter was largely based on the relative number of these items found (e.g., low, medium prevalence, large amount), regardless if the plastic items were in the creek or on the bank. The scores typically decreased in the downstream direction.

10) There were few trash items found considered to be threats to human health. The most common were sharp objects, such as glass and jagged metal. There were animal feces and diapers found on the banks of two sites. The condition for this parameter was never optimal because there was always glass found on-site; five of the nine sites were rated sub-optimal due to presence of glass. There were no spatial trends observed for this parameter.

11) Dumping and littering appear to be a major problem for some sites we assessed. All four sites that were rated poor for this parameter had the lowest total scores and the highest number of trash items. Three of these sites were commercial and one was

ATTACHMENT C

Table 1. Rapid trash assessment results from watersheds in Santa Clara and San Mateo County. Individual trash assessment parameter scores range from 0-20, with low numbers representing poor conditions. Similarly, low total score represents poor conditions. The sites marked with (*) refer to previously known trash problem areas.

Location Description	Site Id	Land use	Date	Trash Assessment Parameter Scores						
				Qual.	Quant.	Aquatic Life	Human health	Dump/ Litter	Accum	Total Score
Santa Clara County (Upper Penitencia Creek)										
Fleamarket	UP-1	Commercial	9/12/02	6	0	5	16	5	7	**39**
Penitencia Park (lower)	UP-2	Residential/park	9/12/02	13	4	11	3	12	10	**53**
Penitencia Park (upper)	UP-3	Residential/park	9/12/02	15	5	15	15	14	13	**77**
Watson Park (Coyote)*	C-1	Undeveloped Park	9/12/02	8	2	4	12	1	6	**33**
San Mateo County (San Pedro Creek)										
Above Pacifica Beach*	SPC-T-1	Commercial	9/20/02	6	1	4	5	5	9	**30**
Behind Sanchez Art Center	SPC-T-2	Residential	9/20/02	12	3	6	15	15	4	**55**
Below Linda Mar Bridge	SPC-T-3	Residential	9/20/02	12	3	8	15	14	5	**57**
Above Oddstad Bridge	SPC-T-4	Residential/park	9/20/02	15	6	14	15	13	19	**82**
Behind Shopping Center (North Fork)*	SPC-T-5	Commercial	9/20/02	1	0	1	11	5	1	**19**

Table 2. Total number of items from each major category of trash tallied in trash assessments for nine locations in Santa Clara and San Mateo County. Stream location "A" and "B" represents above and below, respectively, high water line.

Site Id	Plastic		Biohazard		Const Debris		Misc.		Metal		Large Items		Toxic		Bio-degradable		Glass		Fabric		Total #
Location	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	
UP-1	77	85	0	0	3	0	2	13	10	4	0	0	0	0	35	36	0	0	1	4	**270**
UP-2	22	7	2	0	5	0	2	0	14	0	0	0	1	0	6	6	6	0	2	1	**74**
UP-3	17	13	0	0	0	1	2	0	1	4	0	0	0	0	7	12	2	1	1	0	**61**
C-1	35	17	0	0	4	0	1	0	10	2	20	0	0	0	18	26	3	3	2	2	**143**
SPC-T-1	32	46	0	1	2	0	1	61	4	6	0	0	0	0	4	64	0	1	0	1	**223**
SPC-T-2	66	29	0	0	11	0	4	0	14	3	1	0	0	0	3	6	1	1	14	3	**156**
SPC-T-3	80	10	0	0	8	0	14	1	11	0	0	0	0	0	4	0	2	0	1	1	**132**
SPC-T-4	5	9	0	0	4	1	1	0	9	2	0	1	0	0	0	2	2	9	1	1	**47**
SPC-T-5	205	31	0	0	11	17	14	3	29	11	4	1	0	0	19	4	0	11	2	4	**366**
Total	539	247	2	1	48	19	41	78	102	32	25	2	1	0	96	156	16	26	24	17	**1472**

undeveloped parkland, which had low scores due to dumping. A majority of the trash observed was from littering, not dumping.

12) Accumulation of trash generally increases in the downstream direction as expected, with the exception of the lower site on San Pedro Creek, which had very little accumulated trash. This may be due to yearly trash clean up events. Only two of nine sites had less than five accumulated trash items; the rest of the sites were marginal or poor.

DISCUSSION

The SCVURPPP Trash AHTG evaluated the results of the pilot assessment and the overall approach used in the RWQCB protocols. The AHTG addressed the following questions to evaluate the utility of the RWQCB's assessment protocols for assessing trash in urban streams:

- What role should the RWQCB's protocol play in assessing trash? (e.g., identify baseline levels of trash in urban creeks; document status and trends; identify trash sources; evaluate effectiveness of BMPs).
- How feasible is the approach to assess all urban creeks in SCVURPPP and SMSTOPPP jurisdictions?
- Can the results be used to assess potential impairment to beneficial uses?
- What refinements would enhance utility of the assessment approach?

Role of Trash Assessment for SCVURPPP

The Trash AHTG agreed that the RWQCB trash assessment could be used at specific reaches to establish baseline levels of trash during selected index periods. The dry season is optimal time period to use RWQCB protocols since low water levels provides maximum access to streambed and banks to measure trash condition. It is important to note the amount of trash documented in the assessment does not measure total amount of trash that enters and is transported in receiving waters, but rather more of a rapid estimate of trash condition for a snapshot in time in a limited number of locations. The trash assessments are useful to identify and prioritize trash problem areas. Future assessments could be conducted at these sites and index period using the same protocols to document status and trends or to help evaluate the effectiveness of targeted BMPs. In addition, the assessment results may assist in the identification of potential sources of trash and appropriate BMPs to implement. Overall, the protocols would be useful in prioritizing and implementing management activities and measuring the effectiveness of these actions.

One limitation identified by the AHTG is related to implementing the RWQCB protocols to characterize trash conditions for entire water bodies or subwatersheds. The level of trash within a single waterbody is assumed to be highly variable due to changes in land use, accessibility, size of the watershed, and channel characteristics (e.g., gradient, stream vegetation). Typically, many 100-foot sections would need to be assessed to measure the range of trash conditions found within an entire creek. Assessing some sections of creek and extrapolating the information to larger areas, however, could lead to misinterpretation of the results and potential listing for an entire waterbody based on data collected at a few reaches. Further discussion on the feasibility of using the RWQCB protocols to assess trash for all creeks within SCVURPPP or SMSTOPPP jurisdiction is provided below.

Another limitation of the RWQCB protocols is that it was not designed to assess lakes, shorelines or sloughs, which are types of waterbodies that are identified on the Regional Board's "monitoring" list due to the threat of trash to impair water quality.

The Trash AHTG agreed that the RWQCB protocols provide a standardized approach to assess trash, which could be used on a regional basis. Collaboration with other storm water programs and SWAMP using the same protocols would provide a larger data set for more detailed data analyses, which may include identifying relationships between trash condition and land use types. These relationships would assist managers in identifying potential trash problem areas and aid in selecting appropriate assessment locations. In addition, compilation of assessment data taken in urban streams would be useful for statistically identifying thresholds used in the condition categories for each of the assessment parameter (see recommendation section below). Program staff has started compiling trash assessment data gathered from Alameda County Cleanwater Program and Regional Board efforts.

Feasibility of Assessing all SCVURPPP and SMSTOPPP Creeks

The Trash AHTG believed it was not feasible or cost-effective to use the RWQCB protocols to assess all creeks within the SCVURPPP and SMSTOPPP jurisdiction. High variability of trash conditions would be expected within sections of urban creeks. In addition, an estimation of trash levels for a single creek would require numerous assessments. It is more cost effective to assess already known trash problem areas or in land uses that are associated with litter or illegal dumping and then monitor these sites over time to determine trends or evaluate the effectiveness of BMPs. The Trash AHTG agreed that a decision to spend resources on conducting trash assessments for all creeks in their jurisdiction needs to be weighed with efforts to resolve problems that have already been identified. For example, schools and commercial areas are land uses that are often associated with trash-impacted areas. The Trash AHTG will identify a process for prioritizing creek segments (potentially on land use) and implementing trash assessments as a task in the SCVURPPP Trash Work Plan. The proper entity (e.g., municipality/agency staff or volunteer citizen group) to conduct trash assessments will also be determined as a task in the Work Plan.

Utility of Assessment to Measure Potential Impairment

The trash AHTG identified several limitations of the protocol in linking trash assessment results with potential impairment to beneficial uses. First, there is no clear linkage between type of trash items or number of trash items in a reach to beneficial use impairment. There are no established criteria or threshold values of specific trash items that can be used to estimate the relative impairment to most beneficial uses. An exception may be using both quantitative and qualitative assessment parameters to evaluate the aesthetic quality of streams for recreational beneficial uses. Two parameters (aquatic and human health) identify specific trash items that may affect beneficial use attainment, but more than the presence of these items is needed to determine the level of impairment. For example, there is no method to determine how many small persistent trash items (e.g., styrofoam pellets) are necessary to impact aquatic biota. In addition, the link between human health and the presence of human diapers or animal feces within a 100-foot section of stream has not been clearly established. These trash items may not have direct contact with the water and in some cases, may not even contain human pathogens. Furthermore, the threat to human health ranking does not take into account the potential level of public exposure. Exposure to contaminated water or sharp objects (e.g., glass and metal) is dependent on the level of accessibility to a creek (e.g., fences limit access to creeks) and creek conditions (e.g., depth of water).

Recommendations for Modifying Protocols

The RWQCB protocols were designed to assess both rural and urban stream conditions. The threshold values used to identify conditions for some of the assessment parameters may be too conservative and not adequately represent the range of conditions typically found in urban streams. As a result, most urban creek segments are likely to fall into the poor or marginal categories. Ubiquitous low scores for all urban creeks would not provide adequate resolution to distinguish spatial or temporal variation in trash conditions.

The RWQCB protocols are intended to assist in management decisions, such as source identification. The utility for the protocols to identify trash sources could be enhanced if litter and illegal dumping were distinguished to better assist managers in the identification of appropriate BMPs to reduce the trash. In addition, new trash item categories should be added to enhance evaluation of BMP effectiveness, such as recycling programs. For example, tallying aluminum cans and plastic bottles that are labeled with California Redemption Value (CRV) symbol, along with non-CRV cans and bottles can help determine if recycling programs are effective at reducing trash in creeks.

Additional information should also be included in the assessment procedures. The assessment datasheet should include a place to indicate if an enforcement action or cleanup event is needed. Previous history of trash management activities (e.g., previous or planned cleanup events; known trash problem area) should be documented. Photo documentation should be used when at sites with large amounts of trash.

Based on the pilot evaluation, Table 3 lists some limitations of the RWQCB protocols for conducting trash assessments of urban creeks and provides recommended modifications. These modifications could be incorporated as an "urban management version" of the RWQCB protocols and not result in changes to the original protocols being used for the SWAMP program. The Trash AHTG will coordinate all recommended modification of the protocols with other stormwater programs, BASMAA Monitoring Committee and the RWQCB staff in order to develop a standardized approach for conducting trash assessments on a regional basis. The SCVURPPP and SMSTOPPP have identified tasks in their respective Work Plans to consider the recommendations to modify RWQCB assessment methodology for the purpose of developing a tool to evaluate trash problem areas. The assessment approach should also be evaluated in the future for continuous improvement as additional assessment results become available.

ATTACHMENT C

Table 3. Recommended Modifications to RWQCB Assessment Parameters

Trash Assessment Parameter	Limitation	Recommendation
Actual Number of Trash Items	Numerical thresholds used to rate categories too conservative and not representative for range of conditions in urban streams	Compile additional assessment results from urban streams and statistically compute ranges.
	Difficult to evaluate BMP effectiveness for existing trash item categories	Include additional categories useful for evaluating BMP effectiveness (e.g., distinction between recyclable and non-recyclable cans and bottles)
Threat to Aquatic Life	Subjective rating (little, medium, large) for number of persistent trash items may not provide consistent results.	Compile additional assessment results for specific trash items found in urban streams and statistically compute ranges.
	Equal weighing for trash above and below water line.	Place greater weight on trash below water line. Define water line mark as the bankfull channel.
Threat to Human Health	Human health threats are determined only by presence of specified trash items, not on potential for exposure.	Include additional rating for potential risk of exposure (e.g., public access: good/poor; wadable habitat: yes/no).
Illegal dumping and Littering	Doesn't provide a mechanism to distinguish two different trash sources.	Separate into two separate categories to enhance distinction of trash sources.
Illegal dumping and Littering	Litter categories do not address accumulation from adjacent land uses that result from wind.	Include narrative description to rate wind accumulated litter from adjacent land uses; expand its definition of "shoreline littering" to include "litter within creek and banks that appear to originate from adjacent land uses."
Accumulation of trash	Numerical thresholds used to rate categories not representative for range of conditions in urban streams.	Compile additional assessment results from urban streams and statistically compute ranges.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

ATTACHMENT D

EXISTING TRASH MANAGEMENT PRACTICES SURVEY

Co- Permittee: _____ Contact Person: _____ Position: _____

Phone: _____ E-mail: _____ Date: _____

1. Does your municipality/agency conduct or participate in the following trash management activities:

			Frequency of Activity
Household Hazardous Waste Collection	☐ Yes	☐ No	_____
Solid waste recycling program	☐ Yes	☐ No	_____
Curb-side recycling program	☐ Yes	☐ No	_____
Respond to trash complaints	☐ Yes	☐ No	_____
Litter pick-up and control	☐ Yes	☐ No	_____
Trash removal from receptacles	☐ Yes	☐ No	_____
Street sweeping	☐ Yes	☐ No	_____
Storm drain operations and maintenance	☐ Yes	☐ No	_____
Inspection and maintenance of storm drain outfalls in creeks	☐ Yes	☐ No	_____
Free trash pick-up and /or drop-off days	☐ Yes	☐ No	_____
Reduced trash collection fees for low-income residents	☐ Yes	☐ No	_____
Removal of homeless encampments along waterways	☐ Yes	☐ No	_____
Anti-litter campaigns	☐ Yes	☐ No	_____
Volunteer creek clean-up programs	☐ Yes	☐ No	_____

2. Which departments of your municipality/agency are responsible for trash management activities/programs and/or the enforcement of litter laws?

3. Provide the role of each department in trash management and/or litter/solid waste enforcement (e.g., Grounds Dept- litter control in parks and medians).

4. How does your agency determine the effectiveness of existing trash management activities or programs? How do you document effective trash management practices? What, if any, future plans do you have to improve documentation?

5. What incentive programs are in place to reduce litter and illegal dumping? Do disincentives (e.g., expensive landfill tipping fees, few trash receptacles, etc.) exist which prevent proper trash management?

6. What mechanisms does your municipality/agency use to document trash complaints and/or incidents? (e.g., report forms; database)

7. What, if any, ordinances are in place to enforce litter or illegal solid waste dumping laws? What, if any, enforcement actions are available to remedy illegal dumping or trash-related violations? Do you have mechanisms to collect penalties? If so, what are they?

8. What additional activities and/or programs do you feel would improve your agency's ability to manage litter and illegal dumping?

9. Provide interesting anecdotes relating to trash management and/or litter/solid waste enforcement. Provide any additional information you wish to share.

ATTACHMENT E

Preliminary Reports Documenting Existing Trash Management Practices and Policies of the SCVURPPP Co-permittee Municipalities and Agencies

Program staff developed and distributed an existing trash management practices survey form to individual Co-permittee staff (Attachment D). The main purpose of the survey was to document existing trash management practices and policies for each Co-permittee. The survey responses were compiled and entered into a Microsoft Access® database. Preliminary reports were generated from the database to document existing trash management practices and policies implemented by the Co-permittees. The first report contains Co-permittee responses to survey question number one; the second report contains responses from survey questions 2 - 9. The Trash AHTG reviewed these reports and commented on the utility of this information at the December 18 Trash AHTG to help in the development of the Trash Work Plan.

The AHTG determined that additional information to the survey data reports would enhance the report and assist the Program to better evaluate the effectiveness of existing management practices and to identify where potential management actions are needed. As part of the Trash Work Plan, Program staff will continue to collect information (and data sources) related to existing trash management practices and policies of agencies within the SCVURPPP jurisdiction. Additional surveys and interviews with individual Co-permittees will assist in filling in the gaps and provide a more detailed and comprehensive documentation of existing trash management and monitoring activities. In addition, the location of known trash problem areas will be collected from the Co-permittee agencies to assist in the evaluation of current management practices.

Co-permittee Existing Trash Management Practices Survey
Detail Report

1. Does your municipality/agency conduct or participate in the following trash management activities:

Cupertino

Activity	Frequency	Notes
Household hazardous waste collection	On-going	
Solid waste recycling program	On-going	
Curb-side recycling program	Variable	Biweekly at homes. Weekly (minimum) at apartments and businesses.
Respond to trash complaints	As Required	Not a frequent problem
Litter pick-up and control	On-going	Regularly picked up by City staff on Stevens Creek and De Anza Blvds.
Trash removal from receptacles	On-going	Picked up at parks and main streets.
Street sweeping	Variable	City contractor sweeps commercial areas once a week. Residential areas are swept twice a week. Approximately 50 % of streets have sweeping and no parking signs.
Stormdrain operations and maintenance	Annually	Storm drain inlets are vacuumed out annually.
Inspection and maintenance of stormdrain outfalls	N/A	Maintained by SCVWD.
Free trash pick-up and/or drop-off days	Biannual	Two on-call disposal days a year.
Reduced trash fees for low-income residents	On-going	Senior, low-income rates available.
Removal of homeless encampments	As Required	Not common in Cupertino.
Anti-litter campaigns	N/A	Never been an important problem in Cupertino.
Volunteer creek clean-up programs	Biennial	Every other year or so- if warranted by litter in creeks.

Los Altos

Activity	Frequency	Notes
Household hazardous waste collection	Variable	Administered by the County. Available by appointment with Sunnyvale being the closest location. Los Altos does host a collection event one week/year by appointment.
Solid waste recycling program	N/A	
Curb-side recycling program	Bimonthly	
Respond to trash complaints	Complaint Dri	Responses are made when complaint is received. Action will depend on the complaint.
Litter pick-up and control	Variable	City parks are cleaned-up daily. City boulevards are cleaned-up monthly. Various events are cleaned-up after completion.
Trash removal from receptacles	Daily	Commercial areas and City Parks are picked-up daily.
Street sweeping	Variable	Residential streets are swept monthly and streets within commercial areas are swept weekly.
Stormdrain operations and maintenance	Annually	Cleaned annually and additionally as needed.
Inspection and maintenance of stormdrain outfalls	Annually	
Free trash pick-up and/or drop-off days	Biannual	By appointment
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	As Required	
Anti-litter campaigns	N/A	
Volunteer creek clean-up programs	N/A	

Los Altos Hills

Activity	Frequency	Notes
Household hazardous waste collection	N/A	
Solid waste recycling program	Weekly	
Curb-side recycling program	Weekly	
Respond to trash complaints	Upon Request	
Litter pick-up and control	Upon Request	
Trash removal from receptacles	Routine	By contract
Street sweeping	Biannual	
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls	Annually	
Free trash pick-up and/or drop-off days	Occasionally	By events
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	N/A	
Anti-litter campaigns	N/A	
Volunteer creek clean-up programs	Biannual	Volunteering events

Milpitas

Activity	Frequency	Notes
Household hazardous waste collection	By Appointme	
Solid waste recycling program	Weekly	
Curb-side recycling program	Weekly	
Respond to trash complaints	Complaint Dri	
Litter pick-up and control	As Required	
Trash removal from receptacles	Daily	
Street sweeping	Variable	Commercial (weekly), Residential (bimonthly). Milpitas sweeps approximately 10,000 curb miles/year.
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls	Biannual	
Free trash pick-up and/or drop-off days	Bimonthly	Landfill drop-off- Second and fourth Saturday of each month.
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	As Required	Requested by the Police
Anti-litter campaigns	On-going	Informational letters
Volunteer creek clean-up programs	Biannual	In May and September

Mountain View

Activity	Frequency	Notes
Household hazardous waste collection	Weekly	County HHW
Solid waste recycling program	On-going	
Curb-side recycling program	On-going	
Respond to trash complaints	Complaint Dri	
Litter pick-up and control	On-going	
Trash removal from receptacles	On-going	
Street sweeping	Variable	Routine, varies by district
Stormdrain operations and maintenance	Variable	Routine, varies by area
Inspection and maintenance of stormdrain outfalls	N/A	
Free trash pick-up and/or drop-off days	Biannual	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	Complaint Dri	On a complaint basis
Anti-litter campaigns	On-going	Regular articles and education regarding proper trash management (schools)
Volunteer creek clean-up programs	Biannual	Two city events per year.

Palo Alto

Activity	Frequency	Notes
Household hazardous waste collection	Variable	Palo Alto provides a drop-off location rather than a collection event(s). Drop-off is available five days/week for mercury, silver and organophosphate pesticides; daily for oil antifreeze and batteries and monthly for all other hazardous waste streams..
Solid waste recycling program	Daily	Backyard pick-up of recyclables and green waste available for the handicapped. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.
Curb-side recycling program	Weekly	Weekly, backyard pick-up. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard). Weekly curbside green waste pick-up.
Respond to trash complaints	Variable	Messy dumpster areas are brought to the attention of the property owner, verbally first, then via letter. If compliance does not result, the sanitation company (City contractor) can clean the area and bill the property owner. In addition, trash on private property is a Palo Alto Municipal Code (PAMC) violation (esp. visible trash – front yard). Incoming complaints result in: a) Logging and tracking; b) Inspection within 5 days; c) Notice of Violation (NCR form delivered or posted.); d) Can be followed by letter; e) Can be followed by administrative penalty and criminal action.
Litter pick-up and control	Variable	a) University Avenue Patrol (Green Machine)- Daily- July 1 through December 31; Five days/week- January 1 through June 30. Hot spots program- Patrol of identified roadside areas known to accumulate trash. Persons who litter are subject to action by the Police Department. The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney. The California Penal Code or the PAMC is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney. Complaints and observations of trash result in clean-up by City Staff (or SCVWD staff for most creek-bed areas). If the responsible party is known, the facts are referred to Code Enforcement (Planning and Community Environment Department) for enforcement. Land fill Litter Control- Litter migration from the working face of the Landfill is controlled primarily through the use of the alternate daily cover tarps, weekly cover and the use of permanent and portable fencing. Litter is routinely picked up by landfill personnel on an as-needed basis. Materials dropped off from vehicles that may pose a hazard are picked up immediately. In the event of high winds, temporary staff is brought on to augment permanent staff, if needed, to pick up windblown litter. Daily from July 1 through December 31. Five days/week January 1 through June 30. b) Hot spots program: Patrol of identified roadside areas known to accumulate trash.
Trash removal from receptacles	Variable	Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers; Sanitation Company is required to clean up trash if it spills. Fines are possible. Trash receptacles are emptied by Sanitation Company (City contractor) at various frequencies depending on location. Trash pick-up of grounds is performed at various frequencies by either City staff or maintenance contractor depending on location.
Street sweeping	Variable	a) Three times per week in Major Commercial Areas (University and California Avenues); b) Weekly in other areas; c) Highway 101 - State responsibility; d) Oregon & Foothill Expressways – County responsibility.
Stormdrain operations and maintenance	Variable	a) Each catch basin cleaned each fall (annually); b) If debris is observed in a line next to a catch basin, the line is flushed; c) Special areas are addressed as needed (e.g. construction site areas after the project is over.); d) Enforcement actions for discharges to the storm drain are taken when intentional discharges are observed; e) Residents and Businesses who sweep excess leaves or debris into the street are notified (via door hanger) of the code violation; f) If the practice continues, it is referred to Code Enforcement (Planning and Community Environment Department).
Inspection and maintenance of stormdrain outfalls	As Required	Typically, there are no locations where trash collects.
Free trash pick-up and/or drop-off days	Annually	a) Residential (less than 5 units); b) By appointment (by phone); c) Four Bulky (furniture) items; d) Other items unlimited; e) Free; f) One visit allowed per year.
Reduced trash fees for low-income residents	On-going	Weekly trash collection is avaliable.
Removal of homeless encampments	As Required	
Anti-litter campaigns	As Required	
Volunteer creek clean-up programs	Variable	Note: The cleaning of most creek reaches within Palo Alto are the responsibility of the Santa Clara Valley Water District (SCVWD). Certain reaches of San Francisquito Creek are the responsibility of Palo Alto. Each Fall (annually) a San Francisquito Creek walk is conducted with other agencies to identify clean-up of debris which is needed. Debris and trash is then removed. Creek Cleaning by Citizen Groups (Community Services and Public Works)- The City and organized citizen groups participate in Coastal Clean-up Day to clean creeks and the Baylands. Citizen groups bag trash and City crews pick it up.

San Jose

Activity	Frequency	Notes
Household hazardous waste collection	Variable	Drop-off: By appointment for 3% of HH/yr. Curbside: Weekly collection of used oil and filters for all single-family HH and by arrangement for multi-family complexes.
Solid waste recycling program	Variable	Varies—most materials can be recycled at multiple locations Monday-Saturday.
Curb-side recycling program	Weekly	Weekly collection (Monday-Friday)
Respond to trash complaints	On-going	Continuous (mostly during business hours)
Litter pick-up and control	On-going	
Trash removal from receptacles	Variable	ESD/IWM (contract with Stevens Creek Disposal & Recycling)- one to six times per week, as needed. General Services/Parks Maintenance and PRNS/Regional Parks staff- one to seven times per week or more, as needed. DOT (contract with Universal Maintenance)- twice daily
Street sweeping	Variable	Residential: semi-monthly. Business and arterials: varies.
Stormdrain operations and maintenance	Annually	27,000 + storm drain inlets serviced annually (after leaf drop)
Inspection and maintenance of stormdrain outfalls	Annually	700+ outfalls inspected annually and maintained as needed and as budget allows.
Free trash pick-up and/or drop-off days	On-going	78(?) neighborhood cleanups per year. One in each Strong Neighborhood Initiative area, plus several related to Code activities).
Reduced trash fees for low-income residents	On-going	$450,000 per year in General Fund subsidy
Removal of homeless encampments	Monthly	Usually the third Saturday
Anti-litter campaigns	On-going	Started in 2002
Volunteer creek clean-up programs	Biannual	Coordinated through Creek Connection Action Group

Santa Clara

Activity	Frequency	Notes
Household hazardous waste collection		
Solid waste recycling program	On-going	On-going at landfill sites.
Curb-side recycling program	Weekly	
Respond to trash complaints	As Required	
Litter pick-up and control	As Required	
Trash removal from receptacles	Weekly	Weekly?
Street sweeping	Variable	Weekly/Biweekly
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls		
Free trash pick-up and/or drop-off days	Seasonal	one clean-up campaign and two free droff-offs
Reduced trash fees for low-income residents	As Required	
Removal of homeless encampments	As Required	
Anti-litter campaigns		
Volunteer creek clean-up programs		

Sunnyvale

Activity	Frequency	Notes
Household hazardous waste collection	Variable	City participates in Countywide HHW program and augments funding to provide service to as many households as wish to participate. County HHW collection event at Carl Road facility occurs the third Saturday of each month from 8 AM - 1 PM and is open to all Sunnyvale residents (no appointment necessary and at no charge). County residents can also make an appointment to drop off material at this location. Motor oil and oil filters are picked up with curbside recyclables for Sunnyvale residents, when placed in special one-gallon oil jugs and plastic oil filter bags. Sunnyvale, Mountain View, and Palo Alto residents can bring motor oil, oil filters, antifreeze, batteries (both household and vehicle), and fluorescent tubes to the SMaRT station from 8 AM - 5 PM, 7 days a week for recycling.
Solid waste recycling program	Daily	Businesses and residents from any community may bring their recyclables to the SMaRT Station Recycling Center from 8 AM - 5 PM, 7 days a week.
Curb-side recycling program	Weekly	Sunnyvale provides weekly (single family and multi-family) residential curb-side recycling program for tin/aluminum beverage containers, plastics (#1-7), glass food and beverage containers, newspaper, used oil and oil filters, and corrugated cardboard. White or other colored paper, junk mail, envelopes, magazines, or waxed food boxes are recovered at the SMaRT station.
Respond to trash complaints	On-going	Public Works, Solid Waste Division - Solid Waste Contractor responds to complaints related to trash collection activities (e.g., blowing debris, litter from collection process, and missed collections). They also respond to open dumpster, litter complaints at businesses. Response times to complaints received must be within 8 hours (1 working day-contract requirement). Public Works, Field Services Division - Field Services staff respond to complaints of trash in roadways, medians, rights-of-way, sidewalks, and City easements. Emergency responses to roadway hazards must occur within 3 hours of receipt of the call. Non-hazardous, non-emergency complaints are responded to within two working days. Community Development -Neighborhood Preservation responds to trash/nuisance calls on private property. Staff have three working days to respond to a complaint. Their goal is to resolve it within 30 days. Resolution usually occurs within 20 days. However, it may sometimes take longer if legal procedures are needed to resolve a complaint. Public Safety responds to dumping of hazardous materials, illegal dumping, and homeless encampments/trespass complaints. Staff respond immediately to hazardous or dangerous complaints. They have up to three days to respond to non-threatening or nuisance complaints.
Litter pick-up and control	On-going	Public Works/Solid Waste Division requires SMaRT Station contractor to pick up litter from areas with high truck traffic/potential for litter on the way to the SMaRT Station (e.g. Borregas Ave, Carl Rd, Mathilda Ave north of Highway 237, Caribbean Drive). Clean ups of these areas are scheduled for twice each week. Refuse collection contractor is required to clean up materials spilled during collection. Public Works -Field Services Division schedules street sweeping to occur every two weeks in residential areas for the day after garbage collection day. They pick up debris from streets on an emergency basis (within 3 hours of a notice). They also pick up litter from public rights-of-way, city easements, and pedestrian walkways when notified of a problem. Public Works - Field Services and Boulevard Landscape field crews sweep or vacuum sidewalks and plazas every other week. Murphy Avenue is cleaned twice each week, due to the high traffic in the area. Parks and Recreation Dept. staff pick up litter from parks on a daily basis in summer months (April - October) and Monday - Friday in winter months (November - March).
Trash removal from receptacles	Variable	Public Works/ Solid Waste Division contracts with waste hauling company to empty litter receptacles weekly or as needed in commercial areas. Valley Transit Authority is responsible for emptying litter receptacles at major bus/transit stops. Parks and Rec. Dept. staff empty waste and recycling receptacles in parks daily (or more frequent basis if there is an event) into the park dumpster and recycling bins in summer months. They remove trash and recyclables from receptacles Monday - Friday in winter months. Waste hauling contractor empties dumpsters/recycle bins daily in summer months and every 2-3 days in winter months.
Street sweeping	Variable	City streets are swept twice each month, usually the day after garbage collection in residential areas. The Downtown District and City parking lots are swept three times a week. Extra sweeping requests can be made in conjunction with a trash complaint.
Stormdrain operations and maintenance	As Required	All municipal catch basins are inspected annually, and cleaned out, if needed. They are also cleaned out on an “as needed” basis if there is a complaint.
Inspection and maintenance of stormdrain outfalls	Annually	Storm Drain outfalls are inspected annually. Storm drain pump stations are inspected weekly. They are also inspected just prior to and almost hourly after major storm events.
Free trash pick-up and/or drop-off days	Seasonal	•Spring and fall clean ups have “extended” curbside collection for city residents. These events last for four weeks and residents can dispose of bulky goods or household debris on their regular garbage day at no extra charge. Loose items must be bagged or boxed or otherwise containerized for collection. •During each spring and fall clean up, the City offers two “extra dump weekends” where residents can dispose of garbage, refuse (especially large bulky items) free of charge at the SMaRT Station.

		•In conjunction with recognized neighborhood associations, there may be a specific neighborhood clean up event where roll-off debris boxes are placed throughout a neighborhood for a specific weekend, then picked up Monday morning. Neighborhood residents who are unable to participate in other no-cost disposal options can use them.
Reduced trash fees for low-income residents	N/A	Fee reductions are not available. However, there are different choices for level of service (limited quantity - 32 gallon can vs. unlimited). Residents can chose to pay for limited service for a lesser fee, then take advantage of spring/fall clean up free "extra dump" day activities.
Removal of homeless encampments	As Required	Community Development - Neighborhood Preservation can, with assistance of Public Safety staff, remove homeless encampments within city limits. Public works department staff will provide equipment to remove trash and debris. This is done on an as-needed basis, based on complaints received.
Anti-litter campaigns	On-going	•Anti-littering messages were developed and sent out as a part of Environmental Outreach program efforts (e.g., transit advertising, movie theatre slide shows) during a two-month period in 2002. •Litter source reduction messages (e.g., keep storm drains cleared of yard debris, options for disposing of various wastes) are sent out through semi-annual Solid Waste Recycling newsletter as well as in utility bill stuffers several times each year. •The Solid Waste Service Guide is mailed to all residents and businesses. It contains information about the proper procedures for preparing solid waste for recycling or disposal.
Volunteer creek clean-up programs	N/A	Sunnyvale does not have its own creek clean up program. However, it does support and promote the creek clean up activities and Adopt-A-Creek programs promoted by the Santa Clara Valley Water District.

West Valley Communities (Campbell)

Activity	Frequency	Notes
Household hazardous waste collection	N/A	Santa Clara County provides service for Campbell
Solid waste recycling program	Weekly	Residential only. Conducted by Green Valley Disposal Company.
Curb-side recycling program	Weekly	Residential only. Separate bins for recyclables and yard waste.
Respond to trash complaints	Daily	
Litter pick-up and control	Daily	
Trash removal from receptacles	Variable	One to three times/month
Street sweeping	Variable	Commercial (once/week), Residential (twice/month)
Stormdrain operations and maintenance	Seasonal	Once/year
Inspection and maintenance of stormdrain outfalls	Seasonal	Once/year
Free trash pick-up and/or drop-off days	Annually	Fall cleanup
Reduced trash fees for low-income residents	On-going	Reduced rates for senior citizens
Removal of homeless encampments	As Required	On occasion
Anti-litter campaigns	On-going	Anti-litter messages are distributed through publications, newspapaer and radio announcements.
Volunteer creek clean-up programs	Variable	Two creek cleanups (May and October) are conducted per year. Other litter clean-up activiites are conducted through Adopt-a-Creek. Litter is also removed from road off-ramps.

West Valley Communities (Los Gatos)

Activity	Frequency	Notes
Household hazardous waste collection	On-going	Santa Clara County HHW provides for Town of Los Gatos.
Solid waste recycling program	On-going	No 1/2 time position to administer AB939 activities.
Curb-side recycling program	Variable	Residential one day/week; Commercial one to three times/week.
Respond to trash complaints	Daily	
Litter pick-up and control	Daily	
Trash removal from receptacles	Frequent	three to four times/week
Street sweeping	Variable	Commercial: once/week; Residential: twice/month
Stormdrain operations and maintenance	Seasonal	once/year
Inspection and maintenance of stormdrain outfalls	Seasonal	once/year
Free trash pick-up and/or drop-off days	Biannual	Spring and Fall Clean Up; twice/year
Reduced trash fees for low-income residents	On-going	
Removal of homeless encampments	As Required	
Anti-litter campaigns	On-going	Education and Outreach
Volunteer creek clean-up programs	On-going	Throughout the year.

West Valley Communities (Monte Sereno)

Activity	Frequency	Notes
Household hazardous waste collection	Monthly	
Solid waste recycling program	Weekly	
Curb-side recycling program	Weekly	
Respond to trash complaints	As Required	
Litter pick-up and control	N/A	
Trash removal from receptacles	N/A	
Street sweeping	Monthly	
Stormdrain operations and maintenance	Biannual	Biannually and before/after any major storm event
Inspection and maintenance of stormdrain outfalls	Biannual	Biannually and before/after any major storm event
Free trash pick-up and/or drop-off days	Biannual	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	N/A	
Anti-litter campaigns	Variable	Conducted by WVCWP
Volunteer creek clean-up programs	Biannual	Events in May and September

West Valley Communities (Saratoga)

Activity	Frequency	Notes
Household hazardous waste collection	Annually	One HHW collection event is conducted once/year within Saratoga. Residents may contact County HHW to schedule an appointment at any time.
Solid waste recycling program	Annually	
Curb-side recycling program	Weekly	
Respond to trash complaints	As Required	
Litter pick-up and control	As Required	
Trash removal from receptacles	Weekly	
Street sweeping	Weekly	
Stormdrain operations and maintenance	As Required	
Inspection and maintenance of stormdrain outfalls	As Required	
Free trash pick-up and/or drop-off days	Annually	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	N/A	
Anti-litter campaigns	On-going	Handled by the WVCWP.
Volunteer creek clean-up programs	Biannual	

Santa Clara County

Activity	Frequency	Notes
Household hazardous waste collection	On-going	Services provided through County HHW Disposal Program: Residents make appointment for dropoff of waste at permanent or mobile collection location. Franchised service providers provide for weekly or bi-weekly collection of used oil and used oil filters for residential customers; latex paint is collected at curbside/streetside in Lexington Hills residenial service area.
Solid waste recycling program	On-going	Varies—most materials can be recycled at multiple locations Monday-Saturday. Ongoing waste reduction and recycling outreach through participation in countywide and regional outreach campaigns, outreach by franchise service providers, information provided on countywide recycling website ReduceWaste.org.
Curb-side recycling program	On-going	Franchises provide for collection of a wide range of recyclable materials, green waste recycling, used oil and oil filters, and seasonal collection of holiday trees. Residential recycling collection is weekly or biweekly. Drop off of green waste is included in services for residential customers in the South County unincorporated area through a voucher program. All other areas have weekly or biweekly collection of residential yard waste. Weekly recycling and green waste collection services are provided at the option of the business customer.
Respond to trash complaints	As Required	Few complaints are received. County staff and franchised service providers respond to complaints. Action requirements vary, according to the nature of the complaint. Roads and Airports Department removes large items from unincorporated roadways.
Litter pick-up and control	On-going	County Roads Department has an ongoing program for litter collection on County maintained roads and highways. County franchise agreements require service providers to clean up any spills and to report observed illegal dump sites to County Environmental Health. The Graffiti and Litter Abatement Program partners with the Probation Department's Juvenile Court Work Program to provide litter collection on a weekly basis in unincorporated pocket areas of the County.
Trash removal from receptacles	On-going	Generally not applicable, because there are few unincorporated civic center areas. San Martin downtown area has litter and recycling receptacles; waste is collected by franchised service provider. Litter cleanup around collection containers is the responsibility of the adjacent businesses.
Street sweeping	Variable	County Roads Department sweeps expressways on a monthly basis; and does limited street sweeping of unincorporated residential streets in response to complaints.
Stormdrain operations and maintenance	Seasonal	Seasonal and as needed
Inspection and maintenance of stormdrain outfalls	Seasonal	Seasonal and as needed
Free trash pick-up and/or drop-off days	Variable	Note that cost of services is included in service rates -- no services are "free." Provisions vary by service area. Franchise agreements provide for drop off days, community cleanup events, and/or on-call disposal days.
Reduced trash fees for low-income residents	On-going	Low-income service rates are provided for in all service areas. Also on-premises collection services are available to customers with physical disabilities that make curbside setout difficult.
Removal of homeless encampments	As Required	Yes, as needed. (usually under expressways)
Anti-litter campaigns	On-going	The Graffiti and Litter Abatement Program, District Attorney's Office and Roads and Airports Department partner with the City of San Jose on the Pick Up San Jose Task Force, which will expand Countywide in 2003. The countywide task force will participate in The Great American Clean Up on May 10, 2003. The litter task force includes 3 subcommittees: eradication, education, and enforcement.
Volunteer creek clean-up programs	On-going	SCVWD is responsible for creek cleanup.

SCVWD

Activity	Frequency	Notes
Household hazardous waste collection	N/A	
Solid waste recycling program	Daily	District actvities
Curb-side recycling program	N/A	
Respond to trash complaints	Daily	
Litter pick-up and control	Weekly	
Trash removal from receptacles	N/A	
Street sweeping	As Required	During district construction projects.
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls	As Required	Following complaints.
Free trash pick-up and/or drop-off days	N/A	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	Bimonthly	
Anti-litter campaigns	Occasionally	
Volunteer creek clean-up programs	Biannual	Each group must conduct two cleanups a year.

Co-Permittee Answer Comparison
Existing Trash Management Practices Survey

2. Which departments of your municipality/agency are responsible for trash management activities/programs and/or the enforcement of litter laws?

3. Provide the role of each department in trash management and/or litter/solid waste enforcement (e.g., Grounds Dept-litter control in parks and medians).

Cupertino	2. -Trash management: Environmental Division (Public Works Department) -Enforcement of litter laws: City Code Enforcement (but this is not a big problem in Cupertino—city staff routinely monitor and clean up the few areas known to have some littering) -Large dumping incidents would involve the County Sheriff's Department 3. Parks trash: Public Works Dept. empties trash and recycling bins Street trash: Bus stop trash bins/litter: Public Works Dept. and the County Valley Transportation Agency share the responsibility of emptying trash containers and cleaning up any litter at bus stops. Illegal dumping on streets: Public Works responds and cleans up dumping if violator can't be identified
Los Altos	2. Public Works and Police Departments 3. The Public Works Department conducts maintenance and cleanup. The Police Department conducts enforcement and reporting.
Los Altos Hills	2. Public Works 3. Public Works is responsible for trash management and/or litter/solid waste enforcement.
Milpitas	2. Utility Engineering and Planning, Recreation & Neighborhood Preservation Department 3. Management of Solid Waste, Recycling and Yard Waste Recycling Program by Utility Engineering including annual promotional campaigns and school projects. Litter control in parks, streets and right-of-way landscaped areas is handled by Public Works.
Mountain View	2. The City has many departments involved in the above activities depending on where the litter is found or responsibilities for maintenance: Police, Public Works, Community Services, Fire Department, and the City Attorney's Office (code enforcement). Most of the trash management is in the form of the City's franchised hauler collection of trash and recycling from all sectors overseen by the Solid Waste Section in Public Works. Litter collection is handled by Public Works (Streets), and volunteer activities (creek clean up) through the Fire Department; and Community Services (Parks & Roadways). Enforcement of litter problems on private non-apartment properties is handled by the City Attorney's office through Code Enforcement. 3. -The Community Services Department maintains City parks, roadway medians, and landscape outside City facilities, which includes litter removal. The Community Services Department also contracts Park Ranger services for patrolling and maintaining Shoreline Park and the Stevens Creek Trail. Rangers also conduct litter control activities. -Police Department coordinates homeless camp removal along with Community Services Department. -Public Works, Solid Waste and Recycling Section oversees garbage franchise with Foothill Disposal, including garbage and recycling collection programs. This Section also enforces the solid waste ordinance. -City Attorney's Office, Code Enforcement Division, enforces nuisance (junk, etc.) violations found on private properties (not apartments) (including illegal dumping); and the Fire Department enforces nuisances and housing codes on apartment properties. -Public Services Dept, Streets Section, responds to illegal dumping on public properties for clean-up. -Fire Department, Fire and Environmental Compliance Section coordinate 2-3 creek clean-up events per year with a local volunteer organization, Friends of Stevens Creek Trail.

2. Police, Public Works, Community Services and the Planning and Community Environmental Departments.

3. 1. Street Sweeping Program (Public Works Department)
A. Three times per week in Major Commercial Areas (University and California Avenues)
B. Weekly in other areas.
C. Highway 101 - State responsibility.
D. Oregon & Foothill Expressways – County responsibility.

2. Sidewalk and Roadside Litter Patrol (Public Works Dept)
A. University Avenue Patrol (Green Machine)
Daily from July 1 through December 31
Five days/week January 1 through June 30
B. Hot spots program
Patrol of identified roadside areas known to accumulate trash.

3. Collection Program (Public Works Department)
A. Weekly, backyard pick-up.
B. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard).
C. Weekly curbside green waste pick-up.
D. Backyard pick-up of recyclables and green waste available for the handicapped.
E. Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers.
F. Sanitation Company is required to clean up trash it spills. Fines are possible.

4. Annual "Clean-up Day" (Public Works Department)
A. Residential (less than 5 units)
B. By appointment (by phone)
C. Four Bulky (furniture) items
D. Other items unlimited
E. Free
F. One visit allowed per year.

5. Storm Drain System Cleaning (Public Works Department)
A. Each catch basin cleaned each fall (annually)
B. If debris is observed in a line next to a catch basin, the line is flushed.
C. Special areas are addressed as needed (e.g. construction site areas after the project is over.)
D. Enforcement actions for discharges to the storm drain are taken when intentional discharges are observed.
E. Residents and Businesses who sweep excess leaves or debris into the street are notified (via door hanger) of the code violation. If the practice continues, it is referred to Code Enforcement (Planning and Community Environment Department).

6. Creek Cleaning by Staff (Public Works Department)
Note: The cleaning of most creek reaches within Palo Alto are the responsibility of the Santa Clara Valley Water District (SCVWD). Certain reaches of San Francisquito Creek are the responsibility of Palo Alto, and those reaches are addressed below:

A. Each Fall (annually) a San Francisquito Creek walk is conducted with other agencies to identify clean-up of debris which is needed. Debris and trash is then removed.

7. Creek Cleaning by Citizen Groups (Community Services and Public Works)
A. The City helps with Coastal Clean-up Day and other organized citizen affords to clean creeks and the Baylands. Citizen groups bag trash and City crews pick it up.

8. Dumpster Area Clean-up (Public Works Department)
Messy dumpster areas are brought to the attention of the property owner, verbally first, then via letter. If compliance does not result, the sanitation company (City contractor) can clean the area and bill the property owner.

9. Trash on Private Property Enforcement Program (Planning and Community Environmental Department)
Trash on private property is a P.A.M.C. violation (esp. visible trash – front yard).
Incoming complaints result in:
A. Logging and tracking.
B. Inspection within 5 days.

C. Notice of Violation (NCR form delivered or posted.)
D.Can be followed by letter.
E.Can be followed by:
-Administrative Penalty
-Criminal Action.

10. Litter Enforcement (Police Department)
-Persons who litter are subject to action by the Police Department.
-The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney.
-The California Penal Code or the Palo Alto Municipal Code (PAMC) is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney.

11. Trash on Public Right-of-Way/Lands (Public Works Department)
A. Complaints and observations of trash result in clean-up by City Staff (or SCVWD staff for most creek-bed areas as noted in #6 above).
B. If the responsible party is known, the facts are referred to Code Enforcement (Planning and Community Environment Department) for the enforcement actions in #9 above.)

12. Palo Alto Parks Litter Patrol (Community Services Department)
A. Trash receptacles are emptied by sanitation company (City contractor) at various frequencies depending on location.
B. Trash pick-up of grounds is performed at various frequencies by either City staff or maintenance contractor depending on location.

13. Landfill Services (Public Works Department)
A. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.

14. Palo Alto Landfill Litter Control (Public Works Department)
A. Litter migration from the working face of the Landfill is controlled primarily through the use of the alternate daily cover tarps, weekly cover and the use of permanent and portable fencing.
B. Litter is routinely picked up by landfill personnel on an as-needed basis. Materials dropped off vehicles that may pose a hazard are picked up immediately.
C. In the event of high winds, temporary staff is brought on to augment permanent staff, if needed, to pick up windblown litter.

San Jose

2. -Environmental Services Department/Integrated Waste Management (ESD/IWM)
   -Code Enforcement
   -Department of Transportation
   -General Services/Parks
   -Parks, Recreation and Neighborhood Services/Anti-Graffiti Program
   -Parks Maintenance
   -San Jose Police Department Metro Unit
   -Creek Connection Action Group
   -Enforcement is conducted by various departments.

3. Household Hazardous Waste Collection:
   -Drop-off- ESD/IWM contracts w/ SCCHHWP
   -Curbside- ESD/IWM contracts with Norcal & GreenTeam for single-family and with GreenTeam for multi-family.

   Solid Waste Recycling Program:
   -ESD/IWM administers 20+ Commercial Solid Waste and Recycling Franchises; more drop-off and buyback sites are operated by private recyclers.

   Curb-side recycling program:
   ESD/IWM contracts for collection of garbage and recyclables in carts and dumpsters with Norcal & GreenTeam for single-family and with GreenTeam for multi-family; garbage is metered, recycling is unlimited.
   ESD/IWM contracts with GreenWaste Recovery and Norcal for unlimited collection of residential yard trimmings, either loose in the street or in carts.

   Respond to trash complaints:
   Code Enforcement: accumulations of waste; front yard blight; shopping carts (through Call Center); early yard trimmings setouts, etc.;
   Dept of Transportation: illegal dumping;
   Police: pedestrian and vehicular littering; untarped loads

   Litter pick-up and control:
   DOT contracts with Universal Maintenance for litter pick-up in the Transit Mall and coordinates the Alternate Work Program, Adopt-A-Park, etc.;
   General Services/Parks Maintenance, PRNS/Regional Parks, and other staff pick up litter on City property;
   PRNS/Anti-Graffiti Program is coordinating the new Pick-Up San Jose program with additional volunteer participation.

   Trash removal from receptacles:
   ESD/IWM contracts with Stevens Creek Disposal & Recycling for 2000 weekly collections from more than 700 sidewalk litter containers and with the SJ Conservation Corps for weekly collection from several hundred recycling receptacles in parks;
   General Services/Parks Maintenance and PRNS/Regional Parks staff collect from additional litter containers at parks and other outdoor City facilities;
   DOT contracts with Universal Maintenance for collection from litter modules in the Transit Mall.

   Street Sweeping:
   ESD/IWM contracts with Norcal and GreenWaste Recovery for residential street sweeping; DOT inspects;
   DOT provides more frequent sweeping of arterials and business districts directly.

   Storm drain operations and maintenance:
   Department of Transportation- 27,000 + storm drain inlets serviced annually (after leaf drop).

   Inspection and maintenance of storm drain outfalls in creeks:
   Department of Transportation- 700+ outfalls inspected annually and maintained as needed and as budget allows.

   Free trash pick-up days:
   ESD/IWM contracts with Norcal and GreenTeam to provide neighborhood cleanups and Code Enforcement oversees.

   Reduced trash collection fees for low-income residents:
   ESD/IWM administers Low-Income Rate Assistance for single-family service provided by Norcal, GreenTeam, and GreenWaste.

Removal of homeless encampments along waterways:
San José Police Department Metro Unit, with SCVWD staff.

Anti-litter campaigns:
Parks, Recreation and Neighborhood Services Anti-Graffiti Program and others.

Volunteer creek clean-up programs:
Coordinated through Creek Connection Action Group

Enforcement:
PRNS/Anti-Graffiti Program is coordinating the new Pick-Up San Jose enforcement program with the participation of the SJPD, Santa Clara County District Attorney, County Sheriff, City Attorney, Code Enforcement, and PRNS rangers; the Local Enforcement Agency in Code Enforcement enforces litter regulations at the solid waste facilities in the City.

Santa Clara

2. Trash Management Programs: Street, Parks Department
   Enforcement of Litter Laws: Police, Planning and Street Departments.
3. Street Department manages residential ground garbage and recycling programs and litter collection in public right-of-ways and the storm drain system. Parks Department collects litter in city parks. Streets, Planning and Police Departments may issue administrative citations for littering or accumulation of refuse.

Sunnyvale

2. Public Works -Solid Waste Division
   Public Works - Trees and Landscape Division
   Public Works - Field Services Division
   Parks and Recreation - Parks Division
   Parks and Recreation - Baylands Park
   Community Development - Neighborhood Preservation
   Public Safety - Patrol Services, Bureau of Field Operations
3. Public Works Solid Waste Division: Collection of household and commercial solid waste and operation of the SMaRT Station (via contractors), promotion of local recycling programs and waste diversion programs, litter clean up on major access roads leading to the SMaRT station, ensure that solid waste collection contractor responds to litter complaints resulting from waste pick up activities. Responsible for public education on waste reduction, recycling, and disposal options.
   Public Works - Environmental Division: Public education and outreach - anti-litter messages and stormwater pollution prevention messages.
   Public Works - Trees and Landscape Division: Boulevard medians, City parking lots, Murphy Avenue business district, landscape maintenance,
   Public Works - Field Services Division: Clean and maintain storm sewers, outfalls, pump stations, street maintenance and cleaning, trash/litter pick up on City easements, public right-of-way, pedestrian walkways and City streets.
   Parks and Recreation - Parks Division and Baylands Park: Park maintenance, litter pick up and trash collection in city parks and picnic areas.
   Community Development - Neighborhood Preservation: Respond to Municipal code violations, illegal dumping, and homeless encampment trespass using municipal code enforcement through administrative citations, notices to abate, and compliance orders.
   Public Safety - Bureau of Field Operations: Homeless encampment removal, criminal citations for littering on public or private property.

Los Gatos

2. Community Services Department, Parks and Public Works.
3. Community Services Department oversees hauler's trash and recycling contract, works with County on SWM activity and administers AB939 Projects and Programs.
   Parks and Public Works administers park, trail and creek cleanups, storm drain activities and street sweeping.

Monte Sereno

2. Public Works Department
3. The Public Works Department oversees storm drain activities, erosion control enforcement, street sweeping and the trash/recycling contract.

Saratoga

2. Public Works and Community Development
3. Public Works- All efforts; Community Development- Code Enforcement

Santa Clara County	2. The Santa Clara County District Attorney's Office is responsible for prosecuting litter citations issued pursuant to the California Penal Code and the California Vehicle Code. Illegal dumping, toxic waste and other environmental crimes are reviewed for prosecution by the DA's Environmental Crimes Unit. 3. The District Attorney's Office coordinates with the primary law enforcement agencies in the county (CHP, San Jose PD, Sheriff's Office) and the courts in which litter matters are heard to oversee that litter citations are appropriately prosecuted.
SCVWD	2. Trash Management-Purchasing Department, Enforcement- Countywide Watershed Programs Unit, Clean up activities-Maintenance Department, Adopt A Creek- public Information. 3. The Field Maintenance Units collect trash along creek right of ways. If illegal dumping takes place it is reported to Countywide Watershed Programs Unit, if the material is hazardous waste the Countywide Watershed Programs Unit disposes of it via a contractor. If it is trash and debris, Maintenance will dispose of it and then Community Projects Review Unit will file an 83-2 violation with the owner of the trash or Responsible Party.

4. How does your agency determine the effectiveness of existing trash management activities or programs? How do you document effective trash management practices? What, if any, future plans do you have to improve

Cupertino	Parks and streets are routinely monitored by Public Works Dept. supervisors on their normal rounds. Monitoring is not documented. No chronic problems have been discovered. There are no plans to document such a routine supervisory activity.
Los Altos	Los Altos conducts inspections of facilities, streets and other city properties to determine if trash is being picked up on a regular basis. Pulbilc Works Maintenance document their efforts on work requests. The Police Department documents their responses on incident reports.
Los Altos Hills	Due to Town of Los Altos Hills' zoning, the Town only has residential area for the trash management activities which are under control.
Milpitas	Monthly review and coordination meetings with contractor. Periodic awareness surveys. "Pre and Post" surveys for classroom projects/lesson plans. Public Works - Monthly scheduling and tracking of litter activities.
Mountain View	The Solid Waste and Recycling section tracks customer complaints about garbage subscription problems (i.e. not enough service causing other problems of odor or litter) or hauler performance. Performance measures are based on tons recycled, number of complaints, and diversion rate. No plans to revise current documentation and tracking. Other departments also track data. The creek clean ups are coordinated by the Fire Department with other agencies using volunteers. The volunteers track how much of which materials they find in the creeks. The majority of litter found in creek clean ups (non-bulky items) are polystyrene foam "peanuts" from nearby businesses or residents. As a result, we are concentrating on more articles about properly bagging polystyrene.
Palo Alto	Effectiveness: By observation Documentation: No separate trash documentation program. Future Plans: No plans for a separate documentation program.
San Jose	Effectiveness has traditionally been measured on a complaint basis for general littering and dumping and on an inspection basis for some specific programs such as Residential Street Sweeping. The Mayor's anti-litter initiative included the establishment of a list of 100 litter hot spots (ten for each of the ten Council Districts) and initiation of a documentation system using Keep America Beautiful's litter index, which has already been used on the 100 hot spots.
Santa Clara	The City of Santa Clara has not performed a study to determine the effectiveness of existing trash management practices. The City maintains regular clean-up schedules for medians, streets and catch basins. The City performs additional work as needed. No plans are in place to improve documentation.

Sunnyvale	Public Works - Solid Waste Division has established program outcomes that are measured annually. These include meeting solid waste diversion requirements, cost effectiveness of service to residents, and number of complaints. Records are kept on waste diversion and cost of service issues and reported annually. Records are kept on number of complaints and responses/resolutions to them. Liquidated damages can be assessed on the waste-hauling contractor for service failures. Complaints are logged in a complaint database by Solid Waste Division staff. An index of the number of solid waste complaints per 10,000 collections is determined. This index is not to exceed an average of the three previous years' complaints. This documents the customer satisfaction with the Solid Waste Program. A Citywide customer service survey also measures resident satisfaction. Public Works - Field Services Division also has established outcomes for their goals of responding to and resolving complaints received. For example for hazardous debris in roadway complaints, they must respond within 3 hours, 95% of the time and for non-hazardous complaints, they must respond within two workdays, 95% of the time. Parks and Recreation, Neighborhood Preservation, and Public Safety - All have measurable outcomes established for their responses to complaints and their resolution. This is tracked and reported on annually. Each Division has its own specific, measurable outcomes to demonstrate effectiveness of programs/activities. Each division in the City tracks its complaints and their resolution in their own database. There are no future plans to change the current documentation program, as it seems to work reasonably well.
Los Gatos	The Town meets all jurisdictional federal and state requirements. The Town submits reports on activities and has been informed that it is meeting and exceeding trash activities. The Town also has a close relationship with the community and documents all complaints relating to this field. Complaints and/or suggestions to improve the service are taken into consideration.
Monte Sereno	The City meets all jurisdictional federal and state requirements and reports on activities which meet or exceed existing trash management requirements. The City also has a close relationship with the community and documents any trash complaints. Complaints and/or suggestions are taken into consideration. Public health and safety is a priority.
Saratoga	Belong to a JPA. The JPA Executive and Board Monitoring Activities.
Santa Clara County	N/A
SCVWD	Recycling and District Solid Waste Practices as well as disposal options have been evaluated. Effectivness Evaluations for trash and clean-up related to creeks have not been developed. The Emergency Response Program and violation of 83-2 program has had effectiveness evaluations of the overall programs but these evaluations were not specifically broken down to the trash level. The extent of evaluations is to have a approximately 60 creek clean events per year and a measurement of the trash removed.

5. What incentive programs are in place to reduce litter and illegal dumping? Do disincentives (e.g., expensive landfill tipping fees, few trash receptacles, etc.) exist which prevent proper trash management?

Cupertino	The City's waste hauler provides two, no cost trash pickups per household, annually. The City provides trash and recycling receptacles at City parks, as well as bus stops. Both types of locations are maintained regularly. City staff distributes many public information pieces targeting how to dispose of electronics, construction materials, etc. City staff is unaware of any chronic trash problems in the city.
Los Altos	Los Altos has no incentive programs at this time.
Los Altos Hills	No disincentives (e.g., expensive landfill tipping fees, few trash receptacles, etc.) exist which prevent proper trash management in the Town.

Milpitas	Household disposal at landfill six times a year for residential customers. Free recycling services for commercial customers. Annual Neighborhood Beautification Awards Program, a Lend-A-Tool Program and Volunteer Program (MVP).
Mountain View	-City has a free on-call clean-up program 3x/yr. allowing residents to dispose of unwanted materials, which could end up being dumped. City also offers bulky goods collection for a fee, but in 2003 non-hazardous bulky goods are being collected at no charge. City participates in County HHW program and has a curbside recycling program. -The City does not have public cans except in the downtown area. Some bus cans provided by the VTA were pulled because residents would illegally dump trash despite the fact that the rates are among the lowest in the County and there has been no rate increase for more than two years. Community Services Department and the Solid Waste Section of the Public Works Department work together to identify illegal dumping and have the Finance Department charge customers for illegal dumping if enough evidence exists and a current billing account exists. -The City also has free drop-off centers for recycled materials in the downtown and at local recycling centers (Foothill @ Terra Bella, downtown district, and 20-20 centers, thrift stores). The City provides a variety of free programs, has very low rates, and has a variety of curbside and drop-off services so that littering and illegal dumping are discouraged. -The City has a good code enforcement program enforcing codes proactively and through complaints. The Solid Waste section requires Foothill Disposal to conduct subscription audits annually and Solid Waste regularly increases services to businesses and residents found insufficiently served. The City has an ordinance requiring trash lids be closed at all times, and the Solid Waste Section has fined businesses in the downtown for every day that a lid is found open. In some cases, Solid Waste required Foothill to weld steel bars at the back of dumpsters to prevent apartments or businesses from keeping the lids open. All recycling dumpsters have locks to prevent scavenging, and scavengers of garbage are actually pretty neat using grocery carts and poles to go through trash and picking up spilled items. Police have talked to scavengers to discourage scavenging, so scavengers tend to be neater to avoid complaints. -Solid Waste staff regularly follows Foothill Disposal collection vehicles and debris boxes en route for litter and leaks, and has only reported two trucks since 1999 that littered or leaked. Debris boxes are covered loads. Foothill is required to pick up any spilled garbage and does so (observed). Solid waste considered a requirement for Foothill to cover collection vehicle hoppers on routes but found it really unnecessary, and found it would be very costly because it would slow down the route collection. -Most of the litter on streets is from private vehicles. Solid Waste reports to Police any passenger and commercial vehicles observed littering, some of it deliberate (a driver threw 3 bags of fast-food garbage onto the street). Finally, Solid Waste runs articles about proper trash management for residents, businesses and the downtown, and regularly refers local schools to the CIWMB website on litter curriculum for students. -The City has many incentive programs to reduce litter and dumping and there really is no reason for litter and illegal dumping except for people who don't read the articles or are deliberate in their actions despite low rates and ample opportunities for trash management. We believe the state should resurrect it's anti-litter radio and television campaign in all languages targeted to adult and child pedestrians, and drivers of passenger vehicles, pick up trucks, and small commercial contractor trucks. Additional ordinances are really unnecessary because these laws are already on the books at city, county and state levels, and it would be more helpful to have a statewide litter campaign and maybe some warnings from the CHP/Police for observed roadway litterbugs.

Palo Alto	Collection Program (Public Works Department) A. Weekly, backyard pick-up. B. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard). Weekly curbside green waste pick-up. C. Backyard pick-up of recyclables and green waste available for the handicapped. D. Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers. E. Sanitation Company is required to clean up trash it spills. Fines are possible. Annual "Clean-up Day" (Public Works Department) A. Residential (less than 5 units) B. By appointment (by phone) C. Four Bulky (furniture) items D. Other items unlimited E. Free F. One visit allowed per year. Landfill Services (Public Works Department) A. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.
San Jose	For the price of basic garbage service, residents are provided with unlimited weekly curbside collection of a wide range of recyclable or compostable materials, including all beverage containers, all paper, many plastic and metal products, used motor oil and filters, and yard trimmings. Storage and collection of recyclables at single-family homes was changed from open tubs to fully-enclosed carts in July 2002. The City participates in the Countywide Household Hazardous Waste Program, providing appointments for three per cent of all household annually to discard any toxic household materials at no charge. Free cleanup events are provided to City neighborhoods, especially blighted or low-income neighborhoods and areas with greater accumulations of rubbish. Since 1985, the number of Civic Litter Modules on or near public sidewalks has been increased from less than 100 to over 800. The City of San José does not believe that local tipping fees affect littering generally or that they are so high that illegal dumping is significantly increased beyond the level that would be expected when there is any fee at all.
Santa Clara	Punitive violators will be issued citations. Departments have citation authority.
Sunnyvale	Incentive programs include all of the free " Extra Dump" days and spring and fall clean ups. The Solid Waste Program also provides an answer point phone number so people can call to find out about disposal options and activity dates. This information is also kept on the City's Solid Waste website: http://www.ci.sunnyvale.ca.us/recycle/index.htm. The Solid Waste Division strives to keep its rates as low as possible and still meet the charges for cost of service. Currently, Sunnyvale's rates are 98% of what charges are for similar cities in the South Bay area. Disincentives: High landfill disposal fees in the County tend to promote illegal dumping, especially by small businesses. The high fees are caused primarily by the $13 per ton City of San Jose Landfill Excise Tax. This accounts for over 25% of typical charges at the four landfills in San Jose, which are the only North County sites available to the general public.
Los Gatos	There does not appear to be much happening in the Town of Los Gatos. Overall, there are enough trash receptacles in the parks, trails and throughout the Town. Expensive landfill tipping fees do not deter the Town from providing quality trash management.
Monte Sereno	Dumping within the City does not appear to be a problem.
Saratoga	Curbside Recycling and HHW Pickups.
Santa Clara County	N/A
SCVWD	The effect of the City of San Jose's increase in land fill tax has not been quantified in the illegal dumping program to date.

6. What mechanisms does your municipality/agency use to document trash complaints and/or incidents? (e.g., report forms; database)	
Cupertino	The City's Code Enforcement Department maintains a database of all complaints received. The database can be sorted by category for trash related complaints.
Los Altos	Public Works Maintenance Division has a service request system that can provide reports on litter/trash complaints. Police Department code enforcement keeps reports of each incident they respond to.
Los Altos Hills	We use both report forms and database.
Milpitas	Complaints are documented on in-take inquiry forms by staff and follow up for resolution with contractor, resident or property owner. Service requests are generated and response tracked.
Mountain View	Complaint forms. Work orders are used if called to clean up a dumping incident. Inspection notices for downtown restaurant dumpsters. Complaints and inspections are tracked on database.
Palo Alto	No separate forms or data base. Complaints are logged in by each Department – not specific to trash.
San Jose	Log of complaints only.
Santa Clara	Service requests to document complaints. Notice of violations, pre citation notices and citations to document incidents to violators.
Sunnyvale	Several different databases are kept for dealing with trash/litter complaints or incidents, depending on the type of incident and where it comes from. Public Works Answer Point staff take in complaints for litter/trash related to collection of wastes or on public property and log them in a database. These may be referred to different Public Works divisions, Parks and Recreation, Neighborhood Preservation, or Public Safety to follow up on and resolve. If it is related to trash transport activities, the trash-hauling contractor is called and they respond to any complaints on the same day (within 8 hours) of receipt of the complaint. They also respond to overflowing or uncovered waste receptacle calls. Solid Waste Division Staff work with Neighborhood preservation to issue citations, if needed. Neighborhood Preservation receives complaints at their Answer Point related to litter, trash, other problems both in public right of ways and on private property, and logs them into a database. They respond immediately (along with Public Safety Haz-mat staff) to any immediate threats to public health or safety. They have up to three days to respond to other complaints and their goal is to resolve the complaint within 30 days. Usually they are resolved within 19-20 days. However, if legal procedures are needed to resolve the complaint, then the time required to resolve the problem may be significantly longer. Mechanisms for resolution of complaints can include a Courtesy Notice, Administrative Citation, or other administrative actions such as Abatement Hearings. The City Finance Department collects administrative penalties, which are deposited in the City's General Fund. Public Safety - Receives complaints from the public or requests for assistance from other City departments to assist with enforcement of penal codes and municipal codes for certain incidents. These are logged into their Record Management System (RMS) database. They respond to complaints received from City dispatch immediately. If they observe someone in the act of littering, they can write a criminal citation. They also respond to illegal dumping complaints and try to determine the responsible party for enforcement actions. They also deal with homeless encampment removal by citing participants with trespass and violations of the penal code. They work with Public Works staff to remove debris left behind from the encampments and make the place less desirable as a continued encampment.
Los Gatos	Trash complaints are documented in the Town's database and in Green Valley Disposal's data base. The Town of Los Gatos has the right to review it's haulers database complaint records at any time. Trash complaints are recorded and reviewed on an annual basis. The Town has a good and open relationship with it's trash and recycling hauler.

Monte Sereno	Complaints are taken down on our "Complaint Tracking Form". Working closely with Green Valley Disposal has proven to be efficient.
Saratoga	E-mail and hard copy files.
Santa Clara County	Referrals from partnering law enforcement agencies by way of infraction citation process or criminal complaint.
SCVWD	A database of 83-2 violations is maintained as well as a spreadsheet of ICID incident responses

7. What, if any, ordiances are in place to enforce litter or illegal solid waste dumping laws? What, if any, enforcement actions are available to remedy illegal dumping or trash-related violations? Do you have mechaisms to collect penalties? If so, what are they?

Cupertino	According to the City's Code Enforcement Department, the California State Penal Code Section 374.3A regarding litter, is used to enforce litter violations. Violations can be a misdemeanor, which carries a fine and/ or imprisonment. If a case is determined to be a nuisance, the nuisance abatement ordinance is followed, which is approved by City Council and then a fee is collected from the violator to pay for the cleanup.
Los Altos	Title 6- Health and Safety of the City's Municipal Code regulates littering, nuisance abatement and gargage collection. Title 11 regulates blight conditions. Police Department code enforcement can cite these regulations.
Los Altos Hills	There are no specific ordinances to enforce litter or illegal solid waste dumping laws.
Milpitas	Neighborhood Preservation Ordinance was enacted in February 2000 and the Solid Waste Management Ordinance. Penalties include administrative citations.
Mountain View	Chapter 16, Mountain View City Code includes litter and illegal solid waste dumping laws. Typical enforcement actions are corrective actions. The City Attorney's Office, Code Enforcement Division may seek penalties to illegal dumping incidents but the problem is identifying who dumped it and finding out where they are now. Ordinance is being revised to include $250 penalty for dumping citation. See answer to question #5 for more details about enforcement.
Palo Alto	Discarding trash on public or private property is illegal (P.A. Municipal Code) Administrative penalties are specified in the Code and utilized. Trash on Private Property Enforcement Program (Planning and Community Environmental Department) Trash on private property is a P.A.M.C. violation (esp. visible trash – front yard). Incoming complaints result in: A. Logging and tracking. B. Inspection within 5 days. C. Notice of Violation (NCR form delivered or posted.) D. Can be followed by letter. E. Can be followed by: - Administrative Penalty - Criminal Action. Litter Enforcement (Police Department) - Persons who litter are subject to action by the Police Department. - The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney. - The California Penal Code or the Palo Alto Municipal Code (PAMC) is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney.

San Jose	The City has dozens of provisions in the Municipal Code relating to litter, however, as part of the Pick Up San José initiative, it has been determined that the Penal Code and Vehicle Code provisions regarding littering and illegal dumping are the best tools for enforcement. The one general exception relates to property-related public nuisance code language related to litter and accumulation of waste, which are enforced by Code Enforcement. A specific exception will be use of the vehicle code provision requiring that truck loads of waste be covered, which will be enforced by both the Police Department and the Highway Patrol.
Santa Clara	Yes, the City of Santa Clara does have Municipal Code Sections making it illegal to litter, accumualte refuse and illegally dump. Citations are the primary enforcement action to remedy these problems. Liens can be placed on properties if citations are not paid.
Sunnyvale	Sunnyvale Administrative Codes: Title 8.16.030 (a) © Solid waste container requirements Title 8.16.060 Solid Waste Management and Recycling - Solid Waste Deposit -where prohibited Title 9.26.030 Abatement of nuisances Title 9.52.010 Prohibition of unauthorized presence in posted parking lots of a closed commercial business Title 9.62.020 Injury or misuse of park property prohibited Title 9.62.030 Polluting waters and dumping of refuse prohibited Title 9.62.060 Picnic areas use Title 13.08.380 Sidewalk maintenance Title 19.54.050 Wireless telecommunications - operation and maintenance standards Title 19.78.020 Mobile vendor permits - standard requirements Title 19.82.020 Miscellaneous plan permit - when required Criminal Code: 373.a Public Nuisance 374.4 Littering Prohibited 5410 Illegal Dumping Administrative Citations, Notices to Abate, and Compliance Orders can be issued by Neighborhood Preservation. Criminal Citations (misdemeanors) can be issued by the Public Safety Department. Public Safety will work with the City Attorney's office to prosecute criminal citations, as needed. Administrative penalties can be collected and can vary from $50 per incident to $500. These penalties are turned over by Neighborhood Preservation to the Finance Department to collect and place in the City's General Fund. Criminal fines can be assessed, and may be up to $1000 per incident.
Los Gatos	Sec. 11.10.055. Dumping of garbage and rubbish restricted to authorized disposal site. No person shall dump any trash or garbage upon any lot, piece or parcel of land not owned by such person or upon any public street, way, alley or place within the Town. Sec. 11.10.025. Disposal by Town, compliance with solid waste management plan required. (a) Except as otherwise expressly provided in this chapter, it shall be unlawful for any person to dispose of garbage and rubbish, except through the service provided by the Town, its agents, servants, or employees, or by persons who shall contract with the Town to gather and collect and to dispose of such garbage and rubbish. (b) Any person who collects and disposes of garbage and rubbish in the Town shall do so in compliance with the solid waste management plan approved by resolution of the Town Council.
Monte Sereno	6.09.040-It shall be unlawful for any person in the City of Monte Sereno to throw or deposit garbage, rubbish or waste matter, or to cause same to throw or deposit the same upon any vacant lot, or back yard, or to store or keep the same otherwise than in cans or receptacles, as required by Sections 6.09.020 or 6.09.050; and it shall be unlawful to have, store, deposit or keep garbage where rats can have access thereto, or feed thereon. Each day in violation of this Section shall be treated and considered, and the same shall be separate and distinct offense. Criminal prosecution and/or public nuisance abatement procedures are used at the discretion of the City.
Saratoga	Ordinances are in place. Information may be found on City of Saratoga website.

Santa Clara County	San Jose Municipal Code section 9.10.550 California Vehicle Code section 23113 California Penal Code section 374(a) Santa Clara County Ordinance B14-22.1(a) Above violations are subject to fine and are collected through the court system.
SCVWD	83-2 soon to be the Water Resources Protection Ordinance, Enforcement Actions include utilization of Fish and Game codes and Clean Water Act laws via the local District Attorneys Office and the RWQCB. We have never used our mechanism to collect penalties.

8. What additional activities and/or programs do you feel would improve your agency's ability to manage litter and illegal dumping?

Cupertino	Cupertino doesn't have much of a problem with illegal dumping. On occasion, an apartment manager reports that a tenant has left furniture or a mattress adjacent to the apartment dumpster, after moving out. The city offers to post "No dumping" signs. The owner still has the responsibility to dispose of waste and pay for the costs. Fortunately, we don't often find this material in the creeks.
Los Altos	None. Trash seems to be a managable problem in Los Altos.
Los Altos Hills	By public participation and public out-reach.
Milpitas	Grant funding to promote messages at the grass root level locally and in the schools ($5K + needed).
Mountain View	-Littering is a regional problem and needs to be addressed through anti-litter messages. See answer at the bottom of question #5 regarding our experience observing passenger and commercial pick up trucks. -The City has many incentive programs to reduce litter and dumping and there really is no reason for litter and illegal dumping except for people who don't read the articles or are deliberate in their actions despite low rates and ample opportunities for trash management. We believe the state should resurrect its anti-litter radio and television campaign to reach them in all languages. Additional ordinances or laws are already on the books and further laws are unnecessary and probably unenforceable due to available resources and other priorities.
Palo Alto	N/A
San Jose	A law prohibiting trash in any open vehicle on public streets, whether moving or not, so parked pickup trucks could be ticketed without having to see the fast food garbage blow out of the bed an hour later on the freeway. Expansion of the State's Beverage Container Redemption Act (AB 2020) to include all single-serve and take-out food and beverage packaging, such as drink cups and burger clamshells (or local fees instead). Advance disposal fees on littered items such as disposable diapers that have durable alternatives.
Santa Clara	Additional neighborhood clean-ups encourage the community to keep their neighborhoods clean and litter free.
Sunnyvale	Parks and Recreation - Would like to see more education on social responsibility for use of public spaces-including litter prevention along with other potentially destructive behaviors that have to be dealt with on public property.
Los Gatos	N/A
Monte Sereno	N/A
Saratoga	Public Outreach and Education and enhanced HHW pick-ups.
Santa Clara County	Education program – DA has begun education program at elementary and middle schools.

SCVWD	Source control of both manufactures and retailers, public outreach and education. Strict enforcement of existing Anti litter laws.

9. Provide interesting anecdotes relating to trash management adn/or litter/solid waste enforcement. Provide any additional information you wish to share.

Saratoga	E-waste is a concern to our city council. Legislation needs to be passed to address this growing waste stream.
Los Altos	None.
Milpitas	Ask a classroom, "Where does your garbage go?" and you get these answers: "Into the garbage truck", "down the street", and "Around the corner." Same with, "What happens to litter?" "It disappears", It goes to litter heaven". This is why we need environmental lessons, and projects that fit the State of California Education Department's curriculum for ALL grades and as many subject areas as possible (Art, Social Studies, Mathematics as well as Sciences).
Santa Clara County	
San Jose	None to report.

Palo Alto

1. Street Sweeping Program (Public Works Department)
A. Three times per week in Major Commercial Areas (University and California Avenues)
B. Weekly in other areas.
C. Highway 101 - State responsibility.
D. Oregon & Foothill Expressways – County responsibility.

2. Sidewalk and Roadside Litter Patrol (Public Works Dept)
A. University Avenue Patrol (Green Machine)
Daily from July 1 through December 31
Five days/week January 1 through June 30
B. Hot spots program
Patrol of identified roadside areas known to accumulate trash.

3. Collection Program (Public Works Department)
A. Weekly, backyard pick-up.
B. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard).
C. Weekly curbside green waste pick-up.
D. Backyard pick-up of recyclables and green waste available for the handicapped.
E. Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers.
F. Sanitation Company is required to clean up trash it spills. Fines are possible.

4. Annual "Clean-up Day" (Public Works Department)
A. Residential (less than 5 units)
B. By appointment (by phone)
C. Four Bulky (furniture) items
D. Other items unlimited
E. Free
F. One visit allowed per year.

5. Storm Drain System Cleaning (Public Works Department)
A. Each catch basin cleaned each fall (annually)
B. If debris is observed in a line next to a catch basin, the line is flushed.
C. Special areas are addressed as needed (e.g. construction site areas after the project is over.)
D. Enforcement actions for discharges to the storm drain are taken when intentional discharges are observed.
E. Residents and Businesses who sweep excess leaves or debris into the street are notified (via door hanger) of the code violation. If the practice continues, it is referred to Code Enforcement (Planning and Community Environment Department).

6. Creek Cleaning by Staff (Public Works Department)
Note: The cleaning of most creek reaches within Palo Alto are the responsibility of the Santa Clara Valley Water District (SCVWD). Certain reaches of San Francisquito Creek are the responsibility of Palo Alto, and those reaches are addressed below:

A. Each Fall (annually) a San Francisquito Creek walk is conducted with other agencies to identify clean-up of debris which is needed. Debris and trash is then removed.

7. Creek Cleaning by Citizen Groups (Community Services and Public Works)
A. The City and citizen groups help out on Coastal Clean-Up Day to clean creeks and the Baylands. Citizen groups bag trash and City crews pick it up.

8. Dumpster Area Clean-up (Public Works Department)
Messy dumpster areas are brought to the attention of the property owner, verbally first, then via letter. If compliance does not result, the sanitation company (City contractor) can clean the area and bill the property owner.

9. Trash on Private Property Enforcement Program (Planning and Community Environmental Department)
Trash on private property is a P.A.M.C. violation (esp. visible trash – front yard).
Incoming complaints result in:
A. Logging and tracking.
B. Inspection within 5 days.
C. Notice of Violation (NCR form delivered or posted.)
D.Can be followed by letter.

E.Can be followed by:
-Administrative Penalty
-Criminal Action.

10. Litter Enforcement (Police Department)
-Persons who litter are subject to action by the Police Department.
-The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney.
-The California Penal Code or the Palo Alto Municipal Code (PAMC) is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney.

11. Trash on Public Right-of-Way/Lands (Public Works Department)
A. Complaints and observations of trash result in clean-up by City Staff (or SCVWD staff for most creek-bed areas as noted in #6 above).
B. If the responsible party is known, the facts are referred to Code Enforcement (Planning and Community Environment Department) for the enforcement actions in #9 above.)

12. Palo Alto Parks Litter Patrol (Community Services Department)
A. Trash receptacles are emptied by sanitation company (City contractor) at various frequencies depending on location.
B. Trash pick-up of grounds is performed at various frequencies by either City staff or maintenance contractor depending on location.

13. Landfill Services (Public Works Department)
A. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.

14. Palo Alto Landfill Litter Control (Public Works Department)
A. Litter migration from the working face of the Landfill is controlled primarily through the use of the alternate daily cover tarps, weekly cover and the use of permanent and portable fencing.
B. Litter is routinely picked up by landfill personnel on an as-needed basis. Materials dropped off by vehicles that may pose a hazard are picked up immediately.
C. In the event of high winds, temporary staff is brought on to augment permanent staff, if needed, to pick up windblown litter.

Los Gatos No additional comments.

Cupertino
Los Altos Hills
SCVWD

Mountain View

A. In the City's downtown area, space for garbage and recycling dumpsters is limited. The City built community recycling enclosures on public property to preserve space for private trash dumpsters on private properties and encourage recycling. A thorough door-to-door downtown business education campaign about proper management of trash, recycling and tallow was conducted, and is repeated through weekly downtown inspections.

B. In response to a complaint about litter coming from a local convenience store, the City found the problem was not with the store but with children and visitors to the local elementary school and a "joint use" park. The litter found was primarily ice cream wrappers and some sport drinks discarded directly in front of the school and along a concrete path to the basketball courts on school property adjoining the park. So the litter was coming from neighborhood children and families visiting the school usually after hours. Only one or two identifiable fast-food containers were found from restaurants along El Camino (not from the convenience store). We found litter near the street corner (on the residential side across from the convenience store) was schoolwork and artwork.

-The litter was also coming from travelers from one bus stop to another. The complainant's property and school property are located between two major arterials with bus routes, El Camino Real and California Avenue. Based on various field inspections lasting a few hours on different days and at different hours revealed a well-traveled path from one bus stop to another with many pedestrians towing roller suitcases. Solid Waste contacted the VTA and they exchanged a 10-gallon public can near the bus stop for a 32-gallon can.

-The school crossing guard was a great source of information. He confirmed our observations about the after hours basketball activity, ice cream street vendors, and bus travelers; and he noted that some of the snack bags found in the bushes across from the school were well-positioned at eye level and checked by passersby and concluded there may be drug activity. Solid Waste notified the Police Department about the guard's observation, and met with the school principal.

-The principal and solid waste staff checked public cans near the basketball area and found litter in one part of the park where a trash can was only 10 feet away. There are about 4 trash cans along the border between the school basketball courts and the park. Solid Waste staff asked Community Services (Park) to add another public can in the park about 5 feet away next to the basketball courts where litter was found. Solid Waste suggested to the principal that the school increase litter removal on its property more frequently, and add another public can near the entrance from the street to the basketball courts. Solid Waste provided reference to the litter sections of the CIWMB curriculum for the school to use in teaching students about litter. Depending on the success of the school, a joint litter education campaign in Spanish may be implemented consisting of store and school posters and banners.

Sunnyvale

Neighborhood Preservation and Public Safety respond to situations at abandoned houses (and sometimes ones that are occupied). In some of these cases "super-cleanups" of the yards were needed. Public Safety staff assisted with site security during these clean up efforts.

A general comment that was received from several staff interviewed for this report was that warning signs and anti-litter signs, (even those with penalties listed e.g., $500 - $1000) do not have any effect on the public and their behaviors.

Monte Sereno

No additional comments.

Santa Clara

Litter and illegal dumping are virtually impossible to stop at the source. Very rarely will you successfully be able to catch the responsible party in the act of littering and/or dumping. A $500 penalty per violation is a significant penalty but it does not seem to prevent littering. It is important to keep neighborhood streets, creeks and medians as clean as possible all of the time. If you remove litter quickly and keep areas clean, people are less likely to litter in clean areas. Once an illegal pile gets started, it grows exponentially until it is removed. People are more likely to add to a pile rather than to start one.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

March 1, 2003

FY 2003-2004 Draft Work Plan

Program and Co-permittee Activities

Submitted in Compliance
with NPDES Permit Order No. 01-024 & 01-119

Milpitas
Palo Alto
Cupertino
Los Altos
San Jose
Sunnyvale
Santa Clara
Los Altos Hills
Mountain View
Santa Clara County
Santa Clara Valley Water District
West Valley Communities – Campbell, Los Gatos, Monte Sereno, Saratoga

Sections 1-10

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Hand Delivered on March 1, 2004

March 1, 2004

Mr. Bruce H. Wolfe
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Wolfe,

I am pleased to submit a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2004-2005. This Work Plan, which consists of Program and Co-permittee Activities, fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order:

- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement the Watershed Education and Outreach Campaign and other local PI/P activities (Provision C.4.)
- Contains the Program's FY 04-05 Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 04-05 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of actions accomplished in FY 03-04;
- Includes the Program's FY 04-05 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 04-05 (Provision C.9.d);

- Provides the Program's Dioxin-like Compounds Work Plan (Provision C.9.e.iii), which begins to identify control measures and/or management practices;
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 03-04 activities and actions, in order to plan FY 04-05 activities.

Most importantly, this Work Plan demonstrates the Program's dedication to the process of continuous review and improvement, which includes seeking new opportunities to control storm water pollution to the "maximum extent practicable". Thus, the Work Plan includes a discussion of continuous improvement tasks that were identified through the individual Co-permittee performance reviews and the joint working relationships between the Program and the Santa Clara Basin Watershed Management Initiative (SCBWMI) and other groups.

The Management Committee is extremely concerned about the availability of resources to conduct all FY 04-05 tasks because of the uncertain State budget condition and repercussions on the local agency budgets. As the resource issue becomes clearer, the Management Committee may have to revisit the priorities and resources assigned to the collaborative tasks.

We look forward to working with you and your staff to implement the actions contained in the attached plans.

Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: Trish Mulvey, CLEAN South Bay
David Chesterman (SCVWD), SCVURPPP Management Committee Chair
SCVURPPP Management Committee Members
Robert Falk, Morrison & Foerster

Attachments: FY 2004-2005 Draft Work Plan (including Co-permittee Work Plans) - two (2) hard copies

FY 2004-2005 Draft Monitoring Plan (Section 4) - one (1) hard copy

FY 2004-2005 Draft Work Plan (excluding the Co-permittee Work Plans) - three (3) compact disks

March 1, 2004

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

FY 2004-2005 Draft Work Plan

Program and Co-permittee Activities

Submitted in Compliance
with NPDES Permit Order No. 01-024 & 01-119

Milpitas
Palo Alto
Cupertino
Los Altos
San Jose
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Santa Clara
Los Altos Hills
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Santa Clara County
Santa Clara Valley Water District
West Valley Communities – Campbell, Los Gatos, Monte Sereno, Saratoga

Sections 1-9

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Certification

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____

Submitted on behalf of the
Santa Clara Valley Urban Runoff Pollution Prevention Program
March 1, 2004

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

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FY 04-05 Draft Work Plan
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H. SANTA CLARA
I. SUNNYVALE
J. WEST VALLEY COMMUNITIES (CAMPBELL, LOS GATOS, MONTE SERENO, SARATOGA)
K. SANTA CLARA COUNTY
L. SANTA CLARA VALLEY WATER DISTRICT

INTRODUCTION

This document comprises a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2004-2005. This Work Plan fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order, consistent with Permit Provision C.6.b:

- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement the Watershed Education and Outreach Campaign and other local PI/P activities (Provision C.4.)
- Contains the Program's FY 04-05 Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 04-05 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of actions accomplished in FY 03-04;
- Includes the Program's FY 04-05 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 04-05 (Provision C.9.d);
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 03-04 activities and actions, in order to plan FY 04-05 activities.

Most importantly, this Work Plan demonstrates the Program's dedication to the process of continuous review and improvement, which includes seeking new opportunities to control storm water pollution to the "maximum extent practicable". Thus, the Work Plan typically includes a discussion of continuous improvement tasks that were identified through any individual Co-permittee performance reviews that occur during the year and the joint working relationships between the Program and the Santa Clara Basin Watershed Management Initiative (SCBWMI) and other groups.

The Work Plan is comprised of nine sections, as follows:

1. **Program Continuous Improvement Tasks:** Section 1 provides continuous improvement tasks identified during FY 04-05 and a schedule for their completion.

2. **Performance Standard Revisions:** Section 2 describes the Program's recent revisions to the New Development-Planning Procedures Performance Standards and a schedule for updating three existing performance standards (i.e., Industrial/Commercial Discharger Control, Illicit Connection/Illegal Dumping Elimination and Water Utility Operation and Maintenance).

3. **Public Involvement and Participation:** The Program's PI/P Work Plan (Section 3) includes a list and description of projects planned for FY 04-05 and the process used to select them. A Pollutant Matrix is included which illustrates how on-going and planned PI/P efforts are directly linked to pollutants of concern.

4. **Monitoring Program:** The Program's FY 04-05 Annual Monitoring Plan is presented in Section 4. The monitoring strategy describes how monitoring projects are linked to Program goals, SCBWMI goals and permit requirements. The section identifies those on-going projects that are related to permit requirements along with a description and tentative schedule for FY 04-05 projects. The Monitoring Plan includes watershed management measures.

5. **Pesticide Management Work Plan:** Section 5 contains a status report on the Program's pesticide management tasks, as identified in the Program's Pesticide Management Plan (2/15/02), and planned tasks for FY 04-05.

6. **Mercury Pollution Prevention Work Plan:** Section 6 contains the Program's mercury pollution prevention tasks for FY 04-05, as identified in the Program's Mercury Pollution Prevention Work Plan (3/1/02). The status of Mercury Pollution Prevention Plan tasks is also provided.

7. **New and Redevelopment Work Plan:** Section 7 describes the Program's progress in assisting Co-permittees in preparing to implement the requirements for new and redevelopment control measures (Provision C.3.) and the Program tasks planned for FY 04-05, as identified in the Program's C.3. Work Plan (3/1/02).

8. **FY 04-05 Program Budget:** The Program's Final FY 04-05 Budget Report, as approved by the Program's Management Committee, is included in Section 8. The Management Committee is concerned about the availability of resources to conduct all FY 04-05 tasks because of the uncertain State budget condition and repercussions on the local agency budgets. As the resource issue becomes clearer, the Management Committee may have to revisit the priorities and resources assigned to the collaborative tasks.

9. **Co-permittee Work Plan Summary Tables:** Section 9 contains the individual Co-permittee Work Plans for FY 04-05 developed consistent with the FY 00-01 Work Plan format approved by Regional Board staff.

SECTION 1

PROGRAM CONTINUOUS IMPROVEMENT TASKS

1. PROGRAM CONTINUOUS IMPROVEMENT WORK PLAN

INTRODUCTION

The 1997 URMP commits the Program and Co-permittees to a process of continuous improvement. The concept of continuous improvement acknowledges that the definition of "maximum extent practicable" evolves over time. Through continuous improvement, the Program will continue to develop and implement reasonable control measures to help advance the goal of achieving water quality objectives in South San Francisco Bay.

The continuous improvement process is described on pages 31-35 of the Program URMP. As shown in Figure 3 (page 35 of the URMP), areas for continuous improvement are identified through the Program and Co-permittees' participation in the Santa Clara Basin Watershed Management Initiative (SCBWMI) and the Program and Co-permittees' annual evaluations and annual reports.

Regional Board staff and representatives of interested parties (including CLEAN South Bay) review the Program and Co-permittee annual reports and work plans, and participate in Co-permittee performance review meetings on a biennial basis. Comments from these reviews and meetings help to identify specific continuous improvement (CI) tasks.

FY 04-05 CONTINUOUS IMPROVEMENT WORK PLAN

FY 04-05 Program Continuous Improvement Items

During December 2-4, 2003, Tetra Tech, Inc. provided an independent evaluation of the Program's monitoring element and certain elements of the City of San Jose and Santa Clara County stormwater programs. The evaluation and was helpful in gauging how well the Program is implementing its monitoring element. An evaluation report will be provided to Program staff. As of February 9, 2004, Program staff has not received the evaluation report. Once the report is received, continuous improvement (CI) tasks will be developed. The Program anticipates developing continuous improvement items based on the results of the evaluation report and Regional Board staff comments on FY 02-03 Annual Report.

Regional Board staff is not planning to conduct performance reviews during FY 03-04 and comments on the FY 02-03 Annual Report have not yet been received. As a result, no CI tasks have been identified. If any new CI tasks for FY 04-05 are identified by Tetra Tech and/or Regional Board staff, they will be included in Table 1-1. An approach and schedule for their implementation by Program staff will also be identified.

ON-GOING CONTINUOUS IMPROVEMENT ITEMS

Table 1-2 provides an update on the status of FY 03-04 CI efforts. The Program's focus during FY 03-04 is on implementing new requirements of its NPDES permit and less on continuous improvement of existing Program elements.

Table 1-1
FY 04-05 Program Continuous Improvement (CI) Tasks

Tasks	Updated Schedule	Status	Evaluation of Effectiveness
As of February 9, 2004, no new continuous improvements were identified for FY 04-05 (see Section 1 of *FY 04-05 Work Plan*)			

Table 1-2
Status of Ongoing
Program Continuous Improvement (CI) Tasks

Tasks	Updated Schedule	Status	Evaluation of Effectiveness
FY 03-04 CI Tasks – New Development and Redevelopment			
1. Develop written tools to be used to train staff on Provision C.3 requirements (in case of staff turnover)	April 2004	**In Progress** – Program staff distributed a *C.3 Handbook (draft)* at the May 21 and 22, 2003 workshops. Additional C.3. guidance is being developed for the Co-permittees. A revised C.3. Handbook will be distributed at the Program's C.3. workshops scheduled for May 2004.	Cannot be evaluated at this stage.
2. Hold future training workshops on multiple days to increase the chances staff will be able to attend.	As Needed	The next C.3. workshop is scheduled for May 2004. Program staff will evaluate whether sufficient resources are available to hold the workshop on 2 days.	**Effective** –Evaluation forms are used to get feedback from participants at the workshops. Evaluation forms from the FY 02-03 workshops indicate that they have been very effective. Having workshops on 2 different days increased attendance by municipal staff.
3. Develop brochures/handouts to provide to developers containing information on Provision C.3 with reference to resources containing ideas.	June 2004	**In Progress** – Program staff distributed the Regional Board's C.3. fact sheet to the Co-permittees for their use. Additional fact sheets will be developed in FY 03-04 based on direction from the C3PO AHTG.	Cannot be evaluated at this stage.
4. Develop design guidance containing stormwater control opportunities for small road modifications.	Pending	**Update** – The Program's permit requirements were made consistent with other Bay Area permits, which exempt road reconstruction (within the same footprint) from C.3. Program staff will discuss with the C3PO AHTG whether this is a priority for road projects that are not exempt.	Cannot be evaluated at this stage.

SECTION 2

PERFORMANCE STANDARD REVISIONS

2. PERFORMANCE STANDARD REVISIONS

Background

The Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) developed model Performance Standards (PSs) in 1996. The model PSs were accepted by the Regional Board in June 1997. Each Co-permittee adopted the model PSs or tailored them to their local community characteristics and conditions. The PSs were incorporated into the Program's September 1, 1997 *Urban Runoff Management Plan* (URMP), updated URMP submitted as part of the permit re-application (Finding 6) and the Co-permittees' local URMPs which is currently part of the NPDES permit (Provision C.2).

The URMP also contains the Program's commitment to a process of continuous improvement. One component of this process is to review an existing PS, or create a new PS, each year. Decisions as to which PS will be created or revised in a given year are made based on requirements in the Program's NPDES permit, comments by Regional Board staff on Annual Reports, continuous improvement items identified as part of annual performance reviews, Program priorities and available Program resources.

New Development - Planning Procedures

To be consistent with the requirements of Permit Provision C.3., the Program revised the 1997 model *Planning Procedures Performance Standard* (PPPS). Provision C.3.k. specifically requires that the Program submit a model enhanced performance standard for source control measures in new and redevelopment projects by March 1, 2003. It made sense to Program staff and the Program's C.3.Permit Oversight (C3PO) AHTG to combine the source control measures requirements with the PPPS revisions; and include the *Draft Model List of Source Control Measures* (submitted to the Regional Board on September 15, 2002, per Provision C.3.k. and the C.3 Table 1) as an attachment to the PPPS. The draft revised PPPS went through several rounds of review (by the C3PO AHTG) and was approved by the AHTG on January 27, 2003 and the Management Committee on February 20, 2003. The revised PPPS was submitted to the Regional Board in the Program's *FY 03-04 Draft Work Plan* on February 28, 2003.

Regional Board staff provided comments on the revised PPPS by electronic mail on June 10, 2003 and October 22, 2003. These comments and additional revisions were discussed with the C3PO AHTG. The major changes made to the PPPS as a result of these discussions included: 1) updating the Group 1 project definition to match the definition in the Program's proposed Alternative Group 2 Project Definition, approved by the Regional Board on October 15, 2003 (see Section 7); 2) adding language requested by Regional Board staff to encourage all projects to incorporate source control and site design measures (regardless of size); and 3) adding language requested by the Santa Clara County Vector Control District staff to include in the BMP section design considerations which minimize production of mosquito habitat. These final revisions were approved by the C3PO AHTG on November 17, 2003 and Management Committee on December 18, 2003. The final revised PPPS were formally transmitted to the Regional Board on January 26, 2004, and are also provided in Attachment 2-1 of this Work Plan.

Enhanced Annual Reporting Requirements- Industrial/Commercial Discharger Control
Enhanced Annual Reporting Requirements- Illicit Connection/Illegal Dumping Elimination

In accordance with the Regional Board's letter, *Review of Program's Draft FY 2003-04 Work Plan* dated June 24, 2003, the Program informed the Co-permittees (see FY 02-03 Annual

Report Preparation Guidance dated June 18, 2003) that each Co-permitee should independently evaluate their individual IND and IC/ID inspection and utilize the results of the analysis to set inspection priorities and gauge program effectiveness. Within the FY 02-03 Annual Report, Co-permittees provided an effectiveness evaluation or analysis of their IND and ICID programs and/or data. This step was performed to address the Regional Board's concerns regarding IND reporting procedures.

To demonstrate consistency and compliance (on a Program-wide basis) with the strategy provided in the Program's technical memoranda regarding IND and IC/ID reporting (dated September 7, 2001) and the approved MC approach, Program staff will continue constructing IND and IC/ID summary tables using individual Co-permittee data. The summary tables are double checked with the Co-permittees. The overall goal of the effort has been to capture the full extent and the results of the Co-pemittees efforts in a consistent format and on a Program-wide basis. Overall, this effort has been very successful.

The Program plans to develop model language for updating the IND and ICID performance standards to incorporate the new reporting procedures and the results of the Co-permittee evaluations. Due to resource and priority changes and the Co-permittee's focus on higher priority tasks in FY 03-04, this task will be performed in FY 04-05. The Program and Co-permittees will continue implementing IND and ICID reporting procedures consistent with the Program's technical memoranda.

Future Efforts- FY 04-05 Activities

Priorities for recent efforts to revise or create new performance standards have been driven by the requirements in the Program's reissued NPDES permit and/or continuous improvement tasks. All new or revised PS required by the permit were recently completed. Future efforts to revise or update existing PS will be identified through the process of continuous improvement (see Section 1) until the next permit re-issuance.

The Water Utility Operation and Maintenance Performance Standard has been identified as the next performance standard needing a major revision. Issues which include changes in methods of disinfection of potable water supplies and the appropriate BMPs for discharges of these waters to storm drains will be addressed. A work group with significant participation from SCVWD and other Co-permittees with water utilities will be formed for this purpose. Due to the Program's focus on higher priority tasks, this task will be performed in FY 04-05.

A list of performance standard-related tasks and a schedule for completion is provided below:

Performance Standard	Action	Due Date
Industrial Commercial Discharger Control Program – Enhanced Annual Reporting Requirements	Update existing PS	Draft December 1, 2004[1] Final March 1, 2005
Illicit Connection/Illegal Dumping Elimination -- Enhanced Annual Reporting Requirements	Update existing PS	Draft December 1, 2004[1] Final March 1, 2005
Water Utility Operation and Maintenance	Update existing PS	Draft March 2005 Final June 2005

[1] The Enhanced Annual Reporting Requirements for IND and ICID were submitted to the Regional Board on September 15, 2001 as required by Permit Provisions C.6.a.i. and C.6.a.ii., and have been successfully implemented by the Program and Co-permittees. This task will update the existing IND and ICID PS to reflect these enhanced reporting requirements.

Attachment 2-1

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM
NEW DEVELOPMENT AND CONSTRUCTION ACTIVITIES CONTROL MEASURES

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Introduction

The goal of new development and redevelopment control measures is to minimize the storm water quality impacts of land development after construction. These control measures apply to both private development projects and municipal capital improvement projects. The Planning Procedures Performance Standard defines the level of implementation that municipal agencies in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) must attain in order to demonstrate that their land use planning, development plan review and approval processes control storm water quality impacts to the maximum extent practicable. Control of impacts on storm water quality from construction activities is addressed under a separate Construction Inspection Performance Standard, although some overlap exists because the planning process is the appropriate opportunity to ensure that projects include erosion and sediment control measures during construction and after completion of construction.

The Planning Procedures Performance Standard was based originally on the San Francisco Bay Regional Water Quality Control Board's April 1994 *Staff Recommendations for New and Redevelopment Controls for Storm Water Programs* (*Recommendations*). The *Recommendations* incorporate the mandates of EPA's storm water regulations as well as the *Coastal Zone Act Reauthorization Amendments.* The performance standard is also consistent with the goals and objectives of the New Development and Construction Activities Component of the Program's *Urban Runoff Management Plan (1997, rev. 2000)*. The performance standard has since been updated to meet the requirements in Provision C.3 of the Program's NPDES permit, amended per Regional Board Order No. 01-119, October 17, 2001.

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

PERFORMANCE STANDARD

1) The municipal agency (Co-permittee[1]) shall have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Permit Provision C.3.a.i.).

2) The municipal agency shall provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for storm water pollution prevention early in the application process, as appropriate for the type of project and location (C.3.a.ii.).

3) The municipal agency shall ensure that environmental documents required for those projects that fall under CEQA or NEPA review address both significant and cumulative storm water quality impacts during the life of the project, and relevant permit requirements. These documents include EIRs, negative declarations and initial study checklists (C.3.m.).

4) The municipal agency shall encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measures that minimize stormwater pollutant discharges to the maximum extent practicable.

5) The municipal agency shall require developers of Group 1 projects[2] to design and implement the following measures to reduce stormwater pollution to the maximum extent practicable[3]:

   a. Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality[4]), and provide detention or retention as part of landscaping where feasible (C.3.b.i. and C.3.j.);

   b. Source controls[5] shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k.), including measures to discourage pesticide use (C.9.d.ii.);

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[1] Performance Standards #1, 2, and 4 may not apply to agencies that do not have land use authority (i.e., the Santa Clara Valley Water District). The District does have authority over construction and related activities occurring within 50 feet of the top of bank of a watercourse. It is expected that Co-permittees will address relevant sections of each performance standard when incorporating the model performance standard into their local urban runoff management plans.

[2] Definitions are provided at the end of this section (page 4).

[3] Unless an alternative method of compliance is approved by the municipal agency in accordance with its alternative compliance program (C.3.g.).

[4] Refer to SCVURPPP *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects*, Infiltration Guidelines.

[5] Source control measures should also be encouraged for all discretionary projects that include potential sources of pollutants or activities that are likely to generate pollutants.

c. Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Provision C.3.d.;

d. Increases in peak runoff flow and volume shall be managed for appropriate projects by implementing the guidance in the Program's Hydromodification Management Plan (HMP) for the specific stream receiving the discharge, following approval of the HMP by the Regional Board (C.3.f.).

6) The municipal agency shall require developers of projects that disturb a land area of one acre or more to demonstrate coverage under the State General Permit for Storm Water Discharges Associated with Construction Activity (C.3.a.iii.).

7) The municipal agency shall require developers of projects with potential for significant erosion and planned construction activity during the wet season[1] to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season (C.3.a.iv.).

8) The municipal agency shall implement an operation and maintenance (O&M) verification program that includes: (C.3.e.)

a) Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;

b) Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;

c) Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

9) The municipal agency shall ensure that municipal capital improvement projects include storm water quality control measures during and after construction, as appropriate for each project, and that contractors comply with storm water quality control requirements during construction and maintenance activities (C.3.a.v.).

10) The municipal agency shall provide training at least annually to its planning, building, and public works staffs on planning procedures, policies, design guidelines, and BMPs for storm water pollution prevention (C.3.a.vi.).

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Definitions

Group 1 Projects – Beginning October 15, 2003, municipal agencies must begin to implement permit Provision C.3. requirements for public and private projects in the following categories:

1. *Commercial, industrial, or residential developments that create one acre (43,560 square feet) or more of impervious surface, including roof area, streets and sidewalks.* This category includes development of any type on public or private land, which falls under the planning and building authority of the Dischargers, where one acre or more of new impervious surface, collectively over the entire project site, will be created. Construction of one single-family home, which is not part of a larger common plan of development, with the incorporation of appropriate pollutant source control and design measures, and using landscaping to appropriately treat runoff from roof and house-associated impervious surfaces (e.g., runoff from roofs, patios, driveways, sidewalks, and similar surfaces), would be in substantial compliance with Provision C.3.
2. *Streets, roads, highways, and freeways that are under the Dischargers' jurisdiction and that create one acre (43,560 square feet) or more of new impervious surface*. This category includes any newly constructed paved surface used primarily for the transportation of automobiles, trucks, motorcycles, and other motorized vehicles. Excluded from this category are sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features.
3. *Significant Redevelopment projects*. This category is defined as a project on a previously developed site that results in addition or replacement, which combined total 43,560 square feet or more of impervious surface on such an already developed site ("Significant Redevelopment"). Where a Significant Redevelopment project results in an increase of, or replacement of, more than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, the entire project must be included in the treatment measure design. Conversely, where a Significant Redevelopment project results in an increase of, or replacement of, less than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, only that affected portion must be included in treatment measure design. Excluded from this category are interior remodels and routine maintenance or repair. Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed.

Wet season -- As defined by local ordinance (typically October 15 to April 15).

Attachment 1
WORK PLAN IMPLEMENTATION

This section should describe the activities to be conducted by the Co-permittee to achieve the performance standard, along with an implementation schedule. Specific tasks for

implementation of Provision C.3. are enumerated in Co-permittee work plans dated March 1, 2002 and September 15, 2002, and subsequent annual work plans.

Co-permittees can reference or insert work plans here]

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 2
LEGAL AUTHORITY TO IMPLEMENT

This section should contain a demonstration that the co-permittee has the legal authority to implement the performance standard, and/or provides a time schedule for developing and obtaining additional authority.

Provide citations for or excerpts from the following documents that demonstrate adequate legal authority:

- General Plan policies and implementation measures which help preserve and enhance water quality.
- Local ordinances and supporting guidelines that provide the municipal agency with an adequate expression of legal authority to fully implement General Plan policies, conduct discretionary reviews of development projects, and require storm water pollution control measures per Permit Provision C.3. (e.g., zoning ordinances, administrative orders, development review guidelines, conditions of approval or other documents or procedures).
- Erosion and sediment control ordinance.
- Storm water discharge ordinance.
- Authority under CEQA to require mitigation measures for environmental impacts.

Note: Guidance on General Plan and environmental assessment language, ordinances and standards is provided in the following documents:

- Permit Provision C.3.I.
- BASMAA *Start at the Source* and *Start at the Source Tools*.
- SCVURPPP Development Policies Comparison
- SCVURPPP *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects*

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 3
BMPS AND CONTROL MEASURES

This section should contain the best management practices and control measures that co-permittees will employ or use as a standard for compliance in the implementation of the performance standard, as well as any design criteria, procedures, or methods that would assist in the use of the BMPs or control measures.

Example BMPs and Control Measures

- Design guidelines and practices which incorporate storm water quality control measures.
- Contract specifications for municipal capital improvement projects which address storm water quality controls.
- Minimum standards or conditions of approval for construction and post-construction BMPs.
- Mechanisms for requiring operation and maintenance of structural controls, and example language.
- Mechanisms to discourage pesticide use at new development sites, such as proper design of landscaping, as appropriate for the site.
- Source control measures, such as the model conditions of approval provided in Attachment 4.
- Guidelines and standards for design, operation and maintenance of stormwater BMPs to avoid the creation of aquatic sites suitable for development of mosquitoes.

References:

- *Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality* (BASMAA, 1999)
- *Using Site Design Techniques to Meet Development Standards for Stormwater Quality – A Companion Document to Start at the Source* (BASMAA, May 2003)
- SCVURPPP, *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects*
- SCVURPPP, *Model Conditions of Approval for Pesticide Reduction in Landscaping Plans*, 9-30-02
- California Stormwater Quality Association, Stormwater Best Management Practice Handbooks, January 2003
- Memorandum to SCVURPPP Management Committee and BMP O&M Verification Work Group from Paul Randall and John Fusco, Program Staff, re *Guidance on Prioritization and Frequency of Stormwater Treatment Best Management Practice Inspections*, June 16, 2003.

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 4

SOURCE CONTROL MEASURES

INTRODUCTION

This section contains a model list of source control measures to control sources of pollutants associated with the post-construction phase of new development and redevelopment projects. These measures may be required at various stages of the development plan review process, e.g., as application submittal requirements or checklists, conditions of approval, plan check comments, etc., depending on the particular process used by each Co-permittee. These measures should be imposed as requirements rather than as recommended best management practices, to meet the intent of Permit Provision C.3.k.

The list relates the source control measures to significant sources of potential pollutants that may be present on the developed site, rather than to a general type of development project. Each identified source of pollutants may have one or more appropriate control measures. The model list is intended to be a menu of measures from which Co-permittees may select appropriate measures to apply to specific projects. (Co-permittees do not have to use the exact wording of a source control measure as long as the intent of the measure is preserved.)

STRUCTURAL CONTROL MEASURES

A. Illegal Dumping to Storm Drain Inlets and Waterways

1) On-site storm drain inlets shall be clearly marked with the words "No Dumping! Flows to Bay," or equivalent, using methods approved by the [Co-permittee].

2) It is unlawful to discharge any wastewater into storm drains, gutters, creeks, or the San Francisco Bay. Unlawful discharges to storm drains include, but are not limited to, discharges from toilets; sinks; industrial processes; cooling systems; boilers; fabric cleaning; equipment cleaning; or vehicle cleaning.

3) It is unlawful to cause hazardous domestic waste materials to be deposited in such a manner or location as to constitute a threatened discharge into storm drains, gutters, creeks or San Francisco Bay.

B. Interior Floor Drains

1) Interior floor drains shall be plumbed to the sanitary sewer system and shall not be connected to storm drains.

C. Parking Lots

1) Interior level parking garage floor drains shall be connected to [a water treatment device approved by the (Co-permittee) prior to discharging to] the sanitary sewer system. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

D. Pesticide/Fertilizer Application

1) Landscaping shall be designed to minimize irrigation and runoff, promote surface infiltration where appropriate, and minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.

2) Structures shall be designed to discourage the occurrence and entry of pests into buildings, thus minimizing the need for pesticides. For example, dumpster areas should be located away from occupied buildings, and building foundation vents shall be covered with screens.

3) Additional requirements are covered in the "Model Conditions of Approval for Pest Resistant Landscaping" (August 19, 2002).

E. Pool, Spa, and Fountain Discharges

1) Pool (including swimming pools, hot tubs, spas and fountains) discharge drains shall not be connected directly to the storm drain or sanitary sewer system. [Exception: Public pool discharge drains must be connected to the sanitary sewer system, per County Department of Environmental Health requirements.]

2) When draining is necessary, a hose or other temporary system shall be directed into a sanitary sewer clean out. The clean out shall be installed in a readily accessible area [example: within 10 feet of the pool]. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

F. Food Service Equipment Cleaning

1) Food service facilities (including restaurants and grocery stores) shall have a sink or other area for cleaning floor mats, containers, and equipment, that is connected to a grease interceptor prior to discharging to the sanitary sewer system. The cleaning area shall be large enough to clean the largest mat or piece of equipment to be cleaned. The cleaning area shall be indoors or in a covered area outdoors; both areas must be plumbed to the sanitary sewer.

G. Refuse Areas

1) New buildings [such as food service facilities and/or multi-family residential complexes or subdivisions] shall provide a covered or enclosed area for dumpsters and recycling containers. The area shall be designed to prevent water run-on to the area and runoff from the area.

2) Areas around trash enclosures, recycling areas, and/or food compactor enclosures shall not discharge to the storm drain system. Any drains installed in or beneath dumpsters, compactors, and tallow bin areas serving food service facilities shall be connected [to a grease removal device prior to discharging] to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

H. Outdoor Process Activities/Equipment[6]

1) Process activities shall be performed either indoors or outdoors under cover. If performed outdoors, the area shall be designed to prevent run-on to and runoff from the site.

2) Process equipment areas shall drain to the sanitary sewer system. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

I. Outdoor Equipment/Materials Storage

1) All outdoor equipment and materials storage areas shall be covered [and bermed], or shall be designed to limit the potential for runoff to contact pollutants [or a storm drain inlet valves shall be provided on exterior drains in the area].

2) Storage areas containing non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners or vaults. . The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

3) All hazardous materials and wastes, as defined [or regulated] by [cite ordinance or regulation], on the site must be used and stored in compliance with the [Co-permittee's] Hazardous Materials Ordinance and Hazardous Materials Management Plan for the site approved by the [Co-permittee department].

[6] Examples of businesses that may have outdoor process activities and equipment include machine shops and auto repair shops, and industries that have pretreatment facilities.

J. Vehicle/Equipment Cleaning

1) Wastewater from vehicle and equipment washing operations shall not be discharged to the storm drain system. [Optional, e.g. for car dealerships: If water only (without soap or other cleaning agent) is used for rinsing of vehicle exterior surfaces for appearance purposes, the runoff may be discharged to the storm drain system.]

2) Commercial/industrial facilities having vehicle/equipment cleaning needs [and new residential complexes of 25 units or greater] shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. Vehicle/equipment washing areas shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

3) Commercial car wash facilities shall be designed and operated such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer [or a wastewater reclamation system shall be installed]. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

K. Vehicle/Equipment Repair and Maintenance

1) Vehicle/equipment repair and maintenance shall be performed in a designated area indoors, or if such services must be performed outdoors, in an area designed to prevent the run-on and runoff of stormwater.

2) Secondary containment shall be provided for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.

3) Vehicle service facilities shall not contain floor drains unless the floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer, for which an industrial waste discharge permit has been obtained. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

4) Tanks, containers or sinks used for parts cleaning or rinsing shall not be connected to the storm drain system. Tanks, containers or sinks used for such purposes may only be connected to the sanitary sewer system if allowed by an industrial waste discharge permit. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

L. Fuel Dispensing Areas

1) Fueling areas[7] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.

2) Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area, as defined below[1].] The canopy [or cover] shall not drain onto the fueling area.

M. Loading Docks

1) Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

2) Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.

3) Door skirts between the trailers and the building shall be installed to prevent exposure of loading activities to rain.

N. Fire Sprinkler Test Water

1) Fire sprinkler test water shall drain to the sanitary sewer system (with approval from the local permitting authority and/or sanitary district with jurisdiction) or drain to landscaped areas where feasible.

O. Miscellaneous Drain or Wash Water

1) Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.

2) [Air compressor or air conditioner] condensate drain lines shall drain to the sanitary sewer system (with approval from the local permitting authority and/or sanitary district with jurisdiction) or drain to landscaped areas where feasible.

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[7] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

3) Roof drains shall discharge and drain away from the building foundation to an unpaved area wherever possible.

4) Roof top equipment shall drain to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

OPERATIONAL BMPS

A. Paved Sidewalks and Parking Lots

1). Sidewalks and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris resulting from pressure washing shall be trapped and collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and shall not be discharged to a storm drain. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

B. Private Streets

1) Owner of private streets and storm drains shall prepare and implement a plan for street sweeping of paved private roads and cleaning of all storm drain inlets.

C. Vehicle/Equipment Repair and Maintenance

1) No person shall dispose of, nor permit the disposal, directly or indirectly, of vehicle fluids, hazardous materials, or rinsewater from parts cleaning operations into storm drains.

2) No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.

3) No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

D. Fueling Areas

1) The property owner shall dry sweep the fueling area and spot clean leaks and drips routinely. Fueling areas shall not be washed down with water unless the wash water is collected and disposed of properly (i.e. not in the storm drain).

REFERENCES

- BASMAA "Start at the Source Tools Handbook" (June 2000);
- California Stormwater Quality Task Force, "Best Management Practice Guide – Retail Gasoline Outlets", March 1997.
- Alameda Countywide Clean Water Program (ACCWP) Model Conditions of Approval (1999);
- City of Palo Alto Municipal Code Chapter 16.09, and revisions to Chapter 16.09 approved July 22, 2002;
- City of San Jose standard conditions;
- City of Cupertino, Guidance for Selecting BMPs for Development Projects;
- Example source control measures provided by Regional Board staff in Provision C.3.k. of the SCVURPPP NPDES Permit (October 2001).

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 5
STANDARD OPERATING PROCEDURES

This section should contain the Co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Examples of Types of SOPs Needed

- A general description of the municipal agency's plan review process, including how Group 1 projects[8] are identified as well as how storm water quality control measures are incorporated into the planning and design stages of development..
- Description of which staff positions are responsible for reviewing the project's storm water impacts, the effectiveness with which the control measures mitigate these impacts, and when in the process these reviews are performed.
- Description of process for allowing independent qualified expert review and certification of stormwater treatment measure designs, if applicable.
- Mechanism to include storm water quality controls in plans and contract specifications for municipal capital improvement projects.
- Guidance on who to give pre-application materials to and when.
- Use of a revised CEQA initial study checklist and/or other plan review checklist that specifically addresses storm water quality impacts.
- Mechanism for recording the treatment control, site design and source control measures used, and the sizing criteria used
- Identification of department/persons responsible for implementing the treatment measure O&M verification program.

See SCVURPPP *C.3. Handbook*, "Summary of Major Changes to the Development Project Review Process" for those additional steps in the development review process necessary in implementing Provision C.3 requirements.

[8] Definitions of Group 1 projects are provided on page 3 of the Performance Standard.

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 6
REPORTING REQUIREMENTS

Co-permittee's will demonstrate implementation of this Performance Standard by providing in their annual reports the information described below (C.3.n.).

- The name or other identifier, type of project, site acreage or square footage, and square footage of new impervious surface on all new development and significant redevelopment projects which meet the Group 1 definitions of C.3.c.[9] For significant redevelopment projects, the square footage of land disturbance will be reported.

- The treatment BMPs used and numeric sizing criteria employed, the operation and maintenance responsibility mechanism including the responsible party, site design measures used, and source control measures required for projects that must implement treatment measures.

- A summary of the types of pesticide reduction measures required for those new development and significant redevelopment projects to be addressed under C.3.c and the percentage of such new development and significant redevelopment projects for which pesticide reduction measures were required.

Model reporting forms for this information are provided on the next two pages.

A summary of all annual and one-time reporting requirements is given in Table 1, Provision C3. of the Permit.

[9] Definitions of Group 1 projects are provided on page 3 of the Performance Standard.

ATTACHMENT6

[Co-permittee Name]
Reporting Form for Planning Procedures Performance Standard
and Provision C.3.n.i. Reporting Requirements

Part 1

Group 1 New Development and Significant Redevelopment Projects[10]
Reviewed and/or Approved During _____

Project Name	Project Type[11]	Site Size (ac. or s.f.)	New Impervious Surface (s.f.)[12]	Area of Land Disturbed (Ac.)[13]	Project Status	Storm Water Control Measures Included in Project
Private Projects						
Public Projects						

[10] List all projects with new impervious surface area greater than 1 acre (43,560 s.f.).
[11] Describe project type, as defined in Provision C.3.c.
[12] "New" is defined as impervious surface created, added or replaced.
[13] If the site is a "significant redevelopment", list the area of land disturbance, if information is readily available.

ATTACHMENT6

[Co-permittee Name]
Reporting Form for Planning Procedures Performance Standard and Provision C.3.n.ii. & iii. Reporting Requirements

Part 2

Stormwater Control Measures for Group 1 Projects[14] Reviewed and/or Approved During FY_____

Project Name	Treatment BMPs	Numeric Sizing Criteria Used	O&M Responsibility Mechanism and Responsible Party	Site Design Measures	Source Control Measures	Pesticide Reduction Measures
Private Projects						
Public Projects						

[14] Beginning October 15, 2003, list all* projects with new impervious surface area greater than 43,560 s.f. (1 acre). See SCVURPP "C.3. Handbook: Guidance for Implementation of Stormwater Requirements for New and Redevelopment Projects".

*Projects that do not require stormwater treatment because they fall under the Alternative Compliance Program must be reported as per Provision C.3.g.v. (see Reporting Form Part 3).

ATTACHMENT6

[Co-permittee Name]
Reporting Form for Planning Procedures Performance Standard
and Provision C.3.g.v. Reporting Requirements

Part 3

Alternative Compliance/Waiver Program Projects
Reviewed and/or Approved During FY_____

Project Name and Location	Project Type	Final Percent Impervious Surface	Reasons for Allowing Alternative Compliance	Alternative Compliance Terms	Project Receiving Benefit (Date of Completion)
Private Projects					
Public Projects					

SECTION 3

PUBLIC INFORMATION/PARTICIPATION WORK PLAN

3. PUBLIC INFORMATION/PARTICIPATION WORK PLAN

INTRODUCTION

The goals of the Public Information/Participation (PI/P) element of the Program are to change specific behaviors which adversely affect water quality and to increase the understanding and appreciation of streams and the Bay, leading to a change in values. To accomplish these goals, Co-permittees pursue PI/P activities jointly through the Program, on a County-wide basis, and individually in their own jurisdictions.

Each year Program staff works with the PI/P Ad Hoc Task Group (AHTG) to identify, prioritize and select County-wide projects to be recommended for funding. Table 3-1 presents the updated Pollutant Matrix, which links past, current, and future PI/P projects with pollutants of concern. The projects are developed and implemented each year by work groups consisting of Program staff, consultants and the contributing Co-permittees.

The Program provides resources to conduct County-wide PI/P tasks through approval (by the Management Committee) of an annual Program budget and Work Plan. All Co-permittees contribute resources to conduct annual Program Work Plan tasks consistent with the Co-permittee assessment procedure contained in the SCVURPPP Memorandum of Agreement[1]. Given the current economic climate, the overall Program annual budget will remain consistent with the FY 03-04 budget. However, the Program has experienced a large increase in external fees. To account for the uncertainty associated with fees assessed by organizations outside of the Program (e.g., NPDES permit fees); some items are identified as "collaborative" and may be subject to budget adjustments if external fees increase. Each year, the Budget Ad Hoc Task Group prioritizes the collaborative line items and determines what adjustments may be necessary.

FY 04-05 PI/P WORK PLAN

Three major projects from FY 03-04 will continue to be funded in FY 04-05 (see Table 3-2). These include the Watershed Education and Outreach, Pesticide User Outreach and Mercury Pollution Prevention Outreach Projects. As part of the Watershed Education and Outreach Campaign, the Program will also contribute to BASMAA's Regional Ad Campaign

Watershed Education and Outreach

The FY 04-05 Watershed Education and Outreach project includes the following tasks:

Watershed Watch Campaign

The Watershed Watch Campaign will be in its fifth year during FY 04-05 (see Attachment 3-1). A Campaign evaluation was conducted in September 2003. The evaluation included a telephone survey of Santa Clara valley residents, two focus groups and feedback from current Watershed Watch partners. The highlights of the evaluation are:

- Compared to 1999, awareness of watersheds has increased significantly. Approximately 46% of respondents could recall seeing or hearing something about

[1] On February 1, 2001 the Management Committee directed Program staff to include all Program-Wide PI/P activities as part of the Projects Group budget and thus eliminated any confusion regarding selective Co-permittee participation.

watersheds. This is an increase of 19 points from the 1999 results. Of those who have heard something about watersheds, 74% (34% of total) can mention something specific.

- 73% of Santa Clara Basin residents attempt to define a watershed, although few are able to accurately describe it in their own words
- Close to half (44%) mention oil/grease as the main pollutant affecting Bay water quality. Nearly everyone can name some type of pollutant.
- Santa Clara Basin residents are more aware of specific solutions to prevent Bay water pollution compared to twelve years ago. There is a very high level of awareness that paint thinner and motor oil within storm drains can seriously affect creek and Bay water quality. Awareness of other pollutants is not as widespread. While awareness has increased, fewer Basin residents are performing one or more selected water pollution prevention activities compared to 1996 and 1999.
- The awareness that private residents and not businesses contribute to storm water pollution has increased.
- Fewer Basin residents recognize that various pollutants enter the storm drain as compared to 1999. However, the 2003 results (43%) show an increase in recognition from 2002 levels (32%).
- There has been a decrease in the percentage of residents taking selected water pollution prevention actions

The main recommendations from the survey are:

- The Campaign should continue with its current media advertising with a greater focus on specific pollution prevention actions that residents can take to prevent storm water pollution;
- More efforts should be made to build awareness of existing water quality problems of our creeks and the Bay;
- For meeting short-term goals, the Campaign should target homeowners and college-educated people;
- The Watershed Watch kit should be revised to be more concise and easily readable; and
- The radio ads should continue but should be remade without the background music.

In FY 04-05, feedback and recommendations from the evaluation will be used to modify messages, advertising, promotions and other Campaign strategies. Campaign advertising and activities will be coordinated with pesticide and mercury outreach efforts. Messages used in outreach efforts will include specific pollution prevention actions that people can take to prevent storm water pollution. The FY 04-05 Watershed Watch Work Plan is included in Appendix 3-1.

Regional Ad Campaign

The Program will participate in the Regional Ad Campaign in FY 04-05. In FY 02-03 and FY 03-04, the Regional Ad Campaign (RAC) implemented the "Beautiful Watersheds" advertising campaigns for increasing the public's awareness about watersheds. The ads were broadcast on radio and television. To achieve saturation in terms of reach and frequency, the same ads will likely be continued during FY 04-05.

By participating in the RAC, the Program aims to reinforce the watershed awareness message regionally while continuing to focus on specific pollution prevention messages locally.

Schools Outreach

For the past three years, the program has sponsored ZunZun assemblies at elementary schools in the Santa Clara Valley. Assemblies are booked using a list of schools provided by the Program's School Outreach Work Group. Each assembly is followed by an evaluation. Teachers are requested to mail back postage paid evaluation cards. The evaluation card asks the teachers to judge what their students have learned from the assembly; and how effective the presentation is in educating them about watersheds. Based on comments from teachers, mid–year and final year evaluation reports are prepared. The Program then incorporates changes to the ZunZun performances. Due to the increasing demand for these assemblies in Santa Clara Valley schools and the positive feedback received from teachers, the Program will sponsor 50 more ZunZun assemblies in FY 04-05.

Strategic Planning

The Watershed Watch evaluation results indicate that while awareness of watersheds, pollutants and pollution prevention has increased, actual pollution prevention behaviors have not increased. The evaluation recommended that the Campaign continue its current activities with an added focus on specific pollution prevention messages. In FY 04-05, a Work Group will be formed to further analyze these recommendations and develop a strategy for improving future outreach. A social-marketing consultant may be used to help develop this strategy.

Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso (Alviso Education Center)

The Program provides resources to the Alviso Education Center to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. This is an on-site educational program conducted primarily on weekends. The activities focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The Program will continue to support these activities in FY 04-05. Attachment 3.2 describes the activities offered in the Watershed Watchers Program.

Watershed Support Fund for Citizen Participation Projects

In FY 04-05, the Program will fund projects that support citizen participation activities. Resources will be made available to local groups working on watershed issues as non-competitive grants. The Program's WEO AHTG will discuss and develop criteria for identifying and selecting projects. Possible projects include providing resources to conduct activities associated with the efforts of the Watershed Action Councils, Creek Cleanup Events, and WMI projects.

Pesticide User Outreach

This project combines elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements of the Program's NPDES permit. Outreach is coordinated with other pollution prevention programs funded by Co-permittees (e.g., County's Household Hazardous Waste Program). The Pesticide User Outreach tasks for FY 04-05 include:

- Task 1 – IPM Store Partnership Program - Continue IPM participation in Santa Clara County stores. At a minimum, visit each store once every two months; maintain an ongoing relationship with participating stores through in-store contacts; refresh/restock literature racks (as needed); and update "shelf talker" labels (as needed). Based on feedback from training sessions offered to store employees in FY 03-04 and the number of stores remaining to be trained, the Program may provide up to five training sessions during FY 04-05. These sessions will train employees on how to sell less-toxic pesticides.
- Task 2 –Regional IPM Partnership –Support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. Review and approve products.
- Task 3 - Pesticide Distributor Outreach Program – Continue to support the Pesticide Distributor Outreach Program through BASMAA. This will involve coordinating Annie Joseph's efforts in this project with the Store Partnership outreach efforts. Provide staff for conducting outreach events at stores (e.g., Orchard Supply Hardware). At these events, customers are educated on available less toxic pest control methods and products, and proper disposal of pesticides.
- Task 4 – Outreach Events - Plan and conduct up to four pesticide outreach events in coordination with the Watershed Watch Campaign. These may include Pumpkins in the Park, YSI Wildlife festival, Spring in Guadalupe Gardens, International Migratory Bird Day, San Jose Spring Home and Garden Show, etc. Program, Co-permittee and TRG staff will conduct outreach at these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures (e.g., Pests Bugging You, Grow It and Backyard Bugs).
- Task 5 – IPM Workshop - Plan and conduct an IPM workshop for the general public in coordination with the Watershed Watch Campaign and its partners. During FY 02-03, the Program conducted a similar workshop. Master Gardeners gave presentations and over thirty people attended. Currently, the FY 03-04 workshop is being planned.
- Task 6 – Media Advertising - Conduct media advertising in coordination with the Watershed Watch Campaign. The ads will focus on pest control using less-toxic methods.
- Task 7 – Outreach to industrial businesses - Continue distributing the "Don't Set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.
- Task 8 – Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to special districts within each Co-permitee's jurisdiction (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts); and to the extent of each Co-permittee's authority – Contact these groups and assess the amount of information they have or need regarding IPM, and develop and implement a prioritized outreach plan based on the findings of the assessment.

<u>Mercury Pollution Prevention Outreach</u>

To implement the Public Education and Outreach element of the Mercury Plan, Program staff established a new work group called the Mercury Pollution Prevention Outreach Work Group in December 2002. The objective of this group is to implement a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products. The Mercury Plan identifies the development of a fluorescent light tube (FLT) recycling public outreach and education plan as a priority and recommends conducting outreach

in two phases. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of fluorescent light tubes.

Phase I of the Public Education and Outreach plan focused on residential FLT disposal. It was completed in FY 02-03. Implementation of Phase II, which targets small businesses and Conditionally Exempt Small Quantity Generators (CESQGs), began in FY 03-04. The ongoing and completed Phase I and Phase II activities are described in detail in Section 6 of this Work Plan.

In FY 04-05, the Program plans to continue its mercury pollution prevention outreach activities and coordinate them with the County Household Hazardous Waste (HHW) Program's Mercury Grant described in Section 6 of this Work Plan. The County HHW Program is implementing this grant to increase collection opportunities for mercury-containing universal wastes (e.g., thermostats, fluorescent lighting and button batteries) at HHW collection events and community collection sites. The Program will coordinate with the County HHW Program in FY 04-05 and help implement an advertising promotion. Outreach information will also be distributed at community events and through newsletter articles. During FY 02-03 and FY 03-04, outreach messages were primarily targeted at recycling of fluorescent lamps. In FY 04-05, outreach messages may be expanded to include information on other mercury containing wastes.

Table 3-2 lists all of the PI/P projects to be funded during FY 04-05. Preliminary descriptions ("Development Strategy Checklists") for the Pesticide User Outreach and Mercury Pollution Prevention Outreach projects are provided in Attachment 3-3. The scopes of work will be finalized in more detail by Program staff and Co-permittees prior to implementation of the projects.

ATTACHMENTS

Attachment 3-1	Watershed Outreach and Education Campaign (Watershed Watch) Fourth Year (FY 04-05) Work Plan, March 1, 2004
Attachment 3-2	Alviso Education Center Work Plan Tasks
Attachment 3-3	Development Strategy Checklists (Project Descriptions for FY 04-05 PI/P Projects)

Table 3-1
Pollutant Matrix for FY 04-05 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 04-05 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Diazinon and pesticides in general	Pesticides (residential, commercial and municipal use)	• Home gardeners • Pest control professionals • Landscapers • Municipal Employees • Residents who hire pest control professionals	Watershed Education & Outreach Campaign (one of four focus topics), IPM Store Partnership Program (regional and local), Pesticide User Outreach Activities, Annual Workshop potential topic, Distribution of restaurant brochure "Don't Set a Table for Pests" through County Health Inspectors.	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "When Ants Invade" Self-Mailer, "Landscaping, Gardening and Pool Maintenance" tri-fold, "Don't Set a Table for Pests", IPM Store Partnership Program Fact Sheets, "Control It", HHW programs, BASMAA Media Relations Campaign topic
Sediment	Erosion from new construction, grading, road wear	• Construction companies/contractors • Architects/engineers • Municipal inspectors • Residents (home improvement projects, remodels)	BASMAA Media Relations Campaign (potential topic), Outreach to developers via RWQCB Construction Site Management Workshops.	Construction BMP Tri-folds in English, Spanish and Vietnamese, "Blueprint for a Clean Bay" (revised 1-04), Construction Site Management workshops, Dewatering Brochure
Mercury	Tailpipe emissions (i.e., diesel-powered vehicles), consumer products (thermometers, fluorescent lighting)	• Residents (auto use, general awareness, proper selection and disposal of products) • Industry (fleet use) • Commercial (fleet use)	Watershed Education and Outreach Campaign (one of four focus topics), BASMAA Media Relations Campaign topic, Mercury P2 Outreach (Residential and business fluorescent light recycling)	"Spare the Air and Water Too" campaign press release and public service announcements, bill stuffers, Program and local co-permittee fact sheets (e.g., Palo Alto and Sunnyvale)

Table 3-1, continued
Pollutant Matrix for Prioritizing PI/P Projects

Pollutant of Concern	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 04-05 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Copper	Brake pads, industrial discharge, copper algaecides, coolant leaks, illegal dumping	• Industry (scrubbers, roofs, cooling towers, piping) • Residents (illegal dumping, pools and spas) • Commercial business (pool, spa, fountain maintenance) • Municipal maintenance staff	BASMAA Media Relations Campaign (potential topic), Watershed Education and Outreach Campaign (potential topic), support of Brake Pad partnership through BASMAA	Brake Pad Partnership, "Keep Pool/Spa Water Out of Storm Drains, Streets, and Creeks" (older pool and spa brochure), "Keeping It All In Tune", Industrial BMPs, storm drain stencils, "Drain Smart – Keep Pool, Spa and Fountain Water Out of Strom Drains, creeks and the Bay" (new pool brochure)
Nickel	Industrial discharges, tailpipe emissions, construction-related erosion	• See sediment and mercury target audiences	See sediment and mercury projects	See sediment and mercury projects
Trash	Intentional littering (cigarette butts, throwing objects from automobiles, illegal dumping), trucks hauling poorly secured materials, uncovered or overflowing garbage cans	• General public • Children • Drivers • Smokers	BASMAA media relations campaign topic, Watershed Education and Outreach Campaign (one of four focus topics)	"The Bay Begins at Your Front Door" brochure, Watershed Watch magnets, Watershed Watch Kit brochure, Watershed Watch web site.

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.

Table 3-2
FY 04-05 PI/P Projects

Project Title	Project Description	Budget	Comments
Non-Discretionary PI/P Projects			
1. Watershed Education and Outreach Campaign (Year 4)	Funding for approved multi-year watershed education and outreach campaign. Includes: • Funding for educational programs at the Alviso Ed Center coordinated with the WE&O campaign; • Funding for ZunZun to perform a watershed –themed show at 50 schools in Santa Clara Valley. • Collaborative funds for citizen participation projects • Funds for strategic planning of future outreach	$450,000[1]	Proposed Budget breakdown is as follows: • Watershed Watch Campaign budget - $259,300 • Alviso Ed Center - $75,700 • ZunZun Contract - $25,000 • Strategic Planning - $10,000 • Program staff support and subcontractor markup - $80,000
2. Pesticide User (PU) Outreach (Year 4)	Project combines cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Scope to include items in Program's Pesticide Management Plan for outreach to residents, commercial businesses, and pest control operators.	$40,000	SCVURPPP will continue to support the Regional IPM Partnership Program, and consider supporting other pesticide related projects through its participation in BASMAA. Program will continue to maintain the 29 stores participating in the store partnership program. Additional outreach will be made locally to pesticide users, potentially residential and commercial users, residents hiring pest control professionals, and/or other audiences. Outreach will be conducted at community events, advertising and by conducting IPM workshops for residents.
3. Mercury Pollution Prevention Outreach (Year 3)	Continuing outreach on proper disposal of mercury containing wastes and education on low-mercury products.	$25,000	Program will continue its mercury outreach and coordinate its efforts with the County HHW Program in implementing its mercury grant. Specific tasks may include maintaining store partnerships for the mercury take back program, developing educational materials and shelf-talkers

Table 3-2
FY 04-05 PI/P Projects

Project Title	Project Description	Budget	Comments
			(identifying low mercury products) and conducting media advertising with Watershed Watch Campaign.
4. Program Supplies	Estimated budget for reprints of materials for Program use and other Program supplies.	$5,000	
FY 04-05 PI/P and WEO Project Budget		$520,000	
WE&O Watershed Support Fund (Collaborative Budget)		$100,000	Program will fund local groups working on watershed issues for implementing Citizen participation projects. The Program's WEO AHTG will develop criteria for disbursement of funds.
TOTAL BUDGET		**$620,000**	

Attachment 3-1

Santa Clara Valley Urban Runoff Pollution Prevention Program

Task 13 Watershed Watch Campaign Work Plan Year Five, FY 2004-2005

Prepared By: TRG & Associates

Introduction

The Santa Clara Valley Urban Runoff Pollution Prevention Program (Program), together with the Watershed Management Initiative (WMI) will be embarking on Year Five of the Watershed Education and Outreach (WE&O) campaign known as "Watershed Watch" at the start of fiscal year (FY) 2004-2005. Year One (FY 2000-2001) involved development of the Three Year Plan, First Year Work Plan, the Latino Characterization Study and campaign materials. Year Two (FY 2001-2002) was launched in September 2001, with the media advertising campaign and other approved campaign elements. Year Three (FY 2002-2003) was the second full year of campaign activities. Year Four of the campaign, FY 2003-2004, in progress, is the third full year of implementation of the campaign.

In this current fiscal year, the Watershed Watch Campaign (Campaign) continues to focus on media advertising, a presence at numerous events, school education outreach assemblies, the web site, promotions, developing and implementing partner resources, a public opinion survey and focus group, and other tasks described below.

FY 2003-2004 Progress to Date

The following is a list of tasks completed to date (or ongoing where noted) during the first half of Year Four (FY 2003-2004).

- **Task 2 - Develop Materials** – A flyer was developed to promote family activities at the Don Edwards National Wildlife Environmental Education Center and inserted into the San Jose Mercury News Newspaper In Education teacher materials. A flyer for the Classic Car Wash promotion through the San Jose Mercury News and KRTY was also developed. (Ongoing)

- **Task 3 - Partner Coordination -** Continued development of the partner database and conducted numerous meetings with potential new partners. New partners this fiscal year include Classic Car Wash, Chinese American Mutual Assistance Association, Strong Neighborhoods and Bonfante Gardens. Other potential partners are still in development. (Ongoing)

- **Task 4 - School Education Outreach –** Fifty ZunZun assemblies have been funded for this fiscal year and to date, all 50 assemblies have been scheduled at 27 schools. The assembly program was revised last year to focus more on watersheds and impacts to our creeks and Bay. A teacher evaluation post card has been developed and provided to ZunZun for distribution to teachers whose students experience the assembly. One hundred twelve teacher surveys have been returned to date. A mid-point evaluation was submitted to the Program in December 2003. Watershed Watch kits are distributed by ZunZun to each teacher at every school. (Ongoing)

- **Task 7 – Events** – A total of twelve events (nine through media and other partners as well as three TRG-staffed events) have been attended this year. In addition, TRG developed and updated the events calendar on a monthly basis; organized and attended numerous events; coordinated materials and supplies for media partner events. (Ongoing)

- **Task 8 – Research and Develop Media Advertising –** TRG launched a radio, print and transit advertising campaign with media partners for a Summer campaign; reused the Got Bugs transit and print ads (both English and Spanish) and used the Got Paint print and radio ads with slight revisions. In addition, TRG implemented the Classic Car Wash promotion, and assisted KRTY with an on-line Watershed Watch quiz and promotion at Raging Waters. A Spring 2004 campaign is in the planning stages. (Ongoing)

- **Task 11 – Develop Web Site –** TRG continued to maintain, revise and add information to the web site, and developed a web site plan that has received approval. Work on new pages is in progress. Web page views are averaging 250 per day. (Ongoing)

- **Task 12 - Reports and Meetings –** Attended meetings with WEO PI/P Ad Hoc Task Group and other committees; submitted monthly reports including activity summary, partner chart, events calendar and web stats; developed Watershed Watch Campaign Update (one completed and one in progress); frequent communication with Program staff. (Ongoing)

- **Task 13 - Develop 2004-05 Work Plan** – This is the second draft of the Work Plan submitted to Program. (Ongoing)

- **Task 14 - Public Opinion Survey** - A public opinion survey was completed and two public focus groups were conducted in 2003. TRG worked with the Ad Hoc Task Group and Evans McDonough to draft the survey and participated in meetings.

FY 2004-2005 Campaign Strategy Summary

Year Five of the campaign will focus on continued implementation of public outreach activities to help achieve the WE & O objectives. It is recommended the campaign continue with the tactics that have proven successful (gauged through number of participants, value added, responses to web site, etc.) and continue to reinforce the watershed/pollution prevention messages using the tools already developed and in progress including advertising, partnering and promotions, events, school education, web site, material distribution, newsletter articles and the information hot line.

A smaller advertising budget and $50,000 allocated to BASMAA requires that TRG alter some tactics and activities for FY 04-05. A limited number of Watershed Watch kits will be available for distribution – TRG will developed an allocation plan for the year to ensure that kits are primarily utilized for school education and events. As described further in the Work Plan, it is recommended that the entire net advertising budget be expended for one longer flight in Fall 2004 rather than broken up into two small campaigns as done in the past. The rationale for this tactic is described further in the Work Plan.

The use of the Watershed Watch discount card has increased in FY 03-04 due to the Classic Car Wash promotion and promotion on the web site. The card can be used at Happy Hollow Zoo, Classic Car Wash and Bonfante Gardens, and it is recommended that TRG and the media buyer work with media partners to find more uses for the card. Although there will be a limited number of discount and pledge cards due to the number of remaining kits, both these forms can be downloaded and printed from the web site.

The tactics mentioned above will be built upon through strengthening and broadening our relationships with existing partners, continuing school assemblies to include new targeted schools; maintaining the web site; and creating new promotions and activities through the media partners. It is recommended that messages in the media and other communications continue to focus on specific behaviors that emphasize pollution prevention.

Some new avenues that are currently in development, and can be continued and expanded in Year Five include:

- A third community IPM workshop with an expanded base of partners to educate the public about nontoxic gardening, pest control (IPM methods), and safe disposal of household hazardous wastes. TRG is currently in discussion with Guadalupe River Park & Gardens, Strong Neighborhoods, United Neighborhoods, Master Gardeners and County Household Hazardous Waste Program to implement a second Spring 2004 workshop. If successful, it is recommended that a third workshop be conducted in 2005.
- TRG is just initiating discussions with the Alviso Education Center to determine how we can expand our partnership efforts and help attract new visitors to the center. We will also help promote Migratory Bird Day as we have in the past, utilizing free on-air promotions provided by our media partners and on the web site.
- Another Classic Car Wash promotion is in the preliminary stage for Spring 2004. The past event was successful and if Classic Car Wash wants to participate again, it could potentially occur again during the Fall 2004 media campaign.
- Happy Hollow Park & Zoo is interested in expanding their partnerships in conjunction with Watershed Watch partners. There is potential for future events, promotions and advertising

with the Zoo. With the Watershed Watch display at the Zoo, the public can be encouraged to visit the Zoo and view the display.

Campaign Messages

The Watershed Watch campaign will continue to utilize the key messages adopted in the Watershed Education and Outreach Strategy and recommendations from the Watershed Watch evaluation. Messages will focus on four pollutants: automotive fluids, litter, mercury and pesticides, and will include specific information about what the public can do to reduce these pollutants. Messages are conveyed through the Watershed Watch kit, web site, media advertising, events and other promotions.

A Watershed Watch Campaign evaluation was conducted in September 2003. The evaluation included a telephone survey of Santa Clara valley residents, two focus groups and feedback from current Watershed Watch partners. The consultants conducting the evaluation recommended dividing target audiences into short term and long term audiences and identified demographics that fit these profiles. Additionally, a sub-group of the WEO AHTG reorganized program goals into short term and long term goals and identified example messages, tactics and which goals and messages are most appropriately handled at the local level and which are best handled at the regional level

In FY 04-05, the Program's WEO/PIP AHTG will further analyze the recommendations from the Watershed Watch evaluation and the revisions recommended by the sub-group. The recommendation from this Work Group and the WEO AHTG will be used to modify campaign messages as needed.

Based on the 1999 Watershed Education and Outreach Strategy and subsequent revisions, the primary messages for adults, school-aged children and Latinos include:

- A watershed is a land area that drains water into a creek, river, lake, wetland, bay or groundwater aquifer. In the Santa Clara Valley, all the water from rain and irrigation which flows over the land surface (called runoff) goes into storm drains, creeks and rivers that flow directly into San Francisco Bay.
- You live in a watershed that flows to a local creek and all of the runoff from your home, yard and neighborhood flows to that creek. Your actions affect local creeks and the Bay.
- Be a watershed steward.
- By protecting the watershed, creeks and the Bay, you are protecting the environment for yourself, your children and future generations.

Secondary messages for adults, school-aged children and Latinos include:

- Protection of the natural resources in our watershed is essential to maintain the health and well-being of all living things.
- Participate in activities that protect or enhance the watershed, creeks and the Bay.
- You help protect the watershed, creeks and the bay when you handle and dispose of pollutants correctly. [Pollutants to be addressed include, but are not limited to, pesticides, mercury, trash/litter, pet waste and household hazardous waste.]
- Choose behaviors that benefit the watershed and protect natural resources.

[Take your car to a commercial carwash, recycle oil, take household hazardous waste to your local collection facility, use pesticides only as a last resort, and clean up after your pet.]
- Don't dispose of anything into a storm drain. It's the law!

TRG may also work with Program staff to integrate or promote other PIP outreach activities. These activities can be supported through use of the Watershed Watch web site, use of the logo on materials, news stories, events and some promotions as they develop. TRG will also be coordinating with BASMAA's regional advertising campaign and its media relations efforts.

FY 2004-2005 Work Plan Tasks

The FY 2004-2005 campaign includes the following tasks:

- Task 3 – Partner Coordination and Promotions
- Task 4 – School Education and Outreach
- Task 7 – Events and Event Coordination
- Task 8 - Media Advertising
- Task 11 - Web Site
- Task 12 - Reports and Meetings

Description of Tasks

Task 3 Partner Coordination and Promotions

Purpose:

To seek partners from the business, environmental, government, media and community/nonprofit sectors that will help augment campaign funding and resources, and demonstrate widespread support for the campaign.

Description of Tasks:

Developing partners has proven very successful in augmenting campaign resources. Partners have published newsletter articles, distributed Watershed Watch Kits through educational and promotional activities and events, offered web site links, hosted a Watershed Watch display, and shared other resources. It is recommended that partner development continue, with more emphasis placed on broadening the existing partnerships already developed.

There are numerous partnerships developed in FY 03-04 that have expressed a willingness to expand opportunities to work together. We recommend moving some funds into event coordination in FY 04-05, because we want to ensure that we can continue with the events hosted in the past and so that we can reserve some funding from Task 7 for any additional events that may occur with those existing partners. TRG will continue to seek new publicity and promotional opportunities (discount cards, contests, etc.) that will occur with existing and any new partners as they are secured. We will continue to identify new potential partners, arrange

meetings and coordinate any resulting partnership arrangements; however we recommend that the majority of our efforts be spent expanding existing partnerships.

TRG will also make attempts to introduce partner relationships between the organizations that we have already worked with. For example, there may be some opportunities for Happy Hollow Zoo and the Alviso Education Center to coordinate environmental education events and efforts. TRG will suggest and facilitate these partnerships.

Work with the Alviso Education Center will continue. TRG is already in discussions with Laurie McEwen,Interpretive Specialist, to discuss opportunities for FY 03-04, and will try to forecast any new activities for FY 04-05. Alviso develops an Annual Work Plan and TRG will coordinate with their planned activities.

Targeted Audiences:

Community Leaders/Nonprofits
Business and Industry
Co-permittees
Other Regulatory Agencies

Goal:

To secure partners who can bring additional resources to the campaign.

Co-permittee/Program Staff Responsibilities:

Co-permittees and staff may be asked to attend some partner meetings if there is a need for more technical/regulatory information.

Budget:

$16,500

Deliverables:

- 20 partner meetings, and coordination of activities with existing and new partners
- Promote activities at the Alviso Education Center and with other partners (Creek Clean ups, Children's Discovery Museum, Pick Up San Jose, IPM workshop, etc.)
- Partner matrix updated on a monthly basis with value of partnership and description of activities
- Two new campaign partners

Completion Date:

June 30, 2005

Task 4 School Education Outreach

Purpose:

The purpose of school outreach is to reach school aged children, one of the targeted audiences, with messages about watersheds and how to protect them; to promote watershed stewardship; and change behaviors that negatively impact creeks and the Bay.

Description of Tasks:

The past school education program has consisted of assemblies presented by ZunZun, a post-assembly teacher evaluation; distribution of the Watershed Watch Kits to all participating schools; developing, printing and distributing teacher evaluations; ongoing coordination with ZunZun; and mid and final reports. In FY 04-05, TRG's activities will be limited to primarily ongoing coordination with ZunZun, due to the limited budget. Program staff will take over the responsibility of printing and tallying evaluations, and developing the mid-year and final school education reports.

During FY 03-04 the web site will be expanded to include activities for students and resources for teachers. Partnerships with other environmental education programs may also result in additional activities and means of promoting Watershed Watch messages in the schools. We recommend that these resources be promoted so that teachers will utilize them from the web site. Funding for a flyer would have to come from other sources since Task 2 Develop Materials has been eliminated from the campaign budget.

Targeted Audiences:

School Aged Children
Educators
Latino Communities (schools residing in predominantly ethnic communities)
Asian Communities (schools residing in predominantly ethnic communities)

Goal:

To build long-term understanding of watersheds and teach students how to prevent pollution.

Co-permittee/Program Staff Responsibilities:

Print teacher evaluation post cards and develop the mid-point and end of the year evaluation of surveys. The Schools Work Group will be involved in this evaluation, and provide direction for the ZunZun assemblies.

Budget:

$1,960

Deliverables:

- Fifty (50) ZunZun assemblies (funding is separate from TRG budget)
- Ongoing coordination with Zun Zun

Completion Date:

June 30, 2005

Task 7 Events Calendar/Planning & Coordination

Purpose:

To reach wide audiences at various events to build watershed awareness, promote campaign messages and disseminate information and materials.

Description of Tasks:

Development of the events calendar, with TRG-staffed events and partner events will continue. It is also recommended that the concept of community workshops dealing with gardening, composting and pesticides reduction be continued with partnerships developed in FY 03-04. TRG will continue to seek partners (media and others) who will distribute Watershed Watch Kits at events. TRG will meet and work with the Alviso Education Center staff to help promote and expand center events. Events developed during the year with partners will also be coordinated and implemented.

Targeted Audiences:

Santa Clara Valley Adults
School Aged Children
Latino Communities

Goal:

To reach out to large groups of people in order to disseminate information and educate about watersheds and watershed issues.

Co-permittee/Program staff responsibilities:

Co-permittees will inform TRG of events occurring within their jurisdictions and request materials as needed. Program staff and Co-permittees will work with TRG to develop new events and staff events as necessary.

Budget:

$27,660

Deliverables:

- Coordination of materials distribution and related promotions at a minimum of 12 events
- Staffing, coordination and planning at four events (in addition to the 12)
- Coordination of a community IPM workshop as budget allows
- Brief listing of attended and upcoming events as part of the monthly campaign reports
- For each event attended by TRG and/or Program staff, an event summary sheet will be completed with the types and numbers of materials distributed, target audiences reached, and approximate number of attendees.

Task 8 Media Advertising Campaign

Purpose:

Implement a media advertising campaign that provides high visibility to the watershed message, increases awareness and eventually influences behavior change with the targeted audiences.

Description of Tasks:

With a recommended net advertising budget of $100,000 for the year, it is recommended that the funds available be used entirely for a longer Fall 2004 campaign. A Spring 2005 advertising campaign would be eliminated. This would allow TRG and the media buyer to utilize $100,000 for a three-four month campaign that would provide more leverage to purchase media at lower rates for a longer period of time, and would bring more value added resources. Utilizing the entire budget for a Fall 2004 campaign would also allow TRG to leverage the funding spent in the Spring 2004 campaign (funded in FY 03-04) along with the Fall 2004 flight and negotiate more value added as well as better rates.

TRG will continue to request "value added" resources from media partners and work to bring in third party sponsors. It is recommended that the campaign stay the course by reusing the Got Paint, Got Bugs print, radio and transit ads to eliminate graphic design expenditures and continue specific pollution prevention messages. TRG will use just the instrumental portion of the Watershed Watch song under the radio ads and try to find another voice talent to record the spots. A small design budget is funded in case of any new promotional activities with media partners where design is needed or if any small changes are required to the existing ads. A budget for production costs and promotions is reserved to fund any media-related events, flyers and promotions.

Task 8 budget includes funding for Buy Right Media Service's (media buyer for the Campaign) commission on the Watershed Watch Campaign and the BASMAA Regional Ad Campaign (RAC). The funding of $50,000 to BASMAA is directly from the Program and separate from the Watershed Watch Campaign Budget. The commission on the BASMAA RAC is subject to BASMAA agreeing to let Buy Right Media Service to pursue direct negotiations with the $50,000 from SCVURPPP. The plan is to let Buy Right Media Service directly negotiate with a San Francisco area television station on behalf of the South Bay (although the reach will be regional) because the media is trying to "court" new business in the largest designated market area in the region (South Bay). This will allow Buy Right Media Service to have excellent negotiating power while also being able to obtain value added resources that will benefit the South Bay and the region as a whole. This plan will be discussed with the BASMAA RAC committee as they develop their Work Plan for FY 04-05.

Media relations in the form of press releases, interviews and stories will continue to be pursued through media partners. A Request for Proposal will be distributed to appropriate media outlets to determine optimal schedules, coverage, and value-added resources, leveraging the Spring 2004 funds along with the FY 04-05 funds. TRG will work with the media buyer to recommend the selected media for FY 04-05, and will continue to track invoices, meet with media partners as necessary and provide mid and end of the year media evaluations.

Tasks:

- Coordinate production changes to print ads and radio spots (music, voice talent, potentially adding more mercury items)
- Coordinate print, transit and radio ad placement with media partners
- Monitor invoices for accuracy of billing and evaluate value-added resources
- Meet with media partners to encourage and develop third party sponsors and other promotions and coordinate those promotions
- Track and report responses to the hot line, web site, and other promotional calls to action and report in mid and final media reports
- Coordinate with BASMAA and co-permittees as opportunities arise with media relations and advertising
- Develop any promotional pieces as needed

Targeted Audiences:

Santa Clara Valley Adults
School Aged Children
Latino Communities

Goal:

Continue to implement media advertising that increases watershed awareness and educates the public about specific pollution prevention actions they can take.

Co-permittee/Program staff Responsibilities:

Co-permittees and Program staff will review the media strategy and the mid-year and final media reports.

Budget:

$146,000 (includes media buys)

Deliverables:

- Coordination of the Fall 2004 advertising campaign and value added resources
- Revisions to radio spots and potential revisions to print ads
- Mid-year and final media reports
- Implementation of third party promotions

Completion Date:

June 30, 2005

Task 11 Web Site Development

Purpose:

To provide up-to-date information in an easily accessible format regarding the campaign, watersheds, pollution prevention practices, upcoming events, promotions and contests and partner-related activities. To encourage and increase public participation in activities and behaviors that protect, preserve, and improve the watershed.

Description of Tasks:

The web site will be expanded in FY 03-04 in accordance with the approved web site plan. Because of the smaller budget in FY 04-05, it is recommended that any modifications or additions be in response to any new media or partner promotions, contests or information, or event announcements provided by the co-permittees.

Targeted Audiences:

Santa Clara Valley Adults
School Aged Children
Latino Communities

Goal:

To provide additional resources and information in response to media and partner events and promotions.

Co-permittee and Program Staff Responsibilities:

Program staff and a small work group of co-permittees will review any new web site content. Co-permittees may suggest links and other resources.

Budget:

$9,880

Deliverables:

- Development of a minimum of four new pages (for promotions, events, etc.)
- Ongoing upkeep and maintenance and removal of outdated materials
- Monthly reporting of web statistics

Completion Date:

June 30, 2005

Task 12 Reports & Meetings

Purpose:

To maintain and improve ongoing communications with Program staff and WEO PI/P Ad Hoc Task Group members regarding campaign progress.

Description of Tasks:

Activity, partner, web stats and event reports will continue to be produced monthly. TRG will participate in quarterly WEO PI/P Ad Hoc Task Group meetings and other presentations as requested.

Targeted Audiences:

Program Staff
Co-Permittees
WEO PI/P Ad Hoc Task Group

Goal:

To ensure smooth communications between Program staff, the WEO PI/P Ad Hoc Task Group and TRG.

Co-permittee and Program Staff Responsibilities:
Attendance at WEO PI/P Ad Hoc Task Group meetings, Program staff review of progress reports, invoices and progress with deliverables.

Budget:

$8,000

Deliverables:

- Twelve monthly reports
- Quarterly meetings with WEO PI/P Ad Hoc Task Group and Program staff
- Presentations (as requested by Program staff and the WEO PI/P Ad Hoc Task Group)
- Mid-year and end of year reports on the effectiveness of the campaign, including Kits distributed, hot line calls, web site hits, events attended and other relevant statistics

Completion Date:

Mid-year Report – January 15, 2005
Final Report – June 30, 2005

Campaign Budget Summary:

TRG Budget	**$ 110,000**
Media Buys	$ 100,000
Watershed Watch Campaign Subtotal	$ 210,000

Alviso Education Center Funding	$ 75,700
BASMAA Funding	$ 50,000
ZunZun Funding	$ 25,000

EOA markup on TRG Contract (10%)	$ 11,000
EOA Staff Support	$ 50,000
Total Campaign Budget	**$ 421,700**

Attachment 3-2

Attachment 3.2: "Watershed Watchers: Keeping Our Waterways Clean" Program with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso.

To conduct the Watershed Watchers Program, the Program will fund and support an interpretive specialist position at the Alviso Education Center. The program includes the following elements:

Watershed Watchers: Puppet show introducing the concept of watersheds and urban runoff. The show will be performed on-site and off-site.

Wildlife in Our Watershed Depends On You: Interpretive programs focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed. Examples include children's bird walks, salt marsh mud studies, twilight walks and general nature hikes followed by chemical demonstration of eutrophication.

Gardening Without Chemicals Workdays: Garden work days emphasizing chemical-free gardening techniques.

Gardening Without Chemicals Workshops: Workshops guiding visitors through various native plants in EEC demonstration gardens while discussing chemical-free gardening techniques used in the gardens and implementation methods for the home garden.

Help Save the Bay This Holiday: Guided nature tours in Bay habitats based on a holiday theme. The program addresses how individual behaviors cause urban runoff pollution which affect wildlife habitats in the watershed.

Our Role in Preventing Urban Runoff: Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. This is usually done with groups that make reservations (e.g., Scouts and Lyceum).

Special Events: These events are designed to attract at least 200 people to the EEC for various activities including games and crafts. Each activity educates participants about urban runoff pollution prevention.

Watershed Clean-Up: A concentrated effort to remove litter from watershed areas (e.g., creeks and sloughs).

Informal Indoor Visitor Contact: Includes interaction at the Center and answering visitor questions over phone.

Distribution of Specified Programs to Local Media: Includes contacting Bay Area Parent, Mercury News, and Metro; and creating appropriate descriptions/press releases.

Developing and Maintaining Partnerships with Local Community Organizations: Phone calls and e-mails to groups which include San Jose Community Gardens, the San Francisco Bay Bird Observatory and volunteer coordinators at local companies (e.g., Intel and Sony, etc.).

Coordinating Refuge Volunteers for Interpretive Programs/Gardens: Contacting volunteers to lead programs, training, and maintaining relationships with volunteers; and scheduling volunteers for special events.

Alviso Summer Camp: This includes acting as a leader and assisting in program planning for the one-week annual camp which targets Alviso residents.

Attachment 3-3

FY 04-05 Development Strategy Checklist
Pesticide User Outreach

1. **Project Title:** **Pesticide User (PU) Outreach**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:**
Toxicity due to organophosphate pesticides (diazinon and chlorpyrifos) in local creeks and San Francisco Bay. Selection, use and disposal of pesticides by residential and commercial users, pest control operators, and pesticide retailers.

4. **General Project Description:**
This project combines the best elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements in the SCVURPPP NPDES permit. The approach will be coordinated with other pollution prevention programs funded by co-permittees, such as the County's Household Hazardous Waste Program. Scope to be developed based on the Program's Pesticide Management Work Plan and the results of the FY 03-04 outreach work. Activities may include:

- IPM Store Partnership Program - Continue the program in stores in participating Santa Clara County stores. Visiting each store once every two months at a minimum, maintain ongoing relationship with participating stores through in-store contacts, refresh/restock literature racks as needed, and update "shelf talker" labels as needed. Based on feedback from training sessions offered to store employees in FY 03-04 and the number of stores remaining, the Program may provide five training sessions to store employees. These sessions train employees in selling less-toxic pesticides.

- Regional IPM Partnership –Support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. Review and approve products.

- Pesticide Distributor Outreach Program – Continue to support the Pesticide Distributor Outreach Program through BASMAA by coordinating Annie Joseph's efforts in this project with the Store Partnership outreach efforts. Provide staff for conducting outreach events at stores, such as Orchard Supply Hardware. At these events customers are educated on available less toxic pest control methods and products, and proper disposal of pesticides.

- Outreach Events - Plan and conduct three or four pesticide outreach events in coordination with Watershed Watch. These may include Pumpkins in the Park , YSI Wildlife festival, Spring in Guadalupe Gardens, International Migratory Bird Day, San Jose Spring Home and Garden Show etc. Program and Co-permittee staff will staff these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures like Pests Bugging You, Grow It and Backyard Bugs.

- IPM Workshop - Plan and conduct an IPM workshop for the general public in coordination with the Watershed Watch campaign and its partners. The Program conducted a similar workshops in FY 02-03. Master gardens gave presentations at this workshop and over 30 people attended it. The FY 03-04 workshop is being currently planned.

- Media Advertising - Conduct media advertising in coordination with the Watershed Watch campaign. The ads will focus on pest control using less-toxic methods.

- Outreach to industrial businesses - Continue distributing the "Don't set a table for pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.

Task 8 - Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies,

FY 04-05 Development Strategy Checklist
Pesticide User Outreach

model contract language, training opportunities, etc.) to special districts within each Co-permitee's jurisdiction (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) and to the extent of each Co-permittee's authority – Contact these groups and assess the amount of information they have or need regarding IPM, and develop and implement a prioritized outreach plan based on the findings of the assessment.

5. **Outreach/Activity Areas and Communication Goals:**
PI/P Outreach/Area to be further determined. PI/P Communication Goal will include Increasing Awareness and Changing Behavior, particularly with respect to pesticide use and disposal.

6. **Target Audience:** To be determined, may include:
(X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools,
( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education,
( ) Other_____

7. **Distribution Strategy:**
To be determined.

8. **Describe how the success of the project will be measured:**
The BASMAA Regional IPM Committee is conducting a customer survey in FY 03-04 to evaluate the success of the IPM Store Partnership Program. This data will be used to assess the success of the Program's outreach efforts. Additionally, data from the Watershed Watch evaluation pertaining to pesticide use will be used to evaluate outreach. Program staff also maintain a log of requests received for fact sheets, number of fact sheets distributed and number of people reached at outreach events.

9. **Have similar projects been done by other agencies?**
Yes

10. **Schedule:**
FY 04-05

11. **Budget:**

$40,000

12. **Identify the evaluation criteria that the project meets:**

(X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
(X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
(X) County-wide implementation will be more cost-effective than local implementation.
(X) The project supplements a regional project and/or program.
(X) The success of the project is measurable.
(X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. **Implementer(s):** (X) Work Group, (X) Program Staff, ( ) Consultant,
( ) Other:_____

FY 04-05 Development Strategy Checklist
Mercury Outreach

1. **Title:** Mercury Pollution Prevention

2. **Project Proposer:** SCVURPPP Mercury Pollution Prevention Ad Hoc Task Group

3. **Specific Pollutant or Behavior Project Addresses:** Mercury

4. **General Project Description:** The reissued NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedance of water quality standards for mercury.

Mercury has been found in sediment from the South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires a mercury pollution prevention plan that includes public education regarding mercury, products containing mercury and proper disposal. The Program completed a Mercury Pollution Prevention Plan and submitted it to the Regional Board on March 1, 2002. The outreach tasks in this Plan are the basis for the FY 02-03 (Phase I) and FY 03-04 (Phase II) work plans. The focus of outreach in FY 02-03 was residential fluorescent light tube disposal. In FY 03-04, this outreach was extended to small businesses and conditionally exempt small quantity generators. Outreach was coordinated with municipal inspectors for integrating mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.

In FY 04-05, outreach will be coordinated with the County Household Hazardous Waste (HHW) Program's Mercury Grant (Attachment 3-3). The County HHW Program is implementing this grant to increase collection opportunities for mercury-containing universal wastes including thermostats, fluorescent lighting, and button batteries at HHW collection events and community collection sites. The Program will coordinate with the County HHW Program in FY 04-05 and help implement an advertising promotion. Outreach information will also be distributed at community events and through newsletter articles. In FY 02-03 and FY 03-04, outreach messages were primarily targeted to recycling of fluorescent lamps; in FY 04-05, outreach messages will be expanded to include information on other mercury containing wastes.

4. **Outreach/Activity Areas and Communication Goal:** Develop a plan to increase outreach efforts to residents and businesses on recycling of mercury containing wastes.

5. **Target Audience:**
(X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools, ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education, ( ) Other_____

6. **Distribution Strategy:** Media advertising, newsletter articles, distribution of information at outreach events.

7. **Describe how the success of the project will be measured:** Number or amount of mercury-containing products (i.e. fluorescent lamps, thermometers) collected by Household Hazardous Waste facilities; description of outreach methods used; number of outreach materials distributed.

FY 04-05 Development Strategy Checklist
Mercury Outreach

8. **Have similar projects been done by other agencies?** City of Palo Alto has conducted a FLT recycling program. Smaller projects (i.e. thermometer take-back programs) have been conducted by other agencies.

9. **Schedule:** FY 04-05

10. **Budget:** $25,000 for FY 04-05

11. **Identify the evaluation criteria that the project meets:**

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    (X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

12. **Implementer(s):** SCVURPPP Mercury Pollution Prevention Outreach Work Group for FLT recycling in coordination with the Watershed Watch campaign and the SCVURPPP PIP Ad Hoc Task Group

FY 04-05 Development Strategy Checklist
Program Supplies

1. **Project Title:** **Program Supplies**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:** Varies

4. **General Project Description:**
   To provide a budget to support requests by the public and co-permittees for Program materials and supplies. This budget allows Program staff to reprint materials and reorder supplies as needed.

5. **Outreach/Activity Areas and Communication Goal:** N/A

6. **Target Audience:** To be determined, as needed.
   (X) Residential, (X) General Public, (X) Industrial, (X) Commercial, (X) Schools, (X) Municipal Employee Training, (X) Public Officials, (X) Multi-cultural Education, (X)
   Other_____

7. **Distribution Strategy:**
   Program staff will coordinate material reprints, reordering supplies and distribution to co-permittees as appropriate. Program staff distributes materials at public events and in response to telephone, e-mail or web site requests.

8. **Describe how the success of the project will be measured:** The Program logs all requests for materials and tracks the amount of materials distributed. The need for reprints is based on successful distribution of existing stock.

9. **Have similar projects been done by other agencies?** N/A

10. **Schedule:** As needed.

11. **Budget:** $5,000

12. **Identify the evaluation criteria that the project meets:** N/A

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    ( ) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

SECTION 4

FY 04-05 ANNUAL MONITORING PLAN & WATERSHED MANAGEMENT MEASURES

4. MONITORING PROGRAM

INTRODUCTION

The Annual Monitoring Program Plan contains two main elements: 1) Summary of Environmental Monitoring Measures (EMMs), and 2) Summary of Programmatic Monitoring Indicators (PMIs). The goals of the Program's monitoring program are provided within the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program) Revised Multi-Year Receiving Waters Monitoring Plan[1].

SUMMARY OF ENVIRONMENTAL MONITORING MEASURES (EMMS)

Environmental monitoring and assessment measures (EMMs) are activities that entail the collection of environmental data through field studies and analysis of information through assessments. EMMS are coordinated at the local or regional level and typically fall into one of two general areas:

- Watershed Assessment Activities; and,
- Pollutants of Concern (POCs) Monitoring.

EMMs are intended to: 1) assist the Regional Board characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program; 2) identify where and what type of screening-level monitoring is appropriate; and 3) recognize the need for site-specific water quality investigations to address questions that might arise while conducting screening-level monitoring efforts. The main EMM activities that the Program will conduct during FY 04-05 are described in the following sections.

FY 04-05 Annual Receiving Waters Monitoring Plan

The Annual Receiving Water Monitoring Plan (Annual Plan) is provided in Attachment 4-1. Table 4-1 in Attachment 4-1 was prepared consistent with the Revised Multi-Year Plan, which is provided in Attachment 4-2. Table 4-1 includes and identifies planned receiving water monitoring activities for FY 04-05, the proposed schedule (by fiscal year quarter) to conduct the work, the rationale for the proposed item and the lead party. The Annual Plan utilizes a tiered monitoring approach. The approach is discussed by Regional Board staff in its RMAS memo (February 8, 2001 Draft Monitoring Design in Regional Board-lead Pilot Watersheds) and includes the following monitoring categories: screening level, investigative, and status and trends.

The locations and frequencies of sampling events scheduled during FY 04-05 are shown in Table 4-2 of Attachment 4-1. A site map (Figure 4-1) detailing sampling locations in the Adobe Creek, San Thomas Aquino Creek, Calabazas Creek, Sunnyvale (East and West) and Matadero/Barron Creek watersheds is also provided Attachment 4-1. Table 4-3 of Attachment 4-1 provides a description of data parameters and analytical methods to be used in the Revised Multi-Year Plan.

[1] Program's Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan) was revised to embrace the recommendations presented in the *Assessment of Watershed Assessment Methods* report and lessons learned from monitoring in FY 02-03 and 03-04. The Revised Multi-Year Plan covers a period of eight years starting with FY 02-03 and is included in Attachment 4-2. Each SCVURPPP Annual Monitoring Plan is developed consistent with the framework in the Revised Multi-Year Plan.

Sediment Assessment

Beginning in FY 03-04, the Program began conducting a limiting factors analysis and sediment management practice assessment in Stevens Creek watershed to determine if the creek is impaired by sediment production from anthropogenic activities. The Work Plan was previously submitted to Regional Board staff on August 30, 2002 in fulfillment of the SCVURPPP NPDES Permit Order No. 01-024 Provision C.9.f.iii paragraph two (see Attachment 4-5 of the Program's FY 03-04 Work Plan).

The Sediment Assessment Work Plan contains two separate phases. Phase I is scheduled for completion in FY 03-04 and includes conducting a limiting factors analysis and sediment management practices assessment. Phase II includes conducting a rapid sediment budget and is scheduled for FY 04-05. Phase II will only be conducted if Phase I study results indicate that excessive sediment from anthropogenic sources is impairing beneficial uses in the watershed.

Planned FY 04-05 Activities

In FY 04-05, the Watershed Analysis Ad Hoc Task Group (Watershed Analysis AHTG), which was previously established to develop the work plan, will review products developed in Phase I and make recommendations for Phase II in Stevens Creek, if warranted; or, if sediment is determined to not be a significant limiting factor in Stevens Creek, a watershed analysis will then begin in Coyote Creek. The Watershed Analysis AHTG recommendations will be reviewed and approved by the Management Committee.

For additional information on sediment assessment-related tasks to be completed in FY 04-05, refer to the sediment monitoring project summary in Attachment 4-3.

Trash Work Plan

To fulfill a FY 01-02 Continuous Improvement item, the Program prepared a Trash Work Plan (see Attachment 4-6 of the FY 03-04 Work Plan) that identifies a strategy for addressing trash problem areas that occur in urban streams and waterways. The Work Plan was developed in response to the November 14, 2001 RWQCB 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on a preliminary or "monitoring" list due to the threat of trash impairment to water quality. The Trash Work Plan includes the following objectives: 1) Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in creeks; 3) Assist municipalities in identifying the high priority trash problem areas and sources of trash; 4) Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas; and 5) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

Planned FY 04-05 Activities

The tasks identified in the FY 04-05 Work Plan focus on the implementation of trash evaluations and management practices. In addition, the Trash AHTG will review existing performance standards relevant to trash management and identify potential revisions to these standards, if necessary. For additional information on planned trash activities, refer to the Trash Workplan monitoring project summary in Attachment 4-3.

Regional Collaborative Monitoring Efforts

Regional Monitoring Program for Trace Substances (RMP)

In accordance with the Program's NPDES permit, the Program contributes approximately $156,000 annually to the Regional Monitoring Program for Trace Substances (RMP), which monitors contaminant concentrations in water, sediments, and fish and shellfish tissue in San Francisco Bay and the Delta. The San Francisco Estuary Institute (SFEI) administers the RMP. This funding is in addition to funding provided by the three South Bay POTWs, who are also Co-permittees, to the SFEI. Program staff participates on the RMP Steering Committee, Technical Review Committee and Sources, Pathways and Loading Work Group. The Program manager will be serving as the BASMAA member to the RMP Steering Committee.

Clean Estuary Partnership (CEP)

On August 6, 2001, a Memorandum of Understanding (MOU) regarding development of: 1) a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries and 2) TMDLs for 303(d) pollutants (including mercury), was entered into by the Regional Board, BACWA and BASMAA. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program assisted in developing and funding potential projects for the Bay TMDLs. During FY 03-04, Program staff has been participating in CEP Executive Board and CEP Technical Committee meetings. The Program intends to continue its participation in the CEP through in-kind technical/policy assistance and by providing collaborative funding.

Bay Area Stormwater Management Agencies Association (BASMAA)

The Program is a member of BASMAA, a consortium of seven San Francisco Bay Area municipal storm water programs. The goal of BASMAA is to promote regional collaboration on developing consistent monitoring and watershed assessment methodologies and to facilitate efficient use of public resources. Program staff participates in the following BASMAA activities: Executive Board, Monitoring Committee, New Development Committee, Public Information/Participation Committee and Operational Permits Committee and serves as the Vice-chair of BASMAA.

Regional Biological Assessment Network (BAMBI)

In February 2002, the Program participated in a workshop for information sharing and discussion of recent and ongoing bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. Additional workshops were held in January 2003 and 2004. The Program intends to continue supporting and participating in BAMBI in FY 04-05. For additional information regarding these activities, please refer to the BAMBI monitoring project summary in Attachment 4-3.

Brake Pad Partnership (BPP)

After studies in the South Bay indicated that automobile brake pads may be the most significant source of copper in urban runoff, the Brake Pad Partnership (BPP) was initiated in 1996 as a collaboration between regulators, storm water programs, brake material manufacturers, scientists and environmentalists to address environmental problems from brake wear debris.

The BPP's work includes research and monitoring, and is an integral part of the Program's Copper Action Plan. In addition, the Program participates (via BASMAA) by funding a BPP technical representative. During FY 04-05, the Program plans to continue participation in the BPP at its current level.

Planned FY 04-05 Activities

The Program will continue to participate in various RMP committees and work groups; participate in the CEP depending on the availability of resources; and collaborate with BASMAA on regional stormwater issues. In addition, the Program anticipates providing support and actively participating in BAMBI activities with the goal of beginning the development of a regional bioassessment tool which is necessary to provide context to bioassessment data collected in creeks relevant to the Program. Contingent upon available funding, the Program also plans to continue participating in the BPP through BASMAA and/or the CEP.

SUMMARY OF PROGRAMMATIC MONITORING INDICATORS (PMIs)

Programmatic Monitoring Indicators (PMIs) are used to gauge how well performance standards are being met and control measures are being implemented. Programmatic monitoring efforts typically include tracking and evaluating continuous improvements and evaluating the effectiveness of implementing control programs for pollutants of concern.

The FY 04-05 PMIs Summary Table (see Attachment 4-4) illustrates all existing commitments and priorities established by the Program, including ongoing activities meant to fulfill Regional Board Order Provisions C.9. "Water Quality-Based Requirements for Specific Pollutants of Concern" and C.10. "Watershed Management" of the NPDES permit. A brief capsule scope is provided for each project along with the anticipated products and expected timeframe for completion. For some projects, specifically those that are being conducted to directly respond to a specific pollutant of concern referenced in the NPDES permit, a separate one-page scope was developed and is contained in Attachment 4-3. A discussion of pesticide management activities planned for FY 04-05 can be found in Section 5 of this Work Plan.

Control Program Activities- PCBs, Mercury, Chlorinated Pesticides and PAHs

All segments of San Francisco Bay were listed as impaired by mercury, polychlorinated biphenyls (PCBs) and certain chlorinated pesticides (DDTs, dieldrin and chlordane) in the 2002 Clean Water Act Section 303(d) list. The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment. The advisory was issued after these pollutants were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. Polynuclear Aromatic Hydrocarbons (PAHs) are not on the 303(d) list, but were placed on the 2002 Monitoring List for the Bay.

The 2002 303(d) list designates the TMDL priority for mercury and PCBs as high; the Regional Board is currently implementing TMDLs for these pollutants. However, the 303(d) list designates the TMDL priority for dieldrin, chlordanes and DDTs in San Francisco Bay as low. A letter dated December 6, 2002 to the State Water Resources Control Board (SWRCB) from the Bay Area Clean Water Agencies requested that the SWRCB move dieldrin, chlordanes and DDTs from the 303(d) list to the Monitoring List. BACWAA believes the original rationale for listing these chlorinated pesticides in San Francisco Bay was inadequate, and that new

information developed since 1999 further supports removal of these compounds from the 303(d) list. This new information includes studies on pollutant concentrations in San Francisco Bay fish (1997 data) and local fish consumption, and data associated with the California Toxics Rule and the State Implementation Policy (BACWA 2002).

More recent data (collected in 2000) on concentrations of pollutants in fish tissue samples suggest a recent decline of DDTs and chlordanes in Bay fish. In addition, concentrations of chlordanes did not exceed human health screening values. Nineteen percent of samples analyzed for dieldrin and four percent of samples analyzed for DDTs exceeded screening values (Greenfield et al., 2003).

Previous Work

During the past three years, the Program has provided leadership to Bay Area storm water agencies collecting data on pollutants of concern and coordinated with relevant regional programs. Activities have included the following:

- The Program led a regional study, referred to as the Joint Stormwater Agency Project (JSAP), which characterized the distribution of mercury, PCBs and chlorinated pesticides in storm water conveyance sediments in Bay Area watersheds.
- The Program and the City of San Jose performed PCBs case study work in six urban areas in San Jose where elevated concentrations of PCBs were found during the JSAP study. The case studies were aimed at identifying PCBs sources and beginning to develop controls.
- The Program prepared work plans for the above regional and local field studies. The work plans included a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County and preliminary tables summarizing PCBs control options.
- The Program coordinated PCBs case studies by other Bay Area storm water agencies, which included developing guidance documents on performing case study work. The guidance documents outlined case study objectives, typical methodologies and tasks, locations and schedules.
- Program staff facilitated a work group of representatives from BASMAA and Regional Board staff to coordinate the JSAP study and PCBs cast studies. The work group has met periodically to facilitate information sharing, coordination of field activities and regional planning.
- Program staff participated in selected stakeholder, Clean Estuary Partnership (CEP), and San Francisco Estuary Regional Monitoring Program (RMP) committees and work groups.
- Program staff represented BASMAA on the RMP Technical Review Committee and the Sources, Pathways and Loadings Work Group.
- Program staff represented BASMAA on the CEP mercury and PCBs work groups.

PCBs Control Review

The Program recently completed a review of recent efforts to develop methods of controlling discharges of PCBs from Bay Area urban runoff conveyances (Konnan 2004). The review:

- summarizes and discusses past, current and planned efforts to identify PCBs control options in the Bay Area in coordination with the Bay PCBs TMDL, including the PCBs case studies performed to date by Bay Area storm water agencies.
- describes existing urban runoff management practices that may help control discharges of PCBs.
- reviews potential new management practices for controlling discharges of PCBs and qualitatively discusses the pros and cons of each practice.

Planned FY 04-05 Activities

During FY 04-05, the Program will continue to work with other Bay area dischargers and Regional Board staff through BASMAA, the CEP and the RMP to coordinate and plan future monitoring activities related to mercury, PCBs, chlorinated pesticides and PAHs.[2] This will include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff. Program staff will continue to represent BASMAA on the RMP Technical Review Committee and the Sources, Pathways and Loadings Work Group; and the CEP mercury and PCBs Work Groups.

For additional information on tasks to be completed in FY 04-05, refer to the monitoring project summaries in Attachment 4-2 for these pollutants. For additional information on the Program's Control Program for Dioxins, see Attachment 4-5. Additional planned FY 04-05 activities for controlling mercury are presented in Section 6.

Control Program Activities – Dioxin-like Compounds

Provision C.9.e. of the Program's NPDES permit requires development of a control program to eliminate or reduce discharges of dioxin-like compounds from urban runoff conveyance systems associated with any controllable sources. The several hundred compounds often referred to as dioxin-like compounds are generally members of three closely related families: the polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and certain polychlorinated biphenyl (PCB) congeners with dioxin-like potency that are often referred to as dioxin-like PCBs (the Program is addressing PCBs, including dioxin-like PCBs, as part of a separate program). All segments of San Francisco Bay were listed as impaired by certain PCDD/F compounds in the 1998 and 2002 Clean Water Act Section 303(d) lists. The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment. The advisory was issued after PCDD/F compounds and other pollutants (e.g., mercury and PCBs) were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. The Regional Board opposed the 1998 listing of PCDD/Fs in the Bay, but was overruled by the United States Environmental Protection Agency (USEPA).

[2]The Program is separately implementing a mercury pollution prevention program. See Section 6 of the Program's Work Plan and past Annual Reports for additional information.

Previous and Current Work

The Clean Estuary Partnership (CEP) is currently developing a Conceptual Model Impairment Assessment report on PCDD/F in the Bay. This report will provide a more detailed analysis of the status of the impairment and associated uncertainties based on the most current data available. The Program's products addressing dioxin compounds include work plans dated March 1, 2002, March 1, 2003 and March 1, 2004; and a technical memorandum dated October 1, 2002. In addition, the Program recently collaborated with other Bay area stormwater management agencies to develop a "synthesis" document on dioxin-like compounds. This document summarizes the current state of knowledge regarding dioxin-like compounds in relation to stormwater runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, impacts, sources, pathways, review of relevant Bay Area, national and international studies, and qualitative review of potential stormwater controls.

Planned FY 04-05 Activities

During FY 04-05 Program staff will actively track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Program staff will also encourage Co-permittees to track and participate in these programs, as appropriate. Co-permittees may wish to evaluate performing public outreach activities and developing policies and ordinances (e.g., the City of Palo Alto's Dioxin Elimination Policy). Relevant regional, state and federal efforts include the Bay Area Dioxins Project managed by the Association of Bay Area Governments, statewide programs and strategies developed by the California Air Resources Board to reduce the emission of smog-forming pollutants and toxics by non-mobile and mobile sources (e.g., diesel trucks), the Motor Vehicle Mitigation Fund (AB 204), and multi-faceted efforts by USEPA to assess dioxin risks and monitor and control dioxins. The Program will also continue to work with other Bay area dischargers and Regional Board staff through the Bay Area Stormwater Management Agencies Association, the CEP and the San Francisco Estuary Regional Monitoring Program (RMP) to coordinate and plan any future PCDD/F monitoring activities. This may include providing resources to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff.

Control Program Activities - Copper and Nickel[3]

On December 9, 2003, the Program assisted the Bay Modeling and Monitoring (BMM) subgroup in conducting a semi-annual review of the Copper Action Plan (CAP) and Nickel Action Plan (NAP). A meeting summary report is included in Attachment 4-6. The focus of this meeting,

[3] In response to Regional Board staff comments dated November 13, 2002 and June 26, 2003, the Program formalized the process in which the Program and Co-permittees identify specific baseline actions within their individual Cu/Ni Work Plans. Program and Co-permittee staff met on June 6 and July 8, 2003 to discuss and subsequently finalize proposed changes to the CAP/NAP reporting approach and format. On August 5, 2003, the Program and Co-permittees submitted a Revised FY 03-04 Copper/Nickel Work Plan consisting of the updated baseline activity tables for each copper and nickel action. Appendices B and C of the Program's 2001 NPDES permit were used as the starting point in developing the updated Cu/Ni baseline activity tables. The Revised FY 03-04 Copper/Nickel Work Plan also included clarifications and additions intended to address questions and concerns raised by Regional Board staff over the last year.

At the Regulatory Executive Forum meeting on September 26, 2003, Regional Board staff provided Program staff a one page document entitled *CAP/NAP briefing 9-23-03 CAP/NAP talking points only*. The document contained comments on several of the baseline activities contained in the Program's Revised FY 03-04 Copper/Nickel Work Plan. On November 21, 2003, Program staff provided Regional Board staff with some additional background information to clarify the baseline activities mentioned in the "talking points".

and future fall review meetings, was agreed to be stormwater activities. Future spring meetings will focus on POTW activities and the Work Plan. Meeting participants were encouraged to bring up other relevant issues (relating to stormwater and POTW activities) at either future semi-annual review meeting.

Overall, Regional Board staff has indicated that they are satisfied with the improvements made in the Program's revised Cu/Ni Work Plan and the strategy implemented regarding the tracking/completion of tasks. Some minor remaining issues were acknowledged to be difficult to resolve since they are in large part due to the vagueness of the language (in certain places) found in the original CAP baseline activity tables.

Implementation of Copper/Nickel Baseline Activities

The majority of baseline actions have been implemented at the Program level (except for those assigned to San Jose, Sunnyvale and Palo Alto), and are included in the Program's Annual Reports and Work Plans. However, the Regional Board expects Co-permittees to implement some of the actions at the local level. The Program has identified the following copper control activities that are feasible to implement at the Co-permittee level:

- CB-1: Measures to reduce copper discharges from vehicle washing operations;
- CB-3: Measures to control copper in discharges of stormwater in targeted industrial sources;
- CB-6, 7: Measures to reduce traffic congestion/promote alternative transportation;
- CB-8: Measures to classify and assess watersheds and improve institutional arrangements for watershed protection;
- CB-11: Measures to improve street sweeping controls and stormwater system operation and Maintenance;
- CB-12: Measures to control copper discharges from pools and spas;
- CB-21: Measures to discourage architectural use of copper; and
- NB-1: Measures to control nickel discharges from construction sites (sediment).

Individual Co-permitees included measures to address each of these activities, as applicable, in their FY 03-04 revised Work Plans and will provide proposed copper and nickel control measures for FY 04-05 within their Work Plans provided within Section 9. In addition, the Program and certain Co-permittees as appropriate will continue to prepare a Copper/Nickel Work Plan as part of their draft Work Plan submitted March 1 of each year. Currently, the Copper/Nickel Work Plan contains 21 copper and 7 nickel baseline actions. Certain copper work plan actions (e.g. measures to improve street sweeping controls, measures to control copper from targeted industrial sources, measures to evaluate effectiveness of performance standards) closely relate to performance standards requirements or are mandated by the Program's NPDES permit (e.g., Permit Provision C.6.a.i and ii). During FY 04-05, the Program is committed to continuing its focus on the following copper control actions: brake pad partnership, water quality monitoring for copper and other constituents as part of the Program's Revised Multi-Year Receiving Waters Monitoring Plan, public education and outreach and municipal/Co-permittee activities.

FY 04-05 Work Plan Content

The Program's FY 04-05 Copper/Nickel Work Plan is consistent with previously agreed upon format as contained in the Program's *Revised FY 03-04 Copper/Nickel Work Plan*, (i.e., tabular format with columns listing the activity, the FY 04-05 tasks, status/comments, due date, and

responsible party). In addition, it provides updates for FY 03-04 accomplishments reported to date; the originally proposed work plan tasks for FY 03-04; and actions accomplished in FY 02-03 (if applicable). It also clarifies the comments provided in the "talking points" document. The intent of the FY 04-05 Work Plan document is to provide (in one place) a complete on-going history of tasks planned and conducted from FY 02-03 through FY 04-05. The FY 04-05 Copper/Nickel Work Plan is provided within Attachment 4-6. Highlights and accomplishments which have occurred during FY 03-04 include the following:

- CB-1- Three mobile surface cleaner workshops have been scheduled for FY 03-04. The first two workshops were conducted on December 17, 2003 and February 10, 2004. A third workshop is scheduled for March 24, 2004. Over thirty people attended the first two workshops. Recent changes at BASMAA may allow this effort to be conducted on-line in the future. In addition, the Program distributed Watershed Watch (WW) campaign brochures at three public events and worked with WW partner, Classic Car Wash, to do four promotional events in August 2003.

- CB-3- The City of San Jose has committed to the additional production and distribution of stand-alone roof vent BMP information to circuit board and metal finishing facilities. BMP information is scheduled to be printed and mailed to all permitted industrial users in the SJ/SC WPCP service area by March 31, 2004. In addition, the Program continued the NOI Filers outreach project with the City of San Jose.

- CB-5(1), CB-4(1,2,4)- Program staff is actively tracking activities of BPP and efforts under the Proposition 13 grant through BASMAA Monitoring Committee monthly meeting notes and BASMAA BPP liaison notes and communications. Meeting notes are posted on the Program's website on a routine basis. Websites which contain BPP Proposition 13 information have also been posted on the Program's website.

- CB-8: Program staff worked with City of San Jose staff to prepare an analysis of the C.3.m. example questions and how they were addressed by the CEQA Guidelines. In addition, the Program collected channel cross-section data and measured bed and bank material as part of the HMP pilot assessment in Ross and San Tomas Creeks.

- CB-16-: In November 2003, the Program executed a contract with the Clean Water Fund to provide resources for a two year period to develop a P2 clearinghouse. Links/information relating to copper research data will be posted to a web portal during CY 2004. The contract includes other relevant tasks relating to the clearinghouse.

Details about other accomplishments conducted during FY 03-04 (to date, as reported to the Program) are provided in Attachment 4-6. A complete report of FY 03-04 accomplishments will be included within the Program's *FY03-04 Annual Report*.

Future CAP/NAP Approach

On December 9, 2003, the subgroup determined that further efforts at fine-tuning the CAP baseline activities would likely be unproductive due to certain remaining inherent challenges with the original CAP/NAP language. To assist in the identification of key baseline copper control activities that are most effective in the removal of copper, the Clean Estuary Partnership is preparing a document entitled *Copper Sources in Stormwater Information Update*. This work will be conduced during early 2004 as part of North of Dumbarton Cu/Ni site-specific objective (SSO) project funded through the CEP. A menu of these prioritized activities would form the

nucleus for a revised potentially consistent bay-wide CAP. The intent would be to focus a more intensive effort on a smaller number of activities that in turn would be subject to a potentially higher level of scrutiny from Regional Board staff. Based on the outcome of this CEP project and subsequent review and discussions with Regional Board staff and Co-permittees, the Program will develop and submit a revised FY 04-05 Copper/Nickel Work Plan to reflect these focused copper control activities.

ADDITIONAL PROGRAMMATIC MONITORING INDICATORS (PMIs)

Enhanced Reporting - Industrial/Commercial Discharger Control and Illicit Connection/Illegal Dumping Elimination

Since October 2001, Program staff has been assisting each Co-permittee (on an individual basis) with the implementation of enhanced reporting requirements for IND and IC/ID. To demonstrate consistency and compliance (on a Program-wide basis) with the strategy provided in the Program's technical memoranda regarding IND and IC/ID reporting (dated September 7, 2001) and the approved MC approach, Co-permittees have been submitting raw IND and IC/ID inspection data to Program staff. This data is used to construct IND and IC/ID summary tables. The summary tables are double checked (with the Co-permittees) to ensure that the results are reasonably consistent with their internal data and their interpretation of the data; provided to the Co-permittees for inclusion in their annual reports; and included in the Program's Annual Report. The overall goal of the effort has been to capture the full extent and the results of the Co-pemittees efforts in a consistent format and on a Program-wide basis. This effort has been very successful in demonstrating compliance with Permit Provisions C.6.a.i and ii. To ensure effective reporting of IND and IC/ID data, Co-permittees will continue this process during FY 04-05.

The Program plans to develop model language for updating the IND and ICID performance standards to incorporate the new reporting procedures and the results of the Co-permittee evaluations. Due to resource and priority changes and the Co-permittee's focus on higher priority tasks in FY 03-04, this task will be performed in FY 04-05. The Program and Co-permittees will continue implementing IND and ICID reporting procedures consistent with the Program's technical memoranda.

Compile, Maintain and Share Program Watershed Data

The Watershed Assessment Subgroup (WAS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0) and November 2003 (version 5.0). The Program funded the initial development of the SSI and each of the annual updates.

To comply with its NPDES permit, the Program also compiles, develops and analyzes a variety of data sets and reports. Most of this data is collected and generated as part of the Program's environmental monitoring and assessment activities. A majority of the information collected and used by the Program originates from different municipalities and agencies that conduct studies within Program jurisdictional boundaries.

The Program developed a relational database as an initial task to systematically describe and document data used for its activities. The intent of the database is to demonstrate its usefulness of how to systematically and efficiently collect and document all of the relevant data used in the Program's activities. In addition, the database was designed to explore the feasibility of eventually expanding and coordinating its maintenance and use with other agencies and organizations in the Program.

The database is a metadata database which focuses on the description, documentation, and indexing of the data sets, sources, reports, etc. It does not focus on data. The current metadata database incorporated information on data sources that were documented in the existing SCBWMI's watershed assessment metadata database (MDDB) and the WMI's Stream Studies Inventory Report data (SSI). In addition, information used for the Program's Coyote Creek Watershed Integrated Pilot Assessment was entered into the database. The Program developed draft written user documentation for the database in FY 02-03.

Planned FY 04-05 Activities

In FY 04-05, the Program will again update the SSI by collecting information on new projects and updating information on existing projects. This data will also be entered into the Program's database. This update will be a limited update since the Program does a full update once every three years. The latest full update was completed during FY 03-04.

Support for Land Use Subgroup

To implement the Program's Monitoring Priority 3c, develop strategies for controlling impacts of land use on beneficial uses, the Program supports the SCBWMI Land Use Subgroup (LUS). The Program's participation in the LUS is intended to fulfill a commitment in the 1997 Urban Runoff Management Plan (URMP) to "translate SCBWMI goals and objectives into model local-jurisdiction policies and procedures." To provide administrative support and leadership for the LUS, the Program has also created projects meeting the URMP goals.

Planned FY 04-05 Activities

In FY 04-05, the Program will continue to support the SCBWMI Land Use Subgroup (LUS) by providing administrative support and direction.

Attachment 4-1

Attachment 4-1

Table 4-1. FY 04-05 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Adobe Creek	*Chemical*						
	Contaminants-Water [3]	I (1)		I (1)		• Baseline: Dissolved and total metals and organophosphate pesticides were measured in FY 03-04 by SCVURPPP at two sites during three seasonal time periods. • FY 04-05: Further investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at one site during two seasonal time periods. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality[4]	S (2)		S (2)	S (3)	• Baseline: General water quality sampling was conducted in FY 03-04 by SCVURPPP at three sites during three seasonal time periods. • FY 04-05: Screening level measurements of general water quality will be conducted synoptically with water chemistry (two sites) and bioassessment (three sites). • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry[5]	S (2)		S (2)		• Baseline: Conventional water quality parameters were collected in FY 03-04 by SCVURPPP during three seasons at three locations to investigate potential sources of nutrients. • FY 04-05: Screening level measurements of conventional water chemistry parameters will be collected at two sites during two seasonal time periods. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity-Water Quality[6]	I (1)		I (1)		• Baseline: Water toxicity testing was conducted in FY 03-04 by SCVURPPP at two sites for wet and dry season, synoptically with water chemistry samples. • FY 04-05: Water toxicity testing will be conducted during wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Pathogen Indicator Organisms [7]	S (2)		S (2)		• Baseline: Bacterial indicators samples were collected in FY 03-04 by SCVURPPP at three sites for three seasonal time periods. • FY 04-05: Conduct monitoring of bacterial indicators at two sites during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment – Macroinvertebrates[8]				S (4)	• Baseline: Benthic macroinvertebrate bioassessments were conducted in FY 03-04 by SCVURPPP at four sites during spring season. • FY 04-05: Benthic macroinvertebrate bioassessment will be conducted at four sites. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment – Fish[9]	S (2)				• Baseline: SCVWD existing fisheries map indicate native warm water fish community in the upper reaches of the watershed. • FY 04-05: Conduct fish bioassessment at two sites in the fall. • Future: Conduct fish bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Physical						
	Physical Habitat[10]				S (4)	• Baseline: Visual physcial habitat assessment was conducted in FY 03-04 by SCVURPPP at four sites. • FY 04-05: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at four sites. • Future: Conduct visual physical habitat assessment to determine status and trends.	SCVURPPP
	Sediment Characterization[11]				S (4)	• Baseline: Substrate composition and embeddedness was visually estimated in FY 03-04 by SCVURPPP at four sites. • FY 04-05: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at four sites. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: No existing data sources identified. • FY 04-05: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 04-05: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
San Tomas Aquino	***Chemical***						
	Contaminants – Water Quality	I (1)		I (1)		• Baseline: Dissolved and total metals and organophosphate pesticides was measured in FY 03-04 by SCVURPPP during three seasonal time periods at three sites on Saratoga and two sites on San Tomas Creek. • FY 04-05: Further investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at one site in San Tomas during two seasonal time periods. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (4)		S (4)	S (7)	• Baseline: General water quality sampling was conducted in FY 03-04 by SCVURPPP at seven sites during three seasonal time periods. • FY 04-05: Screening level measurements of general water quality will be conducted synoptically with water chemistry (four sites) and bioassessment sampling (seven sites). • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry	S (4)		S (4)		• Baseline: Conventional water quality parameters were collected in FY 03-04 by SCVURPPP during three seasons at seven locations to investigate potential sources of nutrients. • FY 04-05: Screening level measurements of conventional water chemistry parameters will be collected at four sites during two seasonal time periods. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality	I (1)		I (1)		• Baseline: Water toxicity testing was conducted in FY 03-04 by SCVURPPP at three sites for wet and dry season, synoptically with water chemistry samples. • FY 04-05: Water toxicity testing will be conducted at one site during wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Pathogen Indicator Organisms	S (3)		S (3)		• Baseline: Bacterial indicators samples were collected in FY 03-04 by SCVURPPP at seven sites for three seasonal time periods. • FY 04-05: Conduct monitoring of bacterial indicators at three sites during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment - Macroinvertebrates				S (7)	• Baseline: Benthic macroinvertebrate bioassessments were conducted in FY 03-04 by SCVURPPP at seven sites during spring season. Benthic macroinvertebrate data were also collected at six sites on Saratoga Creek in 1997 by the USGS. • FY 04-05: Benthic macroinvertebrate bioassessments will be conducted at seven sites during spring season. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment - Fish	S (2)				• Baseline: SCVWD existing fisheries map indicate resident rainbow trout fish community. Rob Leidy conducted fish surveys at two sites in Saratoga in 1996. • FY 04-05: Conduct fish bioassessment at two sites in the fall. • Future: Conduct fish bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Physical						
	Physical Habitat				S (7)	• Baseline: Visual physical habitat assessment was conducted in FY 03-04 by SCVURPPP at seven sites. • FY 04-05: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at seven sites. • Future: Visual habitat assessment will be conducted in the future, concurrent with macroinvertebrate sampling, to determine status and trends	SCVURPPP
	Sediment Characterization				S (7)	• Baseline: Substrate composition and embeddedness was visually estimated in FY 03-04 by SCVURPPP at six sites in Saratoga and one site in San Tomas Creek. • FY 04-05: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assmt at six sites in Saratoga and one site in San Tomas Creek. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: No existing data sources identified. • FY 04-05: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 04-05: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Matadero Creek	***Chemical***						
	Contaminants – Water Quality	I (2)		I (2)		• Baseline: Metal concentrations in water were measured by City of Palo Alto at two locations in spring 1998. • FY 04-05: Investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at two sites during two seasonal time periods. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (3)		S (3)	S (3)	• Baseline: General water quality parameters were measured by City of Palo Alto at two locations in spring 1998. • FY 04-05: Screening level measurements of general water quality will be conducted synoptically with water chemistry (3 sites) and bioassessment sampling (3 sites). • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry	S (3)		S (3)		• Baseline: Nitrates, turbidity and total and dissolved solids were measured by City of Palo Alto at two locations in spring 1998. • FY 04-05: Screening level measurements of conventional water chemistry parameters will be collected at three sites during two seasonal time periods. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality	I (2)		I (2)		• Baseline: No baseline data sources identified. • FY 04-05: Toxicity of water will be conducted at two sites during wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Pathogen Indicator Organisms	S (2)		S (2)		• Baseline: No baseline data sources identified. • FY 04-05: Conduct monitoring of bacterial indicators at two sites during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (3)	• Baseline: No baseline data sources identified. • FY 04-05: Conduct benthic macroinvertebrate bioassessment at three sites. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment - Fish	S (2)				• Baseline: SCVWD existing fisheries map indicate native warm water fish community. Rob Leidy conducted fish surveys at three locations in Matadero Creek in 1997. • FY 04-05: Conduct fish bioassessment at two sites in the fall. • Future: Conduct fish bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Physical						
	Physical Habitat				S (3)	• Baseline: No baseline data sources identified. • FY 04-05: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at three sites. • Future: Visual habitat assessment will be conducted in the future, concurrent with macroinvertebrate sampling, to determine status and trends	SCVURPPP
	Sediment Characterization				S (3)	• Baseline: No baseline data sources identified. • FY 04-05: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at three sites. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Channel cross-sections and longitudinal profiles were conducted by SCVWD starting in 2002 for lower section of Matadero Creek. • FY 04-05: Channel cross-sections and longitudinal profiles will be measured by SCVWD. • Future: Channel cross-sections and longitudinal profiles will be measured on an annual basis by SCVWD through 2011 as part of sediment transport study.	SCVWD
	Riparian Vegetation					• Baseline: No baseline data sources identified. • FY 04-05: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Barron Creek	***Chemical***						
	Contaminants – Water Quality	S (1)		S (1)		• Baseline: Metal concentrations in water were measured by City of Palo Alto at one location in spring 1998. • FY 04-05: Investigation of dissolved and total metals concentrations will be measured at two sites during two seasonal time periods. • Future: Conduct monitoring of contaminants in water to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (1)		S (1)	S (1)	• Baseline: General water quality parameters were measured by City of Palo Alto at one location in spring 1998. • FY 04-05: Screening level measurements of general water quality will be conducted synoptically with water chemistry (1 site) and bioassessment sampling (1 site). • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry	S (1)		S (1)		• Baseline: Nitrates, turbidity and total and dissolved solids were measured by City of Palo Alto at one location in spring 1998. • FY 04-05: Screening level measurements of conventional water chemistry parameters will be collected at one site during two seasonal time periods. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Bioassessment - Macroinvertebrates				S (1)	• Baseline: No baseline data sources identified. • FY 04-05: Conduct benthic macroinvertebrate bioassessment at one site. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Physical						
	Physical Habitat				S (1)	• Baseline: No baseline data sources identified. • FY 03-04: Conduct visual habitat assessment synoptically with macroinvertebrate bioassessment. • Future: Visual habitat assessment will be conducted in the future, concurrent with macroinvertebrate sampling, to determine status and trends	SCVURPPP
	Sediment Characterization				S (1)	• Baseline: No baseline data sources identified. • FY 04-05: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at one site. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Channel Dynamics and Hydrology					• No baseline data sources identified. • FY 04-05: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No baseline data sources identified. • FY 04-05: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
Sunnyvale (East/West)	***Chemical***						
	Contaminants – Water Quality	S (3)		S (3)		• Baseline: No baseline data sources identified. • FY 04-05: Investigation of dissolved and total metals will be measured in West Channel (one site) and East Channel (two sites) during two seasonal time periods. • Future: Conduct monitoring of contaminants in water to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (3)		S (3)		• Baseline: No baseline data sources identified. . • FY 04-05: Screening level measurements of general water quality will be conducted synoptically with water chemistry in West Channel (one site) and East Channel (two sites). • Future: Conduct general water quality monitoring synoptic with other chemical parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry	S (3)		S (3)		• Baseline: No baseline data sources identified. • FY 04-05: Screening level measurements of conventional water chemistry parameters will be collected in West Channel (one site) and East Channel (two sites). • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical parameters to determine status and trends.	SCVURPPP
Calabazas Creek	***Chemical***						
	Contaminants – Water Quality	I (2)		I (2)		• Baseline: No baseline data sources identified. • FY 04-05: Investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at two sites during two seasonal time periods. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP

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Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	General Water Quality	S (3)		S (3)	S (4)	• Baseline: No baseline data sources identified. • FY 04-05: Screening level measurements of general water quality will be conducted synoptically with water chemistry (3 sites) and bioassessment sampling (4 sites). • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry	S (3)		S (3)		• Baseline: No baseline data sources identified. • FY 04-05: Screening level measurements of conventional water chemistry parameters will be collected at three sites during two seasonal time periods. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality	I (2)		I (2)		• Baseline: No baseline data sources identified. • FY 04-05: Toxicity of water will be conducted at two sites during wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Pathogen Indicator Organisms	S (2)		S (2)		• Baseline: No baseline data sources identified. • FY 04-05: Conduct monitoring of bacterial indicators at two sites during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (4)	• Baseline: No baseline data sources identified. • FY 04-05: Conduct benthic macroinvertebrate bioassessment at four sites. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment - Fish	S (2)				• Baseline: SCVWD existing fisheries map indicate mixed native and introduced fish community in the upper and lower reaches. • FY 04-05: Conduct fish bioassessment at two sites. • Future: Conduct fish bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Physical						
	Physical Habitat				S (4)	• Baseline: No baseline data sources identified. • FY 04-05: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at four sites. • Future: Visual habitat assessment will be conducted in the future, concurrent with macroinvertebrate sampling, to determine status and trends	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 04-05				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Sediment Characterization				S (4)	• Baseline: No baseline data sources identified. • FY 04-05: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at four sites. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: No existing data sources identified. • FY 04-05: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No baseline data sources identified. • FY 03-04: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) investigative, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. Sampling locations are described in separate table and figure attached to Plan.

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology.

3 Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg and organophosphate pesticides; sampling conducted during two seasonal time periods (summer/fall and winter/spring).

4 General Water Quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted for three seasonal time periods.

5 Conventional Water Chemistry: Major anions: ortho-phosphate, nitrate, nitrite, chloride, sulfate; total phosphate, boron, TKN, TDS, SSC, ammonia, chlorophyll-a, alkalinity, hardness, TOC and DOC; during two seasonal time periods (summer/fall and winter/spring).

6 Toxicity Testing: Aquatic bioassays on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted at wet and dry season.

7 Pathogen Indicator Organisims: total and fecal coliform, *enterococcus, and E. coli*; sampling conducted for three seasonal time periods.

8 Bioassessment - Macroinvertebrates: following CSBP methodology and conducted in the spring season.

9 Bioassessment – Fish: Rapid assessment of fish communities will be done using methods established in the SEIDP or by other standardized methods utilized by the SCVWD or other Co-permittee agencies; sampling likely to occur in the spring.

10 Habitat survey physical habitat assessment using CSBP methodology.

11 Creek substrate sediment composition and embeddedness is qualitatively estimated by visual observation during bioassessment and habitat survey.

ATTACHMENT 4-1

Table 4-2. Sampling locations and data types for SCVURPPP's FY 04-05 monitoring plan.

Stat Id	Station Name	Site Characteristics	Water Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Fish Bioass	Macro-Invert Bioass	P-Hab Assmt
Adobe Creek										
A-1	Adobe Cr at Middlefield Rd	At Mitchell Park; residential/commercial; concrete channel	2	2	2	2	2			
A-2	Adobe Cr at Terman Park	At Terman Park; residential land use; natural channel		3		2	2		1	1
A-3	Adobe Cr at Edith Ave	Residential; natural channel; mixed native/introduced fish		1				1	1	1
A-4	Adobe Cr at Foothill College	College campus, low density residential and open space land uses; natural channel; warm native fish community		1				1	1	1
A-5	Adobe Cr at Moody Rd	Low density residential, open space; natural channel; warm native fish community		1					1	1
San Tomas Aquino Creek										
ST-1	San Tomas Cr at Scott Blvd	Industrial; concrete channel; below Saratoga Cr confl.	2	2	2	2				
ST-3	San Tomas Cr at Westmont Ave	Below tributary confl. at High school; earth channel		1					1	1
S-1	Saratoga Cr at Cabrillo	At Bowers Park; commercial/resident; earthen channel		2		2	2			
S-1.5	Saratoga Cr at Kiely	At Central Park; residential; earthen channel		2		2	2			
S-2	Saratoga Cr at Bollinger	Mixed land use; natural channel; potential trout fish community		1					1	1
S-2.5	Saratoga Cr at bend of Oak Knoll Dr	At Murdoch Park; mixed landuse; earthen channel; potential trout fish community		2		2	2			

ATTACHMENT 4-1

Stat Id	Station Name	Site Characteristics	Water Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Fish Bioass	Macro-Invert Bioass	P-Hab Assmt
S-3	Saratoga Cr at Prospect	Mixed land use; natural channel; potential trout fish community		1				1	1	1
S-4	Saratoga Cr at Via Monte	Residential; natural channel; potential trout fish community		1					1	1
S-5	Saratoga Cr at Alta Vista Ave	Residential; natural channel; potential trout fish community		1					1	1
S-6	Saratoga Cr at Big Basin and Gate	Low density residential; natural channel; cold trout fish community		1				1	1	1
S-7	Saratoga Cr at Congress Springs and Pierce	Low density residential; natural channel; cold trout fish community		1					1	1
Matadero Creek										
M-1	Matadero Cr above Middlefield Rd	At Hoover Park, residential; concrete channel; mixed native/introduced fish; near upper tidal limit	2	2	2	2	2			
M-2	Matadero Cr at Roble Ridge	At Bol Park; commercial/public use; concrete channel; mixed native/introduced fish		3		2	2		1	1
M-3	Matadero Cr at Old Page Mill	Open space; natural channel; warm native fish		1				1	1	1
M-4	Matadero Cr at Atrascadero Rd crossing	Low density residential, open space, and golf course land uses; warm native fish	2	3	2	2		1	1	1

ATTACHMENT 4-1

Stat Id	Station Name	Site Characteristics	Water Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Fish Bioass	Macro-Invert Bioass	P-Hab Assmt
Barron Creek										
B-1	Barron Cr at Cowper Rd	Residential land use; concrete channel; no fish data; above tidal	2	2		2				
B-2	Barron Cr at Fremont Rd	Residential land use; natural channel; no fish data		1					1	1
Sunnyvale (East/West)										
SU-1	Sunnyvale East at N. Wolfe	At Fair Oaks Park residential; excavated channel and box culvert;	2	2		2				
SU-2	Sunnyvale East at Daffodil Ct	At Braly Park; residential; excavated channel and box culvert;	2	2		2				
SU-3	Sunnyvale West at Mathilda	Industrial land use; below stormdrain outlet and just upstream of tidal area	2	2		2				
Calabazas Creek										
C-1	Calabazas Creek at Arques	Industrial land use; ½ mi d/s El Camino Storm Drain outfall; concrete channel; native/introduced fish assem	2	2	2	2				
C-2	Calabazas Creek at Benton	At Homestead Park; residential land use; concrete channel; no fish reported		2		2	2			
C-3	Calabazas Creek at Miller	Just below Regnart Cr confl and above newly construct flood control channel		1					**1**	1

ATTACHMENT 4-1

Stat Id	Station Name	Site Characteristics	Water Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Fish Bioass	Macro-Invert Bioass	P-Hab Assmt
C-4	Calabazas Creek at Blaney Ave	At Calabazas Park; residential land use; natural channel; mixed native/introduced fish	2	3	2	2	2	**1**	**1**	1
C-5	Calabazas Creek at Railroad Crossing	Just below Prospect Cr confl; natural channel; low density resident, golf course; mixed native/introduced fish		1					**1**	1
C-6	Calabazas Creek at Pierce Rd crossing	Low density resident; mixed native/introduced fish		1				**1**	**1**	1

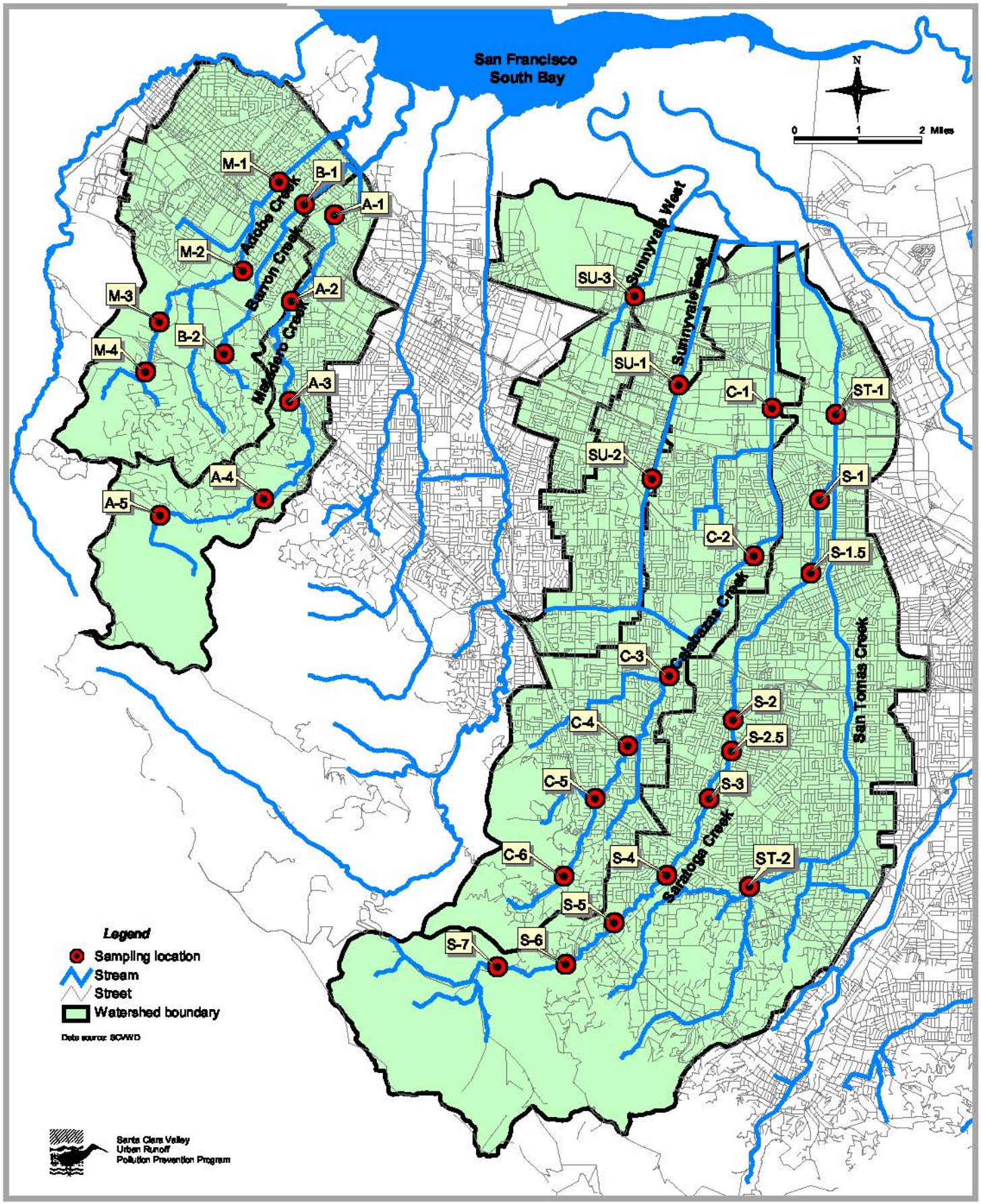

Figure 4-1. Proposed sampling locations for the SCVURPPP FY 04-05 Monitoring Plan.

Attachment 4-1

Table 4-3. Analytical methods used in SCVURPPP FY 03-04 and Multiyear Monitoring Plan.

Description of data parameters	Analytical Methods
Pesticides (water) - Organophosphate suite	EPA 8141A
Pesticides (sediment) - Organochlorine suite	EPA 8081A
PCB congeners	EPA 8082
PAH congeners	EPA 8270
ICPMS metals suite (sediment) (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As--all costs)	EPA 6020
ICPMS metals suite (water)--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	EPA 200.8
ICPMS metals suite (water)--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--al costs)	EPA 200.8
Total mercury (sediment)	EPA 245.7/1631M
Major anions nutrient scan: ortho-phosphate, nitrate, nitrite, chloride, sulfate	EPA 365.2, EPA 300
Total Phosphate	EPA 365.2
Boron	EPA 200.8
TKN	EPA 351.3
TDS	EPA 160.1
Suspended Sediment Concentration (SSC)	ASTM D3977-97
Ammonia	EPA 350.3
Chlorophyll-a	SM 10200H/EPA 445.0
Alkalinity	EPA 310.1
Hardness	EPA 130.2
TOC	EPA 415.1
DOC	EPA 415.1
Sediment grain size - full analysis (phi scale)	Plumb/PSEP
Total coliform	SM 9221B
Fecal coliform	SM 9221B
enterococcus	SM 9230B
Ceriodaphnia 7-day Survival & Reproduction	EPA 1002.0 (WET)
Pimephales (fathead minnow) 7 - day	EPA 1000.0 (WET)
Selenastrum (algae) test	EPA 1003.0 (WET)

(WET) Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants (October 16, 1995)

Attachment 4-2

DRAFT REVISED
MULTI-YEAR RECEIVING WATERS MONITORING PLAN

Original Plan Submitted on March 1, 2002 in Compliance with Permit Provisions C7a & b

March 1, 2004

PREFACE

On March 1, 2002, the SCVURPPP submitted a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) that was prepared in compliance with monitoring requirements of the permit. The previously submitted Multi-Year Plan covered the entire spectrum of the SCVURPPP monitoring activities, both programmatic and environmental, and outlined the SCVURPPP's approach to monitoring, presented monitoring priorities and described accomplishments to-date. Furthermore, the Multi-Year Plan described the SCVURPPP's linkage to, and support for the Santa Clara Basin Watershed Management Initiative (WMI).

Since its approval, the SCVURPPP has fully implemented the Multi-Year Plan and conducted a variety of special studies. In particular, screening level/baseline water quality monitoring was conducted in receiving water bodies in FY 02-03 and 03-04, and the *Assessment of Watershed Assessment Methods Technical Memorandum* (Technical Memo), dated July 31, 2003, recommended improvements to the SCVURPPP's monitoring and assessment program. Lessons learned from data collected during the first two years of implementing the Multi-Year Plan and recommendations presented in the Technical Memo provide the impetus for the revisions to the Multi-Year Plan.

The revisions presented in this Revised Multi-Year Receiving Waters Plan (Revised Multi-Year Plan) are minor and intended to: 1) more fully integrate the monitoring activities identified in the Multi-Year Plan with watershed assessments, and 2) allow for additional follow-up monitoring activities in order to better identify sources of pollutants or causes of impairment to Beneficial Uses. Additionally, the Revised Multi-Year Plan attempts to provide the SCVURPPP a framework for conducting watershed characterization, screening-level monitoring, watershed assessment, investigative monitoring and management action implementation.

Summary of Revisions

It is important to point out that a large majority of the information contained within this Revised Multi-Year Plan was originally presented in the Program's previously submitted Multi-Year Plan (dated March 1, 2002). Therefore, for the sake of the reader, we would like point out the sections of this Revised Multi-Year Plan that contain a majority of the revisions. These include:

- **Sections 2.3 & 2.4**: SCVURPPP's Monitoring and Assessment Approach and Process Flow Chart – Describes the tiered monitoring approach, the proposed framework for conducting monitoring and assessment activities, and how watershed assessments are integrated with this approach and activities.
- **Section 6.0:** Reporting and Quality Control – Describes the deliverables the Program will develop and quality control procedures which will continue to be incorporated into the SCVURPPP's Monitoring and Assessment Program.
- **Section 7.0:** Environmental Monitoring Measures Summary Matrix – Illustrates the revised environmental monitoring and assessment Program's sampling design.

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SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

MULTI-YEAR RECEIVING WATERS MONITORING PLAN
(REVISED MARCH 1, 2004)

1.0 INTRODUCTION

The Santa Clara Valley Urban Runoff Pollution Prevention (SCVURPPP) was reissued a National Pollutant Discharge Elimination System (NPDES) permit to discharge storm water on February 21, 2001 by the San Francisco Bay Regional Water Quality Control Board (Regional Board). On March 1, 2002, the SCVURPPP submitted a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) that was prepared in compliance with monitoring requirements of the permit. In particular Provision C.7b, which reads:

> **Multi-Year Receiving Waters Monitoring Plan.** In conjunction with the submissions required by Provision 9 the Dischargers shall submit by July 1, 2001, an interim draft of a Five-Year Receiving Waters Monitoring Plan, and, by March 1, 2002, a final Five-Year Receiving Waters Monitoring Plan acceptable to the Executive Officer, designed to comply with these Monitoring Program requirements. The Receiving Waters Monitoring Plan shall include provisions for monitoring South San Francisco Bay by participating in the San Francisco Estuary Regional Monitoring Program for Trace Substances or an acceptable alternative monitoring program. The Receiving Waters Monitoring Plan activities shall be coordinated with SCBWMI assessment activities.

The previously submitted Multi-Year Plan covered the entire spectrum of the SCVURPPP monitoring activities, both programmatic and environmental, and outlined the SCVURPPP's approach to monitoring, presented monitoring priorities and described accomplishments to-date. Furthermore, the Multi-Year Plan described the SCVURPPP's linkage to, and support for the Santa Clara Basin Watershed Management Initiative (WMI), a collaborative, stakeholder driven effort aimed at protecting and enhancing the watersheds in the Santa Clara Basin.

Since its approval, the SCVURPPP has fully implemented the Multi-Year Plan and conducted a variety of special studies. In particular, screening level/baseline water quality monitoring was conducted in receiving water bodies in FY 02-03 and 03-04, and the *Assessment of Watershed Assessment Methods Technical Memorandum* (Technical Memo), which provides information necessary to improve SCVURPPP's monitoring and assessment program, was completed on July 31, 2003. Lessons learned from data collected during the first two years of implementing the Multi-Year Plan and recommendations presented in the Technical Memo provided the impetus for revising the Multi-Year Plan. The revisions contained within this Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan) are further described in this section.

1.1 Purpose of the Multi-Year Monitoring Plan and Revisions (2004)

Monitoring activities originally described in the Multi-Year Plan are generally aimed at developing and implementing programs/projects designed to assess programmatic and environmental effectiveness and practical, implementable indicators and protocols for assessing the beneficial uses of receiving water bodies, including local creeks and the San Francisco Bay estuary. The implementation of these indicators and protocols are a

necessary step toward establishing a sound regulatory basis for locally based watershed management.

The Revised Multi-Year Plan continues to embrace this strategy and offers revisions that are intended to: 1) more fully integrate the monitoring activities identified in the Plan with the Program's need to conduct watershed assessments, and 2) allow for additional follow-up monitoring activities that will help better identify sources of pollutants or causes of impacts to Beneficial Uses (Uses). Additionally, the Revised Multi-Year Plan attempts to provide the SCVURPPP a formalized process for conducting future monitoring and assessment activities.

The Revised Multi-Year Plan is intended to provide a broad roadmap for the Program's monitoring activities. The full scopes of many of the activities presented in this Revised Multi-Year Plan have not yet been developed. More detailed descriptions of these planned activities will be provided in the Program's Annual Workplans over the next six years. In addition, it is foreseeable that due to unknown water quality issues in the future, the Program will be directed to focus resources on higher priority monitoring and assessment efforts not presented in this Revised Multi-Year Plan. In this case, new and/or revised monitoring and assessment activities will also be presented in the Program's Annual Monitoring Program Plan, which is submitted with its Annual Report.

1.2 Goals and Objectives

The Revised Multi-Year Plan is intended to be a "living" document, evolving along side other regional and State monitoring and assessment plans and strategies, including: the Regional Monitoring and Assessment Strategy (RMAS), Regional Monitoring Program (RMP) and Surface Water Ambient Monitoring Program (SWAMP). The Revised Multi-Year-Plan helps reach the goals and objectives that were set by the Program's Management Committee in 1996. These goals and objectives were incorporated into the SCVURPPP's 1997 Urban Runoff Management Plan (URMP). In particular, the monitoring program aids in reaching Goals 2 and 3 (see highlighted text in Table 1.0).
To aid the SCVURPPP in reaching its primary goals, the following goals specific to the SCVURPPP's monitoring program were developed:

- Develop a better understanding of the chemical, biological, and physical characteristics of water bodies and watersheds relevant to the Program, which will help inform decisions about future management actions and help clarify and resolve storm water related issues within watersheds;

- Assess baseline water quality conditions in representative watersheds within Program boundaries to evaluate storm water impacts and help solve creek drainage basin-specific water quality problems;

- Assess whether specific pollutants of concern are found in storm water discharges and impact water quality in local water bodies and the San Francisco Bay;

- Evaluate the effectiveness of existing storm water pollution prevention and control Best Management Practices (BMPs) and recommend improvements; and,

- Evaluate overall Program effectiveness over time.

Table 1.0. 1997 Urban Runoff Management Plan
Goals and Objectives

GOAL 1: Comply with Permit

- Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)
- Reduce, to the maximum extent practicable, pollutants in stormwater runoff
- Comply with permit submittal requirements

GOAL 2: Determine Success

- Periodically evaluate the attainment of beneficial uses in selected waterways
- Evaluate changes in public awareness and behavior
- Evaluate effectiveness of specific control measures at pollution reduction.

GOAL 3: Adjust Activities to Meet Changes

- Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP
- Utilize what we learn to plan the next steps

GOAL 4: Achieve Acceptance of Urban Runoff Management Activities

- Effectively facilitate public input into Program planning process
- Integrate urban runoff goals at various intra-agency levels
- Develop and maintain a proactive relationship with regulatory authorities
- Publicize the efforts of the Co-permittees (Program)

GOAL 5: Integrate Urban Runoff Program Elements into other Programs

- Promulgate an understanding of the role of the urban runoff program
- Encourage other agencies to become involved in urban runoff issues
- Encourage action by the appropriate agencies

These goals were designed to achieve each of the following objectives, contained in the Program's NPDES Permit:

1. Characterization of representative drainage areas and storm water discharges, including land-use characteristics, pollutant concentrations, and mass loadings;

2. Assessment of existing or potential adverse impacts on beneficial uses caused by pollutants of concern in storm water discharges, including an evaluation of representative receiving waters;
3. Identification of potential sources of pollutants of concern found in storm water discharges; and,

4. Evaluation of effectiveness of representative storm water pollution prevention or control measures

It is important to point out that although the Revised Multi-Year Plan has been developed to meet the objectives of the NPDES permit, it also addresses the guidance contained in several RWQCB letters written to both the Program and members of the BASMAA monitoring committee.[1]

This Revised Multi-Year Plan is intended to help the SCVURPPP: 1) plan and prioritize its watershed assessment and monitoring activities over the next six years, and 2) coordinate with other watershed assessment programs in the Bay area, including the WMI. The SCVURPPP's watershed assessment and monitoring approach emphasizes characterizing watersheds and collecting data when and where appropriate, which will enable watershed assessments and focused studies to be conducted that will yield information necessary to implement effective and feasible management actions designed to reduce the impacts of urban runoff on Uses.

1.3 Revised Multi-Year Plan Organization and Structure

The Revised Multi-Year Plan is organized into eight (8) sections and describes both environmental and programmatic monitoring designed to meet previously stated goals and objectives. The Revised Multi-Year Plan includes sections:

1.0 Introduction – provides a brief introduction to the Revised Multi-Year Plan, including goals and objectives.

2.0 Monitoring and Assessment Approach – presents the SCVURPPP's approach to monitoring and assessment, including: a description of monitoring categories, monitoring and assessment process, annual project funding process, priorities for assisting the WMI, SCVURPPP monitoring priorities, and regional and SCVURPPP monitoring activities accomplished to-date.

3.0 Watershed Monitoring and Assessment Activities - description of planned watershed monitoring and assessment activities, including: screening-level monitoring and watershed assessments.

4.0 Pollutant of Concern Monitoring and Characterization Activities – provides a description of planned pollutant of concern monitoring and characterization, including local and regionally-based activities.

5.0 BMP and Performance Standard Monitoring – describes monitoring activities associated with measuring the effectiveness of implementing performance standards and control programs for POCs.

6.0 Reporting and Quality Control Procedures - provides a description of the quality control and assurance (QA/QC) procedures and the reporting process the Program will develop and implement.

7.0 Environmental Monitoring and Assessment Measures Summary Matrix- illustrates Environmental Monitoring and Assessment Measures (EMMs) that are currently being

[1] RWQCB letter from Tom Mumley to BASMAA monitoring committee entitled *"Urban Runoff Monitoring Needs/Recommendations"* dated February 2, 2001.
RWQCB letter from Loretta Barsamian to Adam Oliveiri entitled *"FY2002-2003 Stormwater Municipal NPDES Program Priorities"* dated December 7, 2001.
The water quality monitoring comments in the RWQCB from Bruce Wolfe to Beau Goldie entitled *"Pesticide-Related Components of 2000/01 Annual Report"* postmarked December 28, 2001.
RWQCB letter from Loretta Barsamian to Beau Goldie entitled *"Request for revision of the Program's long-term receiving waters monitoring plan"* dated June 5, 2002.

implemented or are planned. EMMs are used to gauge the effects of urban runoff on the environment.

8.0 Programmatic Monitoring Indicators Summary Matrix – illustrates Programmatic Monitoring Indicators (PMIs) that are currently being implemented or are planned. PMIs are used to gauge how well Performance Standards are being met and control measures are being implemented.

2.0 MONITORING AND ASSESSMENT APPROACH

The information contained in Section 2.0 is intended to provide context to the SCVURPPP's Monitoring Program, by briefly describing SCVURPPP's approach to monitoring and assessment. Background information is provided, including: a summary of SCVURPPP's monitoring priorities; descriptions of environmental and programmatic monitoring, and SCVURPPP's monitoring and assessment process; the annual project funding process; priorities for assisting the WMI; the integration of SCVURPPP-led monitoring activities with regional monitoring strategies; and a description of a portion of the SCVURPPP monitoring-related accomplishments to-date

2.1 Background

From its inception in 1990 through 1995, the Program's monitoring activities focused on establishing baseline information through sampling and analysis of runoff from various land uses and ambient waters. A summary of the products produced as part of the SCVURPPP's previous monitoring efforts is contained in the 1997 URMP. In addition to gathering baseline information, the Program's annual monitoring plans have also included assessments intended to enhance understanding of the sources and extent of urban runoff pollution, its effects, and methods for its control.

In August 1996[2] the Regional Water Quality Control Board (RWQCB) requested that the SCVURPPP redirect its monitoring resources and develop a new approach:

> *Specific monitoring activities that should be considered within the strategy include characterization of drainage areas (watershed monitoring) including land use characteristics (general, such as open, residential, commercial, or industrial areas, or specific sources) and consideration of physical and biological, as well as chemical indicators to assess the drainage areas. We strongly encourage you to use community-based (volunteer) monitoring as an inexpensive and effective means to conduct this type of monitoring. The strategy should also establish a mechanism or process for effective use of special or pilot studies by your program or those conducted by other programs.*

Since 1997, the Program's emphasis has been on integrating urban runoff and watershed management. This emphasis continues to be a major condition of the urban runoff permit. The results of this integration effort include the Program's and individual Co-permittee assistance on: managing various subgroups of the WMI, preparing the abridged and unabridged Watershed Characteristics Report, conducting various projects related to the review of development policies, and the completion of the national Stormwater Environmental Indicators Demonstration Project. A more detailed discussion of these efforts is contained the Program's Annual Reports (i.e., see FY 97-98, 98-99, 99-00, 00-01, 01-02 and 02-03).

2.2 Summary of Program Monitoring Priorities

The SCVURPPP's Monitoring AHTG uses the following monitoring priorities to determine which projects are funded for a given year:

[2] Loretta K. Barsamian, Executive Officer. August 30, 1996 letter to Frank Maitski.

1) New projects needed to implement the results, and achieve the goals, of current projects;
2) New projects that implement continuous improvement items identified through the annual review process;
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
    a) Investigate Beneficial Uses and Causes of Impairment (including field work)
    b) Review and Compile Environmental Data and Make it Accessible
    c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
    d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4. Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA.

Each of these priorities is intended to fulfill specific provisions of the Program's NPDES permit and the 1997 URMP, and to provide a strong basis for both program improvement and the next round of permit requirements.

2.3 SCVURPPP's Monitoring and Assessment Approach

The SCVURPPP continues to embrace the watershed approach to direct its monitoring and assessment activities, and meet its goals and objectives. The watershed approach is a coordinating framework for environmental management that focuses efforts to address the highest priority problems within hydrologically-defined geographic areas. The SCVURPPP will continue to define and address high priority issues through the implementation of activities that fall into two monitoring categories: programmatic monitoring and environmental monitoring and assessment. Each monitoring category and specific subcategories are defined below. Specific activities being conducted under each category are further described in Sections 3.0, 4.0 and 5.0; and implementation timelines are presented in Section 7.0.

2.31 Monitoring Categories

The word monitoring can be applied to a wide range of activities; therefore, it is important that a monitoring program begins by defining the types of monitoring that will be employed to achieve its objectives. Nonpoint source programs, including urban runoff management programs, generally employ several types of monitoring depending on the type of observation that is desired. The types of monitoring employed by the SCVURPPP fall into two general categories: *Environmental Monitoring and Assessment Measures (EMMs)* and *Programmatic Monitoring Indicators (PMIs).* Although inherently interconnected, each strategy has its own objectives. The objectives, elements, differences and utility of the environmental monitoring and assessment; and programmatic monitoring strategies are further discussed in the following paragraphs.

Programmatic Monitoring – Programmatic Monitoring Indicators (PMIs) are used to gauge how well performance standards are being met. Programmatic monitoring efforts typically include tracking and evaluating continuous improvements and evaluating the effectiveness of implementing control programs for pollutants of concern. Programmatic monitoring provides the best basis for measuring compliance with Permit requirements

and the success of implementing Program components. Programmatic Monitoring Indicators are presented in described in Section 5.0 *BMP and Performance Standard Monitoring Activities*, and in Section 8.0 *Programmatic Monitoring Indicators Summary Matrix*.

Environmental Monitoring and Assessment - Environmental monitoring and assessment measures (EMMs) are activities that entail the collection of environmental data through field studies and analysis of information through assessments. EMMS are coordinated at the local or regional level and typically fall into one of two general areas:

- Watershed Assessment Activities; and,
- Pollutants of Concern (POC) Monitoring.

EMMs are intended to: 1) assist the RWQCB characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program; 2) identify where and what type of screening-level monitoring is appropriate; and, 3) recognize the need for site-specific water quality investigations to address questions that might arise while conducting screening-level monitoring efforts. Based on the Program's experience, we believe EMMs provide the best context for considering the effects of stormwater runoff on the environment.[3,4] EMMs are further described in Sections 3.0 *Watershed Monitoring and Assessment* and 4.0 *Pollutants of Concern Monitoring*. Implementation timelines for EMMs are presented in Section 7.0.

Tiered Monitoring and Assessment Approach

Because there are a variety of types of environmental monitoring that are available, it is useful to classify parameters that may be measured into two tiers; screening-level monitoring and assessments (i.e. Tier I) and investigative monitoring (i.e., Tier II). Screening level monitoring and assessments include more general measurements made at various sampling locations, providing an initial characterization of the physical, chemical, and biological integrity of a particular watershed/waterbody.

Investigative monitoring or studies include more detailed measurements typically taken in a more defined area (e.g., stream reach). Investigative monitoring is intended to address specific questions of impairment, such as: 1) what is the cause of the potential impairment, and 2) what is the potential source of the pollutant identified? Table 2.0 provides a few examples of screening-level indicators and investigative monitoring parameters.

[3] *Stormwater Environmental Indicators Demonstration Project – Final Report*, prepared for the Water Environment Research Foundation, 2001.
[4] *Watersheds 2000 – A Vision of the SCVURPPP's Role in Watershed Management and the SCBWMI*, December 9, 1999.

Table 2.0. Examples of screening-level indicators and investigative monitoring parameters, with associated beneficial uses.

Indicator/Parameter	Beneficial Uses
Screening-level Indicators	
General Water Quality	Aquatic Life Uses
Rapid Bioassessment	
Fisheries Assemblage Characterization	
Qualitative Physical Habitat Assessments	
Bacterial Indicators	Recreation Uses
Investigative Parameters	
Nutrients (NO3, NO2, NH4, PO4)	Aquatic Life Uses
Sediment (TSS, SSC, Geomorphic Analyses)	
Toxicity (3 species bioassays, TIEs)	
Metals (Cu, Ni, Cd, Hg, Cr, Pb, Se)	Aquatic Life and Recreation Uses
Pesticides (Organophosphates)	Aquatic Life Uses
Quantitative Physical Habitat Assessments	
Organics (PCBs, PAHs, Dioxins)	Aquatic Life and Recreation Uses

2.32 Integrating Monitoring into Watershed Assessment

In the absence of a robust data set that can be used to characterize water quality and the physical, chemical and biological integrity of most water bodies in the Santa Clara Valley basin, initial characterization (i.e., screening-level monitoring/assessments) is needed. To provide this necessary information, the SCUVRPPP intends to conduct screening level monitoring in watersheds within the Santa Clara Valley basin using screening-level indicators. Data collected from these efforts is intended to provide information that will aid the Program in conducting watershed assessments. To the extent possible, these assessments will be conducted in coordination and collaboration with other efforts current underway in the basin (e.g., SCVWD Stream Stewardship Plans).

As an outcome of conducting watershed assessments, data gaps, testable hypotheses and preliminary management actions will be presented. Where feasible, investigative studies will be conducted to help test hypotheses and fill data gaps identified during watershed assessments. These investigative studies will aid the Program in determining the extent of impairment, and the causes and sources of impairment (if necessary), leading to potential recommendations for management actions in these watersheds. This approach is similar to regional (i.e., RMAS) and other Bay area urban runoff management program monitoring and assessment approaches. The approach is illustrated in Figure 1.0 *SCVURPPP's Monitoring and Assessment Process Flow Chart* and further described in Section 2.4. Additionally, a generalized timetable for conducting screening-level monitoring and assessments, watershed assessments, investigative monitoring, and status and trends monitoring is presented in Section 7.0.

2.4 SCVURPPP's Monitoring and Assessment Process Flow Chart

A *Monitoring and Assessment Process Flow Chart* (Figure 1.0) was developed to illustrate the Program's "tiered" monitoring approach to environmental monitoring and the nexus between environmental monitoring and watershed assessment. This process is intended to provide the Program with a formalized structure for conducting monitoring and assessments under the Revised Multi-Year Receiving Waters Monitoring Plan. This process utilizes the best available water quality and watershed-related information throughout each step, with the goal of collecting additional data needed to characterize, assess and protect/restore beneficial uses in receiving water bodies. The following sections describe each step in the process.

Step #1: Watershed Characterization

Watershed characterization is an import foundation-setting activity needed to develop a better understanding of the location and extent of impacts to watersheds, water quality and beneficial uses. Building on recent watershed assessment activities conducted by the WMI and the SCVURPPP, the Program plans to conduct activities entailing the collection and analysis of information needed to further characterize watersheds. To facilitate this process, the SCVURPPP will annually develop a *Watershed Characterization and Sampling Design Technical Memorandum* (Characterization Memo).

The purpose of the Characterization Memo is to describe existing readily available information (e.g. watershed attributes, beneficial use information, water quality data) that will aid in the development of a sampling design for a specific watershed(s) that are scheduled for screening-level monitoring to begin during the next fiscal year. Beginning with the Program's FY 05-06 Annual Workplan, a Characterization Memo that will, (1) describe relevant watershed attributes and (2) provide justification for the selection of sampling parameters and sites within a watershed(s) scheduled for screening-level sampling in that fiscal year ,will be submitted to the Regional Board.

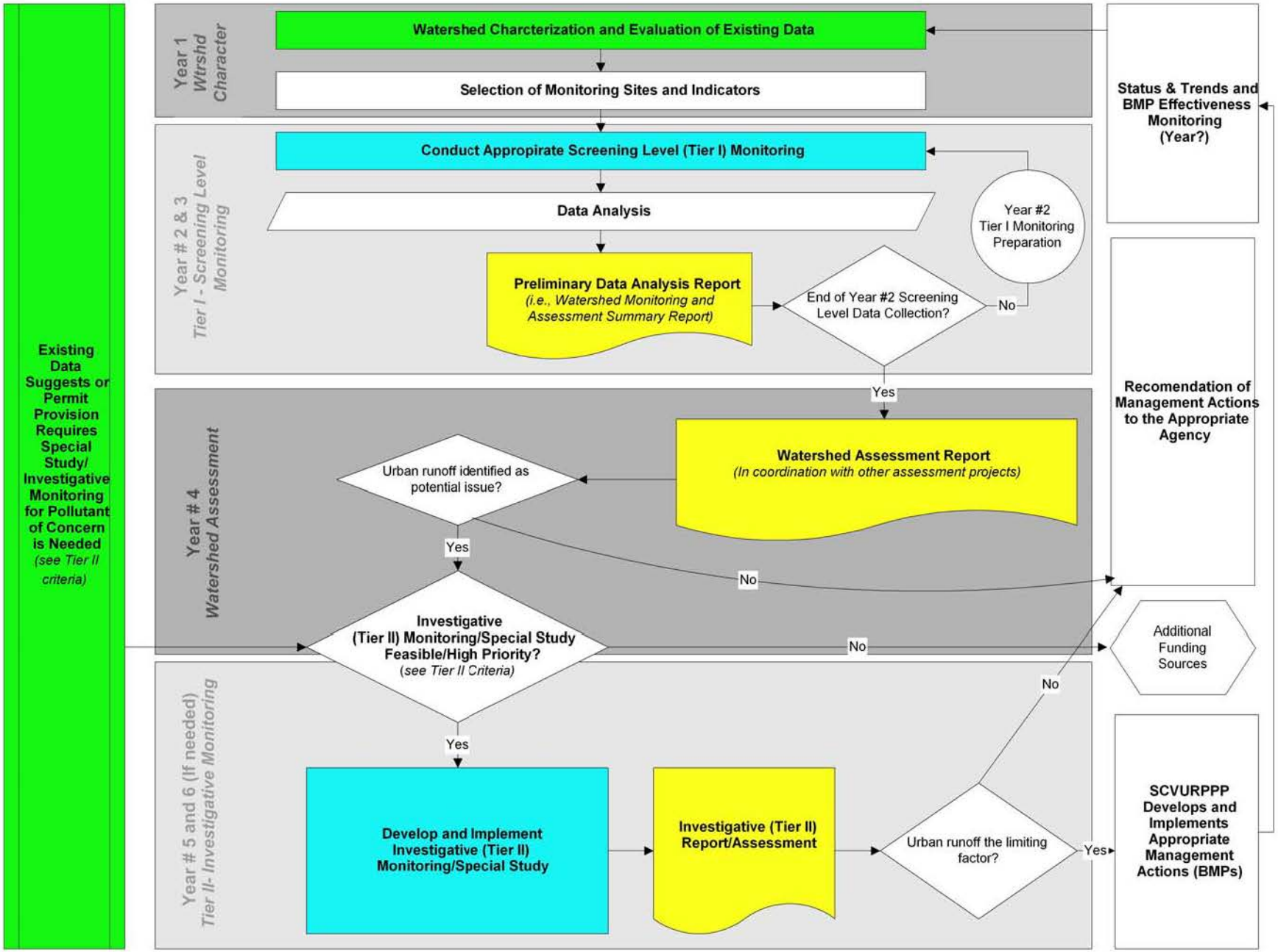
It is important to point out that this task is very similar to activities previously conducted by Program staff when developing the Program's Annual Monitoring Program Plan. The only difference being the deliverable (i.e., Characterization Memo), which will aid the Program in, documenting the extent of readily available information for the given watershed, and developing the rationale behind selection of monitoring indicators and sampling site locations.

Step #2: Screening Level Monitoring

An ecological indicator is a measure, an index of measures, or a model that characterizes an ecosystem or one of its critical components. An indicator may reflect biological, chemical and/or physical attributes of ecological condition, and may also be used to identify major ecosystem stress. The Program intends to collect two types of screening level indicators during the implementation of the Revised Multi-Year Plan: (1) aquatic life use indicators (e.g., benthic macroinvertebrates and fish assemblages) and (2) water recreation use indicators (e.g., fecal and total coliforms, enterococcus and E. coli). Each type of indicator is further described below.

Aquatic Life Use Indicators - As a first step in conducting environmental monitoring, the Program intends to use screening level indicators that will aid in determining ecological

Figure 1.0 SCVURPPP *Monitoring and Assessment Process Flow Chart*, illustrates the Program's "tiered" monitoring approach to environmental monitoring and the nexus between environmental monitoring and watershed assessment.



condition and status of aquatic life uses in Santa Clara basin water bodies. In particular, the Program has selected Benthic macroinvertebrates (BMIs) and fish community assemblages as screening level indicators of aquatic life uses. Extensive guidance on development and use of BMIs and fish as indicators has been supported at the national and state levels, and a number of agencies and volunteer groups have begun to sample BMIs in Bay Area creeks using the California Stream Bioassessment Procedure developed by the California Department of Fish and Game. Additionally, screening level assessments of physical habitat will be conducted to aid in determining the physical/habitat condition or quality of a watershed and water body. Qualitative screening-level physical habitat assessments will be conducted synoptically with BMI and fish data collection efforts. Qualitative physical habitat assessments also include, general water quality measurements and substrate composition estimates taken during biological sampling.

Recreation Use Indicators - Microbiological water analysis is typically carried out to safeguard the health of a community by testing for possible fecal pollution, the source of microorganisms causing waterborne disease. Indicators of recreational use are microbiological organisms that coexist with pathogens in the fecal environment and are easier and less expensive to test for than pathogens. For these reasons, indicator organisms are often the focus of water analyses rather than pathogens. The most commonly employed indicator organisms are total coliform, fecal coliform, enterococcus, and E. coli. The Program intends to use these organisms as screening level indicators of beneficial uses related to recreation (i.e., REC-1 and REC-2). To ensure locations that have a high potential for recreational uses are sampled, Program staff will identify sampling sites within a given watershed during the watershed characterization stage of the watershed monitoring and assessment process (see Step #1). The selection of sampling site locations will be based upon where the highest potential for exposure and access to the creek appears to exist (e.g., parks adjacent to creeks and local swimming sites).

Step #3: Watershed Assessment

Watershed assessment is the systematic review of specific resources such as benthic macroinvertebrates or fish and their habitat and riparian areas in a watershed-scale context. The results of watershed assessment can be used to establish the context for subsequent evaluations and analysis of cumulative watershed effects. It is the Program's intent to conduct watershed assessments in specific watersheds within the Santa Clara basin. Assessments will integrate information collected during watershed characterizations and screening-level assessments to support Program objectives of continuously improving Program components and developing additional ones to support attainment of beneficial uses in selected water bodies. As an outcome of the assessment, the Program will develop a *Watershed Assessment Report* that will describe the assessment process, identify data gaps and potential follow-up studies, and recommend management actions, where feasible. Watershed assessments will be coordinated with other assessment-related activities occurring in the basin, to the extent possible, and will only occur in watersheds identified as high priority by the Program.

Step #4: Investigative Monitoring/Studies

Investigative monitoring/studies include more detailed measurements typically taken in a more defined area (e.g., stream reach). Investigative monitoring is intended to address

specific questions related to potential impairment, such as: 1) what is the cause of the potential impairment, and 2) what is the potential source of the pollutant identified? Table 2.0 provides a few examples of investigative monitoring parameters.

As illustrated in the Monitoring and Assessment Process Flow Chart (Figure 1.0), investigative monitoring/studies can arise through multiple pathways. First, additional data collection (e.g., investigative monitoring or special studies) may be recommended in a *Watershed Assessment Report* to aid in determining beneficial uses impacts. Alternatively, existing data may suggest that additional data collection is needed to determine impacts, or a NPDES Permit Provision may require that investigative monitoring or a special study be conducted. Regardless of which pathway is taken, prior to conducting investigative monitoring or a special study the Program will determine if additional monitoring or a study is feasible and/or a high priority by reflecting on monitoring priorities established in 1997 to determine which projects should occur in a given year (see Section 2.2).

Step #5: Development/Implementation/Recommendation of Management Actions

Once investigative monitoring or a special study has adequately determined the cause(s) and source(s) of adverse impacts in a watershed or sub-watershed, a logical next step is to implement feasible management actions designed to reduce/eliminate the impacts on beneficial uses (e.g., best management practices). Depending on the location of the source, jurisdiction of the agency and feasibility of implementation, management actions could be implemented by a variety of agencies. For example, if a source of a water quality impact is determined to be outside of the jurisdiction of the SCVURPPP, recommendations may be provided to the appropriate agency or individual. Alternatively, a particular municipality within the SCVURPPP may be the most appropriate agency to implement a best management practice (BMP) designed to help protect or restore a beneficial use.

Step #6: Status & Trends Monitoring and BMP Effectiveness Monitoring

Best Management Practices (BMPs) are measures, activities, or other practices that prevent or minimize pollutant discharges to water bodies. Some are routine activities such as recycling materials that contain pollutants, good housekeeping practices and spill prevention procedures. Others are structural treatment measures that are integrated into the storm water conveyance system to remove pollutants from runoff before it enters water bodies. During its second NPDES permit cycle the Program established initial Performance Standards incorporating a variety of BMPs into several components including, Public Information and Participation; New Development and Redevelopment Activities; Illicit Discharge Controls; Industrial and Commercial Business Controls, and; Municipal Government Maintenance Activities. Performance standards under each component are updated on an as needed basis through the Program's continuous improvement process.

To monitor the effectiveness of an implemented BMP or performance standard, the Program will conduct programmatic monitoring by developing and implementing Programmatic Monitoring Indicators (PMIs). As described in Section 2.31, PMIs typically include tracking and evaluating continuous improvements and the effectiveness of implementing BMPs. Programmatic monitoring provides the best basis for measuring compliance with Permit requirements and the success of implementing Program

components. Additionally, once a BMP has been implemented, status and trends monitoring will occur (in parallel with PMIs) over time to determine if a net environmental benefit is apparent. Although particular situations may require the use of more specific monitoring parameters, screening level indicators will likely be used to determine the status and trends of water bodies.

2.5 Priorities for Assisting the Watershed Management Initiative

The Program's Monitoring Ad-hoc Task Group (AHTG), composed of Co-permittee representatives, works with Program staff to review proposed projects and allocate available funds. Regional Board staff and interested parties attend the AHTG meetings. As presented in the Program's monitoring priorities (see section 2.2), there are four general areas in which the SCVURPPP provides support to the SCBWMI. These include:

1. Investigate Beneficial Uses and Causes of Impairment (including field work)
2. Review and Compile Environmental Data and Make it Accessible
3. Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
4. Facilitate and Support WMI Subgroups (including coordination with other agencies).

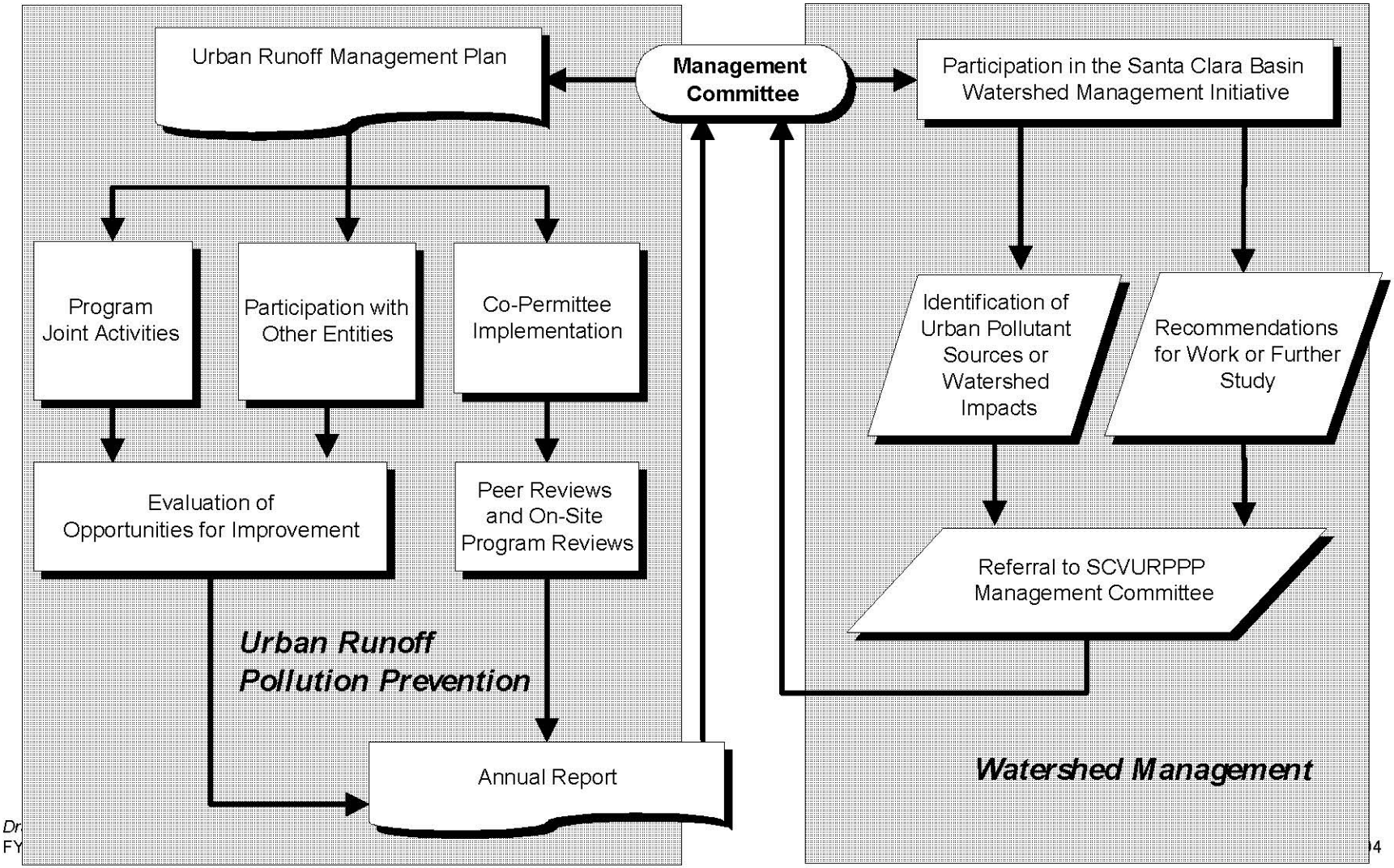
2.6 Continuous Improvement Process

An important feature of a mature Phase I municipal stormwater management program like the Santa Clara Valley Program is a process for continuous improvement. As shown in the Program's 1997 URMP and illustrated in Figure 2.0, continuous improvement is implemented through two feedback "loops." The loop on the left emphasizes programmatic measures to gage the performance of the Co-permittees and the overall Program (and includes participation in regional efforts such as the San Francisco Bay Regional Monitoring Program for Trace Substances). The loop on the right emphasizes watershed assessment and management conducted jointly with other stakeholders in the SCBWMI[5].

This two-pronged approach facilitates the Regional Board's responsibility for fairly measuring regulatory compliance while encouraging a watershed management approach. The continuous improvement process has been utilized by the Program over the past seven years to successfully integrate programmatic monitoring indicators, which provide the best basis for measuring permit compliance, with watershed management measures (including environmental monitoring), which provides the best context for considering the effects of urban runoff on the environment and measures to improve the health of the watershed.

[5] The continuous improvement process concept was developed as part of the Program's 1997 Urban Runoff Management Plan to more effectively integrate urban runoff and watershed management.

Figure 2.0. SCVURPPP's continuous improvement process illustrating two feedback "loops" which emphasize the nexus between the Program and the Santa Clara Basin Watershed Management Initiative (SCBWMI). The continuous improvement process was originally presented in the Program's 1997 Urban Runoff Management Plan (URMP).



2.7 Stakeholder Involvement & Input

A significant factor in the success of the continuous improvement program is the active involvement and input from the various watershed stakeholders. Over the past seven years, this involvement and input has principally come through the Program's and Co-permittees significant involvement in the Santa Clara Basin Watershed Management Initiative (WMI). For example, the Program's involvement involved a major role preparing both the abridged and unabridged versions of the Watershed Characteristics Report, the lead role in conducting the assessment of Coyote Watershed, a continuing leadership role in the Landuse Subgroup as well as the Bay Monitoring and Modeling and Regulatory Subgroups, and it's continued support of the Core Group efforts.

As the SCVURPPP and WMI move forward towards completing ongoing assessments, initiating new assessments, identifying impediments to maintaining and improving water quality and identifying actions to improve water quality, the "continuous improvement" process and input from stakeholders will become even more important to shape the actions and priorities for the future. As illustrated in Figure 2.0 the most advantageous time to provide effective input to the Program and Co-permittees is through the review of the Annual Report. The Annual Report is submitted to the RWQCB on September 15 each year. To be useful, the review and comment needs to occur during the latter half of September and October of each year with comments available by the first of November.

While review of the Annual Report is the most effective means to influence future efforts, the Program and Co-permittees continued involvement in the WMI will also generate new ideas and avenues to improve the management of urban runoff and the effective and efficient integration[6] of urban runoff management into the overall management of the Santa Clara basin watersheds.

2.8 Effectively Integrating Urban Runoff and Watershed Management

The requirement to investigate, consider, and implement watershed management measures first appeared in the Program's 1995 NPDES permit and is also a requirement of the Program's current NPDES permit. As part of its application for the current permit, the Program developed a "Watersheds 2000 Vision" (December 1999) that outlines the principles and approaches that the Program and its Co-permittees will use to support better management of the Santa Clara Basin through the implementation of urban runoff control measures. The vision statement also defines the relationship between and the roles of the Program and the SCBWMI in this context.

The Program's approach for supporting watershed management and the SCBWMI is based on the following principles:

- The goal of the Program and its Co-permittees is to maintain water quality and protect the beneficial uses of the waterbodies in the Santa Clara Basin through the implementation of control measures to the maximum extent practicable.

[6] See the Program's report entitled "Watershed Management and Urban Runoff Management Integration Report-Permit Provision C.10, June 29, 2001" for a further discussion.

- Successful watershed management must be a community-wide, stakeholder-driven effort that includes regulatory agencies, the business community, environmental advocates, and local government.

- The Co-permittees recognize it can be difficult to separate many urban runoff "issues" from the general impacts of urbanization resulting from the cumulative effects of land development.

- The Co-permittees understand that municipal agency activities have the potential to impact water quality and beneficial uses; conversely such activities can create opportunities to improve water quality and enhance aquatic resources.

Given those principles, the Co-permittees envision the roles of the Program and that of the SCBWMI as follows:

- The Program's activities pursuant to the NPDES permit assist Co-permittees and other local agencies to incorporate appropriate watershed management recommendations into their decision-making and specific watershed protection approaches into their day-to-day operations.

- The SCBWMI, as a stakeholder process, provides the tools to identify community goals and issues, and facilitates the development of common ground between stakeholders to recommend to policy-makers the actions needed to better manage watershed resources.

The Program seeks to create an avenue by which the SCBWMI's broad stakeholder goals and objectives can be incorporated into the daily operations of the Co-permittees. The Co-permittees will strive to apply their resources and powers to preserve and enhance the watershed. To do this most effectively, the Program and Co-permittees need to translate SCBWMI stakeholder recommendations into specific actions that are reasonable, practical, and that can be incorporated into their missions and services (see Figure 2.0). In addition, the Program will work with Regional Board staff to apply a regulatory strategy that allows Co-permittees to find ways to coordinate with other agencies within a specific watershed to protect and enhance beneficial uses.

2.9 Integration with Regional Monitoring Activities

The Program has contributed to the Regional Monitoring Program for Trace Substances (RMP) since 1993 and has contributed approximately $150,000 a year to the RMP over the past four years. In addition, the three South Bay municipal wastewater treatment plants (i.e., City of Palo Alto, City of Sunnyvale, and the San Jose-Santa Clara facility) annually contribute between $200,000 and $250,000 a year to the RMP. Thus, local communities (which are urban runoff Co-permittees) contribute approximately $350,000 to $400,0000 a year to a regional monitoring program (consistent with Permit Provision C.7b). The results of the RMP's research and investigations have been published by the San Francisco Estuary Institute (SFEI).

The Regional Board has requested that the Program and other members of the Bay Area Storm water Management Agencies Association (BASMAA) conduct "monitoring" in a broad sense that includes watershed assessment, and pollutants of concern (POCs) and BMP monitoring. The scope and objectives of monitoring and assessment activities

have been refined through a number of initiatives including the BASMAA Regional Monitoring Strategy (BRMS) and the Regional Monitoring and Assessment Strategy (RMAS). The Regional Board's most recent conceptual strategy is based on the design of its Surface Water Ambient Monitoring Program (SWAMP) efforts and uses several categories of monitoring depending on the spatial extent, type of pollutant or stressor and level of detail and data quality required. These activities are described in more detail in Sections 3.0, 4.0 and 5.0.

2.10 Accomplishments to-date

Complying with the Regional Board directive to redirect monitoring resources from a baseline monitoring approach, the Program has, since 1997, moved toward assessment of specific pollutants and conditions of designated beneficial uses. To improve the effectiveness of our special studies and those conducted by other programs, in 1996 and 1997, the SCVURPPP co-sponsored, and participated in, the Bay Area Stormwater Management Agencies Association's (BASMAA's) development of a BASMAA Regional Monitoring Strategy (BRMS). The SCVURPPP continues to coordinate its monitoring activities with other BASMAA member agencies.

In recent years, the Program has conducted substantial original research and investigations into the sources, fate, transport, and effects of urban runoff pollutants, the characteristics of Santa Clara Basin watersheds, the effects of urbanization on watersheds, and the effectiveness of various control measures. Beginning in 1993-1994, the SCVURPPP has funded efforts to assess the condition of beneficial uses of creeks within the Santa Clara Basin. The Program, as part of the Annual Reports, updates a summary of memoranda and reports published as a result of their research and investigative efforts. The most recent update is contained in Table 4-2 of the 2002-2003 Program Annual Report. The following subsections briefly describe a portion of the projects the Program has conducted.

Stormwater Environmental Indicators Demonstration Project (SEIDP)

The SCVURPPP recently completed a two year research project entitled "The Stormwater Environmental Indicators Demonstration Project (SEIDP). The SEIDP is part of USEPA's Environmental Indicators/Measures of Success Project (third phase), which focuses on local demonstration projects and testing of the indicators. The Water Environment Research Foundation sponsored the SEIDP jointly with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP).

The project objectives were to:

- Evaluate the usefulness of the Center for Watershed Protection's (CWP) Stormwater Indicator Methodology under semi-arid conditions;
- Evaluate the applicability of environmental indicators under semi-arid conditions in two different situations: at a watershed level that includes a variety of chemical, physical and biological indicators and in an industrial watershed that emphasizes programmatic indicators;
- Select, test, and refine protocols for monitoring environmental indicators in semi-arid conditions; and,

- Develop guidance on selection and use of environmental indicators, and disseminate guidance to other stormwater programs in California, Oregon and the west to assist in validation of environmental indicators throughout the west.

Consistent with these objectives, the CWP's stormwater indicator methodology was applied at two distinct geographic scales: the 310-square-mile watershed of Coyote Creek (which includes the eastern portion of the City of San Jose) and a 28-acre industrial catchment along Walsh Avenue in the City of Santa Clara. The semi-arid climate is typical of California's coast from the San Francisco Bay area southward.

In Coyote Creek, the baseline was a 1979-1981 EPA-sponsored study that sought to identify the effects of urban runoff on water quality, sediment, fish, macroinvertebrates, attached algae, and rooted aquatic vegetation. In addition, the SCVURPPP monitored stormwater constituents and toxicity in the creek 1987-1996. In 1999, the SEIDP sampled fish and the physical habitat at 18 locations in Coyote Creek, sampled surficial sediment at six locations, and sampled benthic macroinvertebrates at nine locations. The SEIPD analyzed flooding, changes to stream morphology, and sources of imperviousness in the surrounding watershed. Georeferenced reports of illegal dumping and known industrial and construction sites were also generated.

Regional Board staff has been thoroughly involved in these projects through participation in the Program's Monitoring Ad-hoc Task Group, through WMI subgroups, and through special review groups such as the Stormwater Environmental Indicators Demonstration Project Review Committee and other technical advisory groups facilitated by Program staff.

Joint Stormwater Agency Project

The recent emphasis on developing Total Maximum Daily Loads (TMDLs) for water quality impairing pollutants has led the Regional Board to require new assistance from Bay area municipal storm water programs. Requirements include characterizing pollutant distributions in representative watersheds, identifying pollutant sources, estimating pollutant loads and identifying and implementing additional pollutant control measures. To meet these requirements, the Program coordinated a recently completed two-year regional study to characterize distributions of these pollutants found in storm drain and creek embedded sediment. The study found statistically higher concentrations of mercury, PCBs, chlordanes and DDTs in urbanized areas compared to undeveloped, open land uses. Median concentrations of total PCBs, chlordanes and DDTs measured in urban storm drain sediments were roughly two orders of magnitude greater than median concentrations measured in Bay sediments by the Regional Monitoring Program. The median concentration of mercury in urban storm drains was generally comparable to Bay sediments. Several sites with elevated levels of one or more of the study pollutants were identified. The study also developed planning-level estimates of urban runoff pollutant loads to San Francisco Bay from its surrounding watersheds.

Regional Monitoring and Assessment Strategy

Regional Board staff has developed a Regional Monitoring and Assessment Strategy (RMAS) for watershed monitoring and assessment in the Bay area. The purpose of the RMAS is to improve the technical content of the Regional Board's policies and regulatory actions. The specific regulatory focus of the RMAS is to help the Regional Board complete biennial water quality assessments under the Clean Water Act's 305(b) and

303(d) requirements. The RMAS endorses a multi-faceted monitoring approach, including incorporation of bioassessment data and physical measurements into Regional Board decision making, as supported by the 1997 USEPA 305(b) guidelines. The RMAS is being carried out in a phased approach, beginning with "pilot-scale implementation in selected watersheds," and establishing a rotating basin approach that will eventually result in "comprehensive assessment of surface and ground waters in the San Francisco Bay Region."

The Regional Board has begun implementing the RMAS by assessing selected pilot watersheds in the Bay area. These assessments of "Board-lead" watersheds are currently funded by the NPDES permittees, including SCVRUPPP, through permit surcharges for the State Surface Waters Ambient Monitoring Program (SWAMP). The Regional Board is also relying on partnerships with local agencies to implement the RMAS in "Partner-lead" pilot watersheds.

To-date, the Program has participated in the RMAS through its pilot watershed assessment work in the Coyote Creek, Adobe and San Tomas Aquino watersheds. It is the Program's intent to continue to conduct bioassessments in Program relevant watersheds during the implementation of the Revised Multi-Year Plan. A timetable for completion of bioassessments is presented in Section 6.0.

Coyote Creek Watershed Integrated Pilot Assessment

Past Program efforts (reported in the Program's FY 99-00 and FY 01-02 Annual Reports) have been to assist Regional Board staff with the development of a functional and pragmatic assessment approach. To test this functional assessment approach and to contribute to the SCBWMI's assessment of Santa Clara Basin watersheds, the Program conducted an Integrated Pilot Assessment in the Coyote Creek Watershed. The intent of the pilot assessment was to: (1) help facilitate continuous improvement of the SCBWMI's watershed assessment framework; (2) integrate that methodology with that being used by the Regional Board's Regional Monitoring and Assessment Strategy (RMAS) and other Regional Board initiatives; (3) develop a list of appropriate initial management actions to preserve and enhance the Coyote watershed; and (4) identify appropriate monitoring locations and provide baseline information as part of the Multi-year Monitoring Program to assist with continued watershed assessment.

The method used in the Coyote Creek Watershed Integrated Pilot Assessment to assess physical stream ecosystem is based on the Hydrogeomorphic Approach (HGM) that was developed to assess riverine (water and wetland) functions. It has been applied locally and in Central and Northern California. Biological stream ecosystem functions were assessed using a multimetric approach to calculate an Index of Biological Integrity. A multimetric approach is useful to assess biotic integrity in streams in which a broad range of human impacts occur.

The study area for this project was limited to data-rich portions of the two largest creeks in the watershed: Upper Penitencia Creek below Cherry Flat Dam and Coyote Creek below Anderson Dam. Stream reaches were classified using factors related to geomorphology and urbanization. The existing capacities of study area reaches to support the following four physical ecosystem functions were assessed using hydrogeomorphic models: hydrologic processes and channel dynamics, aquatic habitat, riparian habitat and landscape-level connectivity. The existing capacities of study area

reaches to support aquatic fauna (macroinvertebrates and fishes) were assessed using indices of biological integrity. Selected water quality parameters were examined to assist interpreting model results. Future capacities of stream ecosystem functions were assessed by estimating the relative positive and negative impacts of existing and near-term factors that may continue or soon influence the distribution and viability of fish and macroinvertebrate assemblages, their habitats and the functional capacities of supporting stream processes. Potential capacities of stream ecosystem functions were assessed by identifying where existing and future stream ecosystem functional capacities could be maintained or improved by practical, strategic management actions that have not been planned. Potential management actions were prioritized based on which would have the greatest positive impact on cold and warmwater fish and macroinvertebrate communities. Monitoring activities to address data gaps identified through the assessment are also described and prioritized.

Assessment of Watershed Assessment Methods

In keeping with the Program's commitment to continuous improvement of program elements, selected regional and national watershed assessment methods were evaluated to identify and recommend future direction for SCVURPPP's environmental monitoring and assessment program. As part of this evaluation, a memorandum was prepared which identifies the Program's monitoring and assessment needs in the context of prior efforts and pilot studies. In addition, the memorandum provides a framework for linking different types of assessment methodologies to address such needs using an adaptive management approach; summarizes types of and trends in watershed assessments; and focuses on methods using bioassessment and analysis of stream ecosystem functions.

The framework integrates the tiered assessment and rotating basin approaches currently implemented by the Regional Board, Program and many other agencies involved in water quality and watershed monitoring and assessment. Watershed assessment methods were characterized as either Tier I (screening level methods intended to detect beneficial use impairment) or Tier II (more detailed investigations of causes of degradation and use impairment). The framework also embraced the practice of integrating biological, chemical and physical indicators using a regional reference framework to establish water body condition relative to benchmarks. The ultimate goal of implementing this framework is to develop a monitoring and assessment program that provides an information base to support Program objectives of continuously improving program components and to develop additional ones to support attainment of beneficial uses in selected water bodies.

The Tier I assessment methods evaluated included Rapid Bioassessment Protocols, Rapid Stream Assessment Technique, Proper Functioning Condition, Stream Ecosystem Function Assessment, Oregon Watershed Assessment Manual and the Framework for Conducting Watershed Assessments. The Tier II assessment methods evaluated included the North Coast Watershed Assessment Program Limiting Factors Analysis, the Napa River Basin Limiting Factors Analysis, the San Francisquito Creek Sediment Reduction Plan and Aquatic Habitat Assessment and Limiting Factors Analysis, the Program's *Workplan for Watershed Analysis and Management Practice Assessment in Other Creeks Potentially Impaired by Sediment from Anthropogenic Activities*, the Hydromodification Plan, and the Biological Water Quality Target Approach.

Recommendations for the Program's monitoring and assessment program resulting from this evaluation of watershed assessment methods include the following:

Tier I (Screening-level) Assessment Methods

- Use the Stream Ecosystem Function Assessment (SEFA) approach (as recommended by the Program in 2003), augmented by certain aspects of the Rapid Stream Assessment Technique (RSAT), to analyze data generated from an ambient monitoring program based largely on Rapid Bioassessment Protocols (RBPs);

- Coordinate regionally to develop reference conditions and bioassessment tools to support analysis of macroinvertebrate data;

- Work towards developing robust numeric biocriteria; and

- Consider pursuing bioassessment of fish assemblages in larger order streams and in streams supporting steelhead trout.

Tier II (Investigative-level) Assessment Methods

- Continue to implement Limiting Factors Analysis (LFA) as primary approach to investigating factors potentially limiting attainment of aquatic life uses. Incorporate lessons from other projects implementing LFA;

- Consider using the HMP as tool to address potential use impairment caused by hydromodification associated with future development;

- Consider incorporating aspects of the HMP method of geomorphic assessment into a method for classifying Santa Clara Basin streams. Identify and prioritize where restoration efforts could occur; and

- Incorporate biocriteria into assessments as feasible.

The Program's document entitled *Assessment of Watershed Assessment Methods* was provided as Appendix D-2 to the Program's FY 02-03 Annual Report. The results and recommendations included in the report were presented to the SCBWMI Watershed Assessment Subgroup (WAS) and the Ad Hoc Monitoring Workgroup in July 2003, and were generally well received by the participants.

3.0 WATERSHED MONITORING AND ASSESSMENT ACTIVITIES

A watershed is hydrologically-defined geographic area that includes all land and water areas within its boundaries. Creeks, lakes and wetlands are the receiving water bodies that make up the complex system that ultimately receives runoff and drainage from the surrounding upland area within the watershed boundaries. The entire municipal storm drainage system that feeds into the receiving water bodies consists of storm drain inlets, culverts, road-side ditches, and outfalls. Changes to either upland areas or storm drainage systems may cause changes in the physical, chemical or biological characteristics of receiving water bodies. These effects may be most visible in a part of the stream far removed from the area where changes occurred. The response of the system may also take many years after the change has occurred.

3.1 APPROACH AND OBJECTIVES

The goal of the watershed assessment activities element of the SCVURPPP's Revised Multi-Year Plan is to develop a better understanding of the physical, biological, and physical characteristics of watersheds relevant to the Program. The collection and analysis of watershed information will help make informed decisions about future management actions and help clarify and resolve potential issues within the watersheds.

The Program's watershed assessment activities are designed to meet the following three main objectives:

- Collect, analyze and present appropriate watershed data, using a Geographical Information System (GIS) and other mapping tools;

- Develop and refine indicators for evaluating the physical, chemical and biological functioning of watersheds, and identify effective ways to apply them in urban creeks; and,

- Provide guidance and support to better understand watershed processes with the goal of protecting and restoring beneficial uses to the maximum extent practicable.

3.2 WATERSHED MONITORING AND ASSESSMENT ELEMENTS

The SCVRUPPP watershed monitoring and assessment activities are described within this section. By implementing these activities, the SCVURPPP seeks to extend and continue implementation of the Program's monitoring priorities.

To reach the Program's watershed assessment objectives presented above, the Program anticipates that activities will be conducted within two (2) watershed assessment elements during implementation of the Revised Multi-Year Plan.

Watershed Characterization Activities – element entails watershed characterization of watershed attributes, leading to the development of watershed scale features for all watersheds within the co-permittees' jurisdictions.

Screening-level Monitoring and Assessment Activities – element entails the development and implementation of screening-level indicators of creek health,

and aids determining the ability of the water body to support beneficial uses (e.g., aquatic life and recreational uses).

Watershed Assessment Activities – entails a process that characterizes current watershed conditions at a coarse scale. The main goal in conducting watershed assessments is to characterize current watershed conditions by using existing data. Although course in resolution, watershed assessments can provide the basis for watershed-level planning, management and policy decisions and can lead to more detailed hypothesis testing through the implementation of monitoring studies at the finer scale.

Brief descriptions of each watershed assessment element and relevant activities are provided. A timeline for implementing these activities is presented in Section 6.0 *Comprehensive Monitoring Plan Timeline*.

3.21 Watershed Characterization Activities

Watershed characterization is an import foundation-setting activity needed to develop a better understanding of the location and extent of impacts to watersheds, water quality and beneficial uses. The analysis of similarities and differences in watersheds or sub-watersheds can help interpret indicator data and make useful distinctions among these watersheds. Additionally, watershed characterization can aid in the identification of priority areas where management actions may be taken, with the goal of protecting or restoring watershed functions.

Building on recent watershed monitoring and assessment activities conducted by the WMI and the SCVURPPP, the Program plans to conduct activities entailing the collection and analysis of information needed to further characterize watersheds. To facilitate this process, the SCVURPPP will annually develop a *Watershed Characterization and Sampling Design Technical Memorandum* (Characterization Memo). The purpose of the Characterization Memo is to describe existing readily available information (e.g. watershed attributes, beneficial use information, water quality data) that will aid in the development of a sampling design for a specific watershed(s) that are scheduled for screening-level monitoring to begin during the next fiscal year. Beginning in FY 05-06, the Program will submit within its Annual Work Plan. The memo will describe and provide the rationale for the selection of sampling parameters and sites within the watershed scheduled for screening-level sampling in that fiscal year.

3.22 Screening-level Monitoring and Assessment Activities

An ecological indicator is a measure, an index of measures, or a model that characterizes an ecosystem or one of its critical components. An indicator may reflect biological, chemical and/or physical attributes of ecological condition. The primary uses of an indicator are to characterize current status and to track or predict significant change. With a foundation of analytical research, an ecological indicator may also be used to identify major ecosystem stress. The Program intends to collect two types of screening level indicators during the implementation of the Revised Multi-Year Plan: (1) aquatic life use indicators (e.g., benthic macroinvertebrates and fish assemblages) and (2) water recreation use indicators (e.g., microbiological indicators). The following paragraphs briefly describe these indicators and related activities the Program will conduct during the implementation of the Revised Multi-Year Plan.

Biological and Physical Habitat Assessments

Benthic macroinvertebrates (BMIs) are organisms that inhabit the bottom of freshwater habitats for at least part of their life cycles and are at least a half a millimeter in size. BMIs are important indicators of biological and ecological condition of fresh water bodies because they are ubiquitous, affected by a variety of environmental perturbations (e.g. hydromodification, sedimentation, and chemical pollutants), can be easily identified and enumerated, and contain a diversity of taxonomic groups that are well known. Extensive guidance on development and use of BMI indicators has been supported at the national and state levels, and a number of agencies and volunteer groups have begun to sample BMIs in Bay Area creeks using the California Stream Bioassessment Procedure developed by the California Department of Fish and Game.

Fish assemblages have also been used as indicators of biological integrity for many years throughout the world. In fact, many water quality management program consider fish assemblage monitoring an integral component, and its importance is reflected in the aquatic life use-support designations of many states. Assessments of the fish assemblage must measure the overall structure and function of the community to adequately evaluate biological integrity and protect surface water resource quality. Fish bioassessment data quality and comparability are assured through the utilization of qualified fisheries professionals and consistent methods, such as the USEPA's Rapid Bioassessment Procedures for Fish.

Together with biological indicators, assessments of physical habitat can aid in determining the physical/habitat condition or quality of a watershed and water body. Physical habitat assessments can be conducted at multiple spatial and temporal scales and can be quantitative or qualitative in nature. Depending on the methodology used to collect physical habitat data, one may use the information to help interpret results from biological indicator studies, or for separate analyses of ecological condition. Strategies may involve the collection of instream, riparian, and/or landscape scale measurements.

To-date, the Program has conducted biological and physical habitat assessments in the Coyote Creek, Adobe Creek and San Tomas Aquino Creek watersheds. Additionally, a number physical habitat assessment-related activities have been, and will likely continue to be conducted by Co-permittees. It is the Program's intent to continue conducting screening level monitoring by utilizing aquatic life use indicators in Program relevant watersheds during the implementation of the Revised Multi-Year Plan. Additional measurements which will be collected synoptically with aquatic life use indicators include qualitative substrate characterizations and general water quality parameters. A timetable for the completion of screening level monitoring is presented in Section 7.0.

Regional Biological Assessment Network

In February 2002, the SCVURPPP participated in a workshop for information sharing and discussion of recent and ongoing bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area.

Building on the success of the BAMBI workshop in 2002, the Program participated in the second annual BAMBI workshop on January 29, 2003. In preparation for the workshop,

the Program supported the development of issue papers intended to stimulate discussion on issues related to the following five topic areas: (1) the standardization of rapid bioassessment protocols in the Bay Area; (2) the establishment of reference conditions for Bay Area creeks; (3) quality assurance and control in field sampling and laboratory analyses; (4) data management and sharing; and (5) physical habitat assessments and protocols. As a follow up, the third annual BAMBI workshop was held on January 29, 2004.

In fiscal year 2004/05 and beyond, the Program anticipates providing support and actively participating in BAMBI activities with the goal of developing regional bioassessment tools necessary to provide context to bioassessment data collected in creeks relevant to the Program.

Pathogen Indicator Organisms

Microbiological water analysis is typically carried out to safeguard the health of a community by testing for possible fecal pollution, the source of microorganisms causing waterborne disease. Indicators of recreational use are microbiological organisms that coexist with pathogens in the fecal environment and are easier and less expensive to test for than pathogens. For these reasons, indicator organisms are often the focus of water analyses rather than pathogens. The most commonly employed indicator organisms are total coliform, fecal coliform, enterococcus, and E. coli.

To provide data necessary to determine impacts to recreational uses in Santa Clara basin water bodies, the Program intends to conduct screening level monitoring using microbiological indicators. Sampling will likely occur at areas where recreational uses are the most prevalent and during times when recreational uses may occur. A timetable for the completion of screening level monitoring is presented in Section 7.0.

3.23 Watershed Assessment Activities

Watershed assessment is the systematic review of specific resources such as benthic macroinvertebrates or fish and their habitat and riparian areas in a watershed-scale context. Watershed assessment is a stage-setting process intended to be based primarily on existing information. The results of watershed assessment can be used to establish the context for subsequent evaluations and analysis of cumulative watershed effects. Watershed assessments typically: 1) address cumulative effects within a watershed; 2) provide for more ecologically sound resource planning; and, 3) identify and help protect environmentally sensitive areas.

From its inception in 1990 through 1995, the Program's monitoring activities focused on establishing baseline information through sampling and analysis of runoff from various land uses and ambient waters. Most recently, SCVURPPP implemented the monitoring approach endorsed by the State Water Resources Control Board (SWRCB) (Surface Waters Ambient Monitoring Program (SWAMP)) and by the RWQCB (Regional Monitoring and Assessment Strategy (RMAS). However, the SWAMP/RMAS approach focuses on strategies for monitoring but does not describe methods to assess monitoring data. To address this need, SCVURPPP recently developed and tested a method to assess stream ecosystem functions in the Coyote Creek watershed that integrated hydrogeomorphic models and indices of biotic integrity. This method was found useful for evaluating stream ecosystem functions and associated aquatic life Beneficial Uses and for identifying and prioritizing additional management actions that could improve

conditions and beneficial use attainment as well as monitoring activities that could fill existing data gaps.

Following the testing of the stream ecosystem function (SEF) method in Coyote Creek, the Program conducted an *Assessment of the Watershed Assessment Methods* project, which was undertaken to build upon recent pilot studies and evaluate findings in the context of the Program's current monitoring and assessment program as well as those implemented by other selected local, regional, and state agencies. Recommendations from the project included, using the SEF assessment approach to analyze data generated from an ambient monitoring program based largely on rapid bioassessments. The Program has embraced this recommendation by integrating watershed assessments into this Multi-Year Plan.

It is the Program's intent to conduct watershed assessments in specific watersheds within the Santa Clara Valley basin beginning in FY 05-06. Assessments will integrate information collected during watershed characterizations and screening-level assessments to support Program objectives of continuously improving Program components and developing additional ones to support attainment of beneficial uses in selected water bodies. Watershed assessment will be coordinated with other assessment-related activities occurring in the basin, to the extent possible, and will only occur in watersheds identified as high priority by the Program.

4.0 POLLUTANTS OF CONCERN (POC) MONITORING ACTIVITIES

4.1 Approach and Objectives

Several Multi-Year Plan elements address local and regional needs for technical information to address POCs in water bodies in or adjacent to the Santa Clara Valley basin. The goal of POCs monitoring to collect scientifically valid information on the sources, status, trends, fate, and transport of POCs and their effects, so that feasible, cost effective management actions can occur to the maximum extent practicable to reduce the impacts on the beneficial uses. POCs monitoring typically include studies that involve field sampling or environmental monitoring, which should not be confused with monitoring the effectiveness of BMPs implemented to control POCs in urban runoff. BMP monitoring is described in Section 5.0 of this Revised Multi-Year Plan.

To assist in reaching the goal of POCs monitoring, the Program has developed the following two POCs monitoring objectives:

- Continue to participate in regional efforts to gain a better understanding of the impacts of POCs on beneficial uses and to work to mitigate these impacts through implementation of water quality attainment strategies (e.g., TMDLs); and,

- Continue to characterize the concentrations and extent of POCs in Program-relevant water bodies, and investigate and identify potential sources and information to support strategies for controlling POCs.

4.2 Pollutants of Concern Monitoring Elements

To reach the Program's monitoring objectives for POCs, the Program will conduct and participate in monitoring-related activities under the following three POC monitoring elements during implementation of the Multi-Year Plan:

Impacts of POCs on the San Francisco Bay Estuary – element entails participation in, and support regional efforts such as the Regional Monitoring Program for Trace Substances (RMP);

Impacts of POCs on Local Water Bodies and Source Characterization– element entails investigating the impacts to, and sources of POCs present in Program-relevant local creeks and water bodies; and,

Additional Regional POC Activities – element entails participation in, and support for regional programs (e.g., Clean Estuary Partnership) designed to develop studies supporting the development of scientifically based total maximum daily loads (TMDLs) and/or site specific water quality objectives for specific POCs;

Brief descriptions of each POCs monitoring element and relevant activities that either, were recently completed; are currently being implemented; or are planned, are provided below. To the extent possible, results from POCs monitoring activities presented in this Revised Multi-Year Plan have been integrated into the Program's POCs Control Programs as they are revised or developed.

4.21 Impacts of POCs on the San Francisco Bay Estuary

In recent years, the Regional Board has determined that the San Francisco Estuary and associated water bodies are impaired by a variety of POCs, under Section 303(d) of the federal Clean Water Act. There are several regional efforts that are currently helping to address the sources, pathways, loadings of POCs and their impacts on the Bay. The Program is an active participant in these efforts and continues to provide funding to regional programs designed to monitor the Bay for POCs. The following paragraphs provide brief descriptions of these programs and the Program's involvement.

Regional Monitoring Program for Trace Substances (RMP)

The RMP was developed in 1993 to provide information to State and local agencies on the status, trends, sources and pathways of pollutants, and the potential effects on organisms that live in or use the Estuary. The RMP's goal is to collect scientifically valid information that allows movement towards understanding contaminant impacts on beneficial uses of the Bay. The RMP focuses on determining spatial patterns and long term trends through sampling of water, sediment, bivalves, and fish; effects on sensitive organisms; and chemical loading to the Bay. To provide the most complete assessment possible of chemical contamination in the Bay, the RMP seeks to synthesize RMP data with data from other sources. Ultimately, the RMP will provide information on how contaminant concentrations in the Estuary are responding to pollution prevention and reduction measures, and if the financial resources devoted to these efforts are improving water quality.

All Bay Area dischargers with NPDES permits (including the Program) contribute funding to the RMP annually. Currently, Program staff represents BASMAA on the RMP Technical Review Committee (TRC). The Program will continue to contribute and actively participate in the RMP (or its equivalent) during the implementation of the Revised Multi-Year Plan. Additionally, the Program will seek to utilize information collected through the RMP to assess potential impacts from discharges under the Program's jurisdiction and develop appropriate management actions through the implementation of POCs Control Programs.

Brake Pad Partnership

After studies in the South Bay indicated that automobile brake pads may be the most significant source of copper in urban runoff, the Brake Pad Partnership (BPP) was initiated in 1996 as a collaboration among regulators, storm water programs, brake material manufacturers, scientists and environmentalists to address environmental problems from brake wear debris. The BPP's work includes research and monitoring, and is an integral part of the Program's Copper Action Plan. Contingent upon available funding, the Program plans to continue participating in the BPP during the implementation of the Revised Multi-Year Plan.

4.22 Impacts of POCs on Local Water Bodies and Source Characterization

Very few local water bodies (i.e., creeks and lakes) throughout the Bay area are currently listed as impaired by specific POCs under Section 303(d) of the federal Clean Water Act. Rather, local water bodies have been thought of as potential transport pathways of POCs that the Regional Board has determined impair segments of the Bay. This section discusses specific investigative monitoring that will be conducted in local water bodies during the implementation of the Revised Multi-Year Plan. As watershed

characterization, screening level monitoring and watershed assessments progress additional investigative monitoring may be needed.

Urban Creeks Toxicity Testing and Chemical Analyses

The SCVURPPP is currently conducting investigative monitoring to determine if diazinon-related toxicity exists in urban creeks. Sampling is conducted twice a year (wet and dry seasons) and water samples are analyzed for the organophosphate pesticide concentrations and three species bioassays are conducted. The goal of the diazinon monitoring program is to detect changes in diazinon concentrations and related toxicity in urban creeks, as management actions are further implemented. Monitoring will occur in a representative number of creeks that provide adequate information for detecting changes in water quality and associated toxicity. Additionally, the Program will continue to conduct water chemistry analyses in sampling locations where toxicity testing has occurred and/or where elevated levels of POCs are evident. These efforts will be coordinated with other stormwater management programs and regional collaborative efforts (e.g, CEP) to the extent possible.

Guadalupe River Monitoring

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is serving as the stakeholder forum for the development of the Guadalupe River TMDL Report for Mercury. The Guadalupe River Watershed encompasses parts of San Jose, Los Gatos, Campbell, Monte Sereno and Santa Clara. The Program is a stakeholder in the Guadalupe River TMDL. The Santa Clara Valley Water District (SCVWD) and is playing a lead role in the TMDL development process. Program staff is also participating in the TMDL process. Through the Guadalupe River TMDL efforts, a substantial amount of water quality monitoring and bioaccumulation studies are planned to occur during the implementation of the Multi-Year Plan.

San Francsiquito Creek Sediment Analysis

In response to a listing of impairment by sediment under section 303(d) of the Clean Water Act and a need to provide information for a TMDL assessment, two separate (but coordinated) projects have been developed. These projects are the San Francisquito Creek Sediment Reduction Plan, administered by the San Francisquito Creek Joint Powers Authority (JPA); and the Aquatic Habitat Assessment and Limiting Factors Analysis, managed by the Santa Clara Valley Water District (SCVWD).

The primary issues driving the TMDL are flooding and degradation of steelhead trout, other threatened aquatic species and their habitats. The approach adopted by the JPA and SCVWD in these projects is to assess factors limiting the threatened aquatic species, including but not confined to those related to excessive sedimentation caused by human land use activities. Project products are intended to produce information that will assist the Regional Board to confirm or reject the validity of the sediment impairment listing and help identify other causes of impairment to aquatic species and their habitats in San Francisquito Creek.

Additional Watershed Analyses and Sediment Practice Assessments

In accordance with permit provision C.9.f.iii, the Program submitted the Sediment Impairment Report (Other Creeks) to the Regional Board on March 1, 2002. The Program received a request from Regional Board staff on July 8, 2002 to revise the

report to include certain issues regarding the development of a work plan and schedule relating to Stevens, Coyote and Saratoga creeks. On August 30, 2002, the Program developed a work plan entitled *Workplan for Conducting Watershed Analysis and Management Practice Assessment in Other Creeks Potentially Impaired by Sediment from Anthropogenic Activities* (Watershed Analysis Work Plan) to fulfill the request. The Watershed Analysis Work Plan tasks and timeline was designed to evaluate and potential implement new watershed assessment approaches in the future using lessons learned from the San Francisquito Creek TMDL project.

Additional Investigative Monitoring

As watershed characterization, screening level monitoring and watershed assessments progress, areas where beneficial uses appear to be impacted by urban runoff may become apparent. In these cases, additional investigative monitoring may be needed. The goal of investigative monitoring is to collect scientifically valid information on the sources, status, trends, fate, and transport of pollutants and their effects, so that feasible, cost effective management actions can occur to the maximum extent practicable to reduce the impacts on the beneficial uses. As previously described,

4.23 Additional Regional POC Activities

Total Maximum Daily Loads (TMDLs) are actions to restore water bodies that have been determined to be impaired under section 303(d) of the federal Clean Water Act. Through the TMDL process, these water quality problems are examined, sources of pollutants are identified, and specify actions that may create solutions are developed. The Regional Board is currently developing more than 30 TMDL projects to address more than 160 listings of Bay area water bodies impaired by specific pollutants.

Clean Estuary Partnership (CEP)

On August 6, 2001, a Memorandum of Understanding (MOU) regarding development of: 1) a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries; and 2) TMDLs for 303(d) pollutants (including mercury) was entered into by the Regional Board, Bay Area Clean Water Agencies (BACWA) and Bay Area Stormwater Management Agencies Association (BASMAA). This group is referred to as the Clean Estuary Partnership (CEP).

The mission of the Clean Estuary Partnership (CEP) is to use sound science, adaptive management, and public collaboration to develop and implement technically valid and cost-effective strategies (including TMDLs) that result in identifiable, sustainable water quality improvements for San Francisco Bay. As a member agency of BASMAA, the Program has contributed funding annually to the CEP. In addition, Program staff currently participates on the CEP Technical Committee (TC) and pollutant-specific workgroups.

In recent years, CEP accomplishments included the development of technical draft reports and projects, including: *Draft Conceptual Model for Mercury in the Bay; Mercury Source Assessment Report*; implementation alternatives for reducing mercury from various sources (seven reports); and the *Guadalupe River Contaminant/Sediment Loading Study*. Contingent upon available funding, the Program will to continue to actively participate in the CEP during the implementation of the Revised Multi-Year Plan.

5.0 BMP AND PERFORMANCE STANDARD MONITORING ACTIVITIES

5.1 Approach and Objectives

Best Management Practices (BMPs) are measures, activities, or other practices that prevent or minimize pollutant discharges to water bodies. Some are routine activities such as recycling materials that contain pollutants, good housekeeping practices and spill prevention procedures. Others are structural treatment measures that are integrated into the storm water conveyance system to remove pollutants from runoff before it enters water bodies. During its second NPDES permit cycle the Program established initial Performance Standards incorporating a variety of BMPs into several components including, Public Information and Participation; New Development and Redevelopment Activities; Illicit Discharge Controls; Industrial and Commercial Business Controls, and; Municipal Government Maintenance Activities. Performance standards in under each component are updated annually on an as needed basis.

The SCVURPPP has developed the following two BMP effectiveness monitoring objectives to aid the Program in determining the most effective and feasible measures that can be implemented to control potential impacts of urban runoff:

- Evaluate the effectiveness of activities and measures implemented by the Program through POCs control programs designed to alleviate potential adverse effects of POCs on water bodies; and,

- Evaluate the effectiveness of activities implemented by the Program that may effectively reduce pollutants from entering water bodies and causing or contributing to exceedances in water quality objectives and/or adverse impacts to beneficial uses.

5.2 BMP and Performance Standard Monitoring Elements

To reach the Program's objectives for BMP implementation monitoring, the Program will conduct and participate in BMP monitoring related activities under following two elements during implementation of the Revised Multi-Year Plan:

Control Programs for POCs – entails monitoring the effectiveness of measures developed and implemented by co-permittees to control POCs;

Performance Standard Monitoring Activities– entails tracking, evaluating and reporting on the effectiveness of urban runoff BMPs, performance standards through the implementation of continuous improvement activities.

Brief descriptions of ongoing or planned activities related to the BMP and performance standard monitoring elements are provided below.

5.21 Control Programs for POCs

The recent emphasis on the enforcement of long-standing Federal requirements relating to TMDL development and implementation has led the Regional Board to request (and require) assistance with identifying control measures for pollutants of concern. The Program's current Performance Standards provide for the control of urban runoff

pollutants to the maximum extent practicable. In addition, the Program's continuous improvement process provides for timely and orderly updates of the Performance Standards as new technology and information becomes available.

The Program's current NPDES permit has greatly expanded the requirements for developing and implementing copper, mercury, pesticides, PCBs, dioxins and sediment control tasks/measures/plans/programs. Since the permit was reissued, the Program has focused on the creation, revision and implementation of numerous activities associated with developing control programs for POCs. The following paragraphs provide brief summaries of these activities. A detailed timeline for implementation of these activities is provided in Section 7.0, *Programmatic Monitoring Indicators (PMIs) Summary Matrix.*

Copper and Nickel Action Plans

The Metals Control Measures Plan, was first created in FY00-01 to assist implementation of baseline activities contained in the Lower South San Francisco Bay Copper and Nickel Action Plans, to track and report activities, and to continue to work with the SCBWMI Bay Monitoring and Modeling (BMM) and Regulatory Subgroups regarding BMM Work Plan Updates. Descriptions of copper control program activities and nickel control program activities are included in the Copper and Nickel Action Plans approved by the SCBWMI and transmitted to the RWQCB as part of the Copper and Nickel TMDL Project for the South Bay. In addition, those baseline activities that are specifically related to the stormwater program are listed in Appendix B of the recently adopted NPDES permit.

To date, most of the CAP/NAP baseline activities have been implemented at the Program level (except for those assigned to specific Co-permittees). During FY 02-03 SCVURPPP, in response to Regional Board staff comments, formalized the process in which Co-permittees clearly identify specific baseline actions within their individual work plans in addition to Program-wide actions. The SCVURPPP, working with Regional Board staff, met in FY 02-03 and FY 03-04 to discuss proposed changes to the CAP/NAP reporting approach and format and agreed upon a revised approach. Relative to developing the annual Work Plan, the revised reporting format includes the following basic information for each baseline action: description of baseline action, regional applicability, linkage to copper reduction, and identification of the performance measure. For each baseline activity the following information is included in the reporting table: an identification of the lead party (if the lead party is the Co-permittee then the Co-permittee includes the action within their individual work plans), a description of the proposed Work Plan actions, a description of how effectiveness will be evaluated, and a summary of the possible future actions.

In addition, the Work Plans tables also provide a summary of actions accomplished in the prior (i.e., FY 02-03) for each CAP/NAP activity assigned to the Program and certain Co-permittees (San Jose, Sunnyvale and Palo Alto). The CAP/NAP contains 21 copper baseline actions and 7 nickel actions. Overall, Regional Board staff has indicated that they are satisfied with the improvements made in the Program's revised Cu/Ni Work Plan and the strategy implemented regarding the tracking/completion of tasks. Some minor remaining issues were acknowledged to be difficult to resolve since they are in large part due to the vagueness of the language (in certain places) found in the original CAP baseline activity tables.

These tasks will be tracked and reported by the Program in Annual Reports. To the extent possible, the Program will evaluate the effectiveness of implementing the tasks during its annual reporting process.

Mercury Pollution Prevention Activities

The Program's reissued NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires the Program to address the impairment by developing and implementing a mercury pollution prevention plan. The Program developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with this Provision. The Mercury Plan was submitted to the Regional Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan. To the extent possible, mercury pollution prevention measures described in the workplan will be consistent with the required implementation actions for urban runoff described in the approved and adopted Basin Plan Amendment associated with the Mercury TMDL for the San Francisco Bay. Through its annual reporting process, the Program will provide an assessment of the effectiveness of mercury reduction measures following their implementation.

Pesticide Control Program

Diazinon has been identified in recent studies as causing toxicity in local creeks. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA). The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies.

The SCVURPPP's NPDES Permit Provision C.9.d. includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticide by others within municipal jurisdictions. The permit provision also requests that the Program continue to work with the Urban Pesticide Committee, BASMAA, and the California Stormwater Quality Association Pesticide Committee to assess impacts of pesticide use and encourage actions by other state and federal agencies. Through its annual reporting process, the Program will provide an assessment of the effectiveness of mercury reduction measures following their implementation.

Polychlorinated Biphenyls (PCBs) and Dioxin Compounds Control Program

PCBs - To develop data needed for the Bay PCBs TMDL, the Program has provided leadership to Bay Area storm water agencies in their efforts during the past three years. This has included coordinating a regional study that characterized the distribution of PCBs concentrations in storm water conveyance sediments in Bay Area watersheds. The Program has also performed PCBs case studies in selected areas where elevated concentrations of PCBs were found during the regional study and coordinated similar case studies by other Bay Area storm water agencies. The case studies were aimed at identifying PCBs sources and assist in developing controls. To facilitate regional coordination, the Program has led a work group of representatives from BASMAA and Regional Board staff. The Program has also prepared PCBs work plans for the above regional and local field studies. The work plans included a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County and preliminary tables summarizing PCBs control options. Through its annual reporting process, the Program will provide an assessment of the effectiveness of PCDD/Fs control measures following their implementation.

Dioxin-like Compounds – All segments of San Francisco Bay were initially listed as impaired by certain PCDD/F compounds in the 1998 303(d) list and repeated in the 2002 303(d) list. The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment. The advisory was issued after PCDD/F compounds (i.e., Dioxin-like compounds) and other pollutants (e.g., mercury and PCBs) were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay.

There is considerable controversy regarding the Bay 303(d) listing and the associated potential threats to human health by PCDD/Fs. The SWRCB and the Regional Board opposed the 1998 listing of PCDD/Fs in the Bay for three reasons: 1) water column concentrations did not exceed PCDD/F water quality criteria; 2) fish tissue concentrations of PCDD/F were consistent with national background levels; and, 3) the fish consumption advisory was an interim action that only included PCDD/Fs because of exceedances of informal screening levels. The State of California was overruled by the USEPA, which cited two primary reasons for the Bay listing: 1) failure to attain a designated beneficial use of the Bay, Commercial and Sport fishing (COMM), based on the interim fish consumption advisory; and, 2) violation of a narrative objective found in the San Francisco Bay Water Quality Control Plan (Basin Plan) pertaining to bioaccumulation of pollutants.

SCVURPPP has conducted a variety of characterization activities for PCDD/Fs in the recent past. These efforts are summarized in the *Control Program for Dioxin Compounds,* which was submitted in the Program's FY 04-05 Annual Work Plan, per NPDES Permit Provision C.9.e. Additionally, in the SCVURPPP has continued to work with other Bay area dischargers and Regional Board staff through the Bay Area Stormwater Management Agencies Association (BASMAA), the CEP and the San Francisco Estuary Regional Monitoring Program (RMP) to coordinate PCDD/F-related activities. Through its annual reporting process, the Program will provide an assessment of the effectiveness of PCDD/Fs control measures following their implementation.

Trash Management Activities

On November 14, 2001, the Regional Board released the document entitled *Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region* Report. This report states that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …", Regional Board staff will review information concerning trash in the next listing cycle to determine whether specific water bodies warrant 303(d) listing. In addition, the report proposed that all urban creeks of the San Francisco Bay region be placed on the 2002 303(d) "monitoring list" due to the threat of trash impairment to water quality.

On February 4, 2003, the State Water Resources Control Board adopted the 2002 303(d) list of water quality limited segments (which included this recommendation) at its Board meeting. According to the SWRCB's *Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments* (dated February 4, 2003), water bodies placed on the "monitoring list" have:

> *" data or information that are not of adequate quality and/or quantity to support a listing and subsequent TMDL regulatory process. In these cases, a finding is warranted that more information must be collected to resolve whether objectives and beneficial uses are attained. The waters on the Monitoring List are high priority for monitoring before the next section 303(d) list is completed."*

In order to effectively address trash issues, the Management Committee formed a Trash AHTG on February 21, 2002. The Trash AHTG prepared a Trash Work Plan that identifies a strategy for addressing trash problem areas that occur in urban streams and waterways. The Trash Work Plan was submitted within the Program's *FY 03-04 Draft Work Plan* on March 1, 2003. During the implementation of the Revised Multi-Year Plan, the Program will provide an assessment of the effectiveness of trash management measures through its annual reporting process.

5.22 Performance Standard Monitoring Activities

In recent years, the Program has implemented, developed and revised performance standards through its continuous improvement process. These efforts are generally focused towards tracking, reporting and evaluating data collected through Program activities and the implementation of BMPs. The following are activities the Program intends to conduct during the implementation of the Revised Multi-Year Plan.

Enhanced Reporting for Industrial-Commercial Discharger (IND) Control Program Illicit Connection and Illegal Dumping (ICID) Elimination Activities

Since October 2001, Program staff has assisted each Co-permittee (on an individual basis) with the implementation of enhanced reporting requirements for IND and IC/ID. To demonstrate consistency and compliance (on a Program-wide basis) with the strategy provided in the Program's technical memoranda regarding IND and IC/ID reporting (dated September 7, 2001) and the approved MC approach, Co-permittees have been submitting raw IND and IC/ID inspection data to Program staff. This data is used to construct IND and IC/ID summary tables. The summary tables are double checked (with the Co-permittees) to ensure that the results are reasonably consistent with their internal data and their interpretation of the data; provided to the Co-permittees for inclusion in their annual reports; and included in the Program's Annual Report. The

overall goal of the effort has been to capture the full extent and the results of the Co-pemittees efforts in a consistent format and on a Program-wide basis. This effort has been very successful in demonstrating compliance with Permit Provisions C.6.a.i and ii. To ensure effective reporting of IND and IC/ID data, Co-permittees intend to continue this process during the implementation of the Revised Multi-Year Plan.

Development of Strategies for Controlling Impacts of Land Use on Beneficial Uses

To implement this priority, the Program supports the SCBWMI Land Use Subgroup (LUS). The Program's participation in the LUS is intended to fulfill a commitment in the 1997 URMP to "translate SCBWMI goals and objectives into model local-jurisdiction policies and procedures." The LUS includes stakeholders representing business interests, developers, environmental advocates, and Regional Board staff, as well as SCVURPPP Co-permittees. As documented in the LUS "Consensus Points" and in Chapter 4 of the SCBWMI Watershed Characteristics Report ("Land Use in the Basin"), the LUS has reviewed and discussed at length the potential effectiveness of various approaches to controlling urban runoff pollutants and other effects of urbanization on streams. A specific approach to integrating municipal land use planning and watershed management is described in Section 4.1 of the Watershed Characteristics Report (unabridged).

In addition to administrative support and leadership for the LUS, the Program has also created additional projects to support the LUS' development of policies and watershed management measures. These projects include: *Economic and Tax Incentives in Watershed Management* and *Compare and Contrast Development Policies*. The Program encourages the RWQCB staff, as part of developing the revised permit language for new development, to integrate the results of the LUS' work to date, to continue RWQCB staff participation in the LUS, and to work with the Program and LUS to implement consensus recommendations reached within the LUS. The Program intends to monitor the successes of the LUS during the implementation of the Revised Multi-Year Plan. The Program intends to report these efforts through its annual reporting process.

Compile, Maintain and Share Program Watershed Data

The Watershed Assessment Subgroup (WAS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0) and November 2003 (version 5.0). The Program funded the initial development of the SSI and each of the annual updates.

Additionally, to comply with its NPDES permit, the Program compiles, develops and analyzes a variety of data sets and reports. Most of this data is collected and generated as part of the Program's environmental monitoring and assessment activities. A majority

of the information collected and used by the Program originates from different municipalities and agencies that conduct studies within Program jurisdictional boundaries.

The Program developed a relational database as an initial task to systematically describe and document data used for its activities. The intent of the database is to demonstrate its usefulness of how to systematically and efficiently collect and document all of the relevant data used in the Program's activities. In addition, the database was designed to explore the feasibility of eventually expanding and coordinating its maintenance and use with other agencies and organizations in the Program. The database is a metadata database which focuses on the description, documentation, and indexing of the data sets, sources, reports, etc. It does not focus on data. The current metadata database incorporated information on data sources that were documented in the existing SCBWMI's watershed assessment metadata database (MDDB) and the WMI's Stream Studies Inventory Report data (SSI). The Program developed draft written user documentation for the database in FY 02-03.

In an effort to compile, maintain and share watershed data, the Program intends to continue to update the SSI and the Program's relational database, to the extent possible during the implementation of the Revised Multi-Year Plan. Additionally, the Program will report on these efforts during its annual reporting process.

6.0 REPORTING AND QUALITY CONTORL PROCEDURES

Consistent reporting of monitoring activities not only allows the Program to comply with NPDES Permit requirements, but also provides a format to discuss the results of data collection efforts and evaluation of the effectiveness of control measures. Additionally, in any environmental monitoring program effective quality control procedures are necessary to assess the accuracy and completeness of data, and to ensure it's scientifically validity. Lastly, data management is an integral part of environmental monitoring, providing a means to access, query and retrieve data in a relatively easy manner. This section briefly discusses the reporting, quality control and data management activities the Program will undertake during the implementation of the Revised Multi-Year Plan.

6.1 Reporting Procedures and Deliverables

There are a variety of reporting mechanisms the Program utilizes to: 1) demonstrate compliance with monitoring requirements in the Permit; 2) describe monitoring activities conducted; 3) provide an evaluation of information collected; and, 4) suggest next steps, including changes in methodologies, potential management actions and additional data collection efforts. Each reporting mechanism has its purpose and scope, as described below. The following is a list of documents the Program intends to submit to the Regional Board during the implementation of the Revised Multi-Year Plan.

Watershed Characterization and Sampling Design Technical Memorandum

Building on recent watershed monitoring and assessment activities conducted by the WMI and the SCVURPPP, the Program plans to conduct activities entailing the collection and analysis of information needed to further characterize watersheds. To facilitate this process, the SCVURPPP will annually develop a *Watershed Characterization and Sampling Design Technical Memorandum* (Characterization Memo). The purpose of the Characterization Memo is to describe existing readily available information (e.g. watershed attributes, beneficial use information, water quality data) that will aid in the development of a sampling design for a specific watershed(s) that are scheduled for screening-level monitoring to begin during the next fiscal year. Beginning in FY 05-06, the Program will submit the Characterization Memo within its Annual Work Plan. The memo will describe and provide the rationale for the selection of sampling parameters and sites within the watershed scheduled for screening-level sampling in that fiscal year. This task is very similar to activities previously conducted by Program staff when developing the Program's Annual Monitoring Program Plan.

Watershed Monitoring and Assessment Summary Report

Following the first and second year of screening-level monitoring in a given watershed, the Program will develop and submit a *Watershed Monitoring and Assessment Summary Report* (Summary Report). The Summary Report is intended to provide a preliminary analysis of data collected during the previous fiscal year. The Summary Report will discuss the results of implementing the Annual Monitoring Plan, pursuant to Provisions C.8 and C.10(b) of the Program's NPDES Permit, by illustrating the SCVURPPP's support for the WMI by: (1) investigating beneficial uses and causes of impairment; (2) reviewing, compiling, and disseminating environmental data; (3) developing and implementing strategies for controlling adverse impacts of land use on beneficial uses; and, (4) facilitating, implementing, and supporting relevant SCBWMI subgroups.

Furthermore, this Summary Report may also provide information on current or planned watershed management activities and suggest (to the extent possible) next steps needed for continuous improvement in addressing high priorities in each of the subject watersheds. The report will be submitted annually with the Program Annual Report.

Watershed Assessment Report

As described in Section 3.23 and illustrated in Figure 1.0, it is the Program's intent to conduct watershed assessments in specific watersheds within the Santa Clara basin beginning in FY 05-06. Assessments will integrate information collected during watershed characterizations and screening-level assessments to support Program objectives of continuously improving Program components and developing additional ones to support attainment of beneficial uses in selected water bodies. Watershed assessment will be coordinated with other assessment-related activities occurring in the basin, to the extent possible, and will only occur in watersheds identified as high priority by the Program. The *Watershed Assessment Report* (Assessment Report) will document the assessment process implemented in a given watershed and present data gaps that the Program may chose to fill through additional monitoring activities. Additionally, similar to the Coyote Creek Watershed Integrated Pilot Study, potential management actions that will likely enhance beneficial uses may be recommended in the Assessment Report.

Investigative Monitoring Reports

Investigative monitoring/studies include more detailed measurements typically taken in a more defined area (e.g., stream reach). As described in Section 2.4, investigative monitoring activities will be conducted on an as needed basis, where previous monitoring suggests that more detailed studies are warranted and feasible. To document these activities, *Investigative Monitoring Reports* (Investigative Reports) will be developed by the Program as investigative studies are completed. Investigative Reports will likely include a detailed analysis of the methods utilized, a discussion of results and recommended next steps.

Program Annual Reports

The Program annually submits a comprehensive report (Annual Report) to the Regional Board that describes activities conducted during the previous fiscal year that are intended to demonstrate compliance with Permit requirements. Within the report, monitoring and watershed management activities implemented during the previous year are described and an evaluation of the effectiveness of implementing these activities is presented.

6.2 Quality Control Procedures

A thorough and effective quality control program is an essential aspect of any monitoring program. While the specific quality control methods applied may vary with the type of monitoring (e.g., sediment quality, water quality, habitat evaluation) and data quality objectives, a few key activities should be included in the development of the quality control program. These activities include:

- An evaluation and documentation of data quality objectives, data acceptance criteria, and field and laboratory quality control methods;

- A review and documentation of field and laboratory methods, along with appropriate information regarding equipment, personnel, logistics and safety considerations;
- Coordination of each project with other projects in the watershed, to ensure consistency and compatibility of approach and to foster interdisciplinary transfer of data and resources; and,
- Review of the project data (including QA/QC data) to determine where project-specific objectives are or are not being met and to identify any notable QA/QC problems, and modification or revision of study methods as appropriate to provide corrective action where needed.

Since the implementation of the Program's original Multi-Year Plan (FY 02-03), quality control procedures have been followed to the extent possible with available resources. To further document quality control procedures that will be followed, the Program will develop, adopt and implement a Quality Assurance Project Plan (QAPP) related to its watershed monitoring and assessment and POC monitoring activities during the implementation of Multi-Year Plan. The QAPP is intended to help the Program ensure that data collected under the Revised Multi-Year Plan are of adequate quality given the monitoring objectives. Once complete, the QAPP will be included as an Appendix to the Revised Multi-Year Plan.

7.0 ENVIRONMENTAL MONITORING MEASURES - SUMMARY MATRIX

While continuing the programmatic approach to measuring compliance, the SCVURPPP is committed to monitoring and assessing their creeks and the San Francisco Bay. Table 3.0 is provided to illustrate the SCVURPPP's proposed surface water monitoring program for the next six years. Table 3.0 contains the following information: watershed location (prioritized based on WMI and SCVURPPP assessment priorities), data type (chemical, biological, physical, and trash), FYs (8 years starting with FY02-03 through FY09-10), rationale, and lead agency. The information on data type utilizes a tiered monitoring approach discussed in Section 2.0 of this document, and includes the following monitoring categories: screening level, investigative, and status and trends. Table 4.0 provides a description of data parameters and analytical methods SCVURPPP intends to use during implementation of its Revised Multi-Year Waters Monitoring Plan.

Table 3.0 (Revised 3/1/04). SCVURPPP 8-year monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Coyote Creek (Only tributaries sampled in FY 02-03)	***Chemical***										
	Contaminants - Water [3]	I (3)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Contaminants - Sediment[4]	I (1)								See FY 02-03 Monitoring Plan	SCVURPPP
	General Water Quality[5]	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Biological										
	Toxicity - Water Quality[6]	I (1)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Conventional Water Chemistry[7]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Pathogens (Indicator Organisms) [8]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment – Macroinvertebrates[9]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment – Fish[10]									See FY 02-03 Monitoring Plan	SCVURPPP
	Physical										
	Physical Habitat[11]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Sediment Characterization[12]	S(4)		I	I	I				Identified as high priority for potential impairment from sediment in SCVURPPP sediment report. Conduct studies using methods developed in work associated with sediment workplan.	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									See FY 02-03 Monitoring Plan	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Lower Penitencia Creek	***Chemical***										
	Contaminants - Water Quality	I (2)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Contaminants - Sediment	I (1)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	General Water Quality	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Biological										
	Toxicity - Water Quality	I (2)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Conventional Water Chemistry	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Pathogens (Indicator Organisms)	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment - Macroinvertebrates	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment - Fish									See FY 02-03 Monitoring Plan	SCVURPPP
	Physical										
	Physical Habitat	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Sediment Characterization	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
San Thomas Aquino	***Chemical***										
	Contaminants - Water Quality		I (6)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP
	Contaminants - Sediment		I (1)							Investigative Monitoring	SCVURPPP
	General Water Quality		S(7)	S(11)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Conventional Water Chemistry		S(7)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality		I (3)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Pathogen Indicator Organisms		S(7)	S(3)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates		S(7)	S(7)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Fish			S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Physical										
	Physical Habitat		S(7)	S(7)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Sediment Characterization		S(7)	S(7)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection currently planned	SCVURPPP
Adobe Creek	***Chemical***										
	Contaminants - Water Quality		I (2)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP
	Contaminants - Sediment		I (1)							Investigative Monitoring	SCVURPPP
	General Water Quality		S(3)	S(5)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Conventional Water Chemistry		S(3)	S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality		I (1)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP
	Pathogen Indicator Organisms		S(3)	S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates		S(4)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Fish			S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Physical										
	Physical Habitat		S(4)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Sediment Characterization		S(4)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Matadero/ Barron Creeks	***Chemical***										
	Contaminants - Water Quality			I (3)	I		T	T	T	Screening level monitoring	SCVURPPP
	General Water Quality			S(6)	S		I	I	T	Screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(4)	S		I	I		Screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality			I (2)	I		T	T	T	Screening level monitoring	SCVURPPP
	Pathogen Indicator Organisms			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Fish			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Physical										
	Physical Habitat			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Sediment Characterization			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Calabazas Creek	***Chemical***										
	Contaminants – Water Quality			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	General Water Quality			S(6)	S		I	I	T	Screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Pathogen Indicator Organisms			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Fish			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Physical										
	Physical Habitat			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Sediment Characterization			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Sunnyvale Channel (East/West)	***Chemical***										
	Contaminants - Water Quality			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	General Water Quality			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality									No data collection is currently	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
										planned	
	Pathogen Indicator Organisms									No data collection is currently planned	SCVURPPP
	Bioassessment - Macroinvertebrates									No data collection is currently planned	SCVURPPP
	Bioassessment - Fish									No data collection is currently planned	SCVURPPP
	Physical										
	Physical Habitat									No data collection is currently planned	SCVURPPP
	Sediment Characterization									No data collection is currently planned	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Stevens Creek	***Chemical***										
	Contaminants - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Conventional Water Chemistry				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	General Water Quality				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Biological										
	Toxicity - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Pathogens (Indicator Organisms)				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Bioassessment - Macroinvertebrates				S	S		I	I	Baseline data collected by USGS in 1997 and RWQCB in 2002	SCVURPPP
	Bioassessment - Fish				S	S		I	I	Coordinate with SCVWD to obtain permits and/or develop approach to monitor status and trends of steelhead populations.	SCVWD/ SCVURPPP
	Physical										
	Physical Habitat				S	S		I	I	Salmonid habitat survey in 1999 by FAHCE; Visual habitat assessment by RWQCB in 2002	SCVURPPP
	Sediment Characterization		I	I	S	S				Identified as high priority for potential impairment from sediment in SCVURPPP sediment report. Conduct studies using methods developed in work associated with sediment workplan.	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Permanente Creek	***Chemical***										
	Contaminants - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Conventional Water Chemistry				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	General Water Quality				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Biological										
	Toxicity - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Pathogens (Indicator Organisms)				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Bioassessment - Macroinvertebrates				S	S		I	I	Baseline data collected by RWQCB in 2002	SCVURPPP
	Bioassessment - Fish				S	S		I	I	Coordinate with SCVWD to monitor status and trends of resident rainbow trout populations.	SCVWD/ SCVURPPP
	Physical										
	Physical Habitat				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Sediment Characterization				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	RWQCB/ SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Monitoring Activities in watersheds not currently considered in plan.											
San Francisquito Creek		I	I	I						Detailed watershed assessment being conducted by stakeholder workgroup administered by the San Francisquito Creek Joint Powers Authority (JPA)	
Guadalupe River	Contaminants - Water Quality	S 16	S 16	S 16	S 16	S 16	S 16	S 16	S 16	Four reaches. Monitoring is shown as quarterly; actual frequency will be in accordance with RWQCB requirements. Total Hg, Methylmercury, TSS.	SCVWD
	Contaminants - Sediment	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	Methylmercury concentrations in riverbed and suspended sediments.	SCVWD
	General Water Quality	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	Monitoring used to calibrate model to simulate stream temperature. Key variable for fish survival.	SCVWD
	Bioassessment - Fish	S 17	S 17	S 17	S 17	S 17	S 17	S 17	S 17	Adult migration & spawning; juvenile rearing and/or migration in 17 or more locations.	SCVWD
	Physical										
	Channel Dynamics and Hydrology	S 14	S 14	S 14	S 14	S 14	S 14	S 14	S 14	Channel bottom stability in 14 transects	SCVWD
	Riparian Vegetation	S 23	S 23	S 23	S 23	S 23	S 23	S 23	S 23	Survival, health & vigor, non-native species cover, and/or tree basal area (18 plots)	SCVWD

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) investigative, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. For FY's 05-06 to 09-19, Parameters types (I and T) only serve as place holders. Future annual monitoring plan submittals will indicate the number of sites where screening-level (S) , investigative (I), and status and trends (T) monitoring will occur in a given watershed.

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology. Adjustments will be made, if necessary, when SWAMP QAPP becomes available in September 2002.

3 Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se) and organophosphate pesticides; sampling conducted for two times per year.

4 Sediment chemistry: Metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As), PCB, mercury, PAHs and organochlorine pesticides; sampling conducted in the dry season only.

5 General water quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted two times per year.

6 Toxicity testing of water on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted at wet and dry season.

7 Conventional water chemistry: Major anions: ortho-phosphate, nitrate, nitrite, chloride, sulfate; total phosphate, boron, TKN, TDS, SSC, ammonia, chlorophyll-a, alkalinity, hardness, TOC and DOC; sampling conducted two times per year.

8 Indicator organisims: total and fecal coliform and *enterococcus*; sampling conducted two times per year.

9 Bioassessment: following CSBP methodology and conducted in the spring season.

10 Rapid bioassessment of fish communities will be done using methods established in the SEIDP or by other standardized methods utilized by the SCVWD or other Co-permittee agencies.

11 Habitat survey physical habitat assessment using CSBP methodology.

12 Sediment characterization includes collecting sediment grain size (full analysis) at sites where sediment samples are collected. Suspended sediment concentrations (SSC) are collected with conventional water chemistry samples. Stream substrate composition is estimated qualitatively during Macroinvertebrate bioassessments and physical habitat surveys.

Table 4.0 Analytical methods used in SCVURPPP Multi-Year Monitoring Plan.

Description of data parameters	Analytical Methods
Pesticides (water) - Organophosphate suite	EPA 8141A
Pesticides (sediment) - Organochlorine suite	EPA 8081A
PCB congeners	EPA 8082
PAH congeners	EPA 8270
ICPMS metals suite (sediment) (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As--all costs)	EPA 6020
ICPMS metals suite (water)--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	EPA 200.8
ICPMS metals suite (water)--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--al costs)	EPA 200.8
Total mercury (sediment)	EPA 245.7/1631M
Major anions nutrient scan: ortho-phosphate, nitrate, nitrite, chloride, sulfate	EPA 365.2, EPA 300
Total Phosphate	EPA 365.2
Boron	EPA 200.8
TKN	EPA 351.3
TDS	EPA 160.1
Suspended Sediment Concentration (SSC)	ASTM D3977-97
Ammonia	EPA 350.3
Chlorophyll-a	SM 10200H/EPA 445.0
Alkalinity	EPA 310.1
Hardness	EPA 130.2
TOC	EPA 415.1
DOC	EPA 415.1
Sediment grain size - full analysis (phi scale)	Plumb/PSEP
Total coliform	SM 9221B
Fecal coliform	SM 9221B
enterococcus	SM 9230B
Ceriodaphnia 7-day Survival & Reproduction	EPA 1002.0 (WET)
Pimephales (fathead minnow) 7 - day	EPA 1000.0 (WET)
Selenastrum (algae) test	EPA 1003.0 (WET)

(WET) Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants (October 16, 1995)

8.0 PROGRAMMATIC MONITORING INDICATORS - SUMMARY MATRIX

Based on the SCVURPPP's experience in implementing Performance Standards, monitoring projects and the continuous improvement process, the Program believes that a key element of its strategy should focus on developing better programmatic indicators and on collecting and analyzing programmatic data. A summary matrix of the various ongoing and planned projects relative to how they address the four major components of the RWQCB's long-term monitoring goals is shown in Table 5.0. The purpose of this table is to give the reader a perspective on the various projects that the SCVURPPP has underway or planned.

In general, specific details on the project scope, expected or completed products and overall due dates can be found in several other reports produced by the Program and are not reproduced in this report. Please refer to the Program's website (www.scvurppp.org) or see the following areas noted below for additional information:

- Project Scopes & Schedules: see the annual monitoring plan contained in the Annual Program Workplans.
- Completed Products: see Table 4-2 contained in the monitoring section of the Program's Annual Reports.
- Status Reports: distributed to AdHoc Monitoring Group and Management Committee at least on a quarterly basis. In addition, the Program discusses the status of various projects on an as needed basis at the BASMAA monitoring subcommittee meetings, special workshops, and various WMI subgroup meetings, in particular the Land Use Subgroup. The results of those presentations and discussions are contained in meeting notes that are distributed to the Management Committee and members of the specific workgroup.

TABLE 5.0
SUMMARY OF ONGOING AND PLANNED SCVURPPP PROGRAMMATIC MONITORING ACTIVITIES

SCVURPPP Programmatic Monitoring Elements	Screening Level[7]	Investigative (targeted – source ID) [8]	Status and Trends Monitoring[3]	Evaluate Management Effectiveness[4]	Status (Expected FY)
Control Programs for POCs					
Copper/Nickel Baseline Actions	Yes	Yes	Yes	Yes	Ongoing
Mercury Pollution Prevention	Yes	Yes	Yes	Yes	Ongoing
Pesticide Control Program	Yes	Yes	Yes	Yes	Ongoing
PCBs Control Program	Yes	Yes	Yes	Yes	Ongoing
Dioxin-like Compounds Control Program	Yes	Yes	Yes	Yes	Ongoing
Trash Management Activities	Yes	Yes	Yes	Yes	Ongoing

[7] Screening-level monitoring involves the collection and analysis of existing and/or new data (chemical, physical, biological) to characterize baseline conditions.
[2] Investigative monitoring typically includes the collection of more detailed measurements in a defined area (e.g., stream reach), to answer specific questions of impairment our source/causes of adverse impacts to beneficial uses and water quality.
[3] Status and trends monitoring typically involves the periodic collection of new data for comparison against baseline conditions and analysis of trends.
[4] Management Effectiveness monitoring involves designing specific receiving water and/or programmatic monitoring programs to evaluate BMPs and/or the implementation and effectiveness of overall stormwater program activities.

SCVURPPP Programmatic Monitoring Elements	Screening Level[7]	Investigative (targeted – source ID) [8]	Status and Trends Monitoring[3]	Evaluate Management Effectiveness[4]	Status (Expected FY)
Performance Standard Monitoring Activities					
Program Data Management & ICID/IND enhanced reporting	No	Yes	Yes	Yes	Ongoing
Land Use Subgroup • Economic and Tax Incentives • Compare and Contrast develop. policies • Stormwater's role in congestion management	No	No	No	Yes	Ongoing

Attachment 4-3

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Watershed Monitoring & Assessment Summary and Watershed Characterization

Purpose: To analyze data collected during implementation of the Program's FY 03-04 Annual Monitoring Program Plan, summarize results and recommend next steps regarding data collection and watershed management; and to characterize watersheds (using available data) that are scheduled to be monitored in FY 05-06, according to the Program's Multi-Year Receiving Waters Monitoring Plan.

Background: Since FY 02-03, the Program has developed and implemented an Annual Monitoring Program Plan (Annual Plan) in fulfillment of Provision C.7 of its NPDES Permit. The Plan identifies monitoring activities that are implemented each year as part of the Program's Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan). Annual Plans have previously been implemented in the Lower Penitencia and Coyote Creek watersheds (FY 02-03) and in the San Tomas and Adobe Creek watersheds (FY 03-04).

In accordance with Provision C.10 (b), the Program developed a Watershed Monitoring and Assessment Summary Report (Summary Assessment Report) which summarizes the results and analyses of baseline data collected during the implementation of the Program's Annual Plan. This data were generated through ambient surface water quality monitoring; physical habitat assessment studies and bioassessment studies. The Summary Assessment Report provides information on possible beneficial use impacts to the extent possible (based on the study design and available data) and suggests next steps for monitoring/assessments and developing strategies to control potential impacts. In September 2003, the Program developed a Summary Assessment Report for monitoring activities that occurred in the Lower Penitencia and Coyote Creek watersheds as part of the FY 02-03 Annual Plan.

In FY 04-05, the Program will summarize and analyze data collected in the San Tomas and Adobe Creek watersheds as part of the FY 03-04 Annual Plan. In addition, the Program will characterize Permanente and Stevens Creek watersheds, which have been identified in the Multi-Year Plan as watersheds the Program will monitor in FY 05-06. Watershed characterization will consist of compilation of existing data sources in effort to understand the physical and biological attributes of these watersheds. The characteristics may include the geologic and geomorphic setting, vegetation, land uses and associated water quality issues, status of biological communities and relevant beneficial uses that occur in each watershed. These data sources will be used to identify appropriate monitoring parameters and locations for implementation of the Program's FY 05-06 Annual Monitoring Plan.

Scope Summary:

1. Analyze data collected in San Tomas and Adobe Creek watersheds as part of the FY 03-04 Annual Monitoring Program Plan and summarize results.
2. Compile existing information to characterize the general physical and biological attributes of Stevens and Permanente Creek watersheds.

Products: Technical Memorandum (Watershed Characterization); Technical Report (Watershed Monitoring and Assessment Summary)

Schedule: July 2004 – June 2005

Program Staff: Chris Sommers, Paul Randall, Lucy Buchan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Watershed Analysis (i.e., Sediment Assessment) in either Stevens Creek or Coyote Creek Watershed

Purpose: To conduct watershed analysis in one of two possible ways: 1) conduct a rapid sediment budget in Stevens Creek if results of the limiting factors analysis warrant further investigation of sediment sources in the watershed; or 2) begin conducting a limiting factors analysis and sediment management practice assessment in Coyote Creek to determine if the watershed is impaired by sediment production from erosion due to anthropogenic activities.

Background: In fulfillment of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program) NPDES Permit Order No. 01-024 Provision C.9.f.iii paragraph two, the Program submitted a sediment assessment work plan to RWQCB staff on August 30, 2002. The sediment assessment work plan contains two separate phases. Phase I includes conducting a limiting factors analysis and sediment management practices assessment, which will be completed in FY 03-04 for Stevens Creek. Phase II includes conducting a rapid sediment budget and is scheduled for the subsequent year. Phase II will only be conducted in Stevens Creek if the Phase I study results indicate that excessive sediment from anthropogenic sources is impairing beneficial uses in the watershed. In FY 04-05, the Watershed Analysis AHTG will review products developed in Phase I and make recommendations for Phase II in Stevens Creek, if warranted; or, if sediment is determined to not be a significant limiting factor in Stevens Creek, then watershed analysis will begin in Coyote Creek. All Watershed Analysis AHTG recommendations will be reviewed and approved by the Management Committee prior to implementation.

Scope Summary:

1. Assist the AHTG to identify if Phase I results indicate Phase II should be implemented in Stevens Creek (pending approval by Management Committee).
2. Conduct rapid sediment budget in Stevens Creek if results of previous year's limiting factors analysis (Phase I) warrant further investigation of sediment sources (Phase II) in the watershed.
3. If sediment is determined to not be a significant limiting factor, then a watershed analysis will begin in Coyote Creek, including:
    a. Conduct limiting factors analysis (described in Task 1 of Work Plan)
    b. Inventory, document and evaluate effectiveness of existing sediment management practices (described in Task 2 of Work Plan).
4. Plan, organize and facilitate meetings with consultants and Watershed Analysis AHTG members.

Products: As related to Stevens Creek - Technical Memorandum (Implementation Recommendations) and Technical Report (Rapid Sediment Budget) **OR, as related to Coyote Creek** - Technical Report (Limiting Factors Analysis) and Technical Memorandum (Sediment Management Assessment).

Schedule: July 2004 – June 2005

Program Staff: Chris Sommers and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Purpose: Provide coordination assistance and staff support to the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Background: In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in storm water programs that include rapid bioassessments in their watershed monitoring and assessment programs.

Building on the success of the BAMBI workshop in 2002, BASMAA participants (including SCVURPPP) coordinated and participated in the second annual BAMBI workshop on January 29, 2003. In preparation for the workshop, Program staff supported (through in-kind services) the development of issue papers intended to stimulate discussion on issues related to the following five topic areas: (1) the standardization of rapid bioassessment protocols in the Bay Area; (2) the establishment of reference conditions for Bay Area creeks; (3) quality assurance and control in field sampling and laboratory analyses; (4) data management and sharing; and (5) physical habitat assessments and protocols.

The third annual BAMBI workshop occurred on January 29, 2004. Technical information on existing and planned bioassessment studies conducted in the San Francisco Bay Area was presented. Workshop participants also reviewed and discussed potential BABMI goals and objectives as an initial step in the development of a work plan that identifies future BAMBI activities.

In FY 04-05, the Program will plan to support and actively participate in the development of a BAMBI work plan with the goal of developing regional bioassessment tools necessary to provide context to bioassessment data collected in Santa Clara Basin creeks. In addition, Program staff will help coordinate and facilitate BAMBI workshop(s) and meeting(s).

Scope Summary:

1. Assist in the planning and coordination of the forth annual BAMBI workshop.
2. Assist in the development of BAMBI work plan and provide in-kind services to implement specific tasks identified in the work plan.
3. Coordinate with other agencies and stormwater programs in further development and implementation of bioassessment tools and sharing of bioassessment data.

Products:

- BAMBI meeting summary(s)
- BAMBI work plan and associated work products

Schedule: July 2004 – June 2005

Program Staff: Chris Sommers, Paul Randall, Lucy Buchan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Purpose: Assist the Program in addressing these pollutants of concern.

Background: All segments of San Francisco Bay were listed as impaired by mercury, polychlorinated biphenyls (PCBs) and certain chlorinated pesticides (DDTs, dieldrin and chlordane) in the 2002 Clean Water Act Section 303(d) list. The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment. The advisory was issued after these pollutants were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. Polynuclear Aromatic Hydrocarbons (PAHs) are not on the 303(d) list, but were placed on the 2002 Monitoring List for the Bay.

Scope Summary: During FY 04-05, the Program will continue to work with other Bay area dischargers and Regional Board staff through BASMAA, the CEP and the RMP to coordinate and plan future monitoring activities related to mercury, PCBs, chlorinated pesticides and PAHs.[1] This will include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff. Program staff will continue to represent BASMAA on the RMP Technical Review Committee and the Sources, Pathways and Loadings Work Group and the CEP mercury and PCBs work groups.

Products: The above actions will be documented in the Program's Annual Report.

Schedule: July 2004 – June 2005.

Program Staff: Chris Sommers, Jon Konnan and Adam Olivieri.

[1]The Program is separately implementing a mercury pollution prevention program. Please see Section 6 of the Program's Work Plan and past Annual Reports for more information.

MONITORING
PROJECT SUMMARY

Dioxins Control Program

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Purpose: Assist the Program in addressing NPDES permit requirements related to dioxin compounds.

Background: Provision C.9.e. of the Program's NPDES permit requires development of a control program to eliminate or reduce discharges of dioxin-like compounds from urban runoff conveyance systems associated with any controllable sources. The several hundred compounds often referred to as dioxin-like compounds are generally members of three closely related families: the polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and certain polychlorinated biphenyl (PCB) congeners with dioxin-like potency that are often referred to as dioxin-like PCBs (the Program is addressing PCBs, including dioxin-like PCBs, as part of a separate program). All segments of San Francisco Bay were listed as impaired by certain PCDD/F compounds in the 1998 and 2002 Clean Water Act Section 303(d) lists. The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment. The advisory was issued after PCDD/F compounds and other pollutants (e.g., mercury and PCBs) were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. There is considerable controversy regarding the Bay 303(d) listing and the associated potential threats to human health by PCDD/Fs. The Regional Board opposed the 1998 listing of PCDD/Fs in the Bay, but was overruled by the United States Environmental Protection Agency (USEPA). The Clean Estuary Partnership (CEP) is currently developing an Impairment Assessment / Conceptual Model report on PCDD/F in the Bay. This report will provide a more detailed analysis of the status of the impairment and associated uncertainties based on the most current data available. The Program's products addressing dioxin compounds include work plans dated March 1, 2002, March 1, 2003 and March 1, 2004, and a technical memorandum dated October 1, 2002. In addition, the Program recently collaborated with other Bay area stormwater management agencies to develop a "synthesis" document on dioxin-like compounds. This document summarizes the current state of knowledge regarding dioxin-like compounds in relation to stormwater runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, impacts, sources, pathways, review of relevant Bay Area, national and international studies, and qualitative review of potential stormwater controls.

Scope Summary: During FY 04-05, Program staff will actively track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Program staff will also encourage Co-permittees to track and participate in these programs as appropriate. Co-permittees may wish to evaluate performing public outreach activities and developing policies and ordinances, such as the City of Palo Alto's Dioxin Elimination Policy. Relevant regional, state and federal efforts include the Bay Area Dioxins Project managed by the Association of Bay Area Governments, statewide programs and strategies developed by the California Air Resources Board to reduce the emission of smog-forming pollutants and toxics by non-mobile and mobile sources (e.g., diesel trucks), the Motor Vehicle Mitigation Fund (AB 204), and multi-faceted efforts by USEPA to assess dioxin risks and monitor and control dioxins. The Program will also continue to work with other Bay area dischargers and Regional Board staff through the Bay Area Stormwater Management Agencies Association , the CEP and the San Francisco Estuary Regional Monitoring Program (RMP) to coordinate and plan any future PCDD/F monitoring activities. This will include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff.

Products: The above actions will be documented in the Program's Annual Report.

Schedule: July 2004 – June 2005.

Program Staff: Jon Konnan and Adam Olivieri.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Implement Trash Work Plan

Purpose: Implement Trash Work Plan (Year 2)

Background: This project is identified in Tasks 6 - 11 of the Program's Trash Work Plan. The Work Plan was prepared to fulfill a Program FY 01-02 Continuous Improvement item and actions within the Program's Multi-Year Receiving Waters Monitoring Plan. The Work Plan was developed in response to the November 14, 2001 San Francisco Bay Regional Water Quality Control Board (RWQCB) 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on a preliminary or "monitoring" list due to the threat of trash impairment to water quality. The State Water Resources Control Board adopted this recommendation in the final version of the 2002 Clean Water Act 303 (d) list.

The RWQCB Staff Report states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by stormwater agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information and developing a program of action to address the principle sources. Regional Board staff has indicated that it will review this specific information in the next listing cycle; determine whether specific water bodies warrant a 303(d) listing for trash and note the existence of relatively clean urban streams.

In a proactive response to the 303(d) Staff Report, the Program developed a Work Plan to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways. The Work Plan includes the following objectives: 1) Document existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in or near creeks; 3) Assist municipalities to identify high priority trash problem areas and sources of trash; 4) Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas; and 5) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

The tasks identified in the FY 04-05 Work Plan focus on the implementation of trash evaluations and management practices. In addition, the Trash AHTG will review existing performance standards relevant to trash management and identify potential revisions to these standards, if necessary.

Scope Summary

- The Program will assist Co-permittee's to develop a strategy to conduct trash evaluations in or near watersheds;
- Co-permittees will conduct trash evaluations in a subset of identified trash problem areas;
- Identify and begin implementation or refinement of trash control measures, as appropriate to address trash problem areas within high priority areas; and
- Program will assist Co-permittees in the review of existing performance standards relevant to trash management and identify potential revisions to these standards, as appropriate.

Products: Completed trash assessment evaluation forms; technical memorandum with maps and tables showing trash evaluation results and providing recommendations for implementing trash management practices; report identifying location and type of trash management practices implemented; revised or new performance standards, as appropriate.

Schedule: July 2004 – June 2005

Program Staff: John Fusco and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Stream Studies Inventory Update

Purpose: Provide update to the Santa Clara Basin Watershed Management Initiative's (SCBWMI) Stream Studies Inventory (SSI) database.

Background: The Watershed Assessment Subgroup (WAS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0) and November 2003 (version 5.0). The Program funded the initial development of the SSI and each of the annual updates.

Scope Summary

- The Program will update, revise and reissue a Stream Studies Inventory (SSI) in coordination with the SCBWMI.

Products: Updated Stream Studies Inventory

Schedule: July 2004 – June 2005

Program Staff: Paul Randall and

Attachment 4-4

Attachment 4-4
FY 2004-2005 Programmatic Monitoring Indicators

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Trash Work Plan	MP#2 & 3c	303d Threatened Listing	The Program will assist Co-permittee's to develop a strategy to conduct trash evaluations in or near watersheds; Co-permittees will conduct trash evaluations in a subset of identified trash problem areas; Identify and begin implementation or refinement of trash control measures, as appropriate to address trash problem areas within high priority areas; and Program will assist Co-permittees in the review of existing performance standards relevant to trash management and identify potential revisions to these standards, as appropriate.	Completed trash assessment evaluation forms; technical memorandum with maps and tables showing trash evaluation results and providing recommendations for implementing trash management practices; report identifying location and type of trash management practices implemented; revised or new performance standards, as appropriate.	July 2004 - June 2005
Dioxin Control Program Activities	MP#1 Provision C.9.e.	NPDES permit and 303d listing	See separate project scope in Attachment 4-3	Dioxins Control Program Work Plan Participation in CEP Technical Committee	Tied to CEP & BASMAA Time Schedule

[1] Monitoring Priorities (updated at Monitoring AHTG meeting November 8, 1999):

1) New projects needed to implement the results, and achieve the goals, of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
   a) Investigate Beneficial Uses and Causes of Impairment (including field work)
   b) Review and Compile Environmental Data and Make it Accessible
   c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
   d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4) Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA

Attachment 4-4
FY 2004-2005 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
PCBs, Chlorinated Pesticides and PAH Control Program Activities	MP#1	303d Monitoring listing	See separate project scope in Attachment 4-2.	CEP Work Products (e.g., CMIAs, Technical Reports) Participation in CEP Technical Committees and Workgroups	Tied to CEP & BASMAA Time Schedule
Continued Implementation of Enhanced IC/ID and IND Tracking and Reporting	Follow-up/ Continuous Improvement MP#2 Provision 6.a.i.	SEIDP #21	Continue Implementation and Reporting of Enhanced Reporting; Revise IC/ID and IND Performance Standards	Database and annual report summary	September 2004
Mercury Pollution Prevention	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.c	NPDES permit	Coordinate implementation of Program's Mercury Pollution Prevention Plan. (See separate FY04-05 Work Pan)	Status Report and internal guidance	See Plan for details
Copper and Nickel Baseline Activities	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.a & b	NPDES permit	The FY 04-05 Copper and Nickel Action Plan Baseline Activity Work Plans and summary of certain FY 03-04 accomplishments are provided within Attachment 4-6.	Revised Copper and Nickel Action Plans	TBD
Pesticide Plan Coordination, Implementation, and Reporting	Follow-up/Continuous Improvement MP#1,2 Provision C.9.d	Implement URMP Pesticide Management Efforts	Coordinate implementation of Program's Pesticide Plan. (See separate FY04-05 Work Pan)	Status Report and internal guidance	See Plan for details

Attachment 4-4
FY 2004-2005 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Compile, Maintain and Share Program/ Watershed Data	Follow-up MP#1	Continuation of Project SC22.63	Data management for the SCVURPPP Program. Coordinate data collected and analyzed by Program-sponsored projects. Insure that data is quality-assured, comparable across projects and comparable across watersheds (where possible). Where feasible, make data accessible to Co-permittees and to the public. Maintain and update website. Summarize available information on the background, purpose, and activities of planned and ongoing studies of the physical, chemical and biological characteristics of creeks and wetlands in the Santa Clara Basin.	Updated inventory of data and metadata generated by the Program and by Program-sponsored studies.	Ongoing
Support for Land Use Subgroup	WMI Subgroups MP# 1, 3c, 3d Provision C.10.	Continue WMI support	Provide administrative support and leadership for the Land Use Subgroup. Maintain the subgroup mailing list; prepare and distribute agendas; chair meetings; edit and distribute meeting summaries; liaison to, and correspond with, the SCBWMI Core Group other subgroups as needed; update workplans; facilitate interaction between consultants and the subgroup; summarize, compile, and convey subgroup products.	Meeting agendas and summaries, Work Plans and other products as directed by the subgroup.	July 2004 – June 2005
FY 05-06 Monitoring Plan and QAPP	Provision C.7.	Permit	Refine Receiving Water Monitoring Plan; develop and adopt a Quality Assurance Project Plan (QAPP)	FY 05-06 Receiving Water Monitoring Plan and QAPP	July 2004 – June 2005

Attachment 4-5

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Control Program for Dioxin Compounds per NPDES Permit Provision C.9.e. Work Plan

March 1, 2004

INTRODUCTION

The NPDES permit issued to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) by the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board) includes water quality-based requirements for specific pollutants of concern. Provision C.9.e. requires that the SCVURPPP develop a control program to eliminate or reduce discharges of dioxin-like compounds from urban runoff conveyance systems associated with controllable sources (if any), and includes the following language:

Characterize the representative distribution of PCBs and dioxin-like compounds in the urban areas of the Santa Clara basin to determine if: a) PCBs and dioxin-like compounds are present in urban runoff, b) if any such PCBs or dioxin-like compounds are distributed relatively uniformly in urban areas, and c) whether storm drains or other surface drainage pathways are sources of PCBs or dioxin-like compounds themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PCBs or dioxin-like compounds to San Francisco Bay via urban runoff conveyance systems;

Provide information to allow calculation of PCBs and dioxin-like compound loads to San Francisco Bay from urban runoff conveyance systems;

Identify control measures and/or management practices to eliminate or reduce discharges of PCBs or dioxin-like compounds conveyed by urban runoff conveyance systems.

Implement actions to eliminate or reduce discharges of PCBs or dioxin-like compounds from urban runoff conveyance systems from controllable sources (if any)…for dioxin-like compounds: submit plan with implementation schedule by March 1, 2004; begin implementation by July 1, 2004 although implementation of early action priorities should take place before that date.

The SCVURPPP prepared this work plan in accordance with the above requirements for dioxin-like compounds.

DESCRIPTION OF DIOXIN-LIKE COMPOUNDS

The chemical compounds referred to as dioxin-like compounds are generally members of three related families: polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs). The specific PCBs congeners with dioxin-like

potency are often referred to as dioxin-like PCBs. PCDDs and PCDFs (referred to collectively as PCDD/Fs) are formed as byproducts in combustion or manufacturing processes. In contrast, PCBs, including dioxin-like PCBs, were intentionally manufactured for a wide variety of applications, and have different sources and probably a different distribution in local watersheds.

This work plan focuses on PCDD/F compounds. It should be noted that dioxin-like PCBs have been found to contribute most of the overall dioxin-like potency in Bay fish (please see the next section – Regulatory Background). For example, dioxin-like PCBs accounted for 81 percent of dioxin-like potency in Bay fish tissue samples collected in 2000 (Greenfield et al. 2003). The SCVURPPP has and continues to address PCBs, including dioxin-like PCBs, through a separate program. For instance, all of the PCBs field characterization programs conducted to-date has included chemical analysis of the12 PCB congeners thought to contribute significant dioxin-like potency in the environment (Ahlborg et al. 1994; Van den Berg et al. 1998). Please refer to the SCVURPPP's annual reports and work plans for more information regarding PCBs-related activities.

REGULATORY BACKGROUND

The Clean Water Act (CWA) requires that states develop water quality standards protective of human health and the aquatic environment. Section 303(d) of the CWA requires the development of a list of "impaired" water bodies that do not meet these standards. The State Water Resources Control Board (SWRCB) and its Regional Water Quality Control Boards are responsible for compiling and periodically updating the 303(d) list of impaired water bodies in California. The list is subject to approval by the United States Environmental Protection Agency (USEPA).

All segments of San Francisco Bay were initially listed as impaired by certain PCDD/F compounds in the 1998 303(d) list (SWRCB 1999). The listing was repeated in the 2002 303(d) list (SWRCB 2003). The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment (OEHHA 1997, 1999). The advisory was issued after PCDD/F compounds and other pollutants (e.g., mercury and PCBs) were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay.

There is considerable controversy regarding the Bay 303(d) listing and the associated potential threats to human health by PCDD/Fs. The SWRCB and the Regional Board opposed the 1998 listing of PCDD/Fs in the Bay for the following reasons (BACWA 2002):

- Water column concentrations did not exceed PCDD/F water quality criteria.
- Fish tissue concentrations of PCDD/F were consistent with national background levels.
- The fish consumption advisory was an interim action that only included PCDD/Fs because of exceedances of informal screening levels.

The State of California was overruled by the USEPA, which cited two primary reasons for the Bay listing (USEPA 1999):

- Failure to attain a designated beneficial use of the Bay, Commercial and Sport fishing (COMM), based on the interim fish consumption advisory.

- Violation of a narrative objective found in the San Francisco Bay Water Quality Control Plan (Basin Plan) pertaining to bioaccumulation of pollutants.

More recently, the Bay Area Clean Water Agencies (BACWA) requested that the SWRCB move PCDD/Fs from the 303(d) list to the "Monitoring List" (BACWA 2002). BACWA believes the original rationale for listing PCDD/Fs in San Francisco Bay was inadequate, and that new information developed since 1999 further supports removal of these compounds from the 303(d) list. This new information includes studies on pollutant concentrations in Bay fish and local fish consumption, and information found in the California Toxics Rule and the State Implementation Policy. The Clean Estuary Partnership (CEP) is currently developing an Impairment Assessment / Conceptual Model report on PCDD/F in the Bay. This report will provide a more detailed analysis of the status of the impairment and associated uncertainties based on the most current data available.

Total Maximum Daily Loads (TMDLs) are a type of water quality attainment strategy often employed to restore impaired water bodies. TMDLs examine water quality problems, identify sources of pollutants, and specify actions to restore water quality. The 2002 303(d) list (SWRCB 2003) designates the TMDL priority for PCDD/F compounds in the Bay as low, and a schedule for performing a TMDL is not included. The Regional Board is currently performing TMDLs for other pollutants thought to impair the Bay (e.g., mercury and PCBs). However, the SCVURPPP understands that the Regional Board does not plan to perform a TMDL for PCDD/Fs in the Bay. The USEPA believes that, since PCBs are the most significant contributor to dioxin-like toxicity in Bay fish, the Bay PCBs TMDL being conducted by the Regional Board is high priority (http://www.epa.gov/region09/water/dioxin/sfbay.html).

PAST SCVURPPP ACTIVITIES

During FY 2001/02, the SCVURPPP submitted an initial work plan (dated March 1, 2002) to address dioxin compounds (SCVURPPP 2002a). The work plan specified reviewing readily available data on methods used to characterize dioxin-like compounds in stormwater runoff and surface waters and concentrations typically found in the Bay Area and other areas. The review revealed that PCDD/Fs have been found in urban runoff in the Bay Area and other locations, and in sediments in the Bay and other estuaries. It was concluded that existing data are not sufficient to characterize the distribution in urban runoff among Bay Area land uses or calculate loadings to the Bay. Based on the data reviewed, combustion-related air emissions may currently be the largest source of PCDD/Fs to the environment and stormwater runoff in the Bay Area. In addition, reservoirs of PCDD/Fs associated with activities no longer practiced in the Bay Area (e.g., medical waste incineration and municipal garbage burning) may exist (SCVURPPP 2002b).

In accordance with the recommendations from the above data review, the SCVURPPP had planned to analyze archived embedded storm drain and creek sediment samples for PCDD/Fs. These samples were archived during the second year (FY 2001/02) of a regional survey of mercury, PCBs and chlorinated pesticides. However, an internal communication error at the project laboratory resulted in inadvertent disposal of the samples before analysis could be performed. However, the Alameda County Clean Water Program has analyzed similar archived sediment samples collected in Alameda County for PCDD/Fs. The SCVURPPP intends to look at the possibility of extrapolating the Alameda County data to other parts of the Bay Area to develop rough characterization and loading estimates.

During FY 2002/03, the SCVURPPP submitted a second work plan (dated March 1, 2003) addressing dioxin compounds (SCVURPPP 2003). The work plan described the SCVURPPP's collaboration with other Bay area stormwater management agencies to develop a "synthesis" document on dioxin-like compounds. This document was recently completed and summarizes the current state of knowledge regarding dioxin-like compounds in relation to stormwater runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, impacts, sources, pathways, review of relevant Bay Area, national and international studies, and qualitative review of potential stormwater controls (BASMAA 2004).

In accordance with the March 1, 2003 work plan, the SCVURPPP has also continued to work with other Bay area dischargers and Regional Board staff through the Bay Area Stormwater Management Agencies Association (BASMAA), the CEP and the San Francisco Estuary Regional Monitoring Program (RMP) to coordinate PCDD/F-related activities.

CURRENT AND FUTURE SCVURPPP ACTIVITIES

The SCVURPPP will implement the actions described below beginning July 1, 2004 (implementation of some of these activities has already begun). The actions fall under two general categories:

- Regional, State and Federal Coordination
- Monitoring and Science

The below actions generally target PCDD/Fs and not dioxin-like PCBs. As described earlier, the SCVURPPP is addressing dioxin-like PCBs as part of a separate program.

Regional, State and Federal Coordination

The SCVURPPP will actively track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Staff will also encourage co-permittees to track, understand, and participate in these programs as appropriate. Co-permittees may wish to evaluate performing public outreach activities and developing policies and ordinances, such as the City of Palo Alto's Dioxin Elimination Policy.

Relevant regional, state and federal efforts include those described below.

<u>ABAG Bay Area Dioxins Project</u>

Beginning in 1999, the Bay Area Dioxins Project (http://dioxin.abag.ca.gov/index.html) began investigating the problems posed by PCDD/Fs and potential source control activities. This effort is managed by the Association of Bay Area Governments (ABAG) and is funded through grants from USEPA and contributions from the City of Berkeley, the City of Palo Alto (a SCVURPPP co-permittee), the City of Oakland, the City and County of San Francisco, the County of Alameda, and the Port of Oakland. The primary goals of this effort are to:

- Pool local governments' knowledge and resources to study dioxins and to provide information about possible solutions or actions for local governments in the San Francisco Bay Area.

- Coordinate efforts with state, federal, and regional agencies working on dioxins issues.

- Work with community groups, trade and industry groups, and the general public on issues of concern related to dioxins.

The Bay Area Dioxins Project is focused specifically on pollution prevention (*i.e.*, preventing the formation of PCDD/Fs). On behalf of the project, TDC Environmental (2001) conducted a screening evaluation of a set of dioxins pollution prevention options identified by the participating municipalities. The evaluation process consisted of identifying benefits, detriments, implementation issues, and costs associated with various pollution prevention options. The options investigated are listed in Table 1.

Table 1. PCDD/F Pollution Prevention Options, from TDC Environmental (2001). Sources associated with dioxin-like PCBs not included.

PCDD/F Source	Pollution Prevention Options
2,4-D (weed control)	• Mechanical weed control • Other herbicides
Agricultural Burning	• Non-burning alternatives
Diesel Engines	• Natural gas • Biodiesel • Oxydiesel • Diesel engine retrofits • Reduce trips/change modes
Drum Reclamation	• Non-burning methods
Medical Waste	• Non-incineration medical waste management methods • Reduce medical waste volumes • Eliminate medical PVC use
Paper Bleaching	• Process or totally chlorine free paper • Elemental chlorine free paper
Pentachlorophenol (PCP)	• Non-wood alternative utility poles • Different wood preservatives
Petroleum Refining	• Refining process modifications
Polyvinyl Chloride (PVC)	• Non-PVC alternatives
Wood Burning	• Natural gas fireplaces • USEPA-certified wood stoves • BAAQMD model ordinance “Better wood burning practices” • No burning

The project has facilitated a series of public meetings, including a workshop and vendor fair, to educate public agency staff, elected officials, and the public on the environmental impacts of dioxins and pollution prevention options. Resources for municipalities to implement four dioxins pollution prevention pilot projects have been provided:

- Diesel alternatives
- Purchasing of dioxin-free paper products
- Purchasing of PVC alternative building materials

- Medical waste management

A final project report is currently being prepared that will include a review of the extent of implementation in the Bay Area of the dioxins pollution prevention measures in Table 1. Many Bay Area municipalities are already implementing one or more of the measures. One example of implementation is the City of Palo Alto's public outreach regarding PCDD/F and other emissions associated with residential wood burning.

California Air Resources Board

The California Air Resources Board (CARB) develops statewide programs and strategies to reduce the emission of smog-forming pollutants and toxics by non-mobile and mobile sources. These include both on and off-road sources such as diesel trucks, heavy-duty construction equipment, and stationary engines (e.g., stand-by power generators). CARB's efforts may lead to reductions in PCDD/F emissions associated with diesel combustion.

AB 204 - Motor Vehicle Mitigation Fund

The Motor Vehicle Mitigation Fund (AB 204) would support projects that reduce, remediate, or offset adverse environmental impacts of motor vehicles and related facilities (e.g. public streets, roads, bridges and parking lots) on the quality of the waters, watersheds, riparian areas and habitats of the San Francisco Bay Area. One such potential impact is urban runoff transporting PCDD/Fs emitted by diesel trucks to the Bay. This legislation authorizes a fee of up to $4.00 per vehicle per year to be assessed on vehicles registered in Bay Area counties that choose to participate in the program. Each county would elect to participate by a majority vote of its board of supervisors. At least three of the nine Bay Area counties would need to participate for the program to be activated. If all nine Bay Area counties participated, the fund would generate close to $20 million annually to reduce and prevent environmental impacts from motor vehicles and related facilities. The BASMAA Executive Board recently approved sending a letter of support for this bill.

USEPA

USEPA has taken aggressive actions to reduce and control dioxins in all environmental media by placing strict regulatory controls on all of the major industrial sources of dioxins. Known, quantifiable industrial emissions have been reduced by more the 90% from their levels in the 1980's as a result of USEPA's efforts, along with efforts by state government and private industry. Other related USEPA efforts include:

- Nationally, USEPA is reviewing dioxin's toxicity. A draft risk reassessment was circulated in 2002. A final risk assessment is pending.

- USEPA is working with the Bay Area Air Quality Management District and CARB to collect data on ambient dioxin levels in Bay Area air.

- USEPA has several projects and partnerships underway to reduce pollutant loadings and educate people fishing from the San Francisco Bay, including a Hospital Waste Pollution Prevention (P2) project and a grant to the California Department of Health Services for a Seafood Consumption Outreach project to reduce consumption levels in at-risk populations.

More information on USEPA's efforts related to dioxins and San Francisco Bay are available at www.epa.gov/region09/water/dioxin/sfbay.html.

Monitoring and Science

The SCVURPPP will continue to work with other Bay area dischargers and Regional Board staff through BASMAA, the CEP and the RMP to coordinate and plan any future PCDD/F monitoring activities. This will include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff.

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Attachment 4-6

Santa Clara Valley Urban Runoff Pollution Prevention Program

Date/Time: December 9, 2003, 1:30 -3:30

Place: San Jose/Santa Clara WPCP

Who Attended: See attached sheet

South Bay CAP/NAP Semi-Annual Meeting

Meeting Summary Report

Key Issues Discussed:

- General- It was agreed that the fall semi-annual review meeting would focus on stormwater activities and the spring meeting on POTW activities and the Work Plan. This format does not preclude discussing other relevant issues at either meeting. Karen McDonough, City of San Jose will replace Dan Bruinsma as chair of the South Bay CAP/NAP subgroup to the WMI Bay Modeling and Monitoring (BM&M) subgroup. Richard Looker acknowledged that he will be the primary point-of-contact (for the Regional Board staff) regarding CAP/NAP. He stated that Jan O'Hara is deferring stormwater CAP/NAP issues to him. Richard asked that Jan O'Hara and Gina Kathuria (POTW permit writer) be copied on the activities of BM&M subgroup. Richard will keep Tom Mumley informed of CAP/NAP status and activities.

- Structure/Content of FY 03-04 Cu/Ni Work Plan- In response to Regional Board staff comments dated November 13, 2002 and June 26, 2003, the Program formalized the process in which the Program and Co-permittees identify specific baseline actions within their individual Cu/Ni Work Plans. Program and Co-permittee staff met on June 6 and July 8, 2003 to discuss and subsequently finalize proposed changes to the CAP/NAP reporting approach and format. On August 5, 2003, the Program and Co-permittees submitted a *Revised FY 03-04 Copper/Nickel Work Plan* consisting of baseline activity tables for each copper and nickel action. Appendices B and C of the Program's 2001 NPDES permit were used as the starting point in developing the Cu/Ni baseline activity tables.

  The *Revised FY 03-04 Copper/Nickel Work Plan* included clarifications and additions intended to address questions and concerns raised by Regional Board staff over the last year. Overall, Regional Board staff is satisfied with the Program's Cu/Ni Work Plan and the strategy implemented regarding the tracking/completion of tasks. Any minor remaining issues were acknowledged to be difficult to resolve given that they are due in large part to the vagueness of the language in certain places in the original CAP baseline activity tables. Different interpretations of such language are possible, have occurred, and have been at times the source of differing expectations of what was or was not to be performed.

- Future C/NAP Approach- Given the problems inherent with the old CAP/NAP language, attendees were in general agreement that further efforts at fine-tuning the historic CAP baseline activities list were unlikely to be productive. Instead, Board staff is looking to results from the Clean Estuary Partnership (CEP) "Copper Sources in Stormwater Information Update" work to help identify the key baseline copper control activities that provide the greatest relative removals per effort expended. This work will be conduced during early 2004 as part of North of Dumbarton Cu/Ni site-specific objective (SSO) project that is being conducted and funded through the CEP. A menu of these prioritized activities would form the nucleus for a revised CAP. The intent would be to focus a more intensive effort on a smaller number of activities. These activities would involve a higher level of scrutiny from Regional Board staff.

  RWQCB staff indicated a desire to work towards a single bay-wide CAP. One potential approach would be to develop the baseline activity language for the North Bay Cu/Ni Action Plans and then to incorporate the language directly (or perhaps by reference) into the

appropriate North Bay stormwater permits. Next, following the prior South Bay approach, the Basin Plan would be amended to include the both the North Bay SSOs and references to the C/NAP in the implementation section. Concurrently, the existing Basin Plan language regarding the South Bay C/NAP activities would also be amended to be consistent with the North Bay language and C/NAP approach.

- Instructions to Co-permittees regarding FY 03-04 & 04-05 Cu/Ni Work Plans- Program staff informed the Co-permittees regarding the need to develop FY 03-04 Cu/Ni Work Plan tasks in January and July 2003. On January 14, 2003, Co-permittees were provided FY 03-04 Work Plan instructions requesting the identification of Cu/Ni tasks that have not been completed or will be on-going during FY 03-04. On July 16, 2003, Program staff requested that the Co-permittees include tasks in their revised FY 03-04 Cu/Ni Work Plans, as appropriate and applicable to their communities, to address six CAP and one NAP baseline activities that make sense to implement. In late July 2003, one additional CAP activity was added as a Co-permittee FY 03-04 task.

  Program staff will distribute instructions to Co-permittee staff regarding the development of FY 04-05 Cu/Ni Work Plans in late December or early 2004. Instructions will focus on the eight CAP/NAP activities identified in the FY 03-04 Cu/Ni Work Plan. A submittal schedule will also be provided. FY 04-05 Cu/Ni Work Plans will be submitted to the Regional Board on March 1, 2004.

  Palo Alto has agreed to investigate why copper-containing pesticides usage is increasing. The question may relate to actual increases or perhaps how the City of Palo Alto is gathering data.

- Tracking/Completion of FY 03-04 Cu/Ni Work Plan Tasks by Program Staff- To ensure the tracking and completion of FY 03-04 Cu/Ni Work Plan tasks, each baseline activity was assigned to appropriate Program staff. The list of individuals tracking tasks was discussed. To clarify the expectations regarding the tracking/completion of each activity, tracking task assignment sheets were developed for the majority of the activities. Each task sheet lists the baseline activity, describes what should be completed and provides a timeline for completion. Program staff is providing updates (on a quarterly basis) within the baseline activity reporting tables that detail the completion status of certain tasks. Current information on the status of these tasks will be included in the FY 04-05 Cu/Ni Work Plan.

  A brief update regarding the tracking/completion of FY 03-04 Cu/Ni Work Plan was provided. CB-1- Program staff mentioned that three mobile surface cleaner workshops have been scheduled for FY 03-04. The first workshop is scheduled for Wednesday, December 17, 2003 at the San Jose/Santa Clara WPCP. CB-16-The scope of work for the Clean Water Fund/Environmental Clearinghouse was provided. This project involves the development of a web-portal that provides information on nation-wide copper and nickel pollution prevention activities. CB-17/18- The draft scope of work for CAP "tracking research activities" was discussed. This project involves the development of a website (by SFEI) that contains projects and reports for regional activities related reducing scientific uncertainties associated with the impairment assessment conclusion. Future funding beyond 2004 needs to be identified. Potential funding sources include RMP or CEP.

- RWQCB 9/23/03 "Talking Points" Handout Follow-up Information- At the September 26, 2003 Regulatory Executive Forum meeting, Tom Mumley distributed a one-page document entitled *CAP/NAP briefing 9-23-03 CAP/NAP talking points only*. The document contained comments on several of the baseline activities presented in the Program's *Revised FY 03-04 Copper/Nickel Work Plan*. To clarify the content of the *Revised FY 03-04 Copper/Nickel Work Plan*, Program staff prepared and distributed a letter dated 11/21/03 entitled *CAP/NAP Briefing 9/23/03, CAP/NAP Talking Points-Follow-up Information*. A recap of the information contained in that letter will be included in the Program's *FY 03-04 Annual Report*.

  An update of scheduled CB-3 tasks for FY 03-04 was provided. One task is the additional production and distribution of stand-alone roof vent BMP information (by the City of San Jose) to circuit board and metal finishing facilities. Program staff described how industrial and many commercial facilities are routinely inspected and their performance tracked relative to potential stormwater contamination as part of other baseline Program activities.

- Update of Results of Lower South Bay Ambient Monitoring- Graphs showing the Dry Weather Dissolved Copper/Nickel Means for Indicator Stations were provided. The data indicates no significant changes in dissolved copper/nickel concentrations. The trend line is flat.
- Upcoming CAP Activities- CEP FY 03-04 Project #4.11- "Impairment Assessment for CU/Ni North of Dumbarton Bridge" was briefly discussed. In the near future, a technical paper will be prepared which updates copper sources, control and quantification information (see above). In addition, the report will note data gaps and identify information needed to address uncertainties relating to potentially significant sources. The information presented in this report will be used to update proposed Cu actions for the South Bay. In addition, the report will assist in the development of future Cu actions for the North Bay. It was agreed that the ultimate goal is to develop one Cu/Ni action plan for the entire Bay.

  The North Bay SSO/CAP permitting and Basin Plan Amendment language may be completed in the next 9-12 months. Timing needs to be coordinated with the reissuance of the Program's NPDES permit in 2005. It was suggested that a master schedule be developed to incorporate South Bay needs into the North Bay copper action planning effort. The master schedule would include stormwater and POTW permitting plus Basin Plan amendment timelines for the next five years. Currently, Monica Oakley (LWA) is compiling a milestone timeline for South Bay POTW permits. Information from her timeline could be incorporated into the master timeline. In addition, Action Plans must include three basic elements: monitoring with baselines and triggers; source control activities; and activities to help resolve uncertainties in the impairment assessment. Bay-wide action plans may use the pollution prevention menu approach where one could select the most effective measures from a larger list.

  Currently, there is no time driver for the North Bay Cu/Ni SSO work since it is not a high priority for the Regional Board. It was suggested that the Program consider obtaining the updated stormwater copper sources work (from CEP & BPP) and run the URS SFO hydrodynamic model to re-evaluate current loading impacts on the bay. It was noted that this is basically the work that the Brake Pad Partnership Proposition 13 funded brake pad debris copper fate and transport project will be conducting beginning in the summer of 2004.

- Wrap-up- The next BM&M subgroup meeting will occur in April/May 2004 and focus on POTW CAP issues and FY 04-05 Workplan issues. Tom Hall and Karen McDonough will provide this subgroup with relevant information from the North Bay SSO/CAP activities for comment. Additional meetings may be held to develop South Bay Action Plan amendments.

Next Steps:

- Program staff will prepare a master schedule to include stormwater and POTW permitting; and Basin Plan amendment timelines for the next five years. The timeline will be prepared prior to the next BM&M meeting.
- Phil Bobel will task LWA and Kelly Moran with determining why copper-containing pesticides usage appears to be increasing. This will be determined prior to the next BM&M meeting.

Issue Bin:

- It was asked what level of cooperation the VTA was providing relative to responding to issues raised by the Program in prior white papers about potential actions to reduce vehicle usage.
- It was asked if adequate funding was allocated for P/IP reprints during FY 04-05. During the last P/IP budget meeting, this subject was not discussed.

Location	San Jose/Santa Clara WPCP
Date	December 9, 2003, 1:30 – 3:30
Name	**Affiliation**
Brad Eggleston	City of Palo Alto
Cheri Donnelly	West Valley Clean Water Program
Dave Drury	SCVWD
Dave Grabiec	City of Sunnyvale
John Fusco	Program Staff – SCVURPPP
Karen McDonough	City of San Jose
Kristy McCumby	City of Sunnyvale
Lorrie Gervin	City of Sunnyvale
Melody Tovar	City of San Jose
Phil Bobel	City of Palo Alto
Richard Looker	RWQCB
Steve Osborn	City of San Jose
Tom Hall	EOA, Inc.
Trish Mulvey	Clean South Bay

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB-1 – Reduce copper discharges from vehicle washing operations: (1) outreach on residential car washing, (2) outreach and requirements for commercial & industrial vehicle washing, and (3) education of and implementation of BMPs by mobile cleaners. Include mechanisms to evaluate effectiveness of each of these 3 measures. **Region of Applicability:** South Bay. Concept potentially applicable Bay-wide. **Linkage to Copper Reduction:** Indirect. Assumes vehicle wash water contains copper that will be permanently captured/redirected away from storm drains. **Performance Measure(s):** Extent of outreach, training, retraining, inspection, and enforcement efforts by SCVURPPP and Co-permittees				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-1(1)		a. Continue to distribute Watershed Watch (WW) campaign brochures at public events and post information on the WW website. Include information on proper car washing in WW advertising. This task is an on-going P/IP activity. b. Work with WW partner business, Classic Car Wash, to do promotional events in June/July 2004.	Effectiveness Measures: a. Track quantities of outreach material distributed and gross impressions of advertising (see Annual Watershed Watch Campaign Media Report). b. Track number of participants in car wash events and repeat customers using the discount card at the car wash.	Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP CB-1(2)		Track the following Co-permittee activities: a. Require source control measures for Group 1 new development and redevelopment projects that will conduct vehicle/equipment washing and maintenance activities. This activity is consistent with Permit Provision C.3.k. b. Inspect automotive facilities (car washes are a subset of this category) as part of the Program's Industrial/Commercial Discharger Control Program. Inspection results are summarized in the Program's Annual Report submitted each September. This activity is consistent with Permit Provision C.6.a.i.	As applicable, Co-permittes are inspecting automotive facilities in accordance with their planned IND inspection commitments. Follow-up inspections are conducted at facilities determined to be out-of-compliance.	Ongoing Ongoing. This activity is part of the Program's enhanced reporting requirements.
Palo Alto, Sunnyvale, San Jose CB-1(3)		Continue to respond to training requests from mobile surface cleaners who desire initial BASMAA surface cleaning certification. Maintain list of individuals and dates of training. Provide training information to Program staff for reporting purposes. Municipal staff (or encourage public parties) will select certified mobile cleaners (from the list) when contracting cleaning services.	Provide lists in Annual Reports.	Training will be provided, as requested, by one of the three POTW cities. On a biannual basis, local trainers will provide Program staff with a list of individuals and dates of training.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
All Co-permittees All CB-1 tasks		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP CB-1(1)		• Distributed Watershed Watch (WW) campaign brochures at three public events.	75 WW kits were distributed at public events during July-October 2003	
		• Worked with WW partner, Classic Car Wash, to do four promotional events in August 2003. Classic Car Wash offered fifty percent discounted car washes to patrons who mentioned the Watershed Watch Campaign at the event. The *San Jose Mercury News* and KBAY provided free promotional advertisement for each event. These ads provided information on how the use of a commercial car wash prevents stormwater pollution. The promotion was also posted on the WW web site for one month. Co-permittee and Program staff distributed WW kits and flyers describing the environmental impact of washing cars on paved surfaces at each event. The WW kit included a discount coupon offering a $4.00 discount at all Classic Car Wash locations. This discount is also being promoted on the Watershed Watch web site.	264 WW kits were distributed at the four events. An additional 536 kits were distributed at Classic Car Wash kiosks/cash registers. Use of discount cards by repeat customers: 40 in September, 70 in October, 41in November and 51 in December.	Another Classic Car Wash promotion will probably occur in May/June 2004.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP CB-1(2)		Track the following Co-permittee activities: a. Require source control measures for Group 1 new development and redevelopment projects that will conduct vehicle/equipment washing and maintenance activities (consistent with Permit Provision C.3.k). b. Inspected vehicle washing facilities as part of stormwater inspections for industrial and commercial businesses.	Co-permittes are inspecting vehicle washing facilities in accordance with their planned commitments. Follow-up inspections are conducted for facilities out-of-compliance.	Ongoing-Consistent with Permit Provision C.3.k. Ongoing-Consistent with Permit Provision C.6.a.i

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP CB-1(3)		a. On October 29, 2003, a planning meeting was held with the three POTW cities to review the Program's standardized mobile surface cleaner training program. All three POTW cities are now ready to conduct training when requested.	All three workshops and subsequent trainings will consist of a standardized message.	
		b. Each of the three POTW cities will be conducting a Program-sponsored training workshop to certify (and re-certify in some cases) mobile surface cleaners in proper surface cleaning techniques. The first training was conducted on December 17, 2003. Approximately 31mobile cleaners attended the workshop.	The December 17, 2003 workshop was very well received. Trainees are requested to provide evaluation forms after the trainings.	Additional mobile training workshops will be held February 11 and March 24, 2004. Recertification workshops will be held every two years.
		c. Distributed a list of 31 mobile surface cleaners to the Management Committee (by electronic mail) on December 18, 2003. Municipal staff (and other public agencies as appropriate) will use the list to select certified mobile cleaners when contracting cleaning services.	Improves the likelihood that certified mobile cleaners are used when contracting cleaning services.	An updated list of certified cleaners will be distributed to the Management Committee when the remaining workshops are completed.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto, Sunnyvale, San Jose CB-1(3)		**As Required:** Respond to training requests from mobile surface cleaners who desire initial BASMAA surface cleaning certification. Maintain list of individuals and dates of training. **Biannual:** Provide training information to Program staff for reporting purposes. **Ongoing**: Municipal staff (or encourage public parties) will select certified mobile cleaners (from the list) when contracting cleaning services.	Provide lists in Annual Reports.	Ongoing. Training will occur when requested. Local trainers will provide training information on a biannual basis
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-1(1)		a. Continue to distribute Watershed Watch (WW) campaign brochures at public events and post information on the WW website (see FY 02-03 actions described below). Include information on proper car washing in WW advertising. b. Work with WW partner business, Classic Car Wash, to do 4 promotional events in August 2003. At the events, Classic Car Wash will offer discounted car washes to all patrons who mention Watershed Watch. Drivers will receive a WW brochure and a flyer promoting the WW discount card, which will allow future discounts on car washes. The events will be promoted by KRTY and the Mercury News. Ads for the events will explain how the use of commercial car washes prevents stormwater pollution.	<u>Effectiveness Measures</u>: a. Track quantities of outreach material distributed and gross impressions of advertising (see Annual Watershed Watch Campaign Media Report). b. Track number of participants in car wash events and repeat customers using the discount card at the car wash. c. Follow-up with Co-permittees to obtain data regarding local vehicle washing outreach activities. Summarize activities in Annual Report.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP CB-1(2)		Track the following Co-permittee activities: a. Require source control measures for Group 1 new development and redevelopment projects that will conduct vehicle/equipment washing and maintenance activities (consistent with Permit Provision C.3.k). b. Inspect vehicle washing facilities as part of stormwater inspections for industrial and commercial businesses.	Collect and review data for annual reports.	
SCVURPPP CB-1(3)		a. Review with the three POTW cities the Program's standardized mobile surface cleaner training program, and ensure that they are ready to conduct the training when requested. b. Conduct a Program-sponsored training workshop to re-certify mobile surface cleaners in proper surface cleaning techniques (bi-annual recertification will be required approx. February 2004). c. Distribute the most recent list of certified cleaners to Co-permittees annually. Municipal staff (and other public agencies as appropriate) will use the list to select certified mobile cleaners when contracting cleaning services.	Document training. Use evaluation form at workshop.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto, Sunnyvale, San Jose CB-1(3)		Respond to training requests from mobile surface cleaners who desire initial BASMAA surface cleaning certification. Maintain list of individuals and dates of training. Provide training information to Program staff for reporting purposes. Municipal staff (or encourage public parties) will select certified mobile cleaners (from the list) when contracting cleaning services.	Provide lists in annual reports.	
All Co-permittees All CB-1 tasks		Refer to individual Co-permittee Work Plans.		
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP CB-1 (1)		Included outreach on residential car washing as part of the Program's Watershed Watch campaign. Brochure contains recommended practices for car washing. Also posted information on car washing and automotive maintenance on the Watershed Watch website. Developed a newsletter article entitled *Your Car's Tailpipe Isn't the Only Source of Auto Pollution*. This article, which discusses proper car washing and maintenance techniques, was distributed to over 137 agencies for inclusion in their newsletters.	33,150 English and 6,500 Spanish-language Watershed Watch brochures were distributed in FY 02-03	Continue to distribute brochures and promote website (see FY 03-04 work plan above.)

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP CB-1(2)		Developed a model list of source control measures for new development and redevelopment projects that includes measures for projects with vehicle/equipment washing and maintenance activities onsite (consistent with Permit Provision C.3.k). These were submitted to the Regional Board in September 2002 and approved as part of Regional Board staff review of the Planning Procedures Performance Standard.	Cannot be evaluated at this time.	See FY 03-04 work plan above.
SCVURPPP CB-1(3)		Developed and provided the three POTW cities with a standardized mobile surface cleaner training program, including training procedures/format, training materials and other aids. Provided updated list of designated local trainers to the Management Committee.	Will help provide a more standardized training course for mobile cleaners in the South Bay.	See FY 03-04 work plan above.

CAP Category: Potential Source Tracking				
BASELINE ACTIVITY: CB- 2 – Water Supplier Copper Sulfate Use **Region of Applicability:** South Bay and other Bay areas with open water reservoirs and conveyance facilities **Linkage to Copper Reduction:** Raw water copper sulfate applications to control algae could potentially increase treated water concentrations **Performance Measure(s):** Raw water copper sulfate dosage and treated water copper concentrations				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVWD		Provide State DWR copper sulfate dosage notices annually to City of Palo Alto. This is an on-going activity.		Ongoing. Notices will be provided annually.
FY 2003-2004		**Actions Accomplished in Period**		
SCVWD		**To occur during FY 03-04**: Provide State DWR copper sulfate dosage notices annually to City of Palo Alto		Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVWD		Discontinue	Additional effort unwarranted	None
FY 2002-2003		**Actions Accomplished in Period**		
SCVWD Palo Alto	Annual report to Palo Alto	Raw and treated water concentrations and copper sulfate dosages applied to South Bay Aqueduct from 4/17/2 SCWD report included in Palo Alto Feb. 2003 "Copper Action Plan Report" (CB-4(3)).	Raw water copper sulfate applications to control algae shown to not increase treated water concentrations. Treated water not a significant source of copper loading to the Bay.	Provide State DWR copper sulfate dosage notices annually to Palo Alto
SCVWD	Copper in Source Water Report of 4/17/02	"Data analysis Report Copper in Source Water for Drinking Water Treatment Plants" submitted to BMM/RS 4/24/02. Report found copper sulfate dosage to SBA to have no significant effect on treated water concentrations from SCVWD water treatment plants	Average and median treated water concentrations in 5-6 ug/L range.	Action Plan Item CB-2 deemed completed

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: CB- 3: Measures to control copper in discharges of stormwater from targeted industrial sources: older printed circuit board manufacturers and metal plating facilities using copper.

Region of Applicability: Primarily South Bay and City of San Jose.

Linkage to Copper Reduction: Roof-top exhaust vents from etching equipment and acid plating baths can contribute copper and nickel to roof runoff from these industries.

Performance Measure(s): Outreach to appropriate industries; use of recommended BMPs; future industrial inspection reports.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Distribute the stand-alone roof vent BMP information (developed by the City of San Jose) to Co-permittees. The City of San Jose distributed this piece to circuit board and metal finishing facilities in FY 03-04.		
SCVURPPP		As part of the Program's Industrial/Commercial Discharger Control Program, continuing inspecting facilities which are potential sources of copper. Potential sources may include electric/electrical components, metal manufacturing and metal finishing facilities. Inspection results are summarized in the Program's Annual Report submitted each September. This activity is consistent with Permit Provision C.6.a.i	As applicable, Co-permittes are inspecting industrial and commercial facilities in accordance with their planned IND inspection commitments. Follow-up inspections are conducted at facilities determined to be out-of-compliance. Co-permittees report evaluation of effectiveness of IND programs for target industries in Annual Reports.	Ongoing. This activity is part of the Program's enhanced reporting requirements.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP		Begin working with the IND AHTG to develop model language for updating the IND Performance Standards. If necessary, continue update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater.		Possible update to URMPs of Co-permittees with IND programs.
San Jose		Continue NOI Filers outreach project.		
All Co-permittees with IND Programs		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		• Complete summary re ort on most effective targeted industry stormwater control measures. Distribute to Co-permittees, BASMAA and other Bay Area stormwater programs (Fall 2003). **Update:** Co-permittees routinely inspect industrial and commercial facilities for illicit or other potential discharges/releases of constituents of concern. There are relatively few pathways for copper to be released from industries in a manner that would contaminate stormwater. The primary potential source identified by San Jose's investigations was from roof vents in older printed circuit board and copper plating. As a result, this action will be addressed through the distribution of a stand-alone BMP. In addition, the inspection of industrial and		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		commercial facilities has been incorporated into the Program's Industrial/Commercial Discharger Control Program. The approach for identifying potential sources of storm water pollution is described in the Program's memorandum entitled *Continuous Improvement of Industrial Reporting* (dated September 7, 2001). The approach was developed by the Industrial AHTG in 2001. • Hold Industrial (IND) Ad Hoc Task Group (AHTG) meeting to review results of IND-1 and IND-2 efforts and San Jose's NOI industry outreach program. Work with the IND AHTG to develop model language for updating the IND Performance Standards and a timeframe for implementation. Consider update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater. **Update:** This task was originally scheduled for FY 03-04. Due to higher priority Program issues, this task has been delayed until FY 04-05		
San Jose		• The City of San Jose has committed to the additional production and distribution of stand-alone roof vent BMP information to circuit board and metal finishing facilities. BMP information is scheduled to be printed and mailed to all permitted industrial users in the SJ/SC WPCP service area by March 31, 2004. The continued distribution of roof vent BMP information is a follow-up action to San Jose's spring 2001 publication of roof vent information in the City's pretreatment newsletter entitled *Tributary Tribune*.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		• Continued NOI Filers outreach project. Tasks completed in FY 03-04 include the following: – Collected educational materials relating to General Permit requirements, NOI, BMPs and/or SWPPPs. – Provided NOI filing information to San Jose Watershed Enforcement inspectors. Currently determining NOI status and needs as part of Inspection SOPs. – Posted NOI filing information on the City of San Jose web site. – Distributed an all-purpose BMP brochure entitled *Preventing Storm Drain Pollution*, as appropriate, to all facilities as part of routine storm water facility inspections. It details general storm water BMP information. – Began translating *Preventing Storm Drain Pollution* into Spanish and Vietnamese. Both documents will be printed and distributed, as appropriate in FY 04-05. • Other tasks to be completed include: – Providing NOI filing information to industry representatives at the San Jose Industrial User Academy Trainings (scheduled for March 2004). Information to be provided includes: regulatory background and requirements, actions needed to achieve compliance, and details on determining exposure. – Obtaining an updated list of industries requiring NOI filing from San Jose's IND Database. Letters will be mailed in June 2004 to companies who may need to file NOIs. Letters will include information on how to achieve compliance with		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		the GIASP.		
All Co-permittees with IND Programs		Refer to individual Co-permittee FY 03-04 Annual Reports.		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Complete summary report on most effective targeted industry stormwater control measures. Distribute to Co-permittees, BASMAA and other Bay Area stormwater programs (Fall 2003). • Hold Industrial (IND) Ad Hoc Task Group (AHTG) meeting to review results of IND-1 and IND-2 efforts and San Jose's NOI industry outreach program. Work with the IND AHTG to develop model language for updating the IND Performance Standards and a timeframe for implementation. Consider update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater.	Co-permittees to report evaluation of effective-ness of IND programs for target industries in annual reports.	Possible IND performance standard update; possible update to URMPs of Co-permittees with IND programs.
San Jose		• Continue distribution of information regarding copper from roof vents. Article previously published in Tributary Tribune newsletter will be produced as separate piece and distributed to targeted industries. Information is also available on ESD website. • Continue NOI Filers outreach project.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
All Co-permittees with IND Programs		Refer to individual Co-permittee Work Plans.		
FY 2002-2003		**Actions Accomplished in Period**		
San Jose		• Roof vent BMP outreach -- Published BMP info on copper from metal finishing facility roof vents in FY 00-01. Published article in "Tributary Tribune" newsletter, and posted information on ESD website. • NOI Filer Outreach -- NOI requirements are taught at Industrial User Academy. Watershed Enforcement inspectors check for NOI status as part of routine facility inspections and educate as needed. (For additional details, see City of San Jose's FY 02-03 Annual Report.)		
SCVURPPP		Due to SCVURPPP focus on higher priority issues, no actions on this task were taken in FY 02-03.		See FY 03-04 work plan above.

CAP Category: Potential Source Tracking				
BASELINE ACTIVITY: CB- 4(3) – Potential Copper Sources, Loadings, and Impact Indicators **Region of Applicability:** Mainly South Bay; some indicators (brake pad content and BPP) applicable Bay-wide **Linkage to Copper Reduction:** Measures of copper sources, indicators of potential release to the environment, and monitoring of impacts on indicator aquatic organisms **Performance Measure(s):** Relative change in specified indicator measurements				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto	2005 Palo Alto CAP Report	• Palo Alto will prepare fourth annual *Copper Action Plan Report* in Feb/Mar 2005. Influent, effluent and loading data from Sunnyvale, San Jose will also be included within the report. This is an on-going activity.		Report will include DWR copper sulfate dosage (to the South Bay Aqueduct) data
FY 2003-2004		**Actions Accomplished in Period**		
Palo Alto	2004 Palo Alto CAP Report	• **Update:** Palo Alto is currently preparing third annual *Copper Action Plan Report*. Influent, effluent and loading data from Sunnyvale, San Jose will also be included within the report. • Identify and agree on approach to consolidate related task reporting in this annual report.		Report will include DWR copper sulfate dosage (to the South Bay Aqueduct) data

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto	2004 Palo Alto CAP Report	• Palo Alto will prepare a third annual "Copper Action Plan Report" in Feb/Mar 2004. Include influent, effluent, and loading data from SU, SJ in 2004 CAP report. • Identify and agree on approach to consolidate related task reporting in this annual report.		
FY 2002-2003		**Actions Accomplished in Period**		
Palo Alto	"Copper Action Plan Report" of 2/21/03 in Appendix F of the City's Feb. 2003 "Clean Bay Plan"	Second annual report includes summaries of copper concentrations in raw and treated water plus amounts of copper sulphate applied to the South Bay Aqueduct by the Department of Water Resources for algae control (data from 4/17/02 SCVWD report prepared in fulfillment of CB-2).	P2 plan to focus on copper pipe corrosion and copper roofing materials (CB-21(1))	Continue to include DWR copper sulfate dosage to the South Bay Aqueduct data in report
Palo Alto	"Copper Action Plan Report, Feb. 22, 2002" in Appendix D of the City's "Clean Bay Plan" www.city.palo-alto.ca.us/cleanbay	The report outlines the data collected on the following potential indicators listed under CB-4(3): a) Copper content in brake pads, b) population and total vehicle miles traveled in Santa Clara Basin, c) copper containing pesticide sales, d) non-pesticidal uses and sales of copper containing products, e) *Macoma* and benthic studies.	Potential for redundant reporting of CB-4(4) and CB-5 on BPP, CB Plan also includes section on copper/nickel sources and P2 plan	

CAP Category: Potential Source Reduction (and uncertainty reduction)

BASELINE ACTIVITY: CB-5 – Local support for Brake Pad Partnership (BPP): (1) research on brake pad wear debris & content; (2) involve other local state and federal players, (3) assist in making research data accessible

CB-4(1) – Quantification studies of copper in vehicle brake pads

CB-4(2) – Quantification studies of brake pad copper debris fate and transport

CB-4(4) – Issue paper on feasibility of monitoring brake pad copper fate and transport

Region of Applicability: Bay-wide

Linkage to Copper Reduction: Brake pad debris is apparent dominant non-point source. Relative fate, transport, and bioavailability uncertain.

Performance Measure(s): Comprehensive assessment proceeding under Prop. 13 project to address all baseline activities.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP via BASMAA CB-5(1) CB-4(1, 2, 4)	BASMAA liaison to BPP (Kelly Moran, TDC Environmental)	• Continue to actively track activities of BPP (and other efforts under the Proposition 13 grant) through BASMAA Monitoring Committee monthly meeting notes and BASMAA BPP liaison notes and communications. Continue to post meeting notes on SCVURPPP website. • Continue contributing SCVURPPP portion of BASMAA baseline funding allocated to BASMAA BPP liaison and BPP support. • **When scheduled:** Continue attending BPP Annual Stakeholder Meetings and share results with Management Committee.		The BPP is a standing item at the monthly BASMAA Monitoring Committee meetings. The Program will continue monitoring and supporting all ongoing BPP activities. The City of Palo Alto will continue to report on BPP activities within their Annual Copper Action Plan Report prepared every February/March.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
SCVURPPP CB-5(3), CB-16		• Continue providing links at Program website (www.scvurppp.org) to websites which contain BPP Proposition 13 information. • Continue posting technical documents relevant to the BPP and other brake pad information on the SCVURPPP website.		Ongoing. Update as needed. Ongoing. Update as needed.
SCVURPPP CB-5(3), CB-16		Continue providing resources for a two year period to develop a P2 clearinghouse via the Clean Water Fund. Links/information relating to copper research data will be posted to a web portal during CY 2004. Track project timeline and interface with contractor regarding project status and completion.		Additional funding- To be determined.
SCVURPPP CB-4(1, 2, 4)		Continue tracking quantification studies as they relate to brake pads.		Other quantification studies which are far beyond the scope of brake pads will be tracked and presented in the appropriate Copper/Nickel baseline activity tables.
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP via BASMAA CB-5(1) CB-4(1, 2, 4)	BASMAA liaison to BPP (Kelly Moran, TDC Environmental)	• **Update:** Program staff is actively tracking activities of BPP and efforts under the Proposition 13 grant through BASMAA Monitoring Committee monthly meeting notes and BASMAA BPP liaison notes and communications. Meeting notes are posted on		Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
		the Program's website on a routine basis. • Contributed SCVURPPP portion of BASMAA baseline funding allocated to BASMAA BPP liaison and BPP support. • **When scheduled:** Attend BPP Annual Stakeholder Meetings and share results with SCVURPPP Management Committee. A stakeholder meeting has not been scheduled for FY 03-04.		
SCVURPPP CB-5(2)		**Update**: Program staff will evaluate if this task is feasible. Recommend that BASMAA approach CASQA to consider funding to support State involvement with BPP. Request Regional Board assistance in making this a priority in other regions.		
SCVURPPP CB-5(3), CB-16		Provided links at Program website (www.scvurppp.org) to websites which contain BPP Proposition 13 information. Current websites include: Sustainable Conservation, http://www.suscon.org/brakepad/index.asp and TDC Environmental (technical reference library) http://www.tdcenvironmental.com/brake/ Technical documents relevant to the BPP and other brake pad information have been posted on the Program's website.		
SCVURPPP CB-5(3), CB-16		**Update:** In November 2003, the Program executed a contract with the Clean Water Fund to provide resources for a two year period to develop a P2 clearinghouse. Links/information relating to copper research data will be posted to a web portal during CY 2004. The contract includes other relevant tasks relating to the clearinghouse.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP via BASMAA CB-5(1) CB-4(1, 2, 4)	BASMAA liaison to BPP (Kelly Moran, TDC Environmental)	• Continue to actively track activities of BPP and efforts under the Proposition 13 grant through BASMAA Monitoring Committee monthly meeting notes and BASMAA BPP liaison notes and communications. Post notes on SCVURPPP website. • Contribute SCVURPPP portion of BASMAA baseline funding allocated to BASMAA BPP liaison and BPP support. • Attend BPP Annual Stakeholder Meetings and share results with SCVURPPP Management Committee.	BPP Proposition 13 grant contracting status summary is provided as an attachment to the CAP/NAP Work Plan submittal.	
SCVURPPP CB-5(2)		Recommend that BASMAA approach CASQA to consider funding to support State involvement with BPP. Request Regional Board assistance in making this a priority in other regions.		
SCVURPPP CB-5(3), CB-16		Provide links at Program website (www.scvurppp.org) to websites which contain BPP Proposition 13 information. Current websites include: Sustainable Conservation, http://www.suscon.org/brakepad/index.asp and TDC Environmental (technical reference library) http://www.tdcenvironmental.com/brake/		
SCVURPPP CB-5(3), CB-16		Provide resources for a two to three year period to develop a P2 clearinghouse via the Clean Water Fund. Links/information and other documents relating to copper research data will be posted to a web portal.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP via BASMAA		• Continued to actively track activities of BPP through BASMAA Monitoring Committee monthly meeting notes and BASMAA BPP liaison notes and communications. Notes were distributed to the Management Committee monthly. • Attended BPP Annual Stakeholder Meeting and distributed meeting summary to SCVURPPP Management Committee.		See FY 03-04 Work Plan above.
SCVURPPP via BASMAA		BPP with SFEP awarded $700,000 Proposition 13 grant in October 2002 for technical studies to implement the BPP Action Plan. SCVURPPP provided letter of support.	Work will address all CAP CB-4 and CB-5 listed activities.	See attached project scope of work.

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: CB-6 – Measures to Reduce Traffic Congestion: Review appropriateness of transportation control measures, prioritize reasonable measures and identify potential efforts for further development

CB-7 – Measures to Reduce Traffic Congestion: (1) Establish transportation/impervious surface "forum," **(2)** Consider results of Vehicle Miles Traveled (VMT) and imperviousness load estimates and control effectiveness evaluation; identify potential further control efforts

Region of Applicability: South Bay focus. Potential to become regional.

Linkage to Copper Reduction: Reductions in VMT and congestion may reduce generation of brake pad debris.

Performance Measure(s): VMT and congestion measurements are indirect indicators; the BPP wear debris characterization test is a more direct indicator (see CB-5).

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	SCBWMI LUS	**Approach:** Collaboration with the agencies and organizations (e.g., VTA) that are better poised to take the lead on transportation-related tasks will increase the likelihood of successful, efficient implementation. • Prepare a memorandum that summarizes the current status of projects and activities of the main players involved in traffic congestion reduction and alternative transportation promotion; and provide recommendations on how the Program and SCBWMI LUS may best assist in these efforts.	Memorandum will summarize the current status of projects listed in Table 1 of the Program's document entitled *The Role of Stormwater Agencies in Regional Congestion Management Planning and Implementation* (dated March 13, 2002); and strategize best avenues for collaboration with lead agencies.	CB-6&7 issues appear to have been adequately addressed by SCVURPPP for CAP purposes. This issue is now in the hands of municipal transportation planners, and congestion management and transportation agencies (i.e. VTA), and is not a high priority of SCVURPPP.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		• Ensure that the lead transportation agencies (e.g., VTA) are aware of and promote the transportation-related analysis in the Development Policies Comparison report.	Memorandum transmitting section of Development Policies Comparison report along with municipal responses to transportation-related questions of Site Design review (dated September 13, 2003) to appropriate staff.	
Core Group	SCBWMI Core Group and/or LUS	• In accordance with SCBWMI's schedule, participate in defining SCBWMI's efforts regarding outreach to stakeholders and "Smart Growth" advocates on Federal and State Transportation spending per section 3.e.2 (p. 3-11) of the Watershed Action Plan.	To be determined.	Core Group is currently discussing implementation efforts and schedules for the Watershed Action Plan
SCVURPPP	SCBWMI LUS	• Work with SCBWMI LUS to provide a summary of available information that links pollutants and land use/transportation decisions to the COS, Watershed Watch Campaign and BASMAA Media Relations Campaign. This information will be used by the COS to develop a publication directed at policy makers per section 9.h.1 (p. 9-14) of the Watershed Action Plan.	Memorandum to COS, Watershed Watch Campaign and BASMAA Media Relations Campaign which provides technical information for developing outreach pieces and campaigns.	
SCVURPPP		Continue messages in the Watershed Watch Campaign promoting protection of water quality by reducing automobile use.	Messages promoting protection of water quality by reducing automobile use will continue to be posted on the Watershed Watch website.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP	SCBWMI LUS	**Update**: Encouraged Co-permittees to update development rules to promote better transportation-related design practices and alternative modes of transportation, as recommended in the Development Policies Comparison Project Report (see Section VI., Policies to Limit Auto Use/Promote Alternative Transportation, in the Policy, Code, and Ordinance Worksheet). Facilitated updates via periodic discussions at LUS meetings (Site Design Dialogues) on transportation and land use issues and document in LUS meeting (dialogue) summaries. On September 28, 2003, Program staff attended a "Smart Growth" presentation provided by former Maryland Governor Parris Glendening. The presentation discussed approaches for reducing sprawl development.	Co-permittees are currently revising development site design standards related to transportation (per Permit Provision C.3.j) based on analysis and recommendations made in the Development Policy Comparison report (April 2003) and described in the Site Design Review submittal (September 15, 2003). VTA has completed a pedestrian document and participated in the Program's/SCBWMI LUS's site design dialogues during FY 03-04.	Complete revision of and implement revised development site design standards
SCVURPPP	SCVURPPP Watershed Watch Campaign	Messages promoting water quality by reducing automobile use have been posted on the Wateshed Watch website.	The message is included on the Watershed Watch website under "Caring for Your Vehicle and the Environment" at http://www.watershedwatch.net/vehicle_care.htm	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	SCBWMI LUS	Encourage Co-permittees to update development rules to promote better transportation-related design practices and alternative modes of transportation, as recommended in the Development Policies Comparison Project Report (see Section VI., Policies to Limit Auto Use/Promote Alternative Transportation, in the Policy, Code, and Ordinance Worksheet). Facilitate these updates via periodic discussions at LUS meetings on transportation and land use issues, and document in LUS meeting summaries.		
SCVURPPP		Continue messages in the Watershed Watch Campaign and BASMAA's Media Relations Campaign promoting protection of water quality by reducing automobile use.		
Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP	SCBWMI LUS	SCVURPPP continued to provide support to the WMI Land Use Subgroup (LUS) meetings. Copies of three products completed in FY 01-02 were distributed to the WMI Core Group and the SCVURPPP Management Committee: 1) White paper on "The Role of Stormwater Agencies in Regional Congestion Management Planning and Implementation", March, 2002 2) White paper on "Economic and Tax Incentives	CB-6&7 issues appear to have been adequately addressed by SCVURPPP for CAP purposes. This issue is now in the hands of municipal transportation planners, and congestion management and transportation agencies (i.e. VTA), and is not a high priority of SCVURPPP.	Traffic congestion issues are not a high priority task in the SCBWMI Watershed Action Plan (to be adopted by the SCBWMI Core Group in August 2003).

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		in Watershed Management", April, 2002 3) Comments on VTA draft document "Community Design and Transportation: A Manual of Best Management Practices for Integrating Transportation and Land Use, June, 2002." At its July 10, 2002 meeting, LUS decided not to take to the SCBWMI Core Group the Short Term Issue Application which recommended convening a Transportation Forum Work Group to address the recommendations in the March, 2002 white paper. SCVURPPP also completed the Development Policies Comparison Project (April 2003) and published a report on its findings, as well as the Policy, Code, and Ordinance Worksheet (PCOW) for each Co-permittee (see www.scvurppp.org). Section VI. of the PCOW addresses "Policies to Limit Auto Use / Promote Alternative Transportation"		VTA completed the "Community Design and Transportation" document in June 2003, incorporating some SCVURPPP comments, and will be requesting resolutions of support from municipal city councils in the coming year.

CAP Category: Watershed Assessment

BASELINE ACTIVITY: CB-8 - Measures to classify and assess watersheds and to improve institutional arrangements for watershed protection:
(1) Ensure that watershed protection is considered in all applicable elements of Dischargers' General Plans, (2) seek appropriate changes in State General Plan Guidelines, (3) ensure that watershed protection is considered in the CEQA process, and (4) continue to implement watershed classification and assessment efforts of SCBWMI.

Region of Applicability: South Bay

Linkage to Copper Reduction: No specific linkage to copper; actions apply to watershed protection in general.

Performance Measure(s): Changes in General Plans and CEQA process documents; results of SCVURPPP and SCBWMI assessments

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Continue implementing the *Multi-Year Receiving Waters Monitoring Plan* (see FY 04-05 Work Plan)	To be provided in FY 04-05 Annual Report	
SCVURPPP		• Participate in the Water Resources Protection Collaborative and implement any agreed upon guidelines and standards for watershed protection		
Co-permittees		See individual Co-permittee Work Plans.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP CB-8 (1)	Permit Prov. C.3.I.	• Provide recommendations from the *Development Policies Comparison Project* and other guidance as needed to help Co-permittees update their General Plans, as needed, for implementing Provision C.3.I.	Update progress in annual reports	Revise General Plans at next scheduled update after 10/15/04
SCVURPPP CB-8 (2)		Action not needed now that Provision C.3.I. provides guidance for water quality and watershed protection principles and policies that should be included in General Plans.		None
SCVURPPP CB-8 (3)	Permit Prov. C.3.m.	• **Update:** Program staff worked with City of San Jose staff to prepare an analysis of the C.3.m. example questions and how they were addressed by the CEQA Guidelines. This analysis is provided in the memorandum entitled *Draft Recommendations for Addressing Provision C.3.m, Water Quality Review Processes* (dated October 17, 2003). Program staff is currently working on the next step, which is to provide a list of the CEQA guidelines questions, in order, and guidance for addressing C.3.m. in responses to each question. All Co-permittees will be encouraged to use this guidance internally and to provide it to their environmental review consultants, thus ensuring a consistent approach to evaluating water quality and watershed impacts throughout the Valley.	Request Co-permittees to document projects reviewed for water quality issues in annual reports.	
SCVURPPP		• Continued implementing the *Multi-Year Receiving*	To be provided in FY 03-04 Annual Report	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
CB-8 (4)		*Waters Monitoring Plan* (see FY 03-04 Work Plan) • **Update:** Collected channel cross-section data and measured bed and bank material as part of the HMP pilot assessment in Ross and San Tomas Creeks. Monitoring activities for this HMP pilot assessment will be completed in FY 03-04. • **Update:** Distributed Program's *Assessment of Watershed Assessment Methods* by electronic mail (on August 12, 2003) to the following parties: Program's Management Committee, Program's Ad Hoc Monitoring Committee and SCBWMI Watershed Assessment Subgroup. Distributed hard copies to the SCVURPPP Management Committee on August 28, 2003.	To be provided in Final HMP Report, Jan. 2004	
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-8 (1)	Permit Prov. C.3.l.	• Provide recommendations from the *Development Policies Comparison Project* and other guidance as needed to help Co-permittees update their General Plans, as needed, for implementing Provision C.3.l.	Update progress in annual reports	Revise General Plans at next scheduled update after 10/15/04
SCVURPPP CB-8 (2)		Action not needed now that Provision C.3.l. provides guidance for water quality and watershed protection principles and policies that should be included in General Plans.		None
SCVURPPP CB-8 (3)	Permit Prov. C.3.m.	• Work with San Jose to provide guidance on addressing water quality in the CEQA review process.	Request Co-permittees to document projects reviewed for water quality issues in annual reports.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP CB-8 (4)		• Continue to implement the *Multi-Year Receiving Waters Monitoring Plan* (see FY 03-04 Work Plan) • Participate with the SCVWD in the assessment of Ross Creek as part of the Hydromodification Management Plan development. • Finalize and distribute Program's *Assessment of Watershed Assessment Methods* to appropriate parties.	To be provided in FY 03-04 Annual Report To be provided in Final HMP Report, Jan. 2004	
Co-permittees		See individual Co-permittee Work Plans.		
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP CB-8 (1)	Permit Prov. C.3.I.	Completed *Development Policies Comparison Project Report* (April 2003), which compares Co-permittees' General Plans, ordinances and policies to a worksheet of model policies, codes, and ordinances for watershed protection, and provides recommendations for improvement (see www.scvurppp.org).	This product has been very useful to the Co-permittees in implementing CAP and C.3. tasks.	See FY 03-04 work plan above.
San Jose/SCVURPPP CB-8 (3)	Permit Prov. C.3.m.	SCVURPPP Permit Provision C.3.m. requires Co-permittees to evaluate water quality impacts when conducting environmental reviews of development projects, beginning March 2003. San Jose took the lead in reviewing the State's CEQA Guidelines (initial study checklist) and comparing them to the example questions in Provision C.3.m. San Jose hosted a meeting of City staff, other Co-permittees and environmental review consultants to discuss the comparison. A report with recommendations and guidance for using the CEQA checklist to comply with		See FY 03-04 work plan above.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		C.3.m. is being prepared.		
SCVURPPP CB-8 (4)		• Completed *Assessment of Stream Ecosystem Functions for the Coyote Creek Watershed*, • Prepared draft of Program's *Assessment of Watershed Assessment Methods* • Began implementing *Multi-Year Receiving Waters Monitoring Plan* (see FY 02-03 Annual Report)		See FY 03-04 work plan above.
SCBWMI		Completed *Watershed Assessment Report*, with assessments of Upper Penitencia, Guadalupe and San Francisquito Creek watersheds.		
Co-permittees		See individual annual reports, C.3. tasks		

CAP Category: POTW Actions				
BASELINE ACTIVITY: CB- 9 – Continue Current Efforts and Track Corrosion Control Opportunities **Region of Applicability:** South Bay and Bay-wide **Linkage to Copper Reduction:** Corrosion of copper piping is dominant source of loading to POTWs **Performance Measure(s):** Increased use of alternatives to copper pipe. Outreach to plumbers. Water purveyor corrosion control program effectiveness.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		When finalized, the Program will distribute (to Co-permittees) outreach materials developed by BACWA's Bay Area Pollution Prevention Group-Copper Pollution Prevention Subcommittee regarding the proper design, installation and maintenance of copper piping.		The completion of this task is dependent on the Subcommittee's timeframes and delivery of outreach materials.
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		Schedule and provide outreach to local pipe fitters unions and American Society of Plumbing Engineers. Presentations will be provided at their sites. The schedule is dependent on obtaining the outreach materials.	A post presentation survey has been developed to gauge increase in awareness.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto RWQCP		Continue to distribute Palo Alto RWQCP guidelines for proper design, installation and maintenance of copper piping to local plumbers.		**Ongoing**
SCVURPPP		Encourage Co-permittees to provide similar outreach/presentations on copper pollution prevention to own building departments and municipal plumbing staff.		
SCVURPPP		Continue dialogue with Department of Health Services and the Regional Board regarding opportunities to enhance corrosion control (as it relates to copper piping).		
FY 2003-2004		**Actions Accomplished in Period**		
Palo Alto RWQCP		Information regarding the proper design, installation and maintenance of copper piping is now available to the Building Department. The City's Environmental Compliance staff has discussed this subject with Building Department staff. The majority of staff time during 2003 has been used to develop the materials for the Bay-wide outreach program.		
Palo Alto RWQCP Sunnyvale San Jose/Santa		A comprehensive list of unions, associations, and their contacts was developed in 2003. All three POTWs have signed up to provide outreach to local unions, engineering societies and associations. The outreach work load was divided between the three POTWs.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Clara WPCP				
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		During 2003, San Jose, Sunnyvale, and Palo Alto POTW staff members have participated in a BACWA's Bay Area Pollution Prevention Group- Copper Pollution Prevention Subcommittee. This subcommittee has designed fact sheets, developed a "freebie" item for plumbers and created a generic Powerpoint presentation applicable throughout the Bay Area.		CY 2004 is the target for conducting outreach
SCVURPPP		**To occur:** Distribute Palo Alto RWQCP guidelines for proper design, installation, and maintenance of copper piping to Co-permittees.		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto RWQCP		Continue to distribute Palo Alto RWQCP guidelines for proper design, installation, and maintenance of copper piping to local plumbers.		
Palo Alto RWQCP Sunnyvale		Continue and/or expand outreach of Palo Alto RWQCP guidelines to local pipe fitters unions and American Society of Plumbing Engineers. Presentations will be given by Palo Alto, Sunnyvale	Surveys will be distributed at pipe fitters union meetings to measure if the message is understood.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
San Jose/Santa Clara WPCP		and San Jose.		
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		Continue to participate on BACWA's Bay Area Pollution Prevention Group-Copper Pollution Prevention Subcommittee. Assist in the development of a Copper Pollution Prevention Campaign to educate pipe system designers and installers regarding steps to reduce copper pollution in the Bay.		
SCVURPPP		Distribute Palo Alto RWQCP guidelines for proper design, installation, and maintenance of copper piping to Co-permittees.		
FY 2002-2003		**Actions Accomplished in Period**		
Palo Alto RWQCP	Feb. 2003 Clean Bay Plan	Presentations on Guidelines given to local pipe fitters union and American Society of Plumbing Engineers. Tracked proposed changes to Uniform Building Code. Tracked SCVWD corrosion inhibitor pilot study.		
Palo Alto RWQCP		Developed and began distributing facts sheets on copper plumbing entitled *Good Plumbing Practices Protect San Francisco Bay and Preventing Corrosion Protect San Francisco Bay*. Both facts sheets have been posted on the City of Palo Alto website. (www.cityofpaloalto.org)		

CAP Category: Assessment/Monitoring

BASELINE ACTIVITY: CB- 10/NB-2 - Measures associated with utilizing the Sediment Characteristics and Contamination Environmental Indicator.

(1) Determine whether SEIDP Indicator #5 results suitable to serve as an indicator of the relationship between sediment quality and urbanization,

(2) Investigate the linkage with SFEI sources and loading work efforts.

Region of Applicability: South Bay and generally Bay-wide

Linkage to Copper Reduction: Direct and indirect measures of sediment concentrations may assist in sources and loadings estimates

Performance Measure(s): Collection and reporting of sediment quality data; participation in RMP & CEP projects and work groups.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-10(1)		• Conduct screening-level monitoring of total and dissolved metals (including copper) in water in Adobe, San Tomas, Matadero, Barron, Calabazas Creeks; and Sunnyvale East and West Channels (FY 04-05 Annual Monitoring Plan).	Water quality data collected as part of the SCVURPPP Long-Term Monitoring Plan may assist with source identification and loadings estimates.	
SCVURPPP CB-10(2)		• Continue to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG); and other RMP and CEP work groups that address sediment issues. • Continue to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP CB-10(1)		• Conducted screening-level monitoring of total metals (including copper) in sediment; and total dissolved metals in water in Adobe and San Tomas Creeks (FY 03-04 Annual Monitoring Plan).	Sediment and water quality data collected as part of the SCVURPPP Long-Term Monitoring Plan may assist with sources and loadings estimates.	
SCVURPPP CB-10(2)		• Continued to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG); and other RMP and CEP work groups that address sediment issues. • Continued to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-10(1)		In the SEIDP study, sediment samples from Coyote Creek were analyzed to investigate the relationship between sediment characteristics/contamination and impacts of urbanization on streams. In Coyote Creek, lead, cadmium, and mercury demonstrated spatial differences that corresponded to urban-ization. Other metals, including copper, chromium,	The level of copper in stream sediments is not a useful indicator of the effects of urbanization on the stream.	Discontinue further consideration of sediment quality as an indicator for copper.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		and arsenic, showed neither spatial nor temporal trends.[1] Nickel was not evaluated. The report postulates that measurement of pollutant concentrations in storm drain sediment might be useful in connection with targeted P2 measures in specific industrial areas[2]. For copper, control measures for industrial sources are covered under CB-3.		
SCVURPPP CB-10(1)		• Conduct screening-level monitoring of total metals (including copper) in sediment in Adobe and San Tomas Creeks (FY 03-04 Annual Monitoring Plan).	Sediment quality data collected as part of the SCVURPPP Long-Term Monitoring Plan may assist with sources and loadings estimates.	
SCVURPPP CB-10(2)		• Continue to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG); and other RMP and CEP work groups that address sediment issues. • Continue to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.		
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP		Reviewed SEIDP report results and evaluated Indicator #5's effectiveness at relating sediment	See FY 03-04 Work Plan above (CB-10(1)) for	None (see above)

[1] SCVURPPP, 2001. "Environmental Indicators: A Useful Tool for Assessing Stormwater Programs?", prepared for the Water Environment Research Foundation, Project 96-IRM-3, p. 6-13.

[2] Ibid, p. 6-14.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
CB-10(1)		quality and urbanization.	discussion of effectiveness.	
SCVURPPP CB-10(2)		• Participated on the RMP Sources, Pathways, and Loading Work Group (SPLWG). • Supported sediment studies through participation in the CEP and RMP. • Collected sediment samples at four stations during the dry season and analyzed for total metals (including copper), as part of the SCVURPPP FY 02-03 Monitoring Program[3].		

[3] SCVURPPP FY 02-03 Receiving Waters Monitoring Report, July 2003. Prepared for EOA, Inc. by Kinnetic Laboratories, Inc.

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: CB- 11 - Measures to improve street sweeping controls and storm water system operation and maintenance:

(1) evaluate need for improvements to existing street sweeping controls,

(2) evaluate need for improvement to storm water system operation and maintenance controls,

(3) evaluate need for improvements to standard operating procedures for disposal of collected materials

Region of Applicability: South Bay and Bay-wide

Linkage to Copper Reduction: Removal and disposal of copper associated with street sweepings and storm drain cleaning

Performance Measure(s): Estimates of volume/weight of materials removed and miles swept

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Request Co-permittees to evaluate need to improve standard operating procedures for disposal of collected materials.		
SCVURPPP		• Request that Co-permittees evaluate the effectiveness of street sweeping practices in accordance with the Program's Performance Standard for Public Streets, Roads and Highway Operation and Maintenance		
SCVURPPP		• Continue to compile and summarize Co-permittee street sweeping and leaf removal data (obtained from monthly recordkeeping forms) within Program's Annual Report.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Co-Permittees		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		• Provided written guidance to Co-permittees regarding the collection of street sweeping data (November 2003). Co–permittees have been requested to collect (on a monthly basis) and provide to Program staff (on a biannual basis) the following information: volume of waste collected, number of miles swept, any changes to the street sweeping program and leaf removal data (seasonal). To ensure standardized collection and reporting of data, monthly recordkeeping forms were provided. Co-permittee data will be summarized in the Program's Annual Report. • Requested that Co-permittees evaluate need for improvement of current street sweeping and storm drain system O&M programs (within available budgets) in FY 03-04 Annual Report (November 2003). • Requested that Co-permittees (through the use of a survey) provide specific information regarding their street sweeping and leaf removal programs. Completed surveys were provided to Program staff in December 2003. • **Update:** Tracked status of scheduled update of Fairfield-Suisun street sweeping study which will estimate copper loading reductions. This update		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		will likely occur in FY 04-05. • **In Process**: Review previous studies for San Jose, San Mateo Countywide STOPPP and Fairfield-Suisun URMP on copper removed from street sweeping activities. Evaluate feasibility of using data to identify changes in procedures that would reduce copper in stormwater.		
Co-Permittees		Refer to individual Co-permittee FY 03-04 Annual Reports.		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Provide written guidance to Co-permittees regarding the collection of street sweeping data. At a minimum, will recommend that Co-permittees collect information as to the quantity of waste collected, number of miles swept and frequency of sweeping. Provide reporting table templates to ensure standardized collection and reporting of data. Summarize results in Annual Report. • Request Co-permittees to evaluate need for improvement of current street sweeping and storm drain system O&M programs (within available budgets) in FY 03-04 Annual Report. • Review previous studies for San Jose, San Mateo Countywide STOPPP and Fairfield-Suisun URMP on copper removed from street sweeping activities. Evaluate feasibility of using data to identify changes in procedures that would reduce copper in stormwater.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		• Track status of scheduled update of Fairfield-Suisun street sweeping study which will estimate copper loading reductions.		
Co-Permittees		Refer to individual Co-permittee Work Plans.		
FY 2002-2003		**Actions Accomplished in Period**		
Co-Permittees		Street sweeping, catch basin cleaning, and/or storm drain maintenance was performed as appropriate in each jurisdiction. Data on volume/weight of materials collected or miles swept are not kept by most Co-permittees at this time.		See FY 03-04 work plan above.

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: CB- 12 - Public education and outreach measures to control copper discharges from pools and spas

Region of Applicability: South Bay and Bay-wide

Linkage to Copper Reduction: Reduce use of copper based algaecides in pools and spas and discharge of copper treated water to storm drains.

Performance Measure(s): Quality and quantity of outreach materials distributed.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		As part of the Program's Illicit Connection and Illegal Dumping (IC/ID) Elimination activities, investigate pool, fountain and spa discharge incidents. Inspectors provide verbal or written information regarding pollution prevention and proper management of waters. Results and follow-up relating to the incident are summarized in the Program's Annual Report submitted each September. This activity is consistent with Permit Provision C.6.a.ii	Individual Co-permittes are documenting IC/ID incidents in accordance with Permit Provision C.6.a.ii. Follow-up inspections are conducted as required.	Ongoing
SCVURPPP		Continue to distribute updated pool brochure. Distribution methods may include: mass mailing to pool owners (per County tax assessor's list); mailing to pool and spa service companies; handouts at public events; brochures at agency department counters and public places; and placement on Watershed Watch, SCVURPPP, and Co-permittee websites. The method and extent of distribution will relate to efforts completed during FY 03-04.	The number of brochures distributed will be included in the Program's Annual Report.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
All Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		The text for the updated pool brochure entitled *Keep Pool, Spa and Fountain Water Out of Storm Drains, Creeks and the Bay* has been finalized and photographs obtained for use in the brochure. Currently, the Work Group is working with Jill McCoy to design the brochure. Currently, a distribution plan is being developed by the Program and Co-permittees. Distribution methods will likely include: mass mailing to pool owners (per County tax assessor's list); mailing to pool and spa service companies; handouts at public events; brochures at agency department counters and public places; and placement on Watershed Watch, SCVURPPP, and Co-permittee websites. Distribution is likely to occur in late FY 03-04.	Cannot be measured at this time. Will obtain feedback from pool service contractors and pool owners following distribution of the brochure. The number of brochures distributed will be included in the Program's Annual Report.	
All Co-permittees		Refer to individual Co-permittee FY 03-04 Annual Reports.		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Develop and implement Program and Co-permittee distribution plan for the updated pool brochure. Distribution methods will likely include: mass mailing to pool owners (per County tax assessor's list);	Plan will include reporting mechanisms to track the outreach method and number of outreach	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		mailing to pool and spa service companies; handouts at public events; brochures at agency department counters and public places; and placement on Watershed Watch, SCVURPPP, and Co-permittee websites.	materials distributed each year. Data will be included in annual report.	
All Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP		Discussed and finalized the text and layout of an updated brochure entitled *Keep Pool, Spa and Fountain Water Out of Storm Drains, Creeks, and the Bay*. Brochure is in MS Word so it can be easily customized and printed by individual Co-permittees. The brochure will be distributed to Co-permittees and made available on the Watershed Watch website (www.watershedwatch.net) in August 2003.	Effectiveness cannot be measured at this time.	See FY 03-04 work plan above.
SCVURPPP		Completed model list of source control measures for new development and redevelopment projects, including measures for projects which may have pool, spa and fountain discharges (consistent with Permit Provision C.3.k). List submitted to and approved by Regional Board staff as part of Planning Procedures Performance Standard. Measures include: 1) no direct discharge to storm drain or sanitary sewer; 2) draining pool to sanitary sewer via clean-out (with POTW permission; and 3) installing clean-out in accessible area near pool.	Effectiveness cannot be measured at this time.	

CAP Category: POTW Potential Source Reduction

BASELINE ACTIVITY: CB-13/NB-3 – Track POTW Pretreatment Program efforts and POTW loadings.

Region of Applicability: South Bay.

Linkage to Copper Reduction: Both indirect and direct. Pretreatment efforts are indirect because there is not a linear relationship between influent reductions and effluent concentrations. POTW loading is direct.

Performance Measure(s): Pounds of copper reduced.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Track BACWA Pollution Prevention Menus Project.		Implement, as appropriate, project recommendations.
San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report and Pretreatment Program Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Clean Bay Strategy Report and Annual Pretreatment Program Report
Sunnyvale	Annual Pretreatment Program Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Pretreatment Program Report

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto	Annual Clean Bay Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Clean Bay Report
FY 2003-2004		**Actions Accomplished in Period**		
San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report and Pretreatment Program Report	**In Process**: Continue implementation of the pretreatment and pollution prevention work, including updating and modifying the Mass Audit Studies, Reasonable Control Measure Plans and Flow Audit Studies. This might include updating and modifying the protocols and developing additional guidance documents. We will continue to calculate permitted industrial loading and compare to 1997 levels. Continue influent and effluent monitoring to document contaminant loading to the treatment plant.	Compare permitted industrial loading to 1997 levels. Maintain effluent concentrations below permit limits.	Continuously evaluate the pretreatment program and the tools used to ensure improved effectiveness.
Sunnyvale	Annual Pretreatment Program Report	**In Process:** Continue with pretreatment and pollution prevention efforts including industrial user and influent and effluent monitoring. Update annual Source Loadings Appendix to pretreatment report.	Compare current to historic concentrations and loadings	Apply continuous improvement actions to Annual Report preparation and presentations.
Palo Alto	Annual Clean Bay Report	**In Process:** Continue with existing activities presented in Clean Bay Report including Copper Action Plan Appendix (see CB-4(3)).	Compare current to historic concentrations and loadings	Continue on-going actions.
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
San Jose/Santa	Annual Clean	Continue implementation of the pretreatment and	Compare permitted	Continuously

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Clara Water Pollution Control Plant	Bay Strategy Report and Pretreatment Program Report	pollution prevention work, including updating and modifying the Mass Audit Studies, Reasonable Control Measure Plans and Flow Audit Studies. This might include updating and modifying the protocols and developing additional guidance documents. We will continue to calculate permitted industrial loading and compare to 1997 levels. Continue influent and effluent monitoring to document contaminant loading to the treatment plant.	industrial loading to 1997 levels. Maintain effluent concentrations below permit limits.	evaluate the pretreatment program and the tools used to ensure improved effectiveness.
Sunnyvale	Annual Pretreatment Program Report	Continue with pretreatment and pollution prevention efforts including industrial user and influent and effluent monitoring. Update annual Source Loadings Appendix to pretreatment report.	Compare current to historic concentrations and loadings	Apply continuous improvement actions to Annual Report preparation and presentations.
Palo Alto	Annual Clean Bay Report	Continue with existing activities presented in Clean Bay Report including Copper Action Plan Appendix (see CB-4(3))	Compare current to historic concentrations and loadings	Continue on-going actions.
FY 2002-2003		**Actions Accomplished in Period**		
San Jose/Santa Clara WPCP		Prepared January and July 2003 Clean Bay Strategy Reports and Pretreatment Program Reports. The Plant influent and effluent levels for copper remained consistent with results over previous five years. Industrial contribution remained well below 50% of the 1997 baseline loading.	Compare permitted industrial loading to 1997 levels. Maintain effluent concentrations below permit limits.	Continuously evaluate the pretreatment program and the tools used to ensure improved effectiveness.
Sunnyvale	Annual Pretreatment Program	Prepared Annual Pretreatment Program Report and 2002 Update Of Source Loadings to the WPCP	Compare current to historic concentrations and	Continue on-going actions.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
	Report		loadings	
Palo Alto		Prepared 2003 Clean Bay Report		

CAP Category: POTW Potential Source Reduction				
BASELINE ACTIVITY: CB-14/NB-4 – Track and encourage water recycling efforts. **Region of Applicability:** South Bay. **Linkage to Copper Reduction:** Direct due to flow diversion. **Performance Measure(s):** Millions of gallons per day of diverted effluent.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto				
San Jose/Santa Clara Water Pollution Control Plant				
Sunnyvale	2004 Water Recycling Annual Report	Submit annual report on reclamation activities including updates on current and planned future reclamation activities as required by Water Reclamation Permit (Order 94-069)	Quantity recycled. New connections added.	Will be reported in February 2005

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report	**Update:** South Bay Action Plan (SBAP)will be updated in the February 2004 report. Some current actions include tracking the completion of funded South Bay Water Recycling projects along with any resulting additional flow diverted to customers. We will continue providing financial incentives for industrial flow reduction including recycle/reuse projects. Encourage water recycling by continuing the collaborative process (with the Santa Clara Valley Water District) to develop an institutional framework for long-term ownership, operation and maintenance, and future expansion of SBWR. Continue to distribute outreach materials (e.g., cooling tower BMPs) and promote the financial incentive program through workshops and direct calls to potential customers. We are also in the process of updating the City of San Jose Water Policy.	Average Dry Weather Effluent Flows (ADWEF) remains below 120 MGD.	Will be reported in updated SBAP, February 2004.
Sunnyvale	2003 Water Recycling Annual Report	**Update:** In process of preparing annual report on reclamation activities which will include updates on current and planned future reclamation activities (as required by Water Reclamation Permit-Order 94-069)	Quantity recycled. New connections added.	Will be reported in February 2004
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
San Jose/Santa Clara Water Pollution Control	Annual Clean Bay Strategy	South Bay Action Plan (SBAP) to be updated in the February 2004 report. Some current actions include tracking the completion of funded South Bay Water	Average Dry Weather Effluent Flows (ADWEF)	Will be reported in updated SBAP,

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Plant	Report	Recycling projects along with any resulting additional flow diverted to customers. We will continue providing financial incentives for industrial flow reduction including recycle/reuse projects. Encourage water recycling by continuing the collaborative process with the Santa Clara Valley Water District to develop an institutional framework for long-term ownership, operation and maintenance, and future expansion of SBWR. Continue to distribute outreach materials such as cooling tower BMPs and promoting the financial incentive program via workshops and direct calls to potential customers. We are also in the process of updating the City of San Jose Water Policy.	remains below 120 MGD.	February 2004.
Sunnyvale	2003 Water Recycling Annual Report	Submit annual report on reclamation activities including updates on current and planned future reclamation activities as required by Water Reclamation Permit (Order 94-069)	Quantity recycled. New connections added.	Will be reported in February 2004
FY 2002-2003		**Actions Accomplished in Period**		
San Jose	CBS Reports	SBWR added 39 customers over the year, including the Los Esteros Critical Energy Center. Averaged over 10 MGD diversion over the dry weather period.	MGD delivered to customers.	
Sunnyvale	2002 Water Recycling Annual Report	Produced 216 MG of recycled water and identified 7 potential new connections.	Quantity recycled. New users added.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto				

CAP Category: Potential Source Reductions				
BASELINE ACTIVITY: CB-15/NB-5 - Measures to evaluate effectiveness of Performance Standards and identify cost-effective modifications to reduce discharges of copper (see NB-1, CB-3 and CB-11).				
Region of Applicability: South Bay				
Linkage to Copper Reduction: Reductions in copper associated with sediment generated from construction related activities				
Performance Measure(s): Co-permittee Annual Reports evaluating implementation of Construction Inspection Performance Standard (including effectiveness of erosion control measures and construction site inspections).				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
FY 2003-2004		**Actions Accomplished in Period**		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP (ref. NB-1, CB-3, and CB-11)	CIPS	• Co-permittees will continue to implement Construction Inspection Performance Standards (CIPS) (see Construction Inspection Work Plan section).	Effectiveness evaluation in Co-permittee Annual Reports	
	PSRH PS	• Co-permittees will continue to implement the Public Streets, Roads and Highways O&M Performance Standard and evaluate effectiveness of street sweeping (see PSRH O&M Work Plan section).		
	SDOM PS	• Co-permittees will continue to implement the Storm Drain O&M Performance Standard and evaluate effectiveness of storm drain and catch basin cleaning (see SD O&M Work Plan section).		
	IND PS	• Co-permittees will continue to implement the Industrial Discharger Control (IND) Performance Standard and evaluate effectiveness of industrial inspections (see IND Work Plan section).		
	RPW PS	• Co-permittees will begin to implement the Rural Public Works Maintenance and Support Performance Standard, as applicable to their communities (see Rural Public Works Work Plan section).		
SCVURPPP (ref. CB-3)	IND PS	Work with the IND AHTG to develop model language for updating the IND Performance Standards and a timeframe for implementation. Consider update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP	CIPS	Work with Co-permittees to develop a reporting form to track the number of violations, follow-up and enforcement actions relating to inadequate erosion/sediment control measures at construction sites. Report this information within Annual Reports.		
SCVURPPP	CIPS	Sponsor and help conduct the annual Regional Board Construction Site Management Workshop for municipal staff (scheduled for September 24, 2003). Include information on the latest erosion/sediment control techniques.	Attendee list, evaluation forms	
All Co-permittees (ref. NB-1, CB-3 and CB-11)		Refer to individual Co-permittee Work Plan tasks for NB-1, CB-3 and CB-11.		
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP		The Program's Construction Inspection Performance Standards (CIPS) were revised in FY 01-02 to respond to RWQCB comments and suggestions for improvement. The changes included more specificity about enforcement procedures, and documentation and tracking of sites cited for inadequate erosion/sediment control measures. Co-permittees incorporated the changes into their local URMPs during FY 02-03. Co-permittees submitted the Legal Authority sections of their performance standards and a description of any changes to the model performance standard to the RWQCB on April 28. 2003.	Changes to CIPS increased effectiveness of enforcement and tracking of erosion control violations.	See FY 03-04 Work Plan.
SCVURPPP		Co-permittees, Program staff and RWQCB staff participated in performance review meetings during November and December 2002. The meetings	See Table 9-1 and RWQCB staff comments on performance reviews	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		focused on Co-permittee implementation of the Construction Inspection Performance Standard and preparation for implementation of the upcoming C.3. requirements. Continuous improvement items were agreed upon at the meetings (see Table 9-1, FY 03-04 Work Plan, submitted March 1, 2003). RWQCB staff provided meeting summaries and additional comments on March 3. These additional comments were added to the revised Table 9-1 (submitted on August 5, 2003) with the Program's responses to RWQCB comments on the FY 03-04 Work Plan.	with Annual Reports.	

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: CB- 16 – Measures to Establish an Environmental Clearinghouse

Region of Applicability: Region-wide

Linkage to Copper Reduction: Information source on nation-wide copper and nickel pollution prevention activities affecting water quality

Performance Measure(s): Amount and utility of information accessible through the web portal

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	Web portal & semi-annual report from CWF	Continue providing resources for a two year period to develop a P2 clearinghouse via the Clean Water Fund. Links/information relating to copper research data will be posted to a web portal during CY 2004. Track project timeline and interface with contractor regarding project status and completion.		Identification of additional funding sources (after two-year period) is required. The Program will transition from program coordination/administration to an oversight role.
SCVURPPP		Start discussions regarding the identification of additional funding sources after two-year period. Determine who will be responsible for future coordination of web page activities.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP		**Ongoing**: Continue posting CAP related information and reports on Program's website.		Ongoing. All relevant documents will be posted as appropriate.
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP	Web portal & semi-annual report from CWF	**Update:** In November 2003, the Program executed a contract with the Clean Water Fund to provide resources for a two year period to develop a P2 clearinghouse. Links/information relating to copper research data will be posted to a web portal during CY 2004. The contract includes other relevant tasks relating to the clearinghouse.		
SCVURPPP	CWF/SVP2	**Status (To be Determined):** Develop TMDL pollution prevention survey, collect responses and draft report (early 2004). Present final report to WMI Cu/Ni Work Group by the end of FY03-04.		
SCVURPPP	BPP	Provided links at Program website (www.scvurppp.org) to websites which contain BPP Proposition 13 information. Current websites include: Sustainable Conservation, http://www.suscon.org/brakepad/index.asp and TDC Environmental (technical reference library) http://www.tdcenvironmental.com/brake/		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		Technical documents relevant to the BPP and other brake pad information have been posted on the Program's website.		
SCVURPPP		Developed copper/nickel webpage on Program's website which links to local CAP related information and reports (e.g., BPP).		Relevant CAP related information and reports will be posted on the SCVURPPP website, as appropriate.
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	Web portal & semi-annual report from CWF	Provide resources for a two to three year period to develop a P2 clearinghouse via the Clean Water Fund. Links/information and other documents relating to copper research data will be posted to a web portal.	Track by web inspection and semi-annual progress reports	
SCVURPPP	CWF/SVP2	Develop TMDL pollution prevention survey, collect responses and draft report (early 2004). Present final report to WMI Cu/Ni Work Group by the end of FY03-04.		
SCVURPPP	BPP	Provide links at Program website (www.scvurppp.org) to websites which contain information on BPP Proposition 13 grant project progress and products. Current websites include: Sustainable Conservation, http://www.suscon.org/brakepad/index.asp and TDC Environmental (technical reference		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		library) http://www.tdcenvironmental.com/brake/.		
SCVURPPP		Develop copper/nickel webpage on SCVURPPP website which link to local CAP related information and reports.	Additional information added and made accessible	See CB-17&18 for proposed RMP site approach for 2004
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP		Initiated and negotiated contract with Clean Water Fund to establish and maintain web based environmental clearinghouse (May 2003)	Track by web inspection and semi-annual progress reports	

CAP Category: Uncertainty Reduction Studies				
BASELINE ACTIVITY: CB-17(1) – Phytoplankton species toxicity and prevalence **Region of Applicability:** South bay and bay-wide (Linkage to CB-17(4) toxicity bioassays, CB-18(3) copper speciation, CB-18(4) competing metals uptake) **Linkage to Copper Reduction:** Ambient concentrations could influence certain phytoplankton species composition, prevalence, and distribution **Performance Measure(s):** Ambient concentrations of sensitive phytoplankton.				
Lead Party	**Reports**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004 – 2005		**PROPOSED WORKPLAN TASKS**		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Work with RMP/SFEI to develop approach to track and view results of bay-wide phytoplankton monitoring and toxicity related research. Identify how to integrate into existing RMP programs/budget or identify other candidate funding sources. Target implementation during 2004.	SCVURPPP will provide limited seed money and in-kind assistance to RMP/SFEI to initiate the project. Stakeholders need to identify project priority and level of support.	Present approach and solicit support from RMP member agencies
USGS with SCVURPPP to track pending proposed transition to RMP		Coordinate with USGS Jim Cloern to identify plans and schedule for compiling and reporting on historic bay-wide species composition and abundance information.		Work may require funding.
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP with transition to RMP reporting annually to SCVURPPP	Annually	Work with RMP/SFEI to develop approach to track and view results of bay-wide phytoplankton monitoring and toxicity related research. Identify how to integrate into existing RMP programs/budget or identify other candidate funding sources. Target implementation during 2004.	SCVURPPP will provide limited seed money and in-kind assistance to RMP/SFEI to initiate the project. Stakeholders need to identify project priority and level of support.	Present approach and solicit support from RMP member agencies
USGS with SCVURPPP to track pending proposed transition to RMP		Coordinated with USGS Jim Cloern to identify plans and schedule for compiling and reporting on historic bay-wide species composition and abundance information.		Work may require funding.

Lead Party	Reports	Actions	Effectiveness Evaluation	Future Actions
FY 2003 – 2004		**PROPOSED WORKPLAN TASKS**		
SCVURPPP with transition to RMP reporting annually to SCVURPPP	Annually	Work with RMP/SFEI to develop approach to track and view results of bay-wide phytoplankton monitoring and toxicity related research. Identify how to integrate into existing RMP programs/budget or identify other candidate funding sources. Target implementation during 2004.	SCVURPPP will provide limited seed money and in-kind assistance to RMP/SFEI to initiate the project. Stakeholders need to identify project priority and level of support.	Present approach and solicit support from RMP member agencies
USGS with SCVURPPP to track pending proposed transition to RMP		Coordinate with USGS Jim Cloern to identify plans and schedule for compiling and reporting on historic bay-wide species composition and abundance information.		Work may require funding.
FY 2002-2003		**Actions Accomplished in Period**		
City of San Jose	Dec. 2002 RTC semi-annual progress report; Draft Phase I Rpt.	RTC semi-annual report completed for Dec 2002. Feb 2003 cruise conducted. Preliminary Phase I sampling concluded. Historic data compiled into database. Draft Phase I report produced and submitted to Technical Advisory Group. TAG meeting 5/8/03. Project success constrained by lack of access to historic USGS data.	Marginal success due to limited access of USGS historical data set. However, recent monitoring demonstrates sensitive phytoplankton groups thriving in South Bay environs.	None. Project concluded.
City of San Jose	April and June 2002 RTC semi-annual progress reports	TAG meeting held 9/19/02. Phase I phytoplankton, zooplankton and related water quality reported for 8/23/01, 12/10/01, 2/22/02, 5/17/02, 8/28/02, and 12/2/02 samplings. Substantial variability in species composition and abundance. Cyanobacteria concentrations were similar to previously published values measured during 1998.	To be determined. Depends on ability to link phyto- and zoo-plankton community composition and abundance and possible covariance with water quality conditions,	Plankton speciation and abundance is bay-wide issue. Identify approach to transition to bay-wide effort.

Lead Party	Reports	Actions	Effectiveness Evaluation	Future Actions
			including contaminants.	
Central Valley RWQCB Tracked by SCVURPPP	Aug. and Sep. 2002 reports	Central Valley RWQCB published results of two CALFED funded studies to identify the causes of algae toxicity in the Sacramento and San Joaquin River Watersheds and the Delta titled "*Algae Toxicity Study Monitoring Results: 2000-2001*" and "*Identification of Causes of Algal Toxicity in Sacramento-San Joaquin Delta*." Efforts focused on improving standard toxicity identification evaluation (TIE) methods for use in algae toxicity tests. Analyses focused on organics. Diuron was primary toxicant identified.	To be determined. Depends on success of development of TIE methodologies that can accurately differentiate and assess impacts of water column copper concentrations on algae.	Report recommended agencies establish regional center for analytical support of TIEs aimed at identification of causes of ambient toxicity
San Jose Tracked and encouraged by San Jose	Draft and Final Reports	Work initiated in August 2001 by Romberg Tiburon Center (RTC) under contract to City of San Jose. RTC is conducting bioassessment study in lower South Bay to cooperatively develop, with academic and regulatory communities, bioassessment techniques that could lead to site-specific environmental indicators for the South Bay. Two years of quarterly sampling off Calaveres Point.	To be determined. Phase I Preliminary Historic Data Analysis and Sampling draft report April 2003; final report June 2003. Phase II Pilot Study draft report due April 2005 and final report due June 2005.	Evaluate potential of establishing plankton indicators of change in the South SF Bay.

CAP Category: Uncertainty Reduction Studies

BASELINE ACTIVITY: CB-17(2) – Measures to assess cycling and fluxes between water column, phytoplankton, sediments, and benthos

Region of Applicability: South Bay and likely Bay-wide

Linkage to Copper Reduction: Improve understanding of mechanisms and flux rates impacting water column concentrations

Performance Measure(s): Development and validation of methodologies to conduct cycling analyses

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
FY 2003-2004		**Actions Accomplished in Period**		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
WMI Core Group SCVURPPP		Activity to be reassessed when decision revisited during SCVURPPP permit reissuance and/or during North of Dumbarton Impairment Assessment Report development about updating the Conceptual Model.		
SCVURPPP		Continue to track results of sediment TIE investigations and method development efforts by RMP funded researchers. Obtain third party review of North Bay sediment toxicity possibly linked to copper. Review available data on health and prevalence of benthos in areas reportedly showing toxicity.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Include in bay-wide research tracking effort proposed to be conducted by SFEI/RMP (see description under CB-17(1)).	May require additional non-RMP funding	
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP		Activity on hold until decision made and resources provided to further develop and validate cycling analysis methodologies.		

CAP Category: Uncertainty Reduction Studies

BASELINE ACTIVITY: CB-17(3) – Measures to Assess Wet Season Tributary Loading and Loading Uncertainty

Region of Applicability: South Bay and likely Bay-wide

Linkage to Copper Reduction: Improved estimates of loadings may improve understanding of impacts on water column concentrations

Performance Measure(s): Development of methodologies to reliably and cost-effectively collect accurate flow and concentration data

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	BASMAA/BPP	Continue Tracking results from BPP Prop. 13 ambient water quality monitoring and modeling (USEPA BASINS and SFO models) of loading from Castro Valley Creek watershed.		
SCVURPPP	CEP/RMP	Continue tracking progress of CEP and RMP Sources Pathways and Loadings Workgroup projects involving improving loading estimates (e.g., Hg/PCB TMDLs).		
SCVURPPP	RWQCB	Continue tracking results from RWQCB Surface Water Ambient Monitoring Program (SWAMP) for potential utility in developing improved loading estimates		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Include in bay-wide research tracking effort proposed to be conducted by SFEI/RMP (see description under CB-17(1))		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Measure water and sediment samples (for copper and other contaminants) in the San Thomas Aquino, Adobe Creek and Guadalupe River Watersheds (at two to five locations with each watershed) during two to three varying season events. (see CB-8 and CB-10)		Part of Multi-Year Receiving Waters Monitoring Plan
SCVURPPP	BASMAA/BPP	Track results from BPP Prop. 13 ambient water quality monitoring and modeling (USEPA BASINS and SFO models) of loading from Castro Valley Creek watershed.		
SCVURPPP	RMP	Support continued RMP funding for and track results from second year of RMP Guadalupe River continuous sediment monitoring (small tributary) pilot project (CEP 4.7). Results of study will help determine feasibility and	Depends on availability of methodologies and if available, the cost of obtaining such information vs. the expected improvements in loading estimates	
SCVURPPP	CEP/RMP	Track progress of CEP and RMP Sources Pathways and Loadings Workgroup projects involving improving loading estimates (e.g., Stormwater Literature Review project, Hg/PCB TMDLs).		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP	RWQCB	Track results from RWQCB Surface Water Ambient Monitoring Program (SWAMP) for potential utility in developing improved loading estimates		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Include in bay-wide research tracking effort proposed to be conducted by SFEI/RMP (see description under CB-17(1))		

CAP Category: Uncertainty Reduction Studies				
BASELINE ACTIVITY: CB-17(4) – Bioassessment tools to track presence of copper sensitive taxa in LSB **Region of Applicability:** South Bay and possibly Bay-wide **Linkage to Copper Reduction:** Independent indicator of whether ambient concentrations are adversely impacting biota **Performance Measure(s):** Availability of appropriate bioassessment tools with ability to differentiate between copper and other stressors				
Lead Party	**Reports**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004 – 2005		**PROPOSED WORKPLAN TASKS**		
FY 2003-2004		**Actions Accomplished in Period**		
FY 2003 – 2004		**PROPOSED WORKPLAN TASKS**		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Include in bay-wide research tracking effort proposed to be conducted by SFEI/RMP (see description under CB-17(1))		

Lead Party	Reports	Actions	Effectiveness Evaluation	Future Actions
FY 2002-2003		**Actions Accomplished in Period**		
San Jose Tracked and encouraged by San Jose	See RTC Work Plan	Work initiated in August 2001 by Romberg Tiburon Center (RTC) under contract to City of San Jose includes bioassessment study in lower South Bay to cooperatively develop, with academic and regulatory communities, bioassessment techniques that could lead to site-specific environmental indicators for the South Bay.(see description under CB-17(1))	Minimal success. Development of reliable and accurate indicators of copper stress on sensitive phytoplankton and zooplankton species was outside the reach of this research endeavor.	None. Project concluded.

CAP Category: Uncertainty Reduction Studies

BASELINE ACTIVITY: CB- 18(1) Investigate flushing time estimates for different wet weather conditions

CB- 18(2) Investigate location of northern boundary conditions

Region of Applicability: South bay and bay-wide

Linkage to Copper Reduction: Reduce uncertainty about sedimentation/resuspension dynamics and water column copper concentrations

Performance Measure(s): Track progress of hydrodynamic and sediment transport modeling efforts by others

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Proposed Changes
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Continue to track modeling development efforts and results from SSO, BPP, and SFO projects. (see CB-5&4)	SCVURPPP encourages through CEP and BASMAA baseline funding	
FY 2003-2004		**Actions Accomplished in Period**		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Continue to track modeling development efforts and results from SSO, BPP, and SFO projects. (see CB-5&4)	SCVURPPP encourages through CEP and BASMAA baseline funding	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Proposed Changes
SCVURPPP		Track CEP activities with modeling components and particularly Task 4.7 Future Modeling Needs.		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Include activities in bay-wide research tracking effort proposed to be conducted by SFEI/RMP (see description under CB-17(1)).		
FY 2002-2003		**Actions Accomplished in Period**		
CEP	CEP TC 5/7/03	The detailed scope of work for the copper nickel North of Dumbarton SSO project to be funded by CEP in 03-04 includes bay modeling as part of the anti-degradation analysis work	$20,000 level of effort	Track in 2004
BASMAA Monitoring Committee & SCVURPPP	BPP Steering Committee Meeting 4/29-5/1/03	Brake Pad Partnership Prop. 13 grant Work Plan includes Bay modeling by URS. It will use a combination of hydrodynamic (SFO work) and compartment (WASP) models to address both short and long-term behavior of brake pad wear debris copper in SF Bay.	$125,000 level of effort.	Track through reporting on BPP under CB-5
San Jose & SCVURPPP	Inside Cal/EPA Newsletter 4/11/03	On April 2, 2003 a San Francisco Superior Court judge ruled that despite the federal government refusing access to the environmental documents, the city of San Francisco, which is a partner in the SFO project, must release the records under the City's Sunshine Ordinance. Considerable modeling has reportedly been performed as part of the	Depends on availability of information and content.	Keep tracking availability

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Proposed Changes
		environmental studies.		
San Jose & SCVURPPP	Water Policy Report Newsletter	BayKeeper and two other environmental groups filed suit against the City of San Francisco and its airport director on August 8, 2002 for failing to disclose the environmental documentation prepared for the proposed San Francisco Airport runway expansion project. Nine volumes of materials were sent to a panel of scientists in April but none has been released to the public.	Depends on availability of information and content.	Keep tracking

CAP Category: Uncertainty Reduction Studies				
Baseline Activity: CB-18(3) – Determine Cu-L1 and L2 complex concentrations (copper speciation) **CB-17(5) – Assess feasibility of phytoplankton bioassays to measure toxicity** **Region of Applicability:** Bay-wide **Linkage to Copper Reduction:** Ambient free ionic copper (not complexed with organic ligands) is form toxic to phytoplankton **Performance Measure(s):** Bruland speciation work schedule. Ambient free ionic copper concentrations.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004 – 2005		**PROPOSED WORKPLAN TASKS**		
RWQCB				
FY 2003 – 2004		**Actions Accomplished in Period**		
RWQCB				
FY 2003 – 2004		**PROPOSED WORKPLAN TASKS**		
RWQCB				

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2002-2003		**Actions Accomplished in Period**		
RWQCB	July 2002 Bruland Rpt	Draft report on copper speciation with results of January and March 2003 sampling released. Similar results to 2001 sampling. Ambient free ionic copper levels 100 times lower than toxic threshold.		
RWQCB Track and encourage (funder)	May 2002 interim report Annual report until completed	RWQCB contracted with Ken Bruland during 2001 to evaluate copper speciation at seven sites from Dumbarton Bridge to Grizzly Bay. Samples were collected in June 2001 and during July – August 2001. Results in draft report distributed by RWQCB staff in May 2002 showed that over 99.99% of total copper concentrations were complexed by L1 (strong) ligands at all locations and on both cruises. Maximum free ionic copper concentration was 10^{-13}M.	Program staff will coordinate with RWQCB staff to determine what additional monitoring is proposed and when the results to be reported. IAR 5.3.1 cited literature threshold concentration of 10^{-11}M (100 times that measured in Bay).	Secure funding to collect results from total of 4 – 6 sample events.
RWQCB	Pending	RWQCB staff to prepare an issue paper on the feasibility and cost of conducting phytoplankton bioassays to directly measure copper toxicity.	Availability of appropriate methodology uncertain.	Copper speciation results may make this unnecessary.

CAP Category: Uncertainty Reduction Studies				
Baseline Activity: CB-18(4) – Investigate algal uptake/toxicity with competing metals **Region of Applicability:** Bay-wide **Linkage to Copper Reduction:** Algae may preferentially uptake substances (e.g., Mn) reducing the toxicity of ambient copper concentrations **Performance Measure(s):** Ambient free ionic copper, Mn, possibly other constituent concentrations.				
Lead Party	**Reporting**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004- 2005		**PROPOSED WORKPLAN ACTIONS**		
FY 2003- 2004		**Actions Accomplished in Period**		
FY 2003- 2004		**PROPOSED WORKPLAN ACTIONS**		
CEP consultants via SCRURPPP	Work Plan in summer 2003	Include in work plan for North of Dumbarton Bridge Impairment Assessment Report (IAR)	Determine/fill data gaps	
FY 2002- 2003		**Actions Accomplished in Period**		
RWQCB	CB-18(3) & CB-17(3)	Linkage with CB-18(3) – Determine Cu-L1 and L2 complex concentrations (copper speciation) and CB-17(4) – Assess feasibility of phytoplankton bioassays to measure toxicity	Study coordination.	Synthesize results when available.

Lead Party	Reporting	Actions	Effectiveness Evaluation	Future Actions
North of Dumbarton Copper Nickel Project	July 2002 WER Report	Mn and ancillary water quality data collected in 2000-2001 as part of NDB Cu/Ni project	Data compiled & reported	Evaluate further in NDB Impairment Assessment Report.

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB-19/NB-6 – Track industrial virtual closed-loop wastewater efficiency measures as part of POTW Source Control programs. **Region of Applicability:** South Bay. **Linkage to Copper Reduction:** Indirect. Potential flow and copper influent reduction. **Performance Measure(s):** Completed studies.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCBWMI - San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report.	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Clean Bay Strategy Report and Annual Pretreatment Program Report
Sunnyvale WPCP	Pretreatment Program Annual Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Pretreatment Program Annual Report

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
SCBWMI - San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report.	**Ongoing-** Industry projects are identified and tracked by the City through the Water Efficiency Technology rebates or studies done by the industry. We will continue to provide financial and technical assistance for these projects. These projects will be reported in the annual report.	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continuously evaluate the pretreatment program and the tools used to ensure improved effectiveness.
Sunnyvale WPCP	Pretreatment Program Annual Report	**Ongoing-** Water usage and wastewater generation tracked and reported under pretreatment program. Water conservation information sources provided during facility inspections and general outreach is provided to city businesses about water conservation through the PIP program (See Attachment G of FY 02-03 Stormwater Annual Report)	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continue to track and report on water usage and wastewater generation rates. Continue outreach to businesses and industrial users.
Other Co-Permittees		Not applicable		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCBWMI – San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report.	Industry projects are identified and tracked by the City through the Water Efficiency Technology rebates or studies done by the industry. We will continue to provide financial and technical assistance for these projects. These projects will be reported in the annual report.	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continuously evaluate the pretreatment program and the tools used to ensure improved

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
				effectiveness.
Sunnyvale WPCP	Pretreatment Program Annual Report	Water usage and wastewater generation tracked and reported under pretreatment program. Water conservation information sources provided during facility inspections and general outreach is provided to city businesses about water conservation through the PIP program (See Attachment G of FY 02-03 Stormwater Annual Report)	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continue to track and report on water usage and wastewater generation rates. Continue outreach to businesses and industrial users.
Other Co-Permittees		Not applicable		
FY 2002-2003		**Actions Accomplished in Period**		
San Jose WPCP	Annual Clean Bay Strategy Report.	Tracked projects identified by the industry and provided technical and financial assistance. These projects were reported on in the semi-annual reports in a Mass Audit Study or Flow Audit Study are tracked and reported in the annual report. Projects may also be tracked through the Water Efficient Technologies financial incentives program.	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continuously evaluate the pretreatment program and the tools used to ensure improved effectiveness.
Sunnyvale WPCP	Recycled Water Annual Report	Added seven new sites/users in 2002, with an estimated additional usage of 6750 ccf/year of recycled water. No new production or distribution facilities were constructed this year. However some improvements were made to instrumentation and control systems at the San Lucar Recycled Water Pumping and Storage facilities.	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continue to track and report on water usage and wastewater generation rates. Continue outreach to businesses and industrial users.

CAP Category: Uncertainty Reduction				
BASELINE ACTIVITY: CB- 20 - Measures to revise the Copper Conceptual Model Report findings. **Revise copper conceptual model report uncertainty table (Appendix D) and produce a status report at permit reissuance** **Region of Applicability:** South Bay and likely bay-wide **Linkage to Copper Reduction:** May reduce uncertainty associated with conceptual model predictions of copper dynamics in the bay **Performance Measure(s):** Availability of improved input data and uncertainty in multiple assumptions underlying model				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
FY 2003-2004		**Actions Accomplished in Period**		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	CEP	Track CEP Task 4.7 to evaluate future modeling needs and other CEP tasks with modeling elements.		
SCVURPPP		Track results as they become available from SFO, CEP Cu/Ni, Cargill, and other potential modeling efforts.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP	BPP	Track results from BPP hydrodynamic and compartment modeling based on SFO and WASP models.(see CB-18, CB-4&5)		
WMI, SCVURPPP		Re-evaluate approach to model revisions and updating the uncertainty table during reissuance of SCVURPPP NPDES permit.		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Include in bay-wide research tracking effort proposed to be conducted by SFEI/RMP (see description under CB-17(1))		

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: CB- 21 - Measures to discourage architectural use of copper.

(1) evaluate feasibility of discouraging architectural use of copper & explore feasibility of related policy

(2) promote Green Building principles

Region of Applicability: South Bay and Bay-wide

Linkage to Copper Reduction: Copper from corroding roofing related material washes off with rainfall and can enter storm drains

Performance Measure(s): Building permits/inspections for new and replacement roofing work involving copper containing materials

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Review procedures (submitted by the Copper Development Association to the City of Palo Alto) for evaluating alternative mitigation measures to reduce copper loading from new or existing structures.		If applicable, provide to Co-permittees at a later date.
Palo Alto		**Ongoing**: Continue enforcing ban on architectural copper (roofs and gutters) per ordinance provision. Continue to conduct outreach to Building/Planning staff and developers on ban of copper roofs, shingles and gutters.		Ongoing
San Jose		Continue reporting on the status of the implementation of Green Building policies and recommendations for opportunities to discourage architectural use of copper.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
All Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		**Update:** On July 29, 2003, Program staff distributed (via electronic mail) the City of Palo Alto report entitled *Architectural Uses of Copper: An evaluation of stormwater pollution loads and BMPs* and its model ordinance banning architectural copper (roofs and gutters). This information will be redistributed during FY 03-04. Co-permittees will also be encouraged to consider the feasibility of limiting or banning these uses of copper.	Information will be useful in determining next steps regarding CB-21.	
Palo Alto		**Status (To be Determined)**: Enforce ban on architectural copper (roofs and gutters) per ordinance provision. Continue to conduct outreach to Building/Planning staff and developers on ban of copper roofs, shingles and gutters.		Follow-up with the City of Palo Alto staff
San Jose		**Status (To be Determined)**: Periodically report on the status of the implementation of Green Building policies and recommendations for opportunities to discourage architectural use of copper.		Follow-up with the City of San Jose staff
SCVURPPP		**In Progress**: Track EPA cancellation of virtually all residential uses of chromated copper arsenate (CCA) treated lumber (December 30, 2003). Track replacement of preservatives for copper content.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
All Co-permittees		Refer to individual Co-permittee FY 03-04 Annual Reports.		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Distribute to Co-permittees City of Palo Alto report regarding architectural uses of copper, and model ordinance banning architectural copper (roofs and gutters). Encourage Co-permittees to consider feasibility of limiting or banning these uses of copper.		
Palo Alto		Enforce ban on architectural copper (roofs and gutters) per ordinance provision. Continue to conduct outreach to Building/Planning staff and developers on ban of copper roofs, shingles and gutters.		
San Jose		Periodically report on the status of the implementation of Green Building policies and recommendations for opportunities to discourage architectural use of copper.		
SCVURPPP		Track EPA cancellation of virtually all residential uses of chromated copper arsenate (CCA) treated lumber (December 30, 2003). Track replacement of preservatives for copper content.		
All Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2002-2003		**Actions Accomplished in Period**		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto **y**	Ordinance, August 2002	In August 2002, City of Palo Alto adopted an ordinance prohibiting the use of copper for new roofs. Prohibitions include copper metal roofing; asphalt shingles containing copper granules; and copper gutters. Copper flashing and ornaments are exempted. The ordinance became effective on January 1, 2003.		See FY 03-04 work plan
Palo Alto	Report on Architectural Uses of Copper, rev. March 2001	RWQCP investigated the relative importance of copper in roofing materials as a source of copper to the environment.		See FY 03-04 work plan
San Jose		Adopted Green Building Policies and Guidelines in June 2001 (see http://www.ci.san-jose.ca.us/esd/gb-sitemap.htm) Continued to monitor progress of San Jose Green Building program to identify opportunities for discouraging architectural use of copper.		See FY 03-04 work plan

NAP Category: Potential Source Reduction

BASELINE ACTIVITY: NB-1 – Measures to control nickel discharges from construction sites: (1) continue to implement performance standards for construction inspection, (2) participate in development of region-wide training and certification program for construction site inspectors, (3) continue to conduct workshops for municipal staff on post-construction controls for new development and re-development, and 4) continue to support annual workshops for contractors and municipal staff on construction site management and erosion/sediment controls.

Region of Applicability: South Bay. Concept potentially applicable Bay-wide.

Linkage to Nickel Reduction: Nickel occurs naturally in local soils. Assumes that better erosion/sediment controls at construction sites will reduce the amount of sediment (and thus nickel) washed into creeks and the Bay.

Performance Measure(s): Co-permittee annual reports evaluating implementation of Construction Inspection Performance Standard; number of workshops held and number of attendees.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP NB-1(2)(4)		• Sponsored and participated in the annual Regional Board Construction Site Management Workshop for municipal staff on September 24, 2003. Provided information on the latest erosion/sediment control techniques		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP NB-1(1)		• Co-permittees will continue to implement Construction Inspection Performance Standards (see Construction Inspection work plan section). • Co-permittees will begin to implement the Rural Public Works Maintenance and Support Performance Standard, as applicable to their communities.	Effectiveness evaluation in Co-permittee annual reports	
SCVURPPP NB-1(3)		• Conduct a third workshop on implementing Provision C.3., including information on appropriate post-construction controls for types of new and redevelopment projects (Fall 2003)	Attendee list, evaluation forms	
SCVURPPP NB-1(2)(4)		• Sponsor and help conduct the annual Regional Board Construction Site Management Workshop for municipal staff (scheduled for September 24, 2003). Include information on the latest erosion/sediment control techniques.	Attendee list, evaluation forms	
Co-permittees		Refer to individual Co-permittee work plans for nickel and for Construction Inspection.		
FY 2002-2003		**Actions Accomplished in Period**		
SCVURPPP		• Co-permittees incorporated revised Construction Inspection Performance	Performance standards have been an effective tool for defining MEP and	See FY 03-04 work plan above.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
NB-1 (1)		Standards (rev. 1/17/02) into their URMPs. In response to a request by Regional Board staff, SCVURPPP submitted the Legal Authority sections of the Co-permittees' performance standards to Regional Board staff on 4/28/03. All Co-permittees have either adopted the revised model performance standard with no changes or adopted a version with very small changes to the model. • SCVURPPP submitted, and Regional Board staff approved, the Rural Public Works Maintenance and Support Performance Standard, which includes erosion and sediment controls for rural roads.	promoting consistent implementation of Program elements by Co-permittees. Regional Board staff conducted Co-permittee performance review meetings on the topic of construction inspection programs during Nov.-Dec. 2002 and documented the findings in a letter dated 3/3/03.	
SCVURPPP NB-1(2)		The Regional Board's annual Construction Site Management Workshops constitute a region-wide training program, and provide certificates of completion to contractors and other attendees.	Workshops are an effective and well-known training mechanism.	No further action needed by SCVURPPP (combine with NB-1(4))
SCVURPPP NB-1(3)		SCVURPP held two workshops on implementation of Provision C.3., including discussion of post-construction treatment controls, on December 11, 2002 and May 21-22, 2003	Both workshops were very well attended, and evaluation forms showed that the workshops were successful in educating attendees (see FY 02-03 Annual Report).	See FY 03-04 work plan above.
SCVURPPP NB-1(4)		SCVURPPP sponsored and helped conduct a Regional Board Construction Site Management Workshop for municipal staff in San Jose on October 2, 2002. The agenda included review of erosion and	The workshop was well attended, and evaluation forms showed that the workshop was successful	See FY 03-04 work plan above.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		sediment control measures and demonstration of products by vendors.	in educating attendees (see FY 02-03 Annual Report).	

NAP Category: Potential Source Reduction

BASELINE ACTIVITY: NB-7 – Measures to establish a watershed model linked to process oriented Bay model.

Region of Applicability: South Bay and generally Bay-wide.

Linkage to Nickel Reduction: Better understanding of nickel sources, pathways, and loadings to the Bay.

Performance Measure(s): Report on and incorporate results of various modeling activities.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
FY 2003-2004		**Actions Accomplished in Period**		
FY 2003-2004		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	CEP	Track CEP Task 4.7 to evaluate future modeling needs and other CEP tasks with modeling elements (see CB-20).		
SCVURPPP		Track results as they become available from SFO, CEP Cu/Ni, Cargill, and other potential modeling efforts (see CB-20).		
SCVURPPP	BPP	Track results from BPP hydrodynamic and compartment modeling based on SFO and WASP models.(see CB-20, CB-18, CB-4&5)		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP	BPP	Track results from BPP Prop. 13 ambient water quality monitoring and modeling (USEPA BASINS and SFO models) of loading from Castro Valley Creek watershed (see CB-17(3)).		

SECTION 5

PESTICIDE MANAGEMENT WORK PLAN

5. FY 04-05 PESTICIDE MANAGEMENT WORK PLAN

INTRODUCTION

The goals and objectives of the SCVURPPP Urban Runoff Management Plan (URMP) include: effectively prohibiting non-storm water discharges to storm drains and watercourses; reducing pollutants in storm water discharges to the "maximum extent practicable" (MEP); and not causing or contributing to violations of water quality standards, as required by the Program's NPDES permit. The Program's approach to meeting these goals and objectives focuses on the use of best management practices (BMPs) for source control and pollution prevention; and public education and outreach.

The Program's approach to pesticide management has a similar focus on source control and pollution prevention. Program BMPs for pesticide management have included significant outreach efforts to residents, businesses, and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide issues; and development of performance standards and local pest management plans.

BACKGROUND

Diazinon and chlorpyrifos have been identified in recent studies as causing toxicity in local creeks and wastewater treatment plant effluent. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA). The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies. In September 2002, the Regional Board developed a Preliminary Project Report for diazinon and pesticide-related toxicity in San Francisco Bay Area urban creeks. The Preliminary Project Report provides a draft source assessment and pollutant allocation scheme; and discusses potential implementation actions relevant to urban runoff management programs, including the SCVURPPP. A final project report will likely be released in 2004, followed by a draft Basin Plan amendment.

The Program's reissued NPDES permit (Order No. 01-024, February 21, 2001) includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticides by others within municipal jurisdictions. The Program will also continue to work with the Urban Pesticide Committee and the California Stormwater Quality Association Pesticide Work Group to assess impacts of pesticide use and encourage actions by other state and federal agencies.

As required by Permit Provision C.9.d., the Program developed a Pesticide Management Plan and submitted it to the Regional Board by July 1, 2001 (June 26, 2001). The submittal to the Regional Board included a preliminary draft Pest Management Performance Standard as well as municipal pesticide use surveys completed by each Co-permittee. The Pesticide Management Plan was revised in response to Regional Board staff comments dated August 15, 2001 and December 21, 2001, and the revised version (dated February 15, 2002) submitted to the Regional Board as Attachment 5-1 to the Program's *FY 02-03 Work Plan*.

The Pest Management Performance Standard was also revised based on Regional Board Staff comments emailed in November 2001. The final performance standard was submitted to the Regional Board as Attachment 2-2 of the Program's *FY 02-03 Work Plan*.

The purpose of the Pesticide Plan is to control pesticide-related toxicity in urban runoff, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Plan identifies the goals of each work plan element, actions, monitoring mechanisms, and schedules. The Plan also identifies whether actions will be implemented at the Program level, municipality level, or both. Program-level actions in the Plan form the basis of this FY 04-05 Pesticide Management Work Plan. The details of municipality actions and schedules were provided in individual Co-permittee pest management plans submitted with the Co-permittees' FY 00-01 annual reports and future tasks are provided in the Co-permittees' FY 04-05 work plans (Section 9 of this *FY 04-05 Work Plan*).

PAST PESTICIDE MANAGEMENT ACTIVITIES

The Program has, since its inception, actively participated in a number of activities aimed at understanding water quality problems in creeks and San Francisco Bay and reducing pollutants, including pesticides, to the MEP. The Program's FY 99-00, FY 00-01, FY 01-02, FY 02-03 and FY 03-04 Work Plans presented the history of the Program's and Co-permittee's pesticide-related activities in the areas of monitoring and science, outreach and education, and URMP implementation.

All of the Program tasks in the Pesticide Plan were scheduled to be completed or begun by FY 02-03. Table 5-1 presents the status of these tasks. Details of the FY 04-05 Pesticide User Outreach Work Plan are provided in Section 3 Attachment 3-3.

FY 04-05 PESTICIDE MANAGEMENT TASKS

Table 5-2 presents the list of tasks from the Pesticide Plan that are still in progress and will be implemented in FY 04-05. (Ongoing tasks from FY 03-04 (Table 5-1) are not repeated in Table 5-2).

Table 5-1
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
I. Municipal Pesticide Use		
I.A.1 Develop and implement a process for tracking pesticide use on municipally owned property (PS#8). Include in the process reporting and justification for the use of OP pesticide and BMPs employed during OP pesticide use.	Ongoing	The Pest Management Performance Standard includes a suggested reporting process which, for FY 01-02, is focused on reporting use of organophosphate pesticides, particularly chlorpyrifos and diazinon. All Co-permittees submitted information on pesticide use in their FY 01-02 and FY 02-03 Annual Reports . Program staff will work with the Co-permittees to review and improve the reporting process as needed.
I.A.3 Assist Co-permittees to develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM policy. (PS #3). BMPs will include special precautions to reduce water quality impacts when applying pesticides.	Done	Program guidance completed as part of Model Pest Management Performance Standard, submitted to Regional Board March 1, 2002. Guidance to Co-permittees included a packet of example IPM policies and practices.
I.A.4. Assist Co-permittees to update local URMPs to incorporate/adapt the model Pest Management Performance Standard, including a description of the legal authority (IPM policy/ordinance, contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done	See notes for Action I.A.3. The Program held a workshop on March 20, 2002 on how to implement the performance standard.
I.B.4. Conduct a workshop for municipal staff on least-toxic pest control methods and pesticide management BMPs.	Done	Workshop held March 20, 2002. Program also co-sponsored ACCWP IPM Symposium held on 2/5/03.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II. Public Education and Outreach		
II.A.1 Implement the Watershed Education & Outreach (WE&O) Campaign, which will target the general public and include messages about less-toxic pest control and proper disposal. The Campaign will include extensive media campaign with South Bay English- and Spanish-language radio stations, newspapers, and bus posters.	Done/Ongoing	An article on impacts of pesticide use to water quality and less toxic pest control was written and sent through the campaign distribution list. Pesticides are listed as a concern in the campaign brochure and the Watershed Watch song. Media ads and public service announcements with less toxic pest management messages are under development and will be run in Spring 2003. The campaign web site added several new pages on IPM and IPM fact sheets are available to download. Print, radio and transit ads with less toxic pest management messages were developed in FY 02-03. Advertising was conducted in FY 02-03 and FY 03-04.
II.A.2 Develop simple, effective, targeted messages regarding proper pesticide use and disposal, effects on water quality, and IPM.	Done/Ongoing	See above for Watershed Watch activities. The Program continues to participate in regional IPM partnership and media relations efforts. The regional IPM partnership committee develops new fact sheets each year.
II.A.3 Prepare appropriate outreach materials (e.g., fact sheets or a consumer guide regarding pest control services) to address target groups.	Done	Program developed landscape maintenance fact sheet. A PCO fact sheet has been developed through BASMAA participation -- this fact sheets educates consumers on hiring pest control professionals who practice IPM..
II.A.4 Identify and attend community events and distribute outreach materials. (Program will attend events strategic to the WE&O campaign.)	Done/Ongoing	Program staff and Watershed Watch consultant staff attend 4-5 events each year. Brochures such as IPM fact sheets, "Grow It!" guide, "Pests Bugging You?", and "Backyard Bugs" are distributed.
II.A.6. Create, update, and publicize web sites to promote IPM and reduce pesticide use.	Done/Ongoing	The Watershed Watch website was launched in September 2001 and is continually updated. The website directs browsers to call the toll-free number to the Program office for information on less-toxic pest control. A web page specifically for IPM was completed in June 2002 and is updated regularly. The web page also includes links to other sites with information on IPM.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.A.7 Coordinate with the Master Gardeners program and use their services to train residents. Provide IPM training and information on water quality impacts of pesticide use to Master Gardeners as needed.	Done	The Program funded a proposal by Master Gardeners and San Jose Community Gardens staff to conduct an IPM training program for community gardeners. Four workshops were conducted and training materials were purchased with SCVURPPP funds.
II.A.8 Create and/or publicize existing IPM demonstration gardens (such as the garden at the San Francisco Bay Wildlife Refuge in Alviso).	Done/Ongoing	The Watershed Watch campaign has partnered with the Don Edwards San Francisco Bay Wildlife Refuge at Alviso. The Alviso site has a pesticide-free native plant demonstration garden. Garden workshops at this garden are promoted on the Watershed Watch website. Additionally, the Watershed Watch consultant is working with Don Edwards staff to develop page on the website specific to the demonstration garden. Program staff are looking into possibilities for sponsoring/publicizing other demonstration gardens.
II.A.9 Continue to fund BASMAA Regional Media Relations Campaign featuring pitches to Bay Area media and responses to breaking news on pesticide-related topics.	Ongoing	The Program funds this campaign as part of its BASMAA baseline dues. Program staff participates in meetings of the work group and review draft products.
II.A.11 Identify consumer and business publications that could include articles about IPM or less toxic pest management, submit articles or letters to the editor, and encourage them to print them.	In Progress	An article regarding impacts of pesticide use to water quality and containing hints for pesticide-free pest control was written and sent through the WEO campaign distribution list; however, it was difficult to confirm whether the article was published. Efforts to identify publications and get articles included are ongoing.
II.A.12 Develop a work plan for and implement a "Pesticide User Outreach" project targeting residential and commercial users, which will include continuing the IPM Store Partnership Program and selected Household Chemical Management project tasks. Include an evaluation component in the work plan.	Complete Annually	Work Plan implemented for FY 02-03 and ongoing for FY 03-04. Activities included: • Media advertising • IPM Store Partnership Program • IPM Community Workshop • Outreach at Community Events

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.A.13 Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	In Progress	VTA and open space and vector control district staff were invited to the Program's IPM Workshop in March 2003 and provided copies of the Program's Pest Management Performance Standard. These groups will be addressed in the Pesticide User Outreach Plan for FY 04-05
Monitoring Mechanism II.A.1 Document or estimate numbers of residents reached by outreach efforts, including events, web site promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts through documentation of calls to the Program's general and watershed campaign hotlines.	In Progress. Completed Annually	Number of residents reached and outreach materials distributed are documented after each event. Response to outreach efforts is tracked by documenting calls to hotline and website visits. This information is provided in the Annual Report each year.
Monitoring Mechanism II.A.2 Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages. (Program will conduct countywide survey as part of evaluation of WE&O campaign. Program may also conduct surveys to evaluate effectiveness of specific projects.)	Countywide survey conducted in September 2003	A Countywide survey was conducted to evaluate the success of the WE&O campaign. Section 3 of this Work Plan describes the results. An evaluation report was submitted to the Management Committee on November 20, 2003. Some of the survey questions tracked the publics' knowledge about various pollutants, including pesticides, affecting the water quality in the Bay. 19% of the respondents in 2003 say that pesticides affect the water quality of the Bay compared to 7% in 1991. About 23% of residents say that they use less –toxic ways to control pests in their home and garden. The BASMAA Regional IPM Committee is planning to conduct a survey in FY 03-04 to evaluate the Store Partnership Project. The Program will provide input in developing this survey and help implement it if needed.
II.B.1 Continue to fund and participate in the BASMAA Regional IPM Partnership.	Ongoing	The Program annually funds this program as part of its BASMAA baseline dues. These funds cover the Program's supply of IPM Fact Sheets. Program staff participates in meetings of the work group and review draft products.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.B.2 Continue to implement cost-effective elements of the IPM Store Partnership Program. Create and provide fact sheets and other materials to pesticide retailers to facilitate point-of-purchase outreach. Visit stores as necessary to ensure ongoing participation.	Ongoing	The IPM store partnership program expanded in FY 02-03 to include 29 stores in the Santa Clara Valley. Training on selling less-toxic products was provided to 123 employees at 16 stores. The Program will continue maintaining these stores in FY 04-05 and provide trainings to store employees if needed.
II.B.3 Offer IPM training opportunities to pesticide retailer employees through coordination with Master Gardener-taught educational programs.	Task Eliminated (covered under Action Item II.A.12.)	It was not possible to arrange for Master Gardeners to train store employees due to staff shortages within the Master Gardener program. The Program has contracted with Annie Joseph to provide training to pesticide retailers, as she has been successful in getting store participation. The Community Gardeners project has been a successful way to work with the Master Gardener program and may be repeated if there is sufficient demand and resources available.
Monitoring Mechanism II.B.1. Document number of participating stores, materials distributed and employees trained. Evaluate the cost-effectiveness of the IPM Store Partnership Program each year. Implement the evaluation component of the Pesticide User Outreach work plan each year	Ongoing	Data on number of participating stores, materials distributed and employees trained is documented and reported in the Annual Report each year. Evaluation of other work plan tasks is also reported.
III. Pest Control Operators (PCOs)		
III.A.1 Develop a database of licensed structural and landscape maintenance PCOs.	Done	The list was obtained from the County Agricultural Commissioner's office prior to the PCO workshop of November 4, 2003
III.A.2. Identify active PCO and landscape maintenance organizations in the South Bay and conduct awareness-raising presentations at their meetings	Done	The Program contracted with Bart Brandenburg, consultant, to plan and conduct a PCO Workshop. Awareness raising presentations were made at the two local PCO associations before the PCO workshop to increase attendance.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
III.A.3. Develop and conduct accredited workshops for PCOs that focus on IPM techniques.	Done	The workshop was conducted on November 4, 2003. About 30 PCOs from 19 companies attended this workshop. The workshop was very well received by attendees.
III.A.4 Require PCOs contracted for municipal applications to use pest control methods consistent with the municipality's IPM policy (through contract specifications). Specifically, municipalities will require contractors to: a) follow the agency's IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on agency property to the agency in a timely manner (PS#5).	Program Guidance Done	Guidance was completed in December 2001 as part of the Pest Management Performance Standard. Co-permittees are beginning or continuing to implement the guidance. The IPM workshop on March 20, 2002 included a section on contracting for IPM services from professional pest control businesses.
Monitoring Mechanism III.A.1. Document the number of PCOs receiving presentations and/or training and pesticide use by PCOs on municipal property.	FY 03-04	About 30 PCOs from 19 companies attended the PCO workshop.
III.B.1. Identify and work with PCO trade organizations to develop industry standards for BMPs to protect water quality, through participation in UPC and BASMAA.	To Be Done in FY 04-05	Program will work with the UPC and a consultant to accomplish this task.
IV. Commercial Businesses		
IV.A.1 Research reports and surveys of commercial business pesticide use and other stormwater programs' and POTWs' efforts to address this issue. Develop recommendations and a work plan (including an evaluation component) to provide outreach on less toxic pest control to target businesses in the South Bay, as appropriate and cost-effective.	In Progress –	Program staff surveyed Co-permittees, BASMAA members, and Monterey County programs for IPM materials specific to restaurants. Very little IPM restaurant outreach material was found. Several programs reported using San Francisco's "Don't Set a Table for Pests" poster. In FY 02-03 County Health Inspectors began distributing this poster to restaurants during routine inspections. A reprint of this poster is being organized.
IV.A.2. Develop and implement education programs that target commercial businesses, per recommendations from Action IV.A.1.	Ongoing	See Action Item IV.A.1.
Monitoring Mechanism IV.A.1. Document outreach efforts targeting	Ongoing	The number of posters distributed and the number of

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
businesses, as recommended in the work plan to be developed by the Program. Implement the evaluation component of the work plan.		businesses receiving them is documented and reported in the Annual Report each year.
V. Household Hazardous Waste Collection		
V.A.3 Work with HHW collection agencies to support, enhance, and help publicize programs for proper pesticide disposal (PS #7).	Ongoing	The Program is working closely with the HHW Program to publicize proper pesticide disposal. The Program's "Got Paint" advertising campaign focused on the proper disposal of paints, pesticides and other hazardous wastes.
Monitoring Mechanism V.A.2. Document quantities of pesticide disposal at household hazardous waste collection facilities (only possible on a county-wide basis at present)	Ongoing	Reported in the Annual Report each year
VI. County Agricultural Commissioners		
VI.A.1 Keep County Agricultural Commissioners informed of Program goals and activities and regional water quality issues through periodic meetings.	Ongoing	County Agricultural commissioners were involved in the development and review of the pest management performance standards. Contact is ongoing.
VI.A.2 Involve County Agricultural Commissioners in education and outreach efforts targeting PCOs.	Done	Program staff worked with County Agricultural Commissioners for planning and conducting the PCO workshop.
Monitoring Mechanism VI.A.2 Document meetings with County Agricultural Commissioner and staff involvement in outreach efforts	Ongoing	Program staff met with County Agricultural Commissioners to plan the PCO workshop. Workshop information was published in their newsletters. Outreach staff from the Ag. Commissioner's office made a presentation at the PCO workshop.
VII. New Development		
VII.A.1. Coordinate with municipal arborists or other relevant municipal staff to identify landscaping techniques less likely to attract pests, including a list of pest-resistant	Done	Program completed model conditions of approval, a landscape maintenance fact sheet, guidance on landscaping techniques for stormwater treatment, and a

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
plants, and develop model conditions of approval for pest resistant landscaping features and practices.		draft pest-resistant plant list. The plant list proved not to be a useful tool, as plant resistance depends highly on local planting conditions.
VII.A.2. Assist Co-permittees to consider pest-resistant landscaping and design features in the design, landscaping, and environmental reviews of proposed development projects.	Done	Model conditions of approval provided to Co-permittees, and a form developed to track projects for which education or conditions of approval were required.
VII.A.3. Assist Co-permittees to train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval (see Actions VII.A.1. and VII.A.2.) and the importance of minimizing pesticide use in runoff from development sites.	Done	The topic was presented at the December 11, 2002 New Development workshop.
VII.A.4. Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites.	Done	A section for documenting pesticide reduction measures required of project applicants is included in the Program's model data collection form for collecting other development project data prior to implementing C.3. (i.e., impervious surface area) and the Planning Procedures PS Reporting Form.
VIII. Monitoring and Science		
VIII.A.1. Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP advisory and technical committees to focus RMP resources on 303(d) problem pollutants, including OP pesticides.	Ongoing	The Program annually contributes its share to the RMP. Program staff attends the RMP Technical Review Committee meetings and prepare meeting summaries for Management Committee.
VIII.A.2. Work with Regional Board staff to refine the problem statement for the diazinon TMDL and determine data needs.	Ongoing	Program staff attends the Urban Pesticide Committee meetings, at which the diazinon TMDL has been discussed. Staff is also working on the TMDL with Regional Board staff as part of the Clean Estuary Program (CEP).

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
VIII.A.3. Participate in a coordinated regional plan to collect data for the diazinon TMDL.	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX. Regional, State, and Federal Coordination		
IX.A.1. Support actions by the California Stormwater Quality Association (CASQA) Pesticide Work Group to comment on and assist with USEPA's pesticide risk assessments and to assist USEPA in development of a scope for a diazinon TMDL case study.	Ongoing; Case study TBD	SCVURPPP provides funding to the CASQA's consultant contract, which funded Geoff Brosseau and Kelly Moran's efforts to review risk assessments and provide comments on behalf of the CASQA member agencies. The EPA case study has not yet been planned or discussed.
IX.A.2. Through participation in the UPC and CASQA, work with the U.S.EPA, the California Department of Pesticide Regulation, and the pesticide industry to eliminate uses of pesticides likely to enter surface water from those listed on product labels.*	Ongoing	Program staff regularly participates in the UPC and CASQA, and support efforts to eliminate uses of pesticides that cause risk to water quality.
IX.B.1. Participate in the activities of BASMAA, CASQA, and UPC, and communicate Program efforts.	Ongoing	Program staff regularly attends BASMAA, the CASQA and its Executive Committee, and the UPC and communicate Program efforts.
IX.B.2. Collaborate in technical studies to support TMDL development and implementation. (See Action VIII.A.3.)	As Needed.	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX.B.3. Continue to participate in the BASMAA Pesticide Work Group to evaluate implementation of and continuously improve the Pesticide Strategy and report on the results of the evaluation.	Task Eliminated	The BASMAA Pesticide Work Group is no longer active, as each municipal stormwater program has its own pesticide plan in place of the Pesticide Strategy.
X. Review and Revision of Work Plan		
X.A.1. Review and continuously improve the goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Regional Board staff	Ongoing (Annually)	The Pesticide Plan was revised twice in FY 01-02 based on comments from Regional Board staff and interested parties (specifically RWQCB letters dated 8/15/01 and 12/21/01)

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
and other interested parties, and results of local performance review meetings if any.		and submitted to the RWQCB on October 15, 2001 and March 1, 2002, respectively. The Plan will continue to be evaluated and improved each year.

Table 5-2
Schedule and Deliverables for FY 04-05 Pesticide Management Tasks

Task	Schedule	Deliverables
Public Education and Outreach		
II.A.3. Prepare appropriate outreach materials (e.g., fact sheets or a consumer guide regarding pest control services) to address target groups.	Ongoing	• The PCO fact sheet is complete. • Distribution Plan – The fact sheet will continue to be distributed at outreach events, through literature racks at stores. It was also distributed to attendees at the Program's PCO workshop.
II.A.11 Identify consumer and business publications that could include articles about IPM or less toxic pest management, submit articles or letters to the editor, and encourage them to print them.	Ongoing	• An article on use of less-toxic pesticides was sent to a number of publications in FY 02-03. Another article will be prepared and distributed in FY 04-05. • Efforts to identify publications and get articles included are ongoing.
II.A.12. Develop a work plan for and implement a "Pesticide User Outreach" project targeting residential and commercial users, which will include continuing the IPM Store Partnership Program and selected Household Chemical Management project tasks. Include an evaluation component in the work plan.	Ongoing	• Implementation of ongoing and remaining pesticide plan tasks will be continued in FY 04-05. The Work Plan for FY 04-05 will focus on continuing the IPM partnership program, conducting outreach on less-toxic pesticides through media advertising and outreach events (See Section 3 and Attachment 3-3 of this Work Plan).
II.A.13 Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts within the Co-permittee's jurisdiction (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	June 2005	• These groups will be contacted to assess the amount of information they have or need regarding IPM, and develop and implement prioritized outreach plan based on the findings of the assessment
Pest Control Operators (PCOs)		

Table 5-2, continued
Schedule and Deliverables for FY 03-04 Pesticide Management Tasks

Task	Schedule	Deliverables
III.B.1. Identify and work with PCO trade organizations to develop industry standards for BMPs to protect water quality, through participation in UPC and BASMAA.	June 2005	• PCO-accepted BMP Document (work with UPC and consultant)
Commercial Businesses		
IV.A.2. Develop and implement education programs that target commercial businesses, per recommendations from Action IV.A.1.	Ongoing	• Reprints of the "Don't Set a Table for Pests" poster are being coordinated. • Poster will continue to be distributed to food facilities by County Health Inspectors. It will also be provided to Co-permittees for distribution through storm water inspectors.

SECTION 6

MERCURY POLLUTION PREVENTION WORK PLAN

6. MERCURY POLLUTION PREVENTION WORK PLAN

INTRODUCTION

The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires the Program to develop and implement a mercury pollution prevention plan. The Program developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with the permit provisions. The Mercury Plan was submitted to the Regional Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan. This section of the FY 04-05 Work Plan summarizes Mercury Plan tasks completed during FY 03-04 and describes the tasks that will be developed, continued, or completed during FY 04-05.

SUMMARY OF MERCURY POLLUTION PREVENTION PLAN

The Mercury Plan is based on the premise that a Bay area-wide approach (and coordination) in addressing mercury pollution prevention will be most successful. For this reason, many of the actions identified in the Plan are for Program-level participation in regional efforts. These efforts are supplemented by countywide and local efforts.

The Mercury Pollution Prevention Plan addresses five general goals:

I. **Municipal Use of Mercury-Containing Products** – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

II. **Household Hazardous Waste Collection** – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

III. **Monitoring and Science** – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

IV. **Regional, State, and Federal Coordination** – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

V. **Public Education and Outreach** –Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

The Mercury Plan identifies actions that will be implemented at the Program level, municipality level, or both, as well as the schedule for initiation and/or completion of Program-level actions. The details of municipality actions and schedules are included in the individual Co-permittee Work Plans and/or Annual Reports, as appropriate.

STATUS OF FY 03-04 MERCURY POLLUTION PREVENTION ACTIVITIES

The status of Program tasks in the Mercury Plan is presented in Table 6-1. Highlights of Program accomplishments during FY 03-04, as developed and/or implemented by the Mercury Pollution Prevention Plan Ad Hoc Task Group (Mercury P2 Plan AHTG), Mercury Pollution Prevention Outreach Work Group, Program staff and municipalities are provided below.

Monitoring and Science

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is serving as the stakeholder forum for the development of the Guadalupe River TMDL Report. The Guadalupe River Watershed encompasses parts of San Jose, Los Gatos, Campbell, Monte Sereno and Santa Clara. SCVURPPP is a stakeholder in the Guadalupe River TMDL process. The Santa Clara Valley Water District (SCVWD) and the City of San Jose are taking lead roles in the TMDL development process. Program staff is also participating in the TMDL process.

The Program continued to provide financial support to the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study funded by the City of San Jose. In addition, Program and Co-permittee staffs actively participate in RMP Technical Review Committee (TRC) and Steering Committee (SC) meetings and provide meeting summaries to the Management Committee. Staff reviewed available reports and provided comments on the proposed 2004 RMP Draft Monitoring Plan.

A Memorandum of Understanding (MOU) regarding development of a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries was entered into by the Regional Board, Bay Area Clean Water Agencies (BACWA), and Bay Area Stormwater Management Agencies Association (BASMAA) on August 6, 2001, and includes the development of TMDLs for 303(d) pollutants including mercury. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program is involved in the development and funding of potential projects for the mercury TMDL. Program staff has been participating in the CEP technical committee meetings and CEP Board meetings. In addition, a City of San Jose staff member is serving as chair of the CEP technical committee and Program staff serves as the BASMAA representative to the Mercury Work Group.

Mercury-Containing Product Survey

In fulfillment of Action I.A of the Mercury Plan, the Mercury P2 Plan AHTG and Program staff developed a survey to determine the types of mercury-containing products used by municipalities. The objective of the survey was to assess the municipal mercury-containing products being used, their locations, and waste disposal and purchasing routes; and identify the level of awareness of product alternatives and proper disposal methods. The Management Committee reviewed and approved the survey in October 2002. On November 5, 2002, the survey (See Appendix F-1) was distributed (by electronic mail) to municipal staff contacts identified by the Management Committee. The surveys were completed and returned to the Program by February 2003. Thirteen survey summary tables were provided to the Management Committee in June 2003. Survey responses were provided in the Program's FY 02-03 Annual Report (submitted to the Regional Board on September 15, 2003). This Mercury Work Plan task has been deemed complete.

Guidelines for Reduction and Management of Mercury-Containing Products

In December 2002, the Mercury P2 Plan AHTG and Program staff began developing guidelines for the reduction and management of mercury-containing products identified for virtual elimination.

The *Guidelines for Mercury-Containing Products Reduction and Management* satisfies Permit Provision C.9.c; and Mercury Plan Actions I.E. and II.C. Information regarding current use, purchasing and disposal practices of mercury containing products was gathered using the Mercury-Containing Product Survey. As a result, this information and the collaborative efforts of the Mercury P2 Plan AHTG were used to develop the guidelines.

The goals of the *Guidelines for Mercury-Containing Products Reduction and Management* are to work towards the virtual elimination of mercury from controllable sources that may affect urban runoff due to agency operations; and establish proper recycling and disposal methods for products that cannot be eliminated due to technological, safety or economic factors.

A final draft of the Guidelines was submitted to the Management Committee in March 2003. The Management Committee approved the Guidelines in April 2003. A copy of the Guidelines was included in the FY 02-03 Annual Report. In FY 04-05, Co-permittees will continue implementation of the *Guidelines for Mercury-Containing Products Reduction and Management*.

Mercury Virtual Elimination Policy

In January 2002, Mercury P2 Plan AHTG and Program staff began developing a model mercury virtual elimination policy to fulfill Permit Provision C.9.c. and Mercury Plan Action I.C. The model policy, which requires the virtual elimination of mercury from controllable sources in urban runoff, was submitted to the Management Committee in March 2003 and approved in April 2003. A copy of the model policy was included in the FY 02-03 Annual Report. The model policy serves only as suggested language. It was recommended that Co-permittees review the EPA document entitled *Developing a Virtual Elimination Strategy for Mercury* (October 1999) for additional language regarding virtual elimination.

In accordance with the Mercury Plan, Co-permittees are expected to adopt a Mercury Virtual Elimination policy, procedure, or ordinance consistent with municipal requirements during FY 03-04. Co-permittees will implement the newly adopted policy, procedure, or ordinance in FY 04-05.

Mercury Pollution Prevention Outreach Workgroup

In December 2002, Program staff established a new Work Group called the Mercury Pollution Prevention Outreach Work Group. This Work Group will implement the Public Education and Outreach element of the Mercury Plan by organizing a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products. The Mercury Plan identifies the development of a fluorescent light tube (FLT) recycling public outreach and education plan as a priority and recommends conducting outreach in two phases. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of fluorescent light tubes.

Phase I of the Public Education and Outreach plan focused on residential FLT disposal and was completed during FY 02-03. Implementation of Phase II, which targets small businesses and Conditionally Exempt Small Quantity Generators (CESQGs), began in FY 03-04.

Mercury Plan efforts implemented for the residential campaign (Phase I) during FY 02-03 include the following:

- A fact sheet on the proper disposal of FLTs and other mercury-containing household items was added to the Watershed Watch web site (www.watershedwatch.net).
- An article on safe disposal of mercury containing items was developed (as part of the Watershed Watch Campaign) and distributed to over 137 agencies for use in their newsletters.
- Radio and print ads regarding the proper disposal of FLTs and other hazardous materials (at the CoHHW Program) ran from mid April to mid May. To encourage the use of the CoHHW Program, tickets to the San Jose Saber Cats game on May 5, 2003 were offered as an incentive to residents bringing mercury-containing wastes to CoHHW disposal events.
- A video public service announcement on the proper disposal of mercury-containing wastes (obtained from STOPPP and customized for Program use) was provided to Co-permittees for broadcast on local city cable.

Program staff developed survey forms to evaluate the effectiveness of the Mercury Pollution Prevention Outreach advertising campaign. Residents bringing mercury-containing wastes to the CoHHW Program were requested to complete the survey forms. From April through June 2003, the CoHHW Program compiled the information collected from the completed surveys. Section 3 (PI/P Activities) of the FY 02-03 Annual Report provides additional information regarding the results of this survey.

In FY 03-04, the Program and Mercury Pollution Prevention Outreach Work Group worked with stakeholders to develop the following two outreach pieces for the small business and CESQG campaign (Phase II):

- An article intended for the worldwide web, which will be made available through the SCVURPPP and Watershed Watch websites.
- A public announcement article intended for newsletters.

Both the article and public announcement explain, in simple language, what recent environmental legislation exists for proper disposal and recycling of mercury-containing wastes; which businesses are affected by this legislation; what means are available to small businesses for directing their used FLTs (or other hazardous wastes) to hazardous waste drop-off programs; and information on the negative health and environmental impacts of mercury.

The Program has coordinated with the San Jose/Silicon Valley Chamber of Commerce, the Building Owners and Managers Association (BOMA) and the International Facility Management Association (IFMA) to organize the publication of a public announcement article in the newsletters and newspapers of these agencies. The Mercury Pollution Prevention Outreach Work Group will continue to seek other appropriate avenues for extending this outreach to a wider business audience throughout the remainder of FY 03-04. Potential avenues include but are not limited to: County HHW Program staff presenting outreach information at meetings organized by BOMA and IFMA; work group members transmitting mercury outreach information to their municipal inspectors to promote the integration of outreach to industrial businesses through their existing routine pretreatment, source control, and/or hazardous materials inspection processes; work group members encouraging the inclusion of the public announcement article in their municipal newsletters and/or utility bill insets; and assisting CoHHW Program staff in the development of a store partnership program (for collecting spent fluorescent lamps) which would include the development of outreach materials (e.g., shelf talkers).

Grant Proposals

In FY 02-03, the County Household Hazardous Waste Program (CoHHW) applied for grant funding from the California Integrated Waste Management Board (CIWMB). The CoHHW Program submitted a Mercury Reduction Grant to the CIWMB on May 23, 2003. The grant proposed to: 1) Develop an aggressive mercury reduction public education and outreach program targeted for residents and Heating, Ventilation, and Air Conditioning (HVAC) contractors and remodeling contractors in partnership with local planning and permitting agencies;2) Expand collection opportunities for mercury containing wastes including thermostats, button batteries and fluorescent lamps by increasing services at HHW collection events, retail stores, and community sites; and 3) Conducting three Earth Day Thermometer Exchanges through a residential campaign entitled "Catch the Fever". In FY 03-04, the CoHHW Program was notified that their submittal was awarded grant funding for $300,000. The grant was approved by the CIWMB at their September 16, 2003 meeting.

The grant will be implemented over a period of three years. CoHHW Program staff has requested assistance from the Program in implementing the outreach requirements of the grant, specifically the store partnership program for collecting spent fluorescent lamps. The Program will assist in identifying appropriate businesses and associations for realizing potential store-partnership outreach relations and help develop shelf talkers, flyers or other outreach material. The Mercury Pollution Prevention Outreach Work Group will remain active, as necessary, to assist the CoHHW Program.

NEXT STEPS FOR MERCURY PLAN IN FY 04-05

Since the establishment of the Mercury Pollution Prevention Plan, Mercury P2 Plan AHTG and Mercury Pollution Prevention Outreach Work Group, it is anticipated that FY 04-05 will see continued Mercury Pollution Prevention Plan implementation activities. A summarized list of Mercury Plan tasks that will be implemented during FY 04-05 include:

Guidelines for Reduction and Management of Mercury-Containing Products: Co-permittees will continue implementing the Program's guidelines for reduction and management of mercury-containing products identified for virtual elimination. An evaluation regarding the effectiveness of implementation will also occur.

Mercury Virtual Elimination Policy: Co-permittees will begin their first full fiscal year of implementing their newly adopted (FY 03-04) mercury virtual elimination policy or ordinance.

Mercury Pollution Prevention Outreach: As municipal budgets/resources permit, outreach on the negative health and environmental impacts of mercury and the methods available for properly disposing of FLTs to residents and small businesses, which were established during the two-year, two-phase FLT recycling campaign completed during FY 02-03 and FY 03-04; will continue. For example, the three Co-permittees with industrial wastewater inspection programs (San Jose, Sunnyvale and Palo Alto) will continue to integrate, into their existing routine pretreatment, source control, and/or hazardous materials inspection processes, mercury outreach for industrial businesses. The mercury outreach articles designed for the worldwide web and local agency newsletters will continue to be made accessible to the public and updated appropriately. In addition, as resources allow, the Program will assist the CoHHW Program with the outreach requirements of their mercury grant.

Coordination efforts with regional organizations (Clean Estuary Partnership TMDL): In addition to attending CEP meetings, Guadalupe Watershed Mercury TMDL Workgroup and Stakeholder meetings, Program Staff will continue to attend Regional Monitoring Program (RMP) Steering Committee and Technical Review Committee meetings.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

I. Municipal Use of Mercury-Containing Products **Goal I.** Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated. **Actions –**		SCVURPPP	Municipality	Completion Date
I.A.	Develop a process to survey the types of mercury-containing products used by municipal departments. Identify appropriate municipal personnel to conduct survey. For those products with a potential to enter stormwater runoff, identify possible alternatives or proper disposal procedures.	X	A	**Completed**- the Management Committee approved the survey on October 17, 2002. Surveys were distributed to Co-permittees on November 5, 2002. The surveys were completed and returned to the Program by February 2003.
I.B.	Complete and report results of survey of mercury-containing products used by municipal departments.	A	X	**Completed** - All surveys were submitted by February 2003 (original deadline December 2002); and survey results were included in the FY 02-03 Annual Report.
I.C.	Develop guidelines for a mercury policy or ordinance requiring the virtual elimination of mercury from controllable sources in urban runoff from agency operations. (The word "virtual" acknowledges that total elimination of mercury-containing products may be impossible due to technological or economic factors.)	X	N	**Completed** - A final draft of the model policy was submitted to the Management Committee in March 2003. The Management Committee approved the model policy in April 2003. The model policy was included in the FY 02-03 Annual Report.
I.D.	Adopt a mercury policy or ordinance requiring the virtual elimination of mercury from controllable sources in urban runoff from agency operations.	N	X	**In Progress -** FY 03-04.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

I. Municipal Use of Mercury-Containing Products **Goal I.** Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated. **Actions –**	SCVURPPP	Municipality	Completion Date
I.E. Develop guidelines for mercury-containing products reduction and management. These guidelines will include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	X	A	**Completed** - A final draft of the guidelines was submitted to the Management Committee in March 2003. The Management Committee approved the Guidelines in April 2003. The guidelines were included in the FY 02-03 Annual Report.
I.F. Implement guidelines developed under Action I.E.	N	X	**In Progress -** FY 03-04.
Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines (to be developed under Action I.E).	A	X	Annually (beginning in FY 02-03 Annual Report)

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
II.A. Assist HHW collection agencies with preparation of a technical memorandum summarizing infrastructure and budgetary concerns regarding the anticipated increase in fluorescent bulbs and other mercury-containing products to be recycled.	X	N	**Completed**--The technical memorandum was completed by HHW in June 2002 and distributed (as an informational item) at the July 18, 2002 Management Committee meeting. The memorandum describes the existing capabilities of the Santa Clara County HHW Program and discusses the potential financial impacts on the HHW Program due to SCVURPPPP outreach efforts. The memorandum was included in the FY 01-02 Annual Report.
II.B. Provide mercury-containing products disposal services for residents and small businesses.	X	X	Ongoing

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
II.C. Develop guidelines for documenting and reporting quantities of mercury-containing products disposed of by city.[1]	X	A	**Completed -** A final draft of the guidelines was submitted to the Management Committee in March 2003. The Management Committee approved the Guidelines in April 2003. A copy of the Guidelines was included in the FY 02-03 Annual Report.
II.D. Implement guidelines developed under Action II.C.	X	X	**In Progress –** During FY03-04, Co-permittees will begin annually reporting the types of high priority mercury-containing products their agency is focusing on; how they will be addressed; and progress towards meeting the identified management option goals. Co-permittees will use the reporting format provided in Table 2 of the Guidelines document. Completed – In FY 02-03 Annual Report, the PI/P section reported the survey of residents bringing mercury-containing products to CoHHW facility.
II.E. Assist HHW collection agencies in developing a Prop 13 Program grant proposal for a HHW fluorescent light recycling program (Action II.F).			**Completed** -- CoHHW submitted a Mercury Reduction Grant to CIWMB on April 5, 2002. The Program submitted a concept proposal to the SWRCB on February 1, 2002. Both submittals were not selected to receive grant funding.
• Submit concept proposal	X	N	**Completed**-February 2002
• Submit full proposal	X	N	**Not applicable-** Proposal not advanced in Prop 13 grant

[1] Guidelines for documenting and reporting quantities of mercury-containing products disposed of by city will developed, taking into consideration whether it is possible to separate mercury from other waste streams and whether it is possible to track mercury-containing product disposal by municipality.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
			process
• Decision deadline			**Not applicable-** Proposal not advanced in Prop 13 grant process
II.F. Work with HHW collection agencies to develop and help publicize fluorescent light recycling program.[2]	X	X	**Completed/Ongoing –** Began effort in FY 02-03. The Mercury Pollution Prevention Outreach Workgroup collaborated with the Santa Clara County HHW Program on a two-year, two-phase fluorescent light tube (FLT) recycling campaign. The first phase of the campaign, which was developed in FY 02-03, targeted residents. The second phase, which began in FY 03-04, targets small businesses. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs.
Monitoring Mechanism II.A. Evaluate whether household hazardous waste collection programs adequately serve residents and businesses.	X	N	FY03-04 (periodic review)
Monitoring Mechanism II.B. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis (see Action II.C). [1]	X	N	Annually (beginning in FY 03-04 Annual Report)

[2] Action II.F may be conducted in conjunction with Public Education and Outreach Actions (see Section V of this Work Plan). Completion date for Action II.F is contingent upon award of a Prop 13 Program grant.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment. **Actions –**	SCVURPPP	Municipality	Completion Date
III.A. Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee.	X	A	Ongoing
• Supported completion of the San Francisco Bay Atmospheric Deposition Pilot Study Part 1: Mercury	X	A	**Completed**- submitted August 2001
• The City of San Jose will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San Jose.	N	O[3]	Ongoing (through 2004).
III.B. Provide financial and staff support for a coordinated regional plan to collect data for the mercury TMDL, as defined in the RWQCB/BACWA/BASMAA MOU. (Now called the Clean Estuary Program, or CEP)	X	A	Ongoing (Program participation in the CEP)
III.C. Continue financial and staff support for the Joint Stormwater Agency Project to Study Urban Sources of Mercury to assess sediment mercury concentrations and percentage of fine material.	X	A	**Completed**
• Completed the Work Plan Joint Stormwater Agency Project – Year Two Investigation of Urban Sources of Mercury, PCBs and Organochlorine Pesticides	X	A	**Completed** - Report submitted June 1, 2001.
• Preparing the Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides - Year Two Report.	X	A	**Completed**- Report submitted on April 15, 2002.
III.D. Develop and implement a five-year program of monitoring efforts.	X	N	**Completed**- Draft completed March 2002; implementation began July 2002.
Monitoring Mechanism III. Submit monitoring data and reports to the Regional Water Quality Control Board and other interested parties (such as USEPA). Review monitoring data and reports and develop follow-up recommendations.	X	N	Ongoing, when available.

[3] Participation in this action by municipalities is limited to the City of San Jose.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**		SCVURPPP	Municipality	Completion Date
IV.A.	Participate in the activities of the Bay Area Stormwater Management Agencies Association, the California Storm Water Quality Task Force, and the San Francisco Estuary Institute and communicate Program efforts.	X	N	Ongoing
IV.B.	Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup.	X	O[4]	Ongoing
IV.C.	Support and participate in development of the WMI Watershed Action Plan.	X	O[5]	**Completed –** The final Watershed Action Plan, Volume III of the Watershed Management Plan, was approved in August 2003 by the Santa Clara Basin Watershed Management Initiative (SCBWMI) Core Group. Volume III intends to prioritize alternative actions in watershed planning and suggest programmatic changes in regards to policies and regulations. Co-permittees funded the consultants' time and Program staff provided review and comments to the consultant by way of the appropriate WMI channels between the subgroups and the SCBWMI Core Group.
IV.D.	Submit the SCVURPPP draft Mercury Pollution Prevention Plan to the WMI to ensure that efforts are coordinated.	X	N	**Completed** -- Plan was submitted to WMI Guadalupe Mercury TMDL Work Group in July 2002 (original deadline was March 2002).
IV.E.	Support, participate in, and advocate increased regional collaboration with the RWQCB and the Bay Area Air Quality Management District (BAAQMD).	X	N	Ongoing

[4] The City of San Jose and the Santa Clara Valley Water District are participating in the development of the Guadalupe River Mercury TMDL.
[5] The Cities of San Jose, Sunnyvale, and Palo Alto, SCVWD, and SCVURPPP (on behalf of the other co-permittees) are signatories to the WMI and participate in the Core Group and subgroups.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
IV.F. Support and track the progress of the U.S. Department of Energy (DOE) Office of Building Technology's Vision 2020 Lighting Technology Roadmap.[6]	X	N	Ongoing-- As of July 2002, the DOE's Office of Energy Efficiency and Renewable Energy and the former Office of Building Technology, State and Community Programs have been reorganized into the Building Technologies Program and the Weatherization and Intergovernmental Program. DOE's Building Technologies Program continues to move forward on their Vision 2020 Roadmap. Progress includes seven strategies to address the challenges of transforming the lighting marketplace and developing new technologies that enhance lighting quality, efficiency and cost effectiveness. (See Section 7 text of the FY 02-03 Annual Report for more detail).
Monitoring Mechanism IV. Document participation of Program staff in collaborative efforts and progress of these efforts.	X	N	Annually (beginning in FY 02-03 Annual Report)

[6] DOE's Vision 2020 Lighting Technology Roadmap includes the following as one of its goals for the year 2020, "Highly efficient, reduced-mercury fluorescent sources will come to market." Sustainable Conservation's September 27, 2000 report entitled "Reducing Mercury Releases From Fluorescent Lamps: Analysis of Voluntary Approaches," concluded that " we do not believe that starting a new collaborative approach with manufacturers to create mercury-free fluorescent lamps is the most effective use of resources at this time." Instead, Sustainable Conservation recommends focusing on voluntary recycling of mercury-containing lamps.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
V.A. Develop various outreach programs to educate target audiences about proper disposal of mercury-containing products and alternative non-mercury containing products. Outreach programs will include, but may not be limited to, the following:	X	A	**Completed/Ongoing**[7] **–** In FY 02-03, the Mercury Pollution Prevention Outreach Work Group developed and began implementation of a two-year, two-phase outreach effort focused on recycling fluorescent light tubes (FLTs) with target audiences including residential communities and small businesses. (See also Action II.F.)
• Develop and begin to implement a fluorescent light recycling outreach program to educate residential users and encourage proper disposal of fluorescent lights.	X	A	**Completed/Ongoing**[7] **–** In FY 02-03, the Work Group formed and developed a Work Plan. Phase I of the two-year, two-phase Work Plan, focused on residential outreach. Phase I outreach began in Spring 2003 and will continue as appropriate. (See Section 6 text for more detail.)
• Develop and begin to implement a fluorescent light recycling outreach program to educate small businesses and conditionally exempt small quantity generators and encourage proper disposal of fluorescent lights. (For example, the small business outreach program might include coordination with local chapters of the Building Owners and Managers Association [BOMA] or the National Association of Industrial and Office Properties [NAIOP].)	X	A	**Completed/Ongoing**[7] **–** In FY 03-04, the Work Group began implementing Phase II of the two-year, two-phase Work Plan. Phase II outreach efforts are focused on small businesses and CESQGs and this outreach will continue as appropriate. Inclusion of the Program's outreach article in agency newsletters, including the San Jose/Silicon Valley Chamber of Commerce, BOMA, and the International Facility Management Association (IFMA) is anticipated for FY 03-04, with continued annual coordination as appropriate. (See Section

[7] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			6 text for more detail.)
• Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	A	X	**In Progress** -- Co-permittees will begin coordination efforts with municipal inspectors in FY 03-04.
• Develop and distribute "tailgate safety meeting cards" about mercury to inspectors and other municipal employees. (The Program will first review the product developed by the Fairfield-Suisun Sewer District when it is made available to the Bay Area Pollution Prevention Group [BAPPG].)	X	X	**Completed –** "Tailgate safety meeting cards" were developed by the Fairfield-Suisun Sewer District and reviewed by the Bay Area Pollution Prevention Group (BAPPG) and Program prior to distribution (as an informational item) to the Management Committee on April 23, 2003.
V.B. Develop or adapt existing mercury outreach materials, as needed, for outreach programs.	X	A	**Completed/Ongoing**[7] **–** Development of materials began in FY 02-03, as part of outreach Work Plan for Action V.A. To date, four outreach pieces have been developed by the Outreach Work Group – two articles intended for the worldwide web and two public announcement pieces (one video and one text) intended for broadcast on local city cable channels and publication in local newsletters. All outreach pieces aim to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs. (See also Action II.F.)
V.C. Attend community events and distribute outreach materials.	X	X	**Completed/Ongoing**[7] **–** Distribution of outreach

[7] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

[7] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			materials began in FY 02-03 as part of outreach Work Plan for Action V.A. Tickets to the San Jose Saber Cats game on May 5, 2003 were offered as an incentive to residents bringing mercury-containing wastes to CoHHW disposal events. (See Section 6 text for more details.)
Monitoring Mechanism V.A. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis. (See Monitoring Mechanism II.B.)	X	N	Annually (beginning FY 02-03)
Monitoring Mechanism V.B. In the Annual Report, document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	X	X	Annually (beginning FY 02-03)
Monitoring Mechanism V.C. Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages (coordinate survey with Watershed Watch Campaign Survey).	X	A	FY 03-04

Legend:

"X" = will implement at this level (SCVURPPP or municipality)
"N" = not being implemented at this level
"A" = assist with or develop guidance for implementation
"R" = coordinate with regional effort
"O" = optional
"FY" = fiscal year
"TBD" = to be decided

SECTION 7

NEW AND REDEVELOPMENT WORK PLAN

7. FY 04-05 NEW AND REDEVELOPMENT (C.3.) WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 04-05 to continue to assist Co-permittees to control the impacts of development on stormwater quality and flow through the development project planning, review and approval process.

BACKGROUND

On October 17, 2001, the Regional Board adopted Order 01-119 which amended the Program's Permit Provision C.3. (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharges from new or redevelopment sites that may increase erosion in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

Provision C.3. also required the Program and Co-permittees to submit specific work plans for: 1) modifications to the development project review process (C.3.b.); 2) implementation of Group 1 requirements (C.3.c.); and 3) site design standards review and revision (C.3.j.). In response, the Program and Co-permittees submitted work plans for implementing all C.3. requirements to the Regional Board on March 1, 2002 (as part of the Program's *FY 02-03 Work Plan*, Volume II.

To guide this effort, Program staff prepared a separate document entitled "Guidance for Work Plan Tasks Related to Implementation of Permit Provision C.3. (New and Redevelopment Requirements)" (referred to herein as C3 Work Plan Guidance) which identifies proposed actions to meet the requirements of Provision C.3. and whether the actions will be implemented at the Program level, Co-permittee level or both. The Program tasks for FY 04-05 listed in the C3 Work Plan Guidance are the basis of this work plan section.

Since the October 17, 2001 adoption by the Regional Board of Order 01-119, there have been several changes to the requirements of Provision C.3. The first change, authorized by the Regional Board Executive Officer, was an extension of three of the permit deadlines, as shown below, in order to be consistent with other Bay Area stormwater permits adopted

subsequent to SCVURPPP Order 01-119[1]. This decision extends the completion dates for corresponding tasks in the C3 Work Plan Guidance.

Provision	Activity	Original Deadline	New Deadline
C.3.c.i.	Require stormwater treatment BMPs at Group 1 Projects	July 15, 2003	October 15, 2003
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects in addition to Group 1 Projects	October 15, 2004	April 15, 2005
C.3.f.	Submit HMP for Regional Board approval	October 15, 2003	January 15, 2004

The second change relates to the definition of Group 2 projects. The Program requested Regional Board approval of an Alternative Group 2 Project Definition, as allowed under Provision C.3.c.iii. of the Program's permit (Order No. 01-119). In a letter dated September 22, 2003 (Attachment 7-1), the Program proposed an Alternative Group 2 Project Definition that would make its Provision C.3. project size requirements consistent with the other Bay Area stormwater permit requirements. At the Regional Board's October 15, 2003, meeting, the Board authorized the Executive Officer to approve the Program's proposal. Approval of the proposal did not change the implementation dates for Provision C.3. (beyond the changes described in the table above).

PAST AND CURRENT ACTIVITIES TO IMPLEMENT C.3.

Section 8 of the Program's *FY 02-03 Annual Report* described the progress of the Program (up to September 15, 2003) in completing Program tasks in the C.3 Work Plan and assisting Co-permitees to prepare for implementation of the C.3. requirements. Additional tasks accomplished between September 2003 and February 2004 include the following:

- Program staff completed final revisions to the Program's model Planning Procedures Performance Standards to incorporate the C.3. requirements and the model source control measures list (see Section 2).
- The Program conducted a series of four Site Design Dialogues, in cooperation with the SCBWMI Land Use Subgroup, to obtain a better understanding of the underlying issues beneath potential conflicts to implementing better site designs from a water quality perspective. This series culminated in a workshop on January 29, 2004 which presented successful application of site design techniques in projects that had overcome a number of design hurdles.
- Program staff are creating a Manual of Better Site Design Examples to help encourage the use of better site design measures in local projects. This guidebook will include information on local projects or areas where innovative design measures

[1] Letter to Beau Goldie, SCVURPPP Management Committee Chair, from Loretta Barsamian, Executive Officer, San Francisco Bay Regional Water Quality Control Board, re: Extension of Specified Deadlines in Order 01-119, May 12, 2003.

have been applied, including photographs, maps, design drawings, and other documents that provide Co-permittees with examples of site design implementation.

- Program staff and its consultant team completed a number of draft technical memoranda related to the technical and implementation aspects of the Hydromodification Management Plan (HMP), and continued to work with two HMP subgroups to finalize the documents. Assessment of the second set of test watersheds, Ross and San Tomas Creeks, is nearly completed and will be incorporated into the HMP technical analyses and final report.

On January 15, 2004, the Program submitted to the Regional Board an update on the HMP, a description of the future work to be undertaken, and a proposed schedule for completing the identified tasks (see Attachment 7-2). Most of the future tasks described in the letter, including completion of the technical analyses and implementation guidance, identification of priority areas and potential pilot projects, and preparation of the draft comprehensive HMP report, are scheduled to be completed in FY 03-04. Efforts to be undertaken in FY 04-05 include:

- Conduct meetings with Co-permittee staff and Regional Board staff to discuss and receive comments on the draft Comprehensive HMP Report;
- Complete the final Comprehensive HMP Report;
- Conduct an HMP Implementation Workshop for Co-permittees and the development community;
- Provide additional guidance to Co-permittees on implementation of pilot projects and interim flow control measures on applicable projects; and
- Provide input and assistance as needed to District studies of potential regional or in-stream flow control projects.

FY 04-05 C.3. TASKS

Table 7-1 presents the list of tasks from the C.3. Work Plan that will be implemented in FY 04-05. Program staff will also provide general support to Co-permittees as questions arise during implementation. There are no additional continuous improvement items for the Program related to C.3. implementation that were identified during FY 03-04:

ATTACHMENTS

Attachment 7-1 Letter to Loretta Barsamian, Executive Officer, San Francisco Bay Regional Water Quality Control Board, from Beau Goldie, Chair, SCVURPPP Management Committee, re: Revised Request for Regional Board Approval of an Alternative “Group 2 Project” Definition, September 22, 2003.

Attachment 7-2 Letter to Bruce Wolfe, Executive Officer, San Francisco Bay Regional Water Quality Control Board, from David Chesterman and Randolph Shipes, Chair and Vice Chair of the SCVURPPP Management Committee, re: Hydromodification Management Plan, January 15, 2004

Table 7-1
Schedule and Deliverables for FY 04-05 New and Redevelopment (C.3) Tasks

Task	Schedule	Deliverables
C.3.c. Requirements for Group 1 and Group 2 Projects		
c.9. Update guidance manual and performance standards for Group 2 projects as needed.	4/05	• Updated sections of Guidance Manual
C.3.e. Operation and Maintenance of Treatment BMPs		
e.1. Assist Co-permittees to report on treatment BMP O&M verification program in each annual report, including organizational structure, evaluation of effectiveness, and planned improvement to the program.	FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
C.3.f. Hydromodification Management Plan		
f.1. Complete the final HMP and submit to the Regional Board	Draft 6/03 Final 10/04	• Final Comprehensive HMP Report (schedule pending review by RWQCB of Program's 1-15-04 HMPSubmitlal.)
f.2. Develop guidance to the Co-permittees on implementation of the HMP as part of requirements for Group 1 projects that may cause increased erosion or other related impacts.	Draft 6/03 Final 10/04	• Part of Final Comprehensive HMP Report (see note above.)
f.3. Upon adoption by the Regional Board, begin implementation of HMP requirements for Group 1 projects that may cause increased erosion or other related impacts. Before adoption, encourage early implementation of likely elements of the HMP where possible.	TBD pending adoption by RWQCB Early implementation ongoing from FY 03-04	• Program to assist Co-permittees with questions about implementation • Conduct HMP Workshop, Fall 2004
f.4. Provide assistance and input as needed to District study to evaluate potential regional treatment and/or flow control projects.	As needed	• Assistance and review of District work products

Table 7-1, continued
Schedule and Deliverables for FY 03-04 New and Redevelopment (C.3) Tasks

Task	Schedule	Deliverables
C.3.g. Waiver and Compensatory Mitigation Program		
g.3. Assist Co-permittees to track and report information on waivers granted, including project name, location, type, percent impervious surface, reasons for and terms of waiver, and the alternative benefit project and completion date.	FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
C.3.j. Site Design Measures Guidance and Standards Development		
j.2. Assist Co-permittees to prepare and submit reports summarizing the status of review, revision, and implementation of local site design guidance and standards, as part of their annual reports.	Submit by 9/15/04 (FY 03-04 AR)	• Guidance on Site Design Submittal
C.3.n. Reporting Requirements		
n.1. Provide information described in Table 1 of Provision C.3. in annual reports	FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
n.2. Assist Co-permittees to collect information and report a summary of types of pesticide reduction measures required for development projects, and the percentage of projects for which pesticide reduction measures were required.	FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation

Attachment 7-1

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

September 22, 2003

Loretta Barsamian
Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: **Santa Clara Valley Urban Runoff Program NPDES Permit No. CAS029718**
Revised Request for Regional Board Approval of an Alternative "Group 2 Project" Definition

Dear Ms. Barsamian:

I am writing on behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program ("SCVURPPP" or "Program") to request that the Regional Board approve, as soon as possible, an alternative Group 2 Project definition pursuant to Provision C.3.c.iii of NPDES Permit No. CAS029718 ("Santa Clara Basin permit")[1].

As you know, the description of projects subject to Provision C.3 of the Santa Clara Basin permit differs from the description of covered projects in the C.3 provisions of the recently reissued/modified Alameda, Contra Costa, and San Mateo permits. In addition, the other permits allow individual dischargers, as well as the countywide program, to propose their own alternative Group 2 definitions. Accordingly, as suggested in your letters to me of April 2, 2003, and to Robert Falk of June 30, 2003, we are requesting Regional Board approval of an alternative Group 2 Project definition to conform the Santa Clara Basin permit to the other counties' permits in these important respects. The proposed alternative Group 2 Project definition described in this letter includes multiple "tiers" and therefore also subsumes the existing Group 1 definition such that, consistent with the modified compliance deadlines set forth in your letter to me of May 12, 2003, implementation of the first tier of Provision C.3.d (i.e. application of numeric sizing criteria to a subset of projects which reflects a conformed version of the

[1] The SCVURPPP is composed of 13 cities and towns in the Santa Clara Valley, the County of Santa Clara, and the Santa Clara Valley Water District; each SCVURPPP member is an independent co-permittee under the Santa Clara Basin permit. The submission of this request does not represent a waiver or release of any claims or rights that the cities of Milpitas and San Jose may have as a result of their legal challenge to the C.3 Provision.

former Group 1 project definition) will begin on October 15 of this year. Implementation of Provision C.3.d. with respect to the second tier of projects (i.e., those to be subject to a potential 10,000 square foot of impervious surface size threshold) will begin on April 15, 2005. Under this proposal, each of the dischargers would be entitled to propose additional changes to the Group 2 project definition, as allowed in the other counties' permits.

The details of this request are as follows:

Tier 1

Tier 1 of the alternative Group 2 Project definition will supersede the existing Group 1 definition. Implementation of Tier 1 will begin on October 15, 2003. During this phase, covered projects will include public and private projects in the following categories:

1. *Commercial, industrial, or residential developments that create one acre (43,560 square feet) or more of impervious surface, including roof area, streets and sidewalks.* This category includes development of any type on public or private land, which falls under the planning and building authority of the Dischargers, where one acre or more of new impervious surface, collectively over the entire project site, will be created. Construction of one single-family home, which is not part of a larger common plan of development, with the incorporation of appropriate pollutant source control and design measures, and using landscaping to appropriately treat runoff from roof and house-associated impervious surfaces (e.g., runoff from roofs, patios, driveways, sidewalks, and similar surfaces), would be in substantial compliance with Provision C.3.
2. *Streets, roads, highways, and freeways that are under the Dischargers' jurisdiction and that create one acre (43,560 square feet) or more of new impervious surface.* This category includes any newly constructed paved surface used primarily for the transportation of automobiles, trucks, motorcycles, and other motorized vehicles. Excluded from this category are sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features.
3. *Significant Redevelopment projects.* This category is defined as a project on a previously developed site that results in addition or replacement, which combined total 43,560 square feet or more of impervious surface on such an already developed site ("Significant Redevelopment"). Where a Significant Redevelopment project results in an increase of, or replacement of, more than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, the entire project must be included in the treatment measure design. Conversely, where a Significant Redevelopment project results in an increase of, or replacement of, less than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, only that affected portion must be included in treatment measure design. Excluded from this category are interior remodels and routine maintenance or repair. Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed.

Tier 2.

The Tier 2 Project definition is in all ways the same as the Tier 1 Project definition, except that the size threshold of impervious area for new and Significant Redevelopment projects is reduced from one acre (43,560 square feet) of impervious surface to 10,000 square feet. However, projects consisting of one single family home not part of a larger common plan of development are excluded from the Tier 2 definition, and therefore excluded from the requirement to implement appropriate stormwater treatment measures. Dischargers shall begin implementation of Provision C.3.d with respect to Tier 2 projects on April 15, 2005.

As part of this proposal, we are also asking the Regional Board to expressly recognize the right of the Program or any Co-permittee to propose for approval by the Regional Board, further revision of the alternative Group 2 Project definitions, with the goal that any such alternative definition would aim to ensure that the maximum created impervious surface area is treated for the minimum number of projects subject to Co-permittee review. Any such proposal will contain supporting information about the Co-permittees' development patterns, and sizes and numbers of proposed projects for several years, that demonstrates that the proposed definition would be substantially as effective as the definition stated above. Proposals may include differentiating projects subject to the alternative Group 2 Project definition by land use, by focusing solely on the techniques recommended by "Start at the Source"[2] (i.e., site design measures) for documented low pollutant loading land uses, and/or by optimum use of landscape areas required by Co-permittees under existing codes as treatment measures. Proposals may be submitted anytime, with the understanding that the alternative Group 2 Project definition, as described in this request, will be upheld as the default in the absence of an approved further revised alternative Group 2 Project definition.

* * * * *

Because of the severe strain on Program member resources in the current fiscal environment, the Program is requesting action as soon as possible, preferably in advance of the October 15 date that your May 12, 2003, letter identifies for commencing Group 1 implementation. Therefore, we would appreciate it if you or your staff could contact us to discuss how to bring this request before the Regional Board for approval at the earliest possible time (i.e., possibly as a consent item on the Board's agenda).

Thank you for your consideration, and please contact me with your questions and concerns.

Sincerely yours,

/s/ *Beau Goldie*

Beau Goldie
Chair
Management Committee
SCVURPPP

[2] Bay Area Stormwater Management Agencies Association, "Start at the Source: Design Guidance Manual for Stormwater Quality Protection", 1999.

cc: Larry Kolb
Bruce Wolfe
Dorothy Dickie
Janet O'Hara
Adam Olivieri
Robert Falk
SCVURPPP Management Committee
SCVURPPP Permit Ad Hoc Steering Group

Attachment 7-2

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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San Jose · Santa Clara · Saratoga · Sunnyvale · Santa Clara County · Santa Clara Valley Water District

(Hand Delivered)
January 15, 2004

Mr. Bruce Wolfe
Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
San Francisco, CA 94612

Subject: Hydromodification Management Plan

Dear Mr. Wolfe:

The purpose of this letter is to provide an update on the Hydromodification Management Plan (HMP), to be prepared by the SCVURPPP pursuant to our Permit Provision C.3.f, and to confirm the results of our meeting of January 7, 2004.

Progress to Date

The progress made to date includes:

1. Submittal of the HMP Work Plan (March 1, 2002) and response to Regional Board staff comments on the Work Plan (September 13, 2002) (C.3.f.viii.1.).

2. Submittal of the HMP Literature Review (September 15, 2002) (C.3.f.iv.1. and viii.2.).

3. Submittal of draft HMP (which included, as Appendix A, a memorandum on our technical approach to the HMP assessment) (March 1, 2003) (C.3.f.iv.2.).

4. Presentations made to the BASMAA New Development Subcommittee and Regional Board staff about the technical approach. (Additionally, several presentations have been made to the Program's Management Committee.)

5. Submittal of the Hydromodification Management Plan, Draft Interim Report, Assessment of the Lower Silver-Thompson Creek Subwatershed (July 30, 2003) (C.3.f.iv.2. and vi.1. and 2.) .

6. Completion of the field assessments of Ross and San Tomas Creeks, and hydrologic and hydraulic modeling of Ross Creek (C.3.f.vi.1. and 2.).

7. Development of various draft methodologies for identifying highly developed watersheds and infill projects, and formation of a subgroup to develop draft guidelines for Co-Permittees to use in identifying these areas and projects (C.3.f.ii. and iv.4.).

8. Identification of a potential range of rainfall event design standards for HMP on site stormwater management measures (C.3.f.iv.3.).

9. Development of working draft technical recommendations for design of on-site stormwater management measures, including preparation of a draft memorandum summarizing these recommendations, and formation of a subgroup to develop draft guidelines for Co-permittees to use in implementing these recommendations (C.3.f.iv.5. and vi.3, and 4.).

Challenges Associated with the HMP

The process of evaluating the impact of new development on erosion potential in creeks, and determining the development related limitations, if any, that are needed for protecting the creeks, is extremely complicated and technically challenging. We used an approach on our test watersheds that was well-documented in the literature review and recommended by an expert review panel convened by SCVURPPP. We believed that the approach selected would produce a scientifically sound basis for setting flow control standards. However, in further reviewing it and considering approaches for implementation, we are finding questions and potential challenges to the more general use of this approach including, among other things: applying it to developed watersheds; determining how much data is needed to confirm the validity of the approach; and providing the necessary explanation, education and background information to ensure that the development community and local officials can understand and implement the HMP recommendations. These challenges were unanticipated and have involved (and continue to involve) a significant amount of comment and response time with the HMP Work Group and other Co-permittee staff. While this vetting process has taken longer than expected, we believe that it is critical for designing a sound and consensus-based HMP and for the related successful implementation of the HMP's requirements by the Co-permittees.

Future HMP Work

The future work that we plan to undertake is as follows:

1. Complete the assessment of the Ross and San Tomas Creek Watersheds;
2. Additional analyses to further develop and prioritize application and evaluation of proposed hydromodification management control recommendations;
3. Development of technical support for implementing the recommendations at the municipal and project-levels respectively;
4. Assembly of the technical work and guidance into a stand alone, comprehensive report ("Report"); and
5. Coordination of Co-permittee and Regional Board review processes.

As we discussed, we believe that we have met the overall intent of the Permit and have developed working products meeting all of the required mandatory elements of the HMP. However, additional work on the HMP would assist Co-permittees in its implementation. We anticipate addressing this additional work according to the following schedule:

- Present Ross and San Tomas Creeks Assessment Report to HMP Work Group – late February 2004
- Submit final draft Ross and San Tomas Creeks Assessment Report to Regional Board staff – mid-April 2004
- Refinement of technical studies (March 2004):
  - Range of rainfall event design standards for on site stormwater management measures
  - Technical recommendations for hydromodification control measures
  - Identification of priority areas for application of the HMP (see attached outline)
  - Plan for HMP application to a pilot project (see attached outline)
- Refinement of implementation guidance (April 2004):
  - Interim guidelines for flow control in priority development areas
  - Guidelines for identifying highly developed watersheds and infill projects
  -
- Assemble into comprehensive standalone report and provide draft Report to Co-permittees and Regional Board staff for review (June , 2004)
- Coordinate Co-permittee and Regional Board staff review process and meetings (July – September 2004)
- Submit final Report to Regional Board (October 15, 2004)
- Refinements per Regional Board staff feedback
- Coordination with other Bay Area Stormwater programs

As you know, the Santa Clara Program is the first in the Bay Area, and possibly the State, to conduct this HMP assessment and development process. In the Bay Area, other Programs will not even be submitting *draft* HMPs until November 15, 2004. The additional work by the SCVURPP outlined above will not only benefit the Santa Clara Program, but other Bay Area stormwater programs as well. While we have once again played a leadership role in terms of development of HMPs and intend to work with the Regional Board staff to evaluate application of the control measures, to ensure a level economic development playing field, we request that final, formal approval of our HMP by the Regional Board be scheduled to occur in conjunction with its approval of the HMPs of the other Bay Area programs, as a consolidated public comment process, Board hearing, and approval action will allow implementation to occur concurrently across the entire Region, as well as help to conserve the resources of the Regional Board staff.

We appreciate the Regional Board staff's understanding of the challenges we face, its reception to our prior submittals, its continuing receptivity to reviewing and providing us with feedback on interim work products, and, particularly, its willingness to engage and work with us (through meetings and workshops and otherwise) to help ensure the successful overall development and phased implementation of our HMP. We remain committed to work diligently on refinement of our HMP pursuant to the steps outlined above, and to keeping Regional Board staff engaged in the process in order to facilitate their review and assure them of our continued progress.

We greatly appreciate your and the entire Board staff's support for our efforts and with the approach and timetable that we have outlined above. If you have additional questions or concerns, please contact either of us or Adam Olivieri at 510-832-2852.

Sincerely,

David Chesterman
Chair, Program Management Committee

Randolph Shipes
Vice Chair, Program Management Committee

Cc: SCVURPPP Management Committee
Jan O'Hara, RWQCB

ATTACHMENT 1

DETAIL OF ADDITIONAL NEXT STEPS FOR "DUAL-TRACK"

1. Complete interim deliverables
    a. Ross/San Tomas Assessment Report – 4/04
    b. Range of storms analysis -- 3/04
    c. Exempt area analysis -- 3/04
    d. Prioritization analysis (maps and memo) (see #2 below) – 3/04
    e. Plan for pilot project (see #4 below) – 3/04

2. Identify priority areas for application of the HMP
    a. Start with San Jose as an example
        i. Use vacant land inventory map and highlight large areas of undeveloped land in not highly developed watershed(s)
        ii. Collect and provide information on other planning efforts for those areas
        iii. Coordinate HMP implementation schedule with other efforts (e.g., Coyote Valley Specific Plan starting to be developed; expect to complete 12/05)
    b. Do similar analysis for other Co-permittees
    c. Develop priority list and schedule for HMP implementation

3. Identify interim actions that could be taken in priority areas
    a. Set interim HMP guidelines in priority areas for development that will occur in the near future (e.g., control increases in flow to the MEP, as much as can be done with on-site management measures)

4. Identify potential pilot project(s) that could be undertaken as HMP models
    a. Logical choice is a medium to large sized project in the Thompson/Ross/San Thomas Creek subwatershed, in which the assessment has been done
        i. Discuss candidate projects with affected Co-permittees
        ii. Find out more about what additional analyses the District has run in these watersheds that might support the pilot project
        iii. Coordinate with planned and funded District stream restoration projects downstream of pilot area(s)
    b. Develop design criteria based on Thompson/Ross/San Thomas Creek study and planned and funded downstream District restoration projects
    c. Assist agency/applicant with BMP selection, sizing, and cost analysis
    d. Investigate feasibility of continuing pilot into construction phase and post-construction monitoring

SECTION 8

FINAL BUDGET REPORT: FISCAL YEAR 2004-2005

SCVURPPP budget reviewed and approved by BATG at January 7, 2004 meeting
SCVURPPP budget reviewed and approved by MC at January 15, 2004 meeting

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Final Budget Report:

Fiscal Year 2004-2005

Final
January 15, 2004

SCVURPPP budget reviewed and approved by BATG at January 7, 2004 meeting
SCVURPPP budget reviewed and approved by MC at January 15, 2004 meeting

Final Budget Report for FY 04-05

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Santa Clara Valley
Urban Runoff
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Final FY 04-05 Budget

TOTAL PROGRAM FY 04-05 BUDGET

Budget Summary

Item	Staff Hours	Total Cost
Operational Group		
1. Program Management/Administration (EOA)	3054	$436,700
2. Permit Management (EOA)	3323	$475,200
3. Technical Program Management (EOA)	1058	$137,500
4. Legal Service (MOFO)	0	$80,000
5. Fiscal Agent (SCVWD)	0	$15,000
6. RMP Contribution (SFEI) (see Collaborative Budget)		
Sub-total: Operational Group	**7435**	**$1,144,400**
Projects Group		
7. Monitoring Projects (EOA/Subs)	1154	$690,000
8. HMP Technical Assistance/Guidance/Workshops	769	$100,000
9. PI/P & WEO budget	577	$520,000
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)		
11. NPDES Permit Renewal	969	$126,000
Sub-total: Project Group	**3469**	**$1,436,000**
Collaborative Group		
A. Program Monitoring Special Studies		$159,000
B. WE&O - Watershed Support Fund		$100,000
C. CASQA Dues (Regional Collaboration)		$15,000
D. TMDL CEP Participation (Regional Collaboration)		$97,000
E. RMP Fee (Regional Collaboartion)		$162,000
F. BASMAA Fee (Regional Collaboration)		$65,000
G. NPDES Permit Fee		$109,000
Subtotal		**$707,000**
TOTAL PROGRAM FY 03-04 BUDGET	**10904**	**$3,287,400**

TOTAL PROGRAM FY 04-05 BUDGET
Budget Summary

Item	Staff Hours	Total Cost
Operational Group		
1. Program Management/Administration (EOA)		
a. Administrative Assistance	738	$96,000
b. Management Committee and Task Group Support		
i. Management Committee	554	$72,000
ii. Task Groups	762	$99,000
c. Program Budget Administration		
i. Develop Budgets	135	$17,500
ii. Prepare Expenditure Reports[1]	246	$32,000
d. Coordinate with Legal Consultant	177	$23,000
e. Develop and Manage PI/P Program (non-watershed watch campaign tasks)	385	$50,000
f. Performance Evaluation	58	$7,500
g. Expenses		$39,700
Subtotal	**3054**	**$436,700**
2. Permit Management (EOA)		
a. Report Preparation and Submittal		
i. Annual Report	369	$48,000
ii. Work Plans	346	$45,000
b. Internal Co-permittee Liaison		
i. Develop Guidance	138	$18,000
ii. Local Program Reviews (delay until FY 04-05)	0	$0
iii. Conduct Training (4 Workshops)	369	$48,000
c. External Organization Meetings[2]	1023	$133,000
d. NDC Implementation Assistance, Tracking & Reporting	385	$50,000
e. Implement Continuous Improvement Items	308	$40,000
f. TMDL Program Tracking, Review & Reporting	385	$50,000
g. Expenses		$43,200
Subtotal	**3323**	**$475,200**

[1] Includes coordination with Fiscal Agent.

[2] Includes Program representation at selected BASMAA (Board, New Development Committee, PI/P Committee, and Monitoring Committee), California Stormwater Quality Association, Regional Monitoring Program/SFEI, WMI (Core Group, Watershed Assessment, Regulatory and Bay Monitoring/Modeling Subgroups), Urban Pesticide Committee, and Regional and State Board meetings, and meetings with environmental/public interest groups.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Final FY 04-05 Budget

TOTAL PROGRAM FY 04-05 BUDGET
Budget Summary

Item	Staff Hours	Total Cost
3. Technical Program Management (EOA)		
a. Prepare RFPs, Technical Project Management	385	$50,000
b. Technical Review of Work Products	385	$50,000
c. Develop/Revise Performance Standards	192	$25,000
d. Expenses	96	$12,500
Subtotal	**1058**	**$137,500**
4. Legal Services	0	$80,000
5. Fiscal Agent	0	$15,000
6. Fees		
a. NPDES Permit Fee (SWRCB) (Moved to Collaborative)	0	
b. Regional Monitoring Program Contribution (moved to collaborative)	0	
Subtotal	**1058**	**$95,000**
Operational Group Total		**$1,144,400**
Projects Group		
7. Monitoring Projects[1]	1154	$690,000
8. HMP Technical Assistance/Guidance/Workshops	769	$100,000
9. PI/P & WEO budget[2,3]		
a. Watershed Education and Outreach Campaign	385	$450,000
b. Pesticide User (PU) Outreach		$40,000
c. Mercury Pollution Prevention Outreach	192	$25,000
d. BASMAA Regional Collaboration (See Collaborative)		
e. Program Supplies		$5,000
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)		
11. Permit Renewal		
a. Permit Application (Co-permittee organization)	423	$55,000
b. Update Program URMP	369	$48,000
c. Coordinate Co-permittee URMP Updates	177	$23,000
Projects Group Total	**3469**	**$1,436,000**

[1] Scope is based on the Program's Multi-Year (8-year) Monitoring Plan.

[2] On February 15, 2001 the MC approved the Budget Adhoc Task Groups recommendation to incorporate certain elements of the PI/P budget into the Projects Group budget.

[3] Budget based on WE&O Ad Hoc Task Group draft memo dated December 17, 2003 regarding workplan options and budgets.

TOTAL PROGRAM FY 04-05 BUDGET
Budget Summary

Item	Staff Hours	Total Cost
Collaborative Group		
A. Program Monitoring Special Studies		$159,000
B. WE&O - Watershed Support for Citizen Participation		$100,000
C. CASQA Dues (Regional Collaboration)		$15,000
D. TMDL CEP Participation (Regional Collaboration)		$97,000
E. RMP Fee (Regional Collaboartion)		$162,000
F. BASMAA Fee (Regional Collaboration)		$65,000
G. NPDES Fee		$109,000
Subtotal: Collaborative Group		**$707,000**
TOTAL PROGRAM FY 03-04 BUDGET		**$3,287,400**

TOTAL PROGRAM FY 04-05 BUDGET
Backup Information

OPERATIONAL GROUP

A summary of tasks to be performed by EOA, based on EOA's current contract with the Santa Clara Valley Water District (on behalf of the SCVURPPP), is provided in Items (1.), (2.), and (3.) below. The resource requirements are based, in part, on the requirements contained in the RWQCB Order No. 01-024 adopted February 21, 2001 and Order No. 01-119 adopted October 17, 2001 (new and redevelopment requirements).

The budget was developed to meet the following objectives that were developed by the BATG as part of the FY03-04 budget process.

- Maintain the overall FY 04-05 budget consistent with the FY 03-04 and 02-03 budgets[1];
- Maintain the Co-permittee FY 04-05 assessments approximately equivalent to the FY 03-04 and 02-03 assessments (this objective is based on the assumption that the Collaborative Group budget is funded by all Co-permittees); and
- Include the estimated annual NPDES permit fees in the Collaborative Group budget[2]

A summary of the key budget assumptions is shown below and additional detail that defines the basis for the budget are identified in the following sections.

- Labor rate costs increased by 4% above FY 03-04 labor rates, but budgets have been held at FY 03-04 levels.
- All Regional Collaboration projects/fees are shown in the Collaborative Group (projects are listed in order of priority, i.e., lowest priority first if budget modifications need to be made).
- The RMP fee remained the same as the FY 03-4 fee, consistent with the MC direction given at the October meeting.
- Legal Assistance was increased because of the permit renewal task.
- The Projects Group WE&O campaign budget was held consistent with FY 03-04 levels and includes a new Watershed Fund resource task was included (see attached draft WE&O AHTG memo).
- Annual Interest accrued is assumed to be available for use as needed for projects approved by the BATG and MC.
- Assume no new full-scale watershed assessments are initiated until FY05-06.
- Assumes no full scale Co-permittee performance reviews until FY 05-06.
- Includes $97,000 contribution for participation in the Clean Estuary Program.

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[1] Note that the total Operational and Projects Group budget for FY 03-04 was reduced by ten percent (10%) from the FY 02-03 budget.

[2] The estimated fees in FY 03-04 were based on a doubling on the FY02-03 permit fees (i.e., $54,000 to $108,000). However, the final permit fees ended up at $161,000. The current budget includes $108,000 as a line item and the ability to use up to another $70,000 of collaborative funds for an estimated permit fee of $178,000. Thus, the operating budget of the Program has absorbed the increase in permit fees of approximately $170,000. Absorbing these fees along with the actual 10% reduction from FY 02-03 has effectively reduced the Program operating budget.

- Includes resources to assist with implementing the approved Trash Work Plan (work plan is based on implementation over two years).
- Include resources to conduct the work the approved Sediment Assessment Work Plan previously approved by the MC.
- Includes resources to assist with finalizing guidance for implementation of C3 and HMP tasks, holding workshops, coordination with Co-permittees and providing some assistance to Co-permittees with implementation.
- Includes resources for permit application and renewal. Assumes that the application includes: EPA application, Annual Report, updated URMP (Program and Co-permittees), and monitoring plan, that the application will be submitted on or before February 21, 2005, that internal permit adhoc meetings are initiated in the fall of 2004 and that stakeholder meetings are initiated coincident with submission of the application.

The Budget Ad Hoc Task Group met on January 7, 2004 to review the draft Program budget dated December 23, 2003. The BATG approved the budget for submission to the MC for final approval.

1. Program Management/Administration

a. Administrative Assistance

- General administrative assistance
- Maintain Program 800 number
- Distribute PIP and other materials
- Develop partnerships with external organizations

b. Management Committee (MC) and Ad-Hoc Task Group (AHTG) Support

- Monthly MC meetings (up to 12) - develop, distribute, and post agendas; prepare and mail meeting materials; facilitate meetings; draft and finalize minutes; and conduct follow-up activities
- AHTG meetings (up to 40) - support groups formed to address specific tasks (meeting number and times vary)

c. Program Budget Administration

- Develop, draft, and finalize FY 2005-2006 budget; organize and facilitate quarterly Budget AHTG meetings
- Coordinate with Fiscal Agent, track expenditures, and prepare quarterly status reports

d. Coordinate with Legal Consultant

- Communicate with and assist Program legal counsel as needed (up to 5 meetings and 10 extended telephone discussions) on General Program issues.

e. Develop and Manage Program PI/P Program

- Conduct long-range planning for Program PI/P activities

- Manage development of PI/P work plan for FY 2005-2006
- Provide support, as needed, to Co-permittee's requests for public education assistance
- Manage subcontracts
- Coordinate and work with the WMI Communications Subgroup and various other adhoc and work groups to address numerous new people and "pollutants of concern".[3]

f. Performance Evaluation

- No budget in FY 03-04.

g. Expenses

- Approximately 10 percent of costs

2. Permit Management

a. Report Preparation and Submittal

- Prepare annual report for FY 2003-2004 and submit to Regional Board by September 15, 2004 (includes preparation of 1 draft for MC review, reproduction/distribution of 15 copies)
- Review results of Program activities and recommend improvements
- Prepare Program Work Plan (or equivalent) for FY 2005-2006 (includes 2 drafts for MC review, response to Regional Board comments, reproduction and distribution of 15 copies)
- Provide guidance for Co-permittees' work plans
- Review all Co-permittee Work Plans and Annual Reports for completeness and consistency.

b. Internal Co-permittee Liaison

- Develop guidance on permit requirements
- Conduct focused local program review meetings for all Co-permittees, summarize meetings, make recommendations for improvements
- Conduct up to four training workshops for co-permittee staff

c. External Organization Liaison

- Represent Program at Regional Board, State Board, BASMAA, Regional Monitoring Program, Stormwater Quality Task Force, Urban Pesticide Committee, SCBWMI core and relevant subgroups, environmental group/public (up to 88 meetings)
- Obtain and transmit updates to state NOI database

d. New NDC Permit Compliance Issues (Non-HMP)

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[3] Over the next several years PI/P will be a key element of the SCVURPPP. As the WMI and Program proceed to define and implement various outreach efforts, additional time will be required to work with the Ad Hoc, work groups and subgroups. As TMDL programs move forward to address new "pollutants of concern" Program staff will need to work with the regulatory agencies and Co-permittees to address these new concerns.

- Meet with Regional Board staff, Program legal counsel, Program ad hoc task group and/or environmental groups as needed
- Prepare responses to comments and supplementary documentation as needed.
- Conduct the projects to comply with permit provision C.3. The estimated budgets are based on and consistent with the C3 Work Plan.

e. Implement Continuous Improvement Items

- Investigate, develop implementation plans, and implement items for Program continuous improvement identified in Co-permittee reviews, work plan, and annual report within the allocated resources
- Summarize for Program annual report

f. Expenses

- Approximately 10 percent of cost

3. Technical Program Management

a. Prepare RFPs, Technical Project Management

- Develop up to 4 RFPs for technical services
- Assist implement Multi-Year Monitoring Plan including selection of subcontractors
- Oversee contractors' work
- Coordinate with BATG/MC/Monitoring Ad Hoc Group/WAS and hold up to four Monitoring Ad Hoc meetings annually (quarterly basis) in association with WAS.

b. Technical Review of Work Products

- Provide technical review of contractor work products
- Make recommendations to BATG/MC/Monitoring Ad Hoc Task Group regarding quality of work and any modifications needed for improvement.

c. Develop/Revise Performance Standards

- Assist MC in development of one new performance standard, or substantially improve one or more existing performance standards at the same level of effort.

d. Expenses

- Approximately 10 percent of cost

4. Legal Services

This assumes that the Program will retain the services of Morrison and Foerster (Robert Falk, Esq.) to provide legal advice. The working assumption is that the majority of the legal budget is earmarked for assistance with implementing the C3 provisions of the new permit and other permit conditions where potential compliance issues may arise. In addition, TMDL, HMP, appeal

(pending Program specific as well as other related Baykeeper appeals) and permit renewal issues will also arise and, as appropriate, will be addressed with the available budget.

5. Fiscal Agent

The Santa Clara Valley Water District is the treasurer and contracting agent for the Program. This item represents the amount to be reimbursed to the District (or other co-permittee) for the staff time involved in carrying out this task. It is assumed that the budget for this item will be the same as previous years. All Program staff time required to coordinate with the Fiscal Agent is included under Budget Item 1.c.

6. Fees (SEE Collaborative Group)

PROJECTS GROUP

7. Monitoring Projects

The purpose of this item is to fund projects that satisfy the monitoring requirements of the Program's NPDES permit. The estimate of the resource requirements are based on implementation of the Multi-Year Monitoring Plan (MY-RWMP) submitted to the RWQCB by the MC on August 5, 2002 and is consistent with Program's implementation of the first and second year of the MY-RWMP. In addition, the budget estimate includes resources to cover the following tasks/projects: SCVURPPP data management including updating the SSI, copper & nickel baseline actions and reporting, participation in the LUS, fifth year of the PCB program, Hg program, dioxin plan development (other pesticide monitoring consistent with the permit will be conducted to the extent that budget allows), sediment assessments consistent with the MC September 1, 2002 Work Plan, resources for assisting the Co-permittees implementation a two-year Trash Work Plan and investigating and reporting on trash as a "pollutant of concern" within the urban boundary, resources for updating and developing the necessary annual sampling plans, QA plans and reporting the surface water monitoring results (as defined within the MY-RWMP), and limited resources to assist the ad hoc mercury work group.

8. HMP technical Assistance, Guidance and Workshops

The purpose of this task is to address the additional work effort to complete the HMP. The work effort involves managing subcontractors to complete the technical work, internal review and approval by the MC, preparation of Program guidance, conducting workshops and coordination with and addressing RWQCB staff comments.

9. PI/P and WEO Budget

a. Watershed Education and Outreach Campaign – see attached draft memo from WE&O AHTG dated December 17, 2003 (Option 1).

   Funds will be used for year five of an approved multi-year watershed education and outreach campaign. Budget includes:
   - Funding for educational programs at the Alviso Ed Center coordinated with the WE&O campaign;
   - Funding for schools outreach using ZunZun (or similar group) to perform a watershed –themed shows at schools in Santa Clara Valley.
   - Funding for a media campaign

- Funding for strategic planning
- Funding to support citizen participation projects (see collaborative group)
- Funding to support a grant writer (potential).

Proposed Budget breakdown:

- Campaign consultant budget - $259,300
- Alviso Ed Center - $75,700
- Schools Outreach (e.g., ZunZun) - $25,000
- Strategic Planning - $10,000
- Program staff support and subcontractor markup- $80,000.
- Watershed Support – see collaborative group.

b. Pesticide User (PU) Outreach

This project combines cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Project scope will include items in Program's Pesticide Management Plan (2-15-02), based on provision C.9.d. of the permit, for outreach to residents, commercial businesses, and pest control operators.

c. Mercury Pollution Prevention Outreach

This project encompasses several tasks in the Program's Mercury Pollution Prevention Plan (3-1-02), provision C.9.c. of the permit. It involves public education regarding the effects of mercury on the environment, products containing mercury and proper disposal of such products. The proposed project is the third year of the MC approved budget of $25,000 per year.

d. Program Supplies

Estimated budget for reprints of materials for Program use and other Program supplies.

10. Project Monitoring Special Studies (see collaborative group)

11. NPDES Permit Renewal

This task includes resources for permit application and renewal. The estimated budget assumes that the application includes: EPA application, Annual Report, updated URMP (Program and Co-permittees), and monitoring plan, that the application will be submitted on or before February 21, 2005, that internal permit adhoc meetings are initiated in the fall of 2004 and that stakeholder meetings are initiated coincident with submission of the application.

COLLABORATIVE GROUP

a. **Program Monitoring Special Studies**: The line item covers any necessary changes in scope of the projects requiring consultant services. The amount has been set at 10 percent of the total budget of the Projects Group (excluding the PI/P tasks) as per the MOA. The BATG recommended for FY 03-4 that the item be included in the Collaborative Group budget.

b. **WE&O – Watershed Support Fund**: Recommendation by WE&O adhoc task group for source of funds for grass roots approach to educate communities via stewardship grants and projects.

c. **CASQA Dues (Regional Collaboration)**: Statewide stormwater Organization dues

d. **TMDL CEP (Regional Collaboration):** These resources are used to fund the participation (i.e., technical participation annual cost) in the Clean Estuary Program (TMDL MOU between the RWQCB, BASMAA and BACWA). The resources are included as part of the Collaborative Group budget at a level of 60% ($97,000) of the total annual CEP request made to the Program. The budget is consistent with the contribution made during FY 03-04.

e. **RMP fee (Regional Collaboration):** The RMP is a program initiated by the Regional Board to monitor the water quality of San Francisco Bay. The San Francisco Estuary Institute has a contract to conduct sampling in the Bay and administer the program with oversight from the Regional Board. The Program is one of a number of dischargers contributing to the cost of the program. It is expected that the Program will continue to fund the RMP at about the same level for each fiscal year for the term of the permit.

f. **BASMAA Fee (Regional Collaboration):** BASMAA is the local regional stormwater association. It is expected that the Program will continue to fund the organization at about the same level for each fiscal year for the term of the permit.

g. **NPDES Fee:** This is the annual fee imposed by the State Water Resources Control Board for NPDES municipal storm water permits in the San Francisco Bay area. In FY 02-03 the SWRCB increased annual fee from $10,000 to $54,000 which was absorbed into the overall Program budget. During FY 03-04 the SWRCB increased the fees to $161,000, which again was absorbed into the overall Program budget. While the SWRCB has initiated meetings with stakeholders relative to the FY 04-05 fees, no estimates are currently available. Therefore the fee has been estimated. Once again the estimated increase has been absorbed into the overall budget. To absorb these fees reductions in Program tasks have occurred in monitoring, WE&O, performance evaluations and continuous improvement tasks. Absorbing any additional increases in fees beyond the estimated level included in the FY 04-05 budget will result in the further reduction of contributions to regional collaborative programs.

Attachment 1 – WE&O Draft 12/17/03 memo.

Attachment 1

MEMORANDUM

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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TO: **Budget Ad Hoc Task Group**

FROM: **Mary Morse, WE&O Chair, Vishakha Atre and Jill Bicknell, Program staff**

CC: **Watershed Education and Outreach Ad Hoc Task Group**

DATE: December 17, 2003

SUBJECT: **WE&O AHTG Recommendations for FY 04-05 Work Plan**

The Budget AHTG is meeting in January 2004 to discuss the Program's FY 04-05 Work Plan. The Program's WEO AHTG was requested to discuss, identify and prioritize tasks for the FY 04-05 WE&O Work Plan. This memo describes the tasks identified by the WEO AHTG at its December 8, 2003 meeting. The WEO AHTG also prioritized the identified tasks based on three budget scenarios for FY 04-05. The budget scenarios considered are:

1. Available funding equal to FY 03-04 Campaign funds plus collaborative funds ($550,000).
2. Available funding equal to only FY 03-04 Campaign funds, no collaborative funds ($ 455,000).
3. Available funding equal to 80% of Option 2 ($364,000).

Tasks identified at the WEO AHTG meeting

The WEO AHTG identified and prioritized the following 6 tasks for implementation in FY 04-05. The tasks are described below in order of decreasing priority:

1. Public Education and Media Campaign – The WEO AHTG recommended continuing a local outreach and media campaign as part of the Watershed Watch Campaign and also participating in the BASMAA Regional Ad Campaign (RAC). The distribution of funds between the BASMAA RAC and local Watershed Watch Campaign will be decided based on the total available budget. Similarly, Watershed Watch tasks like maintaining the website, developing community partnerships, staffing outreach events etc. will be prioritized based on the available budget.

2. Watershed Support Fund For Citizen Participation Projects – The WEO AHTG recommended developing a grass roots approach to educating communities. To achieve this, the group recommends disbursing a portion (approximately 15-20%) of the WE&O funds as non-competitive grants to fund stewardship programs conducted by local groups working on watershed issues. The WEO AHTG will discuss and develop criteria for identifying and selecting projects. Possible projects include funding Watershed Action Councils, Creek Cleanup Events, WMI projects etc.

3. Schools Outreach – For the past three years, the program has sponsored ZunZun assemblies at elementary schools in the Santa Clara Valley. ZunZun assemblies are booked using a list of schools provided by the Program's School Outreach Work Group. The WEO AHTG recommended continuing outreach to elementary school students. The outreach will be done using ZunZun or some other group.

4. Strategic Planning – An evaluation of the Watershed Watch Campaign was conducted in September 2003. The evaluation results indicated that while awareness of watersheds, pollutants and pollution prevention has increased, actual pollution prevention behavior has not increased. The evaluation recommended that the Campaign continue its current activities with an added focus on specific pollution prevention messages. The WEO AHTG recommends working with a social-marketing consultant to identify the strategy for future outreach.

5. San Francisco Bay National Wildlife Refuge at Alviso (Alviso Ed Center) – The Program has supported a full-time staff person at the Alviso Ed Center to conduct primarily weekend educational programs for children. These programs focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The City of San Jose also funds a different staff person at the Alviso Ed Center for a similar educational program (more focused on waters conservation and water recycling issues). Based on the budget available, the WEO AHTG will explore ways to optimize funds that are used for supporting these two programs at the Alviso Ed Center.
6. Funds to support a grant writer – The WEO AHTG discussed the availability of various government funds for conducting outreach projects. The group agreed that funding a grant writer to apply for these grants may help the Program obtain funds for outreach, especially if the budget is cut significantly (Option 3). A key factor in being able to receive and use grants Program-wide is to have an agency like the Water District be the grantee. SCVURPPP is not set up as a non-profit and cannot receive grants. Other Co-permittees may also choose to be the grantees, provided they are able to use the grant funds for implementing projects outside their city boundary (Program-wide).

Prioritization of Tasks

The WEO AHTG discussed prioritizing tasks based on the three budget options. The group agreed that while some tasks are higher in the priority list, all tasks are necessary for conducting successful public education and outreach. The AHTG did not recommend eliminating any task in case of budget cuts. It was recommended that all tasks be implemented under all budget scenarios. In case of a budget cut, the funds available under each task will be reduced in proportion to the budget cut (Options 2 and 3 below). The only task that will not be affected by a budget cut is the task for working with a social-marketing consultant for strategic planning.

Table 1 describes the funds available for each task under the three budget scenarios:

Attachment 1

Table 1: Funds available for each task under the three budget scenarios

Task	FY 03-04 Budget ($ 549,828)	FY 04-05 Budget Option 1 ($550,000)	FY 04-05 Budget Option 2 ($455,000)	FY 04-05 Budget Option 3 ($364,000)
Media Campaign (Watershed Watch & RAC)	$ 219,230	$259,300	$207,300	$167,000
Collaborative funds (spring media campaign)	$94,830	NA	NA	NA
Watershed Support Fund For Citizen Participation Programs	NA	$100,000	$80,000	$55,000
Schools Outreach (assemblies)	$25,000	$25,000	$20,000	$17,000
Strategic Planning	NA	$10,000	$10,000	$10,000
Alviso Ed Center	$75,700	$75,700	$65,700	$50,000
EMC (WW evaluation)	$48,250	NA	NA	NA
Grant Writer		0	0	$10,000
Program Budget*	$86,818	$80,000	$72,000	$55,000
TOTAL	**$549,828**	**$550,000**	**$455,000**	**$364,000**

* Program budget includes labor, subconsultant markup and other expenses

The WEO AHTG is meeting again in January 2004 to discuss and develop the FY 04-05 WE&O Work Plan. Tasks for developing the Work Plan include:

- making a recommendation to the Budget AHTG about continuing with TRG (Campaign consultants)
- identifying ways to optimize funds that are used for supporting the two grant programs (Program and City of San Jose) at the Alviso Ed Center
- developing a plan for continuing outreach to elementary schools

- determining how the media campaign budget will be split between the local Watershed Watch Campaign and the BASMAA RAC
- identifying criteria for disbursement of funds to local watershed support groups

The Work Plan tasks and budget will be finalized based on input from the Budget AHTG on the final budget available for WE&O tasks.

SECTION 9

CO-PERMITTEE FY 04-05 WORK PLANS

Paper Copies Available from Program

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

March 1, 2005

FY 2005-2006 Draft Work Plan

Sections 1-9

Program and Co-permittee Activities

Submitted in Compliance
with NPDES Permit Order No. 01-024 and 01-119

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Hand Delivered on February 25, 2005

February 25, 2005

Mr. Bruce H. Wolfe
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. ~~Wolfe~~ Bruce,

I am pleased to submit a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2005-2006. This Work Plan, which consists of Program and Co-permittee Activities, fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order:

- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement Program and other local PI/P activities (Provision C.4.)
- Contains the Program's FY 05-06 Annual Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 05-06 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of certain actions accomplished in FY 04-05;
- Includes the Program's FY 05-06 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 05-06 (Provision C.9.d);

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1-800-794-2482

- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 04-05 activities and actions, in order to plan FY 05-06 activities.

The Management Committee is concerned about the availability of resources to conduct all FY 05-06 tasks because of the uncertain State budget condition and repercussions on the local agency budgets. As the resource issue becomes clearer, the Management Committee may have to revisit the priorities and resources assigned to the collaborative tasks.

We look forward to working with you and your staff to implement the actions contained in the attached plans.

Very truly yours,

Adam

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: Trish Mulvey, CLEAN South Bay
David Chesterman (SCVWD), SCVURPPP Management Committee Chair
SCVURPPP Management Committee Members
Robert Falk, Morrison & Foerster

Attachments: --FY 2005-2006 Draft Work Plan (including Co-permittee Work Plans) - one (1) hard copy
--FY 2005-2006 Draft Work Plan (including Co-permittee Work Plans) -three (3) compact disks

FY 05-06 Draft Work Plan

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Certification

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Submitted on behalf of the
Santa Clara Valley Urban Runoff Pollution Prevention Program
March 1, 2005

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

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G. SAN JOSE
H. SANTA CLARA
I. SUNNYVALE
J. WEST VALLEY COMMUNITIES (CAMPBELL, LOS GATOS, MONTE SERENO, SARATOGA)
K. SANTA CLARA COUNTY
L. SANTA CLARA VALLEY WATER DISTRICT

INTRODUCTION

This document comprises a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2005-2006. This Work Plan fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order, consistent with Permit Provision C.6.b:

- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement Program and local PI/P activities (Provision C.4.)
- Contains the Program's Annual FY 05-06 Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 05-06 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of actions accomplished in FY 04-05;
- Includes the Program's FY 05-06 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 05-06 (Provision C.9.d);
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 04-05 activities and actions, in order to plan FY 05-06 activities.

The Work Plan is comprised of nine sections, as follows:

1. **Program Continuous Improvement Tasks:** Section 1 describes continuous improvement tasks and provides a schedule for their completion.

2. **Performance Standard Revisions:** Section 2 describes the Program's recent revisions to the Industrial/Commercial Discharger Control and Illicit Connection/Illegal Dumping Elimination Performance Standards and current efforts to update the Water Utility Operation and Maintenance Performance Standard.

3. **Public Involvement and Participation:** The Program's PI/P Work Plan (Section 3) includes a list and description of projects planned for FY 05-06 and the process used to

select them. A Pollutant Matrix is included which illustrates how on-going and planned PI/P efforts are directly linked to pollutants of concern.

4. **Monitoring Program:** The Program's FY 05-06 Annual Monitoring Plan is presented in Section 4. The monitoring strategy describes how monitoring projects are linked to Program goals, SCBWMI goals and permit requirements. The section identifies those on-going projects that are related to permit requirements along with a description and tentative schedule for FY 05-06 projects. The Monitoring Plan includes watershed management measures.

5. **Pesticide Management Work Plan:** Section 5 contains a status report on the Program's pesticide management tasks, consistent with the Program's Pesticide Management Plan (2/15/02), and planned tasks for FY 05-06.

6. **Mercury Pollution Prevention Work Plan:** Section 6 contains the Program's mercury pollution prevention tasks for FY 05-06, consistent with the Program's Mercury Pollution Prevention Work Plan (3/1/02). The status of Mercury Pollution Prevention Plan tasks is also provided.

7. **New and Redevelopment Work Plan:** Section 7 describes the Program's progress in assisting Co-permittees in preparing to implement the requirements for new and redevelopment control measures (Provision C.3.) and the Program tasks planned for FY 05-06, consistent with the Program's C.3. Work Plan (3/1/02).

8. **FY 05-06 Program Budget:** The Program's Final FY 05-06 Budget Report, as approved by the Program's Management Committee, is included in Section 8. The Management Committee is concerned about the availability of resources to conduct all FY05-06 tasks because of the uncertain State budget condition and repercussions on the local agency budgets. As the resource issue becomes clearer, the Management Committee may have to revisit the priorities and resources assigned to the collaborative tasks.

9. **Co-permittee Work Plan Summary Tables:** Section 9 contains the individual Co-permittee Work Plans for FY 05-06 developed consistent with the FY 00-01 Work Plan format approved by Regional Board staff.

SECTION 1

PROGRAM CONTINUOUS IMPROVEMENT TASKS

1. PROGRAM CONTINUOUS IMPROVEMENT WORK PLAN

INTRODUCTION

The 2004 URMP commits the Program and Co-permittees to a process of continuous improvement. The concept of continuous improvement acknowledges that the definition of "maximum extent practicable" evolves over time. Through continuous improvement, the Program will continue to develop and implement reasonable control measures to help advance the goal of achieving water quality objectives in South San Francisco Bay.

The continuous improvement process is described on pages 37-39 of the Program URMP. As shown in Figure 2 of the 2004 URMP, areas for continuous improvement are identified through the Program and Co-permittees' participation in the Santa Clara Basin Watershed Management Initiative (SCBWMI) and the Program and Co-permittees' annual evaluations and annual reports.

Regional Board staff and representatives of interested parties (including CLEAN South Bay) review the Program and Co-permittee annual reports and work plans, and participate in Co-permittee performance review meetings on a biennial basis. Comments from these reviews and meetings help to identify specific continuous improvement (CI) tasks.

FY 05-06 CONTINUOUS IMPROVEMENT WORK PLAN

FY 05-06 Program Continuous Improvement Items

Since Regional Board staff has not conducted performance reviews since December 2003 and has not provided comments on the FY 03-04 Annual Report, no CI tasks have been identified for FY 05-06. Program staff will focus efforts on working with Regional Board staff on the SCVURPPP permit re-issuance.

On-Going Continuous Improvement Items

There were no new continuous improvement items identified for FY 04-05. There are a few remaining continuous improvement tasks from previous years, and their status and updated schedules are provided in Table 1-1.

Table 1-1
Status of Ongoing Program Continuous Improvement (CI) Tasks

Tasks	Updated Schedule	Status[1]
Remaining FY 03-04 CI Tasks – New Development and Redevelopment		
4. Develop design guidance containing stormwater control opportunities for small road modifications.	June 2005	**Update** – The Program's permit requirements were made consistent with other Bay Area permits, which exempt road reconstruction (within the same footprint) from C.3. Program staff will discuss with the C3PO AHTG whether this is a priority for road projects that are not exempt.
Remaining FY 00-01 CI Tasks – Program Management		
3. Provide guidance to Co-permittees on requirements for temporary non-stormwater discharges to storm drains.	Pending	**Update** – Co-permittees have requested assistance from the RWQCB staff with determining under what conditions temporary non-stormwater discharges are allowed to flow to storm drains. To date, RWQCB have only provided guidance in individual letters to contractors.
6. Conduct a workshop for municipal staff based on the municipal training protocols being developed by an ad hoc task group. (Priority – Medium)	June 2005	**Update** -- Four Power Point presentations were developed in FY 01-02 on BMPs for corporation yards, storm drain O&M, road maintenance and pest management. In FY 02-03 and FY 03-04, this project was put on hold due to work on higher priority items. A fifth training module will be developed in FY 04-05 on mercury pollution prevention. Upon completion and approval of the funding Co-permittees, planning will begin for the workshop (tentatively scheduled for spring 2005).

[1] Tasks reported as completed in the FY 03-04 Annual Report have been removed from the list.

Table 1-1
Status of Ongoing Program Continuous Improvement (CI) Tasks

Tasks	Updated Schedule	Status[1]
Remaining FY 99-00 CI Tasks – Program Management		
6. Send letter to contractors who received Construction General Permit Binder, explaining that the binder is being revised and contractors should reference the Regional Board's Erosion Control Field Manual. (Priority- Medium)	June 2005	**Update** – In the near term, the Program has focused on outreach to developers regarding Provision C.3. One of the fact sheets in the *C.3. Stormwater Handbook* provides resources for information on construction BMPs (Attachment II-6). Due to the many resources now available to contractors, a separate SCVURPPP binder may no longer be needed. Program staff will bring this item to the C3PO AHTG for discussion and next steps.
9. Consider developing, with the help of an ad hoc task group, a fact sheet addressing common construction BMP problems, like drain inlet protection and dewatering. (Priority – Medium)	June 2005	**Update** – Management Committee approved having the Program adapt an existing brochure on dewatering (created by Palo Alto, Mountain View and San Jose) for the other Co-permittees' use. Due to higher priorities, no further work was completed on this task. Program staff will bring this item to the C3PO AHTG for discussion and next steps
15. Look into providing storm water training to building officials through the Peninsula Chapter of Building Officials monthly training sessions. (Priority –Low)	June 2005	**Update** – This item is low priority, and has been delayed due to Program staff's focus on higher priority items. Program staff will bring this item to the C3PO AHTG for discussion and next steps

SECTION 2

PERFORMANCE STANDARD REVISIONS

2. PERFORMANCE STANDARD REVISIONS

Background

The Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) developed model Performance Standards (PSs) in 1996. The model PSs were accepted by the Regional Board in June 1997. Each Co-permittee adopted the model PSs or tailored them to their local community characteristics and conditions. The original PSs were incorporated into the Program's September 1, 1997 *Urban Runoff Management Plan* (URMP). Revised PSs are included in the 2004 Program URMP and the Co-permittees' local URMPs, in accordance with NPDES permit Provision C.2.

The URMP contains the Program's commitment to a process of continuous improvement. One component of this process is to review an existing PS, or create a new PS, each year. Decisions as to which PS will be created or revised in a given year are made based on requirements in the Program's NPDES permit, comments by Regional Board staff on Annual Reports, continuous improvement items identified as part of annual performance reviews, Program priorities and available Program resources.

Enhanced Annual Reporting Requirements- Industrial/Commercial Discharger Control Enhanced Annual Reporting Requirements- Illicit Connection/Illegal Dumping Elimination

On September 7, 2001, the Industrial Inspection Ad Hoc Task Group (Industrial Inspection AHTG) recommended the adoption of Program-wide categories and enforcement actions developed by the Industrial Inspection AHTG. These categories and procedures are described in the *Continuous Improvement of Industrial Reporting Technical Memorandum* and *Continuous Improvement of Illicit Connection/Illegal Dumping Reporting Technical Memorandum*. The Management Committee approved both memoranda as the Program's strategy to implement IND and IC/ID reporting requirements (as required in Permit Provisions C.6.a.i. and ii). The memoranda were included as attachments within the Program's FY 00-01 Annual Repor*t* and submitted to the Regional Board on September 17, 2001. Each Co-permittee began implementing these procedures immediately thereafter. Implementation of the enhanced reporting requirements by the Co-permittees has been very successful as shown in the past three Program annual reports.

In accordance with the Regional Board's letter, *Review of Program's Draft FY 2003-04 Work Plan* dated June 24, 2003, the Program informed the Co-permittees (see FY 02-03 Annual Report Preparation Guidance dated June 18, 2003) that each Co-permitee should independently evaluate their individual IND and IC/ID inspection data and utilize the results of the analysis to set inspection priorities and gauge program effectiveness. Within the FY 02-03 Annual Report, Co-permittees provided an effectiveness evaluation or analysis of their IND and ICID programs and/or data. This step was performed to address the Regional Board's concerns regarding IND reporting procedures.

In accordance with the Program's FY 04-05 Work Plan submitted to the Regional Board on March 1, 2004, the Program committed to updating both performance standards during FY 04-05. The updates were essentially administrative (e.g., incorporating enhanced reporting requirements and results of Co-permittee evaluations) and were directed at modifying the Program's model performance standards to reflect Management Committee direction and actual Co-permittee implementation. These administrative updates were provided to the Industrial Inspection AHTG for review during January 2005. Final updated performance

standards were approved by the Management Committee on February 17, 2005. Final updates are provided within Attachments 2-1 and 2-2 of this Work Plan and hereby incorporated into the URMP.

Future Efforts- FY 05-06 Activities

Priorities for recent efforts to revise or create new performance standards have been driven by the requirements in the Program's reissued NPDES permit and/or continuous improvement tasks. All new or revised PS required by the permit have been completed. Future efforts to revise or update existing PS will be identified through the process of continuous improvement (see Section 1) until the next permit re-issuance.

The Water Utility Operation and Maintenance Performance Standard is the last performance standard needing revision. Issues which need to be addressed include changes in methods of disinfection of potable water supplies and the appropriate BMPs for discharges of these waters to storm drains. A work group with significant participation from SCVWD and other Co-permittees with water utilities will be formed and updating of the Water Utility Operation and Maintenance Performance Standard will be considered by the Management Committee during FY 05-06.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

INDUSTRIAL/COMMERCIAL DISCHARGER CONTROL PROGRAM PERFORMANCE STANDARD

Revised February 17, 2005

Participating Agencies:

Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

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PART I

Introduction

Performance Standard and Supporting Documents

for the

Industrial/Commercial Discharger Control Program

Revised February 17, 2005

Introduction

Performance standards define control measures or levels of achievement for particular tasks carried out by all Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) Co-permittees. Control measures are described in the Program's 2004 Urban Runoff Management Plan (URMP), which details what the Program is doing to reduce urban runoff pollution in the Santa Clara Valley watershed. The development and implementation of performance standards is an integral part of the Program's URMP.

The components contained herein constitute the revised Industrial/Commercial Discharger Control Program Performance Standard.

The goal of industrial and commercial discharger control measures is to reduce or eliminate adverse water quality impacts from activities conducted at selected industrial and commercial sites. The Industrial/Commercial Discharger Control (IND) Performance Standard defines the level of implementation that Co-permittees must attain to demonstrate their IND activities reduce pollutants to the maximum extent practicable.

The performance standard for IND is based on current and proposed practices that municipal agencies are and/or will be implementing to minimize water quality impacts; and practices that are accepted by the State and Regional Board as being effective in controlling these impacts. The performance standard is also consistent with the goals and objectives of the Program's Urban Runoff Management Plan and is intended to work parallel with the State's General Industrial Permit.

PART II

Performance Standard

Performance Standard and Supporting Documents for the Industrial Commercial Discharger Control Program

MODEL PERFORMANCE STANDARD
(Revised February 17, 2005)

A. INSPECTION CATEGORIES AND FREQUENCIES

Industrial and commercial facilities covered under the Industrial Commercial Discharger Control Program may be described using one or more of the following facility inspection categories: Notice of Intent (NOI) Filers and Program-wide Facilities. The Program-wide Facilities category includes additional facilities not limited to those industrial sites required to obtain coverage under the State's Industrial Stormwater NPDES General Permit. The Program-wide Facilities category was also developed to include facilities typically inspected by Co-permittees and to ensure standardized reporting of facility inspections. Inspection frequencies, which are provided for each category, may vary between Co-permittees, depending on the types of businesses and potential threats of stormwater pollution occurring in each jurisdictional area. In addition, each Co-permittee has assigned an inspection frequency for each industrial and commercial category within their jurisdictional area. Inspection frequencies for certain categories are included in Co-permittee Management Plans, Work Plans, and/or Annual Reports.

1. Notice of Intent (NOI) Filers

NOI filers are those facilities that have filed an NOI with the State and appear on a list provided by the State. The following shall be accomplished for all NOI filers and facilities with individual NPDES permits for storm water discharge:

- A complete initial storm water inspection shall be performed within one (1) year of beginning implementation of this Performance Standard.
- At the beginning of each fiscal year the lists of NOI filers shall be reviewed and revised as needed.
- Any facility that files an NOI after the date that the jurisdictional Co-permittee begins implementation of this performance standard shall undergo its initial inspection within one (1) year of filing report received by Co-permittees.
- During the initial inspection, it will be verified that the facility has submitted an NOI.
- NOI filers who have undergone their initial inspection shall have an inspection frequency of no less than once in five (5) years. However, the inspection frequency can be reduced for sites that demonstrate a history of compliance or exhibit little threat to water quality.
- Inspection frequency should be increased (greater than once in five (5) years) for sites

that demonstrate non-compliance, or exhibit significant threat to water quality.

2. Program–wide Facilities

Program-wide facilities (Table 1) have a potential to be a source of pollutants to storm water. This category includes seventeen descriptive facility types typically inspected by the Co-permittees. To ensure standardized reporting of inspections, facility types described as NOI Filers are also included within this category. The program-wide facility type described as "Other" is provided to include miscellaneous industries that are less significant or less probable sources of stormwater pollution. Each program-wide facility category was developed in accordance with the Program's Enhanced Annual Reporting Requirements for the Industrial/Commercial Discharger Control Program (Permit Provision C.6.a.i). Each category is also described in the *Continuous Improvement of Industrial Reporting* Technical Memorandum dated September 7, 2001. Program-wide facilities that are not NOI Filers are inspected no less than once every five (5) years. Program-wide facilities that are NOI filers shall be inspected within one (1) year of filing report received by Co-permittees. However, the inspection frequency for Program-wide facilities can be reduced for sites that demonstrate a history of compliance or exhibit little threat to water quality. Inspection frequency should be increased (greater than once in five (5) years) for sites that demonstrate non-compliance, or exhibit significant threat to water quality.

TABLE 1 - Program–wide Facilities

Facility Category	Description
• Automotive	Automotive sales, engine and body repair, gas stations, car washes, parking, vehicle services
• Food Service	Eating and drinking establishments, including cafeterias, delis, bakeries, mobile food
• Paint Facilities	Manufacturing and retailing
• Dry Cleaners	Dry cleaners
• Cleaning Services	Mobile washers, building cleaning, carpet cleaning
• Pesticide Facilities	Manufacturing and retailing; pesticide applicators
• Machine Shops	Industrial machinery and equipment
• Metal Manufacturing	Metal fabricating, finishing, plating, metal work (40 CFR 413, 433)
• Electric/Electrical Components	Manufacturing (40 CFR 469)
• Construction/Building	Retail, trade contractors, construction, landscape and garden businesses
• Local Transit; Highway Transport	Electric, Gas and Sanitary Services, Trucking Industries
• Recycling yards	Recycling yards
• Auto Dismantlers	Auto Dismantlers
• Concrete/Stone/Clay Products	Concrete/Stone/Clay Products
• Corporation Yards	Corporation Yards
• Landfills	Landfills
• Other	Other

Other may include:

- Photographic/Printing
- Laboratories
- Medical and Dental Labs
- Chiropractors
- Radiologists
- Veterinarians
- Plastics manufacturing
- Pharmaceuticals manufacturing
- Cabinetry
- Wood furniture
- Commercial Areas
- Winery
- Florist
- Jewelry/Precious Metal manufacturing
- Miscellaneous Manufacturing
- Storage
- Welding/Iron Works
- Amusement Parks
- Laundries
- Hazardous Waste
- Underground Storage Tanks

B. GENERAL ADMINISTRATION

- All facilities addressed by this Performance Standard will be inspected to determine the existence of discharges or threatened discharges that are illegal under local ordinances.
- For any Storm Water Infiltration Devices (SWIDs) discovered, a SWID notification card will be completed. One copy will be submitted to the Santa Clara Valley Water District's Water Quality Unit.
- Facilities will be inspected to determine compliance with local municipal storm water ordinances. The facility operator will be notified of observed areas of concern; official action on violations will take place under local authority.
- Significant problems that cannot be addressed promptly and fully under local authority shall be referred to the Regional Board or other appropriate agency.
- Best Management Practices (BMP) information will be distributed to those facilities that do not already have them at the time of the inspection. These BMP documents include the Santa Clara Valley Urban Runoff Pollution Prevention Program literature for: Industrial Facilities, Construction, Food Service Facilities and Automotive Facilities will be distributed as appropriate depending on the type of facility inspected.
- Internal summaries of the type and number of violations reported, and the type of facilities with reported violations, will be reviewed annually. Recommendations for updates to the standard list of violations on the Inspection Checklist, or possible Program-wide focus for facility type or violation type, will be made as needed.

C. ENFORCEMENT

- When non-compliance is observed, educate facility operators/owners on the impacts of their actions, explain the storm water requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Certain violations may warrant immediate mitigation and/or enforcement actions. Each Co-permittee will follow its enforcement plan to determine the level of enforcement for issues identified during inspections.
- If a specific problem is identified during an inspection, provide information on corrective actions and provide either verbal or written warnings to the facility owner and expected dates to correct the problem.
- If compliance has not been achieved upon re-inspection, initiate formal enforcement procedures (e.g., Compliance Order, Notice to Comply or Compliance Directive). Conduct follow-up inspections to evaluate progress towards compliance.
- If compliance has not been achieved upon a second re-inspection, enforcement actions should be taken. Enforcement actions can include a Compliance Agreement or Administrative Citation, which may include fines and/or court action.

D. RECORD KEEPING/ REPORTING

- Document and report IND inspections annually using one of the descriptive categories provided within Tables 1 and 2[1]. The categories provided in each tables relate to the facility category and enforcement actions for each IND inspection. A category from each table will be assigned to document the each IND inspection.
- IND inspections will be documented by, and the documentation maintained in the files of, the local agency or its contractor. The standard Santa Clara Urban Runoff Industrial/Commercial Inspection Checklist (see Reporting Form on page 8) or an inspection reporting form developed by a Co-permittee that contains all of the elements in the standard incident reporting form, will be used by all local agencies
- If actual non-compliance or threatened non-compliance is noted during an inspection, the nature of the follow-up, through resolution of the noted issues, up to and including the enforcement action will be reported annually.
- Submit IND inspection results to the Regional Board within Annual Reports.
- Provide IND inspection results (within an electronic format) to Program staff for inclusion in SCVURPPP Annual Report (see below).
- Provide IND effectiveness evaluation results in Annual Reports.

IND Inspection Data for SCVURPPP Annual Report

To facilitate the continuous improvement of industrial facility inspection reporting on a Program-wide level, each Co-permittee will routinely submit raw IND inspection data (within an electronic format) to Program staff during each fiscal year. The procedures and schedule for submitting raw IND inspection data will be provided to Co-permittees each November.

Once received within an electronic format, Program staff will analyze all categories to ensure that they are reported in accordance with the categories provided in the IND technical memoranda. Once all reported data is linked to the appropriate category, Program staff will produce a summary report detailing all IND information for the Program. Individual reports detailing individual Co-permittee IND inspection information will be developed for each Co-permittee.

[1] Reporting requirements and categories are also described in the *Continuous Improvement of Industrial Reporting* Technical Memorandum dated September 7, 2001.

The following levels of enforcement shall be reported by municipalities against non-compliant facilities:

Table 2 – IND Enforcement Actions

Level 1 – (Warning)
Verbal and/or written notice to facility owner/operator identifying the problem and providing information on corrective actions. A time frame to correct the problem should be specified based on the severity and/or complexity of the problem.
Level 2 - (Administrative Actions):
Issuance of Compliance Order, Notice to Comply or Compliance Directive, or other similar notification outlined in the municipality's storm water ordinance that identifies a problem, requires correction or abatement but does not assess fines. A time frame to correct the problem should be specified based on the severity and/or complexity of the problem. This category is more descriptive and provides steps conducted prior to assessing fines.
Level 3 - (Enforcement Actions):
Administrative and/or civil actions that may include fines or require the facility to resolve the matter in the court system. Level 3 may include the following categories: administrative citations with monetary fines and referral for legal action. Level 3 is the highest level of enforcement.
No Action:
Facilities observed to be in compliance with storm water ordinances and/or current and proposed practices implemented to minimize water quality impacts.

Santa Clara Valley Urban Runoff Industrial/Commercial Inspection Checklist

Date: _____ Time: _____

Agency or Department: _____

Inspector(s): _____

I. FACILITY INFORMATION

1. Facility Name: _____

2. Address: _____

3. Responsible Party: _____ 4. Phone: _____

5. Notice of Intent (NOI) has been submitted: Yes ☐ No ☐ N/A ☐

6. **Describe the Facility Type:**

- ☐ Automotive
- ☐ Food Service
- ☐ Paint Facilities
- ☐ Dry Cleaners
- ☐ Cleaning Services
- ☐ Pesticide Facilities
- ☐ Machine Shops
- ☐ Metal Manufacturing
- ☐ Electric/Electrical Components
- ☐ Construction/Building
- ☐ Local Transit/Highway Transport
- ☐ Recycling Yards
- ☐ Auto Dismantlers
- ☐ Concrete/Stone/Clay Products
- ☐ Corporation Yards
- ☐ Landfills
- ☐ Other* _____

☐ **No Violations Observed**

II. ENFORCEMENT ACTIONS

1. **Describe Enforcement Action** (Definitions on Back).

- ☐ No Action
- ☐ Level 1 (Warnings)
- ☐ Level 2 (Administrative Actions)
- ☐ Level 3 (Enforcement Actions)

III. COMMENTS/RECOMMENDATIONS/REFERRALS

_____

_____

_____

Inspector(s): _____

Received by: _____

PART III

Guidance for Support Documents

SECTION 1

Work Plan/Implementation Schedule

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 1
WORK PLAN IMPLEMENTATION

This section contains the plan or activities to be conducted to enable the Co-permittee to implement the performance standard along with an implementation schedule. The work plan will be developed by each Co-permittee based on its responsibility to conduct industrial/commercial discharger control activities within its jurisdiction.

Example Contents of the Work Plan

- Steps needed to incorporate the implementation of the performance standard.
- Obtain legal authority for inspection and enforcement (if necessary).
- Facilities to be inspected and inspection frequency
- Develop inspection program for a new category of discharger.
- Develop agreements with other agencies to conduct facility inspections (e.g., Health Department).
- Develop referral and complaint response protocols.
- Develop documentation and record keeping tools.
- Develop a training program for inspectors and field personnel.
- Conduct workshops for inspectors or the regulated community.
- Develop and/or distribute public information.
- Develop an inspection checklist.
- Incorporate BMPs (included in section 3) and other control measures into facility inspections.
- Develop program evaluations (may include):
    1. Reviewing the industrial/commercial facility tracking system to assess the effectiveness of data collection, the inspection reporting format and identification of facilities to be inspected.
    2. Verifying the frequency requirements for facility inspections outlined in the current performance standard.
    3. Identifying other facilities or activities related to industrial/commercial storm water discharge(s) not addressed in the current performance standard that require attention.
    4. Obtaining and reviewing feedback on the Industrial/Commercial Discharger Control Program from: 1) citizen reports 2) inspections 3) workshops for inspectors.
    5. Documenting recommended modifications to the performance standard.
    6. Reviewing data for the purposes of evaluating compliance and opportunities for Program improvement.
- Submit industrial/commercial facility data to Program staff.

SECTION 2

Legal Authority to Implement

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 2
Legal Authority to Implement

This section contains a demonstration that the Co-permittee has the legal authority to implement the performance standard. Each Co-permittee should provide citations for, or excerpts from, documents that demonstrate adequate legal authority, and/or provide a time schedule for developing and obtaining additional authority. Required areas of authority may include, but are not limited to, the following:

- Authority to control quantity and quality of discharges from industrial activities that enter the municipality's storm drain system.
- Authority to prohibit illicit discharges to the municipality's storm drain system.
- Authority to control discharges to the municipality's storm drain system which result from spills, dumping or disposal of substances other than storm water.
- Authority to conduct inspections, surveillance and monitoring of discharges into the municipality's storm drain system.

(Full documents do not need to be included within this performance standard, but should be available upon request by the Regional Board.)

SECTION 3

Best Management Practices and Other Control Measures

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 3
WORK PLAN BMPs AND CONTROL MEASURES

The purpose of best management practices for a commercial and industrial discharger control program is to eliminate or reduce adverse water quality impacts from activities commonly conducted at commercial and industrial sites. This section contains a list of model best management practices to be used as guidance by Co-permittees in conducting commercial and industrial facility inspections.

The model BMPs are grouped into four areas: general facility information, indoor activities, outdoor activities and equipment. These areas correspond to each element in the standard Santa Clara Valley Urban Runoff Facility Inspection Checklist (see part II). Note: BMPs were developed by Co-permittees through the Industrial/Commercial Subcommittee.

I. General Facility Information

A. Notice of Intent (NOI)
   1) Determine whether an NOI for coverage under the State's General Permit has been submitted (if required).
   2) Make visual verification of NOI.
   3) If NOI has not been filed, but is required, advise facility to contact RWQCB.

B. Storm Water Pollution Prevention Plan and Storm Water Monitoring Plan
   1) If NOI has been filed, a visual verification of a Storm Water Pollution Prevention Plan (SWPPP) and a Storm Water Monitoring Plan will be conducted.
   2) If SWPPP and SWMP are required, but not on site, advise facility to contact the RWQCB regarding NPDES requirements.

C. Best Management Practices (BMPs)
   1) Distribute appropriate BMP brochures to all inspected industrial and commercial facilities.

II. Indoor Activities

A. Floor Cleaning
   1) Verify where all floor cleaning water, wax and unused stripper is disposed of. Advise facility staff on proper disposal of unused products.
   2) Make visual inspection of all drains and sinks. Look for signs of improper disposal of waste liquids.
   3) Verify waste liquids from automated floor cleaning equipment holding tanks are discharged to the sanitary sewer.

B. Indoor Equipment Cleaning
   1) Wastewater from cleaning equipment should be discharged to the sanitary sewer (within local POTW discharge limits) or recycled. The facility should consult with the POTW or manage wastewater as a hazardous waste.

C. Indoor Manufacturing, Residues and Spills
   1) Ensure proper cleaning and disposal methods are performed for interior spills and leaks. Proper disposal methods depend on the type of substance. If hazardous material is spilled, the facility should refer the incident to the local hazardous material agency.
   2) Verify appropriate absorbent materials are kept readily accessible and designated employees are trained on proper spill response techniques.
   3) Ensure proper control of process residues and dust near exterior doorways (e.g., recommend relocating machinery and improving housekeeping).
   4) Verify proper connection of interior floor drains (e.g., review plumbing schematics, conduct a dye test). All interior floor drains and sumps should be plumbed to the sanitary sewer or closed loop treatment system.

III. Outdoor Activities

A. Vehicle and Equipment Fuel Dispensing Areas
   (Note: Some items in this section are the responsibility of the local hazardous materials or fire prevention agency. Refer to appropriate enforcement agencies as needed).
   1) Determine whether any fuel dispensing equipment is exposed to storm water and/or whether fueling or the transfer of any chemical from one vessel or another is conducted near a storm drain. If so:
      a) Verify the dewatering procedures for the secondary containment areas that surround fuel tank farms or other fuel storage equipment.
      b) Ensure a method is in effect to protect all adjacent storm drains in the event of a spill.
      c) Ensure absorbent material and booms are readily at hand.

B. Vehicle and Equipment Washing
   1) Verify floor mat and equipment screen/filter cleaning is not conducted in a location that may adversely impact a storm drain.
   2) All vehicle and equipment rinse water should be discharged, with proper approval, into a sanitary sewer drain. All wastewater resulting from power washing of contaminated surfaces may be subject to some type of pretreatment prior to entering the sanitary sewer.
   3) Recommend wash water be recycled in a closed loop system.

C. Vehicle and Equipment Maintenance
   1) If vehicles are maintained on site, ensure there are no associated impacts to any storm drains.
   2) If leaks or drips occur under vehicles, drip pans should be placed under the vehicles.
   3) If applicable, inspect all outdoor drains and suspicious indoor drains in the vehicle maintenance area. Conduct dye tests to verify proper connections.
   4) If specialized equipment (forklifts, fifth wheels, etc.) is maintained on site, ensure wash water used to clean equipment is not disposed to the storm drain directly or indirectly.

D. Material Storage
   1) Determine whether raw materials and their by-products are exposed to rain water. Ensure loose materials are stored under cover or in bermed areas if possible.

2) If raw materials and their by-products are transferred from one place to another in or adjacent to any storm drain, or in such a manner to impact the storm drain, recommend placing protective covers or similar devices over storm drains and improving housekeeping in these areas.

E. Waste Storage

(Note: In cases where hazardous materials or hazardous waste storage pose a threat to the storm drain, the facility should consult with the local hazardous materials/waste enforcement agency).

1) Determine whether the facility stores or disposes of hazardous materials, hazardous wastes, or any other substances on site.
2) Verify if rainwater can enter any double contained areas and how these areas are drained once rainwater comes into contact with these materials. The facility should consult with the local hazardous materials enforcement agency and POTW.
3) Determine whether the transfer of hazardous materials, waste or non-hazardous substances may potentially impact the storm drain. If non-hazardous substances are involved:
   a) Recommend good housekeeping measures.
   b) Recommend the facility protect storm drains by relocating substance to a covered area.
   c) Recommend the facility berm or cover substance(s) or install an approved protective device at storm drain inlets.
4) If there are any storm drains adjacent to any storage areas, request that the facility effect a method to monitor and protect storm drain inlet from accidental discharge.

F. General Construction Activities

1) Facilities are responsible to advise and require contractors to protect storm drains.
2) Advise facility that if 5 acres or more are disturbed, a general construction permit (NPDES) is required.
3) If construction activities are current, determine if there is a potential for soil to erode into the storm drain by rain or irrigation run-off. If so:
   a) Recommend installing filter fabrics in combination with swales or berms to protect storm drain inlets.
   b) Recommend erosion control techniques.
4) Verify construction workers are not washing tools and/or equipment adjacent to any storm drains.
   a) Recommend that the facility incorporate storm control verbage into all contracts.
   b) Recommend that the facility provide an employee training program.
5) Verify construction materials are <u>not</u> being disposed in the storm drain directly or indirectly. Construction debris and materials such as paint, mineral spirits, drywall compounds, adhesives and other solvents should be properly disposed of. If a material is a hazardous waste, the facility should refer to the appropriate agency.

G. Power Washing

1) Recommend dry methods of clean-up.
2) If power washing must be used, the facility should refer to the proper procedures in the Bay Area Storm Water Management Agencies Association's "Pollution From Surface Cleaning."

H. Outdoor Equipment Storage
   1) Inspect all scrap yards, vehicle storage lots or areas where retired/surplus equipment is stored. Determine where storm drains are in relation to these areas.
      a) The facility should cover oily and soiled equipment with a leak proof cover.
      b) The facility should drain all automotive related fluids prior to storage, and dispose of properly.
      c) Drip pans should be placed under leaky equipment.

I. Process Residues
   1) Determine if any manufacturing process that creates any residue is conducted outdoors and whether this residue can impact the storm drain.
      a) The facility should ensure good housekeeping.
      b) Recommend conducting manufacturing processes in a covered location.
      c) Recommend protection of adjacent storm drains.

J. General Housekeeping
   1) Determine the general overall condition of the facility. Is housekeeping conducted on a consistent basis? Are there accumulations of debris, refuse or litter? Make necessary recommendations.
   2) Recommend a training program addressing good housekeeping practices.

K. Irrigation and Landscape
   1) Determine if landscape contractors are properly disposing of lawn clippings and other vegetative wastes.
   2) Inspect storm drains for vegetative wastes.
   3) Ensure temporary protection of all impacted storm drain inlets while conducting landscape activities.
   4) Inspect paving around landscaping to see if sprinklers are over watering and causing undue erosion and runoff of associated chemicals. If, so have facility representative adjust irrigation timers or sprinkler heads.
   5) Determine whether pesticides, herbicides or fertilizers are applied to the landscaping; identify how much and how often. Refer all pesticide/herbicide application problems to the Santa Clara County Agriculture Department.
   6) Verify landscape equipment is washed properly and away from paved areas or storm drain. The facility should filter wash water and discharge to sanitary sewer (if within POTW limits).

IV. Equipment

A. Air Compressors
   1) Inspect air compressor units that are exposed to storm water for residual grease on the tank or motor surface.
   2) Air compressors should be located in a covered area.
   3) Request air compressor leaks be repaired.
   4) Inspect area beneath air compressor bleed line and determine if any oily substance is being released which could impact the storm drain. If so, place a catch pan below he bleed off valve and dispose of water from pan on a regular basis.

B. HVAC, Chillers and Refrigerators
   1) Determine whether air conditioning units (generally found on roof) and chillers have a condensate line that is plumbed to a roof storm drain.
      a) For existing buildings, non-contaminated discharge can go to the storm drain.

b) For new development or building remodels, the discharge should go to the sanitary sewer. Consult with local planning/building department.

2) Determine whether air conditioning and chiller units are treated with descaling or anti-algae agent. Facility representatives are responsible to direct HVAC contractor to properly dispose of all flushing agent residues and by-pass condensate line while flushing unit.
3) Determine whether HVAC condenser tubes are annually flushed with any type of chemical by a servicing contractor and how wastewater is disposed of. The runoff from the tube cleaning must be captured and properly disposed of.
4) Determine whether any of the units are power washed. If so, refer to proper procedures in the Bay Area Storm Water Management Agencies Association's "Pollution From Surface Cleaning".
5) Determine whether defrost water or condensate is discharged. The facility representative is responsible to ensure defrost water does not come into contact with any pollutants directly or indirectly.
6) Determine how waste compressor oil from chillers is disposed of. The facility should contact the local hazardous waste enforcement agency regarding proper disposal.

C. Air Scrubbers
1) Determine whether particulate from air scrubbers is deposited on any surface in a manner that may impact the storm drain.
2) Advise the facility representative to repair air scrubbers and remove any debris. If feasible, a protective catch pan should be placed around the scrubber.
3) Refer any fall out violations to the Bay Area Air Quality Management District.
4) Inspect the discharge point of any wet scrubber. Wet scrubbers must discharge to the sanitary sewer.

D. Basement Sump Pumps
1) If the facility has a basement parking lot, verify rainwater drains to a storm drain.
2) Inspect the bottom of the storm drain sump drain and determine the method of cleaning.
3) Advise the facility representative that only rainwater can be pumped into the storm drain. Any debris surrounding or inside the sump should be removed. A screen mesh or filter fabric may be installed on the sump grate to assist in protecting sump from particulate debris (if it will not cause a flood hazard). The facility should consult the appropriate agency regarding proper disposal of sump debris.
4) Determine whether automotive fluid spills and/or drips are cleaned with appropriate absorbent.
5) Determine whether cars are washed in the basement parking lot. This should include mobile auto detailers.
6) Advise the facility representative that all floor cleaning contractors must protect the storm drain system from accidental discharge.

E. Boilers
1) Determine whether the blow line or tank drain line is located adjacent to any storm drain inlet or channel, directly or indirectly. All treated boiler discharge must be discharged to the sanitary sewer or recycled/reused in an approved closed loop system.

2) Determine whether the boiler is treated with scaler or algicide and if any leakage is present. Discharge from boiler chemical additives may meet hazardous waste criteria. If so, the facility should refer to the local hazardous waste compliance agency for proper storage and disposal.
3) Determine whether the boiler vents to the roof. If so, determine whether vapor will recondense on the roof and make contact with storm water runoff. Advise facility representative to repair condensate pipe and redirect flow to sanitary sewer.

F. Facility Catch Basins
1) Inspect all catch basins and drop inlets for debris or other foreign material and have the facility clean or remove debris regularly.
2) Identify all storm drains with stencil: "Do Not Dump- Flows to Bay"

G. Refuse Dumpster and Compactor
1) Advise the facility to keep dumpster lids closed when not in use and/or exchange bins without lids.
2) The facility should relocate dumpsters and bins away from storm drains.
3) Contaminated rainwater that has accumulated from an open container must be discharged to the sanitary sewer (if within POTW limits).
4) Verify plugs are installed on dumpsters and are not leaking. If so, the facility should install plugs or exchange dumpsters.
5) Verify compactor leachate or associated hydraulic fluid does not leak into or adjacent to any storm drain or onto the pavement. If so, the facility should protect the storm drain, repair the compactor, absorb leaked material, and discharge absorbent in compactor. Liquid can also be discharged to the sanitary sewer, if within POTW limits.

H. Cooling Tower
1) All cooling tower discharges must be directed to the sanitary sewer.
2) Cooling tower chemicals should not be stored adjacent to any storm drain. Refer any chemical storage problems to the local hazardous waste enforcement agency. Also contact POTW.
3) Ensure proper disposal of washing detergents and/or muriatic acid (common cooling tower cleaner). The facility should contact the appropriate agency for proper disposal.

I. Emergency Showers
1) Verify emergency showers do not discharge to the storm drain sewer.

J. Filter Back flush
1) Back flushed or back washed equipment filters, including filters for pools and fountains, should discharge to the sanitary sewer. The facility should collect and dispose of solids into a refuse container.
2) Commercial and institutional swimming pool facilities should refer to the Santa Clara County Health Department, Consumer Protection Division for filter medium disposal issues

K. Grease Interceptor, Tallow Containers
1) Inspect the area around outdoor grease interceptor cover and verify rain water can not carry residual grease to the storm drain.
2) Advise facility representative to clean debris on a regular basis and clean the interceptor area after it is pumped by a septic hauler. Residual grease must be

collected or washed back into the interceptor.

3) Tallow bins must be stored in areas where they do not come into contact with storm water. Recommend a covered area for tallow bin storage.
4) Ensure a mechanism is in effect to protect storm drains if an interceptor overflows.
5) Replace or exchange bins, if necessary.

L. Ground Water Treatment Discharge
1) Determine whether ground water is being treated at the site and where it is discharged. Consult with RWQCB or SCVWD.
2) If ground water is discharged to the storm drain, verify an NPDES permit has been issued. If ground water is discharged to the sanitary sewer, verify POTW permit.

M. Ground Water Dewatering Devices
1) Determine if any groundwater is discharged from the site, and verify which sewer it connects to.
2) Uncontaminated groundwater infiltration need not be prohibited unless the discharge is identified by a public agency or the RWQCB as a source of pollutants to receiving waters.
3) If applicable, review spill control plan.
4) Determine whether pumped water comes into contact with any pollutants before water is discharged. Consult with RWQCB and SCVWD.

N. Loading Docks
1) Inspect all loading dock drains for potential pollutants, including truck fluid leaks.
2) Debris from catch basins should be removed on a regular basis.
3) Catch basin inlets should be protected from accidental spillage by placing absorbent booms or covers over drains or installing valved inlet inserts (if safe and feasible).
4) Advise local hazardous materials agency if materials that could impact the storm drain are loaded or transferred at the dock.
5) Dock wash water should be diverted to the sanitary sewer, (if within POTW limits) or a dry method of clean-up should be used.

O. Parking Lots
1) Inspect facility parking lots for excessive vehicle fluid leaks or spills. The facility should clean-up spills by (1) sweeping up particles and debris, (2) absorbing spills with rags or absorbent, (3) mopping area.

P. Ponds, Fountains and Pools
1) Overflow drains from ponds and decorative fountains must be discharged to the sanitary sewer or re-used for irrigation. This includes all pool filter backwash and associated debris.
2) The facility should consult with the local POTW if ponds or fountains are treated with copper-based algaecides (shock), growth inhibitors or other agents.
3) Ensure pond or fountain filters are not back flushed into a storm drain.

Q. Roof Vents and Equipment
1) Excessively greasy roof vents should be cleaned on a regular basis, especially during the wet season.
2) If feasible, catchment pans or trays should be installed at the base of the vents.
3) Duct work should be properly sealed and maintained.
4) If feasible, protective devices should be installed around storm drains.
5) Inspect roof for residual machinery process residues on roof (paper dust, sawdust,

steam condensate, paint, etc.). The facility should consult with the local hazardous material waste enforcement agency and the Bay Area Air Quality Management District for control measures.

R. Reverse Osmosis and Deionization Units.

1) Ensure reject water from reverse osmosis (R.O.) units, in no way impacts the storm drain. Reject water from R.O. unit should be diverted to the sanitary sewer. The facility should consult the local POTW for requirements.
2) Back flush water from deionization units should be discharged to the sanitary sewer. The facility should consult the local POTW for requirements.

References

California Storm Water BMP Industrial Handbook

Mobile Cleaner BMP, CETA

Machine Shop BMP, City of San Jose

Guidelines for Vehicle Service Facilities, Santa Clara Valley Nonpoint Source Program

Restaurant BMPs, Santa Clara Valley Nonpoint Source Program

Vehicle Service BMP, City of Sunnyvale

California Storm Water BMP Construction Handbook

BMPs for Industrial Storm Water Pollution Control, Santa Clara Valley Nonpoint Source Program

Pollution from Surface Cleaning BMPs, Bay Area Storm Water Management Agency Association

SECTION 4

Standard Operating Procedures

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 4
STANDARD OPERATING PROCEDURES

This section contains the Co-permittee's standard operating procedures for implementation of the performance standard.

Example Contents

- Enforcement Response Plan
- Documentation and/or Record Keeping Methods
- Staff Training
- Enforcement Procedures
- Public Information and Participation Distribution

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

ILLICIT CONNECTION & ILLEGAL DUMPING ELIMINATION ACTIVITIES PERFORMANCE STANDARD

Revised February 17, 2005

Participating Agencies:

Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

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PART I

Introduction/Purpose

Performance Standard and Supporting Documents

for

Illicit Connection & Illegal Dumping Elimination Activities

Revised February 17, 2005

Introduction

Performance standards define control measures or levels of achievement for particular tasks carried out by all Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) Co-permittees. Control measures are described in the Program's 2004 Urban Runoff Management Plan (URMP), which details what the Program is doing to reduce urban runoff pollution in the Santa Clara Valley watershed. The development and implementation of performance standards is an integral part of the Program's URMP.

The components contained herein constitute the revised ILLICIT CONNECTION & ILLEGAL DUMPING ELIMINATION ACTIVITIES PERFORMANCE STANDARD.

Purpose

The goal of illicit connection and illegal dumping control measures is to identify and eliminate non-permissible non-storm water discharges associated with illegal dumping or illicit connections to the storm drain system. The Illicit Connection & Illegal Dumping Elimination Activities (ICID) Performance Standard defines the level of implementation that Co-permittees in the Program must attain to demonstrate that their ICID activities reduce pollutants to the maximum extent practicable.

The performance standard for ICID is based on current practices that municipal agencies are and/or will be implementing to eliminate non-storm water discharges and practices that are accepted by the State and Regional Board as being effective in controlling these impacts. The performance standard is also consistent with the goals and objectives of the Program's Urban Runoff Management Plan.

Part II

Performance Standard

Performance Standard and Supporting Documents for

Illicit Connection & Illegal Dumping Elimination Activities

PERFORMANCE STANDARD

A. GENERAL ADMINISTRATION

1) Resource Commitment

- Identify where responsibility for IC/ID enforcement is located within the jurisdiction.

2) Training/Education/Outreach

- Ensure IC/ID Inspectors are trained.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-storm water discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other agencies or industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

3) Complaint Referral/Incident Response System

- Follow existing spill response[1] and cleanup programs used within the jurisdiction.
- Develop and formalize an inter-agency referral process for both internal referrals (within a Co-permittee's jurisdiction) and referrals between Co-permittees.
- Respond to complaints regarding illegal dumping violations into the storm drainage system within the jurisdiction.

4) Field Investigation

- Conduct field investigations[2] that include inspecting portions of the municipal storm drain system for potential sources of non-storm water discharges. Observed discharges will be referred to the appropriate investigating agency.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific areas for pro-active investigations.

5) Effectiveness Evaluation

[1]Activities carried out upon receiving a report of an existing non-storm water discharge.

[2]Pro-actively looking for non-storm water flows.

- Review annually the ICID Performance Standard and internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from complaining parties, other agencies, or citizens, on your agency's response to their concern or complaint.
- Regularly evaluate how the city's interagency ICID referral system works.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- Provide ICID effectiveness evaluation results in Annual Reports.

B. ENFORCEMENT

- If the responsible party is identified, educate the party on the impacts of their actions, explain the storm water requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
  (1) Contact the responsible party to discuss methods of eliminating the non-storm water discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
  (2) Provide Program information to the responsible party, where appropriate.
  (3) Begin enforcement procedures, if appropriate.
  (4) Continue inspection and follow-up activities until the illicit discharge activity has ceased
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

C. RECORD KEEPING/REPORTING

- Document and report ICID incidents annually using one of the descriptive categories provided within Tables 1 through 4 (see below)[3]. The categories provided in each table (total of 4) relate to the origin of report, source of incident, type of incident, and enforcement actions for each ICID incident. A category from each table will be assigned to document the each ICID incident.
- ICID incidents will be documented by, and the documentation maintained in the files of, the local agency or its contractor. The standard Santa Clara Urban Runoff Illicit Connection/Illegal Dumping Reporting Form (see Reporting Form on page 8) or an incident reporting form developed by a Co-permittee that contains all of the elements in the standard incident reporting form, will be used by all local agencies.

[3] Reporting requirements and categories are also described in the *Continuous Improvement of Illicit Connection/Illegal Dumping Reporting* Technical Memorandum dated September 7, 2001

- Submit ICID incident results to the Regional Board within Annual Reports.
- Provide ICID incident results (within an electronic format) to Program staff for inclusion in SCVURPPP Annual Report (see below).
- Develop a tracking system designed to identify and prioritize specific areas for pro-active investigations in order to:
  (1) Determine the appropriate frequency for repeat inspections of high, medium, and low priority areas based on an investigation of the municipality's entire drainage area.
  (2) Determine the number of cross jurisdictional violations (for example, mobile cleaners), seasonal violations, and interagency duplication.
  (3) Review complaint response data.

ICID Inspection Data for SCVURPPP Annual Report

To facilitate the continuous improvement of industrial facility inspection reporting on a Program-wide level, each Co-permittee will provide raw ICID incident data (within an electronic format) to Program staff during each fiscal year. The procedures and schedule for submitting raw ICID incident data will be provided to Co-permittees each November.

Once received within an electronic format, Program staff will analyze all categories to ensure that they are reported in accordance with the categories provided in the ICID technical memorandum. Once all reported data is linked to the appropriate category, Program staff will produce a summary report detailing all ICID incident information for the Program. Individual reports detailing individual Co-permittee ICID inspection information will be developed for each Co-permittee.

Table 1. Categories describing the nature and source of ICID incidents.

Source of Report	Definition
Illicit discharge inspectors	Routine inspection, patrols
Interdepartmental	Referrals within agency, including channel and road maintenance crews, construction inspectors
Other agency	Referrals from other agencies, including other municipalities, SCVWD, State and County Health Departments
Citizen Complaints	Calls from public
Other	None of the above

Table 2. Potential source categories associated with ICID incidents.

Potential Source of Incident	Definition
Residential	Houses or apartments.
Industrial	Industrial facilities or land use area.
Commercial	Commercial facilities or land use area (not including automotive or food facilities).
Automotive Facilities	Includes all automotive facilities, including engine and body repair, gas stations, sales and other vehicle services.
Food Facilities	Includes all food facilities, including restaurants, cafeterias, delis, bakeries, mobile food, and grocery stores.
Construction Sites	Includes all construction related activities.
Public facilities and Utilities	Publicly or utility owned sites and projects (corporation yards, transportation or right of ways).
Other/unknown	All other target audiences associated with ICID incidents, or when specific target audiences can't be identified.

Table 3. Category name and definition of ICID incident types.

Incident Type Category	**Definition (Discharges are defined as releases potentially resulting in pollutants entering stormwater conveyance systems and/or surface waters.).**
Tracking soil	The movement of soil and other materials from vehicle or heavy machinery operation resulting in discharge. Typically occurring at construction sites
Saw cutting slurry discharge	The cutting of Asphalt, Cement, Concrete, etc. that results in a saw cut slurry discharge.
Surface cleaning discharge	The washing of toxic materials such as oil, antifeeze, grease, as well as cleaning chemicals used to clean parking lots, sidewalks, buildings or other surfaces, that results in discharge.
Vehicle & equipment leaking	The leaking of fluids from automobiles, trucks, heavy machinery and other equipment, including but not limited to: brake fluid, radiator fluid, motor oil, transmission fluid, battery acid, etc. resulting in discharge.
Dewatering	Contaminated water from construction areas resulting in discharge.
Water line breaks	Unplanned release of water from break in water pipes and potential soil erosion resulting in discharge.
Landscape material dumping	The illegal dumping of landscape materials resulting in discharge.
SWIDs	Storm Water Infiltration Devices
Vehicle washing	The washing of vehicles that results in discharge.
Vehicle repair	The illicit discharge of automotive fluids or contaminated water from vehicles associated with activities such as oil changing, radiator flushing that result in discharge.
Used oil dumping	The illegal dumping of motor oil resulting in discharge.
Un-hardened cement discharge	The washing of cement and/or the rinsing of cement mixing and laying equipment resulting in discharge.
Equipment cleaning	The washing of equipment using solvents resulting in discharge.
Dumpster discharge	Dumpster that is exposed to rainwater and/or contains leaks resulting in discharge.
Pools/Spas/Fountains discharge	The release of contaminated pool, spa and/or fountain water resulting in discharge.
Cooling water discharge	The release of contaminated water associated with flushing, leaking or blow down of cooling towers.
Accidental spills	Accidental releases of pollutants resulting in discharge.
Abandoned drums discharge	Drums of hazardous or non-hazardous materials dumped and exposed to rainwater or runoff, which results in discharge.
Sanitary spill or leak	Accidental release from sanitary sewer system resulting in discharge.
Dumping -	Improper disposal of hazardous materials, as defined in

hazardous	California Code of Regulations.
Dumping – non-hazardous	Improper disposal of materials not considered hazardous, resulting in discharge. Materials include but are not limited to, construction materials, animal waste, medical waste and pesticide.
Grey water discharge	The release of contaminated water associated with wash water discharge.
Carpet cleaning discharge	The dumping of contaminated water collected during the cleaning of carpets resulting in discharge.
Paint discharge	The dumping or paint and/or the washing of painting equipment resulting in discharge.
Food Facility Oil & grease discharge	Fats, Oils or Grease released from improperly maintained grease traps resulting in discharge.
RV Waste discharge	The dumping of wastes collected in Recreational Vehicles resulting in discharge.
Allowable discharge	Discharges that do not pollute storm drain or do not pollute storm drain when proper control measures are implemented. These include irrigation, car washing (residential), water releases, and pumped water from foundation and footing drains
Misc. incidents	Any type of discharge not listed above. Including, but not limited to sediment laden water and animal waste
Illicit connections	An improperly plumbed facility or parcel plumbed to the storm sewer instead of the sanitary sewer
Complaint not found	Complaint not found

Table 4. Categories describing enforcement actions.

Category	**Description**
Verbal Notice	Verbal warning providing information for corrective actions
Warning Notice	Written letter providing information for corrective actions
Administrative Action	Official letter describing requirements and consequences
Administrative Action with Penalty &/or Fine	Administrative actions, including fines
Criminal Action	Legal actions
Referral for Enforcement	Refer case to agency with enforcement powers

Santa Clara Urban Runoff Illicit Connection/Illegal Dumping Reporting Form

Date: _____ Time: _____

Agency or Department: _____

Inspector(s): _____

I. ORIGIN OF REPORT

1. **Describe reason for conducting the investigation**. (Definitions on Back):
   - ☐ Illicit Discharge Inspection (Routine)
   - ☐ Citizen Complaints
   - ☐ Interdepartmental Referral
   - ☐ Other _____
   - ☐ Other Agency Referral

II. SOURCE OF INCIDENT

1. Describe location of source of discharge (company name, address, cross streets, physical features, etc.)

   _____

   _____

2. **Describe Source of Incident** (Definitions on Back):
   - ☐ Residential
   - ☐ Industrial
   - ☐ Commercial
   - ☐ Automotive Facilities
   - ☐ Food Facilities
   - ☐ Construction Sites
   - ☐ Public Facilities/Utilities
   - ☐ Other/Unknown

3. Responsible Party: _____

   Address and Phone: _____

4. Property Owner: _____

   Address and Phone: _____

III. TYPE OF INCIDENT

1. **Illegal Dumping** Describe Material Discharged**:**

- ☐ Sanitary Spill or Leak
- ☐ Unhardened Cement Discharge
- ☐ Pools/Spas/Fountains Discharge
- ☐ Tracking Soil
- ☐ Surface Cleaning Discharge
- ☐ Saw Cutting Slurry Discharge
- ☐ Vehicle/Equipment Leaking
- ☐ Vehicle Washing
- ☐ Vehicle Repair
- ☐ Equipment Cleaning
- ☐ Used Oil Dumping
- ☐ Landscape Material Dumping
- ☐ Accidental Spills
- ☐ Paint Discharge
- ☐ Carpet Cleaning Discharge
- ☐ Food Facility Oil & Grease Discharge
- ☐ Grey Water Discharge
- ☐ Dewatering
- ☐ RV Waste Discharge
- ☐ Water Line Breaks
- ☐ Dumping (Hazardous)
- ☐ Dumping (Non-hazardous)
- ☐ Abandoned Drums Discharge
- ☐ Dumpster Discharge
- ☐ Cooling Water Discharge
- ☐ Allowable Discharge
- ☐ Miscellaneous Incidents
- ☐ Other (describe): _____

Provide Additional Discharge Information (as appropriate): _____

_____

2. **Other Sources**:
   - ☐ Illicit Connection
   - ☐ Storm Water Infiltration Devices
   - ☐ Other _____

3. **Complaint Not Found** (Circle)

IV. FOLLOW-UP AND ENFORCEMENT ACTIVITIES

1. Describe corrective actions: _____

   _____

   _____

2. Describe materials distributed (brochures, BMPs, etc.): _____

3. **Describe Enforcement Action** (Definitions on Back):
   - ☐ None (Incident Resolved)
   - ☐ Verbal Notice
   - ☐ Warning Notice
   - ☐ Administrative Action
   - ☐ Administrative Action with Penalty/Fine
   - ☐ Criminal Action
   - ☐ Referral for Enforcement

Inspector(s) Signature _____

PART III

Guidance for Support Documents

SECTION 1

Work Plan/Implementation Schedule

Performance Standard and Supporting Documents for

Illicit Connection & Illegal Dumping Elimination Activities

Section 1
WORK PLAN IMPLEMENTATION

This section contains the plan or activities to be conducted to enable the Co-permittee to implement the performance standard along with an implementation schedule. The work plan will be developed by each Co-permittee based on its responsibility to conduct illicit connection and illegal dumping elimination control activities within its jurisdiction.

Example Contents of the Work Plan

- Describe steps needed to incorporate the implementation of the performance standard.
- Obtain adequate legal authority (if necessary).
- Develop a training program for inspectors and field personnel.
- Develop and/or distribute public information.
- Develop and/or implement spill response drills.
- Develop an inter-agency referral process.
- Develop an implementation schedule for priority area field investigation (see Table 5 for a model implementation schedule).
- Develop and/or implement complaint response protocols.
- Develop documentation and record keeping tools.
- Develop priority area field investigation tracking system.
- Develop program evaluations (may include):

  1) Reviewing the Illicit Connection and Illegal Dumping Elimination Activities Performance Standard. Identify any necessary modifications or improvements.

  2) Reviewing internal field investigation results, assessing if the purpose was met and identifying what changes or improvements are necessary.

  3) Obtaining feedback on the Illicit Connection and Illegal Dumping Control Program from involved parties (e.g., complaining parties, other agencies, citizens, etc.).

  4) Formally evaluating the interagency referral system.

  5) Reviewing the Illicit Connection and Illegal Dumping tracking system to identify necessary modifications or improvements in data collection or reporting methods.

Table 5 - Field Investigation Implementation Schedule

The Field Investigation Implementation Schedule below pertains to high, medium and low priority area field investigations. The schedule is a model that may be used by Co-permittees to document priority area field investigations. This model is not intended to be an exclusive template, but rather to provide a simple format Co-permittees may choose to utilize or modify.

The schedule is designed to be based on historical field investigation data and the results of the tracking system for priority area field investigations described in the performance standard. The outfall description and corresponding sector, investigation frequency and total number(s) of outfall investigations for high, medium and low priority areas for a given fiscal year are identified in the Table below. This schedule should be evaluated annually to determine modifications to outfall priorities and to determine appropriate frequencies for repeat investigations.

Priority	Investigation Frequency	Repeat Investigation	Source	Outfall Description	Total (s)
High	AD*	AD*			
				Total Outfalls	
Medium	AD*	AD*			
				Total Outfalls	
Low	AD*	*AD			
				Total Outfalls	

AD* At Agency's Discretion

SECTION 2

Legal Authority to Implement

Performance Standard and Supporting Documents for
Illicit Connection & Illegal Dumping Elimination Activities

Section 2
LEGAL AUTHORITY TO IMPLEMENT

This section contains a demonstration that the Co-permittee has the legal authority to implement the performance standard. Each Co-permittee should provide citations for, or excerpts from, documents that demonstrate adequate legal authority, and/or provide a time schedule for developing and obtaining additional authority. Required areas of authority may include, but are not limited to, the following:

- Authority to prohibit illicit discharges to the municipality's storm drain system.
- Authority to control discharges to the municipality's storm drain system which result from spills, dumping or disposal of substances other than storm water.
- Authority to conduct inspections, surveillance and monitoring of discharges into the municipality's storm drain system.

(Full documents do not need to be included within this performance standard, but should be available upon request by the Regional Board.)

SECTION 3

Work Plan BMPs and Control Measures

Performance Standard and Supporting Documents for
Illicit Connection & Illegal Dumping Elimination Activities

Section 3
WORK PLAN BMPs AND CONTROL MEASURES

This section contains the best management practices and control measures that will be used as a standard for compliance in the implementation of the performance standard. Best management practices, as determined by the Co-permittee, should be available to the responsible personnel.

Example BMP's and Control Measures (outlined in the following documents)

- *Manual for the Investigation and Elimination of Illegal Dumping*, Woodward Clyde Consultants, February 1991.
- *Methods for Conducting Illicit Connection Programs*, Woodward Clyde Consultants, January 1991.
- *NPDES Storm Water Sampling Guidance Document*, Environmental Protection Agency, July 1992.

SECTION 4

Standard Operating Procedures

Performance Standard and Supporting Documents for
Illicit Connection & Illegal Dumping Elimination Activities

Section 4

STANDARD OPERATING PROCEDURES

This section contains the Co-permittee's standard operating procedures for implementation of the performance standard.

Example Contents

- Enforcement Procedures/Response Plan (may include coordination with city/county/district attorney, etc.)
- Documentation and/or Record Keeping Methods
- Staff Training: determine method(s) - internal, conferences, Program generated, etc.
- Public Information and Participation Procedures - determine methods, materials and distribution.
- Complaint Referral Procedures
- Incident Response Procedures

SECTION 3

PUBLIC INFORMATION/PARTICIPATION WORK PLAN

3. PUBLIC INFORMATION/PARTICIPATION WORK PLAN

INTRODUCTION

The goals of the Public Information/Participation (PI/P) element of the Program are to change specific behaviors which adversely affect water quality and to increase the understanding and appreciation of streams and the Bay, leading to a change in values. To accomplish these goals, Co-permittees pursue PI/P activities jointly through the Program, on a County-wide basis, and individually in their own jurisdictions.

Each year Program staff works with the PI/P Ad Hoc Task Group (AHTG) to identify, prioritize and select County-wide projects to be recommended for funding. Table 3-1 presents the updated Pollutant Matrix, which links past, current, and future PI/P projects with pollutants of concern. The projects are developed and implemented each year by work groups consisting of Program staff, consultants and the contributing Co-permittees.

The Program provides resources to conduct County-wide PI/P tasks through approval (by the Management Committee) of an annual Program budget and Work Plan. All Co-permittees contribute resources to conduct annual Program Work Plan tasks consistent with the Co-permittee assessment procedure contained in the SCVURPPP Memorandum of Agreement[1]. In FY 05-06, the Program will experience a major decrease in contribution from the Santa Clara Valley Water District (SCVWD), due to loss of SCVWD revenue needed to balance the State budget. Since the Program has completed the Watershed Education and Outreach requirements of Permit Provision C.4., activities in FY 05-06 will focus on maintaining a baseline level of general outreach and continuing targeted outreach in the areas of pesticide use reduction and proper recycling/disposal of mercury-containing products. The Program will coordinate with SCVWD staff to ensure that, where feasible and practicable, the District's own outreach efforts incorporate the Program's stormwater messages.

FY 05-06 PI/P WORK PLAN

The Program conducts its public education and outreach through three projects: Watershed Education and Outreach, Pesticide User Outreach and Mercury Pollution Prevention Outreach. The Program has completed all tasks planned for these projects under the current Permit. During FY 05-06, ongoing tasks will be implemented. Program staff and the WEO AHTG will also focus efforts on working with Regional Board staff on the SCVURPPP permit re-issuance (and the Regional General Permit) and begin to plan for any new outreach related requirements that may be contained in that permit.

Watershed Education and Outreach

The FY 05-06 Watershed Education and Outreach tasks include the following:

Watershed Watch Campaign

The Watershed Watch Campaign completed its fifth year during FY 04-05. Due to budget constraints, it is not possible to implement another full year of the Campaign. The Campaign tasks that will be implemented during FY 05-06 include website maintenance, responding to

[1] On February 1, 2001 the Management Committee directed Program staff to include all Program-Wide PI/P activities as part of the Projects Group budget and thus eliminated any confusion regarding selective Co-permittee participation.

hotline calls and attending one or two community outreach events. Depending on the availability of resources, other items will be considered.

Regional Ad Campaign

The Program will participate in the Regional Ad Campaign (RAC) in FY 05-06. In FY 02-03, FY 03-04 and FY 04-05, the RAC implemented the "Beautiful Watersheds" advertising campaigns for increasing the public's awareness about watersheds and problems caused by litter. The ads were broadcast on radio and television. The topic for the FY 05-06 RAC has not been decided.

Schools Outreach

For the past four years, the Program has sponsored up to 50 ZunZun assemblies at elementary schools in the Santa Clara Valley. Due to budget constraints, the Program will sponsor a smaller number of assemblies during FY 05-06. Outreach to schools will mainly be conducted through the *Wacky Watersheds* teachers training workshop. This workshop is offered free of charge to teachers by the City of San Jose. In the last year, the Program's Schools and Youth Outreach Work Group worked with the *Wacky Watersheds* group to identify three lessons on watersheds, correlate them to State Standards and integrate them in the workshop binder. Efforts are ongoing to make this workshop available to teachers at their in-service training days.

Strategic Planning

The Watershed Watch evaluation results indicated that while awareness of watersheds, pollutants and pollution prevention has increased, actual pollution prevention behaviors have not increased. The evaluation recommended that the Campaign continue its current activities and focus on specific long-term and short-term pollution prevention messages as noted in the evaluation report. In FY 04-05, a Work Group was formed to analyze these results and begin revising the Program's 1999 WEO Strategy. A draft revised strategy entitled *SCVURPPP WEO Strategy, June 2005* was submitted to the *Reg*ional Board in the Program FY 03-04 Annual Report. The Program will evaluate the draft revisions and plan outreach activities for future years.

Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso (Alviso Education Center)

The Program provides resources to the Alviso Education Center to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. This is an on-site educational program conducted primarily on weekends. The activities focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The Program will continue to support these activities in FY 05-06. Attachment 3.2 describes the activities offered in the Watershed Watchers Program.

<u>Pesticide User Outreach</u>

This project combines elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements of the Program's NPDES permit. Outreach is coordinated with other pollution prevention programs funded by Co-permittees (e.g., County's Household Hazardous Waste Program). During FY 05-06, ongoing outreach tasks from the Program's Pesticide Plan will be completed (see Section 6 of this Work Plan).

The tasks for FY 05-06 include:

- Task 1 – IPM Store Partnership Program - Continue IPM participation in Santa Clara County stores. At a minimum, visit each store once every two months; maintain an ongoing relationship with participating stores through in-store contacts; refresh/restock literature racks (as needed); and update "shelf talker" labels (as needed). Based on feedback from training sessions offered to store employees in FY 04-05 and the number of stores remaining to be trained, the Program may provide up to five training sessions during FY 05-06. These sessions will train employees on how to sell less-toxic pesticide products.
- Task 2 –Regional IPM Partnership –Support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. Review and approve products.
- Task 3 - Pesticide Distributor Outreach Program – Continue to support the Pesticide Distributor Outreach Program through BASMAA. This will involve coordinating Annie Joseph's efforts in this project with the Store Partnership outreach efforts. Provide staff for conducting outreach events at stores (e.g., Orchard Supply Hardware). At these events, customers are educated on available less toxic pest control methods and products, and proper disposal of pesticides. The Program may provide funds to support Annie Joseph's efforts after the grant ends in December 2005.
- Task 4 – Outreach Events - Plan and conduct one or two pesticide outreach events. These may include Pumpkins in the Park, Spring in Guadalupe Gardens, or San Jose Spring Home and Garden Show, etc. Program and Co-permittee staff will conduct outreach at these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures (e.g., Pests Bugging You, Grow It and Backyard Bugs).
- Task 5 – Outreach to industrial businesses - Continue distributing the "Don't Set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.

Mercury Pollution Prevention Outreach

To implement the Public Education and Outreach element of the Mercury Plan, Program staff established a new work group called the Mercury Pollution Prevention Outreach Work Group in December 2002. The objective of this group is to implement a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products. The Mercury Plan identifies the development of a fluorescent light tube (FLT) recycling public outreach and education plan as a priority and recommends conducting outreach in two phases. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of fluorescent light tubes.

Phase I of the Public Education and Outreach plan focused on residential FLT disposal. It was completed in FY 02-03. Implementation of Phase II, which targets small businesses and Conditionally Exempt Small Quantity Generators (CESQGs) was completed in FY 03-04.

In FY 04-05, the Program is continuing its mercury pollution prevention outreach activities in coordination with the County Household Hazardous Waste (HHW) Program's Mercury Grant described in Section 6 of this Work Plan. The County HHW Program is implementing this grant to increase collection opportunities for mercury-containing universal wastes (e.g., thermostats, fluorescent lighting and button batteries) at HHW collection events and community collection

sites. The Program is assisting the County HHW program in implementing the outreach component of this grant. The County HHW Program has partnered with a number of stores in the County for providing free fluorescent lamp drop-off sites for residents. The Program is implementing an advertising campaign as well as developing in-store signage to promote these drop-off locations.

In FY 05-06, the Program will continue to assist the HHW Program in implementing the outreach component of this grant. The Program may also coordinate its outreach activities with other Regional groups/program that are planning to conduct mercury outreach in FY 05-06.

Table 3-2 lists all of the PI/P projects to be funded during FY 05-06. Preliminary descriptions ("Development Strategy Checklists") for the Pesticide User Outreach and Mercury Pollution Prevention Outreach projects are provided in Attachment 3-1. The scopes of work will be finalized in more detail by Program staff and Co-permittees prior to implementation of the projects.

ATTACHMENTS

Attachment 3-1	Development Strategy Checklists (Project Descriptions for FY 05-06 PI/P Projects)
Attachment 3-2	Alviso Education Center Work Plan Tasks

Table 3-1
Pollutant Matrix for FY 05-06 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 05-06 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Diazinon and pesticides in general	Pesticides (residential, commercial and municipal use)	• Home gardeners • Pest control professionals • Landscapers • Municipal Employees • Residents who hire pest control professionals	Information on Watershed Watch website, IPM Store Partnership Program (regional and local), Pesticide User Outreach activities, Distribution of restaurant brochure "Don't Set a Table for Pests" through County Health Inspectors	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "When Ants Invade" Self-Mailer, "Landscaping, Gardening and Pool Maintenance" tri-fold, "Don't Set a Table for Pests", IPM Store Partnership Program Fact Sheets, "Control It", HHW programs, BASMAA Media Relations Campaign topic, Got Bugs magnet
Sediment	Erosion from new construction, grading, road wear	• Construction companies/contractors • Architects/engineers • Municipal inspectors • Residents (home improvement projects, remodels)	BASMAA Media Relations Campaign (potential topic), Outreach to developers via RWQCB Construction Site Management Workshops or other mechanism.	Construction BMP Tri-folds in English, Spanish and Vietnamese, "Blueprint for a Clean Bay" (revised 1-04), Construction Site Management workshops, Dewatering Brochure
Mercury	Tailpipe emissions (i.e., diesel-powered vehicles), consumer products (thermometers, fluorescent lighting)	• Residents (auto use, general awareness, proper selection and disposal of products) • Industry (fleet use) • Commercial (fleet use)	Information/fact sheets on Watershed Watch website, BASMAA Media Relations Campaign (potential topic), Mercury P2 Outreach (Residential and business fluorescent light recycling)	"Spare the Air and Water Too" campaign press release and public service announcements, bill stuffers, Program and local co-permittee fact sheets (e.g., Palo Alto and Sunnyvale), Watershed Watch radio and print ads, newsletter articles

Table 3-1, continued
Pollutant Matrix for Prioritizing PI/P Projects

Pollutant of Concern	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 05-06 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Copper	Brake pads, industrial discharge, copper algaecides, coolant leaks, illegal dumping	• Industry (scrubbers, roofs, cooling towers, piping) • Residents (illegal dumping, pools and spas) • Commercial business (pool, spa, fountain maintenance) • Municipal maintenance staff	BASMAA Media Relations Campaign (potential topic), Information on Watershed Watch website, support of Brake Pad partnership through BASMAA	Brake Pad Partnership, "Keep Pool/Spa Water Out of Storm Drains, Streets, and Creeks" (older pool and spa brochure), "Keeping It All In Tune", Industrial BMPs, storm drain stencils, "Draining Pools & Spas – Keep Pool, Spa and Fountain Water Out of Strom Drains, creeks and the Bay" (new pool brochure), Palo Alto's fact sheet on architectural use of copper
Nickel	Industrial discharges, tailpipe emissions, construction-related erosion	• See sediment and mercury target audiences	See sediment and mercury projects	See sediment and mercury projects
Trash	Intentional littering (cigarette butts, throwing objects from automobiles, illegal dumping), trucks hauling poorly secured materials, uncovered or overflowing garbage cans	• General public • Children • Drivers • Smokers	BASMAA media relations campaign (potential topic), Information on Watershed Watch website, BASMAA Regional Ad Campaign (potential topic)	"The Bay Begins at Your Front Door" brochure, Watershed Watch magnets, Watershed Watch Kit brochure, Watershed Watch web site, BASMAA's "Beautiful watersheds/trash" TV and radio ads

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.

Table 3-2
FY 05-06 PI/P Projects

Project Title	Project Description	Anticipated Budget	Comments
Non-Discretionary PI/P Projects			
1. Watershed Education and Outreach Campaign (Year 6)	The Watershed Education & Outreach Campaign is complete. Limited maintenance will be conducted along with planning for FY 06-07.	$308,200	Proposed Activities: • Limited Watershed Watch Campaign to include website maintenance • BASMAA RAC • Strategic Planning • School Outreach • Alviso Education Center • Advertising to support Creek Cleanup Activities
2. Pesticide User (PU) Outreach (Year 4)	Project combines cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Scope to include items in Program's Pesticide Management Plan for outreach to residents, commercial businesses, and pest control operators.	$40,000	SCVURPPP will continue to support the Regional IPM Partnership Program, and consider supporting other pesticide related projects through its participation in BASMAA. Program will continue to maintain the 29 stores participating in the store partnership program. Additional outreach will be made locally to pesticide users, potentially residential and commercial users, residents hiring pest control professionals, and/or other audiences. Outreach will be conducted at community events, advertising and by conducting IPM workshops for residents.
3. Mercury Pollution Prevention Outreach (Year 3)	Continuing outreach on proper disposal of mercury containing wastes and education on low-mercury products.	$25,000	Program will continue its mercury outreach and coordinate its efforts with the County HHW Program in implementing its mercury grant. The Program may also coordinate its outreach activities with other Regional groups/programs that are planning to conduct mercury outreach in FY 05-06.
4. Program Supplies	Estimated budget for reprints of materials for Program use and other Program supplies.	$5,000	

Attachment 3-1

FY 05-06 Development Strategy Checklist
Watershed Education and Outreach

1. **Project Title:** **Watershed Education and Outreach**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:**
   Change specific behaviors that adversely affect water quality; increase understanding about watersheds and stormwater pollution prevention.

4. **General Project Description:**
   This project includes the following tasks:

   Watershed Watch Campaign - The Watershed Watch Campaign completed its fifth year during FY 04-05. Due to budget constraints, it is not possible to implement another full year of the Campaign. The Campaign tasks that will be implemented during FY 05-06 include website maintenance, responding to hotline calls and attending one or two community outreach events.

   Regional Ad Campaign - The Program will participate in the Regional Ad Campaign (RAC) in FY 05-06. In FY 02-03, FY 03-04 and FY 04-05, the RAC implemented the "Beautiful Watersheds" advertising campaigns for increasing the public's awareness about watersheds and problems caused by litter. The ads were broadcast on radio and television. The topic for the FY 05-06 RAC has not been decided.

   Schools Outreach - For the past four years, the Program has sponsored up to 50 ZunZun assemblies at elementary schools in the Santa Clara Valley. Due to budget constraints, the Program will sponsor a smaller number of assemblies in FY 05-06. Outreach to schools will mainly be conducted through the *Wacky Watersheds* teachers training workshop. This workshop is offered free of charge to teachers by the City of San Jose. In the last year, the Program's Schools and Youth Outreach Work Group worked with the *Wacky Watersheds* group to identify three lessons on watersheds, correlate them to State Standards and integrate them in the workshop binder. Efforts are ongoing to make this workshop available to teachers at their in-service training days.

   Strategic Planning - The Watershed Watch evaluation results indicated that while awareness of watersheds, pollutants and pollution prevention has increased, actual pollution prevention behaviors have not increased. The evaluation recommended that the Campaign continue its current activities and focus on specific long-term and short-term pollution prevention messages as noted in the evaluation report. In FY 04-05, a Work Group was formed to analyze these results and begin revising the Program's 1999 WEO Strategy. A draft revised strategy entitled SCVURPPP WEO Strategy, June 2005 was submitted to the Regional Board in the Program FY 03-04 Annual Report. The Program will evaluate the draft revisions and plan outreach activities for future years.

   Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso (Alviso Education Center) - The Program provides resources to the Alviso Education Center to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. This is an on-site educational program conducted primarily on weekends. The activities focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The Program will continue to support these activities in FY 05-06. Attachment 3.2 describes the activities offered in the Watershed Watchers Program.

FY 05-06 Development Strategy Checklist
Watershed Education and Outreach

5. **Outreach/Activity Areas and Communication Goals:**
   Increasing Awareness and Changing Behavior, particularly with respect to watersheds and stormwater pollution prevention.

6. **Target Audience:** To be determined, may include:
   (X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, (X) Schools,
   ( ) Municipal Employee Training, ( ) Public Officials, (X) Multi-cultural Education,
   ( ) Other_____

7. **Distribution Strategy:**
   Regional media campaign, website, distribution of brochures, school assembly program

8. **Describe how the success of the project will be measured:**
   The various tasks will be evaluated as described below:
   Watershed Watch Campaign – By tracking website visits, hotline calls and outreach material distributed.
   BASMAA RAC – Gross impressions of radio and TV ads.
   Schools Outreach – Survey cards filled by teachers after ZunZun assemblies, number of teachers attending the Wacky Watersheds workshop and feedback received from them.

9. **Have similar projects been done by other agencies?**
   Yes

10. **Schedule:**
    FY05-06

11. **Budget:**

    See Table 3-2

12. **Identify the evaluation criteria that the project meets:**

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    (X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    (X) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. **Implementer(s):** (X) Work Group, (X) Program Staff, (X) Consultant,
    ( ) Other:_____

FY 05-06 Development Strategy Checklist
Pesticide User Outreach

1. Project Title: Pesticide User (PU) Outreach

2. Proposer: Program Staff

3. Specific Pollutant or Behavior Project Addresses:
Toxicity due to organophosphate pesticides (diazinon and chlorpyrifos) in local creeks and San Francisco Bay. Selection, use and disposal of pesticides by residential and commercial users, pest control operators and pesticide retailers.

4. General Project Description:
This project combines the best elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements in the Program's NPDES permit. The approach will be coordinated with other pollution prevention programs funded by Co-permittees (e.g., County's Household Hazardous Waste Program). Scope to be developed based on the Program's Pesticide Management Work Plan and the results of the FY 03-04 outreach work. Activities may include:

- IPM Store Partnership Program - Continue the program in stores in participating Santa Clara County stores. Visiting each store once every two months at a minimum, maintain ongoing relationship with participating stores through in-store contacts, refresh/restock literature racks as needed, and update "shelf talker" labels as needed. Based on feedback from training sessions offered to store employees in FY 04-05 and the number of stores remaining, the Program may provide training sessions to store employees. These sessions train employees in selling less-toxic pesticides.
- Regional IPM Partnership –Support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. Review and approve products.
- Pesticide Distributor Outreach Program – Continue to support the Pesticide Distributor Outreach Program (currently funded through a Prop 13 Grant to Marin County) through BASMAA by coordinating Annie Joseph's efforts with the Store Partnership outreach efforts. Provide staff for conducting outreach events at stores, i.e., Orchard Supply Hardware. At these events, customers are educated on available less toxic pest control methods and products, and proper disposal of pesticides.
- Outreach Events - Attend one or two pesticide outreach events in coordination with Watershed Watch. These may include Pumpkins in the Park, Spring in Guadalupe Gardens, or San Jose Spring Home and Garden Show. Program and Co-permittee staff will staff these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures (e.g., Pests Bugging You, Grow It and Backyard Bugs).
- Outreach to commercial businesses - Continue distributing the "Don't set a table for pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.

5. Outreach/Activity Areas and Communication Goals:
PI/P Outreach/Area to be further determined. PI/P Communication Goal will include Increasing Awareness and Changing Behavior, particularly with respect to pesticide use and disposal.

FY 05-06 Development Strategy Checklist
Pesticide User Outreach

6. Target Audience: To be determined, may include:
(X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools,
( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education,
( ) Other_____

7. Distribution Strategy:
To be determined.

8. Describe how the success of the project will be measured:
The BASMAA Regional IPM Committee conducted a customer intercept survey in October and November 2004 to evaluate the success of the IPM Store Partnership Program. In addition, the BASMAA Regional IPM Committee conducted a customer intercept survey in September and October 2004 to evaluate the Store Partnership Project. Five stores from Santa Clara County were included in this survey. The survey indicates that approximately 23% of Santa Clara County residents are aware of the Our Water Our World promotion. The final survey report will be included within the Program's FY 04-05 Annual Report. The Watershed Watch evaluation conducted in September 2003 tracked the publics' knowledge about various pollutants, including pesticides, affecting the water quality in the Bay. The final evaluation report was included in the Program's FY 03-04 Annual Report. Program staff also maintains a log of requests received for fact sheets, number of fact sheets distributed and number of people reached at outreach events.

9. Have similar projects been done by other agencies?
Yes

10. Schedule:
FY05-06

11. Budget:

See Table 3-2

12. Identify the evaluation criteria that the project meets:

(X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
(X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
(X) County-wide implementation will be more cost-effective than local implementation.
(X) The project supplements a regional project and/or program.
(X) The success of the project is measurable.
(X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. Implementer(s): (X) Work Group, (X) Program Staff, ( ) Consultant,
( ) Other:_____

FY 05-06 Development Strategy Checklist
Mercury Pollution Prevention Outreach

1. **Title:** Mercury Pollution Prevention Outreach

2. **Project Proposer:** SCVURPPP Mercury Pollution Prevention Ad Hoc Task Group

3. **Specific Pollutant or Behavior Project Addresses:** Mercury

4. **General Project Description:** The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedance of water quality standards for mercury.

Mercury has been found in sediment from the South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires a mercury pollution prevention plan that includes public education regarding mercury, products containing mercury and proper disposal. The Program completed a Mercury Pollution Prevention Plan and submitted it to the Regional Board on March 1, 2002. The outreach tasks in this Plan are the basis for the FY 02-03 (Phase I) and FY 03-04 (Phase II) work plans. The focus of outreach in FY 02-03 was residential fluorescent light tube disposal. In FY 03-04, this outreach was extended to small businesses and conditionally exempt small quantity generators (CESQGs). Outreach was coordinated with municipal inspectors for integrating mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.

In FY 04-05, outreach is being coordinated with the County Household Hazardous Waste (HHW) Program's Mercury Grant. The County HHW Program is implementing this grant to increase collection opportunities for mercury-containing universal wastes including thermostats, fluorescent lighting, and button batteries at HHW collection events and community collection sites. Program's Mercury Outreach Work Group is currently discussing ways to promote the fluorescent lamps drop-off locations to residents. In FY 05-06, the Program will continue to assist the CoHHW Program in conducting outreach in support of its Mercury Grant. The Program may also coordinate its outreach activities with other Regional groups/program that are planning to conduct mercury outreach in FY 05-06.

4. **Outreach/Activity Areas and Communication Goal:** Develop a plan to increase outreach efforts to residents and businesses on recycling of mercury containing wastes.

5. **Target Audience:**
(X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools, ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education, ( ) Other_____

6. **Distribution Strategy:** Media advertising, newsletter articles.

FY 05-06 Development Strategy Checklist
Mercury Pollution Prevention Outreach

7. **Describe how the success of the project will be measured:** Number or amount of mercury-containing products (i.e. fluorescent lamps, thermometers) collected by Household Hazardous Waste facilities; description of outreach methods used; number of outreach materials distributed.

8. **Have similar projects been done by other agencies?** City of Palo Alto has conducted a FLT recycling program. Smaller projects (i.e., thermometer take-back programs) have been conducted by other agencies.

9. **Schedule:** FY 05-06

10. **Budget:**

See Table 3-2

11. **Identify the evaluation criteria that the project meets:**

(X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
(X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
(X) County-wide implementation will be more cost-effective than local implementation.
( ) The project supplements a regional project and/or program.
(X) The success of the project is measurable.
(X) The targeted audience is consistent with targeted PI/P activities and audiences.

12. **Implementer(s):** SCVURPPP Mercury Pollution Prevention Outreach Work Group for FLT recycling in coordination with the Watershed Watch campaign and the SCVURPPP PIP Ad Hoc Task Group

FY 05-06 Development Strategy Checklist
Program Supplies

1. **Project Title:** **Program Supplies**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:** Varies

4. **General Project Description:**
   To provide a budget to support requests by the public and co-permittees for Program materials and supplies. This budget allows Program staff to reprint materials and reorder supplies as needed.

5. **Outreach/Activity Areas and Communication Goal:** N/A

6. **Target Audience:** To be determined, as needed.
   (X) Residential, (X) General Public, (X) Industrial, (X) Commercial, (X) Schools, (X) Municipal Employee Training, (X) Public Officials, (X) Multi-cultural Education, (X) Other_____

7. **Distribution Strategy:**
   Program staff will coordinate material reprints, reordering supplies and distribution to co-permittees as appropriate. Program staff distributes materials at public events and in response to telephone, e-mail or web site requests.

8. **Describe how the success of the project will be measured:** The Program logs all requests for materials and tracks the amount of materials distributed. The need for reprints is based on successful distribution of existing stock.

9. **Have similar projects been done by other agencies?** N/A

10. **Schedule:** As needed.

11. **Budget:**

See Table 3-2

12. **Identify the evaluation criteria that the project meets:** N/A

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    ( ) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

Attachment 3-2

Attachment 3.2: "Watershed Watchers: Keeping Our Waterways Clean" Program with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso.

To conduct the Watershed Watchers Program, the Program will fund and support an interpretive specialist position at the Alviso Education Center. The program includes the following elements:

Watershed Watchers: Puppet show introducing the concept of watersheds and urban runoff. The show will be performed on-site and off-site.

Wildlife in Our Watershed Depends On You: Interpretive programs focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed. Examples include children's bird walks, salt marsh mud studies, twilight walks and general nature hikes followed by chemical demonstration of eutrophication.

Gardening Without Chemicals Workdays: Garden work days emphasizing chemical-free gardening techniques.

Gardening Without Chemicals Workshops: Workshops guiding visitors through various native plants in EEC demonstration gardens while discussing chemical-free gardening techniques used in the gardens and implementation methods for the home garden.

Help Save the Bay This Holiday: Guided nature tours in Bay habitats based on a holiday theme. The program addresses how individual behaviors cause urban runoff pollution which affect wildlife habitats in the watershed.

Our Role in Preventing Urban Runoff: Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. This is usually done with groups that make reservations (e.g., Scouts and Lyceum).

Special Events: These events are designed to attract at least 200 people to the EEC for various activities including games and crafts. Each activity educates participants about urban runoff pollution prevention.

Watershed Clean-Up: A concentrated effort to remove litter from watershed areas (e.g., creeks and sloughs).

Informal Indoor Visitor Contact: Includes interaction at the Center and answering visitor questions over phone.

Distribution of Specified Programs to Local Media: Includes contacting Bay Area Parent, Mercury News, and Metro; and creating appropriate descriptions/press releases.

Developing and Maintaining Partnerships with Local Community Organizations: Phone calls and e-mails to groups which include San Jose Community Gardens, the San Francisco Bay Bird Observatory and volunteer coordinators at local companies (e.g., Intel and Sony, etc.).

Coordinating Refuge Volunteers for Interpretive Programs/Gardens: Contacting volunteers to lead programs, training, and maintaining relationships with volunteers; and scheduling volunteers for special events.

Alviso Summer Camp: This includes acting as a leader and assisting in program planning for the one-week annual camp which targets Alviso residents.

SECTION 4

FY 05-06 ANNUAL MONITORING PLAN & WATERSHED MANAGEMENT MEASURES

4. MONITORING PROGRAM

INTRODUCTION

The Annual Monitoring Program Plan contains two main elements: 1) Summary of Environmental Monitoring Measures (EMMs), and 2) Summary of Programmatic Monitoring Indicators (PMIs). The goals of the Program's monitoring program are provided within the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program) Revised Multi-Year Receiving Waters Monitoring Plan[1].

SUMMARY OF ENVIRONMENTAL MONITORING MEASURES (EMMS)

Environmental monitoring and assessment measures (EMMs) are activities that entail the collection of environmental data through field studies and analysis of information through assessments. EMMS are coordinated at the local or regional level and typically fall into one of two general areas:

- Watershed Assessment Activities; and,
- Pollutants of Concern (POCs) Monitoring.

EMMs are intended to: 1) assist the Regional Board characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program; 2) identify where and what type of screening-level monitoring is appropriate; and 3) recognize the need for site-specific water quality investigations to address questions that might arise while conducting screening-level monitoring efforts. The main EMM activities that the Program will conduct during FY 04-05 are described in the following sections.

FY 05-06 Annual Receiving Waters Monitoring Plan

The SCVURPPP Annual Receiving Water Monitoring Plan (Annual Plan) is provided in Attachment 4-1. Table 4-1 in Attachment 4-1 was prepared consistent with the Program's Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan), which was submitted in the Program's FY 04-05 Work Plan[2]. Table 4-1 identifies planned receiving water monitoring activities for FY 05-06, the proposed schedule (by fiscal year quarter) to conduct the work, the rationale for the proposed item and the lead party. The locations and frequencies of sampling events scheduled during FY 05-06 are provided in Table 4-2 of Attachment 4-1. A site map (Figure 4-1) detailing sampling locations in the Stevens Creek, Permanente Creek, Calabazas Creek, Sunnyvale (East and West) Channels and Matadero/Barron Creek watersheds is also provided in Attachment 4-1. Table 4-3 of Attachment 4-1 provides a description of data parameters and analytical methods to be used in the Revised Multi-Year Plan.

The Annual Plan utilizes a tiered monitoring approach. The approach is discussed by Regional Board staff in its RMAS memo (February 8, 2001 Draft Monitoring Design in Regional Board-

[1] Program's Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan) was revised to embrace the recommendations presented in the *Assessment of Watershed Assessment Methods* report, lessons learned from monitoring in FY 02-03 and 03-04 and to address the Regional Board's December 2003 review of the SCVURPPP monitoring efforts conducted by Tetra Tech. The Revised Multi-Year Plan covers a period of eight years starting with FY 02-03. Each SCVURPPP Annual Monitoring Plan is developed consistent with the framework in the Revised Multi-Year Plan.

[2] The Revised Multi-Year Plan is part of the SCVURPPP Urban Runoff Management Plan per Permit Provision C.6.b of the NPDES permit and includes types, intervals and frequencies of monitoring consistent with the recent Baykeeper court decision.

lead Pilot Watersheds) and includes the following monitoring categories: screening level, investigative, and status and trends.

Consistent with the Revised Multi-Year Plan, the Program has also developed a characterization memorandum that includes a summary of existing data and information resources; a description of relevant watershed attributes; and a list of key issues in watersheds where a first year of data collection will occur (i.e., Stevens and Permanente Creeks). This memorandum, which is entitled *Watershed Characterization and Sampling Design Rationale-Stevens and Permanente Creek Watersheds*, is included as Attachment 4-2. It is intended to assist Program staff in developing an appropriate FY 05-06 sampling design for these watersheds.

Sediment Assessment

Beginning in FY 03-04, the Program began conducting watershed analyses and sediment management practice assessments in high priority Santa Clara Valley watersheds to determine if excessive sediment production from anthropogenic activities is adversely impacting creeks. To provide a framework for conducting these studies, the Program submitted a Sediment Assessment Work Plan to Regional Board staff on August 30, 2002 in fulfillment of the Permit Provision C.9.f.iii paragraph two (see Attachment 4-5 of the Program's FY 03-04 Work Plan).

The Sediment Assessment Work Plan contains two separate phases. Phase I includes conducting a limiting factors analysis (LFA) and sediment management practices assessment. Phase II includes conducting a rapid sediment budget. Phase II will only be conducted if Phase I study results indicate that excessive sediment from anthropogenic sources is adversely impacting beneficial uses in the watershed.

In FY 04-05, the Program successfully completed a LFA and sediment management practices assessment in Stevens Creek and began conducting a LFA in the Upper Penitencia Creek watershed.

Planned FY 05-06 Activities

In FY 05-06, the Watershed Analysis Ad Hoc Task Group (Watershed Analysis AHTG), which was previously established to develop the Sediment Assessment Work Plan, will complete their review of documents developed in Phase I of the Upper Penitencia Creek watershed and make recommendations for Phase II, if warranted. In addition, Program Staff in coordination with the Watershed Analysis AHTG will complete a sediment management practices assessment for Upper Penitencia Creek. All Watershed Analysis AHTG recommendations will be reviewed and approved by the Management Committee.

Watershed Assessment

Watershed assessment is the systematic review of specific resources (e.g., benthic macroinvertebrates or fish and their habitat and riparian areas in a watershed-scale context). Watershed assessment is a stage-setting process intended to be based primarily on existing information. The results of a watershed assessment can be used to establish the context for subsequent evaluations and analysis of cumulative watershed effects. Watershed assessments typically address cumulative effects within a watershed; provide for more ecologically sound resource planning; and identify and help protect environmentally sensitive areas.

From its inception in 1990 through 1995, the Program's monitoring activities focused on establishing baseline information through sampling and analysis of runoff from various land uses and ambient waters. Most recently, the Program implemented the monitoring approach endorsed by the State Water Resources Control Board (SWRCB) Surface Waters Ambient Monitoring Program (SWAMP) and by the Regional Board's Regional Monitoring and Assessment Strategy (RMAS). However, the SWAMP/RMAS approach focuses on strategies for monitoring but does not describe methods to assess monitoring data. To address this need, the Program recently developed and tested a method to assess stream ecosystem functions in the Coyote Creek watershed that integrated hydrogeomorphic models and indices of biotic integrity. This method was found useful for evaluating stream ecosystem functions and associated aquatic life beneficial uses. In addition, it is useful for identifying and prioritizing additional management actions which could improve conditions and beneficial use attainment; and monitoring activities that could fill existing data gaps.

After testing the stream ecosystem function (SEF) method in Coyote Creek, the Program conducted an *Assessment of the Watershed Assessment Methods* project. This project was undertaken to build upon recent pilot studies and evaluate findings in the context of the Program's current monitoring and assessment program as well as those implemented by other selected local, regional, and state agencies. Recommendations from the project included using the SEF assessment approach to analyze data generated from an ambient monitoring program based largely on rapid bioassessments. The Program has embraced this recommendation by integrating watershed assessments into the Revised Multi-Year Plan. The framework includes conducting screening-level monitoring over a period of two years, followed by an assessment of existing data sources in a watershed-scale context. Results of these assessments will be documented in a *Watershed Assessment Report*, and include descriptions of assessment methods, identification of data gaps and potential follow-up studies, and recommended management actions, where feasible.

Planned FY 05-06 Activities

The Program conducted ambient surface water quality monitoring, physical habitat assessment studies, and bioassessment studies in the San Tomas and Adobe Creek watersheds for two consecutive years (FY 03-04 and FY 04-05). The results and analyses of these data collection activities will be summarized in the Program's *FY 04-05 Watershed Monitoring and Assessment Summary Report* (Summary Assessment Report).

Consistent with the Revised Multi-Year Plan, the Program will conduct a watershed assessment in selected watershed areas of San Tomas and/or Adobe Creek watershed. The area assessed will depend on the extent of the watershed area that supports specific beneficial uses and the type of indicator data that are available. For example, assessment of cold freshwater habitat indicators in the San Tomas watershed would be restricted to the Saratoga Creek subwatershed since it is the only water body in this watershed that supports a cold water fish community (i.e., resident rainbow trout).

During the watershed assessment, the Program intends to:

- Evaluate existing data sources collected in San Tomas and Adobe Creek with respect to environmental indicators of watershed health and support of beneficial uses.
- Identify data gaps or investigative studies needed to determine potential impacts to

beneficial uses.
- Conduct field reconnaissance and/or collect additional data, where feasible, to address data gaps.
- Identify recommended management actions designed to reduce/eliminate impacts on beneficial uses.

Additional information on the FY 05-06 watershed assessment is provided in Attachment 4-3.

Trash Work Plan

To fulfill a FY 01-02 Continuous Improvement item, the Program prepared a Trash Work Plan (see Attachment 4-6 of the FY 03-04 Work Plan) that identifies a strategy for addressing trash problem areas that occur in or near urban streams and waterways. The Work Plan was developed in response to the November 14, 2001 RWQCB 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on a preliminary or "monitoring" list due to the threat of trash impairment to water quality. The Trash Work Plan includes the following objectives: 1) Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in or near creeks; 3) Assist municipalities in identifying the high priority trash problem areas and sources of trash; 4) Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas; and 5) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

Planned FY 05-06 Activities

The tasks identified in the FY 05-06 Work Plan focus on the implementation of trash evaluations and control measures, as appropriate to address trash problem areas within high priority areas. For additional information on planned trash activities, refer to the Implement Trash Work Plan monitoring project summary in Attachment 4-3.

Regional Collaborative Monitoring Efforts

Regional Monitoring Program for Trace Substances (RMP)

In accordance with the Program's NPDES permit, the Program contributes approximately $162,000 annually to the Regional Monitoring Program for Trace Substances (RMP), which monitors contaminants in water, sediments, and fish and shellfish tissue in San Francisco Bay and the Delta. The San Francisco Estuary Institute (SFEI) administers the RMP. This funding is in addition to funding provided by the three South Bay POTWs, who are also Co-permittees, to the SFEI. Program staff participates on the RMP Steering Committee, Technical Review Committee and Sources, Pathways and Loading Work Group (SPLWG). The Program Manager serves as the BASMAA representative to the RMP Steering Committee.

Clean Estuary Partnership (CEP)

On August 6, 2001, a Memorandum of Understanding (MOU) regarding development of: 1) a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries and 2) TMDLs for 303(d) pollutants (including mercury), was entered into by the Regional Board, BACWA and BASMAA. This group is referred to as the Clean Estuary Partnership (CEP). As a member

agency of BASMAA, the Program assisted in developing and funding potential projects for the Bay TMDLs. During FY 04-05, Program staff has been participating in the CEP Technical Committee meetings.

Bay Area Stormwater Management Agencies Association (BASMAA)

The Program is a member of BASMAA, a consortium of seven San Francisco Bay Area municipal storm water programs. The goal of BASMAA is to promote regional collaboration on developing consistent monitoring and watershed assessment methodologies and to facilitate efficient use of public resources. Program staff participates in the following BASMAA activities: Executive Board, Monitoring Committee, New Development Committee, Public Information/Participation Committee and Operational Permits Committee and serves as the Vice-chair of BASMAA.

Regional Biological Assessment Network (BAMBI)

In February 2002, the Program participated in a workshop for information sharing and discussion of recent and ongoing bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. Additional workshops were held in January 2003, 2004 and 2005. The Program intends to continue supporting and participating in BAMBI in FY 05-06. For additional information regarding these activities, refer to the BAMBI monitoring project summary in Attachment 4-3.

Brake Pad Partnership (BPP)

After studies in the South Bay indicated that automobile brake pads may be the most significant source of copper in urban runoff, the Brake Pad Partnership (BPP) was initiated in 1996 as a collaboration between regulators, storm water programs, brake material manufacturers, scientists and environmentalists to address environmental problems from brake wear debris. The BPP's work includes research and monitoring, and is an integral part of the Program's Copper Action Plan. In addition, the Program participates (via BASMAA) by funding a BPP technical representative.

Planned FY 05-06 Activities

The Program will continue to participate in various RMP committees and work groups; participate in the CEP depending on the availability of resources; and collaborate with BASMAA on regional stormwater issues. In addition, the Program anticipates providing support and actively participating in BAMBI activities with the goal of beginning the development of a regional bioassessment tool which is necessary to provide context to bioassessment data collected in creeks relevant to the Program. Contingent upon available funding, the Program also plans to continue participating in the BPP through BASMAA and/or the CEP.

SUMMARY OF PROGRAMMATIC MONITORING INDICATORS (PMIs)

Programmatic Monitoring Indicators (PMIs) are used to gauge how well performance standards are being met and control measures are being implemented. Programmatic monitoring efforts typically include tracking and evaluating continuous improvements and evaluating the effectiveness of implementing control programs for pollutants of concern.

The FY 05-06 PMIs Summary Table (see Attachment 4-4) illustrates all existing commitments and priorities established by the Program, including ongoing activities meant to fulfill Regional Board Order Provisions C.9. "Water Quality-Based Requirements for Specific Pollutants of Concern" and C.10. "Watershed Management" of the NPDES permit. A brief capsule scope is provided for each project along with the anticipated products and expected timeframe for completion. For some projects, specifically those that are being conducted to directly respond to a specific pollutant of concern referenced in the NPDES permit, a separate one-page scope was developed and is presented within Attachment 4-3. Pesticide management activities planned for FY 05-06 are presented within Section 5 of this Work Plan.

Control Program Activities- PCBs, Mercury, Dioxins and Legacy Pesticides

The 1998 and 2002 Clean Water Act Section 303(d) lists designate all segments of San Francisco Bay as impaired by certain dioxin-like compounds, mercury, polychlorinated biphenyls (PCBs) and certain chlorinated pesticides referred to as legacy pesticides (DDTs, dieldrin and chlordanes). The listings were in response to an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment (OEHHA). OEHHA issued the advisory after these pollutants were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. It should be noted that the Regional Board opposed the 1998 listing of dioxins in the Bay, but was overruled by the United States Environmental Protection Agency (USEPA).

The 2002 303(d) list designates the TMDL priority for mercury and PCBs as high. As a result, the Regional Board is currently implementing TMDLs for these pollutants. The 303(d) list designates the TMDL priority for dioxins, dieldrin, chlordanes and DDTs as low. Bay TMDLs are not currently planned for these pollutants.

Previous Work

During the past several years, monitoring program activities related to dioxins, mercury, PCBs, and chlorinated pesticides have included:

<u>Multiple Pollutants</u>

- The Program led a regional study, referred to as the Joint Stormwater Agency Project (JSAP), which characterized the distribution of mercury, PCBs and chlorinated pesticides in storm water conveyance sediments in Bay Area watersheds.

- The Program has provided funding to BASMAA, the Clean Estuary Partnership (CEP), and the San Francisco Estuary Regional Monitoring Program (RMP). These regional programs help monitor pollutants of concern and/or assist in the development of management strategies.

- Program staff has participated in selected stakeholder, BASMAA, CEP and RMP committees and work groups.

- Program staff represented BASMAA on the RMP Technical Review Committee and the Sources, Pathways and Loadings Work Group; and CEP mercury and PCBs work groups.

- The Program has collected and analyzed water and sediment samples from selected Santa Clara Valley watersheds as part of its receiving waters monitoring and assessment program. Additional information is available in the Revised Multi-Year Plan.

PCBs

- The Program and the City of San Jose performed PCBs case study work in six urban areas in San Jose where elevated concentrations of PCBs were found during the JSAP study. The case studies were aimed at identifying PCBs sources and beginning to develop controls.

- To assist other Bay Area storm water agencies, the Program developed guidance documents on performing PCBs case studies. The guidance documents outlined case study objectives, typical methodologies and tasks, locations and schedules.

- Program staff facilitated a work group of representatives from BASMAA and Regional Board staff to coordinate the JSAP study and PCBs cast studies. The work group met periodically to facilitate information sharing, coordination of field activities and regional planning.

- The Program prepared a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County.

- The Program completed a review of efforts to develop methods of controlling discharges of PCBs from Bay Area urban runoff conveyances. The review:

    - Summarizes and discusses past, current and planned efforts to identify PCBs control options in the Bay Area in coordination with the Bay PCBs TMDL, including the PCBs case studies performed by Bay Area storm water agencies.
    - Describes existing Bay Area urban runoff management practices that may help control discharges of PCBs.
    - Reviews potential new management practices for controlling discharges of PCBs and qualitatively discusses the pros and cons of each practice.

Dioxins

- The Program reviewed readily available data on methods used to characterize dioxin compounds in storm water runoff and surface waters and concentrations typically found in the Bay Area and other areas.

- The Program collaborated with other Bay area storm water management agencies to develop a “synthesis” document on dioxin-like compounds. This document summarizes the current state of knowledge regarding dioxin-like compounds in relation to storm water runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, impacts, sources, pathways, review of relevant Bay Area, national and international studies, and qualitative review of potential storm water controls.

- Program staff began tracking regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Program staff also began encouraging Co-permittees to track and participate in these programs; and evaluate the feasibility of performing public outreach activities and developing policies and ordinances (e.g., City of Palo Alto's Dioxin Elimination Policy).

Planned FY 05-06 Activities

The Program plans to continue collaborating with the regulatory and discharger community; and other stakeholders to develop technically and economically feasible strategies to address controllable sources of pollutants of concern. The overarching principle is to develop cost-effective strategies with realistic potential to protect public health. Factors other than strict cost-effectiveness (e.g., the likelihood of identifying responsible parties or obtaining state or federal funding to identify and cleanup on-land PCBs sites) may be important. The Program will also consider the potential benefit of implementing strategies that concurrently address multiple sediment-bound pollutants.

During FY 05-06, the Program will continue to work with other Bay area dischargers and Regional Board staff through BASMAA, the CEP and the RMP to implement regional projects related to dioxins, mercury, PCBs, and chlorinated pesticides.[3] This may include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff. Program staff will continue to represent BASMAA on the RMP Technical Review Committee, the RMP Sources, Pathways and Loadings Work Group, the CEP mercury work group and the CEP PCBs work group.

Program staff will continue to track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Co-permittees will be encouraged to track and participate in these programs and evaluate the feasibility of performing public outreach activities and developing related policies and ordinances. Relevant regional, state and federal efforts include the Bay Area Dioxins Project managed by the Association of Bay Area Governments and multi-faceted efforts by USEPA to assess dioxin risks and monitor and control dioxins.

For additional information on planned FY 05-06 tasks related to dioxins, mercury, PCBs, and chlorinated pesticides, refer to the monitoring project summary in Attachment 4-3. Additional planned FY 05-06 activities for controlling mercury are presented in Section 6.

Control Program Activities - Copper and Nickel

The majority of baseline actions are implemented at the Program level (except for those assigned to San Jose, Sunnyvale and Palo Alto), and are included in the Program's Annual Reports and Work Plans. However, the Regional Board expects Co-permittees to implement applicable actions at the local level. The Program has identified the following copper control activities that are feasible to implement at the Co-permittee level:

[3]The Program is separately implementing a mercury pollution prevention program. See Section 6 of the Program's Work Plan and past Annual Reports for additional information.

- CB-1: Measures to reduce copper discharges from vehicle washing operations;
- CB-3: Measures to control copper in discharges of stormwater in targeted industrial sources;
- CB-6, 7: Measures to reduce traffic congestion/promote alternative transportation;
- CB-8: Measures to classify and assess watersheds and improve institutional arrangements for watershed protection;
- CB-11: Measures to improve street sweeping controls and stormwater system operation and Maintenance;
- CB-12: Measures to control copper discharges from pools and spas;
- CB-21: Measures to discourage architectural use of copper; and
- NB-1: Measures to control nickel discharges from construction sites (sediment).

Individual Co-permitees included measures to address each of these activities, as applicable, within their Work Plans provided in Section 9. Currently, the Program's Copper/Nickel Work Plan contains 21 copper and 7 nickel baseline actions. Certain copper work plan actions (e.g. measures to improve street sweeping controls, measures to control copper from targeted industrial sources, measures to evaluate effectiveness of performance standards) closely relate to existing performance standards requirements or are otherwise independently mandated by the Program's NPDES permit (e.g., Permit Provision C.6.a.i and ii). During FY 05-06, the Program is committed to continuing its focus on the following copper control actions: Brake Pad Partnership (BPP), water quality monitoring for copper and other constituents as part of the Program's Revised Multi-Year Receiving Waters Monitoring Plan, public education and outreach and providing guidance for Co-permittee activities.

FY 05-06 Work Plan Content

The Program's FY 05-06 Copper/Nickel Work Plan is consistent with the previously agreed upon format as first used in the Program's *Revised FY 03-04 Copper/Nickel Work Plan*, (i.e., tabular format with columns listing the activity, the FY 05-06 tasks, status/comments, due date, and responsible party). In addition, it provides updates for FY 04-05 accomplishments reported to date; the originally proposed work plan tasks for FY 04-05; and actions accomplished in FY 03-04 (if applicable). The FY 05-06 Copper/Nickel Work Plan is provided in Attachment 4-5. A complete report of FY 04-05 accomplishments will be included within the Program's *FY04-05 Annual Report*. In addition, the City of San Jose will continue to monitor and report on dissolved copper and nickel concentrations during the dry season in Lower South San Francisco Bay as part of the CAP/NAP ambient monitoring and trigger program. This continued independent sampling effort needs to be evaluated as part of the changes made to the overall RMP Bay-wide sampling effort.

Future CAP/NAP Approach

On December 9, 2003, the Bay Modeling and Monitoring (BMM) subgroup met and collectively determined that further efforts at fine-tuning the CAP baseline activities would likely be unproductive due to certain remaining inherent challenges with the original CAP/NAP language. To assist in the identification of key baseline copper control activities that are most effective in the removal of copper, the Clean Estuary Partnership prepared a document entitled *Copper Sources in Urban Runoff and Shoreline Activities: Information Update*. This report was prepared as part of North of Dumbarton Cu/Ni site-specific objective (SSO) project funded through the CEP and finalized in November 2004. Based on the outcome of this CEP project and subsequent review and discussions with Regional Board staff and Co-permittees, the

Program will develop and submit a revised FY 05-06 Copper/Nickel Work Plan to reflect these focused copper control activities.

On November 10, 2004, the subgroup reviewed the current CAP using the adaptive management process built into the CAP. This process involved reviewing tables which described how each baseline activity had either been completed or been incorporated into another on-going Program or POTW activity. The tables also contained proposed revised CAP activities reporting approaches, describing where and how annual CAP activity information could be found within other reports. The goal of the effort was to reduce the increasingly voluminous and generally duplicative CAP reporting by changing reporting by reference to other reports to the greatest extent possible. The tables also included a column with recommendations on whether or not each baseline activity would be appropriate to implement (or continue to implement) Bay-wide and how reporting might best be conducted. The subgroup agreed that the majority of baseline activities are being addressed by on-going stormwater program required activities or on-going POTW required activities. Agreement was not reached on what activities could be considered "completed" or how to move towards CAP reporting by reference. It was suggested that an actual Bay-wide Copper Action Plan would not necessarily need to be developed if all the pertinent CAP activities were otherwise included and conducted as stormwater and POTW NPDES permit conditions (e.g., pursuant to pollutant reduction plans). Regional Board staff is in the process of reviewing the proposed revised CAP activities reporting approach tables and providing comments on the recommendations.

ADDITIONAL PROGRAMMATIC MONITORING INDICATORS (PMIs)

Enhanced Reporting - Industrial/Commercial Discharger Control and Illicit Connection/Illegal Dumping Elimination

Since October 2001, Program staff has been assisting each Co-permittee (on an individual basis) with the implementation of enhanced reporting requirements for IND and IC/ID. Since FY 01-02, Co-permittees have submitted raw IND and ICID inspection data to Program staff. To demonstrate consistency and compliance (on a Program-wide basis) with the strategy provided in the Program's technical memoranda regarding IND and IC/ID reporting (dated September 7, 2001) and the approved MC approach, Program staff has been constructing IND and IC/ID summary tables using individual Co-permittee data. The summary tables are double checked with the Co-permittees to ensure that the results are reasonably consistent with their internal data and their interpretation of the data; provided to the Co-permittees for inclusion in their annual reports; and included in the Program's Annual Report. The overall goal of the effort has been to capture the full extent and the results of the Co-pemittees efforts in a consistent format and on a Program-wide basis. Overall, this effort has been very successful.

Planned FY 05-06 Activities

To ensure effective reporting of IND and IC/ID data, Co-permittees will continue this process during FY 05-06. In addition, Co-permittees will conduct their own effectiveness evaluations based on their own data. The Program will work with the Co-permittees to construct IND and IC/ID summary tables using individual Co-permittee data.

Compile, Maintain and Share Program Watershed Data

The Watershed Assessment and Monitoring Subgroup (WAMS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a

solid scientific foundation for watershed planning. One of WAMS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0) and November 2003 (version 5.0). Version 6.0 is currently being developed. The Program funded the initial development of the SSI and each of the annual updates.

To comply with its NPDES permit, the Program also compiles, develops and analyzes a variety of data sets and reports. Most of this data is collected and generated as part of the Program's environmental monitoring and assessment activities. A majority of the information collected and used by the Program originates from different municipalities and agencies that conduct studies within Program jurisdictional boundaries.

The Program developed a relational database as an initial task to systematically describe and document data used for its activities. The intent of the database is to demonstrate its usefulness of how to systematically and efficiently collect and document all of the relevant data used in the Program's activities. In addition, the database was designed to explore the feasibility of eventually expanding and coordinating its maintenance and use with other agencies and organizations in the Program.

The database is a metadata database which focuses on the description, documentation, and indexing of the data sets, sources, reports, etc. It does not focus on data. The current metadata database incorporated information on data sources that were documented in the existing SCBWMI's watershed assessment metadata database (MDDB) and the WMI's Stream Studies Inventory Report data (SSI). In addition, information used for the Program's Coyote Creek Watershed Integrated Pilot Assessment was entered into the database. The Program developed draft written user documentation for the database in FY 02-03.

Planned FY 05-06 Activities

In FY 05-06, the Program will again update the SSI by collecting information on new projects and updating information on existing projects (See Attachment 4-3). This data will also be entered into the Program's database. This update will be limited since the Program does a full update once every three years. The latest full update was completed during FY 03-04.

Watershed Management Initiative- Support for Land Use Subgroup

To implement the Program's Monitoring Priority 3c, develop strategies for controlling impacts of land use on beneficial uses, the Program supports the SCBWMI Land Use Subgroup (LUS). While providing administrative support and leadership for the LUS, the Program has also created projects meeting the URMP goals.

Planned FY 05-06 Activities

In FY 05-06, the Program will continue to provide limited support to the SCBWMI Land Use Subgroup (LUS) by providing administrative support and direction.

Attachment 4-1

Attachment 4-1

Table 4-1. FY 05-06 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Calabazas Creek	***Chemical***						
	Contaminants-Water [3]	I (1)		I (1)		• Baseline: Dissolved and total metals and organophosphate pesticides were measured in FY 04-05 by SCVURPPP at two sites during dry and wet seasons. • FY 05-06: Further investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at one site during dry and wet seasons. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality[4]	S (2)		S (2)	S(4)	• Baseline: General water quality sampling was conducted in FY 04-05 by SCVURPPP at three sites during dry and wet seasons and four sites during spring season. • FY 05-06: Screening level measurements of general water quality will be conducted synoptically with water chemistry (two sites) and bioassessment (four sites). • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry[5]	S (2)		S (2)		• Baseline: Conventional water quality parameters were collected in FY 04-05 by SCVURPPP during dry and wet seasons at three locations to investigate potential sources of nutrients. • FY 05-06: Screening level measurements of conventional water chemistry parameters will be collected at two sites during dry and wet seasons. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity-Water Quality[6]	I (1)		I (1)		• Baseline: Water toxicity testing was conducted in FY 04-05 by SCVURPPP at two sites during the dry and wet season, synoptically with water chemistry samples. • FY 05-06: Water toxicity testing will be conducted at one site during wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Pathogen Indicator Organisms [7]	S (2)		S (2)		• Baseline: Bacterial indicators samples were collected in FY 04-05 by SCVURPPP at two sites during the dry and wet season. • FY 05-06: Conduct monitoring of bacterial indicators at one site during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment – Macroinvertebrates[8]				S (4)	• Baseline: Benthic macroinvertebrate bioassessments were conducted in FY 04-05 by SCVURPPP at four sites during spring season. • FY 05-06: Benthic macroinvertebrate bioassessment will be conducted at four sites. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment – Fish[9]					• Baseline: Existing SCVWD fish survey indicates majority of creek does not support native fish fauna due to lack of flow during summer season. • FY 05-06: No fish bioassessment is currently planned. • Future: No fish bioassessment is planned.	SCVURPPP
	Physical						
	Physical Habitat[10]				S (4)	• Baseline: Visual physical habitat assessment was conducted in FY 04-05 by SCVURPPP at four sites. • FY 05-06: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at four sites. • Future: Conduct visual physical habitat assessment to determine status and trends.	SCVURPPP
	Sediment Characterization[11]				S (4)	• Baseline: Substrate composition and embeddedness was visually estimated in FY 04-05 by SCVURPPP at four sites. • FY 05-06: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at four sites. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Geomorphic assessment conducted in 2004 as part of SCVWD Stream Stewardship Project; type and extent of assessment is unknown. • FY 05-06: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP/ SCVWD
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 05-06: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Sunnyvale	***Chemical***						
East/West Channel	Contaminants – Water Quality	I (2)		I (2)		• Baseline: Dissolved and total metals and organophosphate pesticides was measured in FY 04-05 by SCVURPPP during the dry and wet season at two sites on the East Channel and one site on the West Channel. • FY 05-06: Further investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured at one site in East Channel and one site in West Channel during the dry and wet season. • Future: Conduct monitoring of contaminants in water to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (2)		S (2)		• Baseline: General water quality sampling was conducted at three sites in FY 04-05 by SCVURPPP during the dry and wet season. • FY 05-06: Screening level measurements of general water quality will be conducted synoptically with water chemistry at one site in East Channel and one site in West Channel during the dry and wet season • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP
	Conventional Water Chemistry	S (2)		S (2)		• Baseline: Conventional water quality parameters were collected in FY 04-05 by SCVURPPP during the dry and wet season at three locations to investigate potential sources of nutrients. • FY 05-06: Screening level measurements of conventional water chemistry parameters will be collected at two sites during two seasonal time periods. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality					• Baseline: No existing data was available. • FY 05-06: Water toxicity testing is not planned. • Future: Water toxicity testing is currently not planned.	SCVURPPP
	Pathogen Indicator Organisms					• Baseline: No existing data was available. • FY 05-06: Sampling is not planned due to limited potential for contact recreation. • Future: Future monitoring of bacterial indicator organisms is currently not planned.	SCVURPPP
	Bioassessment - Macroinvertebrates					• Baseline: No existing data was available. • FY 05-06: Sampling is not planned. • Future: Future monitoring of benthic macroinvertebrates is currently not planned.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment - Fish					• Baseline: No existing data was available. • FY 05-06: Sampling is not planned. • Future: Future monitoring of fish is currently not planned.	SCVURPPP
	Physical						
	Physical Habitat					• Baseline: No existing data was available. • FY 05-06: Sampling is not planned. • Future: Future monitoring of physical habitat is currently not planned.	SCVURPPP
	Sediment Characterization					• Baseline: No existing data was available. • FY 05-06: Sampling is not planned. • Future: Future monitoring of sediment condition is currently not planned.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: No existing data sources identified. • FY 05-06: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 05-06: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
Matadero Creek	***Chemical***						
	Contaminants – Water Quality	I (1)		I (1)		• Baseline: Dissolved and total metals and organophosphate pesticides were measured in FY 04-05 by SCVURPPP at two sites during dry and wet seasons. • FY 05-06: Investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at one site during dry and wet seasons. • Future: Conduct monitoring of contaminants in water, synoptically with toxicity testing and physical and biological parameters, to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (2)		S (2)	S (2)	• Baseline: General water quality sampling was conducted in FY 04-05 by SCVURPPP at three sites during dry and wet seasons and two sites during spring season. • FY 05-06: Screening level measurements of general water quality will be conducted synoptically with water chemistry (2 sites) and bioassessment sampling (2 sites). • Future: Conduct general water quality monitoring synoptic with chemical, physical and biological parameters to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Conventional Water Chemistry	S (2)		S (2)		• Baseline: Conventional water quality parameters were collected in FY 04-05 by SCVURPPP during dry and wet seasons at three locations to investigate potential sources of nutrients. • FY 05-06: Screening level measurements of conventional water chemistry parameters will be collected at two sites during dry and wet seasons. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality	I (1)		I (1)		• Baseline: Water toxicity testing was conducted in FY 04-05 by SCVURPPP at two sites during the dry and wet season, synoptically with water chemistry samples. • FY 05-06: Toxicity of water will be conducted at one site during wet and dry season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Pathogen Indicator Organisms	S (2)		S (2)		• Baseline: Bacterial indicators samples were collected in FY 04-05 by SCVURPPP at two sites during the dry and wet season. • FY 05-06: Conduct monitoring of bacterial indicators at two sites during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (2)	• Baseline: Benthic macroinvertebrate bioassessments were conducted in FY 04-05 by SCVURPPP at two sites during spring season. • FY 05-06: Conduct benthic macroinvertebrate bioassessment at two sites. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment - Fish					• Baseline: Fish bioassessments were conducted in FY 04-05 by SCVURPPP at two sites in October 2004. • FY 05-06: No sampling is planned. • Future: Conduct fish bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
	Physical						
	Physical Habitat				S (2)	• Baseline: Visual physical habitat assessment was conducted in FY 04-05 by SCVURPPP at two sites. • FY 05-06: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at two sites. • Future: Visual habitat assessment will be conducted in the future, concurrent with macroinvertebrate sampling, to determine status and trends	SCVURPPP
	Sediment Characterization				S (2)	• Baseline: Substrate composition and embeddedness was visually estimated in FY 04-05 by SCVURPPP at two sites. • FY 05-06: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at two sites. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Channel cross-sections and longitudinal profiles were conducted by SCVWD starting in 2002 for lower section of Matadero Creek. • FY 05-06: Continued measurements of channel geometry by the SCVWD. • Future: Channel cross-sections and longitudinal profiles will be measured on an annual basis by SCVWD through 2011 as part of sediment transport study.	SCVWD
	Riparian Vegetation					• Baseline: No baseline data sources identified. • FY 05-06: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
Stevens Creek	***Chemical***						
	Contaminants – Water Quality	I (2)		I (2)		• Baseline: Dissolved and total metals and pesticide suite were measured in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 05-06: Investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at two sites during dry and wet seasons. • Future: Conduct monitoring of contaminants in water to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (4)		S (4)	S (7)	• Baseline: General water quality sampling (both probe and continuous) was conducted in 2002 and 2003 by RWQCB at three sites during three seasonal time periods. • FY 05-06: Screening level measurements of general water quality will be conducted synoptically with water chemistry (4 sites) and bioassessment sampling (7 sites). • Future: Conduct general water quality monitoring synoptic with other chemical parameters to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
	Conventional Water Chemistry	S (4)		S (4)		• Baseline: Conventional water quality parameters were collected in 2002 and 2003 by RWQCB at three sites during three seasonal time periods. • FY 05-06: Screening level measurements of conventional water chemistry parameters will be collected at four sites during dry and wet seasons. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality	I (2)		I (2)		• Baseline: Water toxicity testing was conducted in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 05-06: Toxicity of water will be conducted at two sites during dry and wet season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	Toxicity - Water Quality
	Pathogen Indicator Organisms	S (2)		S (2)		• Baseline: No baseline data was available. • FY 05-06: Conduct monitoring of bacterial indicators at two sites during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (7)	• Baseline: Benthic macroinvertebrate bioassessments were conducted in April 2002 by RWQCB at eight sites. USGS also collected BMI samples in spring and fall 1997 at seven sites in Stevens Creek. • FY 05-06: Conduct benthic macroinvertebrate bioassessment at seven sites during spring season. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment - Fish					• Baseline: Fish surveys were conducted at five stream locations between 1994 and 1996 by Rob Leidy. Additional fish survey information was collected by the SCVWD at selected locations between 1998 and 2000. • FY 05-06: No sampling is planned. • Future: Future monitoring of fish populations is not currently planned due to anticipated difficulty in obtaining collecting permits for steelhead.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
	Physical						
	Physical Habitat				S (7)	• Baseline: Visual physical habitat assessment was conducted in April 2002 by RWQCB at eight sites. • FY 05-06: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at seven sites. • Future: Conduct visual physical habitat assessment to determine status and trends.	SCVURPPP
	Sediment Characterization				S (7)	• Baseline: Substrate composition and embeddedness was visually estimated in April 2002 by RWQCB at eight sites. • FY 05-06: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at seven sites. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Geomorphic assessment conducted in 2004 as part of SCVWD Stream Stewardship Project; type and extent of assessment is unknown. • FY 05-06: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 05-06: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
Permanente Creek	***Chemical***						
	Contaminants – Water Quality	I (2)		I (2)		• Baseline: Dissolved and total metals and pesticide suite were measured in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 05-06: Investigation of dissolved and total metals and organophosphate pesticides concentrations will be measured synoptically with toxicity testing at two sites during dry and wet seasons. • Future: Conduct monitoring of contaminants in water to determine status and trends. Monitoring pollutants of concern will be coordinated with the CEP.	SCVURPPP
	General Water Quality	S (3)		S (3)	S (6)	• Baseline: General water quality sampling (both probe and continuous) was conducted in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 05-06: Screening level measurements of general water quality will be conducted synoptically with water chemistry (3 sites) and bioassessment sampling (6 sites). • Future: Conduct general water quality monitoring synoptic with other chemical parameters to determine status and trends.	SCVURPPP

Attachment 4-1

Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
	Conventional Water Chemistry	S (3)		S (3)		• Baseline: Conventional water quality parameters were collected in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 05-06: Screening level measurements of conventional water chemistry parameters will be collected at three sites during dry and wet seasons. • Future: Conduct monitoring of conventional water chemistry synoptically with other chemical parameters to determine status and trends.	SCVURPPP
	Biological						
	Toxicity - Water Quality	I (2)		I (2)		• Baseline: Water toxicity testing was conducted in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 05-06: Toxicity of water will be conducted at two sites during dry and wet season, synoptically with water chemistry samples. • Future: Water toxicity will be conducted synoptically with water chemistry for three species during wet and dry seasons to determine status and trends.	SCVURPPP
	Pathogen Indicator Organisms	S (2)		S (2)		• Baseline: No baseline data was available. • FY 05-06: Conduct monitoring of bacterial indicators at two sites during two seasonal time periods. • Future: Conduct monitoring of bacterial indicator organisms synoptically with other chemical, biological and physical parameters to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (6)	• Baseline: Benthic macroinvertebrate bioassessments were conducted in April 2002 by RWQCB at seven sites. • FY 05-06: Conduct benthic macroinvertebrate bioassessment at six sites during spring season. • Future: Conduct benthic macroinvertebrate bioassessment synoptically with chemical and physical data to determine status and trends.	SCVURPPP
	Bioassessment - Fish		S (3)			• Baseline: Fish surveys were conducted at two stream locations between 1994 and 1996 by Rob Leidy. • FY 05-06: Conduct fish bioassessments at three sites in summer/fall season. • Future: Future monitoring of fish populations is not currently planned due to anticipated difficulty in obtaining collecting permits for steelhead.	SCVURPPP
	Physical						
	Physical Habitat				S (6)	• Baseline: Visual physical habitat assessment was conducted in April 2002 by RWQCB at seven sites. • FY 05-06: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at six sites. • Future: Conduct visual physical habitat assessment to determine status and trends.	SCVURPPP

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Watershed Area	Data Type[2]	Quarter in FY 05-06				Rationale	Lead Agency
	Sediment Characterization				S (6)	• Baseline: Substrate composition and embeddedness was visually estimated in April 2002 by RWQCB at seven sites. • FY 05-06: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at six sites. • Future: Conduct visual estimates of substrate composition and embeddedness to determine status and trends.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Existing channel conditions downstream of Foothill Expresway described by SCVWD as part of flood planning study. • FY 05-06: Monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 05-06: Specific monitoring objectives have not been identified at this time. • Future: Future monitoring objectives have not been identified at this time.	SCVURPPP

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) investigative, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. Sampling locations are described in separate table and figure attached to Plan.

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology.

3 Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg and organophosphate pesticides; sampling conducted during dry and wet seasons (summer/fall and winter/spring).

4 General Water Quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted during dry and wet seasons.

5 Conventional Water Chemistry: Major anions: ortho-phosphate, nitrate, nitrite, chloride, sulfate; total phosphate, boron, TKN, TDS, SSC, ammonia, chlorophyll-a, alkalinity, hardness, TOC and DOC; during dry and wet seasons

6 Toxicity Testing: Aquatic bioassays on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted during dry and wet seasons.

7 Pathogen Indicator Organisims: total and fecal coliform, *enterococcus, and E. coli*; sampling conducted during dry and wet seasons.

8 Bioassessment - Macroinvertebrates: following CSBP methodology and conducted in the spring season.

9 Bioassessment – Fish: Rapid assessment of fish communities will be done using methods established in the SEIDP or by other standardized methods utilized by the SCVWD or other Co-permittee agencies; sampling likely to occur in the spring.

10 Habitat survey physical habitat assessment using CSBP methodology.

11 Creek substrate sediment composition and embeddedness is qualitatively estimated by visual observation during bioassessment and habitat survey.

ATTACHMENT 4-1

Table 4-2. Sampling locations and data types for SCVURPPP's FY 05-06 monitoring plan.

Stat Id	Station Name	Site Characteristics	Water Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Fish Bioass	Macro-Invert Bioass	P-Hab Assmt
Matadero Creek										
M-2	Matadero Cr at Laguna	At Bol Park; channelized; warm native fish	2	3	2	2	2		1	1
M-3	Matadero Cr at Old Page Mill	Open space; natural channel; warm native fish		3		2	2		1	1
Sunnyvale (East/West)										
SU-1	Sunnyvale East at Ahwanhee	At Fair Oaks Park residential; excavated channel and box culvert;	2	2		2				
SU-3	Sunnyvale West at Mathilda	Industrial land use; below stormdrain outlet and just upstream of tidal area	2	2		2				
Calabazas Creek										
C-1	Calabazas Creek at Arques	Industrial and commercial; concrete channel	2	2	2	2				
C-2	Calabazas Creek above Miller Ave	At Creekside Park; above Regnart confluence; natural channel; residential		1					**1**	1
C-3	Calabazas Creek at Blaney Ave	At Calabazas Park; natural channel; recreational access; residential		3		2	2	**1**	**1**	1
C-4	Calabazas Creek below Railroad Crossing	Downstream Prospect Cr confl and SCVWD turnout; natural channel; residential		1					**1**	1
C-5	Calabazas Creek at Pierce Rd crossing	Natural channel; low density residential; some new development		1					**1**	1

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Stat Id	Station Name	Site Characteristics	Water Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Fish Bioass	Macro-Invert Bioass	P-Hab Assmt
Stevens Creek										
SV-1	Stevens Creek at La Avenida	Upstream tidal zone; earth levee channel; industrial and commercial	2	3	2	2			**1**	1
SV-2	Stevens Creek at Diversion Channel	Downstream of Permanente Creek Diversion; modified channel; residential		1					**1**	1
SV-3	Stevens Creek at Barranca	Downstream of Heney Creek confl; natural modified channel; residential		1					**1**	1
SV-4	Stevens Creek above Stevens Creek Blvd	Downstream of Blackberry Farm Golf Course; natural modified channel; residential	2	3	2	2	2		**1**	1
SV-5	Stevens Creek at USGS Gage Station	At Lower Stevens Creek County Park; natural channel below dam;		3		2	2		**1**	1
SV-6	Stevens Creek at Lower Stevens Cr County Park	Upper end of Lower Stevens Creek County Park above reservoir; natural channel;		3		2			**1**	1
SV-7	Stevens Creek at Upper Stevens Cr County Park	At Upper Stevens Creek County Park; natural channel;		1					**1**	1
Permanente Creek										
P-1	Permanente Creek at Charleston	Upstream tidal zone; earth levee channel; industrial and commercial	2	3	2	2			**1**	1
P-2	Permanente Creek above Diversion Channel	Above diversion; concrete and natural channel; residential		3		2	2		**1**	1
P-3	Permanente Creek at Foothill Expressway	Natural modified channel; residential		1				**1**	**1**	1
P-4	Permanente Creek at Rancho San Antonio park		2	3	2	2	2	**1**	**1**	1

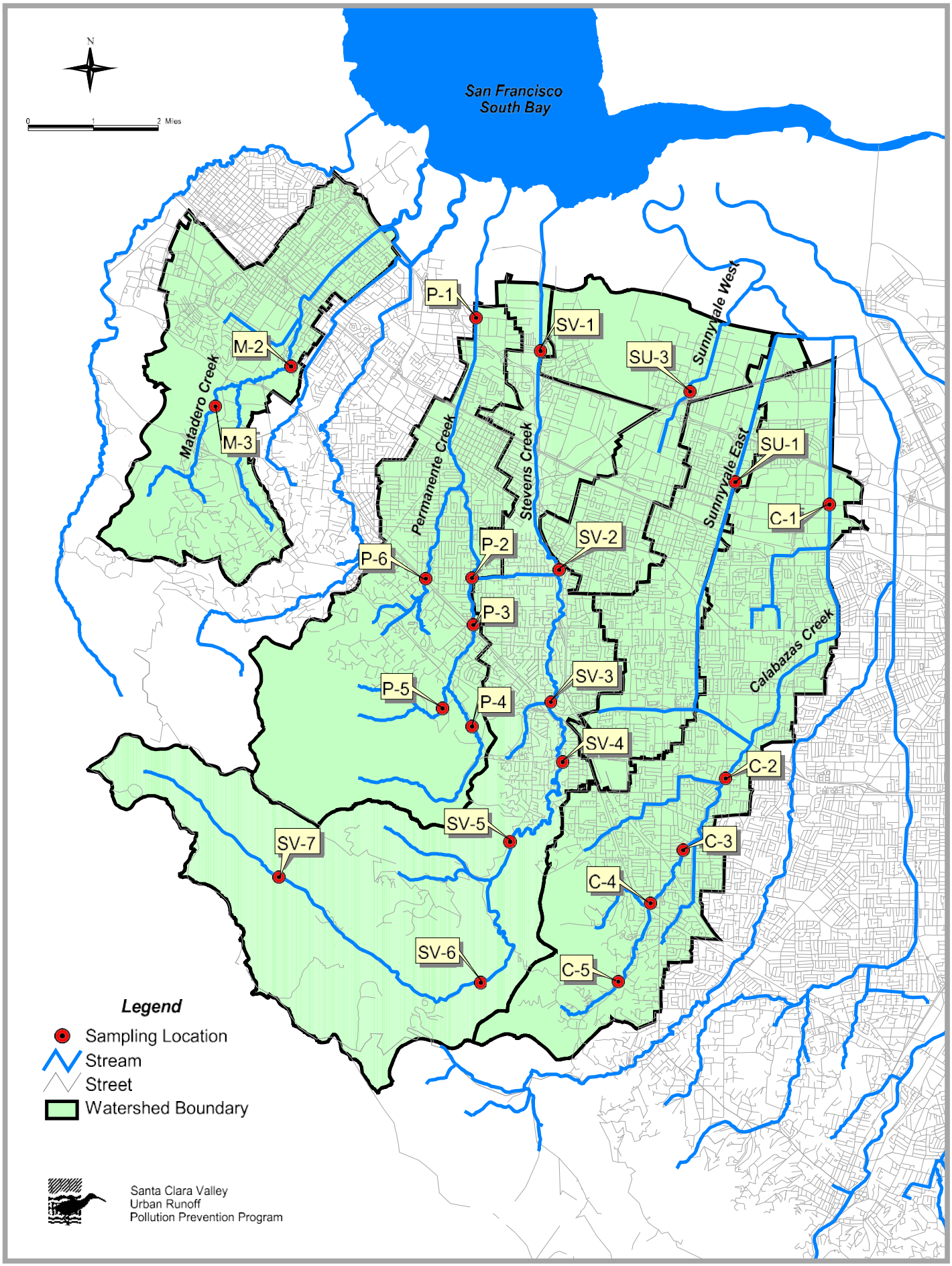
ATTACHMENT 4-1

Stat Id	Station Name	Site Characteristics	Water Chem	Gen Water Qual	Water Tox (3spp.)	Conven chem	Bact Indicat	Fish Bioass	Macro-Invert Bioass	P-Hab Assmt
P-4d	Duplicate sample		2			2				
P-5	West Branch Permanente Creek at Open Space District			1				**1**	**1**	1
P-6	Hale Creek at Foothill Expressway			1					**1**	1

Attachment 4-1

Table 4-3. Analytical methods used in SCVURPPP Multi-Year Monitoring Plan.

Description of data parameters	Analytical Methods
Pesticides (water) - Organophosphate suite	EPA 8141A
ICPMS metals suite (water)--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se)	EPA 200.8, 206.3TR, 270.3
ICPMS metals suite (water)--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se)	EPA 200.8, 206.3D, 270.3
Total mercury (water)	EPA 245.7
Major anions nutrient scan: ortho-phosphate, nitrate, nitrite, chloride, sulfate	EPA 365.3, EPA 300.0
Total Phosphorus	EPA 365.2
Boron	EPA 200.8
TKN	EPA 351.3
TDS	EPA 160.1
Suspended Sediment Concentration (SSC)	ASTM D3977-97C
Ammonia	EPA 350.2
Chlorophyll-a	SM 10200H
Alkalinity	EPA 310.1
Hardness	EPA 130.2
TOC	EPA 415.1
DOC	EPA 415.1
Total coliform	SM 9221B&E
Fecal coliform	SM 9221B&E
Enterococcus	EPA 1600
Ceriodaphnia 7-day Survival & Reproduction	EPA-821-R-02-013
Pimephales (fathead minnow) 7 - day	EPA-821-R-02-013
Selenastrum (algae) test	EPA-821-R-02-013



Attachment 4-1 Figure 4-1. SCVURPPP FY 05-06 Watersheds and Sampling Site Locations.

Attachment 4-2

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

DRAFT
Technical Memorandum

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

TO: **Management Committee**

FROM: **Program Staff**

DATE: **March 1, 2005**

SUBJECT: **Watershed Characterization and Sampling Design Rationale - *Stevens and Permanente Creek Watersheds***

Introduction and Background

Environmental monitoring and watershed assessments are key components in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program). Environmental monitoring provides information needed to: (1) assist the Regional Water Quality Control Board (RWQCB) to characterize receiving water quality in urban watersheds consistent with the priorities of the Santa Clara Basin Watershed Management Initiative (SCBWMI) and the Program; (2) develop an understanding of baseline conditions in water bodies; (3) recognize the need for site-specific water quality investigations to address questions that might arise while conducting screening-level monitoring efforts; (4) allow for determining if control measures are having an intended effect; and, (5) conduct watershed assessments aimed at determining the condition of, and potential impacts to water bodies and Beneficial Uses (Uses).

On March 1, 2002, the SCVURPPP submitted a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) that was prepared in compliance with monitoring requirements of the permit. The Multi-Year Plan identifies Program monitoring activities in Santa Clara Basin Watersheds over an eight-year period. On March 1, 2004, the Program submitted the Revised Multi-Year Plan. The revisions were intended to 1) more fully integrate the monitoring activities identified in the Multi-Year Plan with watershed assessments, and 2) allow for additional follow-up monitoring activities in order to better identify sources of pollutants or causes of impairment to Beneficial Uses. Additionally, the Revised Multi-Year Plan attempts to provide the SCVURPPP a framework for conducting watershed characterization, screening-level monitoring, watershed assessment, and investigative monitoring and management action implementation.

The Program submits an Annual Monitoring Program Plan (Annual Plan) on March 1 of each year that identifies specific monitoring activities planned for the following year. The Annual Plans include information on the type of monitoring parameters and the frequency of sampling events for each watershed. To provide additional details on the

rationale for the selecting sampling site locations and parameters, the Program is supplementing the FY 05-06 Annual Plan with this technical memorandum. This memo includes a summary of existing data and information resources; descriptions of the relevant watershed attributes, and lists key issues relevant to the development of the proposed sampling design for Stevens and Permanente Creek watersheds in FY 05-06.

Information Resources

Several data and information resources from Stevens Creek and Permanente Creeks watersheds were compiled and assessed to identify baseline data for a range of environmental indicators. Existing watershed monitoring and assessment information originated from the following projects:

Monitoring Data

Surface Waters Ambient Monitoring and Assessment Program (SWAMP) (unpublished)
The San Francisco Regional Water Quality Control Board (Regional Board) collected screening level/baseline data from bioassessment studies, physical habitat assessment studies and ambient surface water quality monitoring in the Stevens and Permanente Creek watersheds as part of the SWAMP activities in 2002 and 2003. Rapid bioassessments using benthic macroinvertebrate (BMI) assemblages and visual assessments of physical habitat were conducted at eight sites in Stevens Creek watershed and seven sites in Permanente Creek watershed in April 2002.

Water grab samples were collected from three sites in Stevens Creek and two sites in Permanente Creek in April and June 2002 and January 2003. Water samples were analyzed for metals, organics (e.g., pesticides, PCBs), nutrients, anions, and suspended sediment concentrations. Water was also collected for acute and chronic toxicity testing for three aquatic species. Sediment grab samples were collected from the lowest elevation site from each watershed in June 2002 and were analyzed for metals. Field measurements of physical water quality were taken at each sampling event. In addition, continuous water quality measurements were collected over 1-2 week span during all three sampling event at three sites in Stevens Creek and one site in Permanante Creek. Rapid trash assessments were also conducted at selected sampling sites.

The RWQCB is planning to release an interpretative report documenting the monitoring results for SWAMP activities in Stevens and Permanente Creeks in early 2005.

Mercury, PCB and Organochlorine Pesticide Monitoring (KLI 2002)
The SCVURPPP analyzed PCB, mercury, and organochlorine pesticide concentrations from sediment samples collected in 2001 at two locations within the Stevens Creek watershed as part of the Joint Stormwater Agency Program (JSAP), a San Francisco Bay region wide pollutant study.

Stream Maintenance Program (SCVWD 2002)
The SCVWD conducted sediment removal activities (dredging) within Stevens Creek reaches downstream of La Avenida in 2001 and 2002 and in the Permanente Creek Diversion Channel in 2002 as part of its Stream Maintenance Program. The SCVWD characterizes the sediment material to be removed to satisfy waste discharge requirements established by the RWQCB and local sanitary landfills. Sediment characterization includes analysis for concentrations of metals (includes mercury),

organics (includes pesticides, PAHs and PCBs) and sediment grain size. Results of the sediment analysis are documented in the SCVWD's Annual Sediment Characterization Report.

Benthic Macroinvertebrate Study (USGS 2000)

The U.S. Geological Survey (USGS) sampled benthic macroinvertebrate (BMI) community assemblages at seven stream sites along Stevens Creek in the spring and fall of 1997. Preliminary results, including selected metric scores and a complete taxonomic list, were documented in the 2000 report.

Bay Area Stream Fisheries Project (Leidy 2002)

Rob Leidy of U.S. EPA conducted stream surveys for 79 streams in the San Francisco Bay Area between 1992 and 2002. Fish community assemblage information was collected at five stream locations in Stevens Creek and two stream locations in Permanente Creek between 1994 and 1996. Stream survey results were documented in a report published on the San Francisco Estuary Institute (SFEI) website and released as an Access database.

Watershed Assessment

Watershed Analysis using Limiting Factors Analysis (LFA) (Stillwater 2004)

The Stevens Creek LFA was conducted by Stillwater Sciences to fulfill the Program's NPDES permit requirements to conduct watershed analysis of creeks that are potentially impaired by sediment from anthropogenic activities. The objectives of the Stevens Creek LFA were to identify and fill information gaps related to physical and biological factors controlling population dynamics of steelhead (*Oncorhynchus mykiss*) and to identify the impacts of sediment on steelhead relative to other potential limiting factors. Based on the available existing information and reconnaissance surveys, focused studies were developed to test hypotheses regarding potential limiting factors for steelhead in Stevens Creek. The focused studies addressed the following factors: fish passage barriers, gravel permeability, pool filling, bed mobility, overwintering habitat, and water temperature.

Field data collected for the Stevens Creek LFA included: 1) permeability measurements at potential steelhead spawning sites; 2) volume of fine sediment within pools; and 3) estimated embeddedness of large substrate at potential juvenile overwintering sites. Qualitative geomorphic assessments of bed mobility were also conducted to identify potential for redd scour. The study assessed existing aquatic habitat data, fish passage impediments, and water temperature data collected in the FAHCE study (see below).

A summary of the findings of the Stevens Creek LFA included: 1) barriers, both partial and complete, limited access to a substantial amount of stream habitat; 2) seasonal low flows downstream of Fremont Avenue may severely limit steelhead outmigration success in some years; 3) gravel permeability is low but not likely limiting smolt production; 4) pool filling is low, indicating high sediment transport capacity relative to sediment supply; 5) bed mobility (and therefore potential redd scour) is relatively low in upper reaches but increases downstream; 6) overwintering habitat is likely the key limiting factor for steelhead prior to smolt outmigration; and 7) water temperature is elevated but not likely to lethal levels and is not likely limiting fish growth.

The above findings indicate that factors associated with fish passage and lack of overwintering habitat is likely to have the greatest influence on the steelhead population. Although considerable uncertainty remains regarding sediment dynamics in Stevens Creek, results of the LFA study indicated that factors related to current anthropogenic sediment inputs were not believed to substantially limit steelhead production. The study also identified important data gaps that are needed to reduce uncertainty associated with development and testing of the key hypotheses.

The Fisheries and Aquatic Habitat Collaborative Effort (FAHCE) (SCVWD 2003)

FAHCE is a multi-agency endeavor convened by the SCVWD and the Department of Fish and Game to develop an interim fisheries and aquatic habitat management plan. The goals for FAHCE include: 1) identify the contribution of SCVWD facilities and operations to existing fishery habitat conditions within the context of the variety of factors impacting salmon and steelhead populations; and 2) identify reasonable flow and non-flow measures that will improve habitat conditions for such fish populations within the context of competing water and land use demands. The FAHCE study area included Stevens Creek below the reservoir. The FAHCE project quantified the following factors: 1) diversity, abundance, and condition of existing salmon and steelhead resources; 2) habitat quantity and quality that may limit these target fish populations; 3) types and locations of non-flow measures that could change existing conditions; and 4) alternative flow regimes that could change the conditions that limit the target fish populations.

The SCVWD conducted an extensive aquatic habitat survey below the reservoir using a modified California Department of Fish and Game Level 4 Salmonid Habitat Classification. The survey identified the location and extent of critical salmonid habitat, including spawning gravels and juvenile habitat, and quantified potential impacts to these areas (e.g., substrate embeddedness). The SCVWD also conducted an inventory of fish passage impediments for the entire reach below the dam. Other data collected included continuous water temperature measurements at selected stream locations and fish population surveys.

The FAHCE Summary Report summarizes specific issues and actions for Stevens Creek watershed (SCVWD 2003). Phase I work objectives included creating a suitable spawning and rearing habitat for four miles below Stevens Creek Dam by, 1) releasing reservoir flows for fish; 2) improve passage at selected fish barriers; 3) restoring spawning and rearing areas; and, 4) stabilizing banks. Also recommended is the installation of a “gravity-fed, multi-port outlet” for releases from the cold areas in the reservoir and aeration at the outlet to restore oxygen to the water from the hypolimnion. Phase 2 and 3 include extending the steelhead habitat further upstream, downstream, and eventually into the tributaries as necessary. In addition, the study created a system of reservoir rules for which the coldwater management zone is designated and the reservoir releases are regulated.

Ongoing Projects

Relevant data sources resulting from the following projects were not available for this assessment:

Stevens and Permanente Creek Watershed Council Water (SPCWC) Quality Monitoring Program

The SPCWC is sponsoring a pilot volunteer water quality monitoring program in the Stevens and Permanente Creek watersheds. The monitoring activities to date have included collecting water quality measurements (temperature, DO, pH, conductivity and turbidity) using probes at five locations in Stevens Creek. General water quality was previously measured at three of these locations by the RWQCB in 2002 and 2003. Future monitoring activities in Permanente Creek are planned if additional funding becomes available. The SPCWC is also applying for a grant to fund BMI bioassessment study at all the stream locations previously sampled by the RWQCB's 2002-03 study.

SCVWD Stream Stewardship Program

The SCVWD is currently developing watershed stewardship plans for watersheds in the Lower Peninsula, West Valley, and Guadalupe Watershed Areas. The purpose of the plans are to provide the SCVWD with the capability to effectively and efficiently identify and implement projects and activities that will allow the District to be proactive in meeting the goals described in the Ends Policies for these watersheds areas. These stewardship plans will include two different levels of information: a planning level assessment (i.e., coarse scale) for all watershed units in each Watershed Area, using the methods described in this document, and an implementation level assessment (i.e., fine scale) for one watershed unit within each Watershed Area, using information from supplemental field data collection activities. The three pilot watersheds selected for fine scale assessment include Alamitos, Calabazas and Stevens Creek watersheds. The information on the type, methods and extent of field data collection for the three watershed areas was not available for this assessment. Geomorphic assessments at different scales of resolution were conducted at various locations in the Stevens Creek watershed.

Beneficial Use Designation

The 1995 Basin Plan (SFRWQCB 1995) designates the following beneficial uses for Stevens and Permanente Creek Watersheds:

	Beneficial Uses	Stevens Creek	Stevens Creek Reservoir	Stevens/ Permanente Creek
COLD	Cold Freshwater Habitat	E	E	E
FRSH	Freshwater Replenishment	E		
GWR	Groundwater Recharge		E	
MIGR	Fish Migration	E	E	
MUN	Municipal and Domestic Supply		E	
REC-1	Water Contact Recreation	E		E
REC-2	Non-contact Water Recreation	E	E	E
SPWN	Fish Spawning	P	E	E
WARM	Warm Freshwater Habitat	E	E	
WILD	Wildlife Habitat	E	E	E

E=Existing P=Potential

Watershed Characterization

Stevens Creek Watershed

Hydrology

Stevens Creek drains a watershed of approximately 29 mi^2 and discharges into South San Francisco Bay (Figure 1). Stevens Creek originates at an elevation of 2,500 feet in the Santa Cruz Mountains, flowing southeast for just over five miles along the San Andreas Fault, then bending northeast and flowing an additional three miles before reaching Stevens Creek Reservoir. From the reservoir, Stevens Creek flows northward for approximately 12.5 miles through the Santa Clara Valley Basin before emptying into the South Bay.

The Stevens Creek Reservoir was constructed in 1935 for the purpose of storing winter runoff for the recharge of the Santa Clara Groundwater Basin during the summer months (SCBWMI, 2001). Stevens Creek Reservoir is managed by the SCVWD and has a current capacity of 3,465 acre-feet of water (SCBWMI 2001). Typical summer flow into the reservoir is 0.4 cfs compared to releases of 4–5 cfs below the dam. Under current management, approximately 5.7 miles downstream of the reservoir (to Fremont Avenue) are typically wetted to allow for groundwater recharge during the summer. The typical dryback zone is about 3.25 miles (Abel 2001).

One tributary joins Stevens Creek below Stevens Creek Reservoir. Heney Creek drains an area of 0.64 mi^2 and enters Stevens Creek 3.7 miles below the reservoir (SCBWMI 2001). Additionally, a diversion from Permanente Creek (constructed in 1959) diverts winter storm flows (up to 1,500 cfs) into Stevens Creek approximately 6.3 miles below the reservoir (SCBWMI 2001). In the past, imported water from the Trans-Valley/West Pipeline provided water to the aquifer and instream gravel dams were installed seasonally and extended the percolation zone downstream to El Camino Road (Abel 2001).

Geologic and Geomorphic Setting

The urbanized and relatively flat Santa Clara Valley makes up roughly 40 percent of the watershed area above Highway 101, and is underlain by mostly unnamed Quaternary alluvial fan and valley fill deposits (younger and older alluvium deposits) (Stillwater 2004). Towards the hills, strata of the Pliocene and/or Quaternary Santa Clara, Livermore, or Packwood Gravels exist (Santa Clara Formation). The Mesozoic Franciscan Complex and Lower Tertiary Vaqueros Sandstone, part of the Cretaceous sedimentary formation (Great Valley Sequence), make up most of the uplands near the headwaters. Other small outcrops of Tertiary volcanic rocks, as well as primarily mudstone and shale rocks occur in the watershed (Stillwater 2004).

Geologic mapping in the Stevens Creek watershed has revealed a large landslide, the Monte Bello Ridge Landslide Complex, just west of Stevens Creek Reservoir, which provides a continuous source of sediment to the reservoir (Stillwater 2004). The landslide has overridden a smaller branch of the San Andreas Fault named the Sargent-Berrocal fault, which consists of several large bedrock masses as much as 100 meters thick with a combined area of more than 1.5 km^2. Numerous local shallow landslides indicate that the slide complex is still active (Sorg and McLaughlin 1980). Although the Monte Bello Ridge Landslide Complex is the only landslide within the watershed that has been analyzed and documented, this observation of deep-seated with active shallow

landsliding indicates that surface sediments and the underlying lithology are composed of erodible sediments that are likely to act as a continuous source of sediment to the channel of Stevens Creek (Stillwater 2004).

Stillwater (2004) identified four distinct geomorphically significant reaches (Upper, Transition, Middle, and Lower) from the reservoir to the Bay based on field reconnaissance observations of floodplain geometry and channel function. The highest level of natural floodplain and channel function occur in the Upper Reach, located between the dam and continuing two miles downstream, where incision and entrenchment was observed to be the lowest of all reaches. Here, the creek flows through a relatively wide, well vegetated inset valley that is relatively unconfined by urban development and is free to meander.

In the Transition Reach, located between 2.0 and 4.3 mile section below the dam, Stillwater (2004) observed "the channel and floodplain function progressively degrade as the channel narrows and residential houses encroach. Here, the channel is straight, point and lateral bars shrink or disappear altogether, and an increasing number of concrete walls and weirs act as grade control and bank stabilizing structures. Transport capacity increases as the number of roughness elements (i.e. bedforms, bar deposits, sinuosity) decrease and anthropogenic influences increase. As a result, a greater amount of scour and incision was observed."

Floodplain entrenchment and observed incision values were greatest in the Middle Reach, located from reach mile 4.3 to reach mile 10.0 below the dam, which is primarily straight and narrow. Stillwater (2004) reports "Of the few existing bar deposits, most are perched 4–6 feet above the active channel. A number of concrete and steel structures exist in the channel and along the banks, and frequent 15–25 foot bluffs continually provide fine sediment to the channel via fluvial bank erosion. Floodplain function is somewhat restored in the Lower Reach, located from reach mile 10.0 to the Bay, as the valley widens or disappears and the creek has more room for lateral movement."

Land Use and Potential Water Quality Impacts

Undeveloped forest and rangeland covers over 60% of the Stevens Creek watershed, most of which occurs in the upper watershed area above Stevens Creek Reservoir. Over 35% of the watershed is legally protected by agencies, easements, and land trusts (SCBWMI 2001). There is currently a minimal amount of development occurring in the drainage area above Stevens Creek reservoir, which includes low density houses, vineyards, horse stables and a rock quarry (Pamela Chu, Santa Clara County Planning Department, personal communication, 2004). The Stevens Creek Rock Quarry is located in the Swiss Creek subwatershed, which drains into the reservoir just west of the dam.

The watershed area downstream of the reservoir is primarily developed and includes the cities of Cupertino, Los Altos, Sunnyvale, and Mountain View. High-density residential neighborhoods cover most of the area below the reservoir, comprising 24% of the total watershed area. The residential areas are interspersed with commercial and industrial uses, and public institutions, collectively covering 7% of the watershed. The riparian corridor within a three mile reach below the dam is minimally development with much of the area occurring in County and City parks and two golf courses. The riparian corridor downstream of Blackberry Farm Golf Course, however, is significantly impacted from urban development and channel modifications.

Aquatic Biological Communities

The Stevens Creek watershed supports an assemblage of four native species, including federally listed steelhead (*Oncorhynchus mykiss*) and its resident form rainbow trout, as well as Sacramento sucker (*Catostomus occidentalis*), threespine stickleback (*Gasterosteus aculeatus*), and California roach (*Lavinia symmetrucus*). Steelhead is currently restricted to reaches below Stevens Creek Reservoir. Native Pacific Lamprey (*Lampetra tridentate*), hitch (*Lavinia exilicauda*), and Sacramento squawfish (*Ptychocheilus grandis*) have been collected in Stevens Creek downstream of the reservoir but records of their occurrence are rare (Stillwater 2004).

Historical steelhead run sizes are not known for Stevens Creek, but it is generally thought that construction of Stevens Creek Reservoir in the 1935 dramatically reduced the potential steelhead population by blocking access to much of the perennially flowing reaches of the stream (Stillwater 2004). A review of recent fish survey data indicates that juvenile *O. mykiss* are common to abundant from Stevens Creek Reservoir downstream to Fremont Avenue and rare to absent below Fremont Avenue (Stillwater 2004).

Introduced fish, including goldfish (*Carassius auratus*), red shiner (*Cyprinella lutrensis*) carp (*Cyprinus carpio*), mosquitofish (*Gambusia affinis)*, channel catfish (*Ictalurs punctatus*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*), are occasionally found downstream of Stevens Creek Reservoir, but survey data indicate that the abundance of nonnative fish is low and their distribution appears to be restricted (Stillwater 2004).

Permanente Creek Watershed

Hydrology

Permanente Creek drains a watershed of approximately 17.5 mi^2 on the northeast-facing slopes of the Santa Cruz Mountains (Figure 1). Permanente Creek originates at an elevation of 2,800 feet near Black Mountain along the Montebello Ridge (SCVWD 2004). The mainstem flows east for about five miles, then bends to the north at the base of the foothills and continues another eight miles through the valley floor before emptying into the South Bay. The major tributaries to Permanente Creek are West Branch Permanente Creek and Hale Creek. The West Branch has a drainage area of about three square miles and joins the mainstem at the base of the foothills at an elevation of about 300 feet. Hale Creek has a drainage area of approximately four square miles and joins the mainstem in the valley an elevation of about 115 feet.

Stream flows are typically perennial in the upper watershed areas and ephemeral in the valley floor, with the exception of Hale Creek, which typically has minimal flow during the summer season. The hydrology of the watershed has been significantly altered to provide greater flood protection. The Permanente Creek Diversion, located about 1.5 mile upstream of Hale Creek confluence, was constructed in 1959 and currently diverts stream flows up to 1,500 cfs into Stevens Creek during the winter season (SCBWMI 2001). Permanente Creek is also diverted at the mouth from Charleston Slough eastward to Mountain View Slough (SCVWD 2004). The SCVWD does not import water to the creek during the summer season (as it does in Stevens Creek) to percolate stream flow for groundwater recharge.

Geologic and Geomorphic Setting

The underlying geology in Permanente Creek watershed is very similar to what is found in the Stevens Creek watershed. Approximately 40 percent of the watershed area occurs in the flat Santa Clara Valley that is underlain by young, unconsolidated alluvial fill washed down from the Santa Cruz Mountains. The foothill region consists of a narrow strip of northwesterly bedded tertiary shale of the Monterey Formation and gently and broadly folded claystone, sandstone, and conglomerate of the Santa Clara Formation (SCVWD 2004). The upper watershed areas are underlain by the Franciscan Group of formations that include highly deformed, contorted, faulted, sheared and weathered sections of shale, sandstone, chert, limestone, and greenstone (SCVWD 2004).

The older formations in the mountain areas are cut by numerous inactive faults. The San Andreas Fault, located to the west in the Stevens Creek watershed along the Monte Bello Ridge, is the closest active fault (SCVWD 2004). The possibly active Monte Vista Fault separates the Franciscan Group and the Monterey Formation in the foothill region of Permanente Creek watershed. This fault may be an extension of the possibly active Shannon Fault (SCVWD 2004).

Existing information was not available to classify stream channel morphology and geomorphic processes for the entire watershed. Existing channel conditions were described for ten reaches of Permanente and Hale Creek below Foothill Expressway (SCVWD 2004). The stream channel downstream of Highway 101 (Reaches 1-2) was characterized as a tidally influenced low flow channel that meandered through a wider flood plain channel. The channel bottom consisted of mud and silt substrate with banks covered in marsh vegetation (lower end) and grasses and small bushes (upper end). A short section of concrete trapezoidal channel occurred just downstream of Highway 101.

The section of creek between Highway 101 and the Hale Creek confluence (Reaches 3 – 5) was described as a combination of rectangular, trapezoidal and U-Frame constructed concrete channel. The entire section contained five drop structures and two sections of underground culvert. The channel between Hale Creek confluence and the Permanente Creek Diversion was described as a natural trapezoidal-shaped channel that contained modified sections of sacked concrete, shotcrete, or stacked concrete walls. The channel bottom consisted of mostly silt, sand, gravel with minimal cobble substrate. The bank vegetation varied from bare ground to mature trees with limited undergrowth in a very narrow riparian corridor with significant urban encroachment. The entire creek below the diversion channel was a low gradient channel (< 1% slope).

The section of creek between the diversion and Foothill Expressway (Reach 8) was primarily a natural channel, with the exception of a short section of corrugated metal pipe and another short section of trapezoidal concrete channel. This reach also contained two drop structures associated with the concrete sections. The natural section between Portland Avenue and Foothill Expressway consisted of both straightened and meandering channel alignments. The bank vegetation consisted of mature trees with limited to dense understory. The substrate consisted of primarily sand and gravel with patches of concrete fragments. The gradient slightly increased above the diversion (1 % slope).

The Permanente Diversion channel is about a 1.5 mile section of trapezoidal concrete. The lower section of Hale Creek (below Rosita Avenue) consists of U-Frame or

trapezoidal concrete channel. The remaining section up to Foothill Expressway is primarily a natural trapezoidal-shaped channel with well vegetated banks and sand and gravel substrate.

Land Use and Potential Water Quality Impacts

Undeveloped forest and rangeland covers just over 35% of the Permanente Creek watershed, most of which occurs in the drainage area above the West Branch Permanente Creek confluence. About 19% of the watershed is legally protected by agencies, easements, and land trusts (SCBWMI 2001), most of which occurs in the Rancho San Antonio Open Space Preserve. The Hanson Cement Plant and Limestone Quarry is located in the upper reaches of Permanente Creek, which accounts for almost 5% of the total watershed area. A study conducted by the USGS determined that the quarry and cement plant was a significant sediment source to the creek (USGS 1989).

The watershed area downstream of the West Branch confluence is primarily developed and includes the cities of Los Altos and Mountain View. High-density residential neighborhoods cover most of this area, comprising 43% of the total watershed area. The residential areas are interspersed with commercial and industrial uses, and public institutions, collectively covering 8% of the watershed. The riparian corridor downstream of Interstate 280 is significantly impacted from urban development and channel modifications.

Aquatic Biological Communities

Existing studies show Permanente Creek watershed supports an assemblage of four native species, including rainbow trout (*Oncorhynchus mykiss*), Sacramento sucker (*Catostomus occidentalis*), threespine stickleback (*Gasterosteus aculeatus*), and California roach (*Lavinia symmetrucus*) (Leidy 2002, SCBWMI 2001). Rainbow trout are reported to be distributed in the mainstem above Interstate 280 and in the West Branch Permanente Creek. California red-legged frogs (*Rana aurora draytonii*) have also been documented in the West Branch drainage area.

Sampling Design Rationale

Several key issues relevant to the development of a sampling design for the Program's FY 05-06 Monitoring Plan were identified based on the information described above. These include:

- The monitoring data collected by the RWQCB in 2002 and 2003 as part of the SWAMP provided extensive spatial coverage of sampling locations across an urban gradient for both Stevens and Permanente Creek watersheds. The type of data collected is very similar to data collected by the Program, which will provide a useful baseline data set to potentially study status and trends over a 3-4 year time period.

- Benthic macroinvertebrate samples collected in Stevens Creek by the USGS in 1997 provide an additional data set to study long-term trends in BMI community assessmblages at many of the same locations that were sampled by the RWQCB.

- Existing data show the upper 4.5 miles of Stevens Creek below the dam contain critical steelhead habitat. Sampling stations should be established to investigate

potential water quality impacts in this reach from upstream and adjacent land uses (e.g., two golf courses below the dam), as well as water operations for the Stevens Creek Dam. Existing information indicates the creek below the dam contains elevated turbidity concentrations, which appear to diminish in a downstream direction.

- Existing and planned geomorphic assessment information in Stevens Creek will be useful for interpreting results from benthic macroinvertebrate bioassessments and physical habitat assessments (i.e., assess if biological response is mostly related to habitat condition or water quality).

- Upper Permanente Creek and West Branch are similar in size, geology and land cover, but have significantly different land use impacts. The upper mainstem contains a large cement plant and quarry operation, and the West Branch is protected open space. Paired watershed monitoring design would provide useful information to study impacts of these different land uses.

- There was very limited fish information in Permanente Creek available to determine condition of native fish community. The upper watershed is reported to support rainbow trout and other native fishes. Excessive sediment production from quarry activities can have significant impacts to rainbow trout population.

- The upper watershed areas for Stevens Creek (above dam) and Permanente Creek (West Branch) are minimally disturbed and may provide suitable reference conditions for BMIs.

- Public access to creeks is primarily in Rancho San Antonio County Park and Open Space Preserve in upper Permanente Creek and in the County and City Parks and Open Space Preserves in Stevens Creek, most of which occurs above the dam and within a three mile reach below the dam.

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Attachment 4-3

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Watershed Monitoring & Assessment Summary and Watershed Characterization

Purpose: To analyze data collected during implementation of the Program's FY 04-05 Annual Monitoring Program Plan, summarize results and recommend next steps regarding data collection and watershed management; and to characterize watersheds (using available data) that are scheduled to be monitored in FY 06-07, according to the Program's Revised Multi-Year Receiving Waters Monitoring Plan.

Background: Since FY 02-03, the Program has developed and implemented Annual Monitoring Program Plans (Annual Plans) in fulfillment of Provision C.7 of its NPDES Permit. The Annual Plans identify monitoring activities that are implemented each year as part of the Program's Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan). Annual Plans have previously been implemented in the Lower Penitencia and Coyote Creek watersheds (FY 02-03); San Tomas and Adobe Creek watersheds (FY 03-04 & FY 04-05); and Matadero/Barron Creeks, Calabazas Creek, and Sunnyvale Channel watersheds (FY 04-05).

In accordance with Provision C.10 (b), the Program annually develops a Watershed Monitoring and Assessment Summary Report (Summary Assessment Report) that summarizes the results and analyses of baseline data collected during the implementation of the Program's Annual Plans. These data are generated through ambient surface water quality monitoring; physical habitat assessment studies and bioassessment studies. The Summary Assessment Reports provide information on possible beneficial use impacts to the extent possible (based on the study design and available data) and suggests next steps for monitoring/assessments and developing strategies to control potential impacts. In September 2004, the Program developed a Summary Assessment Report for monitoring activities that occurred in the San Tomas and Adobe Creek watersheds in FY 03-04.

In FY 05-06, the Program will summarize and analyze data collected in the San Tomas Creek, Adobe Creek, Matadero/Barron Creeks, Calabazas Creek, and Sunnyvale Channel watersheds. In addition, the Program will conduct a brief characterization of Lower Penitencia and Coyote Creek watersheds, which have been identified in the Multi-Year Plan as watersheds the Program will monitor in FY 06-07. Watershed characterization will consist of compilation of existing data sources in an effort to understand the physical and biological attributes of these watersheds. The characteristics may include the geologic and geomorphic setting, vegetation, land uses and associated water quality issues, status of biological communities and relevant beneficial uses that occur in each watershed. These data sources will be used to identify appropriate monitoring parameters and locations for implementation of the Program's FY 06-07 Annual Plan.

Scope Summary:

1. Analyze data collected in San Tomas Creek, Adobe Creek**,** Matadero/Barron Creeks, Calabazas Creek, and Sunnyvale Channel watersheds as part of the FY 04-05 Annual Monitoring Program Plan and summarize results.
2. Compile existing information to characterize the general physical and biological attributes of Lower Penitenica and Coyote Creek watersheds.

Products: Technical Memorandum (Watershed Characterization); Technical Report (Watershed Monitoring and Assessment Summary)

Schedule: July 2005 – June 2006

Program Staff: Chris Sommers, Paul Randall, Lucy Buchan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Watershed Assessment

Purpose: To assess existing data sources for San Tomas and Adobe Creek watersheds, identify data gaps and potential follow-up studies and recommend management actions, where feasible.

Background: Consistent with the March 1, 2004 Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan), the Program conducted ambient surface water quality monitoring, physical habitat assessment studies, and bioassessment studies in the San Tomas and Adobe Creek watersheds for two consecutive years (FY 03-04 and FY 04-05). The results and analyses of these data collection activities were summarized in the Program's *Watershed Monitoring and Assessment Summary Report* (Summary Assessment Report). The Summary Assessment Report identifies potential beneficial use impacts to the extent possible (based on the study design and available data) and suggests subsequent steps for monitoring, assessments, and strategies to control potential impacts.

The Program identified a framework to more fully integrate the Program's monitoring activities with watershed assessments in the Revised Multi-Year Plan. The framework includes conducting screening-level monitoring over a period of two years, followed by an assessment of existing data sources in a watershed-scale context. Results of these assessments will be documented in *Watershed Assessment Reports*, and include descriptions of assessment methods, identification of data gaps and potential follow-up studies, and recommended management actions, where feasible.

The assessment will be conducted in selected watershed areas of the San Tomas and/or Adobe Creek watershed. The area assessed will depend on the extent of the watershed area that supports specific beneficial uses and the type of indicator data that are available. For example, assessment of cold freshwater habitat indicators in the San Tomas watershed would be restricted to the Saratoga Creek subwatershed since it is the only waterbody in this watershed that supports a cold water fish community (i.e., resident rainbow trout). Assessment of recreational use indicators in either watershed would occur in areas of creeks that have the highest potential for human access and exposure.

Scope Summary:

1. Evaluate existing data sources collected in San Tomas and Adobe Creek with respect to environmental indicators of watershed health and support of beneficial uses.
2. Identify data gaps or investigative studies needed to determine potential impacts to beneficial uses.
3. Conduct field reconnaissance and/or collect additional data, where feasible, to address data gaps.
4. Identify recommended management actions designed to reduce/eliminate impacts on beneficial uses.

Products: Technical Report

Schedule: July 2005 – June 2006

Program Staff: Chris Sommers, Paul Randall, Lucy Buchan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Purpose: Provide coordination assistance and staff support to the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Background: In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in storm water programs that include rapid bioassessments in their watershed monitoring and assessment programs.

Building on the success of the BAMBI workshop in 2002, BASMAA participants (including SCVURPPP) coordinated and participated in the second annual BAMBI workshop on January 29, 2003. In preparation for the workshop, Program staff supported (through in-kind services) the development of issue papers intended to stimulate discussion on issues related to the following five topic areas: (1) the standardization of rapid bioassessment protocols in the Bay Area; (2) the establishment of reference conditions for Bay Area creeks; (3) quality assurance and control in field sampling and laboratory analyses; (4) data management and sharing; and (5) physical habitat assessments and protocols.

The third annual BAMBI workshop occurred on January 29, 2004. Technical information on existing and planned bioassessment studies conducted in the San Francisco Bay Area was presented. Workshop participants also reviewed and discussed potential BABMI goals and objectives as an initial step in the development of a work plan that identifies future BAMBI activities.

In FY 05-06, the Program will plan to support and actively participate in the development of an Index of Biotic Integrity (IBI) for Bay Area Creeks, with the goal of developing a regional bioassessment tool necessary to provide context to data collected in Santa Clara Basin creeks. In addition, Program staff will help coordinate and facilitate BAMBI workshop(s) and meeting(s).

Scope Summary:

1. Assist in the planning and coordination of the fifth annual BAMBI workshop.
2. Assist in the development of BAMBI IBI work plan and provide in-kind services to implement specific tasks identified in the work plan.
3. Coordinate with other agencies and stormwater programs in further development and implementation of bioassessment tools and sharing of bioassessment data.

Products:

- BAMBI meeting summary(s)
- Draft IBI for San Francisco Bay Area Creeks

Schedule: July 2005 – June 2006

Program Staff: Chris Sommers, Paul Randall, Lucy Buchan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Dioxins, Mercury, PCBs, and Legacy Pesticides

Purpose: Assist Co-permittees in addressing these pollutants of concern.

Background: The 1998 and 2002 Clean Water Act Section 303(d) lists designate all segments of San Francisco Bay as impaired by certain dioxin-like compounds, mercury, polychlorinated biphenyls (PCBs) and certain chlorinated pesticides referred to as legacy pesticides (DDTs, dieldrin and chlordanes). The listings were in response to an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment (OEHHA). OEHHA issued the advisory after these pollutants were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. It should be noted that The Regional Board opposed the 1998 listing of dioxins in the Bay, but was overruled by the United States Environmental Protection Agency (USEPA).

Scope Summary: During FY 05-06, the Program will continue to work with other Bay area dischargers and Regional Board staff through BASMAA, the CEP and the RMP to implement regional projects related to dioxins, mercury, PCBs, and chlorinated pesticides.[1] This may include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff. Program staff will continue to represent BASMAA on the RMP Technical Review Committee, the RMP Sources, Pathways and Loadings Work Group, the CEP mercury work group and the CEP PCBs work group. Program staff will also continue to track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Co-permittees will be encouraged to track and participate in these programs and to evaluate 1) performing public outreach activities and 2) developing related policies and ordinances. Relevant regional, state and federal efforts include the Bay Area Dioxins Project managed by the Association of Bay Area Governments and multi-faceted efforts by USEPA to assess dioxin risks and monitor and control dioxins.

Products: The above actions will be documented in the Program's Annual Report.

Schedule: July 2005 – June 2006.

Program Staff: Chris Sommers, Jon Konnan and Adam Olivieri

[1]The Program is separately implementing a mercury pollution prevention program. See Section 6 of the Program's Work Plan and past Annual Reports for additional information.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Implement Trash Work Plan

Purpose: Implement Trash Work Plan

Background: The Trash Work Plan was prepared to fulfill a Program FY 01-02 Continuous Improvement item and actions within the Program's Multi-Year Receiving Waters Monitoring Plan. The Work Plan was developed in response to the November 14, 2001 San Francisco Bay Regional Water Quality Control Board (RWQCB) 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on a preliminary or "monitoring" list due to the threat of trash impairment to water quality. The State Water Resources Control Board adopted this recommendation in the final version of the 2002 Clean Water Act 303 (d) list.

The RWQCB Staff Report states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by stormwater agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information and developing a program of action to address the principle sources. Regional Board staff has indicated that it will review this specific information in the next listing cycle; determine whether specific water bodies warrant a 303(d) listing for trash and note the existence of relatively clean urban streams.

In a proactive response to the 303(d) Staff Report, the Program developed a Work Plan to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways. The Work Plan includes the following objectives: 1) Document existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Assist municipalities to identify high priority trash problem areas and sources of trash; 3) Implement trash assessments at identified trash problem areas; 4) Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas; and 5) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

The Work Plan tasks for FY 05-06 will focus on continued implementation and evaluation of trash evaluations and management practices.

Scope Summary

- Co-permittees will continue to conduct trash evaluations in a subset of identified trash problem areas and submit trash evaluation information in standardized format to Program staff;
- Assist Co-permittees in evaluating information collected during trash evaluations;
- Continue identifying and begin implementation or refinement of trash control measures, as appropriate to address trash problem areas within high priority areas;
- Assist Co-permittees in developing a long-term strategy for trash conditions in urban streams and waterways; and
- Revise trash problems areas list on an as needed basis.

Products: Technical memorandum summarizing trash evaluation results; technical memorandum providing recommended approach for developing a long-term strategy for trash conditions in urban streams and waterways.

Schedule: July 2005 – June 2006

Program Staff: John Fusco and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Stream Studies Inventory Update

Purpose: Provide update to the Santa Clara Basin Watershed Management Initiative's (SCBWMI) Stream Studies Inventory (SSI) database.

Background: The Watershed Assessment and Monitoring Subgroup (WAMS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAMS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0) and November 2003 (version 5.0). The Program funded the initial development of the SSI and each of the annual updates.

Scope Summary

- The Program will update, revise and reissue a Stream Studies Inventory (SSI) in coordination with the SCBWMI.

Products: Updated Stream Studies Inventory

Schedule: July 2005 – June 2006

Program Staff: Paul Randall and Chris Sommers

Attachment 4-4

Attachment 4-4
FY 2005-2006 Programmatic Monitoring Indicators

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Trash Work Plan	MP#2 & 3c	303d Threatened Listing	The Program will assist Co-permittee's in evaluating information collected during trash evaluations and in developing a long-term strategy for trash conditions in urban streams and waterways; Co-permittees will continue to conduct trash evaluations in a subset of identified trash problem areas and submit trash evaluation information in standardized format to Program staff, continue identifying and begin implementation or refinement of trash control measures, as appropriate to address trash problem areas within high priority areas; and revise trash problem areas list on an as needed basis.	Completed trash evaluation forms; technical memorandum summarizing trash evaluation results; technical memorandum providing recommended approach for developing a long-term strategy for trash conditions in urban streams and waterways; and revised trash problem areas list.	July 2005 - June 2006
Dioxin Control Program Activities	MP#1 Provision C.9.e.	NPDES permit and 303d listing	See separate project scope in Attachment 4-3	Dioxins Control Program Work Plan Participation in CEP Technical Committee	Tied to CEP & BASMAA Time Schedule

[1] Monitoring Priorities (updated at Monitoring AHTG meeting November 8, 1999):

1) New projects needed to implement the results, and achieve the goals, of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
   a) Investigate Beneficial Uses and Causes of Impairment (including field work)
   b) Review and Compile Environmental Data and Make it Accessible
   c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
   d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4) Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA

Attachment 4-4
FY 2005-2006 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
PCBs, Chlorinated Pesticides and PAH Control Program Activities	MP#1	303d Monitoring listing	See separate project scope in Attachment 4-3.	CEP Work Products (e.g., CMIAs, Technical Reports) Participation in CEP Technical Committees and Workgroups	Tied to CEP & BASMAA Time Schedule
Continued Implementation of Enhanced IC/ID and IND Tracking and Reporting	Follow-up/ Continuous Improvement MP#2 Provision 6.a.i.	SEIDP #21	Continue Implementation and Reporting of Enhanced Reporting;	Database and annual report summary	September 2005
Mercury Pollution Prevention	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.c	NPDES permit	Coordinate implementation of Program's Mercury Pollution Prevention Plan. (See separate FY05-06 Work Pan)	Status Report and internal guidance	See Plan for details
Copper and Nickel Baseline Activities	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.a & b	NPDES permit	The FY 05-06 Copper and Nickel Action Plan Baseline Activity Work Plans and summary of certain FY 04-05 accomplishments are provided within Attachment 4-5.	Revised Copper and Nickel Action Plans	TBD
Pesticide Plan Coordination, Implementation, and Reporting	Follow-up/Continuous Improvement MP#1,2 Provision C.9.d	Implement URMP Pesticide Management Efforts	Coordinate implementation of Program's Pesticide Plan. (See separate FY05-06 Work Pan)	Status Report and internal guidance	See Plan for details

Attachment 4-4
FY 2005-2006 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Compile, Maintain and Share Program/ Watershed Data	Follow-up MP#1	Continuation of Project SC22.63	Data management for the SCVURPPP Program. Coordinate data collected and analyzed by Program-sponsored projects. Insure that data is quality-assured, comparable across projects and comparable across watersheds (where possible). Where feasible, make data accessible to Co-permittees and to the public. Maintain and update website. Summarize available information on the background, purpose, and activities of planned and ongoing studies of the physical, chemical and biological characteristics of creeks and wetlands in the Santa Clara Basin.	Updated inventory of data and metadata generated by the Program and by Program-sponsored studies.	Ongoing
Support for Land Use Subgroup	WMI Subgroups MP# 1, 3c, 3d Provision C.10.	Continue WMI support	Provide administrative support and leadership for the Land Use Subgroup. Maintain the subgroup mailing list; prepare and distribute agendas; chair meetings; edit and distribute meeting summaries; liaison to, and correspond with, the SCBWMI Core Group other subgroups as needed; update workplans; facilitate interaction between consultants and the subgroup; summarize, compile, and convey subgroup products.	Meeting agendas and summaries, Work Plans and other products as directed by the subgroup.	July 2005 – June 2006

Attachment 4-5

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB-1 – Reduce copper discharges from vehicle washing operations: (1) outreach on residential car washing, (2) outreach and requirements for commercial & industrial vehicle washing, and (3) education of and implementation of BMPs by mobile cleaners. Include mechanisms to evaluate effectiveness of each of these 3 measures. **Region of Applicability:** South Bay. Concept potentially applicable Bay-wide. **Linkage to Copper Reduction:** Indirect. Assumes vehicle wash water contains copper that will be permanently captured/redirected away from storm drains. **Performance Measure(s):** Extent of outreach, training, retraining, inspection, and enforcement efforts by SCVURPPP and Co-permittees				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-1(1)		a. Continue to distribute Watershed Watch (WW) campaign brochures at public events and post information on the WW website. Include information on proper car washing.	a. Track quantities of outreach material distributed and gross impressions of advertising (see Program's *FY 05-06 Annual Report*).	Ongoing activity.
SCVURPPP CB-1(2)		Same actions as FY 04-05 (see below).		Ongoing activity. To reduce discharges from vehicle washing activities, Co-permittees will continue outreach to businesses and residents on BMPs.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto, Sunnyvale, San Jose CB-1(3)		Same actions as FY 04-05 (see below).		Ongoing activity.
All Co-permittees All CB-1 tasks		Refer to individual Co-permittee Work Plans.		
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP CB-1(1)		• Distributed Watershed Watch (WW) campaign brochures at three public events and through website and hotline requests. • Worked with WW partner, Classic Car Wash, to do four promotional events in October and November 2004. Classic Car Wash offered fifty percent discounted car washes to patrons who mentioned the Watershed Watch Campaign at the event. The *San Jose Mercury News* provided free promotional advertisement for each event and KBAY conducted live remotes at all events. Ads provided information on how the use of a commercial car wash prevents stormwater pollution. The promotion was also posted on	During the first half of FY 04-05, 1,512 English and 835 Spanish WW kits were distributed. Distribution occurred at public events, through web site and hotline requests and to neighborhood associations. During the first half of FY 04-05, approximately 800 WW kits have been distributed to patrons at Classic Car Wash. Approximately 169 kits were distributed during the four Classic Car Wash events. Approximately 231 WW kits were distributed at Classic Car Wash kiosks/cash registers. Staff talked to	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		the WW web site for one month. Co-permittee and Program staff volunteered at these events and distributed WW kits and flyers describing the environmental impact of washing cars on paved surfaces to Classic Car Wash patrons. The WW kit included a discount coupon offering a $4.00 discount at all Classic Car Wash locations from August to December 31, 2004. This discount is also being promoted on the Watershed Watch web site.	approximately 204 people at these events. Use of discount cards by repeat customers: 71 in August 2004, 61 in September 2004, 83 in October 2004, 83in November 2004 and 56 in December 2004.	
SCVURPPP CB-1(2)		Track the following Co-permittee activities: a. Required source control measures for Group 1 new development and redevelopment projects that will conduct vehicle/equipment washing and maintenance activities (consistent with Permit Provision C.3.k). b. Inspected vehicle washing facilities as part of stormwater inspections for industrial and commercial businesses.	Collect and review data submitted with Co-permittee Annual Reports. Co-permittes inspected vehicle washing facilities in accordance with their planned commitments. Follow-up inspections were conducted for facilities out-of-compliance. Co-permittee industrial/commercial inspection summary tables for FY 04-05 will be provided within Section 10 of the Program's *FY 04-05 Annual Report*.	Ongoing-Consistent with Permit Provision C.3.k. Ongoing-Consistent with Permit Provision C.6.a.i
Palo Alto, Sunnyvale, San		**As Required:** During the first half of FY 04-05, the City of San Jose responded to one training request	Will provide lists in Annual Reports.	Ongoing. Training will occur when

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Jose CB-1(3)		from a mobile surface cleaner who desired initial BASMAA surface cleaning certification. A list of individuals and dates of training will be maintained. **Biannual:** Provided training information to Program staff for reporting purposes. **Ongoing**: Municipal staff (or encourage public parties) will select certified mobile cleaners (from the list) when contracting cleaning services.		requested. Local trainers will provide training information on a biannual basis
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-1(1)		b. Continue to distribute Watershed Watch (WW) campaign brochures at public events and post information on the WW website. Include information on proper car washing in WW advertising. This task is an on-going P/IP activity. c. Work with WW partner business, Classic Car Wash, to do promotional events in June/July 2004.	a. Track quantities of outreach material distributed and gross impressions of advertising (see Annual Watershed Watch Campaign Media Report). b. Track number of participants in car wash events and repeat customers using the discount card at the car wash.	Ongoing
SCVURPPP CB-1(2)		Track the following Co-permittee activities: a. Require source control measures for Group 1 new development and redevelopment projects that will conduct vehicle/equipment washing and maintenance activities. This activity is consistent with Permit Provision C.3.k.	Results will be provided in Annual Report, per Permit Provision C.3.n	Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		b. Inspect automotive facilities (car washes are a subset of this category) as part of the Program's Industrial/Commercial Discharger Control Program. Inspection results are summarized in the Program's Annual Report submitted each September. This activity is consistent with Permit Provision C.6.a.i.	As applicable, Co-permittees are inspecting automotive facilities in accordance with their planned IND inspection commitments. Follow-up inspections are conducted at facilities determined to be out-of-compliance.	Ongoing. This activity is part of the Program's enhanced reporting requirements.
Palo Alto, Sunnyvale, San Jose CB-1(3)		Continue to respond to training requests from mobile surface cleaners who desire initial BASMAA surface cleaning certification. Maintain list of individuals and dates of training. Provide training information to Program staff for reporting purposes. Municipal staff (or encourage public parties) will select certified mobile cleaners (from the list) when contracting cleaning services.	Provide lists in Annual Reports.	Training will be provided, as requested, by one of the three POTW cities. On a biannual basis, local trainers will provide Program staff with a list of individuals and dates of training.
All Co-permittees All CB-1 tasks		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP CB-1(1)		• Distributed Watershed Watch (WW) campaign brochures at three public events and through website and hotline requests.	During FY 03-04, 19,336 English and 854 Spanish WW kits were distributed. Distribution occurred at public events, through web	Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		• Worked with WW partner, Classic Car Wash, to do four promotional events in August 2003 and four in April/May 2004. Classic Car Wash offered fifty percent discounted car washes to patrons who mentioned the Watershed Watch Campaign at the event. The *San Jose Mercury News* provided free promotional advertisement for each event and KBAY conducted live remotes at all events. Ads provided information on how the use of a commercial car wash prevents stormwater pollution. The promotion was also posted on the WW web site for one month. Co-permittee and Program staff volunteered at these events and distributed WW kits and flyers describing the environmental impact of washing cars on paved surfaces to Classic Car Wash patrons. The WW kit included a discount coupon offering a $4.00 discount at all Classic Car Wash locations from August to December 31, 2003 and May 2004 through December 31, 2004. This discount is also being promoted on the Watershed Watch web site.	site and hotline requests and to neighborhood associations. During FY 03-04, approximately 1,600 WW kits were distributed to patrons at Classic Car Wash. Approximately 450 kits were distributed during the eight Classic Car Wash events. Approximately 1,050 WW kits were distributed at Classic Car Wash kiosks/cash registers. Use of discount cards by repeat customers: 40 in September 2003, 70 in October 2003, 41in November 2003, 51 in December 2003, 35 in May 2004 and 75 in June 2004. During FY 03-04, a total of 312 repeat customers used the discount cards.	
SCVURPPP CB-1(2)		Track the following Co-permittee activities: c. Required source control measures for Group 1 new development and redevelopment projects that will conduct vehicle/equipment washing and maintenance activities	Collect and review data submitted with Co-permittee Annual Reports.	Ongoing-Consistent with Permit Provision

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		(consistent with Permit Provision C.3.k). d. Inspected vehicle washing facilities as part of stormwater inspections for industrial and commercial businesses.	Co-permittes inspected vehicle washing facilities in accordance with their planned commitments. Follow-up inspections were conducted for facilities out-of-compliance. Co-permittee industrial/commercial inspection summary tables for FY 03-04 are provided within Section 10 of the Program's *FY 03-04 Annual Report*.	C.3.k. Ongoing-Consistent with Permit Provision C.6.a.i
SCVURPPP CB-1(3)		a. On October 29, 2003, a planning meeting was held with the three POTW cities to review the Program's standardized mobile surface cleaner training program. All three POTW cities are now ready to conduct training when requested. b. Each of the three POTW cities conducted Program-sponsored training workshop to certify (and re-certify in some cases) mobile surface cleaners in proper surface cleaning techniques. The training workshops were conducted on December 17, 2003, February 11, 2004 and March 24, 2004. All three workshops attracted 137 participants. Approximately 84 of the 137 participants were mobile surface cleaners.	All three workshops and subsequent trainings consisted of a standardized message. Each workshop was very well received. The vast majority of workshop participants reported that the training met their expectations.	Recent changes at BASMAA may allow this effort to be conducted on-line in the future.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		c. Distributed a list of 84 mobile surface cleaners to the Management Committee and BASMAA Executive Director (by electronic mail) on March 31, 2004. This list is provided within Appendix A-5 of the Program's *FY 03-04 Annual Report*. Municipal staff (and other public agencies as appropriate) will use the list to select certified mobile cleaners when contracting cleaning services.	Improves the likelihood that certified mobile cleaners are used when contracting cleaning services.	BASMAA re-certification will occur every two years.
Palo Alto, Sunnyvale, San Jose CB-1(3)		**As Required:** Respond to training requests from mobile surface cleaners who desire initial BASMAA surface cleaning certification. Maintain list of individuals and dates of training. **Biannual:** Provide training information to Program staff for reporting purposes. **Ongoing**: Municipal staff (or encourage public parties) will select certified mobile cleaners (from the list) when contracting cleaning services.	Provide lists in Annual Reports.	Ongoing. Training will occur when requested. Local trainers will provide training information on a biannual basis

CAP Category: Potential Source Tracking				
BASELINE ACTIVITY: CB- 2 – Water Supplier Copper Sulfate Use **Region of Applicability:** South Bay and other Bay areas with open water reservoirs and conveyance facilities **Linkage to Copper Reduction:** Raw water copper sulfate applications to control algae could potentially increase treated water concentrations **Performance Measure(s):** Raw water copper sulfate dosage and treated water copper concentrations				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto		Same action as FY 04-05 (see below).		Ongoing activity.
FY 2004-2005		**Actions Accomplished in Period**		
Palo Alto		Obtained State DWR copper sulfate dosage notices. The RWQCB sent a letter dated September 22, 2004 to San Francisco PUC requesting dosages applied to local reservoirs. Palo Alto will include this data in its 2005 C*opper Action Plan Report* (Appendix E of the *2005 Clean Bay Plan)* in February 2005. This is an on-going activity.	Copper sulfate usage is regulated by SWRCB Aquatic Pesticide Application General NPDES permit Order No. 2004-0009-DWQ. Annual monitoring and reporting required.	Ongoing.
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto		Obtain State DWR copper sulfate dosage notices. Obtain from San Francisco PUC dosages applied to		Ongoing. DWR notices will be

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		local reservoirs. Palo Alto will include these data in its annual *Copper Action Plan Report.* This is an on-going activity.		obtained annually. SFPUC dosage will be requested more frequently.
FY 2003-2004		**Actions Accomplished in Period**		
Palo Alto		Obtained State DWR copper sulfate dosage notices from SCVWD. This data was included in the City's *Copper Action Plan Report* (Appendix E of the *2004 Clean Bay Plan)* dated February 25, 2004.	Applied dosages are indirect indicators. The amount of concentration will increase in treated water is delivered to consumers.	Ongoing. This activity occurs annually.

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB- 3: Measures to control copper in discharges of stormwater from targeted industrial sources: older printed circuit board manufacturers and metal plating facilities using copper. **Region of Applicability:** Primarily South Bay and City of San Jose. **Linkage to Copper Reduction:** Roof-top exhaust vents from etching equipment and acid plating baths can contribute copper and nickel to roof runoff from these industries. **Performance Measure(s):** Outreach to appropriate industries; use of recommended BMPs; future industrial inspection reports.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		As part of the Program's Industrial/Commercial Discharger Control Program, continue inspecting facilities which are potential sources of copper. Potential sources may include electric/electrical components, metal manufacturing and metal finishing facilities. Inspection results are summarized in Section 9 or 10 of the Program's Annual Report submitted each September. This activity is consistent with Permit Provision C.6.a.i	As applicable, Co-permittees are inspecting industrial and commercial facilities in accordance with their planned IND inspection commitments. Follow-up inspections are conducted at facilities determined to be out-of-compliance. Co-permittees report evaluation of effectiveness of IND programs for target industries in Annual Reports.	Ongoing. This activity is part of the Program's enhanced reporting requirements (Permit Provision C.6.a.i). Individual POTW Pretreatment Programs will continue inspecting categorical facilities in accordance with their NPDES permits. Results are reported in annual Pretreatment

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
				reports. Industrial facilities are also subject to Industrial Stormwater General Permit requirements.
Sunnyvale, San Jose		Continue distributing stand-alone roof vent BMP information to applicable industrial facilities during routine IND inspections.		Ongoing activity.
All Co-permittees with IND Programs		Refer to individual Co-permittee Work Plans.		
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP		**Status**: Worked with the Industrial Inspection AHTG to update the IND Performance Standard. The updates were essentially administrative (e.g., incorporating enhanced reporting requirements and results of Co-permittee evaluations). The inspection frequency of industrial/commercial facilities was also updated to match the Program's NPDES permit. A final revised draft of the IND performance standard was approved by the Management Committee on February 17, 2005.	Effectiveness of implementation is evaluated in Co-permittee annual reports.	Possible update to URMPs of Co-permittees with IND programs.
		Status: On May 20, 2004, Program staff provided the stand-alone roof vent BMP information (developed by the City of San Jose) to the Management Committee. The City of San Jose printed and mailed the BMP information to all permitted industrial users in the SJ/SC WPCP	Obtain feedback from participants in San Jose's Industrial User Academy.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		service area. The City of Sunnyvale has modified the original version to fit their local conditions and characteristics. It is being distributed to applicable industrial facilities within their service area.		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Distribute the stand-alone roof vent BMP information (developed by the City of San Jose) to Co-permittees. The City of San Jose will distribute this piece to circuit board and metal finishing facilities in FY 03-04.	Obtain feedback from participants in San Jose's Industrial User Academy.	
SCVURPPP		As part of the Program's Industrial/Commercial Discharger Control Program, continue inspecting facilities which are potential sources of copper. Potential sources may include electric/electrical components, metal manufacturing and metal finishing facilities. Inspection results are summarized in the Program's Annual Report submitted each September. This activity is consistent with Permit Provision C.6.a.i	As applicable, Co-permittees are inspecting industrial and commercial facilities in accordance with their planned IND inspection commitments. Follow-up inspections are conducted at facilities determined to be out-of-compliance. Co-permittees report evaluation of effectiveness of IND programs for target industries in Annual Reports.	Ongoing. This activity is part of the Program's enhanced reporting requirements.
SCVURPPP		Begin working with the IND AHTG to develop model language for updating the IND Performance Standards. If necessary, continue update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater.	Effectiveness of implementation to be evaluated in Co-permittee annual reports.	Possible update to URMPs of Co-permittees with IND programs.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
San Jose		Continue NOI Filers outreach project.		
All Co-permittees with IND Programs		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		• Completed summary report on most effective targeted industry stormwater control measures. Distributed to Co-permittees, BASMAA and other Bay Area stormwater programs (Fall 2003). **Update:** There are relatively few pathways for copper to be released from industries in a manner that would contaminate stormwater. Potential sources may include electric/electrical components, metal manufacturing and metal finishing facilities. The primary potential source identified by San Jose's investigations was from roof vents in older printed circuit board and copper plating facilities. As a result, this action was addressed through the distribution of a stand-alone BMP information sheet which focuses on this potential source In addition, the inspection of industrial and commercial facilities has been incorporated into the Program's Industrial/Commercial Discharger Control Program. The approach for identifying potential sources of storm water pollution is described in the Program's memorandum entitled *Continuous Improvement of Industrial Reporting* (dated September 7, 2001). The approach was developed by the Industrial AHTG in 2001.	As applicable, Co-	Ongoing. This

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		During FY 03-04, Co-permittees continued inspecting industrial and commercial facilities for illicit or other potential discharges/releases of constituents of concern. Inspection results for FY 03-04 are summarized within the Co-permittee industrial/commercial inspection summary tables provided within Section 10 of the Program's *FY 03-04 Annual Report.* This activity is consistent with Permit Provision C.6.a.i Work with the IND AHTG to develop model language for updating the IND Performance Standards and a timeframe for implementation. Consider update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater. **Update:** This task was originally scheduled for FY 03-04. Due to higher priority Program issues, this task has been delayed until FY 04-05	permittees inspected industrial and commercial facilities in accordance with their planned IND inspection commitments. Follow-up inspections were conducted at facilities determined to be out-of-compliance. Co-permittees reported evaluation of effectiveness of IND programs for target industries within their FY 03-04 Annual Reports.	activity is part of the Program's enhanced reporting requirements.
San Jose		• The City of San Jose committed to the additional production and distribution of stand-alone roof vent BMP information to circuit board and metal finishing facilities. During FY 03-04, BMP information was printed and mailed to all permitted industrial users in the SJ/SC WPCP service area. The continued distribution of roof vent BMP information is a follow-up action to San Jose's spring 2001 publication of roof vent		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		information in the City's pretreatment newsletter entitled *Tributary Tribune*. • On May 10, 2004, the City of San Jose distributed the stand-alone roof vent BMP information to the Management Committee by electronic mail. On May 20, 2004, Program staff provided a paper copy of the BMP information to the Management Committee. • Continued NOI Filers outreach project. Tasks completed in FY 03-04 include the following: – Collected educational materials relating to General Permit requirements, NOI, BMPs and/or SWPPPs. – Provided NOI filing information to San Jose Watershed Enforcement inspectors. Currently determining NOI status and needs as part of Inspection SOPs. – Posted NOI filing information on the City of San Jose ESD web site. – Distributed an all-purpose BMP brochure entitled *Preventing Storm Drain Pollution* to facilities as part of routine storm water facility inspections. It details general storm water BMP information. – Began translating *Preventing Storm Drain Pollution* into Spanish and Vietnamese. Both documents will be printed and distributed, as resources allow in FY 04-05. – Provided NOI filing information to sixty industrial representatives at the San Jose Industrial User Academy Trainings on April 28-29, 2004. Information provided included: regulatory background and requirements, actions needed to achieve compliance, and details on determining exposure.	The success of the NOI Filers outreach project is tracked by the following methods: – Checking the State database periodically to observe changes in the number of NOIs filed. – Tracking the number telephone calls received by the City of San Jose's 1-800 telephone number. Approximately 25 attendees at the Industrial User Academy Trainings submitted evaluations. Approximately 60 percent of the respondents indicated that their knowledge of NOI has	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		• Other tasks to be completed during FY 04-05 include: – Obtaining an updated list of industries requiring NOI filing from San Jose's IND Database. Letters were mailed in June 2004 to companies who may need to file NOIs. Letters included information on how to achieve compliance with the GIASP. – Continue providing NOI filing information to industrial representatives at future San Jose Industrial User Academy Trainings.	increased.	
All Co-permittees with IND Programs		Refer to individual Co-permittee FY 03-04 Annual Reports.		

CAP Category: Potential Source Tracking				
BASELINE ACTIVITY: CB- 4(3) – Potential Copper Sources, Loadings, and Impact Indicators **Region of Applicability:** Mainly South Bay; some indicators (brake pad content and BPP) applicable Bay-wide **Linkage to Copper Reduction:** Measures of copper sources, indicators of potential release to the environment, and monitoring of impacts on indicator aquatic organisms **Performance Measure(s):** Relative change in specified indicator measurements				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto	2006 Palo Alto CAP Report	• Same action as FY 04-05 (see below).		Ongoing activity
FY 2004-2005		**Actions Accomplished in Period**		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto	2005 Palo Alto CAP Report	• Palo Alto will prepare fourth annual *Copper Action Plan Report* in Feb/Mar 2005. Influent, effluent and loading data from Sunnyvale, San Jose will also be included within the report. This is an on-going activity.		Report will include DWR copper sulfate dosage (to the South Bay Aqueduct) data and SFPUC dosage data (to local East Bay reservoirs)

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
Palo Alto	2004 Palo Alto CAP Report	• The City of Palo Alto prepared its Copper Action Plan Report (Appendix E of the 2004 Clean Bay Plan) dated February 25, 2004. Influent, effluent and loading data from Sunnyvale, San Jose and the amount of copper sulfate applied to the South Bay Aqueduct from 1996 through 2002 was also included within the Copper Action Plan Report.		
		• Discussed approach to consolidate related task reporting in this annual report during the April 6, 2004 South Bay CAP/NAP Semi-annual meeting. It was agreed that to reduce redundant reporting, POTW baseline activities could be reported by reference within the Program's Cu/Ni Work Plan. This approach would eliminate reporting out the same activity in multiple regulatory reports. It was noted that the reporting on most if not all other baseline activities within the current Cu/Ni Work Plan could likely be similarly done. Since most of these activities are on-going and have been incorporated into other existing programs, they could be reported on by referencing where the information is found within the appropriate sections of the Annual Report.		Continue to participate in efforts to develop/implement a Bay-wide CAP that will replace the South Bay CAP.

CAP Category: Potential Source Reduction (and uncertainty reduction)

BASELINE ACTIVITY: CB-5 – Local support for Brake Pad Partnership (BPP): (1) research on brake pad wear debris & content; (2) involve other local state and federal players, (3) assist in making research data accessible

CB-4(1) – Quantification studies of copper in vehicle brake pads (Other quantification studies reported under corresponding baseline activity)

CB-4(2) – Quantification studies of brake pad copper debris fate and transport

CB-4(4) – Issue paper on feasibility of monitoring brake pad copper fate and transport

Region of Applicability: Bay-wide

Linkage to Copper Reduction: Brake pad debris is apparent dominant non-point source. Relative fate, transport, and bioavailability uncertain.

Performance Measure(s): Comprehensive assessment proceeding under Prop. 13 project to address all baseline activities.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP via BASMAA CB-5(1) CB-4(1, 2, 4)		• Same action as FY 04-05 (see below).		Participation in BPP is an ongoing effort through BASMAA. Should transition to BPP participation and reporting as part of Bay-wide CAP effort. BPP Prop. 13 grant funded project is addressing most aspects of CB-4(1)(2)(4) and CB-5. CB-4(4) moot since fate and transport studies are included in BPP Prop 13 project.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
SCVURPPP CB-5(3), CB-16		• Same action as FY 04-05 (see below).		
SCVURPPP CB-4(1, 2, 4)		• Same action as FY 04-05 (see below).		
SCVURPPP		• Continue discussions regarding the identification of additional funding sources for clearinghouse. Determine the future coordination of web-page maintenance activities as part of Bay-wide CAP development effort.		Funding and coordination decision needs to be made by December 2005.
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP via BASMAA CB-5(1) CB-4(1, 2, 4)	BASMAA liaison to BPP (Kelly Moran, TDC Environmental)	• Same accomplishment as FY 03-04 (see below).		
SCVURPPP CB-5(3), CB-16		• Same accomplishment as FY 03-04 (see below).		
SCVURPPP		• Completed development of prototype P2 clearinghouse in December 2004. The clearinghouse is available on the Program's website at www.scvurppp.org. The website has been designed as a bay-wide resource. The Program has committed to maintain the website through calendar year 2005.	Intended to be a complementary resource to the BACWA *Pollution Prevention Guidance and Tools for POTWs* project and the CEP *Copper Sources in Urban Runoff and Shoreline Activities*	Identification of additional funding sources (after 2005) is required. The Program may transition from program coordination to an oversight role.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
			report.	
		• SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-wide CAP development effort.
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP via BASMAA CB-5(1) CB-4(1, 2, 4)	BASMAA liaison to BPP (Kelly Moran, TDC Environmental)	• Continue to actively track activities of BPP (and other efforts under the Proposition 13 grant) through BASMAA Monitoring Committee monthly meeting notes and BASMAA BPP liaison notes and communications. • Continue contributing SCVURPPP portion of BASMAA baseline funding allocated to BASMAA BPP liaison and BPP support. • Continue attending BPP Annual Stakeholder Meetings and share results with Management Committee.		The BPP is a standing item at the monthly BASMAA Monitoring Committee meetings. The Program will continue monitoring and supporting all ongoing BPP activities. The City of Palo Alto will continue to report on BPP activities within their Copper *Action Plan Report* prepared every February.
SCVURPPP CB-5(3), CB-16		• Continue providing links at Program website (www.scvurppp.org) to websites which contain BPP Proposition 13 information. • Continue posting technical documents relevant to the BPP and other brake pad information on		Ongoing. Update as needed. Ongoing. Update as

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
		the SCVURPPP website.		needed.
SCVURPPP CB-5(3), CB-16		• Continue providing resources (for a two year period) to develop a prototype P2 clearinghouse. Development of the clearinghouse will be coordinated with the Pollution Prevention Menus Project (see CB-16). Links/information to be posted to the prototype P2 clearinghouse during FY 04-05. • Finish establishing links/information relating to Bay copper impairment research data posted to a prototype SFEI-based web portal during CY 2004. Track project timeline and interface with contractor regarding project status and completion.		Future funding source(s) after 2004 to be determined.
SCVURPPP CB-4(1, 2, 4)		• Continue tracking quantification studies as they relate to brake pads as sources.		Other source quantification studies in addition to brake pads will be tracked and presented in the appropriate Copper/Nickel baseline activity tables.
FY 2003-2004		**Actions Accomplished in Period**		
SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project		• Program staff actively tracked activities of BPP and efforts under the Proposition 13 grant through BASMAA Monitoring Committee monthly meeting notes and BASMAA BPP liaison notes and communications. • Contributed SCVURPPP portion of BASMAA	Proposition 13 grant contract with SFEP, Sustainable Conservation and the Sate of California signed in late 2003.	Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
(see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		baseline funding allocated to BASMAA BPP liaison and BPP support. • Attended BPP Annual Stakeholder Meeting on May 21, 2004. Provided link (www.suscon.org) at Program website (www.scvurppp.org) which contains the meeting's agenda, presentations and handouts. Shared meeting results with SCVURPPP Management Committee.		
SCVURPPP CB-5(2)		Program staff will reevaluate if this task is politically and economically realistic. Program staff will again request that BASMAA approach CASQA to consider funding to support State-wide involvement with BPP. Request Regional Board assistance in making this a priority in other regions with copper impaired waterbodies.		
SCVURPPP CB-5(3), CB-16		Provided links at Program website (www.scvurppp.org) to websites which contain BPP Proposition 13 information. Current websites include: Sustainable Conservation, http://www.suscon.org/brakepad/index.asp and TDC Environmental (technical reference library) http://www.tdcenvironmental.com/brake/ Technical documents relevant to the BPP and other brake pad information have been posted on the Program's website.		
SCVURPPP CB-5(3), CB-16		In November 2003, the Program executed a contract with the Clean Water Fund to provide resources for a two year period to develop a P2 clearinghouse. In May 2004, the Program decided to design and implement the prototype P2 clearinghouse due to the Clean Water Fund not being able to fulfill their contract obligations. In June 2004, the Program developed a strategy for		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Activities
		completing website design and implementation. Links/information relating to copper research data will be posted to the web portal during the remainder of CY 2004.		

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: **CB-6 – Measures to Reduce Traffic Congestion: Review appropriateness of transportation control measures, prioritize reasonable measures and identify potential efforts for further development**

CB-7 – Measures to Reduce Traffic Congestion: (1) Establish transportation/impervious surface "forum," (2) Consider results of Vehicle Miles Traveled (VMT) and imperviousness load estimates and control effectiveness evaluation; identify potential further control efforts

Region of Applicability: South Bay focus. Potential to become regional.

Linkage to Copper Reduction: Reductions in VMT and congestion may reduce generation of brake pad debris.

Performance Measure(s): VMT and congestion measurements are indirect indicators; the BPP wear debris characterization test is a more direct indicator (see CB-5).

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Continue messages from the Watershed Watch Campaign promoting protection of water quality by reducing automobile use.	Messages promoting protection of water quality by reducing automobile use will continue to be posted on the Watershed Watch website.	
SCVURPPP		Provide updates regarding transportation issues at SCBWMI LUS meetings.		This task will occur at least once a year. The establishment of a transportation/ impervious surface "forum" CB-7(2)) is on hold indefinitely due to a lack of resources.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2004-2005		**Actions Accomplished in Period**		
		Status: The memorandum is currently being drafted and is scheduled to be completed by June 2005. In addition, LUS is reviewing the SCBWMI's Public Vision Survey (which includes the same transportation-related subjects) and will provide feedback to the SCBWMI COS on the best way to use this information.		
		Status: The transportation agencies awareness task is currently underway and is scheduled to be completed by June 2005**.**		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	SCBWMI LUS	**Approach:** Collaboration with the agencies and organizations (e.g., VTA) that are better poised to take the lead on transportation-related tasks will increase the likelihood of successful, efficient implementation. • Prepare a memorandum that summarizes the current status of projects and activities of the main players involved in traffic congestion reduction and alternative transportation promotion; and provide recommendations on how the Program and SCBWMI LUS may best assist in these efforts.	Memorandum will summarize the current status of projects listed in Table 1 of the Program's document entitled *The Role of Stormwater Agencies in Regional Congestion Management Planning and Implementation* (dated March 13, 2002); and strategize best avenues for collaboration with lead agencies.	CB-6&7 issues appear to have been adequately addressed for CAP purposes. This issue is now in the hands of municipal transportation planners, and congestion management and transportation agencies (i.e. VTA), and is not a high priority of SCVURPPP

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		• Ensure that the lead transportation agencies (e.g., VTA) are aware of and promote the transportation-related analysis in the Development Policies Comparison report.	Memorandum transmitting section of Development Policies Comparison report along with municipal responses to transportation-related questions of Site Design review (dated September 13, 2003) to appropriate staff.	
SCVURPPP		Continue messages in the Watershed Watch Campaign promoting protection of water quality by reducing automobile use.	Messages promoting protection of water quality by reducing automobile use will continue to be posted on the Watershed Watch website.	
Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP	SCBWMI LUS	**Update**: Encouraged Co-permittees to update development rules to promote better transportation-related design practices and alternative modes of transportation, as recommended in the Development Policies Comparison Project Report (see Section VI., Policies to Limit Auto Use/Promote Alternative Transportation, in the Policy, Code, and Ordinance Worksheet).	During FY 03-04, Co-permittees revised development site design standards related to transportation (per Permit Provision C.3.j) based on analysis and recommendations made in the Development Policy Comparison report (April 2003) and described in the Site Design Review submittal (September 15, 2003). These revisions are summarized within Co-permittee Annual Reports submitted September 15, 2004.	Complete.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		Facilitated updates via periodic discussions at LUS meetings (Site Design Dialogues) on transportation and land use issues and documented in LUS meeting (dialogue) summaries.	During FY 03-04, VTA completed the Community Design and Transportation Manual and participated in the Program's/SCBWMI LUS's site design dialogues.	
		On January 29, 2004, SCVURPPP conducted a workshop on "Overcoming Hurdles to Using Better Site Designs", with presentations on development design that encourages alternative transportation and reduces sprawl (e.g., presentations on Village Homes in Davis, CA and the concept of new urbanism).	This workshop was very well received. The vast majority of attendees gave the workshop high marks.	
SCVURPPP	SCVURPPP Watershed Watch Campaign	Messages promoting water quality by reducing automobile use have been posted on the Wateshed Watch website.	The message is included on the Watershed Watch website under "Caring for Your Vehicle and the Environment" at http://www.watershedwatch.net/vehicle_care.htm	

CAP Category: Watershed Assessment

BASELINE ACTIVITY: CB-8 - Measures to classify and assess watersheds and to improve institutional arrangements for watershed protection:
(1) Ensure that watershed protection is considered in all applicable elements of Dischargers' General Plans, **(2)** seek appropriate changes in State General Plan Guidelines**, (3)** ensure that watershed protection is considered in the CEQA process, and **(4)** continue to implement watershed classification and assessment efforts of SCBWMI.

Region of Applicability: South Bay

Linkage to Copper Reduction: No specific linkage to copper; actions apply to watershed protection in general.

Performance Measure(s): Changes in General Plans and CEQA process documents; results of SCVURPPP and SCBWMI assessments

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Continue implementing the *Multi-Year Receiving Waters Monitoring Plan* (see Section 4 of the *FY 05-06 Work Plan*). • Track and/or participate in the Water Resources Protection Collaborative and working groups, as appropriate.	Water quality data will be reported within the Program's *Annual Watershed Monitoring and Assessment Summary Report* provided within Section 4 of the *FY 05-06 Annual Report*.	CB-8 activities have been incorporated into the Program's and Co-permittees' watershed management activities (Permit Provision C.10). On-going activity.
SCVURPPP/ SCBWMI		• Continue to support the efforts of the SCBWMI Watershed Assessment and Monitoring Subgroup (WAMS) in planning or conducting future	The results of watershed management measures; and collaboration with WMI	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		assessment-related work.	and other applicable organizations will be reported within Section 5 of the Program's Annual Report.	
Co-permittees		See individual Co-permittee Work Plans.		
FY 2004-2005		**Actions Accomplished in Period**		
		• Continued implementing the *Multi-Year Receiving Waters Monitoring Plan* (see FY 04-05 Work Plan). • Tracked and/or participated in the Water Resources Protection Collaborative and working groups, as appropriate.	Monitoring results will be provided within the Program's *FY 04-05 Watershed Monitoring and Assessment Summary* within Section 4 of the *FY 04-05 Annual Report*.	Continue implementing the *Multi-Year Receiving Waters Monitoring Plan* (see FY 04-05 Work Plan).
SCVURPPP/ SCBWMI		• Continued to support the efforts of the SCBWMI Watershed Assessment and Monitoring Subgroup (WAMS), formerly WAS, in planning or conducting future assessment-related work.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Continue implementing the *Multi-Year Receiving Waters Monitoring Plan* (see Section 4 of the *FY 04-05 Work Plan*). • Track and/or participate in the Water Resources Protection Collaborative and working groups, as appropriate.	To be provided within Section 4 of the *FY 04-05 Annual Report*.	
SCVURPPP/ SCBWMI		• Continue to support the efforts of the SCBWMI Watershed Assessment Subgroup (WAS) in planning or conducting future assessment-related work.		
Co-permittees		See individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP CB-8 (1)	Permit Prov. C.3.I.	• See individual Co-permittee annual reports and work plans for progress on updating their General Plans.	Update progress in annual reports	Revise General Plans at next scheduled update after 10/15/04
SCVURPPP CB-8 (2)		Action not needed now that Provision C.3.I. provides guidance for water quality and watershed protection principles and policies that should be included in General Plans.		None

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP CB-8 (3)	Permit Prov. C.3.m.	• Program staff worked with City of San Jose staff to prepare an analysis of the C.3.m. example questions and how they were addressed by the CEQA Guidelines. This analysis is provided in the memorandum entitled *Recommendations for Addressing Provision C.3.m, Water Quality Review Processes* (final version dated December 4, 2003). This memorandum includes a list of the CEQA guidelines questions, in order, and guidance for addressing C.3.m. in responses to each question. All Co-permittees have been encouraged to use this guidance internally and to provide it to their environmental review consultants, thus ensuring a consistent approach to evaluating water quality and watershed impacts throughout the Santa Clara Valley. The CEQA guidance is also provided in the SCVURPPP C.3. Stormwater Handbook.		None-task completed.
SCVURPPP CB-8 (4)		• Continued implementing the *Multi-Year Receiving Waters Monitoring Plan* (see FY 03-04 Work Plan).	Monitoring results are provided with the Program's *FY 03-04 Watershed Monitoring and Assessment Summary* within Section 4 of the *FY 03-04 Annual Report*.	Continue implementing the *Multi-Year Receiving Waters Monitoring Plan* (see FY 04-05 Work Plan).
		• Consultants under contract to the SCVWD collected channel cross-section data and measured bed and bank material as part of the HMP geomorphic assessment in Ross and San Tomas Aquino Creeks. Modeling and stability assessment work for	Field work, modeling and stability analyses were effectively used to demonstrate the application of the erosion potential	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		Ross and San Tomas Aquino Creeks were also completed in FY 03-04. Assessment results are provided within the Program's *Hydromodification Management Plan Report (Public Review Draft) June 2004*. • Distributed Program's *Assessment of Watershed Assessment Methods* by electronic mail (on August 12, 2003) to the following parties: Program's Management Committee, Program's Ad Hoc Monitoring Committee and SCBWMI Watershed Assessment Subgroup. Distributed hard copies to the SCVURPPP Management Committee on August 28, 2003.	methodology in these creeks and to set management criteria for the HMP.	

CAP Category: POTW Actions

BASELINE ACTIVITY: CB- 9 – Continue Current Efforts and Track Corrosion Control Opportunities

Region of Applicability: South Bay and Bay-wide

Linkage to Copper Reduction: Corrosion of copper piping is dominant source of loading to POTWs

Performance Measure(s): Increased use of alternatives to copper pipe. Outreach to plumbers. Water purveyor corrosion control program effectiveness.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		Continue scheduling and providing outreach to local pipe fitters unions and other plumbing associations. Presentations will be provided at their sites.	A post presentation will be used to gauge increase in awareness.	
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		Track and report status of water purveyor corrosion control programs as part of their POTW NPDES Permit Pollutant Minimization Programs. The City of Palo Alto will also provide this information in its annual C*opper Action Plan Report* (February/March 2006)		Corrosion control is regulated under the Safe Drinking Water Act Lead and Copper Rule, not the Clean Water Act. The DHS is the regulatory authority rather than the Regional Board.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Palo Alto RWQCP		Continue distributing Palo Alto RWQCP guidelines for proper design, installation and maintenance of copper piping to local plumbers.		Ongoing.
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP		Obtained and distributed (to Co-permittees) the following materials developed by BACWA's Bay Area Pollution Prevention Group- Copper Pollution Prevention Subcommittee: *Preventing Corrosion Protects San Francisco Bay: A Fact Sheet for Designers* and *Good Plumbing Practices Protect San Francisco Bay: A Fact Sheet for Installers/Plumbers*. Both fact sheets are available on the Program's website at www.scvurppp.org. **Note**: The guidelines distributed by the Palo Alto RWQCB are the two fact sheets developed by BACWA's Bay Area Pollution Prevention Group-Copper Pollution Prevention Subcommittee.		
Palo Alto RWQCP		Continued distributing Palo Alto RWQCP guidelines for proper design, installation and maintenance of copper piping to local plumbers.		Ongoing
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		**Status**: The Palo Alto RWQCP hired a consultant for coordinating presentations at plumbing agencies. During the first half of FY 04-05, six presentations have been provided (by POTW staff) to local pipe fitters unions and other plumbing associations. Additional presentations are planned for FY 04-05.	A post presentation survey has been developed to gauge increase in awareness.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		When finalized, the Program will distribute (to Co-permittees) outreach materials developed by BACWA's Bay Area Pollution Prevention Group-Copper Pollution Prevention Subcommittee regarding the proper design, installation and maintenance of copper piping.		The completion of this task is dependent on the Subcommittee's timeframes and delivery of outreach materials.
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		Schedule and provide outreach to local pipe fitters unions and American Society of Plumbing Engineers. Presentations will be provided at their sites. The schedule is dependent on obtaining the outreach materials.	A post presentation survey has been developed to gauge increase in awareness.	
Palo Alto RWQCP		Continue to distribute Palo Alto RWQCP guidelines for proper design, installation and maintenance of copper piping to local plumbers.		Ongoing
SCVURPPP		Encourage Co-permittees to provide similar outreach/presentations on copper pollution prevention to own building departments and municipal plumbing staff.		
SCVURPPP		Continue dialogue with Department of Health Services (DHS) and the Regional Board regarding opportunities to enhance potable water corrosion control by water purveyors. Copper piping and fixture erosion is the	Corrosion control is regulated under the Safe Drinking Water Act Lead and Copper Rule, not the Clean Water	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		dominant source of copper in most service areas.	Act. The DHS is the regulatory authority rather than the Regional Board.	
SCVURPPP		Distribute Palo Alto RWQCP guidelines for proper design, installation, and maintenance of copper piping to Co-permittees.	Deferred from FY 03-04 to FY 04-05 due to competing priorities.	
FY 2003-2004		**Actions Accomplished in Period**		
Palo Alto RWQCP		Information regarding the proper design, installation and maintenance of copper piping is now available at the Building Department. The City's Environmental Compliance staff has discussed this subject with Building Department staff. During FY 03-04, the majority of staff time was used to develop the materials for the Bay-wide outreach program. In previous years, the City of Palo Alto provided presentations to plumbing unions in Santa Clara County and HVAC engineering associations.		
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		A comprehensive list of unions, associations, and their contacts was developed in 2003. All three POTWs have signed up to provide outreach to local unions, engineering societies and associations. The outreach work load was divided between the three POTWs. Outreach efforts will include the following: - Sunnyvale will work with Santa Clara County's United Association Local Union 393; - San Jose will work with the San Jose chapter of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). San Jose staff		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		was invited to present a brief synopsis of the issue at their June 2004 society meeting. -Palo Alto agreed to work with the Plumbing, Heating, Cooling Contractors Association (PHCC) for the Greater Bay Area. Currently, Palo Alto is scheduling a presentation date.		
Palo Alto RWQCP Sunnyvale San Jose/Santa Clara WPCP		During FY 03-04, San Jose, Sunnyvale and Palo Alto POTW staff members participated in BACWA's Bay Area Pollution Prevention Group- Copper Pollution Prevention Subcommittee. This subcommittee designed fact sheets, developed a "freebie" item for plumbers and created a generic PowerPoint presentation (on copper pollution prevention) applicable throughout the Bay Area.		CY 2004 is the target for conducting outreach.

CAP Category: Assessment/Monitoring

BASELINE ACTIVITY: CB- 10/NB-2 - Measures associated with utilizing the Sediment Characteristics and Contamination Environmental Indicator.

(1) Determine whether SEIDP Indicator #5 results suitable to serve as an indicator of the relationship between sediment quality and urbanization [Completed in FY 02-03],

(2) Investigate the linkage with SFEI sources and loading work efforts [Ongoing participation].

Region of Applicability: South Bay and generally Bay-wide

Linkage to Copper Reduction: Direct and indirect measures of sediment concentrations may assist in sources and loadings estimates

Performance Measure(s): Collection and reporting of sediment quality data; participation in RMP & CEP projects and work groups.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-10(1)	FY 05-06 Watershed Monitoring and Assessment Summary Report	• Conduct screening-level monitoring of total and dissolved metals (including copper) in water in Stevens, Permanente, Matadero, Barron, Calabazas Creeks; and Sunnyvale East and West Channels (per FY 05-06 Annual Monitoring Plan).	Water quality data collected as part of the SCVURPPP Long-Term Monitoring Plan may assist with source identification and loadings estimates.	Sediment and water quality data will continue to be reported within the Program's *Annual Watershed Monitoring and Assessment Summary Report* provided within Section 4 of its Annual Report submitted each September.
		• Continue to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG);		On-going participation

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		and other RMP and CEP work groups that address sediment issues. • Continue to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.		Sediment contaminant and toxicity studies and related information will be tracked by the SFEI "Uncertainty Reduction Studies" website project (see CB-17, 18 and 20).
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP CB-10(1)	FY 04-05 Watershed Monitoring and Assessment Summary Report	• Conducted screening-level monitoring of total and dissolved metals (including copper) in water in Adobe, San Tomas, Matadero, Barron, Calabazas Creeks; and Sunnyvale East and West Channels (per FY 04-05 Annual Monitoring Plan).	Water quality data collected as part of the SCVURPPP Long-Term Monitoring Plan may assist with source identification and loadings estimates.	
SCVURPPP CB-10(2)	Reports posted on RMP and CEP websites	• Continued to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG); and other RMP and CEP work groups that address sediment issues. • Continued to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.	CEP and RMP are devoting increased attention to sediment related special studies.	On-going participation.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP CB-10(1)	FY 04-05 Watershed Monitoring and Assessment Summary Report	• Conduct screening-level monitoring of total and dissolved metals (including copper) in water in Adobe, San Tomas, Matadero, Barron, Calabazas Creeks; and Sunnyvale East and West Channels (per FY 04-05 Annual Monitoring Plan).	Water quality data collected as part of the SCVURPPP Long-Term Monitoring Plan may assist with source identification and loadings estimates.	
SCVURPPP CB-10(2)		• Continue to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG); and other RMP and CEP work groups that address sediment issues. • Continue to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.		On-going participation
SCVURPPP CB-10(2)		• Continue to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG); and other RMP and CEP work groups that address sediment issues. • Continue to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.		On-going participation
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP	FY 03-04 Watershed Monitoring and	• Conducted screening-level monitoring of total metals (including copper) in sediment and total dissolved metals in water in Adobe and San	Sediment and water quality data collected as part of the SCVURPPP	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
CB-10(1)	Assessment Summary Report	Tomas Creeks (per FY 03-04 Annual Monitoring Plan).	Long-Term Monitoring Plan may assist with sources and loadings estimates.	
SCVURPPP CB-10(2)	Reports posted on RMP and CEP websites	• Continued to participate on the RMP Sources, Pathways, and Loading Work Group (SPLWG); and other RMP and CEP work groups that address sediment issues. • Continued to support contaminant loading studies and development of improved sediment toxicity methods through participation in the CEP and RMP.	CEP and RMP are devoting increased attention to sediment related special studies.	On-going participation.

CAP Category: Potential Source Reduction

BASELINE ACTIVITY: CB- 11 - Measures to improve street sweeping controls and storm water system operation and maintenance:

(1) evaluate need for improvements to existing street sweeping controls,

(2) evaluate need for improvement to storm water system operation and maintenance controls,

(3) evaluate need for improvements to standard operating procedures for disposal of collected materials

Region of Applicability: South Bay and Bay-wide

Linkage to Copper Reduction: Removal and disposal of copper associated with street sweepings and storm drain cleaning

Performance Measure(s): Estimates of volume/weight of materials removed and miles swept

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Continue to compile and summarize Co-permittee street sweeping and leaf removal data (obtained from monthly recordkeeping forms) within Program's Annual Report.	Street sweeping data is included in Co-permittee Annual Reports and Section 4 of the Program's Annual Report.	Ongoing activity. Co-permittees will continue to conduct street sweeping activities in accordance with the Streets, Roads and Highways Performance Standard provided within the Program's Urban Runoff Management Plan (URMP) and individual Co-permittee URMPs.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP		• Continued compiling and summarizing Co-permittee street sweeping and leaf removal data.		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Provide guidance for Co-permittees to evaluate their standard operating procedures for disposal of collected materials, and revise them to include any needed improvements.	Include in Annual Reports.	Reevaluate as needed.
SCVURPPP		• Provide guidance for Co-permittees to evaluate the effectiveness of street sweeping practices in accordance with the Program's Performance Standard for Public Streets, Roads and Highway Operation and Maintenance	Include in Annual Reports.	Ongoing
SCVURPPP		• Continue to compile and summarize Co-permittee street sweeping and leaf removal data (obtained from monthly recordkeeping forms) within Program's Annual Report.	Include in Annual Reports.	Ongoing
Co-Permittees		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		• Provided written guidance to Co-permittees regarding the collection of street sweeping data (November 2003). Co–permittees were		See FY 04-05 Work Plan tasks above.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		requested to collect (on a monthly basis) and provide to Program staff (on a biannual basis) the following information: volume of waste collected, number of miles swept, any changes to the street sweeping program and leaf removal data (seasonal). To ensure standardized collection and reporting of data, monthly recordkeeping forms were provided. In August 2004, Co-permittee submitted (at a minimum) street sweeping data for the second half of FY 03-04. Street sweeping data is summarized in the Program's *FY 03-04 Annual Report*, Appendix C. • Requested that Co-permittees evaluate need for improvement of current street sweeping and storm drain system O&M programs (within available budgets) in *FY 03-04 Annual Report* (November 2003). • Requested that Co-permittees (through the use of a survey) provide specific information regarding their street sweeping and leaf removal programs. Completed surveys were provided to Program staff in December 2003. • Tracked status of scheduled update of Fairfield-Suisun street sweeping study which will estimate copper loading reductions. This update will likely be completed in FY 04-05. • Planned to review previous studies for San Jose, San Mateo Countywide STOPPP and Fairfield-Suisun URMP on copper removed from street sweeping activities and evaluate feasibility of using data to identify changes in		This task was originally scheduled for FY 03-04. Due to higher priority Program issues, this

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		procedures that would reduce copper in stormwater.		task has been delayed until FY 04-05.
Co-Permittees		Refer to individual Co-permittee FY 03-04 Annual Reports.		

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB- 12 - Public education and outreach measures to control copper discharges from pools and spas **Region of Applicability:** South Bay and Bay-wide **Linkage to Copper Reduction:** Reduce use of copper based algaecides in pools and spas and discharge of copper treated water to storm drains. **Performance Measure(s):** Quality and quantity of outreach materials distributed.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Same actions as FY 04-05 (see below).		Illicit pool and spa discharges are tracked and reported as part of on-going IC/ID activities (Permit Provision C.6.a.ii).
All Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP		Continued distributing updated pool brochure according to the distribution plan completed during FY 03-04. This brochure was also made available on the Watershed Watch Campaign website (www.watershedwatch.net).	The number of brochures distributed will be included within Section 3 of the Program's *FY 04-05 Annual Report*.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		As part of the Program's Illicit Connection and Illegal Dumping (IC/ID) Elimination activities, investigate pool, fountain and spa discharge incidents. Inspectors to provide verbal or written information regarding pollution prevention and proper management of waters. Results and follow-up relating to the incident will be summarized in the Program's Annual Report submitted each September. This activity is consistent with Permit Provision C.6.a.ii	Individual Co-permittees are documenting IC/ID incidents in accordance with Permit Provision C.6.a.ii. Follow-up inspections are conducted as required.	Ongoing
SCVURPPP		Continue to distribute updated pool brochure according to the distribution plan completed during FY 03-04.	The number of brochures distributed will be included in the Program's Annual Report.	
All Co-permittees		Refer to individual Co-permittee Work Plans.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		An updated pool brochure entitled *Keep Pool, Spa and Fountain Water Out of Storm Drains, Creeks and the Bay* was finalized, printed and distributed to all Santa Clara County pool owners in May 2004. Current distribution methods include: mass mailing to pool owners (per County tax assessor's list); handouts at public events; brochures at agency department counters and public places; and placement on Watershed Watch, SCVURPPP and Co-permittee websites.	The updated pool brochure was mailed to approximately 40,000 Santa Clara County residents (except the City of Los Altos). The City of Los Altos mailed approximately 3,000 brochures to their residents. While it is not possible to directly measure effectiveness,	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
			Program staff received feedback from residents during events and via messages posted on the WW website regarding the usefulness of the brochure. Program staff provided approximately 1,750 pool brochures to the following Co-permittees for distribution: San Jose, Palo Alto, SCVWD and the West Valley Communities. Approximately 75 pool brochures were distributed at the San Jose Spring Home and Garden Show held June 4- 6, 2004.	
All Co-permittees		Refer to individual Co-permittee FY 03-04 Annual Reports.		

CAP Category: POTW Potential Source Reduction				
BASELINE ACTIVITY: CB-13/NB-3 – Track POTW Pretreatment Program efforts and POTW loadings. **Region of Applicability:** South Bay. **Linkage to Copper Reduction:** Both indirect and direct. Pretreatment efforts are indirect because there is not a linear relationship between influent reductions and effluent concentrations. POTW loading is direct. **Performance Measure(s):** Pounds of copper reduced.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report and Pretreatment Program Report	Same action as FY04-05 (see below).		This task is ongoing. Efforts are independently reported in the annual *Clean Bay Strategy Status Reports*, Annual Pretreatment Program Reports and Pollutant Prevention and Minimization Reports.
Sunnyvale	Annual Pretreatment Program Report	Same action as FY04-05 (see below).		This task is ongoing. Efforts are independently reported in the annual

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
				Pretreatment Program Reports and Pollutant Prevention and Minimization Reports.
Palo Alto	Annual Clean Bay Report	Same action as FY04-05 (see below).		This task is ongoing. Efforts are independently reported in the annual *Clean Bay Pollution Prevention Plan*, Annual Pretreatment Program Reports and Pollutant Prevention and Minimization Reports.
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP		Tracked BACWA Pollution Prevention Menus Project that is in part addressing copper sources and control measures.	Dependant on if new measures can be reasonably implemented or implemented more effectively.	Implement, as appropriate, project recommendations.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Track BACWA Pollution Prevention Menus Project that is in part addressing copper sources and control measures.	Dependant on if new measures can be reasonably implemented or implemented more effectively.	Implement, as appropriate, project recommendations.
San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report and Pretreatment Program Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Clean Bay Strategy Report and Annual Pretreatment Program Report
Sunnyvale	Annual Pretreatment Program Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Pretreatment Program Report
Palo Alto	Annual Clean Bay Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Clean Bay Report
FY 2003-2004		**Actions Accomplished in Period**		
San Jose/Santa Clara Water Pollution Control	Annual Clean Bay Strategy Report and	**On-going:** Continue implementation of the pretreatment and pollution prevention work, including updating and modifying the Mass Audit Studies,	Compare permitted industrial loading to 1997 levels. Maintain effluent	Continuously evaluate the pretreatment

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Plant	Pretreatment Program Report	Reasonable Control Measure Plans and Flow Audit Studies. This might include updating and modifying the protocols and developing additional guidance documents. We will continue to calculate permitted industrial loading and compare to 1997 levels. Continue influent and effluent monitoring to document contaminant loading to the treatment plant.	concentrations below permit limits.	program and the tools used to ensure improved effectiveness.
Sunnyvale	Annual Pretreatment Program Report	**On-going:** Continue with pretreatment and pollution prevention efforts including industrial user and influent and effluent monitoring. Update annual Source Loadings Appendix to pretreatment report.	Compare current to historic concentrations and loadings	Apply continuous improvement actions to Annual Report preparation and presentations.
Palo Alto	Annual Clean Bay Report	**On-going:** Continue with existing activities presented in Clean Bay Report including Copper Action Plan Appendix (see CB-4(3)).	Compare current to historic concentrations and loadings	Continue on-going actions.

CAP Category: POTW Potential Source Reduction				
BASELINE ACTIVITY: CB-14/NB-4 – Track and encourage water recycling efforts. **Region of Applicability:** South Bay. **Linkage to Copper Reduction:** Direct due to flow diversion. **Performance Measure(s):** Millions of gallons per day of diverted effluent.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto	2005 Water Recycling Annual Report	Same action as FY04-05 (see below).	Quantity recycled. New connections added	Ongoing and proposed water recycling efforts will continue to be independently reported in their annual water reclamation reports pursuant to the requirements of their water reclamation permits.
San Jose/Santa Clara Water Pollution Control Plant	2005 Water Recycling Annual Report	Same action as FY04-05 (see below).	Quantity recycled. New connections added	Results are reported in annual water reclamation reports, *Clean Bay Strategy* and *South Bay Action Plan*.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
Sunnyvale	2005 Water Recycling Annual Report	Same action as FY04-05 (see below).	Quantity recycled. New connections added.	Water Recycling Annual Report prepared every February.
FY 2004-2005		**Actions Accomplished in Period**		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
Palo Alto	2004 Water Recycling Annual Report	Continue to track and report volumes diverted in accordance with recycled water permit requirements. Prepare feasibility study for pipeline to Mountain View. Water will serve shoreline area.	Quantity recycled. New connections added.	
San Jose/Santa Clara Water Pollution Control Plant	2004 Water Recycling Annual Report	Continue to track and report volumes diverted in accordance with recycled water permit requirements. Continue providing financial incentives for industrial flow reduction including recycle/reuse projects. Continue to encourage water recycling via the collaborative process (with the Santa Clara Valley Water District) to develop an institutional framework for long-term ownership, operation and maintenance and future expansion of SBWR.		Average Dry Weather Effluent Flow for 2004 will be reported in 2005.
		Continue to distribute outreach materials (e.g., cooling tower BMPs and flow/pollutant reduction case studies). Complete two additional case studies. Complete the Industrial Reuse Guidelines and make them available to expedite projects through the	95,000 gpd flow reduction anticipated from current year WET project completion. An	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		permitting process.	additional 175,000 gpd are anticipated in FY 04-05. *(Updated flow estimates, different than reported in February 2004 CBS- South Bay Action Plan Report.)*	
Sunnyvale	2004 Water Recycling Annual Report	Submit annual report on reclamation activities including updates on current and planned future reclamation activities as required by Water Reclamation Permit (Order 94-069)	Quantity recycled. New connections added.	Water Recycling Annual Report prepared every February.
FY 2003-2004		**Actions Accomplished in Period**		
San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report	South Bay Action Plan (SBAP) was updated in February 2004. Tracked the completion of funded South Bay Water Recycling projects along with additional flow diverted to customers. Continued providing financial incentives for industrial flow reduction including recycle/reuse projects. Encouraged water recycling by continuing the collaborative process (with the Santa Clara Valley Water District) to develop an institutional framework for long-term ownership, operation and maintenance, and future expansion of SBWR. Continued to distribute outreach materials (e.g., cooling tower BMPs). Promoted the financial incentive program through workshops and direct calls to potential customers. Updating the City of San Jose Water Policy was	Recycled 10-15mgd during summer months. Distributed $29,000 in incentives Silver Creek pipeline extension completed. 15,200 gpd reduction from Water Efficient Technologies Program.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		delayed (by the City Council) until FY 04-05.		
Sunnyvale	2003 Water Recycling Annual Report (Feb 2004)	**Update:** In process of preparing annual report on reclamation activities which will include updates on current and planned future reclamation activities (as required by Water Reclamation Permit-Order 94-069)	# mgd recycled. # of new connections added.	

CAP Category: Potential Source Reductions				
BASELINE ACTIVITY: CB-15/NB-5 - Measures to evaluate effectiveness of Performance Standards and identify cost-effective modifications to reduce discharges of copper (see NB-1, CB-3 and CB-11). **Region of Applicability:** South Bay **Linkage to Copper Reduction:** Reductions in copper associated with sediment generated from construction related activities **Performance Measure(s):** Co-permittee Annual Reports evaluating implementation of Construction Inspection Performance Standard (including effectiveness of erosion control measures and construction site inspections).				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	PS	Continue to implement the following Performance Standards: Construction Inspection, Public Streets, Roads and Highways O&M (PSRH), Storm Drain O&M (SDOM), Industrial Discharger Control (IND) and Rural Public Works Maintenance and Support (RPW), and evaluate effectiveness annually.	Effectiveness evaluation in Co-permittee Annual Reports (see Self-Evaluation Matrix-Attachment B).	The ongoing implementation of performance standards is independently required in accordance with the Program's and individual Co-permittee Urban Runoff Management Plans.
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP	PS	Co-permittees are continuing to implement the Performance Standards (PS) described below.	Effectiveness evaluation in Co-permittee Annual Reports Section (Self-Evaluation Matrix-Attachment B).	Ongoing
SCVURPPP		**Status**: Worked with the Industrial Inspection AHTG	Effectiveness of	Possible update to

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
(ref. CB-3)		to update the IND Performance Standard. The updates were essentially administrative (e.g., incorporating enhanced reporting requirements and results of Co-permittee evaluations). The inspection frequency of industrial/commercial facilities was also updated to match the Program's NPDES permit. A final revised draft of the IND performance standard was approved by the Management Committee on February 17, 2005.	implementation is evaluated in Co-permittee annual reports.	URMPs of Co-permittees with IND programs.
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	PS	Continue to implement the following Performance Standards: Construction Inspection, Public Streets, Roads and Highways O&M (PSRH), Storm Drain O&M (SDOM), Industrial Discharger Control (IND) and Rural Public Works Maintenance and Support (RPW), and evaluate effectiveness annually.	Effectiveness evaluation in Co-permittee Annual Reports (see Self-Evaluation Matrix-Attachment B).	
SCVURPPP (ref. CB-3)	IND PS	Work with the IND AHTG to develop model language for updating the IND Performance Standards and a timeframe for implementation. Consider update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater.		
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP	PS	Co-permittees are continuing to implement the Performance Standards (PS) described above.	Effectiveness evaluation in Co-permittee Annual Reports Section (Self-Evaluation Matrix-Attachment B).	Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP (ref. CB-3)	IND PS	Work with the IND AHTG to develop model language for updating the IND Performance Standards and a timeframe for implementation. Consider update of language specifying the inspection frequency of industrial/commercial facilities suspected of discharging copper into stormwater. Due to the Program's focus on higher priority items, this update of the IND PS originally scheduled for FY 03-04 will be conducted in FY 04-05.		
SCVURPPP	CIPS	Work with Co-permittees to develop a reporting form to track the number of violations, follow-up and enforcement actions relating to inadequate erosion/sediment control measures at construction sites. **Update**: Co-permittees are aware that they need to report this information within their Annual Reports. Most of them have their own reporting forms or processes for tracking the number of violations, follow-up and enforcement actions relating to inadequate erosion/sediment control measures at construction sites.	Effectiveness evaluation in Co-permittee Annual Reports.	
SCVURPPP	CIPS	The Program sponsored and helped conduct the annual Regional Board Construction Site Management Workshop on September 24, 2003. Information on the latest erosion/sediment control techniques was provided.	The workshop was well attended (95 people, mostly Co-permittee staff). Evaluation forms showed that the workshop was successful in educating attendees (see FY 03-04 Annual Report).	Ongoing- Program will co-sponsor this workshop with RWQCB every two years.
All Co-permittees		Refer to individual Co-permittee Annual Reports for		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
(ref. NB-1, CB-3 and CB-11)		NB-1, CB-3 and CB-11 tasks.		

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB- 16 – Measures to Establish an Environmental Clearinghouse **Region of Applicability:** Region-wide **Linkage to Copper Reduction:** Information source on nation-wide copper and nickel pollution prevention activities affecting water quality **Performance Measure(s):** Amount and utility of information accessible through the web portal				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Continue posting CAP related information and reports on Program's website (www.scvurppp.org).		Ongoing activity.
SCVURPPP		Continue discussions regarding the identification of additional funding sources for clearinghouse. Determine the future coordination of web-page maintenance activities as part of Bay-wide CAP development effort.		Funding and coordination decision needs to be made by December 2005.
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP		Continued posting CAP related information and reports on Program's website.		Ongoing.
SCVURPPP		Completed development of prototype P2 clearinghouse in December 2004. The clearinghouse is available on the Program's website	Intended to be a complementary resource to the BACWA *Pollution*	Identification of additional funding sources (after 2005)

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		at www.scvurppp.org. The website has been designed as a bay-wide resource. The Program has committed to maintain the website through calendar year 2005	*Prevention Guidance and Tools for POTWs* project and the CEP *Copper Sources in Urban Runoff and Shoreline Activities* report.	is required. The Program may transition from program coordination to an oversight role.
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		• Continue providing resources (for a two year period) to develop a prototype P2 clearinghouse. Development of the clearinghouse will be coordinated with the Pollution Prevention Menus Project (see CB-16). Links/information to be posted to the prototype P2 clearinghouse during FY 04-05.		Identification of additional funding sources (after two-year period) is required. The Program will transition from program coordination/administration to an oversight role.
SCVURPPP		• Start discussions regarding the identification of additional funding sources after two-year period. Determine who will be responsible for future coordination of web page activities.		
SCVURPPP		**Ongoing**: Continue posting CAP related information and reports on Program's website.		Ongoing. All relevant documents will be posted as appropriate.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP	Web portal & semi-annual report from CWF	In November 2003, the Program executed a contract with the Clean Water Fund to provide resources for a two year period to develop a P2 clearinghouse. In May 2004, the Program decided to design and implement the prototype P2 clearinghouse due to the Clean Water Fund not being able to fulfill their contract obligations. In June 2004, the Program developed a strategy for website design and implementation. Links/information to be posted to the prototype P2 clearinghouse during the remainder of CY 2004.		
SCVURPPP	BPP	Provided links at Program website (www.scvurppp.org) to websites which contain BPP Proposition 13 information. Current websites include: Sustainable Conservation, http://www.suscon.org/brakepad/index.asp and TDC Environmental (technical reference library) http://www.tdcenvironmental.com/brake/ Technical documents relevant to the BPP and other brake pad information have been posted on the Program's website (see copper/nickel web page).		Relevant CAP related information and reports will be posted on the SCVURPPP website, as appropriate.

CAP Category: Uncertainty Reduction Studies				
BASELINE ACTIVITY: CB-17(1) – Phytoplankton species toxicity and prevalence **Region of Applicability:** South bay and bay-wide (Linkage to CB-17(4) toxicity bioassays, CB-18(3) copper speciation, CB-18(4) competing metals uptake) **Linkage to Copper Reduction:** Ambient concentrations could influence certain phytoplankton species composition, prevalence, and distribution **Performance Measure(s):** Ambient concentrations of sensitive phytoplankton.				
Lead Party	**Reports**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005 – 2006		**PROPOSED WORKPLAN TASKS**		
SCVURPPP	Semi-annual updates	Provide funding to SFEI/RMP for updating information on web-portal during calendar year 2005.		Transition to Bay-wide sponsored activity.
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP with transition to RMP reporting to SCVURPPP	Semi-annual updates	SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-wide CAP development effort.
FY 2004 – 2005		**PROPOSED WORKPLAN TASKS**		
SCVURPPP with transition to RMP	Semi-annually	Work with RMP/SFEI to complete web-based project to track and view results of bay-wide phytoplankton	SCVURPPP will continue to provide limited seed money	Solicit support from RMP member

Lead Party	Reports	Actions	Effectiveness Evaluation	Future Actions
reporting to SCVURPPP		monitoring, toxicity, and other copper impairment uncertainty reduction related research. Identify how to integrate into existing RMP programs/budget or identify other candidate funding sources. Target completion December 2004.	and in-kind assistance to RMP/SFEI to complete the project in CY 2004. Stakeholders need to identify project priority and level of support.	agencies for funding after CY 2004.
USGS with SCVURPPP to track pending transition to RMP		Follow-up again with RMP and USGS Jim Cloern to confirm identify USGS's plans and schedule for compiling and reporting on historic bay-wide species composition and abundance information.	Depends on USGS making data available.	Work may require new or redirected funding for USGS.
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP	Annual	Signed contract with RMP/SFEI and began work to develop and implement a web-based approach to track and view results of bay-wide phytoplankton monitoring and toxicity related research	SCVURPPP provided limited seed money and in-kind assistance to RMP/SFEI to initiate the project.	Presented approach at CAP/NAP and Cu/Ni SSO meetings.
SCVURPPP to track pending proposed transition to RMP		Coordinated with RMP staff to find additional information on Jim Cloern's plans and schedule for compiling and reporting on historic bay-wide species composition and abundance information.	USGS does not routinely analyze for small cyanobacteria	Work may require funding.

CAP Category: Uncertainty Reduction Studies				
BASELINE ACTIVITY: CB-17(2) – Measures to assess cycling and fluxes between water column, phytoplankton, sediments, and benthos **Region of Applicability:** South Bay and likely Bay-wide **Linkage to Copper Reduction:** Improve understanding of mechanisms and flux rates impacting water column concentrations **Performance Measure(s):** Development and validation of methodologies to conduct cycling analyses				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Same action as CB-17(1).		
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-wide CAP development effort.
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
CEP		Continue/complete FY 2003-2004 study needs assessment as part of CEP NDB Cu/Ni site specific		Targeted completion-

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		objective project. Timing dependent on schedules of other projects that have been delayed and funding limitations.		end of CY 2004.
SCVURPPP with transition to RMP reporting annually to SCVURPPP		Include in bay-wide research tracking conducted by SFEI/RMP (see description under CB-17(1)).		
FY 2003-2004		**Actions Accomplished in Period**		
CEP		Prepared a summary and update of impairment assessment uncertainty studies regarding phytoplankton and sediments. Results included in April 2004 CEP North of Dunbarton Bridge Copper Nickel Conceptual Model Impairment Assessment Report (pp. 15-26)	Additional work on cycling/fluxes deemed unnecessary based on results of Bruland copper speciation study.	
		SFEI/RMP began development of web-based copper "uncertainty studies" research tracking project (see CB-17(1)).		

CAP Category: Uncertainty Reduction Studies				
BASELINE ACTIVITY: CB-17(3) – Measures to Assess Wet Season Tributary Loading and Loading Uncertainty **Region of Applicability:** South Bay and likely Bay-wide **Linkage to Copper Reduction:** Improved estimates of loadings may improve understanding of impacts on water column concentrations **Performance Measure(s):** Development of methodologies to reliably and cost-effectively collect accurate flow and concentration data				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	BASMAA/BPP	Same action as FY 04-05 (see below).		Updated loading estimates will be prepared as part of the Bay-wide CAP development effort incorporating results from the *Copper Sources in Urban Runoff and Shoreline Activities* Report and the BPP Prop. 13 project effort.
SCVURPPP	CEP/RMP	Same action as FY 04-05 (see below).		
SCVURPPP	RWQCB	Same action as FY 04-05 (see below).		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**Actions Accomplished in Period**		
CEP	CEP	Finalized report entitled *Copper Sources in Urban Runoff and Shoreline Activities* (dated November 2004) which identifies potential copper and nickel sources and loadings in stormwater and from marine anti-fouling coatings. .	Results to be used in Bay-wide CAP development.	
SCVURPPP with transition to RMP reporting annually to SCVURPPP		SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-wide CAP development effort.
SCVURPPP	CEP/RMP	Tracked progress of CEP and RMP Sources Pathways and Loadings Workgroup projects involving improving loading estimates. Draft reports were released by SFEI/RMP.		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	BASMAA/BPP	Continue tracking results from BPP Prop. 13 ambient water quality monitoring and modeling (USEPA BASINS and SFO models) of loading from Castro Valley Creek watershed (see NB-7). Results will be sealed up to provide Bay-wide runoff loading estimates.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP	CEP/RMP	Continue tracking progress of CEP studies and RMP Sources Pathways and Loadings Workgroup projects involving improving loading estimates (e.g., Hg/PCB TMDLs, sediment loading, etc.). See description under CB-10/NB-2.		
SCVURPPP	RWQCB	Continue tracking results from RWQCB Surface Water Ambient Monitoring Program (SWAMP) for potential utility in developing improved loading estimates		
RMP reporting to SCVURPPP	Semi-annually	Include in bay-wide research tracking effort being implemented by SFEI/RMP (see description under CB-17(1)).		
FY 2003-2004		**Actions Accomplished in Period**		
CEP	CEP	Report prepared entitled *Draft Copper Sources in Urban Runoff* (dated March 19, 2004) which identifies potential copper and nickel sources and loadings in stormwater and from marine anti-fouling coatings. .	Results to be used in Bay-wide CAP development.	Scheduled for completion in late 2004.
SCVURPPP		Measured water and sediment samples (for copper and other contaminants) in the San Thomas Aquino, Adobe Creek and Guadalupe River Watersheds (at two to five locations with each watershed) during two to three varying season events. (see CB-8 and CB-10)		Conducted as part of the Program's Multi-Year Receiving Waters Monitoring Plan.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
SCVURPPP	BASMAA/BPP	BPP Prop. 13 ambient water quality monitoring and modeling (USEPA BASINS and SFO models) of loading from Castro Valley Creek watershed was initiated.		
SCVURPPP	RMP	Continued RMP/CEP funding and tracked results from second year of RMP Guadalupe River continuous sediment monitoring (small tributary) pilot project (CEP 4.07). Mallard Island Interim Report was released.		
SCVURPPP	CEP/RMP	Tracked progress of CEP and RMP Sources Pathways and Loadings Workgroup projects involving improving loading estimates (e.g., Stormwater Literature Review project, Hg/PCB TMDLs). Draft reports were released by SFEI/RMP.		
SCVURPPP	RWQCB	Tracked results from RWQCB Surface Water Ambient Monitoring Program (SWAMP) for potential utility in developing improved loading estimates		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		SFEI/RMP began development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1))		

CAP Category: Uncertainty Reduction Studies				
BASELINE ACTIVITY: CB-17(4) – Bioassessment tools to track presence of copper sensitive taxa in LSB **Region of Applicability:** South Bay and possibly Bay-wide **Linkage to Copper Reduction:** Independent indicator of whether ambient concentrations are adversely impacting biota **Performance Measure(s):** Availability of appropriate bioassessment tools with ability to differentiate between copper and other stressors				
Lead Party	**Reports**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005 – 2006		**PROPOSED WORKPLAN TASKS**		
SCVURPPP		Same action as CB-17(1).		
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP with transition to RMP reporting annually to SCVURPPP		SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-wide CAP development effort.
FY 2004 – 2005		**PROPOSED WORKPLAN TASKS**		
SCVURPPP with transition to RMP	Semi-	Include in bay-wide research tracking effort being implemented by SFEI/RMP (see description under		

Lead Party	Reports	Actions	Effectiveness Evaluation	Future Actions
reporting annually to SCVURPPP	annually	CB-17(1)).		
FY 2003-2004		**Actions Accomplished in Period**		
		SFEI/RMP began development of web-based copper "uncertainty studies" research tracking project (see CB-17(1)).	Romburg-Tiburon project funded by San Jose concluded that it was not likely that indicators of ecosystem health could be linked to anthropogenic effects or to specific pollutant data in the foreseeable future.	

CAP Category: Uncertainty Reduction Studies				
BASELINE ACTIVITY: CB- 18(1) Investigate flushing time estimates for different wet weather conditions **CB- 18(2)** Investigate location of northern boundary conditions **Region of Applicability:** South bay and bay-wide **Linkage to Copper Reduction:** Reduce uncertainty about sedimentation/resuspension dynamics and water column copper concentrations **Performance Measure(s):** Track progress of hydrodynamic and sediment transport modeling efforts by others				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Same action as CB-17(1).		
FY 2004-2005		**Actions Accomplished in Period**		
RMP reporting to SCVURPPP		SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-wide CAP development effort.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Continue to track modeling development efforts and results from SSO, BPP and SFO projects. (see CB-5&4)	SCVURPPP encourages through CEP, RMP and BASMAA baseline funding	
SCVURPPP		Track whether CEP chooses to fund additional runs of URS SFO model as part of CEP Cu/Ni SSO project. This project supports Basin Plan Amendment anti-degradation and related analyses.		
RMP reporting to SCVURPPP	Semi-annually	Include in bay-wide research tracking effort being implemented by SFEI/RMP (see description under CB-17(1)).		
FY 2003-2004		**Actions Accomplished in Period**		
	CEP Technical Committee	CEP Task 4.07 redirected to multi-box model and PCB food web model. CEP unlikely to fund any Cu/Ni modeling (low priority). BPP Bay-wide modeling scheduled for late 2005 and 2006.		

CAP Category: Uncertainty Reduction Studies				
Baseline Activity: CB-18(3) – Determine Cu-L1 and L2 complex concentrations (copper speciation) **CB-17(5) – Assess feasibility of phytoplankton bioassays to measure toxicity** **Region of Applicability:** Bay-wide **Linkage to Copper Reduction:** Ambient free ionic copper (not complexed with organic ligands) is form toxic to phytoplankton **Performance Measure(s):** Bruland speciation work schedule. Ambient free ionic copper concentrations.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005 – 2006		**PROPOSED WORKPLAN TASKS**		
RWQCB		Consider additional speciation monitoring as a phase I action if ambient Cu trigger is exceeded.		
FY 2004 – 2005		**Actions Accomplished in Period**		
		Summarized Bruland speciation results in CEP NDB Conceptual Model/Impairment Assessment Report		
FY 2004 – 2005		**PROPOSED WORKPLAN TASKS**		
RWQCB		Determine if there is a need for additional speciation monitoring. If so, develop schedule, sampling plan and funding source.	Consider additional speciation monitoring as a phase I action if ambient Cu trigger is exceeded.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003 – 2004		**Actions Accomplished in Period**		
RWQCB	July 2003 draft Bruland Reports April 2004 Final	Draft report on copper speciation with results of January and March 2003 sampling released. Similar results to 2001 sampling. Ambient free ionic copper levels 100 times lower than toxic threshold. Final report released April 2004.	Results appear to indicate no need to further develop toxicity bioassay methodologies (CB-17 (5)).	

CAP Category: Uncertainty Reduction Studies				
Baseline Activity: CB-18(4) – Investigate algal uptake/toxicity with competing metals **Region of Applicability:** Bay-wide **Linkage to Copper Reduction:** Algae may preferentially uptake substances (e.g., Mn) reducing the toxicity of ambient copper concentrations **Performance Measure(s):** Ambient free ionic copper, Mn, possibly other constituent concentrations.				
Lead Party	**Reporting**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005- 2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Same action as CB-17(1).		
FY 2004- 2005		**Actions Accomplished in Period**		
RMP reporting to SCVURPPP	Semi-annually	SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-wide CAP development effort.
FY 2004- 2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Track re-evaluation of the importance and need for additional work on this issue as part of the CEP Cu/Ni SSO project. Consider including as a Phase I action if ambient Cu trigger exceeded.		Further work may not be necessary given results of Bruland copper speciation study (see CB-18(3), CB-17(5)).

Lead Party	Reporting	Actions	Effectiveness Evaluation	Future Actions
RMP reporting to SCVURPPP	Semi-annually	Include in bay-wide research tracking effort being implemented by SFEI/RMP (see description under CB-17(1)).		
FY 2003- 2004		**Actions Accomplished in Period**		
	CEP Cu/Ni CMIA Report April 2004	Reviewed and updated IAR uncertainty study status in CEP CMIA report.		Probably not warranted based on Bruland results.

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB-19/NB-6 – Track industrial virtual closed-loop wastewater efficiency measures as part of POTW Source Control programs. **Region of Applicability:** South Bay. **Linkage to Copper Reduction:** Indirect. Potential flow and copper influent reduction. **Performance Measure(s):** Completed studies.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCBWMI - San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report.	Same action as FY04-05 (see below).	San Jose is continuously evaluating the pretreatment program and the tools used to ensure improved effectiveness.	Ongoing activity.
Sunnyvale WPCP	Pretreatment Program Annual Report	Same action as FY04-05 (see below).	Sunnyvale is continuously tracking and reporting on water usage and wastewater generation rates and providing outreach on water conservation to businesses and industrial users.	Ongoing activity

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**Actions Accomplished in Period**		
SCBWMI - San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report.	Same accomplishments as FY 03-04.		
Sunnyvale WPCP	Pretreatment Program Annual Report	Same accomplishments as FY 03-04.		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCBWMI - San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report.	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Annual Clean Bay Strategy Report and Annual Pretreatment Program Report
Sunnyvale WPCP	Pretreatment Program Annual Report	Same action as FY03-04 (see below).		This task is ongoing and is reported in the Pretreatment Program Annual Report

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
SCBWMI - San Jose/Santa Clara Water Pollution Control Plant	Annual Clean Bay Strategy Report.	**Ongoing-** Industry projects are identified and tracked by the City through the Water Efficiency Technology rebates or studies done by the industry. We will continue to provide financial and technical assistance for these projects. These projects will be reported in the annual report.	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continuously evaluate the pretreatment program and the tools used to ensure improved effectiveness.
Sunnyvale WPCP	Pretreatment Program Annual Report	**Ongoing-** Water usage and wastewater generation tracked and reported under pretreatment program. Water conservation information sources provided during facility inspections and general outreach is provided to city businesses about water conservation through the PIP program (See Attachment G of FY 02-03 Stormwater Annual Report)	Reduction of permitted industrial flow and copper loading to the treatment plant.	Continue to track and report on water usage and wastewater generation rates. Continue outreach to businesses and industrial users.
Other Co-Permittees		Not applicable		

CAP Category: Uncertainty Reduction				
BASELINE ACTIVITY: CB- 20 - Measures to revise the Copper Conceptual Model Report findings. Revise copper conceptual model report uncertainty table (Appendix D) and produce a status report at permit re-issuance. **Region of Applicability:** South Bay and likely bay-wide **Linkage to Copper Reduction:** May reduce uncertainty associated with conceptual model predictions of copper dynamics in the bay **Performance Measure(s):** Availability of improved input data and uncertainty in multiple assumptions underlying model				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Same action as CB-17(1).		
FY 2004-2005		**Actions Accomplished in Period**		
		Summary update included in NDB Conceptual Model/Impairment Assessment Report • CEP is developing a multi-box model for the Bay that could be used for other pollutants (e.g., copper).		
SCVURPPP with transition to RMP reporting annually to SCVURPPP	Semi-annual updates	SFEI/RMP completed development of web-based copper "uncertainty studies" research tracking project (see description under CB-17(1)) in December 2004. This web-portal is available on the Program's website at www.scvurppp.org.		Bay-wide stakeholders will need to identify this project's on-going priority, level of support and source of future funding as part of the Bay-

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
				wide CAP development effort.
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Determine if revised Copper Conceptual Model being prepared for the CEP NDB Cu/Ni SSO Basin Plan Amendment project (Task 4.11) fulfills and completes this baseline action.		Updates to the Copper Conceptual Model will be provided as part of the CEP North of Dumbarton Cu/Ni CMIA report.
SCVURPPP with transition to RMP reporting annually to SCVURPPP	Semi-annual updates	Include in bay-wide research tracking effort being implemented by SFEI/RMP (see description under CB-17(1)).		
FY 2003-2004		**Actions Accomplished in Period**		
	CEP	CEP Task 4.07 initiated to evaluate future modeling needs and other CEP tasks with modeling elements. The focus was on multi-box and PCB food web modeling.	Additional Cu modeling considered low priority by CEP.	
	CEP	Summarized CMR uncertainties and updated the copper conceptual model for NDB in the CEP Cu/Ni NDB CMIA report (April 2004)		

CAP Category: Potential Source Reduction				
BASELINE ACTIVITY: CB- 21 - Measures to discourage architectural use of copper. **(1) evaluate feasibility of discouraging architectural use of copper & explore feasibility of related policy** **(2) promote Green Building principles** **Region of Applicability:** South Bay and Bay-wide **Linkage to Copper Reduction:** Copper from corroding roofing related material washes off with rainfall and can enter storm drains **Performance Measure(s):** Building permits/inspections for new and replacement roofing work involving copper containing materials				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Provide Co-permittees with additional information regarding regulation of architectural copper sources, as appropriate.		Investigate the practicality of implementing control measures as part of Bay-wide CAP development effort.
Palo Alto		Same action as FY 04-05 (see below).		Ongoing activity.
San Jose		Continue to monitor progress of San José Green Building program to identify opportunities for discouraging architectural use of copper.		
All Co-permittees		Refer to individual Co-permittee Work Plans.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2004-2005		**Actions Accomplished in Period**		
Palo Alto		Continued enforcing ban on architectural copper (roofs and gutters) per ordinance provision. Continued to conduct outreach to Building/Planning staff and developers on ban of copper roofs, shingles and gutters.		Ongoing activity.
San Jose		Began monitoring the progress of San José Green Building program to identify opportunities for discouraging architectural use of copper.		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Review procedures (submitted by the Copper Development Association to the City of Palo Alto) for evaluating alternative mitigation measures to reduce copper loading from new or existing structures.		If applicable, provide to Co-permittees at a later date.
Palo Alto		Continue enforcing ban on architectural copper (roofs and gutters) per ordinance provision. Continue to conduct outreach to Building/Planning staff and developers on ban of copper roofs, shingles and gutters.		Ongoing
San Jose		Continue reporting on the status of the implementation of Green Building policies and recommendations for opportunities to discourage architectural use of copper.		
All Co-permittees		Refer to individual Co-permittee Work Plans.		

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP		On July 29, 2003, Program staff provided Co-permittees with the City of Palo Alto report entitled *Architectural Uses of Copper: An evaluation of stormwater pollution loads and BMPs* and its model ordinance banning architectural copper (roofs and gutters). Co-permittees will also be encouraged to consider the feasibility of limiting or banning these uses of copper.	Information will be useful in determining next steps regarding CB-21.	
Palo Alto		**Status:** Building Department staff is enforcing the ban on architectural copper (roofs and gutters) per ordinance provision. In fact, staff notified customers before it became effective. The City's Development Center was provided copies of a fact sheet regarding the new ordinance. . Based on requests from the Building Department, Environmental Compliance created stamps and ordinance fact sheets for use with residential blueprints. **Outreach efforts:** During FY 03-04, City of Palo Alto's Environmental Compliance staff gave two presentations to Building Department staff regarding the copper roof ban In addition, the City has conducted outreach to facility managers and architects. In October 2002, the City met with three facility manager associations: BOMA, IFMA, and NIAOP. During the Winter of 2003, the City followed up with these organizations to provide an ordinance summary table and city ordinances relevant to facility managers (i.e., copper	This ordinance has been effective at eliminating the installation of new copper roofs. Due to this ordinance, Palo Alto has the attention of the Copper Development Association (CDA). CDA has been gathering and funding academic research regarding this topic. As a result, information regarding non-point copper sources will be learned. On occasion, CDA meets with City representatives to provide status reports.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
		roof ordinance). In July 2003, a meeting was held with Palo Alto area facility managers to discuss ordinance issues. An ordinance summary table was also provided. Currently, information is disseminated through the Building Department / Development Center and through the City's Environmental Compliance web site.		
San Jose		Continued to implement Green Building policies and recommendations for opportunities to discourage architectural use of copper.	Status reports prepared	Follow-up with the City of San Jose staff
SCVURPPP		Tracked EPA cancellation of virtually all residential uses of chromated copper arsenate (CCA) treated lumber (December 30, 2003). Tracked replacement of preservatives for copper content.		On-going
All Co-permittees		Refer to individual Co-permittee FY 03-04 Annual Reports.		

NAP Category: Potential Source Reduction				
BASELINE ACTIVITY: NB-1 – Measures to control nickel discharges from construction sites: (1) continue to implement performance standards for construction inspection, (2) participate in development of region-wide training and certification program for construction site inspectors, (3) continue to conduct workshops for municipal staff on post-construction controls for new development and re-development, and 4) continue to support annual workshops for contractors and municipal staff on construction site management and erosion/sediment controls. **Region of Applicability:** South Bay. Concept potentially applicable Bay-wide. **Linkage to Nickel Reduction:** Nickel occurs naturally in local soils. Assumes that better erosion/sediment controls at construction sites will reduce the amount of sediment (and thus nickel) washed into creeks and the Bay. **Performance Measure(s):** Co-permittee annual reports evaluating implementation of Construction Inspection Performance Standard; number of workshops held and number of attendees.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP NB-1(1)		• Continue to implement the Construction Inspection and Rural Public Works Maintenance and Support Performance Standards • Educate Co-permittee staff and contractors about the new requirements in the Construction General Permit		Ongoing.
SCVURPPP		• Continue to hold workshops as resources permit.	Attendee list, evaluation forms	
FY 2004-2005		**Actions Accomplished in Period**		
SCVURPPP NB-1(1)		Co-permittees continued to implement the Construction Inspection and Rural Public Works Maintenance and Support Performance Standards.	Effectiveness evaluation will be provided within Co-permittee Annual Reports Section (Self-Evaluation Matrix, Attachment B) of	Ongoing

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
			the *FY 04-05 Annual Report*.	
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Continue to implement the Construction Inspection and Rural Public Works Maintenance and Support Performance Standards		Ongoing
SCVURPPP		• Continue to hold workshops as resources permit.	Attendee list, evaluation forms	
FY 2003-2004		**Actions Accomplished in Period**		
SCVURPPP NB-1(2)(4)		The Program sponsored and helped conduct the annual Regional Board Construction Site Management Workshop on September 24, 2003. Information on the latest erosion/sediment control techniques was provided.	The workshop was well attended (95 people, mostly Co-permittee staff). Evaluation forms showed that the workshop was successful in educating attendees (see FY 03-04 Annual Report).	Ongoing- the Program will co-sponsor this workshop with the RWQCB every two years.
SCVURPPP NB-1(1)		Co-permittees continued to implement the Construction Inspection and Rural Public Works Maintenance and Support Performance Standards.	Effectiveness evaluation in Co-permittee Annual Reports Section (Self-Evaluation Matrix, Attachment B).	Ongoing
SCVURPPP NB-1(3)		On June 3, 2004, the Program held a third workshop on implementing Provision C.3., including information on appropriate post-construction controls for types of new and redevelopment projects. The Program's *C.3 Stormwater Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects* was distributed.	The workshop was well attended (134 people, mostly Co-permittee staff and consultants). Evaluation forms indicated that the workshop met the participant's expectations (see *Appendix A-7* of the	Additional C.3. workshop(s) will be held in FY 04-05 as resources permit.

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
			FY 03-04 Annual Report). Information provided within the *C.3 Stormwater Handbook* will assist project proponents and Co-permittee staff to meet the requirements of Permit Provision C.3.	

NAP Category: Potential Source Reduction				
BASELINE ACTIVITY: NB-7 – Measures to establish a watershed model linked to process oriented Bay model. **Region of Applicability:** South Bay and generally Bay-wide. **Linkage to Nickel Reduction:** Better understanding of nickel sources, pathways, and loadings to the Bay. **Performance Measure(s):** Report on and incorporate results of various modeling activities.				
Lead Party	**Report/Source**	**Actions**	**Effectiveness Evaluation**	**Future Actions**
FY 2005-2006		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP		Same actions as FY 04-05 (see below). Low priority activity.	No impairment in Bay due to nickel.	Consider further activities if phase I ambient Cu trigger is exceeded.
FY 2004-2005		**Actions Accomplished in Period**		
FY 2004-2005		**PROPOSED WORKPLAN ACTIONS**		
SCVURPPP	CEP	Continue to track CEP Task 4.07 evaluating future modeling needs and other CEP tasks with modeling elements (see CB-20).		
SCVURPPP	BPP	Continue to track results from BPP hydrodynamic and compartment modeling based on SFO and WASP models.(see CB-20, CB-18, CB-4&5)		
SCVURPPP		Track CEP Cu/Ni proposal for SFO model runs in support of Basin Plan SSO Amendment	Work ongoing during FY 04-05.	

Lead Party	Report/Source	Actions	Effectiveness Evaluation	Future Actions
FY 2003-2004		**Actions Accomplished in Period**		
		CEP Task 4.07 initiated. SFO and salt pond modeling results released for public review.		

SECTION 5

PESTICIDE MANAGEMENT WORK PLAN

5. 05-06 PESTICIDE MANAGEMENT WORK PLAN

INTRODUCTION

The goals and objectives of the SCVURPPP Urban Runoff Management Plan (URMP) include effectively prohibiting non-storm water discharges to storm drains and watercourses; reducing pollutants in storm water discharges to the "maximum extent practicable" (MEP); and not causing or contributing to violations of water quality standards, as required by the Program's NPDES permit. The Program's approach to meeting these goals and objectives focuses on the use of best management practices (BMPs) for source control and pollution prevention; and public education and outreach.

The Program's approach to pesticide management has a similar focus on source control and pollution prevention. Program BMPs for pesticide management have included significant outreach efforts to residents, businesses, and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide issues; and development of performance standards and local pest management plans.

BACKGROUND

Diazinon and chlorpyrifos have been identified in recent studies as causing toxicity in local creeks and wastewater treatment plant effluent. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA). The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies. In September 2002, the Regional Board developed a Preliminary Project Report for diazinon and pesticide-related toxicity in San Francisco Bay Area urban creeks. The Preliminary Project Report provides a draft source assessment and pollutant allocation scheme; and discusses potential implementation actions relevant to urban runoff management programs, including the SCVURPPP. A final project report was released on March 4, 2004. This Project Report has been reviewed by BASMAA and the Program. Program staff will continue to work with Regional Board staff to develop a reasonable and cost-effective set of control actions to assist the Regional Board implement the TMDL efforts.

The Program's reissued NPDES permit (Order No. 01-024, February 21, 2001) includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticides by others within municipal jurisdictions. The Program will also continue to work with the Urban Pesticide Committee and the California Stormwater Quality Association Pesticide Work Group to assess impacts of pesticide use and encourage actions by other state and federal agencies.

As required by Permit Provision C.9.d., the Program developed a Pesticide Management Plan and submitted it to the Regional Board by July 1, 2001 (June 26, 2001). The submittal to the Regional Board included a preliminary draft Pest Management Performance Standard as well as municipal pesticide use surveys completed by each Co-permittee. The Pesticide

Management Plan was revised in response to Regional Board staff comments dated August 15, 2001 and December 21, 2001, and the revised version (dated February 15, 2002) submitted to the Regional Board as Attachment 5-1 to the Program's *FY 02-03 Work Plan*. The Pest Management Performance Standard was also revised based on Regional Board Staff comments emailed in November 2001. The final performance standard was submitted to the Regional Board as Attachment 2-2 of the Program's *FY 02-03 Work Plan*.

The purpose of the Pesticide Plan is to control pesticide-related toxicity in urban runoff, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Plan identifies the goals of each work plan element, actions, monitoring mechanisms and schedules. The Plan also identifies whether actions will be implemented at the Program level, municipality level, or both. Program-level actions in the Plan form the basis of this FY 05-06 Pesticide Management Work Plan. The details of municipality actions and schedules were provided in individual Co-permittee pest management plans submitted with the Co-permittees' FY 00-01 annual reports and future tasks are provided in the Co-permittees' FY 05-06 work plans (Section 9 of this Work Plan).

PAST PESTICIDE MANAGEMENT ACTIVITIES

The Program has, since its inception, actively participated in a number of activities aimed at understanding water quality problems in creeks and San Francisco Bay and reducing pollutants, including pesticides, to the MEP. The Program's FY 99-00, FY 00-01, FY 01-02, FY 02-03, FY 03-04 and FY 04-05 Work Plans presented the history of the Program's and Co-permittee's pesticide-related activities in the areas of monitoring and science, outreach and education, and URMP implementation.

All of the Program tasks in the Pesticide Plan were scheduled to be completed or begin by FY 02-03. Table 5-1 presents the status of these tasks. Details of the FY 05-06 Pesticide User Outreach Work Plan are provided within Section 3, Attachment 3-3.

FY 05-06 PESTICIDE MANAGEMENT TASKS

No new Pesticide Plan tasks have been identified for FY 05-06. The Program will continue implementing the ongoing Pesticide Plan tasks listed in Table 5-1.

Table 5-1
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
I. Municipal Pesticide Use		
I.A.1 Develop and implement a process for tracking pesticide use on municipally owned property (PS#8). Include in the process reporting and justification for the use of OP pesticide and BMPs employed during OP pesticide use.	Ongoing	The Pest Management Performance Standard includes a suggested reporting process that, for FY 01-02, is focused on reporting use of organophosphate pesticides, particularly chlorpyrifos and diazinon. All Co-permittees submitted information on pesticide use in their FY 01-02, FY 02-03 and FY 03-04 Annual Reports. Program staff will work with the Co-permittees to review and improve the reporting process as needed.
I.A.3 Assist Co-permittees to develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM policy. (PS #3). BMPs will include special precautions to reduce water quality impacts when applying pesticides.	Done	Program guidance completed as part of Model Pest Management Performance Standard, submitted to Regional Board March 1, 2002. Guidance to Co-permittees included a packet of example IPM policies and practices.
I.A.4. Assist Co-permittees to update local URMPs to incorporate/adapt the model Pest Management Performance Standard, including a description of the legal authority (IPM policy/ordinance, contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done	See notes for Action I.A.3. The Program held a workshop on March 20, 2002 on how to implement the performance standard.
I.B.4. Conduct a workshop for municipal staff on least-toxic pest control methods and pesticide management BMPs.	Done	Workshop held March 20, 2002. Program also co-sponsored ACCWP IPM Symposium held on 2/5/03, and the Regional IPM Conference on June 6, 2004

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II. Public Education and Outreach		
II.A.1 Implement the Watershed Education & Outreach (WE&O) Campaign, which will target the general public and include messages about less-toxic pest control and proper disposal. The Campaign will include extensive media campaign with South Bay English- and Spanish-language radio stations, newspapers, and bus posters.	Done/Ongoing	An article on impacts of pesticide use to water quality and less toxic pest control was written and sent through the campaign distribution list. Pesticides are listed as a concern in the campaign brochure and the Watershed Watch song. The campaign web site added several new pages on IPM and IPM fact sheets are available to download. Print, radio and transit ads with less toxic pest management messages were developed in FY 02-03. Advertising was conducted in FY 02-03, FY 03-04, and FY 04-05
II.A.2 Develop simple, effective, targeted messages regarding proper pesticide use and disposal, effects on water quality, and IPM.	Done/Ongoing	See above for Watershed Watch activities. The Program continues to participate in regional IPM partnership and media relations efforts. The regional IPM partnership committee develops new fact sheets as needed.
II.A.3 Prepare appropriate outreach materials (e.g., fact sheets or a consumer guide regarding pest control services) to address target groups.	Done	Program developed landscape maintenance fact sheet. A PCO fact sheet has been developed through BASMAA participation. This fact sheets educates consumers on hiring pest control professionals who practice IPM.
II.A.4 Identify and attend community events and distribute outreach materials. (Program will attend events strategic to the WE&O campaign.)	Done/Ongoing	Program staff and Watershed Watch consultant staff attend 4-5 events each year. Brochures such as IPM fact sheets, “Grow It!” guide, “Pests Bugging You?”, and “Backyard Bugs” are distributed.
II.A.6. Create, update, and publicize web sites to promote IPM and reduce pesticide use.	Done/Ongoing	The Watershed Watch website was launched in September 2001 and is continually updated. The website directs browsers to call the toll-free number to the Program office for information on less-toxic pest control. A web page specifically for IPM was completed in June 2002 and is updated regularly. The web page also includes links to other sites with information on IPM.
II.A.7 Coordinate with the Master Gardeners program and use their services to train residents. Provide IPM training and information on water quality impacts of pesticide use to	Done	The Program funded a proposal by Master Gardeners and San Jose Community Gardens staff to conduct an IPM training program for community gardeners. Four

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
Master Gardeners as needed.		workshops were conducted and training materials were purchased with SCVURPPP funds. In FY 02-03, the Program conducted an IPM workshop in coordination with Watershed Watch, United Neighborhoods, Guadalupe Gardens and the Santa Clara County Household Hazardous Waste Program. Master Gardeners Nancy Garrison and Bracey Tiede were the featured speakers. Approximately 30 people attended this workshop. In FY 03-04, the Program conducted an IPM workshop in coordination with coordination with watershed Watch, Friends of Guadalupe River Park & Gardens, Strong Neighborhoods, Master Gardeners of Santa Clara County, Master Composters, and the County Household Hazardous Waste Program. Stephanie Morris, local landscape architect, Michael Pulhamus of Master Composters and Freddie Howell of the Wild Bird Center in Los Gatos were the featured speakers. Master Gardeners helped publicize the workshop through their web site and newsletters.
II.A.8 Create and/or publicize existing IPM demonstration gardens (such as the garden at the San Francisco Bay Wildlife Refuge in Alviso).	Done/Ongoing	The Watershed Watch campaign has partnered with the Don Edwards San Francisco Bay Wildlife Refuge at Alviso. The Alviso site has a pesticide-free native plant demonstration garden. Garden workshops at this garden are promoted on the Watershed Watch website. In addition, the Watershed Watch consultant is working with Don Edwards staff to develop page on the website specific to the demonstration garden. The Program provided promotional support for the Going Native Garden Tour held on April 18, 2004. Approximately 1,792 people attended the tour. The tour featured 32 gardens. Featured gardens demonstrate environmentally sensitive gardening practices including use of native plants, water conservation, landscaping to prevent urban runoff, reducing pesticide and fertilizer use etc. The Program will also provide support in FY 04-05.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.A.9 Continue to fund BASMAA Regional Media Relations Campaign featuring pitches to Bay Area media and responses to breaking news on pesticide-related topics.	Ongoing	The Program funds this campaign as part of its BASMAA baseline dues. Program staff participates in meetings of the work group and review draft products.
II.A.11 Identify consumer and business publications that could include articles about IPM or less toxic pest management, submit articles or letters to the editor, and encourage them to print them.	Done/ Ongoing	An article regarding impacts of pesticide use to water quality and containing hints for pesticide-free pest control was written and sent through the WEO campaign distribution list; however, it was difficult to confirm whether the article was published. In FY 04-05, another article of IPM has been developed and efforts to identify publications to get the article included are ongoing.
II.A.12 Develop a work plan for and implement a "Pesticide User Outreach" project targeting residential and commercial users, which will include continuing the IPM Store Partnership Program and selected Household Chemical Management project tasks. Include an evaluation component in the work plan.	Ongoing (Complete Annually)	Work Plan implemented for FY 02-03, FY 03-04 and ongoing for FY 04-05. Activities included: • Media advertising • IPM Store Partnership Program • IPM Community Workshop • Outreach at Community Events
II.A.13 Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	Done	VTA and open space and vector control district staff were invited to the Program's IPM Workshop in March 2003 and provided copies of the Program's Pest Management Performance Standard. In January 2005, the Program conducted a mailing (letter and IPM fact sheets) to these groups to provide them information about less-toxic pest control.
Monitoring Mechanism II.A.1 Document or estimate numbers of residents reached by outreach efforts, including events, web site promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts through documentation of calls to the Program's general and watershed campaign hotlines.	Ongoing (Completed Annually)	Number of residents reached and outreach materials distributed are documented after each event. Response to outreach efforts is tracked by documenting calls to hotline and website visits. This information is provided in the Annual Report each year.
Monitoring Mechanism II.A.2 Survey local public attitudes and behavior to evaluate the success of outreach efforts and the	Done	A Countywide survey was conducted in September 2003 to evaluate the success of the WE&O campaign. The final

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

	Action	Status	Notes
	behavior to evaluate the success of outreach efforts and the saturation of outreach messages. (Program will conduct countywide survey as part of evaluation of WE&O campaign. Program may also conduct surveys to evaluate effectiveness of specific projects.)		evaluate the success of the WE&O campaign. The final evaluation report was included in the Program's FY 03-04 Annual Report. Some of the survey questions tracked the publics' knowledge about various pollutants, including pesticides, affecting the water quality in the Bay. 19% of the respondents in 2003 say that pesticides affect the water quality of the Bay compared to 7% in 1991. About 23% of residents say that they use less –toxic ways to control pests in their home and garden. The BASMAA Regional IPM Committee conducted a customer intercept survey in September and October 2004 to evaluate the Store Partnership Project. Five stores from Santa Clara County were included in this survey. The survey indicates that about 23% of Santa Clara County residents are aware of the Our Water Our World promotion. The final survey report will be included with the FY 04-05 Annual Report.
II.B.1	Continue to fund and participate in the BASMAA Regional IPM Partnership.	Ongoing	The Program annually funds this program as part of its BASMAA baseline dues. These funds cover the Program's supply of IPM Fact Sheets. Program staff participates in meetings of the work group and review draft products.
II.B.2	Continue to implement cost-effective elements of the IPM Store Partnership Program. Create and provide fact sheets and other materials to pesticide retailers to facilitate point-of-purchase outreach. Visit stores as necessary to ensure ongoing participation.	Ongoing	The IPM store partnership program expanded in FY 02-03 to include 29 stores in the Santa Clara Valley. Program staff routinely visits the stores and ensure that they are well stocked with fact sheets and shelf talkers. In addition, the Program provides trainings to store employees on selling less-toxic products.
II.B.3	Offer IPM training opportunities to pesticide retailer employees through coordination with Master Gardener-taught educational programs.	Task Eliminated (covered under Action Item II.A.12.)	It was not possible to arrange for Master Gardeners to train store employees due to staff shortages within the Master Gardener program. The Program has contracted with Annie Joseph to provide training to pesticide retailers, as she has been successful in getting store participation. The Community Gardeners project has been a successful way to work with the Master Gardener program and may be repeated if there is sufficient demand and resources

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
		available.
Monitoring Mechanism II.B.1. Document number of participating stores, materials distributed and employees trained. Evaluate the cost-effectiveness of the IPM Store Partnership Program each year. Implement the evaluation component of the Pesticide User Outreach work plan each year	Ongoing	Data on number of participating stores, materials distributed and employees trained is documented and reported in the Annual Report each year. Evaluation of other work plan tasks is also reported.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
III. Pest Control Operators (PCOs)		
III.A.1 Develop a database of licensed structural and landscape maintenance PCOs.	Done	The list was obtained from the County Agricultural Commissioner's office prior to the PCO workshop of November 4, 2003
III.A.2. Identify active PCO and landscape maintenance organizations in the South Bay and conduct awareness-raising presentations at their meetings	Done	The Program contracted with Bart Brandenburg, consultant, to plan and conduct a PCO Workshop. To increase attendance, awareness raising presentations were made at the two local PCO associations prior to the PCO workshop.
III.A.3. Develop and conduct accredited workshops for PCOs that focus on IPM techniques.	Done	The workshop was conducted on November 4, 2003. Approximately 30 PCOs from 19 companies attended this workshop. The workshop was very well received by attendees.
III.A.4 Require PCOs contracted for municipal applications to use pest control methods consistent with the municipality's IPM policy (through contract specifications). Specifically, municipalities will require contractors to: a) follow the agency's IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on agency property to the agency in a timely manner (PS#5).	Program Guidance Done	Guidance was completed in December 2001 as part of the Pest Management Performance Standard. Co-permittees are beginning or continuing to implement the guidance. The IPM workshop on March 20, 2002 included a section on contracting for IPM services from professional pest control businesses.
Monitoring Mechanism III.A.1. Document the number of PCOs receiving presentations and/or training and pesticide use by PCOs on municipal property.	Done/ Ongoing	Approximately 30 PCOs from 19 companies attended the Program's PCO workshop. Co-Permittees track their own trainings and report results in Annual Reports.
III.B.1. Identify and work with PCO trade organizations to develop industry standards for BMPs to protect water quality, through participation in UPC and BASMAA.	Complete June 2005	Standards are being developed for IPM certification for structural pests as part of the PCO IPM Partnership project being implemented by the Bio Integral Research Center (BIRC). The Program will provide input as needed.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
IV. Commercial Businesses		
IV.A.1 Research reports and surveys of commercial business pesticide use and other stormwater programs' and POTWs' efforts to address this issue. Develop recommendations and a work plan (including an evaluation component) to provide outreach on less toxic pest control to target businesses in the South Bay, as appropriate and cost-effective.	Done/Ongoing	Program staff surveyed Co-permittees, BASMAA members, and Monterey County programs for IPM materials specific to restaurants. Very little IPM restaurant outreach material was found. Several programs reported using San Francisco's "Don't Set a Table for Pests" poster. In FY 02-03 County Health Inspectors began distributing this poster to restaurants during routine inspections. The poster was reprinted in FY 03-04.
IV.A.2. Develop and implement education programs that target commercial businesses, per recommendations from Action IV.A.1.	Ongoing	See Action Item IV.A.1.
Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, as recommended in the work plan to be developed by the Program. Implement the evaluation component of the work plan.	Ongoing	The number of posters distributed and the number of businesses receiving them is documented and reported in the Annual Report each year.
V. Household Hazardous Waste Collection		
V.A.3 Work with HHW collection agencies to support, enhance, and help publicize programs for proper pesticide disposal (PS #7).	Ongoing	The Program is working closely with the HHW Program to publicize proper pesticide disposal. The Program's "Got Paint" advertising campaign focused on the proper disposal of paints, pesticides and other hazardous wastes.
Monitoring Mechanism V.A.2. Document quantities of pesticide disposal at household hazardous waste collection facilities (only possible on a county-wide basis at present)	Ongoing	Reported in the Annual Report each year

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
VI. County Agricultural Commissioners		
VI.A.1 Keep County Agricultural Commissioners informed of Program goals and activities and regional water quality issues through periodic meetings.	Ongoing	County Agricultural commissioners were involved in the development and review of the pest management performance standards. Contact is ongoing.
VI.A.2 Involve County Agricultural Commissioners in education and outreach efforts targeting PCOs.	Done	Program staff worked with County Agricultural Commissioners for planning and conducting the PCO workshop.
Monitoring Mechanism VI.A.2 Document meetings with County Agricultural Commissioner and staff involvement in outreach efforts	Done	Program staff met with County Agricultural Commissioners to plan the PCO workshop. Workshop information was published in their newsletters. Outreach staff from the Ag. Commissioner's office made a presentation at the PCO workshop.
VII. New Development		
VII.A.1. Coordinate with municipal arborists or other relevant municipal staff to identify landscaping techniques less likely to attract pests, including a list of pest-resistant plants, and develop model conditions of approval for pest resistant landscaping features and practices.	Done	Program completed model conditions of approval, a landscape maintenance fact sheet, guidance on landscaping techniques for stormwater treatment, and a draft pest-resistant plant list. The plant list proved not to be a useful tool, as plant resistance depends highly on local planting conditions.
VII.A.2. Assist Co-permittees to consider pest-resistant landscaping and design features in the design, landscaping, and environmental reviews of proposed development projects.	Done	Model conditions of approval provided to Co-permittees, and a form developed to track projects for which education or conditions of approval were required.
VII.A.3. Assist Co-permittees to train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval (see Actions VII.A.1. and VII.A.2.) and the importance of minimizing pesticide use in runoff from development sites.	Done	The topic was presented at the December 11, 2002 New Development workshop.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
VII.A.4. Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites.	Done	A section for documenting pesticide reduction measures required of project applicants is included in the Program's model data collection form for collecting other development project data prior to implementing C.3. (i.e., impervious surface area) and the Planning Procedures PS Reporting Form.
VIII. Monitoring and Science		
VIII.A.1. Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP advisory and technical committees to focus RMP resources on 303(d) problem pollutants, including OP pesticides.	Ongoing	The Program annually contributes its share to the RMP. Program staff attends the RMP Technical Review Committee meetings and prepare meeting summaries for Management Committee.
VIII.A.2. Work with Regional Board staff to refine the problem statement for the diazinon TMDL and determine data needs.	Ongoing	Program staff attends the Urban Pesticide Committee meetings, at which the diazinon TMDL has been discussed. Staff is also working on the TMDL with Regional Board staff as part of the Clean Estuary Program (CEP).
VIII.A.3. Participate in a coordinated regional plan to collect data for the diazinon TMDL.	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX. Regional, State, and Federal Coordination		
IX.A.1. Support actions by the California Stormwater Quality Association (CASQA) Pesticide Work Group to comment on and assist with USEPA's pesticide risk assessments and to assist USEPA in development of a scope for a diazinon TMDL case study.	Ongoing; Case study TBD	The Program provides funding to the CASQA's consultant contract, which funded Geoff Brosseau and Kelly Moran's efforts to review risk assessments and provide comments on behalf of the CASQA member agencies. The EPA case study has not yet been planned or discussed.
IX.A.2. Through participation in the UPC and CASQA, work with the U.S.EPA, the California Department of Pesticide Regulation, and the pesticide industry to eliminate uses of pesticides likely to enter surface water from those listed on product	Ongoing	Program staff regularly participates in the UPC and CASQA, and support efforts to eliminate uses of pesticides that cause risk to water quality.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
labels.*		
IX.B.1. Participate in the activities of BASMAA, CASQA, and UPC, and communicate Program efforts.	Ongoing	Program staff regularly attends BASMAA, the CASQA and its Executive Committee, and the UPC and communicate Program efforts.
IX.B.2. Collaborate in technical studies to support TMDL development and implementation. (See Action VIII.A.3.)	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX.B.3. Continue to participate in the BASMAA Pesticide Work Group to evaluate implementation of and continuously improve the Pesticide Strategy and report on the results of the evaluation.	Task Eliminated	The BASMAA Pesticide Work Group is no longer active, as each municipal stormwater program has its own pesticide plan in place of the Pesticide Strategy.
X. Review and Revision of Work Plan		
X.A.1. Review and continuously improve the goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Regional Board staff and other interested parties, and results of local performance review meetings if any.	Ongoing (Annually)	The Pesticide Plan was revised twice in FY 01-02 based on comments from Regional Board staff and interested parties (specifically RWQCB letters dated 8/15/01 and 12/21/01) and submitted to the RWQCB on October 15, 2001 and March 1, 2002, respectively. The Plan will continue to be evaluated and improved each year.

SECTION 6

MERCURY POLLUTION PREVENTION WORK PLAN

6. MERCURY POLLUTION PREVENTION WORK PLAN

INTRODUCTION

The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires the Program to develop and implement a mercury pollution prevention plan. The Program developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with the permit provisions. The Mercury Plan was submitted to the Regional Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan. This section of the FY 05-06 Work Plan summarizes Mercury Plan tasks completed during FY 04-05 and describes the tasks that will be developed, continued, or completed during FY 05-06.

SUMMARY OF MERCURY POLLUTION PREVENTION PLAN

The Mercury Plan is based on the premise that a Bay area-wide approach (and coordination) in addressing mercury pollution prevention will be most successful. For this reason, many of the actions identified in the Plan are for Program-level participation in regional efforts. These efforts are supplemented by countywide and local efforts.

The Mercury Pollution Prevention Plan addresses five general goals:

I. **Municipal Use of Mercury-Containing Products** – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

II. **Household Hazardous Waste Collection** – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

III. **Monitoring and Science** – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

IV. **Regional, State, and Federal Coordination** – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

V. **Public Education and Outreach** –Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

The Mercury Plan identifies actions that will be implemented at the Program level, municipality level, or both, as well as the schedule for initiation and/or completion of Program-level actions. The details of municipality actions and schedules are included in the individual Co-permittee Work Plans and/or Annual Reports, as appropriate.

STATUS OF FY 04-05 MERCURY POLLUTION PREVENTION ACTIVITIES

The status of Program tasks in the Mercury Plan is presented in Table 6-1. Highlights of Program accomplishments during FY 04-05, as developed and/or implemented by the Mercury Pollution Prevention Plan Ad Hoc Task Group (Mercury P2 Plan AHTG), Mercury Pollution Prevention Outreach Work Group, Program staff and municipalities are provided below.

Monitoring and Science

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is serving as the stakeholder forum for the development of the Guadalupe River TMDL Report. The Guadalupe River Watershed encompasses parts of San Jose, Los Gatos, Campbell, Monte Sereno and Santa Clara. SCVURPPP is a stakeholder in the Guadalupe River TMDL process. The Santa Clara Valley Water District (SCVWD) is taking a lead role in the TMDL development process by solely funding the $900,000 study and as Co-Chair of the TMDL Work Group and Stakeholder Group. Program staff is also participating in the TMDL process. The most recent products include a Draft Data Collection Report Part 1 (Wet Season Sampling) and Part 2 (Dry Season Sampling). The Draft Report includes sampling results from urban creeks and estimates of urban runoff loading to the Guadalupe River watershed.

The Program continued to provide financial support to the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study funded by the City of San Jose. In addition, Program and Co-permittee staffs actively participate in RMP Technical Review Committee (TRC) and Steering Committee (SC) meetings and provide meeting summaries to the Management Committee. Staff reviewed available reports and provided comments on the proposed 2005 RMP Draft Monitoring Plan.

A Memorandum of Understanding (MOU) regarding development of a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries was entered into by the Regional Board, Bay Area Clean Water Agencies (BACWA), and Bay Area Stormwater Management Agencies Association (BASMAA) on August 6, 2001, and includes the development of TMDLs for 303(d) pollutants including mercury. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program is involved in the development and funding of potential projects for the San Francisco Bay mercury TMDL (mercury TMDL). Program staff has been participating in the CEP technical committee meetings and CEP Board meetings. In addition, a City of San Jose staff member is serving as chair of the CEP technical committee and Program staff serves as the BASMAA representative to the CEP Mercury Work Group. Currently, the SCVURPPP Program Manager is serving as BASMAA's representative to the Risk Reduction Group which is part of the CEP efforts.

In September 2004, the Regional Board adopted a Basin Plan Amendment for the mercury TMDL. The mercury TMDL includes an implementation plan for all source categories, including urban stormwater runoff, and an adaptive management plan to fill future data gaps. Prior to adoption, Program staff represented BASMAA in a series of productive CEP meetings designed to develop TMDL language.

Mercury-Containing Product Survey

In fulfillment of Action I.A of the Mercury Plan, the Mercury P2 Plan AHTG and Program staff developed a survey to determine the types of mercury-containing products used by municipalities. The objective of the survey was to assess the municipal mercury-containing products being used, their locations, and waste disposal and purchasing routes; and identify the level of awareness of product alternatives and proper disposal methods. The Management Committee reviewed and approved the survey in October 2002. On November 5, 2002, the survey was distributed (by electronic mail) to municipal staff contacts identified by the Management Committee. The surveys were completed and returned to the Program by February 2003. Thirteen survey summary tables were provided to the Management Committee in June 2003. Survey responses were provided in the FY 02-03 Annual Report (submitted to the Regional Board on September 15, 2003). This Mercury Work Plan task is completed.

Guidelines for Reduction and Management of Mercury-Containing Products

In December 2002, the Mercury P2 Plan AHTG and Program staff began developing guidelines for the reduction and management of mercury-containing products identified for virtual elimination. The *Guidelines for Mercury-Containing Products Reduction and Management* satisfies Permit Provision C.9.c; and Mercury Plan Actions I.E. and II.C. The Management Committee approved the Guidelines in April 2003. A copy of the Guidelines was included in the FY 02-03 Annual Report.

The goals of the *Guidelines for Mercury-Containing Products Reduction and Management* are to work towards the virtual elimination of mercury from controllable sources that may affect urban runoff due to agency operations; and establish proper recycling and disposal methods for products that cannot be eliminated due to technological, safety or economic factors. Co-permittees will continue to implement the *Guidelines for Mercury-Containing Products Reduction and Management* in FY05-06.

Mercury Virtual Elimination Policy

In January 2002, Mercury P2 Plan AHTG and Program staff began developing a model mercury virtual elimination policy to fulfill Permit Provision C.9.c. and Mercury Plan Action I.C. The model policy, which requires the virtual elimination of mercury from controllable sources in urban runoff, was submitted to the Management Committee in March 2003 and approved in April 2003. A copy of the model policy was included in the FY 02-03 Annual Report. The model policy serves only as suggested language. It was recommended that Co-permittees review the EPA document entitled *Developing a Virtual Elimination Strategy for Mercury* (October 1999) for additional language regarding virtual elimination.

In accordance with the Mercury Plan, the next task for Co-permittees was to adopt a Mercury Virtual Elimination policy, procedure or ordinance based on the model policy and consistent with municipal requirements. Co-Permittees began implementing this task during FY 03-04.

Mercury Pollution Prevention Outreach Workgroup

In December 2002, Program staff established a new Work Group called the Mercury Pollution Prevention Outreach Work Group. This Work Group is implementing the Public Education and Outreach element of the Mercury Plan by organizing a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products. The Mercury Plan identified the development of a fluorescent light tube (FLT) recycling public outreach and education plan as a priority and recommended conducting

outreach in two phases. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of fluorescent light tubes.

Phase I of the Public Education and Outreach plan focused on residential FLT disposal and was completed during FY 02-03. Implementation of Phase II, which targets small businesses and Conditionally Exempt Small Quantity Generators (CESQGs) was completed in FY 03-04.

Mercury Plan efforts implemented for the residential campaign (Phase I) during FY 02-03 include the following:

- A fact sheet on the proper disposal of FLTs and other mercury-containing household items was added to the Watershed Watch web site (www.watershedwatch.net).
- An article on safe disposal of mercury containing items was developed (as part of the Watershed Watch Campaign) and distributed to over 137 agencies for use in their newsletters.
- Radio and print ads regarding the proper disposal of FLTs and other hazardous materials (at the CoHHW Program) ran from mid April to mid May. To encourage the use of the CoHHW Program, tickets to the San Jose Saber Cats game on May 5, 2003 were offered as an incentive to residents bringing mercury-containing wastes to CoHHW disposal events.
- A video public service announcement on the proper disposal of mercury-containing wastes (obtained from STOPPP and customized for Program use) was provided to Co-permittees for broadcast on local city cable.

Program staff developed survey forms to evaluate the effectiveness of the Mercury Pollution Prevention Outreach advertising campaign. Residents bringing mercury-containing wastes to the CoHHW Program were requested to complete the survey forms. From April through June 2003, the CoHHW Program compiled the information collected from the completed surveys. Section 3 (PI/P Activities) of the FY 02-03 Annual Report provides additional information regarding the results of this survey.

In FY 03-04, the Program and Mercury Pollution Prevention Outreach Work Group worked with stakeholders to develop the following outreach pieces for the small business and CESQG campaign (Phase II):

- Developed and subsequently posted on the Watershed Watch website, a fact sheet educating businesses on proper disposal of fluorescent lamps.
- Developed a newsletter article informing CESQGs on proper disposal of fluorescent lamps. The Program coordinated with the San Jose/Silicon Valley Chamber of Commerce, the Building Owners and Managers Association (BOMA) and the International Facility Management Association (IFMA) to organize the publication of this article in the newsletters and newspapers of these agencies. The article was published in the February issue of the BOMA newsletter and the March issues of IFMA and the San Jose Chamber of Commerce newsletters.
- Continued running the Watershed Watch 'Got Paint' ad to educate people on proper disposal of hazardous wastes including fluorescent lamps. This print and radio ad was used in both the summer and spring media flights.

Both the fact sheet and newsletter article explain, in simple language, what recent environmental legislation exists for proper disposal and recycling of mercury-containing wastes; which businesses are affected by this legislation; what options are available to small businesses for directing their used FLTs (or other hazardous wastes) to hazardous waste drop-off programs; and information on the negative health and environmental impacts of mercury.

In FY 04-05, the Program's Watershed Watch Campaign used the "Got Paint" ad in its fall advertising campaign to educate people on proper disposal of hazardous wastes, including fluorescent lamps. Both print and radio ads were used in the media flight. The Program is also assisting the County HHW Collection Program in implementing the outreach component of its Mercury Grant. Implementation details are provided below.

County HHW Collection Program's Mercury Grant

In FY 02-03, the County Household Hazardous Waste Collection Program (CoHHW) applied for grant funding from the California Integrated Waste Management Board (CIWMB). The CoHHW Program submitted a Mercury Reduction Grant proposal to the CIWMB on May 23, 2003. The grant proposed to: 1) Develop an aggressive mercury reduction public education and outreach program targeted for residents and Heating, Ventilation, and Air Conditioning (HVAC) contractors and remodeling contractors in partnership with local planning and permitting agencies;2) Expand collection opportunities for mercury containing wastes including thermostats, button batteries and fluorescent lamps by increasing services at HHW collection events, retail stores, and community sites; and 3) Conducting three Earth Day Thermometer Exchanges through a residential campaign entitled "Catch the Fever". In FY 03-04, the CoHHW Program was notified that their submittal was awarded grant funding for $300,000. The grant was approved by the CIWMB at their September 16, 2003 meeting.

The grant is being implemented over a period of three years. CoHHW Program staff has requested assistance from the Program in implementing the outreach requirements of the grant, specifically the store partnership program for collecting spent fluorescent lamps. To date, the CoHHW Program has established partnerships with 12 hardware stores for collecting used fluorescent lamps. In addition, there are 22 locations that accept all household batteries (except automotive) and approximately 51 locations that only accept rechargeable batteries. The list of drop-off locations is available at www.hhw.org and is updated as more stores are recruited. In FY 04-05, the Program is conducting outreach to promote the fluorescent lamps drop-off locations to residents. Outreach will be conducted using media advertising, in-store displays (posters, banners) and newsletter articles.

NEXT STEPS FOR MERCURY PLAN IN FY 05-06

Since the establishment of the Mercury Pollution Prevention Plan, Mercury P2 Plan AHTG and Mercury Pollution Prevention Outreach Work Group, it is anticipated that FY 05-06 will see continued Mercury Pollution Prevention Plan implementation activities. A summarized list of Mercury Plan tasks that will be implemented during FY 05-06 include:

Guidelines for Reduction and Management of Mercury-Containing Products: Co-permittees will continue implementing the Program's guidelines for reduction and management of mercury-containing products identified for virtual elimination. An evaluation regarding the effectiveness of implementation will also occur.

Mercury Virtual Elimination Policy: Co-permittees will continue implementing their adopted mercury virtual elimination policy or ordinance.

Mercury Pollution Prevention Outreach: The Mercury Pollution Prevention Outreach Work Group successfully completed the implementation of a two-year, two-phase fluorescent light tube recycling campaign. As municipal budgets/resources permit, outreach on the negative health and environmental impacts of mercury and the methods available for properly disposing of FLTs to residents and small businesses will continue. The three Co-permittees with industrial wastewater inspection programs (San Jose, Sunnyvale and Palo Alto) will continue to integrate

mercury outreach for industrial businesses into their existing pretreatment, source control, and/or hazardous materials inspection programs.. The mercury outreach articles designed for the worldwide web and local agency newsletters will continue to be made accessible to the public and updated appropriately. In FY 05-06, the Program will continue to assist the CoHHW Program in conducting outreach in support of its Mercury Grant. The Program may also coordinate its outreach activities with other Regional groups/program that are planning to conduct mercury outreach in FY 05-06.

Coordination efforts with regional organizations (Clean Estuary Partnership TMDL): In addition to attending CEP meetings, Guadalupe Watershed Mercury TMDL Workgroup and Stakeholder meetings, Program Staff will continue to attend Regional Monitoring Program (RMP) Steering Committee and Technical Review Committee meetings. In addition, Program staff will continue to work with BASMAA and the Regional Board to address urban stormwater runoff actions included in the mercury TMDL.

Monitoring and Science: Planned FY 05-06 monitoring and science activities relating to mercury are provided within Section 4 (i.e., specific funds provided to CEP and RMP).

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

I. Municipal Use of Mercury-Containing Products **Goal I.** Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated. **Actions –**		SCVURPPP	Municipality	Completion Date
I.A.	Develop a process to survey the types of mercury-containing products used by municipal departments. Identify appropriate municipal personnel to conduct survey. For those products with a potential to enter stormwater runoff, identify possible alternatives or proper disposal procedures.	X	A	**Completed**- the Management Committee approved the survey on October 17, 2002. Surveys were distributed to Co-permittees on November 5, 2002. The surveys were completed and returned to the Program by February 2003.
I.B.	Complete and report results of survey of mercury-containing products used by municipal departments.	A	X	**Completed** - All surveys were submitted by February 2003 (original deadline December 2002); and survey results were included in the FY 02-03 Annual Report.
I.C.	Develop guidelines for a mercury policy or ordinance requiring the virtual elimination of mercury from controllable sources in urban runoff from agency operations. (The word "virtual" acknowledges that total elimination of mercury-containing products may be impossible due to technological or economic factors.)	X	N	**Completed** - A final draft of the model policy was submitted to the Management Committee in March 2003. The Management Committee approved the model policy in April 2003. The model policy was included in the FY 02-03 Annual Report.
I.D.	Adopt a mercury policy or ordinance requiring the virtual elimination of mercury from controllable sources in urban runoff from agency operations.	N	X	**Completed –** Co-permittees began implementation in FY 03-04. See individual Co-permittee annual reports for local program activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

I. Municipal Use of Mercury-Containing Products **Goal I.** Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated. **Actions –**	SCVURPPP	Municipality	Completion Date
I.E. Develop guidelines for mercury-containing products reduction and management. These guidelines will include a schedule for the timely phase-out of mercury-containing products identified for virtual elimination as well as reporting requirements, possibly to track recycling, replacement, and reduction in use of mercury-containing products.	X	A	**Completed** - A final draft of the guidelines was submitted to the Management Committee in March 2003. The Management Committee approved the Guidelines in April 2003. The guidelines were included in the FY 02-03 Annual Report.
I.F. Implement guidelines developed under Action I.E.	N	X	**On-going –** Co-permittees began implementation in FY 03-04. See individual Co-permittee annual reports for local program activities.
Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines (to be developed under Action I.E).	A	X	Annually (beginning in FY 02-03 Annual Report)

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
II.A. Assist HHW collection agencies with preparation of a technical memorandum summarizing infrastructure and budgetary concerns regarding the anticipated increase in fluorescent bulbs and other mercury-containing products to be recycled.	X	N	**Completed**--The technical memorandum was completed by HHW in June 2002 and distributed (as an informational item) at the July 18, 2002 Management Committee meeting. The memorandum describes the existing capabilities of the Santa Clara County HHW Program and discusses the potential financial impacts on the HHW Program due to SCVURPPPP outreach efforts. The memorandum was included in the FY 01-02 Annual Report.
II.B. Provide mercury-containing products disposal services for residents and small businesses.	X	X	**Ongoing**

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
II.C. Develop guidelines for documenting and reporting quantities of mercury-containing products disposed of by city.[1]	X	A	**Completed -** A final draft of the guidelines was submitted to the Management Committee in March 2003. The Management Committee approved the Guidelines in April 2003. A copy of the Guidelines was included in the FY 02-03 Annual Report.
II.D. Implement guidelines developed under Action II.C.	X	X	**On-going –** During FY 03-04, Co-permittees began annually reporting the types of high priority mercury-containing products their agency is focusing on; how they will be addressed; and progress towards meeting the identified management option goals. Co-permittees will use the reporting format provided in Table 2 of the Guidelines document. **Completed** – In FY 02-03 Annual Report, the PI/P section reported the survey of residents bringing mercury-containing products to CoHHW facility.
II.E. Assist HHW collection agencies in developing a Prop 13 Program grant proposal for a HHW fluorescent light recycling program (Action II.F).			**Completed** -- CoHHW submitted a Mercury Reduction Grant to CIWMB on April 5, 2002. The Program submitted a concept proposal to the SWRCB on February 1, 2002. Both submittals were not selected to receive grant funding. **On-going** – CoHHW applied for a CIWMB grant on May 23, 2003. The grant was approved in September 2003. The Program and Mercury Pollution Prevention Outreach Work Group will assist with

[1] Guidelines for documenting and reporting quantities of mercury-containing products disposed of by city will developed, taking into consideration whether it is possible to separate mercury from other waste streams and whether it is possible to track mercury-containing product disposal by municipality.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
			implementation as needed.
• Submit concept proposal	X	N	**Completed**-February 2002
• Submit full proposal	X	N	**Not applicable-** Proposal not advanced in Prop 13 grant process
• Decision deadline			**Not applicable-** Proposal not advanced in Prop 13 grant process
II.F. Work with HHW collection agencies to develop and help publicize fluorescent light recycling program.[2]	X	X	**Completed/Ongoing –** Began effort in FY 02-03. The Mercury Pollution Prevention Outreach Work Group collaborated with the Santa Clara County HHW Program on a two-year, two-phase fluorescent light tube (FLT) recycling campaign. The first phase of the campaign, which was developed in FY 02-03, targeted residents. The second phase, which began in FY 03-04, targets small businesses. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs.
Monitoring Mechanism II.A. Evaluate whether household hazardous waste collection programs adequately serve residents and businesses.	X	N	**Completed/Ongoing** – Survey results indicate an increase in HHW facility use for mercury products (48% first time users). There were no problems with facility capacity. This issue is important to stormwater and wastewater pollution prevention activities. BACWA began ongoing discussions (2004) with a HHW Information Exchange group on regional campaigns directing new pollutant-containing products to HHW

[2] Action II.F may be conducted in conjunction with Public Education and Outreach Actions (see Section V of this Work Plan). Completion date for Action II.F is contingent upon award of a Prop 13 Program grant.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
			facilities versus HHW facilities' staffing, capacity and budget issues.
Monitoring Mechanism II.B. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis (see Action II.C). [1]	X	N	Annually (beginning in FY 03-04 Annual Report)

III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment. **Actions –**	SCVURPPP	Municipality	Completion Date
III.A. Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee.	X	A	**Ongoing** – Program and Co-permittee staff actively participated in RMP TRC and SC meetings and provided meeting summaries to Management Committee. Staff reviews available reports and provide comments. Program and Co-permittees' staffs are actively involved with the CEP technical and management committees; review proposed Work Plans and study scopes; and participate in the CEP Mercury Work Group.
• Supported completion of the San Francisco Bay Atmospheric Deposition Pilot Study Part 1: Mercury	X	A	**Completed**- submitted August 2001
• The City of San Jose will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San Jose.	N	O[3]	**Ongoing** (through 2005).
III.B. Provide financial and staff support for a coordinated regional plan to collect data for the mercury TMDL, as defined in the RWQCB/BACWA/BASMAA MOU. (Now called the Clean Estuary Program, or CEP)	X	A	**Ongoing** (Program participation in the CEP)

[3] Participation in this action by municipalities is limited to the City of San Jose.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment. **Actions –**	SCVURPPP	Municipality	Completion Date
III.C. Continue financial and staff support for the Joint Stormwater Agency Project to Study Urban Sources of Mercury to assess sediment mercury concentrations and percentage of fine material.	X	A	**Completed**
• Completed the Work Plan Joint Stormwater Agency Project – Year Two Investigation of Urban Sources of Mercury, PCBs and Organochlorine Pesticides	X	A	**Completed** – Report submitted June 1, 2001.
• Preparing the Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides – Year Two Report.	X	A	**Completed**- Report submitted on April 15, 2002.
III.D. Develop and implement a five-year program of monitoring efforts.	X	N	**Completed**- Draft completed March 2002; implementation began July 2002.
Monitoring Mechanism III. Submit monitoring data and reports to the Regional Water Quality Control Board and other interested parties (such as USEPA). Review monitoring data and reports and develop follow-up recommendations.	X	N	Ongoing, when available.

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
IV.A. Participate in the activities of the Bay Area Stormwater Management Agencies Association, the California Storm Water Quality Task Force, and the San Francisco Estuary Institute and communicate Program efforts.	X	N	**Ongoing** – Program staff continue to attend BASMAA, CASQA and SFEI RMP meetings.
IV.B. Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup.	X	O[4]	**Ongoing** – Program and Co-permittee staffs actively participate in the Guadalupe Watershed Mercury TMDL Work Group and Stakeholder group. Environmental monitoring for mercury in the watershed began in FY 03-04.

[4] The City of San Jose and the Santa Clara Valley Water District are participating in the development of the Guadalupe River Mercury TMDL.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
			Staff provided comments on the Draft Data Collection Report. Monitoring continues in the watershed (phytoplankton and zooplankton study).
IV.C. Support and participate in development of the WMI Watershed Action Plan.	X	O[5]	**Completed –** The final Watershed Action Plan, Volume III of the Watershed Management Plan, was approved in August 2003 by the Santa Clara Basin Watershed Management Initiative (SCBWMI) Core Group. Volume III intends to prioritize alternative actions in watershed planning and suggest programmatic changes in regards to policies and regulations. Co-permittees funded the consultants' time and Program staff provided review and comments to the consultant by way of the appropriate WMI channels between the subgroups and the SCBWMI Core Group.
IV.D. Submit the SCVURPPP draft Mercury Pollution Prevention Plan to the WMI to ensure that efforts are coordinated.	X	N	**Completed** – Plan was submitted to WMI Guadalupe Mercury TMDL Work Group in July 2002 (original deadline was March 2002).
IV.E. Support, participate in, and advocate increased regional collaboration with the RWQCB and the Bay Area Air Quality Management District (BAAQMD).	X	N	**Ongoing** – The Program will support the RWQCB in collaborating with the BAAQMD. However, the RWQCB will not directly work with the BAAQMD. The Program supports the RWQCB through participation in the CEP. Mercury air deposition is being addressed regionally.

[5] The Cities of San Jose, Sunnyvale, and Palo Alto, SCVWD, and SCVURPPP (on behalf of the other co-permittees) are signatories to the WMI and participate in the Core Group and subgroups.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
IV.F. Support and track the progress of the U.S. Department of Energy (DOE) Office of Building Technology's Vision 2020 Lighting Technology Roadmap.[6]	X	N	**Ongoing**--DOE's Building Technologies Program continues to move forward on their Vision 2020 Roadmap. Progress includes seven strategies to address the challenges of transforming the lighting marketplace and developing new technologies that enhance lighting quality, efficiency and cost effectiveness. (See Section 7 text of the FY 03-04 Annual Report for more detail).
Monitoring Mechanism IV. Document participation of Program staff in collaborative efforts and progress of these efforts.	X	N	Annually (beginning in FY 02-03 Annual Report)

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
V.A. Develop various outreach programs to educate target audiences about proper disposal of mercury-containing products and alternative non-mercury containing products. Outreach programs will include, but may not be limited to, the following:	X	A	**Completed/Ongoing**[7] **–** In FY 02-03, the Mercury Pollution Prevention Outreach Work Group developed and began implementation of a two-year, two-phase outreach effort focused on recycling fluorescent light tubes (FLTs) with target audiences including residential communities and small businesses. (See also Action

[6] DOE's Vision 2020 Lighting Technology Roadmap includes the following as one of its goals for the year 2020, "Highly efficient, reduced-mercury fluorescent sources will come to market." Sustainable Conservation's September 27, 2000 report entitled "Reducing Mercury Releases From Fluorescent Lamps: Analysis of Voluntary Approaches," concluded that " we do not believe that starting a new collaborative approach with manufacturers to create mercury-free fluorescent lamps is the most effective use of resources at this time." Instead, Sustainable Conservation recommends focusing on voluntary recycling of mercury-containing lamps.

[7] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			II.F.)
• Develop and begin to implement a fluorescent light recycling outreach program to educate residential users and encourage proper disposal of fluorescent lights.	X	A	**Completed/Ongoing**[7] **–** In FY 02-03, the Work Group formed and developed a Work Plan. Phase I of the two-year, two-phase Work Plan, focused on residential outreach. Phase I outreach began in Spring 2003 and will continue as appropriate. (See Section 6 text for more detail.)
• Develop and begin to implement a fluorescent light recycling outreach program to educate small businesses and conditionally exempt small quantity generators and encourage proper disposal of fluorescent lights. (For example, the small business outreach program might include coordination with local chapters of the Building Owners and Managers Association [BOMA] or the National Association of Industrial and Office Properties [NAIOP].)	X	A	**Completed/Ongoing**[7] **–** In FY 03-04, the Work Group implemented Phase II of the two-year, two-phase Work Plan. Phase II outreach efforts were focused on small businesses and CESQGs. Inclusion of the Program's outreach article in agency newsletters, including the San Jose/Silicon Valley Chamber of Commerce, BOMA, and the International Facility Management Association (IFMA) occurred in FY 03-04. Additional annual coordination will continue, as appropriate.
• Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	A	X	**Completed --** Co-permittees began coordination efforts with municipal inspectors in FY 03-04. Refer to Co-permittee annual reports for local program activities.
• Develop and distribute "tailgate safety meeting cards" about mercury to inspectors and other municipal employees. (The Program will first review the product developed by the Fairfield-Suisun Sewer District when it is made available to the Bay Area Pollution Prevention Group [BAPPG].)	X	X	**Completed –** "Tailgate safety meeting cards" were developed by the Fairfield-Suisun Sewer District and reviewed by the Bay Area Pollution Prevention Group (BAPPG) and Program prior to distribution (as an informational item) to the Management Committee on

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			April 23, 2003.
V.B. Develop or adapt existing mercury outreach materials, as needed, for outreach programs.	X	A	**Completed/Ongoing[7] –** Development of materials began in FY 02-03, as part of outreach Work Plan for Action V.A. To date, four outreach pieces have been developed by the Outreach Work Group – two articles intended for the worldwide web and two public announcement pieces (one video and one text) intended for broadcast on local city cable channels and publication in local newsletters. All outreach pieces aim to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs. (See also Action II.F.) The Program's Watershed Watch Campaign also ran print and radio ads educating people on proper disposal of mercury and other household hazardous wastes.
V.C. Attend community events and distribute outreach materials.	X	X	**Completed/Ongoing[7] –** Distribution of outreach materials began in FY 02-03 as part of outreach Work Plan for Action V.A. Tickets to the San Jose Saber Cats game on May 5, 2003 were offered as an incentive to residents bringing mercury-containing wastes to CoHHW disposal events.

[7] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

[7] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
Monitoring Mechanism V.A. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis. (See Monitoring Mechanism II.B.)	X	N	Annually (beginning FY 02-03)
Monitoring Mechanism V.B. In the Annual Report, document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	X	X	Annually (beginning FY 02-03)
Monitoring Mechanism V.C. Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages (coordinate survey with Watershed Watch Campaign Survey).	X	A	**Completed** - A Countywide survey was conducted in September 2003 to evaluate the success of the Program's Watershed Watch Campaign. The final evaluation report was included in the Program's FY 03-04 Annual Report. Some of the survey questions tracked the public's knowledge about various pollutants (including mercury) which affect the Bay water quality. The highlights of the mercury-related results include: 22% of the respondents in 2003 said that mercury is a "very serious" problem for our creeks and the Bay. 23% of respondents felt that fluorescent lamps put in the garbage are a "very serious" problem for our creeks and the Bay. 9% of respondents said that they take used fluorescent lamps to a HHW facility. Approximately 49% of the respondents said that they are "very willing" to do so. In FY 02-03, survey cards were developed for evaluating the success of the Program's mercury outreach media campaign.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			People who brought in mercury containing wastes to Santa Clara County Household Hazardous Waste disposal events from April – June 2003 were requested to fill out surveys. The survey results were included in the Program's FY 02-03 Annual Report. Survey results indicated that: 48% of the users bringing in mercury containing wastes to the HHW events were first time users of the facility. 86.4% indicated that they were bringing in fluorescent lamps for the first time. 17.3% indicated that they had read about the safe disposal of mercury containing wastes in the *San Jose Mercury News*, 5.3% indicated that they had heard this on the radio and 1.4% had found out about it from the Watershed Watch website. Others indicated that they had learned it from utility bill inserts, garbage companies, flyers, city publications, friends and relatives, internet etc.

Legend:

"X" = will implement at this level (SCVURPPP or municipality)
"N" = not being implemented at this level
"A" = assist with or develop guidance for implementation
"R" = coordinate with regional effort
"O" = optional
"FY" = fiscal year
"TBD" = to be decided

SECTION 7

NEW AND REDEVELOPMENT WORK PLAN

7. FY 05-06 NEW AND REDEVELOPMENT (C.3.) WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 05-06 to continue to assist Co-permittees to control the impacts of development on stormwater quality and flow through the development project planning, review and approval process.

BACKGROUND

On October 17, 2001, the Regional Board adopted Order 01-119 which amended the Program's Permit Provision C.3. (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharges from new or redevelopment sites that may increase erosion in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

Provision C.3. also required the Program and Co-permittees to submit specific work plans for: 1) modifications to the development project review process (C.3.b.); 2) implementation of Group 1 requirements (C.3.c.); and 3) site design standards review and revision (C.3.j.). In response, the Program and Co-permittees submitted work plans for implementing all C.3. requirements to the Regional Board on March 1, 2002 (as part of the Program's *FY 02-03 Work Plan*, Volume II.

To guide this effort, Program staff prepared a separate document entitled "Guidance for Work Plan Tasks Related to Implementation of Permit Provision C.3. (New and Redevelopment Requirements)" (referred to herein as C3 Work Plan Guidance) which identifies proposed actions to meet the requirements of Provision C.3. and whether the actions will be implemented at the Program level, Co-permittee level or both. Most of the tasks in the C3 Work Plan Guidance will have been completed by the end of FY 04-05. The remaining Program tasks for FY 05-06 are the basis of this work plan section.

Since the October 17, 2001 adoption by the Regional Board of Order 01-119, there have been several changes to the requirements of Provision C.3. The first change, authorized by the Regional Board Executive Officer, was an extension of three of the permit deadlines, as shown below, in order to be consistent with other Bay Area stormwater permits adopted

subsequent to SCVURPPP Order 01-119[1]. This decision extends the completion dates for corresponding tasks in the C3 Work Plan Guidance.

Provision	Activity	Original Deadline	New Deadline
C.3.c.i.	Require stormwater treatment BMPs at Group 1 Projects	July 15, 2003	October 15, 2003
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects in addition to Group 1 Projects	October 15, 2004	April 15, 2005
C.3.f.	Submit HMP for Regional Board approval	October 15, 2003	January 15, 2004

The second change relates to the definition of Group 2 projects. The Program requested Regional Board approval of an Alternative Group 2 Project Definition, as allowed under Provision C.3.c.iii. of the Program's permit (Order No. 01-119). In a letter dated September 22, 2003, the Program proposed an Alternative Group 2 Project Definition that would make its Provision C.3. project size requirements consistent with the other Bay Area stormwater permit requirements. At the Regional Board's October 15, 2003, meeting, the Regional Board authorized the Executive Officer to approve the Program's proposal. Approval of the proposal did not change the implementation dates for Provision C.3. (beyond the changes described in the table above). The Program has requested that the date be changed to match other Bay area permits.

Regional Board staff are considering extending the Group 2 implementation date to conform to the actual implementation date in other Bay Area permits (i.e., August 15, 2006). If the date is not formally changed, the Co-permittees will develop a phased implementation program.

PAST AND CURRENT ACTIVITIES TO IMPLEMENT C.3.

Section 8 of the Program's *FY 03-04 Annual Report* described the progress of the Program (up to September 15, 2004) in completing Program tasks in the C.3 Work Plan and assisting Co-permittees to prepare for implementation of the C.3. requirements. With most of the preparation tasks completed, Co-permittees are now focusing on the implementation of C.3. requirements for Group 1 projects (those creating or replacing one acre or more of impervious surface). The Program has held several meetings of the C.3. Provision Oversight Ad Hoc Task Group (C3PO AHTG) to keep Co-permittees updated on current issues and promote exchange of ideas on and experience with C.3. implementation.

Significant progress has been made on the Program's Hydromodification Management Plan (HMP). In June 2004, the Program released a public review draft HMP Report, and over the summer, presented the HMP Report at four public meetings including two meetings with the development community. Program staff and its consultants responded to comments on the

[1] Letter to Beau Goldie, SCVURPPP Management Committee Chair, from Loretta Barsamian, Executive Officer, San Francisco Bay Regional Water Quality Control Board, re: Extension of Specified Deadlines in Order 01-119, May 12, 2003.

June 2004 HMP Report and then completed a revised public draft HMP Report in November 2004. This report includes final results from the assessment of the second set of test watersheds, Ross and San Tomas Aquino Creeks, and a revised management objective and performance criteria to address Regional Board staff and Co-permittee concerns.

Chapter 7 of the November 2004 HMP Report identifies a number of action items that Program and Co-permittee staff will complete in order to address remaining HMP implementation issues. These action items and other related tasks are listed with anticipated start and completion dates in the document "SCVURPPP HMP - Summary of Next Steps" which was approved by the Program's Management Committee (provided as Attachment 7-1).

To make it easier for developers to design flow control facilities to comply with the HMP, the Program has investigated an automated modeling and flow control facility sizing tool called the Western Washington Hydrology Model. The Program has budgeted funds to collaborate with several other Bay Area stormwater programs in developing a version of the tool adapted to the Bay Area, to be called the Bay Area Hydrology Model (BAHM). Development of the regional portion of the model is anticipated to begin in FY 04-05, while calibration of the tool to specific watersheds in Santa Clara Valley would be initiated in FY 05-06 and completed in FY 06-07.

Program and Co-permittee staff have had several meetings with Regional Board staff to discuss remaining issues for HMP implementation, with the goal of reaching consensus on an HMP Report that could be presented to the Regional Board for approval. Although Permit Provision C.3.f. states that the HMP requirements will take effect when the HMP is adopted by the Regional Board, Co-permittees have begun early implementation of HMP requirements on development projects in the early planning stages, so that opportunities for protection of creeks from erosion will not be missed.

Program and Co-permittee staff are continuing to meet with Regional Board staff and with the development community to resolve remaining issues and challenges with implementation of HMP controls. Program staff is tracking the efforts of other Bay Area stormwater programs in developing their HMPs and hoping to benefit from ongoing research being conducted by these programs (e.g., the work in Contra Costa County on sizing flow controls for development projects on small sites).

FY 05-06 C.3. IMPLEMENTATION TASKS

General C.3. Tasks

Table 7-1 presents the list of tasks from the C.3. Work Plan and other tasks that will be implemented in FY 05-06. By the end of FY 04-05, most of the tasks in the original multi-year C.3. Work Plan will be completed, except for ongoing reporting and implementation assistance. Anticipated needs for implementation assistance in FY 05-06 include:

- Development of model standards and specifications for certain BMPs;
- Continued assistance with SCVURPPP agencies' implementation of BMP O&M verification programs;

- Regional roundtable meetings with SCVURPPP agency staff and other stormwater programs to share information about implementation strategies and experience;
- Continued supervision of BASMAA project for developing automated BMP sizing/design tool;
- Workshop on implementation and design of certain BMPs (e.g., bioretention, planter boxes, green roofs, etc.);
- Continued guidance and assistance with annual reporting of C.3. information;
- General support to Co-permittees as questions arise during implementation.

HMP Tasks

It is anticipated that by the beginning of FY 05-06, the HMP Report will be finalized and the focus will be on assisting local agencies and the development community with outreach and implementation. Many of the tasks listed on the "Summary of Next Steps" (Attachment 7-1) are scheduled for completion in FY 04-05. Anticipated tasks for FY 05-06 include:

- Develop fact sheets for outreach to local agencies and developers;
- Conduct one or more workshops on HMP implementation;
- Continue to develop the approach for quantifying the flow control benefits of site design measures and treatment control measures;
- Conduct additional implementation studies for example sites in Santa Clara Valley;
- Continue the Bay Area Hydrology Model development project (both regional and local aspects);
- Continue to coordinate with other Bay Area stormwater programs to work toward a consistent approach for the Bay Area.

ATTACHMENTS

Attachment 7-1 SCVURPPP HMP - Summary of Next Steps

Table 7-1
Anticipated Schedule and Deliverables for FY 05-06 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Anticipated Schedule	Deliverables
C.3.c. Requirements for Group 1 and Group 2 Projects		
c.9. Update guidance manual and performance standards for HMP requirements and Group 2 projects (assumes August 2006 Group 2 implementation date).	6/06	• Updated sections of Guidance Manual
Other Tasks:		
- Develop model standards and specifications for preferred BMPs	6/06	• Model standards and specifications
- Conduct workshop on implementation and design of BMPs, (e.g., bioretention, planter boxes, green roofs, etc.)	Spring 2006	• Workshop
- Supervise BASMAA project for developing automated BMP sizing/design tool	Ongoing – complete 12/05	• Automated sizing tool
- Promote/facilitate regional roundtable meetings with SCVURPPP agency staff and other stormwater programs to share information about implementation strategies and experience	During FY 05-06	
C.3.e. Operation and Maintenance of Treatment BMPs		
e.1. Assist Co-permittees to report on treatment BMP O&M verification program in each annual report, including organizational structure, evaluation of effectiveness, and planned improvement to the program.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
Other Tasks:		
Continue to provide assistance with Co-permittee implementation of BMP O&M verification programs (provide follow-up guidance to Spring 2005 workshop).	6/06	• Additional guidance as needed

Table 7-1, continued
Anticipated Schedule and Deliverables for FY 05-06 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Anticipated Schedule	Deliverables
C.3.f. Hydromodification Management Plan		
f.1. Complete the final HMP and submit to the Regional Board	Draft 6/04 Rev. Draft 11/04 Final 3/05?	• Final HMP Report (schedule pending outcome of discussions with RWQCB of Program's 11-04 HMP Report.)
f.2. Develop guidance to the Co-permittees on implementation of the HMP as part of requirements for Group 1 projects that may cause increased erosion or other related impacts (See also Table 7-2).	Draft 6/04 Rev. Draft 11/04 Final 3/05	• Part of Final HMP Report (see note above.)
f.3. Upon adoption by the Regional Board, begin implementation of HMP requirements for Group 1 projects that may cause increased erosion or other related impacts. Before adoption, encourage early implementation of likely elements of the HMP where possible.	TBD pending adoption by RWQCB Early implementation ongoing from FY 03-04	• Program to assist Co-permittees with questions about implementation • Conduct HMP Workshop, Summer/Fall 2005
f.4. Provide assistance and input as needed to District study to evaluate potential regional treatment and/or flow control projects.	As needed	• Assistance and review of District work products
C.3.g. Waiver and Compensatory Mitigation Program		
g.3. Assist Co-permittees to track and report information on waivers granted, including project name, location, type, percent impervious surface, reasons for and terms of waiver, and the alternative benefit project and completion date.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation

Table 7-1, continued
Anticipated Schedule and Deliverables for FY 05-06 New and Redevelopment (C.3) Tasks

C.3.j.	**Site Design Measures Guidance and Standards Development**		
j.2.	Assist Co-permittees to prepare and submit reports summarizing the status of review, revision, and implementation of local site design guidance and standards, as part of their annual reports.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
C.3.n.	**Reporting Requirements**		
n.1.	Provide information described in Table 1 of Provision C.3. in annual reports	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
n.2.	Assist Co-permittees to collect information and report a summary of types of pesticide reduction measures required for development projects, and the percentage of projects for which pesticide reduction measures were required.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation

Attachment 7-1

Attachment 7-1

SCVURPPP HMP - Summary of Next Steps[1]

(from Chapter 7 of November 2004 HMP Report – *tasks in italics added*)

Task	Time Frame	Anticipated Start Date	Anticipated Completion Date
1. Develop the following:	Short		
a. a funding mechanism such that projects can utilize in-stream control options		12/04	6/05
b. a methodology for determining developer contributions based on the stream changes expected to result from changes in project runoff conditions.		11/04	6/05
2. Work with City/County planning and public works departments and the Water District to determine the timing and method of notifying District staff during the development review process about HMP projects that may need in-stream controls, in a manner that does not unreasonably prolong the review process.	Short	11/04	4/05
Complete text in Chapter 7 ("early consultation language").		11/04	3/05
3. Investigate potential guidelines for quantifying practicability.	Short	12/04	4/05
4. Conduct additional studies of implementation of site design, integrated management practices, and/or basins at example development sites in Santa Clara Valley.	Short	11/04	6/05
	Long	7/05	6/06
5. *BAHM Development Project*	*Regional*	11/04	6/05
(Conducted over 2 FYs)	*Local Calib.*		05-06& 06-07

[1] All dates depend on availability of resources and cooperation/collaboration of numerous staff from different agencies and may change because of circumstances beyond the control of the Program. The Program periodically updates the Management Committee regarding schedule changes and will transmit updates schedules to Regional Board staff.

Task	Time Frame	Anticipated Start Date	Anticipated Completion Date
6. Apply HMP requirements to additional projects and obtain feedback/suggestions for further refinement and implementation guidance	Medium	As needed, beg. 1/05	As needed
7. Coordinate with other Bay Area stormwater programs to work toward a consistent approach for the Bay Area.	Medium	Ongoing	Ongoing
8. Coordinate additional Co-permittee, Bay Area stormwater program, and Regional Board staff review process and progress meetings, including:			
a. The development of a schedule for Bay Area-wide HMP implementation pursuant to requirements to be adopted by the Regional Board in the upcoming regional municipal urban runoff permit.	Medium	1/05	6/05
b. Response to RWQCB comments	*Short*	11/04	2/05
c. Address RWQCB proposed approach	*Short*	11/04	6/05
d. Public outreach – HMP updates, workshop (?)	*Short*	12/04	6/05
e. HMP Work Group Meetings (3, 1 on MDL Analysis)	*Short*	12/04	6/05
9. *Finalize HMP Report*	*Short*	11/04	3/05
a. Work with Co-permittees to complete exempt area maps			
b. Co-permittees obtain city council approval if necessary			
10. Collect data on the implementation of the HMP at small sites for a period of two years after the start of implementation, and plan to re-evaluate the small site size threshold and approach at that time. *Conduct and document reevaluation.*	Long	3/05?	3/07 6/07
11. Make additional refinements per: 1) lessons learned from implementation efforts based on the draft HMP; 2) the need for consistency with HMPs being developed by other Bay Area stormwater programs; and 3) development community, Co-permittee, and Regional Board feedback.	Long	7/05	Report in ARs beginning with FY 05-06 AR

SECTION 8

FINAL BUDGET REPORT: FISCAL YEAR 2005-2006

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 2005-2006 Work Plan

SCVURPPP budget distributed to BATG on December 15, 2004
SCVURPPP budget reviewed and approved by BATG for distribution to MC on January 4, 2005
SCVURPPP budget distributed to MC on January 12, 2005
SCVURPPP budget revised based on BATG direction from January 18 and February 2, 2005 meetings and distributed to Executive Committee and BATG on February 7, 2005.
Revised SCVURPPP budget approved by BATG and distributed to MC on February 14, 2005
SCVURPPP budget reviewed and approved by MC on February 17, 2005

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Final Budget Report:

Fiscal Year 2005-2006

Final February 17, 2005

SCVURPPP budget distributed to BATG on December 15, 2004
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Final Budget Report for FY 05-06

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TOTAL PROGRAM FY 05-06 BUDGET
Backup Information

OPERATIONAL GROUP

A summary of tasks to be performed by EOA, based on EOA's current contract with the Santa Clara Valley Water District (on behalf of the SCVURPPP), is provided in Items (1.), (2.), and (3.) below. The resource requirements are based, in part, on the requirements contained in the RWQCB Order No. 01-024 adopted February 21, 2001 and Order No. 01-119 adopted October 17, 2001 (new and redevelopment requirements).

A summary of the key budget assumptions is shown below and additional detail that defines the basis for the budget are identified in the following sections.

- The Total SCVURPPP FY 05-06 budget is the same as the FY 04-05 total budget.
- Hourly labor rates are increased by 4% above FY 04-05 labor rates.
- Legal Assistance is increased by approximately 10% over the FY 04-05 budget..
- The Projects Group WE&O campaign budget and PI/P budget are decreased from the FY 03-04 & 04-05 levels by approximately 32%. The bulk of the WE&O campaign will be completed during FY 04-05 and planning for future education and outreach efforts will occur during FY 05-06. Resources are included to cover implementation of the Program's PI/P program, Pesticide IPM workplan, the mercury workplan, creek clean-up, RAC, maintenance of the Program's watershed watch website and resources to continue a limited WE&O campaign effort.
- Annual interest accrued is assumed available for use as needed for projects approved by the BATG and MC which has typically been legal assistance.
- The monitoring budget assumes one watershed assessment will be initiated consistent with FY 04-05 MC Integration Report and previous MC planning commitments.
- Assumes no Co-permittee performance reviews.
- Assumes no new sediment assessment conducted, only completion of ongoing FY 04-05 assessment including management/control report.
- Includes the same contribution to CEP as FY 03-04 and FY 04-05.
- Includes resources to assist with implementing the approved Trash Work Plan.
- Includes resources to assist with finalizing guidance for implementation of HMP tasks, holding workshops, development of the regional Bay Area Hydrology Model (BAHM) in collaboration with Alameda County Program and phased development of the local calibration of the model over a two year period., coordination with Co-permittees and assisting Co-permittees with implementation.
- Includes resources for permit renewal negotiations as part of regional permit.
- Includes annual permit fee as a separate line item that is increased by 5% over the FY 04-05 budget. The permit fee has not been absorbed into the main SCVURPPP operating budget. To absorb these fees as was done in past years would require further reductions in Program tasks that would significantly impact meeting permit requirements and further result in a reduction of contributions to regional collaborative programs. Thus the permit fess are shown as direct line item in the budget and the assessment.
- All Regional Collaboration projects/fees are shown in the Collaborative Group (projects are listed in order of priority, i.e., lowest priority first if budget modifications need to be made).
- The RMP fee is increased by 1.5%.

- Includes a new task and budget to review the MOA.
- Increases the fiscal/contract agent reimbursement fee from $15,000 to $50,000 FY.

The Budget Ad Hoc Task Group met on January 4, and 18, 2005 and February 2, 2005 to review and discuss Program budget issues. The MC met and approved the budget on February 17, 2005.

1. Program Management/Administration

a. Administrative Assistance

- General administrative assistance
- Maintain Program 800 number
- Distribute PIP and other materials
- Develop partnerships with external organizations

b. Management Committee (MC) and Ad-Hoc Task Group (AHTG) Support

- Monthly MC meetings (up to 12) - develop, distribute, and post agendas; prepare and mail meeting materials; facilitate meetings; draft and finalize minutes; and conduct follow-up activities
- AHTG meetings (up to 40) - support groups formed to address specific tasks (meeting number and times vary)

c. Program Budget Administration

- Develop, draft, and finalize FY 2006-2007 budget; organize and facilitate quarterly Budget AHTG meetings
- Coordinate with Fiscal Agent, track expenditures, and prepare quarterly status reports

d. Coordinate with Legal Consultant

- Communicate with and assist Program legal counsel as needed (up to 5 meetings and 10 extended telephone discussions) on General Program issues.

e. Develop and Manage Program PI/P Program

- Conduct long-range planning for Program PI/P activities
- Manage development of PI/P work plan for FY 2006-2007
- Provide support, as needed, to Co-permittee's requests for public education assistance
- Manage subcontracts
- Coordinate and work with the WMI Communications Subgroup and various other adhoc and work groups to address numerous new people and "pollutants of concern".[1]

[1] Over the past several years, the PI/P and WE&O elements have been a key component of the SCVURPPP. As TMDL programs move forward to address new "pollutants of concern" outreach will be important and Program staff will need to spend additional time working as part of a regional effort to address these new needs

f. Performance Evaluation

- Limited budget to assist Co-permittee response.

g. Expenses

- Approximately 10 percent of labor costs

2. Permit Management

a. Report Preparation and Submittal

- Prepare annual report for FY 2004-2005 and submit to Regional Board by September 15, 2005 (includes preparation of 1 draft for MC review, reproduction/distribution of up to15 copies)
- Review results of Program activities and recommend improvements
- Prepare Program Work Plan (or equivalent) for FY 2006-2007 (includes 2 drafts for MC review, response to Regional Board comments, reproduction and distribution of up to15 copies)
- Provide guidance for Co-permittees' work plans and SCVURPPP work plans
- Review all Co-permittee Work Plans and Annual Reports for completeness and consistency.

b. Internal Co-permittee Liaison

- Develop guidance on permit requirements
- Provide assistance to Co-permittees as needed.
- Conduct up to four training workshops for co-permittee staff

c. External Organization Liaison

- Represent Program at Regional Board, State Board, BASMAA, Regional Monitoring Program, CASQA, Urban Pesticide Committee, SCBWMI core and relevant subgroups, environmental group/public (up to 88 meetings)
- Obtain and transmit updates from state NOI database

d. New NDC Permit Compliance Issues (Non-HMP)

- Meet with Regional Board staff, Program legal counsel, Program ad hoc task group and/or environmental groups as needed
- Prepare responses to comments and supplementary documentation as needed.
- Conduct the tasks to comply with permit provision C.3. The estimated budgets are based on and consistent with the C3 Work Plan.
- Assist Co-Permitees with implementation of C.3 on projects and with tracking and reporting on C.3 projects.

e. Implement Continuous Improvement Items

- Investigate, develop implementation plans, and implement items for Program continuous improvement identified in Co-permittee reviews, work plan, and annual report within the allocated resources
- Summarize for Program annual report

f. TMDL Tracking, Review and Reporting

- Program staff participation in TMDL tracking, review and reporting to MC.

g. Expenses

- Approximately 10 percent of cost

3. Technical Program Management

a. Prepare RFPs, Technical Project Management

- Develop up to 4 RFPs for technical services
- Implement Multi-Year Monitoring Plan including selection of subcontractors
- Oversee contractors' work
- Coordinate with BATG/MC/Monitoring Ad Hoc Group/WAS and hold up to four Monitoring Ad Hoc meetings annually (quarterly basis) in association with WAS.

b. Technical Review of Work Products

- Provide technical review of contractor work products
- Make recommendations to BATG/MC/Monitoring Ad Hoc Task Group regarding quality of work and any modifications needed for improvement.

c. Develop/Revise Performance Standards

- Assist MC in development of one new performance standard, or substantially improve one or more existing performance standards at the same level of effort.

d. Expenses

- Approximately 10 percent of cost

4. Legal Services

This assumes that the Program will retain the services of Morrison and Foerster (Robert Falk, Esq.) to provide legal advice. The working assumption is that the majority of the legal budget is earmarked for assistance with TMDL, HMP, and permit renewal issues (i.e., work on regional general permit). In addition, implementation issues associated with C3 will also arise and, as appropriate, will be addressed with the available budget.

5. Fiscal Agent

The SCVWD (District) currently serves as the SCVURPPP (Program) Fiscal Agent. On January 28, 2005 the District, pursuant to MOA Section 4.02, notified the Program that they wished to withdraw as the Program's Contracting and Fiscal agent. The Co-permittees met on February 2, 2005 (a Special MC meeting) and wish to establish, forthwith, a new Program Contracting and Fiscal agent pursuant to MOA Section 4. Time is of the essence. The BATG met on February 7, 2005 and initiated selection of a new fiscal agent as well as initiating the steps to transfer the

Program manger contract, establish a SCVURPPP Trust Account, and transfer all remaining funds to the new trust account.

This item represents the amount to be reimbursed to the contract/fiscal agent carrying out this task. The budget for this item has been increased from $15,000 to $50,000 per FY. All Program staff time required to coordinate with the Fiscal Agent is included under Budget Item 1.c.

6. Fees (SEE Collaborative Group)

PROJECTS GROUP

7. Monitoring Projects

The purpose of this item is to fund projects that satisfy the monitoring requirements of the Program's NPDES permit. The estimate of the resource requirements are based on implementation of the Multi-Year Monitoring Plan (MY-RWMP) March 1, 2004 (update - originally submitted to the RWQCB by the MC on August 5, 2002) and is consistent with Program's implementation of the fourth year of MY-RWMP. In addition, the budget estimate includes resources to cover the following tasks/projects: SCVURPPP data management including updating the SSI, copper & nickel baseline actions and reporting and update of the website, participation in the LUS, TMDL technical support/liaison (Hg, PCB, Dioxin, other pesticides), other monitoring consistent with the permit will be conducted to the extent that budget allows, one watershed assessment consistent with the MC integration report and previous Coyote assessment, completion of the ongoing sediment assessment and management control report consistent with the MC September 1, 2002 Work Plan, resources for assisting the Co-permittees implementation the Trash Work Plan and investigating and reporting on trash as a "pollutant of concern" within the urban boundary, resources for updating and developing the necessary annual sampling plans, QA plans and reporting the surface water monitoring results (as defined within the MY-RWMP), and limited resources to coordinate/participate with the CEP. The proposed budget breakdown is as follows:

- Implement Multi-Year Monitoring Plan (includes receiving water monitoring including QA plans, bioassessment, sediment toxicity, BAMBI, annual watershed data analysis report and focused loading assessment for Hg and PCBs) - $340,000
- Program Data Management and Reporting - $100,000
- Trash/CAP-NAP/WMI-Landuse/CEP -$ 75,000
- Sediment Management Report and Watershed Assessment $220,000

8. HMP technical Assistance, Guidance and Workshops

The purpose of this task is to address the additional work effort to complete the HMP. The work effort involves managing subcontractors to complete the technical work (including the BAHM), internal review and approval by the MC, preparation of final Program guidance, conducting workshops and coordination with and addressing RWQCB staff comments.

The budget estimate to complete the development of the BAHM is an upper limit, using estimates of the typical cost of calibrating the model to local watersheds and assuming completion of the work over two FYs (FY 05-06 and FY 06-07). Actual costs may be reduced by limiting the number of watersheds modeled and/or by using existing data from the HMP watershed assessment. In addition, based on the availability of resources from other stormwater programs

that are contributing to the regional portion of the model, the time period for BAHM development may need to be extended into another fiscal year. A more detailed memo is attached.

9. PI/P and WEO Budget

- Watershed Education and Outreach Campaign – assumes all work completed during FY 04-05.
- Assumes that the District will incorporate stormwater messages into District education and outreach materials.
- Assumes limited coordination between District staff , co-permitttees and Program staff.

Proposed Budget breakdown:

- RAC - $50,000
- Alviso Ed. - $75,700
- Website Maintenance - $10,000
- Schools Outreach - $25,000
- Advertising to support for Creek Cleanup - $7,500
- Program staff WE&O & future planning - $50,000
- Campaign - $90,000

a. Pesticide User (PU) Outreach

This project continues implementation, at a reduced level, of the cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Project scope will include items in Program's Pesticide Management Plan (2-15-02), based on provision C.9.d. of the permit, for outreach to residents, commercial businesses, and pest control operators.

b. Mercury Pollution Prevention Outreach

This project encompasses several tasks in the Program's Mercury Pollution Prevention Plan (3-1-02), provision C.9.c. of the permit. It involves public education regarding the effects of mercury on the environment, products containing mercury and proper disposal of such products. The project is in the fourth year of implementing the Program's Mercury Pollution Prevention Plan, is consistent with the public education tasks and is consistent the previous year's budget.

c. Program Supplies

Estimated budget for reprints of materials for Program use and other Program supplies.

10. Project Monitoring Special Studies (see collaborative group)

11. NPDES Permit Renewal

This task includes resources for permit negotiation and renewal. The estimated budget assumes no additional work is required for the application and that all stakeholder meetings will be combined as part of development and negotiation of the regional permit.

COLLABORATIVE GROUP

a. **Program Monitoring Special Studies**: 10% of monitoring project group allocated to cover any necessary changes in scope of the projects requiring consultant services. The amount is to be set at approximately 10 percent of the total budget of the Projects Group (excluding the PI/P tasks) as per the MOA, however funds are not currently available to met this requirement.

b. **WE&O – Watershed Support Fund**: No funds available in this FY for WE&O grass roots approach to educate communities via stewardship grants and projects.

c. **CASQA Dues (Regional Collaboration)**: Statewide stormwater Organization dues

d. **TMDL CEP (Regional Collaboration):** These resources are used to fund the participation (i.e., technical participation annual cost) in the Clean Estuary Program (TMDL MOU between the RWQCB, BASMAA and BACWA). The CEP has requested $147,000 per year, however, because of other higher priority items all Bay area storm water programs reduced their contributions by approximately 1/3 and plan to continue participation at this reduced rate for the next FY.

e. **RMP fee (Regional Collaboration):** The RMP is a program initiated by the Regional Board to monitor the water quality of San Francisco Bay. The San Francisco Estuary Institute has a contract to conduct sampling in the Bay and administer the program with oversight from the Regional Board. The Program is one of a number of dischargers contributing to the cost of the program. It is expected that the Program will continue to fund the RMP at about the same level for each fiscal year for the term of the permit.

f. **BASMAA Fee (Regional Collaboration):** BASMAA is the local regional stormwater association. The Program has and expected to continue to fund the organization at about the same level for each fiscal year for the term of the permit. However, the budget has been increased this FY to allow for an increase in Executive Officer administrative expenses and some collaborative payment for technical and/or legal services in anticipation of development of the RGP.[2]

g. **NPDES Fee:** This is the annual fee imposed by the State Water Resources Control Board for NPDES municipal storm water permits in the San Francisco Bay area. In FY 02-03, the SWRCB increased the annual fee from $10,000 to $54,000, which was absorbed into the overall Program budget. During FY 03-04, the SWRCB increased the fees to $161,000, which again was absorbed into the overall Program budget. The SWRCB individually billed the Co-permittees approximately $162,000 for FY 04-05. While the SWRCB has initiated meetings with stakeholders relative to the FY 05-06

[2] The Executive Director of BASMAA at the December 3 , 2004 BASMAA meeting proposed an increase to the BASMAA budget to cover joint BASMAA costs related to legal and technical services as well as administrative costs. The Executive Board will be discussing this proposal in January and February. The initial reaction was positive relative to developing an approach to more equitably share legal and technical costs. In addition, the Executive Board expressed the desire once again to shift other expenses such as those associated with the copper initiative to the CEP and to not significantly raise BASMAA's costs. SCVURPPP pointed out that budgets are being squeezed while at the same time new permit requirements are expected and that an increase in the BASMAA budget was unlikely to get SCVURPPP support.

fees, no estimates are currently available. Therefore, the fee has been increased by 5% to $169,529[3]. This estimate has not been absorbed into the overall budget. To absorb these fees as was done in past years would require further reductions in Program tasks that would significantly impact meeting permit requirements and further result in a reduction of contributions to regional collaborative programs.

h. **WERF Dues:** Covers the Programs costs as member of WERF.

i. **MOA Review:** Based on direction from the MC the Program shall conduct an independent review by December 31, 2005 to evaluate the MOA's cost allocation formula and evaluate the term, scope and cost of the Program MOA (see MOA 2.04.01).

Attachment 1 – HMP memo (revised)
Revised Co-permittee Assessments

[3] Results of the December 16, 2004 SWRCB Fee Stakeholder Group meeting indicate that MS4 storm water fees could remain relatively stable for FY 05-06.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Draft Distributed to BATG and MC on Dec.15, 2004, approved by MC on February 17, 2005

TOTAL PROGRAM FY 05-06 BUDGET

Budget Summary

Item	Staff Hours	Total Cost
Operational Group		
1. Program Management/Administration (EOA)	3176	$454,168
2. Permit Management (EOA)	3359	$481,408
3. Technical Program Management (EOA)	1100	$143,000
4. Legal Service (MOFO)	0	$87,818
5. Fiscal Agent (SCVWD)	0	$50,000
6. RMP Contribution (SFEI) (see Collaborative Budget)		
Sub-total: Operational Group	**7635**	**$1,216,394**
Projects Group		
7. Monitoring Projects (EOA/Subs)	769	$735,000
8. HMP Technical Assistance/Guidance/Workshops	1806	$234,797
9. PI/P & WEO budget	577	$378,200
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)		
11. NPDES Permit Renewal	577	$75,000
Sub-total: Project Group	**3729**	**$1,422,997**
Collaborative Group		
A. Program Monitoring Special Studies		$80,000
B. WE&O - Watershed Support Fund		$0
C. CASQA Dues (Regional Collaboration)		$15,000
D. TMDL CEP Participation (Regional Collaboration)		$97,000
E. RMP Fee (Regional Collaboartion)		$168,480
F. BASMAA Fee (Regional Collaboration)		$85,000
G. WERF Dues		$8,000
H. MOA Review		$25,000
Subtotal Collaborative Group		**$478,480**
NPDES Permit fee		$169,529
TOTAL PROGRAM BUDGET	**11364**	**$3,287,400**

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TOTAL PROGRAM FY 05-06 BUDGET

Budget Summary

Item	Staff Hours	Total Cost	Budget
Operational Group			
1. Program Management/Administration (EOA)			
a. Administrative Assistance	768	$99,840	$99,840
b. Management Committee and Task Group Support			$177,840
i. Management Committee	576	$74,880	
ii. Task Groups	792	$102,960	
c. Program Budget Administration			$51,480
i. Develop Budgets	140	$18,200	
ii. Prepare Expenditure Reports[1]	256	$33,280	
d. Coordinate with Legal Consultant	184	$23,920	$23,920
e. Develop and Manage PI/P Program (non-watershed watch campaign tasks)	400	$52,000	$52,000
f. Performance Evaluation	60	$7,800	$7,800
g. Expenses		$41,288	$41,288
Subtotal	**3176**	**$454,168**	**$454,168**
2. Permit Management (EOA)			
a. Report Preparation and Submittal			$96,720
i. Annual Report	384	$49,920	
ii. Work Plans	360	$46,800	
b. Internal Co-permittee Liaison			
i. Develop Guidance	144	$18,720	$68,640
ii. Local Program Reviews (delay until FY 04-05)	0	$0	
iii. Conduct Training (4 Workshops)	384	$49,920	
c. External Organization Meetings[2]	1064	$138,320	$138,320
d. NDC Implementation Assistance, Tracking & Reporting	400	$52,000	$52,000
e. Implement Continuous Improvement Items	238	$31,000	$31,000
f. TMDL Program Tracking, Review & Reporting	385	$50,000	$50,000
g. Expenses		$44,728	$44,728
Subtotal	**3359**	**$481,408**	**$481,408**

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TOTAL PROGRAM FY 04-05 BUDGET
Budget Summary

Item	Staff Hours	Total Cost	Budget
3. Technical Program Management (EOA)			
a. Prepare RFPs, Technical Project Management	400	$52,000	$52,000
b. Technical Review of Work Products	400	$52,000	$52,000
c. Develop/Revise Performance Standards	200	$26,000	$26,000
d. Expenses	100	$13,000	$13,000
Subtotal	**1100**	**$143,000**	**$143,000**
4. Legal Services	0	$87,818	$87,818
5. Fiscal Agent	0	$50,000	$50,000
6. Fees			
a. NPDES Permit Fee (SWRCB) (Moved to Collaborative)	0		
b. Regional Monitoring Program Contribution (moved to collaborative)	0		
Subtotal	**1100**	**$137,818**	**$137,818**
Operational Group Total		**$1,216,394**	**$1,216,394**
Projects Group			
7. Monitoring Projects[1]	769	$735,000	$735,000
8. HMP Technical Assistance/Guidance/Workshops	1806	$234,797	$234,797
9. PI/P & WEO budget[2,3]			
a. Watershed Education and Outreach Campaign	385	$308,200	$308,200
b. Pesticide User (PU) Outreach		$40,000	$40,000
c. Mercury Pollution Prevention Outreach	192	$25,000	$25,000
d. BASMAA Regional Collaboration (See Collaborative)			
e. Program Supplies		$5,000	$5,000
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)			
11. Permit Renewal			
a. RGP Negotiations	577	$75,000	$75,000
	0	$0	$0
	0	$0	$0
Projects Group Total	**3729**	**$1,422,997**	**$1,422,997**

[1] Scope is based on the Program's Multi-Year (8-year) Monitoring Plan.

[2] On February 15, 2001 the MC approved the Budget Adhoc Task Groups recommendation to incorporate certain elements of the PI/P budget into the Projects Group budget.

[3] Budget based on WE&O Ad Hoc Task Group draft memo dated December 17, 2003 regarding workplan options and budgets.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TOTAL PROGRAM FY 05-06 BUDGET
Budget Summary

Item	Staff Hours	Total Cost	Budget
Collaborative Group			
A. Program Monitoring Special Studies		$80,000	$80,000
B. WE&O - Watershed Support for Citizen Participation		$0	$0
C. CASQA Dues (Regional Collaboration)		$15,000	$15,000
D. TMDL CEP Participation (Regional Collaboration)		$97,000	$97,000
E. RMP Fee (Regional Collaboartion)		$168,480	$168,480
F. BASMAA Fee (Regional Collaboration)		$85,000	$85,000
G. WERF Member Dues		$8,000	$8,000
H. MOA Review		$25,000	$25,000
Subtotal: Collaborative Group		**$478,480**	**$478,480**
SUBTOTAL PROGRAM FY 05-06 BUDGET		**$3,117,871**	**$3,117,871**
NPDES Fee		$169,529	$169,529
TOTAL BUDGET W/PERMIT FEES		$3,287,400	$3,287,400

MEMORANDUM

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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TO: **Adam Olivieri**

FROM: **Jill Bicknell**

DATE: **December 15, 2004 (Draft)**
January 4, 2005 (Draft)
February 7, 2005 (Draft)
February 17, 2005 (Final

SUBJECT: **FY 05-06 C3/HMP Budget**

This memo describes the estimated budget needs for SCVURPPP tasks related to implementation of Permit Provision C.3. (New and Redevelopment) and in particular, the Hydromodification Management Plan (HMP, C.3.f.).

C.3. Tasks and Budget (Not Including HMP)

By the end of FY 04-05, most of the tasks in the original multi-year C.3. Work Plan will be done, except for ongoing reporting and implementation assistance. Anticipated needs for implementation assistance in FY 05-06 include:

- Continued assistance with SCVURPPP agencies' implementation of BMP O&M verification programs (but no Program-wide database development yet).
- Regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA?);
- Continued supervision of BASMAA project for developing automated BMP sizing/design tool (covered by FY 04-05 collaborative budget item).
- Workshop on implementation and design of certain BMPs, such as bioretention, planter boxes, green roofs, etc. (covered by workshops budget);
- Continued guidance and assistance with annual reporting of C.3. information (covered by annual reporting budget).
- Development of model standard drawings and specifications for certain BMPs, to assist developers and City staff with design/review (beyond sizing calcs.);

Note that: 1) several of these items were suggested by San Jose staff, and I would like to work with the C3PO AHTG at its next meeting to come up with an agreed upon list of priorities for the

FY 05-06 Work Plan; and 2) the last two bullet items can be accomplished under other program management task budgets, assuming they stay at about the same level as FY 04-05.

HMP Tasks

It is assumed that by the beginning of FY 05-06, the HMP Report will be finalized and the focus will be on assistance to the local agencies and development community with outreach and implementation. Many of the tasks listed on the "Summary of Next Steps" (rev. 11/22/04) are scheduled for completion in FY 04-05. Anticipated tasks for FY 05-06 include the following:

- Develop fact sheets for outreach to local agencies and developers;
- Conduct one or more workshops on HMP implementation (covered by workshops budget);
- Continue to develop approach for quantifying the flow control benefits of site design measures/ IMPs;
- Conduct additional implementation studies for example sites in SC Valley (recommend separate line item for special studies);
- Continue BAHM development project (continuation of FY 04-05 collaborative budget item);
- Continue to coordinate with other Bay Area stormwater programs to work toward a consistent approach for the Bay Area;

Budget Estimates

The table below describes the FY 04-05 and FY 05-06 budgets for C.3./HMP tasks:

Budget Line Item	FY 04-05 Budget	FY 05-06 Budget	Comments
NDC Implementation Assistance, Tracking and Reporting	$50,000	$52,000	
BASMAA Stormwater Design Tool, Phase I and II (Collaborative Budget)	$28,600	$0	Design tool project to continue into FY 05-06.
HMP Technical Assistance, Guidance and Workshops	$100,000	$80,000	Workshops to be covered under Program workshops budget
HMP Practicability Analysis (Collaborative Budget)	$36,000	$0	
Bay Area Hydrology Model (Collaborative Budget)	$66,845	$125,000	Total Estimated Project Budget = $192,000(1)
Special Study for C.3. or HMP Implementation	$0	$29,797	To be designated as needed for SCVURPPP or regional project
TOTAL	**$281,445**	**$286,797**	

Notes:
1) $30K for contribution to BAHM modifications, $100K for watershed calibration, and $30K for BAHM support/training in FY 05-06 (assumed contribution of half of total estimated cost), plus 20% for administration and project management.

SCVURPPP FY 05-06 ESTIMATED BUDGET ASSESSMENTS
(2/17/05)

		TOTAL FY 05-06 OPER / PROJ/COLL CONTRIBUTION **$3,117,871**	***PERMIT FEE*** ***$169,529***	***TOTAL ASSESSMENT***
Co-Permittee	Program Contribution			
Campbell	1.88%	$58,616	$7,776	$66,392
Cupertino	2.46%	$76,700	$11,664	$88,364
Los Altos	1.59%	$49,574	$7,776	$57,350
Los Altos Hills	0.43%	$13,407	$3,111	$16,518
Los Gatos	1.74%	$54,251	$7,776	$62,027
Milpitas	2.75%	$85,741	$11,664	$97,406
Monte Sereno	0.14%	$4,365	$3,111	$7,476
Mountain View	3.91%	$121,909	$11,664	$133,573
Palo Alto	4.06%	$126,586	$11,664	$138,250
San Jose	30.01%	$935,673	$31,106	$966,779
Santa Clara	6.23%	$194,243	$19,442	$213,685
Saratoga	1.59%	$49,574	$7,776	$57,350
Sunnyvale	7.25%	$226,046	$19,442	$245,487
County of Santa Clara	5.94%	$185,202	$15,554	$200,755
SCVWD	30.02%	$935,985	$0	$935,985
	100.00%	***$3,117,871***	***$169,529***	***$3,287,400***
** Permit Fee estimate for budget purposes*				

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

March 1, 2006

FY 2006-2007 Draft Work Plan

Sections 1-9

Program and Co-permittee Activities

Submitted in Compliance
with NPDES Permit Order No. 01-024 and 01-119

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Hand Delivered on March 1, 2006

March 1, 2006

Mr. Bruce H. Wolfe
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. ~~Wolfe~~ Bruce,

I am pleased to submit a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2006-2007. This Work Plan, which consists of Program and Co-permittee Activities, fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order:

- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement Program and other local PI/P activities (Provision C.4.)
- Contains the Program's FY 06-07 Annual Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 06-07 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of certain actions accomplished in FY 05-06;
- Includes the Program's FY 06-07 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 06-07 (Provision C.9.d);

- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 05-06 activities and actions, in order to plan FY 06-07 activities.

We look forward to working with you and your staff to implement the actions contained in the attached plans.

Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: Trish Mulvey, CLEAN South Bay
David Chesterman (SCVWD), SCVURPPP Management Committee Chair
SCVURPPP Management Committee Members
Robert Falk, Morrison & Foerster

Attachments: --FY 2006-2007 Draft Work Plan (including Co-permittee Work Plans) - one (1) hard copy
--FY 2006-2007 Draft Work Plan (including Co-permittee Work Plans) -three (3) compact disks

FY 06-07 Draft Work Plan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Certification

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Submitted on behalf of the
Santa Clara Valley Urban Runoff Pollution Prevention Program
March 1, 2006

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

699 Town & Country Village • Sunnyvale, CA 94086 • tel: (408) 720-8811 • fax: (408) 720-8812
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FY 06-07 Draft Work Plan
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D. MILPITAS
E. MOUNTAIN VIEW
F. PALO ALTO
G. SAN JOSE
H. SANTA CLARA
I. SUNNYVALE
J. WEST VALLEY COMMUNITIES (CAMPBELL, LOS GATOS, MONTE SERENO, SARATOGA)
K. SANTA CLARA COUNTY
L. SANTA CLARA VALLEY WATER DISTRICT

INTRODUCTION

This document comprises a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2006-2007. This Work Plan fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order, consistent with Permit Provision C.6.b:

- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement Program and local PI/P activities (Provision C.4.)
- Contains the Program's Annual FY 06-07 Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 06-07 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of actions accomplished in FY 05-06;
- Includes the Program's FY 06-07 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 06-07 (Provision C.9.d);
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 05-06 activities and actions, in order to plan FY 06-07 activities.

The Work Plan is comprised of nine sections, as follows:

1. **Program Continuous Improvement Tasks:** Section 1 describes continuous improvement tasks and provides a schedule for their completion.

2. **Performance Standard Revisions:** Section 2 provides future efforts for revising the Program's performance standards.

3. **Public Involvement and Participation:** The Program's PI/P Work Plan (Section 3) includes a list and description of projects planned for FY 06-07 and the process used to select them. A Pollutant Matrix is included which illustrates how on-going and planned PI/P efforts are directly linked to pollutants of concern.

4. **Monitoring Program:** The Program's FY 06-07 Annual Monitoring Plan is presented in Section 4. The monitoring strategy describes how monitoring projects are linked to Program goals, SCBWMI goals and permit requirements. The section identifies those on-going projects that are related to permit requirements along with a description and tentative schedule for FY 06-07 projects. The Monitoring Plan also includes watershed management measures.

5. **Pesticide Management Work Plan:** Section 5 contains a status report on the Program's pesticide management tasks, consistent with the Program's Pesticide Management Plan (2/15/02), and planned tasks for FY 06-07.

6. **Mercury Pollution Prevention Work Plan:** Section 6 contains the Program's mercury pollution prevention tasks for FY 06-07, consistent with the Program's Mercury Pollution Prevention Work Plan (3/1/02). The status of Mercury Pollution Prevention Plan tasks is also provided.

7. **New and Redevelopment Work Plan:** Section 7 describes the Program's progress in assisting Co-permittees in preparing to implement the requirements for new and redevelopment control measures (Provision C.3.) and the Program tasks planned for FY 06-07.

8. **FY 06-07 Program Budget:** The Program's Final FY 06-07 Budget Report, as reviewed by the Budget AHTG, is included in Section 8.

9. **Co-permittee Work Plan Summary Tables:** Section 9 contains the individual Co-permittee Work Plans for FY 06-07 developed consistent with the FY 00-01 Work Plan format approved by Water Board staff.

SECTION 1

PROGRAM CONTINUOUS IMPROVEMENT TASKS

1. PROGRAM CONTINUOUS IMPROVEMENT WORK PLAN

INTRODUCTION

The 2004 Urban Runoff Management Plan (URMP)[1] commits the Program and Co-permittees to a process of continuous improvement. The concept of continuous improvement acknowledges that the definition of "maximum extent practicable" evolves over time. Through continuous improvement, the Program will continue to develop and implement reasonable control measures to help advance the goal of achieving water quality objectives in South San Francisco Bay.

The continuous improvement process is described on pages 37-39 of the Program URMP. As shown in Figure 2 of the 2004 URMP, areas for continuous improvement are identified through the Program and Co-permittees' participation in the Santa Clara Basin Watershed Management Initiative (SCBWMI) and the Program and Co-permittees' annual evaluations and annual reports.

Water Board staff and representatives of interested parties (including CLEAN South Bay) review the Program and Co-permittee annual reports and work plans, and participate in Co-permittee performance review meetings[2]. Comments from these reviews and meetings help identify specific Co-permittee and Program continuous improvement (CI) tasks.

FY 06-07 CONTINUOUS IMPROVEMENT WORK PLAN

FY 06-07 Program Continuous Improvement Items

Program and Co-permittee staff will work with Water Board staff (through the Municipal Regional Permit Steering Committee) on developing a Municipal Regional Permit to address the Program's permit re-issuance.

On-Going Continuous Improvement Items

There were no new continuous improvement items identified for FY 05-06. There are a few remaining continuous improvement tasks from previous years, and their status and updated schedules are provided in Table 1-1.

[1] In accordance with Permit Provision C.2.b., the Program submitted the 2004 URMP (dated September 1, 2004) to the Water Board on September 1, 2004. In accordance with Permit Provision C.14., the 2004 URMP was resubmitted to the Water Board on February 24, 2005 as part of the *Report of Waste Discharge* (NPDES Permit Application for Re-issuance of SCVURPPP NPDES Permit).

[2] During April 26-28, 2005, Tetra Tech, Inc. provided an independent third party evaluation of certain elements of the Cities of Milpitas, Palo Alto, Santa Clara and Santa Clara County stormwater programs. The following elements were included within the evaluation: ICID/IND inspections and enforcement, municipal maintenance, new development/redevelopment and construction inspection. On October 3, 2005, Water Board staff issued the following : 1) Notice of Violation letter to the City of Milpitas entitled *Failure to Implement an Adequate Construction Inspection Program Pursuant to the NPDES Permit No.* CAS029718 and 2) letter to the Cities of Milpitas, Palo Alto, Santa Clara and Santa Clara County entitled *FY 2004-05 Evaluation of Milpitas, Palo Alto, Santa Clara, and Santa Clara County Programs*. Each City provided a response to the letters by November 3, 2005. Santa Clara County was not required to respond.

Table 1-1
Status of Ongoing Program Continuous Improvement (CI) Tasks

Tasks	Updated Schedule	Status[1]
New Development and Redevelopment		
1. Develop design guidance containing stormwater control opportunities for small road modifications.	June 2006	**Update** – The Program's permit requirements were made consistent with other Bay Area permits, which exempt road reconstruction (within the same footprint) from C.3. However, the C3PO AHTG members have expressed interest in the development of stormwater control design guidance for small road and right-of-way modifications and other tight spaces.
Program Management		
1. Conduct a workshop for municipal staff based on the municipal training protocols being developed by an ad hoc task group. (Priority – Medium)	June 2006	**Update** – Five Power Point presentations have been developed on BMPs for corporation yards, storm drain O&M, road maintenance, pest management and mercury pollution prevention. Program staff will repackage each training protocol into smaller, focused modules. This approach will allow Co-permittees to train municipal staff on certain key municipal elements in shorter blocks on time (e.g., 15 minutes).
2. Consider developing, with the help of an ad hoc task group, a fact sheet addressing common construction BMP problems, like drain inlet protection and dewatering. (Priority – Medium)	June 2006	**Update** – Management Committee approved having the Program adapt an existing brochure on dewatering (created by Palo Alto, Mountain View and San Jose) for the other Co-permittees' use. The C3PO AHTG confirmed its interest in this project at its September 26, 2005 meeting.
3. Look into providing storm water training to building officials through the Peninsula Chapter of Building Officials monthly training sessions. (Priority –Low)	June 2006	**Update** – This item is low priority, and was delayed due to Program staff's focus on higher priority items. The C3PO AHTG confirmed its interest in this project at its September 26, 2005 meeting. Program staff will work with Co-permittee staff to investigate methods of outreach to building officials.

[1] Tasks reported as completed in the FY 03-04 Annual Report have been removed from the list.

SECTION 2

PERFORMANCE STANDARD REVISIONS

2. PERFORMANCE STANDARD REVISIONS

Background

The Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) developed model Performance Standards (PSs) in 1996. The model PSs were accepted by the Water Board in June 1997. Each Co-permittee adopted the model PSs or tailored them to their local community characteristics and conditions. The original PSs were incorporated into the Program's 2004 *Urban Runoff Management Plan* (URMP)[1]. Revised PSs are included in the 2004 Program URMP and the Co-permittees' local URMPs, in accordance with NPDES permit Provision C.2.b

The URMP contains the Program's commitment to a process of continuous improvement. One component of this process is to review an existing PS, or create a new PS, each year. Decisions as to which PS will be created or revised in a given year are made based on requirements in the Program's NPDES permit, comments by Water Board staff on Annual Reports, continuous improvement items identified as part of annual performance reviews, Program priorities and available Program resources.

Future Efforts- FY 06-07 Activities

Priorities for recent efforts to revise or create new performance standards have been driven by the requirements in the Program's NPDES permit and/or continuous improvement tasks. All new or revised PS required by the permit have been completed. Future efforts to revise or update existing PS will be identified as part of the permit re-issuance.

The Water Utility Operation and Maintenance Performance Standard is the last original performance standard needing revision. Issues which need to be addressed include changes in methods of disinfection of potable water supplies and the appropriate BMPs for discharges of these waters to storm drains. During FY 06-07, Program staff will work with BASMAA and Water Board staff on the Municipal General Permit to address any modifications and future expectations for the Water Utility Operation and Maintenance Performance Standard.

[1] In accordance with Permit Provision C.2.b., the Program submitted the 2004 URMP (dated September 1, 2004) to the Water Board on September 1, 2004. In accordance with Permit Provision C.14., the 2004 URMP was resubmitted to the Water Board on February 24, 2005 as part of the *Report of Waste Discharge* (NPDES Permit Application for Re-issuance of SCVURPPP NPDES Permit).

SECTION 3

PUBLIC INFORMATION/PARTICIPATION WORK PLAN

3. PUBLIC INFORMATION/PARTICIPATION WORK PLAN

INTRODUCTION

The goals of the Public Information/Participation (PI/P) element are to identify and change behaviors that adversely affect water quality; and to increase the understanding and appreciation of streams and San Francisco Bay. To accomplish these goals, Co-permittees pursue PI/P activities jointly through the Program, on a countywide basis, and individually in their own jurisdictions.

Each year, the Watershed Education and Outreach Ad Hoc Task Group, which consists of Program staff, Co-permittees representatives and consultants, identifies, prioritizes and selects countywide projects for implementation. Table 3-1 presents the updated Pollutant Matrix, which links past, current, and future PI/P projects with pollutants of concern. The projects are developed and implemented each year by work groups.

The Program provides resources to conduct countywide PI/P tasks through approval (by the Management Committee) of an annual Program budget and Work Plan. All Co-permittees contribute resources to conduct annual Program Work Plan tasks consistent with the Co-permittee assessment procedure contained in the SCVURPPP Memorandum of Agreement[1].

FY 06-07 PI/P WORK PLAN

The Program conducts its public education and outreach through three projects: Watershed Education and Outreach, Pesticide User Outreach and Mercury Pollution Prevention Outreach. The Program has completed all tasks planned for these projects under the current Permit. During FY 06-07, ongoing tasks will be implemented. In addition, Program staff and the WEO AHTG will focus efforts on working with Water Board staff on the Municipal General Permit; and begin to plan for any new outreach-related requirements that may be contained in that permit.

Watershed Education and Outreach

The FY 06-07 Watershed Education and Outreach tasks include the following:

Watershed Watch Campaign

The Watershed Watch Campaign completes its sixth year during FY 05-06. In July 2005, the Program issued a Request for Proposal to select a consultant for planning and implementing the Watershed Watch Campaign after December 2005. The consultant selection process included a review of written proposals followed by two rounds of interviews. In November 2005, Carl and Manor Advertising were selected as the Campaign consultant. Campaign activities from July through December 2005 included media advertising, outreach events and partnership development. During January through June 2006, Carl and Manor will develop a long-term Conceptual Work Plan for the Campaign and maintain partnerships. The WEO AHTG is also exploring the possibility of re-launching the Campaign under a new name and logo. Carl and Manor will develop the name and logo; and focus groups will be used to evaluate them. Based on focus group feedback, changes will be made to Campaign materials.

[1] On February 1, 2001, the Management Committee directed Program staff to include all Program-Wide PI/P activities as part of the Projects Group budget and thus eliminated any confusion regarding selective Co-permittee participation.

Campaign elements that will be implemented in FY 06-07 include media advertising, outreach events, media relations and website maintenance. The detailed FY 06-07 Watershed Watch Campaign Work Plan is included within Attachment 3-1

Regional Ad Campaign

The Program plans to continue with its participation in the Regional Ad Campaign (RAC) in FY 06-07. From FY 02-03 through FY 04-05, the RAC implemented the "Beautiful Watersheds" advertising campaign for increasing the public's awareness about watersheds and problems caused by litter. The advertisements were broadcast on radio and television. The RAC is planning to implement the same advertising campaign during FY 05-06. The topic for the FY 06-07 RAC is under consideration.

Schools Outreach

During FY 06-07, the Program plans to continue to sponsor up to 50 ZunZun assemblies at elementary schools in the Santa Clara Valley. Outreach to schools in FY 06-07 will also be conducted through the *Wacky Watersheds* teachers training workshop. This workshop is offered free of charge to teachers by the City of San Jose. In the last few years, the Program's Schools and Youth Outreach Work Group worked with the *Wacky Watersheds* group to identify three lessons on watersheds, correlate them to State Standards and integrate them in the workshop binder. In FY 04-05, the Program purchased tote bags for packaging the workshop materials (binder, video tapes and a map) and offered stipends to teachers as an incentive for attending the workshop. Efforts are ongoing to make this workshop available to teachers at their in-service training days.

Advertising to Support Creek Cleanup Events

Each year the Creek Connection Action Group sponsors two creek clean-up events: Coastal Clean-up Day in September and National Rivers Clean-up Day in May. In FY 06-07, the Program will continue to provide funds to advertise one of these events.

Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso (Alviso Education Center)

The Program provides resources to the Alviso Education Center to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. This is an on-site educational program conducted primarily on weekends. The activities focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The Program will continue to support these activities in FY 06-07. Attachment 3-2 describes the activities offered in the Watershed Watchers Program.

Pesticide User Outreach

This project combines elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements of the Program's NPDES permit. Outreach is coordinated with other pollution prevention programs funded by Co-permittees (e.g., County's Household Hazardous Waste Program). During FY 06-07, ongoing outreach tasks from the Program's Pesticide Plan will be completed (see Section 5 of this Work Plan).

The tasks for FY 06-07 include:

- Task 1 – IPM Store Partnership Program - Continue IPM participation in Santa Clara County stores. At a minimum, visit each store once every two months; maintain an ongoing relationship with participating stores through in-store contacts; refresh/restock literature racks (as needed); and update "shelf talker" labels (as needed). Based on feedback from training sessions offered to store employees in FY 05-06 and the number of stores remaining to be trained, the Program may provide up to ten training sessions during FY 06-07. These sessions will train employees on how to sell less-toxic pesticide products.
- Task 2 –Regional IPM Partnership –Support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. Review and approve products.
- Task 3 - Pesticide Distributor Outreach Program –During FY 02-03, the Program contributed $5,000 to a BASMAA Task of Regional Benefit known as the Pesticide Distributors Outreach Program, an expansion of the IPM Store Partnership concept to target distributors of pesticide products to retail stores. The purpose of the program is to increase the amount and variety of less-toxic products on store shelves by working through product distributors and educating the distributor sales force. In May 2003, Marin County received a Proposition 13 grant from the State to expand this program into State Water Board Regions 1 (North Coast) and 3 (Central Coast) and create a website for the program (www.OurWaterOurWorld.org). The grant ended in December 2005. During FY 06-07, the Program will provide funds to continue this effort locally.
- Task 4 – Outreach Events - Plan and conduct pesticide outreach events. These may include Pumpkins in the Park, Spring in Guadalupe Gardens, or San Jose Spring Home and Garden Show, etc. Program, consultant and Co-permittee staffs will conduct outreach at these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures (e.g., Pests Bugging You, Grow It and Backyard Bugs).
- Task 5 – Outreach to Industrial Businesses - Continue distributing the "Don't Set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.

Mercury Pollution Prevention Outreach

To implement the Public Education and Outreach element of the Mercury Plan, Program staff established a new work group called the Mercury Pollution Prevention Outreach Work Group in December 2002. The objective of this group is to implement a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products. The Mercury Plan identifies the development of a fluorescent light tube (FLT) recycling public outreach and education plan as a priority and recommends conducting outreach in two phases. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of fluorescent light tubes.

Phase I of the Public Education and Outreach plan focused on residential FLT disposal. It was completed in FY 02-03. Implementation of Phase II, which targets small businesses and Conditionally Exempt Small Quantity Generators (CESQGs) was completed in FY 03-04.

In FY 03-04 and FY 04-05, the Program coordinated its mercury outreach with the County Household Hazardous Waste (HHW) Program. The Program provided funds to develop and

conduct media advertising to meet the requirements of a $300,000, three-year California Integrated Waste Management Board (CIWMB) grant awarded to the County HHW Program. Under this grant, the County HHW Program developed partnerships with local hardware stores for collecting spent fluorescent lamps. The grant ends in March 2006; however, the store partnership program will continue. During FY 06-07, the Program will continue to conduct outreach to promote fluorescent lamps collection locations to residents. Outreach may be conducted using media advertising, in-store displays (posters, banners) and newsletter articles. The Program may also coordinate its outreach activities with other Regional groups/program that are planning to conduct mercury outreach in FY 06-07.

Table 3-2 lists all of the PI/P projects to be funded during FY 06-07. Preliminary descriptions ("Development Strategy Checklists") for the Pesticide User Outreach and Mercury Pollution Prevention Outreach projects are provided in Attachment 3-3. The scopes of work will be finalized in more detail by Program staff and Co-permittees prior to implementation of the projects.

ATTACHMENTS

Attachment 3-1	Watershed Watch Campaign Work Plan
Attachment 3-2	Alviso Education Center Work Plan Tasks
Attachment 3-3	Development Strategy Checklists (Project Descriptions for FY 06-07 PI/P Projects)

Table 3-1
Pollutant Matrix for FY 06-07 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 06-07 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Diazinon[2] and pesticides in general	Pesticides (residential, commercial and municipal use)	• Home gardeners • Pest control professionals • Landscapers • Municipal Employees • Residents who hire pest control professionals	Information on Watershed Watch website, IPM Store Partnership Program (regional and local), Pesticide User Outreach activities, Distribution of restaurant brochure "Don't Set a Table for Pests" through County Health Inspectors	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "When Ants Invade" Self-Mailer, "Landscaping, Gardening and Pool Maintenance" tri-fold, "Don't Set a Table for Pests", IPM Store Partnership Program Fact Sheets, "Control It", HHW programs, BASMAA Media Relations Campaign topic, Got Bugs magnet
Sediment	Erosion from new construction, grading, road wear	• Construction companies/contractors • Architects/engineers • Municipal inspectors • Residents (home improvement projects, remodels)	BASMAA Media Relations Campaign (potential topic), Outreach to developers via RWQCB Construction Site Management Workshops or other mechanism.	Construction BMP Tri-folds in English, Spanish and Vietnamese, "Blueprint for a Clean Bay" (revised 1-04), Construction Site Management workshops, Dewatering Brochure
Mercury	Tailpipe emissions (i.e., diesel-powered vehicles), consumer products (thermometers, fluorescent lighting)	• Residents (auto use, general awareness, proper selection and disposal of products) • Industry (fleet use) • Commercial (fleet use)	Information/fact sheets on Watershed Watch website, BASMAA Media Relations Campaign (potential topic), Mercury P2 Outreach (Residential and business fluorescent light recycling)	"Spare the Air and Water Too" campaign press release and public service announcements, bill stuffers, Program and local co-permittee fact sheets (e.g., Palo Alto and Sunnyvale), Watershed Watch radio, transit and print ads, store signage, newsletter articles

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.

[2] Under terms of an agreement between EPA and pesticide manufacturers, as of December 31, 2004, residential outdoor and indoor uses and sales of Diazinon are prohibited. Program outreach on other pesticides is continuing.

Table 3-1, continued
Pollutant Matrix for Prioritizing PI/P Projects

Pollutant of Concern[3]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 06-07 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Copper	Brake pads, industrial discharge, copper algaecides, coolant leaks, illegal dumping	• Industry (scrubbers, roofs, cooling towers, piping) • Residents (illegal dumping, pools and spas) • Commercial business (pool, spa, fountain maintenance) • Municipal maintenance staff	BASMAA Media Relations Campaign (potential topic), Information on Watershed Watch website, support of Brake Pad partnership through BASMAA	Brake Pad Partnership, "Keep Pool/Spa Water Out of Storm Drains, Streets, and Creeks" (older pool and spa brochure), "Keeping It All In Tune", Industrial BMPs, storm drain stencils, "Draining Pools & Spas – Keep Pool, Spa and Fountain Water Out of Storm Drains, Creeks and the Bay", Palo Alto's fact sheet on architectural use of copper
Nickel	Industrial discharges, tailpipe emissions, construction-related erosion	• See sediment and mercury target audiences	See sediment and mercury projects	See sediment and mercury projects
Trash	Intentional littering (cigarette butts, throwing objects from automobiles, illegal dumping), trucks hauling poorly secured materials, uncovered or overflowing garbage cans	• General public • Children • Drivers • Smokers	BASMAA media relations campaign (potential topic), Information on Watershed Watch website, BASMAA Regional Ad Campaign topic	"The Bay Begins at Your Front Door" brochure, Watershed Watch magnets, Watershed Watch Kit brochure, Watershed Watch web site, BASMAA's "Beautiful watersheds/trash" TV and radio ads

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.

Table 3-2
FY 06-07 PI/P Projects

Project Title	Project Description	Comments
Non-Discretionary PI/P Projects		
1. Watershed Education and Outreach Campaign (Year 7)	Funding for the Watershed Education and Outreach Campaign. Includes: • Funding for the Watershed Watch Campaign • Funding for educational programs at the Alviso Ed Center coordinated with the Watershed Watch Campaign; • Funding for ZunZun to perform a watershed – themed show at 50 schools in Santa Clara Valley. • BASMAA Regional Ad Campaign • Advertising to support Creek Cleanup Activities	Proposed Activities: • Watershed Watch Campaign • BASMAA RAC • School Outreach • Alviso Education Center • Advertising to support Creek Cleanup Activities
2. Pesticide User (PU) Outreach (Year 5)	Project combines cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Scope to include items in Program's Pesticide Management Plan for outreach to residents, commercial businesses, and pest control operators.	SCVURPPP will continue to support the Regional IPM Partnership Program, and consider supporting other pesticide related projects through its participation in BASMAA. Program will continue to maintain the stores participating in the store partnership program. Additional outreach will be made locally to pesticide users, potentially residential and commercial users, residents hiring pest control professionals, and/or other audiences. Outreach will be conducted at community events, advertising and by conducting IPM workshops for residents.
3. Mercury Pollution Prevention Outreach (Year 4)	Continuing outreach on proper disposal of mercury containing wastes and education on low-mercury products.	Program will continue its mercury outreach and coordinate its efforts with the County HHW Program in implementing its mercury grant. The Program may also coordinate its outreach activities with other Regional groups/programs that are planning to conduct mercury outreach in FY 06-07.
4. Program Supplies	Estimated budget for reprints of materials for Program use and other Program supplies.	

Attachment 3-1

FY 06-07 Watershed Watch Work Plan

BACKGROUND

The primary goals of the Watershed Watch Campaign are to:

1. Change behaviors that negatively impact the watershed.
2. Encourage behaviors that protect, preserve and restore the watershed.
3. Inform audiences about activities that impact the watershed.
4. Build awareness of watershed issues in general.

In fiscal year FY 05-06, Carl & Manor Advertising was contracted to:

- Develop new approaches to the campaign creative
- Develop plans and strategies to meet the goals of the campaign
- Maintain and develop partnership relationships that benefit the Program and WE&O campaign goals
- Coordinate campaign activities and consult the WEO AHTG.

Carl & Manor Advertising presented two different creative directions to the WEO AHTG based on two different scenarios:

1. Keep the look of the Campaign same and make changes to existing creative.
2. Make major changes to the Campaign including changing its name, redesigning the logo and developing new creative.

For the second scenario, Carl and Manor proposed a new campaign theme “Clean water ways” because it more clearly and directly communicates the goals of the campaign (education and awareness, behavior modification) with a direct message: Do things the clean water way, to have clean waterways. To ensure that WE&O messages resonate with campaign audiences in FY 06-07, the WEO AHTG decided to seek the opinion of their target audiences (English and Spanish-speaking residents of Santa Clara County). Focus groups were suggested as a means to evaluate the effectiveness of the two different campaign themes, as well as various executions of the campaign messages. Based on the results of the preliminary creative development and focus group results conducted in FY 05-06, the consultants will proceed with fully implementing the creative for the campaign in FY 06-07.

FY 06-07 Work Plan

The following tasks will be implemented in FY 06-07 to achieve the Campaign goals:

TASK 1: Creative Development

The creative development process will involve determining the factors and incentives that lead to behavior changes as well as the barriers to behavior changes in the Program's target audiences. Barriers to behavior changes will also be considered while developing messages. The target audiences are:

Primary target audience:

- Santa Clara County residents
- Homeowners
- Aged 35+
- College educated

Secondary target audiences:

- Spanish-speaking or bilingual Santa Clara County residents
- All Santa Clara County residents aged 15-34
- High school students
- Lower income residents ($35,000 total household income or less)

For example, the motivating factors for the primary target audience could be their children's welfare (if applicable), property values, economic factors, and convenience / time.

The secondary (long-term) audiences are greatly diverse and therefore may have widely varying issues and motivations. The motivating factors for them could be:

- For Spanish-speaking or bilingual Santa Clara County residents - family values / children's welfare, economic factors.
- For Santa Clara County residents aged 15-34, high school students - making their mark on the world, economy / employment, and pleasure / having fun
- For lower income residents ($35,000 total household income or less) - economy / security, housing.

The Campaign will attempt to understand and answer the inherent questions that the target audience will ask upon hearing our message(s):

- Why should I care?
- What's in it for me?
- What can I do?
- What difference will it make?

Campaign messages will answer these target audiences' questions; inform them and show benefits. Each of the messages will get their attention, be clearly understandable, focus on one action or desired outcome, appeal to the audience's values and concerns, demonstrate the relevance of their participation/action, and explain just how easy it is to

take action to protect the environment.

Ideally, the actions that the Campaign asks the audiences to take will be traceable and quantifiable, so as to effectively evaluate the messages, media and partnerships.

The messages will be adapted depending on the communication medium (e.g. newspaper, radio, web, etc.) while maintaining a look and sound consistent with the overall Campaign.. The messages may also be adapted to maintain consistent meaning and intent in Spanish. This consistency or "synergy" in marketing materials is critical in the overall effectiveness of the Campaign, so the marketing messages create a cumulative impact on the audience.

Final execution will be determined by media selections, the needs of partners and participating jurisdictions, and available budget, but are likely to include:

- Print media (daily/weekly newspapers, locally-produced magazines, direct mail)
- Transit media (bus board posters)
- Radio (recorded messages, public service announcements)
- Collateral (point-of-purchase displays/prompts, materials for distribution)

TASK 1 DELIVERABLES:

Final deliverables are contingent upon media plans and WEO AHTG agreement about the message focus for each campaign flight. Deliverables are likely to include:

- Up to 3 print ads focusing on pesticides, mercury and one more pollutant/activity – The advertisements will be sized for SAU publications (standard broadsheet / daily newspaper), Tabloid publications (weekly and specialty publications), and Direct mail (post cards or flyers, if applicable)
- Up to 3 60-second radio spots produced in English and Spanish – Messages will focus on pesticides, mercury and one more pollutant/activity. The spots will be developed with consistent music bed and voice over talent, ideally utilizing a consistent open and closing for increased/developing recognition as Program messages. Spots of 15- and 30-seconds will also be explored for added frequency, if a simplified "awareness" or "quick tips" message is deemed effective in our media mix.
- If they are determined to be a viable medium to deliver our message, transit ads are budgeted for one media flight. Messages will be implemented in English and/or Spanish, depending upon the geographic target area (bus routes) selected for the campaign. If transit ads are not part of the media plan, transit ad production budget will be reallocated to the media budget.
- Primarily the collateral development under consideration is the Discount or Rewards Card and related point-of-purchase display materials for our Program partners. Development and distribution of these materials depends upon budget and partnership development. Printing is not included in the budget, but if needed, consultants will seek support for the budget from partners.

TASK 1 BUDGET: $18,600

TASK 2: Media Advertising

As much as possible, media partnerships, schedules / flight plans and budget allocations will be determined in FY 05-06, so they are ready for implementation early in FY 06-07. In developing these plans, the consultants will work with the WEO AHTG to clearly identify and define their media goals and preferences, and obtain their approval.

Requests for proposals will be developed to clearly define the goals of the campaign, the prospective media schedule(s)/plan, budget, and the criteria on which proposals will be judged. RFPs will be distributed to media in the geographic target area, defined as Santa Clara County geographic area, also known as the area of dominant influence (ADI).

Media Allocation

The consultants will allocate the media budget proportionate to language/population of our target audiences, and the media's effectiveness in delivering reach, frequency and added-value to the campaign. They will create an appropriate balance and synergy of radio, outdoor/transit, print and collateral, based on the goals and budget for the campaign.

Media Selection

Media will be evaluated for: its effective reach in the ADI (ratings); efficiency based on cost per thousand, reach & frequency to target audience(s), added value, and partnership opportunities.

Media selection will be based on creating a desirable balance of reach and frequency; limited duplication in programming and formats for maximum reach; maximum impact weighing rating points and impressions; and adequate frequency to create impact. Selection will also consider the proportion of media in English and Spanish relative to the population; effectiveness in delivery of the message; the messages the Campaign wants to deliver; partnerships and value-added media and promotions; and the recommendations from past surveys and focus groups on the preferred medium for receiving information.

Media Schedule

To develop the media plan, the consultants will determine the flight dates and weight of media for the flights. Schedules will be determined by the seasonality of the message(s) that may impact effectiveness of the campaign. For example, gardening and home improvement projects may be more popular in the spring and summer/fall, so pest control, gardening and household hazardous waste disposal messages may be more effective if delivered in those seasons.

Schedules may also be influenced by partnership activities and relevant event considerations. To maximize partnership opportunities, a campaign message may be tagged with a relevant partner/partnership event announcement. This added-media value could be offered in trade for in-kind Program promotion at the events, and in event marketing (co-sponsorship). A partnership and event calendar will be developed to aid in the media planning.

The consultants recommend that the media be scheduled in compact flights to maximize frequency. If budget permits, these compact flights might be combined with a "top of mind awareness" (TOMA) campaign. A TOMA campaign usually involves a short, simplified message delivered on a regular (high-frequency) basis, ideally in a fixed position or time. Examples of this are traffic or weather news sponsorships on radio or

television media, or a small business-card sized ad in print, in a fixed position such as the weather page, or specific page number, each week or each day.

It is estimated that the budget will afford one or two high-impact 3- or 4-week schedules (need to confirm), depending upon allocation of the additional pesticide and mercury outreach media budgets. The consultants will identify and select media that maximize Campaign reach within the target audience.

When the schedule is determined, the consultants will present the recommended media plan to WEO AHTG for approval. The media plan will revise as needed to meet or exceed approval.

Upon approval of the media plan, the consultants will confirm schedules with the media and secure contracts, including written commitments of added value and promotions. All creative materials and traffic instructions/insertion orders will be distributed to the media.

Task 2 DELIVERABLES:

- RFP to Media (Media Negotiation)
- Media Recommendations
- Media Plan
- Traffic/Distribution to Media
- Billing / Reconciliation / Documentation
- Media Campaign Summary (Report)

Task 2 BUDGET: $43,650 (this will be supplemented with approximately $30,000 available in the Pesticide User Outreach and Mercury Pollution Prevention Outreach media budget)

Task 3: Partner Development and Coordination

Ongoing effort will be devoted to supporting relationships with current partners, including

- Guadalupe River Park & Gardens
- Santa Clara County HHW Program
- The Watershed Program
- United Neighborhoods of Santa Clara County
- RAFT (Resource Area For Teachers)
- San Jose Chamber of Commerce
- Children's Discovery Museum
- Hispanic Chamber of Commerce Silicon Valley
- Don Edwards San Francisco Bay Wildlife Refuge at Alviso
- Santa Clara County Integrated Waste Management Division

- San Francisco Bay Bird Observatory
- Greenbelt Alliance
- Pick Up San Jose
- Going Native Garden Tours
- Pure Water Stores
- Summerwinds Nursery
- San Jose Conservation Corps
- Classic Car Wash
- Kelly Moore Paints
- Quality Tune up
- Creek Connections
- Keep California Beautiful
- Happy Hollow Zoo & Park
- Strong Neighborhoods
- Bonfante Gardens
- Chinese American Mutual Assistance Association
- MEDIA
    - KRTY/KLIV Radio
    - KLOK/KBRG Radio (Radio Univision)
    - KUFX/KCNL (ClearChannel) Radio
    - KEZR/KBAY Radio
    - *San Jose Mercury News*
    - Times Newspaper Group
    - Silicon Valley Community Newspapers
    - Viacom Outdoor

The consultants will also explore development of new partnerships. They will contact those who were previously sought that didn't materialize (VTA, Sierra Club), and pursue new ones like

- Additional or alternate media partners - VietUSA, Cinemas, Pennysaver, ValPak, etc. (direct mail media)
- Santa Clara County Parks & Recreation
- Water-related / Outdoor activity – Fishing, boating, rafting, kayaking
- Hardware/Garden/home improvement – OSH, Ace
- Automotive – dealers, oil change / service centers, auto parts / targeting do-it-yourself oil changes

The support of these relationships includes coordinating outreach materials or messages, promoting the partner's interests that are shared with the Program, participating in key activities and events, and suggesting or developing win-win opportunities. A calendar of events will be developed to keep all partnership activities "on the same page."

There have been developments in the media and with other partners that will require renegotiation and evaluation of partnerships. For example, *San Jose Mercury News* no longer publishes *Nuevo Mundo* or *Viet Merc*, and KCNL has switched from a youth-oriented station to Spanish-language "La Romantica" format.

Changes in the campaign creative also present new opportunities with existing partners.

Task 3 DELIVERABLES:

- Ongoing contact with partners; maintain updated contact data
- Monthly written report of results or activities

Task 3 BUDGET: $ 6,500

Task 4: Development of Value-Added Resources

The media offers excellent value added opportunities. The consultants will negotiate media buys and partnerships for added media exposure, requesting innovative partnerships and sponsorship opportunities with the media and their advertisers. When media proposals lack relevance or inspiration, the consultants will develop and propose concepts, beginning with additional media.

Opportunities include but are not limited to:

- Contests to provide public awareness and incentive
- Public Service Announcements / donated airtime or space
- Sponsorships
- On-site Events
- Cross-promotions with other media clients and with the stations/publications
- Web links, etc.

The consultants will also explore new methods and channels of distribution for campaign messages, as well as activities or opportunities to encourage desired outcome from the audience, and reinforce the positive impact of that action.

Events offering relevant opportunities may be:

- Earth Day events throughout the region
- Home & Garden Shows
- Garden Tours
- Santa Clara County Parks & Recreation's "Go Outside and Play Day"
- Beach/Creek Clean-up days
- Outdoor activities that take place in a watershed recreation area (e.g. Palo Alto's

Moonlight Run).

The consultants will develop a partnership kit, which presents partnership benefits and opportunities. This is simply packaging the partnership program to a cohesive marketing kit that can be utilized as an organized communication tool, and to distribute materials/tools for partners to maximize the effectiveness of our partnership. It might include a brief Program summary page, a list of jurisdictions and partners, a disc with logos and other key marketing materials. Ultimately, it will present a proposal of the activities or added value the Program desires and/or offers.

Many of these materials may serve dual purpose as a public relations package or media kit.

Other resources may be developed as new methods or logistics for distributing the Program messages.

Task 4 DELIVERABLES:

- Partnership kit
- Value added as negotiated with media and partners
- Monthly written report of results or activities
- Annual report of value-added/leveraged dollars for the preceding fiscal year by July 30, 2007

Task 4 BUDGET: $4,900

Other costs/time associated with Value-added development fall under Tasks 2+3.

Task 5: Website Linkage to Program Website and Maintenance

The consultants will develop a clearer and more defined linkage with the main Program website (www.scvurppp.org) and maintain the existing website on an ongoing basis, encouraging partners to provide news. This plan does not call for any additional creative (creating new pages), but for maintenance of the current site. They will update it regularly with the latest news/ articles, creative, partnership links, and events/announcements.

The consultants will track web activity and comment on any potentially relevant trends they observe. They will also consider website improvements and propose them as part of the FY 07-08 work plan.

Task 5 DELIVERABLES:

- Monthly/ongoing maintenance
- Monthly written report of results or activities

Task 5 BUDGET: $6,000

Task 6: Outreach Events

The consultants will develop a comprehensive calendar of events including

- Partner events

- Relevant holidays or observances (Earth Day, Arbor Day, etc.)
- Media schedules

They will work with WEO AHTG to create an Event Plan for prioritizing events, determine the goals of the events (general or specific to the event), and determine who will represent the Program at key events. Event selection will be based on the pollutant/ activity that the Campaign is focusing on. For example, if the focus of Campaign outreach is Integrated Pest Management, outreach will be conducted at gardening related events. The available resources will be reviewed to determine the need for any outreach materials, exhibits or activities. An evaluation mechanism will be developed to evaluate the events and determine the value of Program participation in the selected events. Based on the evaluation results and staff experiences, the consultants will examine and recommend any changes or improvements to the event plan for FY 07-08 Work Plan.

Task 6 DELIVERABLES:

- Event Plan development and maintenance
- Event evaluation development and execution
- Written report of results or activities
- Participation / representation at events (4 full days)

Task 6 BUDGET: $6,850

Task 7: Media and Public Relations

Public and Press Relations can potentially increase audience awareness and understanding of current events and activities that affect the watersheds. Public/press relations can be proactive or reactive. Opportunities sometimes present themselves by the actions of nature, politicians or local citizens. The consultants will communicate to the media, items of interest or potential relevance to the goals/messages of the Program, in case a timely reaction could be relevant news.
Other times, they will craft a relevant news story based on general conditions, planned or anticipated events, or current trends. Public/press relations can also be an important option to creating awareness of something specific that is not covered in the media plan / paid messages, or in support of the Program's participation in a partner event. Examples are:

- "Preserving Property Value" as a spin on creek clean up days or pollution prevention
- Promoting an event at the Don Edwards SF Bay Refuge Education Center in Alviso

Materials will also be emailed to partners and co-permittees for their use and distribution, or loaded to the website for download.

The consultants will seek participation from community calendars in print, TV and radio for no-cost announcements of events, programs and activities. The consultants will also coordinate with the Regional Media Relations (RMR) committee on regional press releases and breaking news generated media coverage.

Task 7 DELIVERABLES:

- Public/press relations plan development and execution (3 news stories or equivalent)
- Ongoing maintenance of press contact data

Task 7 BUDGET: $4,750

Task 8: FY 06-07 Annual Report Submission and FY 07-08 Work Plan Development

The consultants will submit an Annual Report summarizing FY 06-07 activities and develop the FY 07-08 Work Plan.

Task 8 DELIVERABLES:

- FY 06-07 Annual Report
- FY 07-08 Work Plan

Task 8 BUDGET: $3,000

BUDGET SUMMARY:

TASK 1 Creative Development	$18,600
TASK 2 Media Advertising	$ 43,650*
TASK 3 Partner Development	$ 6,500
TASK 4 Value Added Development	$ 4,900
TASK 5 Web Linkage to Program Website and Maintenance	$ 6,000
TASK 6 Event Coordination	$ 6,850
TASK 7 Media / Public Relations	$ 4,750
FY 07-08 Work Plan Development	$ 3,000
TOTAL CONSULTANT BUDGET	$94,250
EOA Mark Up (10%)	$9,425
TOTAL CAMPAIGN BUDGET	**$103,675**

*Media Buys will be supplemented with approximately $30,000 available under Pesticide User Outreach and Mercury Pollution Prevention Outreach.

Attachment 3-2

Attachment 3.2: "Watershed Watchers: Keeping Our Waterways Clean" Program with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso.

To conduct the Watershed Watchers Program, the Program will fund and support an interpretive specialist position at the Alviso Education Center. The program includes the following elements:

Watershed Watchers: Puppet show introducing the concept of watersheds and urban runoff. The show will be performed on-site and off-site.

Wildlife in Our Watershed Depends On You: Interpretive programs focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed. Examples include children's bird walks, salt marsh mud studies, twilight walks and general nature hikes followed by chemical demonstration of eutrophication.

Gardening Without Chemicals Workdays: Garden work days emphasizing chemical-free gardening techniques.

Gardening Without Chemicals Workshops: Workshops guiding visitors through various native plants in EEC demonstration gardens while discussing chemical-free gardening techniques used in the gardens and implementation methods for the home garden.

Help Save the Bay This Holiday: Guided nature tours in Bay habitats based on a holiday theme. The program addresses how individual behaviors cause urban runoff pollution which affect wildlife habitats in the watershed.

Our Role in Preventing Urban Runoff: Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. This is usually done with groups that make reservations (e.g., Scouts and Lyceum).

Special Events: These events are designed to attract at least 200 people to the EEC for various activities including games and crafts. Each activity educates participants about urban runoff pollution prevention.

Watershed Clean-Up: A concentrated effort to remove litter from watershed areas (e.g., creeks and sloughs).

Informal Indoor Visitor Contact: Includes interaction at the Center and answering visitor questions over phone.

Distribution of Specified Programs to Local Media: Includes contacting Bay Area Parent, Mercury News, and Metro; and creating appropriate descriptions/press releases.

Developing and Maintaining Partnerships with Local Community Organizations: Phone calls and e-mails to groups which include San Jose Community Gardens, the San Francisco Bay Bird Observatory and volunteer coordinators at local companies (e.g., Intel and Sony, etc.).

Coordinating Refuge Volunteers for Interpretive Programs/Gardens: Contacting volunteers to lead programs, training, and maintaining relationships with volunteers; and scheduling volunteers for special events.

Attachment 3-3

FY 06-07 Development Strategy Checklist
Pesticide User Outreach

1. **Project Title: Pesticide User (PU) Outreach**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:**
   Toxicity due to organophosphate pesticides (diazinon and chlorpyrifos) in local creeks and San Francisco Bay. Selection, use and disposal of pesticides by residential and commercial users, pest control operators and pesticide retailers.

4. **General Project Description:**
   This project combines the best elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements in the Program's NPDES permit. The approach will be coordinated with other pollution prevention programs funded by Co-permittees (e.g., County's Household Hazardous Waste Program). Scope to be developed based on the Program's Pesticide Management Work Plan and the results of the FY 05-06 outreach work. Activities may include:
   - IPM Store Partnership Program - Continue the program in stores in participating Santa Clara County stores. Visit each store once every two months at a minimum, maintain ongoing relationship with participating stores through in-store contacts, refresh/restock literature racks as needed, and update "shelf talker" labels as needed. Based on feedback from training sessions offered to store employees in FY 05-06 and the number of stores remaining, the Program may provide training sessions to store employees. These sessions train employees in selling less-toxic pesticides.
   - Regional IPM Partnership –Support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. Review and approve products.
   - Pesticide Distributor Outreach Program – Continue to support the Pesticide Distributor Outreach Program (previously funded through a Prop 13 Grant to Marin County) in Santa Clara Valley. The purpose of the program is to increase the amount and variety of less-toxic products on store shelves by working through the product distributors and educating the distributor sales force Provide staff for conducting outreach events at stores, i.e., Orchard Supply Hardware. At these events, customers are educated on available less toxic pest control methods and products, and proper disposal of pesticides.
   - Outreach Events - Attend pesticide outreach events in coordination with Watershed Watch. These may include Pumpkins in the Park, Spring in Guadalupe Gardens, or San Jose Spring Home and Garden Show. Program staff, consultants and Co-permittee staff will staff these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures (e.g., Pests Bugging You, Grow It and Backyard Bugs).
   - Outreach to commercial businesses - Continue distributing the "Don't Set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.

5. **Outreach/Activity Areas and Communication Goals:**
   PI/P Communication Goals include Increasing Awareness and Changing Behavior, particularly with respect to pesticide use and disposal.

FY 06-07 Development Strategy Checklist
Pesticide User Outreach

6. **Target Audience:** To be determined, may include:
(X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools,
( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education,
(X) Store Employees

7. **Distribution Strategy:**
To be determined.

8. **Describe how the success of the project will be measured:**
The BASMAA Regional IPM Committee conducted a customer intercept survey in October and November 2004 to evaluate the success of the IPM Store Partnership Program. Five stores from Santa Clara County were included in this survey. The survey indicates that approximately 23% of Santa Clara County residents are aware of the Our Water Our World promotion. The final survey report was included within the Program's FY 04-05 Annual Report. The Watershed Watch evaluation conducted in September 2003 tracked the publics' knowledge about various pollutants, including pesticides, affecting the water quality in the Bay. The final evaluation report was included in the Program's FY 03-04 Annual Report. Program staff also maintains a log of requests received for fact sheets, number of fact sheets distributed and number of people reached at outreach events.

9. **Have similar projects been done by other agencies?**
Yes

10. **Schedule:**
FY 06-07

11. **Budget:**

See Program Budget

12. **Identify the evaluation criteria that the project meets:**

(X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
(X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
(X) County-wide implementation will be more cost-effective than local implementation.
(X) The project supplements a regional project and/or program.
(X) The success of the project is measurable.
(X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. **Implementer(s):** (X) Work Group, (X) Program Staff, (X) Consultant,
( ) Other:_____

FY 06-07 Development Strategy Checklist
Mercury Pollution Prevention Outreach

1. **Title:** Mercury Pollution Prevention Outreach

2. **Project Proposer:** SCVURPPP Mercury Pollution Prevention Ad Hoc Task Group

3. **Specific Pollutant or Behavior Project Addresses:** Mercury

4. **General Project Description:** The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedance of water quality standards for mercury.

   Mercury has been found in sediment from the South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

   Permit Provision C.9.c. requires a mercury pollution prevention plan that includes public education regarding mercury, products containing mercury and proper disposal. The Program completed a Mercury Pollution Prevention Plan and submitted it to the Regional Board on March 1, 2002. The outreach tasks in this Plan are the basis for the FY 02-03 (Phase I) and FY 03-04 (Phase II) work plans. The focus of outreach in FY 02-03 was residential fluorescent light tube disposal. In FY 03-04, this outreach was extended to small businesses and conditionally exempt small quantity generators (CESQGs). Outreach was coordinated with municipal inspectors for integrating mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.

   In FY 03-04 and FY 04-05, the Program coordinated its mercury outreach with the County Household Hazardous Waste (HHW) Program (see Section 6 of this Work Plan). The Program provided funds to develop and conduct media advertising to meet the requirements of a $300,000, three-year California Integrated Waste Management Board (CIWMB) grant awarded to the County HHW Program. Under this grant, the County HHW Program developed partnerships with local hardware stores for collecting spent fluorescent lamps. The Grant ends in March 2006 but the store partnership program will exist. In FY 06-07, the Program will continue to conduct outreach to promote the fluorescent lamps drop-off locations to residents. Outreach may be conducted using media advertising, in-store displays (posters, banners) and newsletter articles. The Program may also coordinate its outreach activities with other Regional groups/program that are planning to conduct mercury outreach in FY 06-07.

4. **Outreach/Activity Areas and Communication Goal:** Develop a plan to increase outreach efforts to residents and businesses on recycling of mercury containing wastes.

5. **Target Audience:**
   (X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools, ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education, ( ) Other_____

FY 06-07 Development Strategy Checklist
Mercury Pollution Prevention Outreach

6. **Distribution Strategy:** Media advertising, newsletter articles.

7. **Describe how the success of the project will be measured:** Number or amount of mercury-containing products (i.e. fluorescent lamps, thermometers) collected by Household Hazardous Waste facilities; description of outreach methods used; number of outreach materials distributed.

8. **Have similar projects been done by other agencies?** City of Palo Alto has conducted a FLT recycling program. Smaller projects (i.e., thermometer take-back programs) have been conducted by other agencies.

9. **Schedule:** FY 06-07

10. **Budget:**

    See Program Budget

11. **Identify the evaluation criteria that the project meets:**

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    (X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

12. **Implementer(s):** SCVURPPP Mercury Pollution Prevention Outreach Work Group for FLT recycling in coordination with the Watershed Watch campaign and the SCVURPPP PIP/WEO Ad Hoc Task Group

FY 06-07 Development Strategy Checklist
Program Supplies

1. **Project Title:** **Program Supplies**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:** Varies

4. **General Project Description:**
   To provide a budget to support requests by the public and Co-permittees for Program materials and supplies. This budget allows Program staff to reprint materials and reorder supplies as needed.

5. **Outreach/Activity Areas and Communication Goal:** N/A

6. **Target Audience:** To be determined, as needed.
   (X) Residential, (X) General Public, (X) Industrial, (X) Commercial, (X) Schools, (X) Municipal Employee Training, (X) Public Officials, (X) Multi-cultural Education, (X) Other_____

7. **Distribution Strategy:**
   Program staff will coordinate material reprints, reordering supplies and distribution to Co-permittees, as appropriate. Program staff distributes materials at public events and in response to telephone, e-mail or web site requests.

8. **Describe how the success of the project will be measured:** The Program logs all requests for materials and tracks the amount of materials distributed. The need for reprints is based on successful distribution of existing stock.

9. **Have similar projects been done by other agencies?** N/A

10. **Schedule:** As needed.

11. **Budget:**

    See Program Budget

12. **Identify the evaluation criteria that the project meets:** N/A

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    ( ) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

SECTION 4

FY 06-07 ANNUAL MONITORING PLAN & WATERSHED MANAGEMENT MEASURES

4. MONITORING PROGRAM

INTRODUCTION

The Annual Monitoring Program Plan contains two main elements: 1) Summary of Environmental Monitoring Measures (EMMs), and 2) Summary of Programmatic Monitoring Indicators (PMIs). The goals of the Program's monitoring program are provided within the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program) Multi-Year Receiving Waters Monitoring Plan (Version 2.0).

SUMMARY OF ENVIRONMENTAL MONITORING MEASURES (EMMS)

Environmental monitoring and assessment measures (EMMs) are activities that entail the collection of environmental data through field studies and analysis of information through assessments. EMMS are coordinated at the local or regional level and typically fall into one of two general areas:

- Watershed Assessment Activities; and,
- Pollutants of Concern (POCs) Monitoring.

EMMs are intended to: 1) assist the Water Board in characterizing receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program; 2) identify where and what type of screening-level monitoring is appropriate; and 3) recognize the need for site-specific water quality investigations to address questions that might arise while conducting screening-level monitoring efforts. The main EMM activities that the Program will conduct during FY 06-07 are described in the following sections.

Annual Receiving Waters Monitoring Plan

Since FY 02-03, the Program has developed and implemented Annual Monitoring Program Plans (Annual Plans) in fulfillment of Provision C.7 of its NPDES Permit. The Annual Plans identify monitoring activities that are implemented each year as part of the Program's Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan). Annual monitoring activities typically include ambient surface water quality monitoring; physical habitat assessment studies and bioassessment studies. Annual Plans have previously been implemented in the Lower Penitencia and Coyote Creek watersheds (FY 02-03); San Tomas and Adobe Creek watersheds (FY 03-04 and FY 04-05); Matadero/Barron Creeks, Calabazas Creek and Sunnyvale East and West Channels (FY 04-05 and FY 05-06); and Stevens and Permanente Creeks (FY 05-06).

Starting in FY 05-06, the Program supplemented the Annual Plan with a characterization of the watersheds to be monitored during the subsequent year (i.e., Stevens and Permanente Creeks). The watershed characterization included a compilation of existing data sources (and a summary of the geologic and geomorphic setting), vegetation, land uses and associated water quality issues, status of biological communities and relevant beneficial uses that occur in each watershed. These data sources were used to identify appropriate monitoring parameters and locations for implementation of the Program's FY 05-06 Annual Plan.

In accordance with Provision C.10 (b), the Program annually develops a Watershed Monitoring and Assessment Summary Report (Summary Assessment Report) that summarizes the results

and analyses of baseline data collected during the implementation of the Program's Annual Plans. The Summary Assessment Reports provide information on possible beneficial use impacts to the extent possible (based on the study design and available data) and propose potential follow-up studies and/or management actions, where feasible. In September 2005, the Program developed a Summary Assessment Report for FY 04-05 monitoring activities that occurred in the San Tomas Creek, Adobe Creek, Matadero/Barron Creeks, and Calabazas Creek watersheds, and Sunnyvale East and West Channels.

Planned FY 06-07 Activities

The Program's Annual Plan is provided within Attachment 4-1. Table 4-1 within Attachment 4-1 was prepared consistent with the Program's Revised Multi-Year Plan. Table 4-1 identifies planned receiving water monitoring activities for FY 06-07, the proposed schedule (by fiscal year quarter) for conducting the work, the rationale for the proposed item and the lead party. The locations and frequencies of sampling events scheduled during FY 06-07 are provided within Table 4-2 of Attachment 4-1. A site map (Figure 4-1) detailing sampling locations in the Coyote Creek, Stevens Creek and Permanente Creek is also provided within Attachment 4-1. Table 4-3 of Attachment 4-1 provides a description of data parameters and analytical methods to be used in the Revised Multi-Year Plan.

The Program has also developed a characterization memorandum for the Coyote Creek watershed that includes a summary of existing data and information resources; a description of relevant watershed attributes; and a list of key issues. This memorandum, which is entitled *Watershed Characterization and Sampling Design Rationale-Coyote Creek Watershed*, is included as Attachment 4-2. It is intended to assist Program staff in developing an appropriate FY 06-07 sampling design for this watershed.

In September 2006, the Program will develop a Summary Assessment Report for FY 05-06 monitoring activities that occurred in the Stevens Creek, Permanente Creek, Matadero/Barron Creeks, Calabazas Creek watersheds, and Sunnyvale East and West Channels.

Watershed Assessment

Watershed assessment is the systematic review of specific resources (e.g., benthic macroinvertebrates or fish and their habitat and riparian areas in a watershed-scale context). Watershed assessment is a stage-setting process intended to be based primarily on existing information. The results of a watershed assessment can be used to establish the context for subsequent evaluations and analysis of cumulative watershed effects. Watershed assessments typically address cumulative effects within a watershed; provide for more ecologically sound resource planning; and identify and help protect environmentally sensitive areas.

A framework for conducting watershed assessments is identified in the Program's Revised Multi-Year Plan (dated July 1, 2004). The framework includes conducting screening-level monitoring over a period of two years, followed by an assessment of existing data sources in a watershed-scale context. Assessment results will be documented in a *Watershed Assessment Report*; and include descriptions of assessment methods, identification of data gaps and potential follow-up studies, and recommended management actions, where feasible.

During FY 05-06, the Program conducted a watershed assessment of the Saratoga Creek watershed to meet the following objectives:

- Evaluate existing data sources with respect to environmental indicators of watershed health and support of beneficial uses;
- Conduct special study to evaluate potential sediment impacts to salmonid fish population and aquatic habitat;
- Identify data gaps and potential follow-up studies; and
- Identify recommended management actions designed to reduce/eliminate impacts on beneficial uses.

The assessment evaluated existing monitoring data (i.e., ambient surface water quality, physical habitat assessment and bioassessment studies) collected by the Program during the previous two years (FY 03-04 and FY 04-05); and data from other sources. During FY 05-06, the Program collected additional monitoring data to address data gaps and meet the objectives listed above. These studies included conducting a rapid stream assessment within the urban areas of Saratoga Creek to determine overall condition of riparian corridor and identify potential impacts to beneficial uses. In addition, the Program surveyed fish populations and aquatic habitat at representative reaches in the Saratoga Creek watershed to determine potential impacts from fine grained sediment on aquatic life uses. The results of the special study will provide information needed to recalculate priority ranking of potential sediment impairment in Saratoga Creek.

Planned FY 06-07 Activities

All watershed assessment activities conducted in FY 06-07 will be associated with future sediment assessments (see below). The next watershed assessment is tentatively scheduled for FY 07-08 in Adobe and/or Matadero/Barron Creek watersheds.

Sediment Assessment

Beginning in FY 03-04, the Program began conducting watershed analyses and sediment management practice assessments in high priority Santa Clara Valley watersheds to determine if excessive sediment production from anthropogenic activities is adversely impacting creeks. To provide a framework for conducting these studies, the Program submitted a Sediment Assessment Work Plan to Water Board staff on August 30, 2002 in fulfillment of the Permit Provision C.9.f.iii paragraph two (see Attachment 4-5 of the Program's FY 03-04 Work Plan).

The Sediment Assessment Work Plan contains two separate phases. Phase I includes conducting a limiting factors analysis (LFA) and sediment management practices assessment. Phase II includes conducting a rapid sediment budget. Phase II will only be conducted if Phase I study results indicate that excessive sediment from anthropogenic sources is adversely impacting beneficial uses in the watershed.

The Program completed a LFA and sediment management practices assessment in Stevens Creek on September 10, 2004. The Watershed Analysis Ad Hoc Task Group (Watershed Analysis AHTG), which was previously established to develop the Sediment Assessment Work Plan, reviewed the documents developed in Phase I of the Stevens Creek watershed assessment and made recommendations to the Management Committee to not conduct Phase II. In addition, the Watershed Analysis AHTG identified Upper Penitencia Creek as the next high priority watershed to conduct Phase I.

In FY 04-05, the Program initiated a LFA in Upper Penitencia Creek. A Draft LFA Technical Report was released in December 2005. During the remainder of FY 05-06, the Watershed

Analysis AHTG will complete their review of the Upper Penitencia Creek LFA and make recommendations for Phase II, if warranted. In addition, Program Staff in coordination with the Watershed Analysis AHTG will complete a sediment management practices assessment for Upper Penitencia Creek.

During FY 05-06, the Program also conducted a Watershed Assessment of Saratoga Creek as part of the Revised Multi-Year Plan. One of the objectives of the assessment was to investigate potential impacts of fine grained sediment to the salmonid fish population and aquatic habitat. The assessment results will be evaluated to help determine if aquatic life uses are being impaired by fine grained sediment and whether or not further investigation (i.e., LFA) is warranted. The Saratoga Creek Watershed Assessment Report will be completed by June 2006.

Planned FY 06-07 Activities

Specific sediment assessment activities conducted in FY 06-07 will depend on the findings of the Upper Penitencia Creek LFA. If results of the LFA indicate that excessive sediment from anthropogenic sources is impairing beneficial uses in the watershed, the Program will initiate work on the Phase II Rapid Sediment Budget within the Upper Penitencia Creek watershed. In parallel, watershed analyses will begin within the Coyote Creek watershed. The primary functions of the Coyote Creek watershed analysis will be to determine if anthropogenic sources of sediment are impacting beneficial uses in the upper portion of Coyote Creek (below Anderson Dam) and to inventory, document and evaluate the effectiveness of existing sediment management practices. In addition, the Program will initiate planning, development and implementation of a pilot monitoring approach designed to assess the effectiveness of controls implemented through the Program's Hydromodification Management Plan (HMP). For additional details, refer to the *Watershed Analysis (i.e., Sediment Assessment) in Coyote Creek Watershed* monitoring project summary within Attachment 4-3.

Trash Investigations and Plan Implementation

On November 14, 2001, the Water Board released the document entitled Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region Report. This report states that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …" In a proactive response to the 303(d) Staff Report, the Program's Management Committee formed a Trash AHTG that developed a Work Plan (submitted March 1, 2003) to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways of the Santa Clara Basin.

Since FY 03-04, the Program has completed the following Work Plan tasks: 1) Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in or near creeks; 3) Assist municipalities in identifying trash problem areas and sources of trash; 4) Conduct trash evaluations at a subset of identified trash problem areas; 5) Identify and begin to implement or refine existing trash control measures, where feasible, to address trash problem areas; and 6) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

Planned FY 06-07 Activities

The tasks identified in the FY 06-07 Work Plan focus on the implementation of trash evaluations and control measures, as appropriate to address trash problem areas in urban streams and waterways. The Program will provide results from all trash evaluations and specific information on trash management practices implemented within each jurisdiction using a standardized reporting format. The Program will also implement a Pilot Demonstration Project which focuses on documenting type and volume of trash that can potentially be conveyed through the storm drain system and assist Co-permittees in conducting key trash evaluations identified by Co-permittees as part of the Trash AHTG. For additional information on planned trash activities, refer to the *Implement Trash Work Plan* monitoring project summary within Attachment 4-3.

Regional Collaborative Monitoring Efforts

Regional Monitoring Program for Trace Substances (RMP)

In accordance with the Program's NPDES permit, the Program contributes approximately $162,000 annually to the Regional Monitoring Program for Trace Substances (RMP), which monitors contaminants in water, sediments, and fish and shellfish tissue in San Francisco Bay and the Delta. The San Francisco Estuary Institute (SFEI) administers the RMP. This funding is in addition to separate funding provided by the three South Bay POTWs (which are operated by SCVURPPP Co-permittees) to SFEI. The RMP has approved a two percent budget increase for FYs 2007, 2008 and 2009. Program staff participates on the RMP Steering Committee, Technical Review Committee and Sources, Pathways and Loading Work Group (SPLWG). The Program Manager serves as the BASMAA representative to the RMP Steering Committee.

Clean Estuary Partnership (CEP)

On August 6, 2001, a Memorandum of Understanding (MOU) regarding development of: 1) a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries and 2) TMDLs for 303(d) pollutants (including mercury), was entered into by the Water Board, BACWA and BASMAA. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program assisted in developing and funding potential projects for the Bay TMDLs. The CEP is currently under review and may be redesigned to better meet the goals and objectives of the funding agencies. During FY 06-07, Program staff will participate in the redesign process and continue to track ongoing TMDL projects.

Bay Area Stormwater Management Agencies Association (BASMAA)

The Program is a member of BASMAA, a consortium of seven San Francisco Bay Area municipal storm water programs. The goal of BASMAA is to promote regional collaboration on developing consistent monitoring and watershed assessment methodologies and to facilitate efficient use of public resources. Program staff participates in the following BASMAA activities: Executive Board, Monitoring Committee, New Development Committee, Public Information/Participation Committee and Operational Permits Committee and serves as the Vice-chair of the BASMAA Executive Board. The Program expects to continue participating in BASMAA activities during FY 06-07.

Regional Biological Assessment Network (BAMBI)

In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in storm water programs that include rapid bioassessments in their watershed monitoring and assessment programs. Since the initial workshop, the Program has assisted (with planning and coordination) and participated in four annual BAMBI workshops (through 2005).

In support of BAMBI, Program staff has assisted the development of an Index of Biotic Integrity (IBI) for Bay Area Creeks, with the goal of developing a regional bioassessment tool necessary to provide context to data collected in Santa Clara Basin creeks. A draft BAMBI IBI Work Plan was presented at the 2005 BAMBI Workshop. Program staff has provided in-kind services to implement specific tasks identified in the work plan. For additional information regarding these activities, refer to the BAMBI monitoring project summary in Attachment 4-3.

Brake Pad Partnership (BPP)

After studies in the South Bay indicated that automobile brake pads may be the most significant source of copper in urban runoff, the Brake Pad Partnership (BPP) was initiated in 1996 as a collaboration between regulators, storm water programs, brake material manufacturers, scientists and environmentalists to address environmental problems from brake wear debris. The BPP's work includes research and monitoring, and is an integral part of the Program's Copper Action Plan. In addition, the Program participates (via BASMAA) by funding a BPP technical representative and a stakeholder process managed by Stainable Conservation.

Planned FY 06-07 Activities

The Program will continue to participate in various RMP committees and work groups; participate in the CEP depending on the availability of resources; and collaborate with BASMAA on regional stormwater issues. In addition, the Program anticipates providing support and actively participating in BAMBI activities with the goal of beginning the development of a regional bioassessment tool which is necessary to provide context to bioassessment data collected in creeks relevant to the Program. Contingent upon available funding, the Program also plans to continue participating in the BPP through BASMAA and/or the CEP.

SUMMARY OF PROGRAMMATIC MONITORING INDICATORS (PMIs)

Programmatic Monitoring Indicators (PMIs) are used to gauge how well performance standards are being met and control measures are being implemented. Programmatic monitoring efforts typically include tracking and evaluating continuous improvements and evaluating the effectiveness of implementing control programs for pollutants of concern.

The FY 05-06 PMIs Summary Table (see Attachment 4-4) illustrates all existing commitments and priorities established by the Program, including ongoing activities meant to fulfill Water Board Order Provisions C.9. "Water Quality-Based Requirements for Specific Pollutants of Concern" and C.10. "Watershed Management" of the NPDES permit. A brief capsule scope is provided for each project along with the anticipated products and expected timeframe for completion. For some projects, specifically those that are being conducted to directly respond

to a specific pollutant of concern referenced in the NPDES permit, a separate one-page scope was developed and is presented within Attachment 4-3. Pesticide management activities planned for FY 05-06 are presented within Section 5 of this Work Plan.

Control Program Activities- PCBs, Mercury, Dioxins and Legacy Pesticides

The 1998 and 2002 Clean Water Act Section 303(d) lists designate all segments of San Francisco Bay as impaired by certain dioxin-like compounds, mercury, polychlorinated biphenyls (PCBs) and certain chlorinated pesticides referred to as legacy pesticides (DDTs, dieldrin and chlordanes). The listings were in response to an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment (OEHHA). OEHHA issued the advisory after these pollutants were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. It should be noted that the Water Board opposed the 1998 listing of dioxins in the Bay, but was overruled by the United States Environmental Protection Agency (USEPA).

The 2002 303(d) list designates the TMDL priority for mercury and PCBs as high. As a result, the Water Board is currently implementing TMDLs for these pollutants. The 303(d) list designates the TMDL priority for dioxins, dieldrin, chlordanes and DDTs as low. Bay TMDLs are not currently planned for these pollutants.

Previous Work

During the past several years, monitoring program activities related to dioxins, mercury, PCBs, and chlorinated pesticides have included:

Multiple Pollutants

- The Program led a regional study, referred to as the Joint Stormwater Agency Project (JSAP), which characterized the distribution of mercury, PCBs and chlorinated pesticides in storm water conveyance sediments in Bay Area watersheds.

- The Program has provided funding to BASMAA, the Clean Estuary Partnership (CEP), and the San Francisco Estuary Regional Monitoring Program (RMP). These regional programs help monitor pollutants of concern and/or assist in the development of management strategies.

- Program staff has participated in selected stakeholder, BASMAA, CEP and RMP committees and work groups.

- Program staff represented BASMAA on the RMP Technical Review Committee and the Sources, Pathways and Loadings Work Group; and CEP mercury and PCBs work groups.

- The Program has collected and analyzed water and sediment samples from selected Santa Clara Valley watersheds as part of its receiving waters monitoring and assessment program. Additional information is available in the Revised Multi-Year Plan.

PCBs

- The Program and the City of San Jose performed PCBs case study work in six urban areas in San Jose where elevated concentrations of PCBs were found during the JSAP study. The case studies were aimed at identifying PCBs sources and beginning to develop controls.

- To assist other Bay Area storm water agencies, the Program developed guidance documents on performing PCBs case studies. The guidance documents outlined case study objectives, typical methodologies and tasks, locations and schedules.

- Program staff facilitated a work group of representatives from BASMAA and Water Board staff to coordinate the JSAP study and PCBs cast studies. The work group met periodically to facilitate information sharing, coordination of field activities and regional planning.

- The Program prepared a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County.

- The Program completed a review of efforts to develop methods of controlling discharges of PCBs from Bay Area urban runoff conveyances. The review:

    - Summarizes and discusses past, current and planned efforts to identify PCBs control options in the Bay Area in coordination with the Bay PCBs TMDL, including the PCBs case studies performed by Bay Area storm water agencies.
    - Describes existing Bay Area urban runoff management practices that may help control discharges of PCBs.
    - Reviews potential new management practices for controlling discharges of PCBs and qualitatively discusses the pros and cons of each practice.

Dioxins

- The Program reviewed readily available data on methods used to characterize dioxin compounds in storm water runoff and surface waters and concentrations typically found in the Bay Area and other areas.

- The Program collaborated with other Bay area storm water management agencies to develop a “synthesis” document on dioxin-like compounds. This document summarizes the current state of knowledge regarding dioxin-like compounds in relation to storm water runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, impacts, sources, pathways, review of relevant Bay Area, national and international studies, and qualitative review of potential storm water controls.

- Program staff began tracking regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Program staff also began encouraging Co-permittees to track and participate in these programs; and evaluate the feasibility of performing public outreach activities and developing policies and ordinances (e.g., City of Palo Alto’s Dioxin Elimination Policy).

Planned FY 06-07 Activities

The Program plans to continue collaborating with the regulatory and discharger community; and other stakeholders to develop technically and economically feasible strategies to address controllable sources of pollutants of concern. The overarching principle is to develop cost-effective strategies with realistic potential to protect public health. Factors other than strict cost-effectiveness (e.g., the likelihood of identifying responsible parties or obtaining state or federal funding to identify and cleanup on-land PCBs sites) may be important. The Program will also consider the potential benefit of implementing strategies that concurrently address multiple sediment-bound pollutants.

During FY 06-07, the Program will continue to work with other Bay area dischargers and Water Board staff through BASMAA and the RMP to implement regional projects related to dioxins, mercury, PCBs, and chlorinated pesticides.[1] This may include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by BASMAA, the RMP and Water Board staff. Program staff will continue to represent BASMAA on the RMP Technical Review Committee and the RMP Sources, Pathways and Loadings Work Group.

Program staff will continue to track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Co-permittees will be encouraged to track and participate in these programs and evaluate the feasibility of performing public outreach activities and developing related policies and ordinances. Relevant regional, state and federal efforts include the Bay Area Dioxins Project managed by the Association of Bay Area Governments and multi-faceted efforts by USEPA to assess dioxin risks and monitor and control dioxins.

Additional planned FY 06-07 activities for controlling mercury are presented in Section 6.

Control Program Activities - Copper and Nickel

The majority of baseline actions are implemented at the Program level (except for those assigned to San Jose, Sunnyvale and Palo Alto), and are included in the Program's Annual Reports and Work Plans. However, the Water Board expects Co-permittees to implement applicable actions at the local level. The Program has identified the following copper/nickel control activities that are feasible to implement at the Co-permittee level:

- CB-1: Measures to reduce copper discharges from vehicle washing operations;
- CB-3: Measures to control copper in discharges of stormwater in targeted industrial sources;
- CB-6, 7: Measures to reduce traffic congestion/promote alternative transportation;
- CB-8: Measures to classify and assess watersheds and improve institutional arrangements for watershed protection;
- CB-11: Measures to improve street sweeping controls and stormwater system operation and Maintenance;
- CB-12: Measures to control copper discharges from pools and spas;
- CB-21: Measures to discourage architectural use of copper; and
- NB-1: Measures to control nickel discharges from construction sites (sediment).

[1]The Program is separately implementing a mercury pollution prevention program. See Section 6 of the Program's Work Plan and past Annual Reports for additional information.

Individual Co-permitees included measures to address each of these activities, as applicable, within their Work Plans provided in Section 9. Currently, the Program's Copper/Nickel Activity Tables contain 21 copper and 7 nickel baseline actions. Certain copper actions (e.g. measures to improve street sweeping controls, measures to control copper from targeted industrial sources, measures to evaluate effectiveness of performance standards) closely relate to existing performance standards requirements or are otherwise independently mandated by the Program's NPDES permit (e.g., Permit Provision C.6.a.i and ii). Since late 2004[2], the Bay Modeling and Monitoring (BMM) subgroup has been working to transition from the current Program CAP/NAP approach to a bay-wide Copper Management Strategy (CMS). A detailed summary of these efforts is provided within Attachment 4-5.

FY 06-07 Work Plan Content

The Program's FY 06-07 Copper/Nickel Activity Tables are consistent with the previously agreed upon format as first used in the Program's *Revised FY 03-04 Copper/Nickel Work Plan*, (i.e., tabular format with columns listing the activity, the FY 06-07 tasks, status/comments, due date, and responsible party). In addition, it provides updates for FY 05-06 accomplishments reported to date; the originally proposed work plan tasks for FY 05-06; and actions accomplished in FY 5-06 (if applicable). The FY 06-07 Copper/Nickel Activity Tables are provided within Appendix A. A complete report of FY 05-06 accomplishments will be included within the Program's *FY05-06 Annual Report*. In addition, the City of San Jose will continue to monitor and report on dissolved copper and nickel concentrations during the dry season in Lower South San Francisco Bay as part of the CAP/NAP ambient monitoring and trigger program. This continued independent sampling effort needs to be evaluated as part of the changes made to the overall RMP Bay-wide sampling effort.

ADDITIONAL PROGRAMMATIC MONITORING INDICATORS (PMIs)

Enhanced Reporting - Industrial/Commercial Discharger Control and Illicit Connection/Illegal Dumping Elimination

Since October 2001, Program staff has been assisting each Co-permittee (on an individual basis) with the implementation of enhanced reporting requirements for IND and IC/ID. Since FY 01-02, Co-permittees have submitted raw IND and ICID inspection data to Program staff. To demonstrate consistency and compliance (on a Program-wide basis) with the strategy provided in the Program's technical memoranda regarding IND and IC/ID reporting (dated September 7, 2001) and the approved MC approach, Program staff has been constructing IND and IC/ID summary tables using individual Co-permittee data. The summary tables are double checked with the Co-permittees to ensure that the results are reasonably consistent with their internal data and their interpretation of the data; provided to the Co-permittees for inclusion in their annual reports; and included in the Program's Annual Report. The overall goal of the effort has been to capture the full extent and the results of the Co-pemittees efforts in a consistent format and on a Program-wide basis. Overall, this effort has been very successful.

Planned FY 06-07 Activities

To ensure consistent and overall Program reporting of IND and IC/ID data, Co-permittees will continue submitting inspection and incident data so Program staff can construct IND and IC/ID

[2] On November 10, 2004, the BMM subgroup agreed to begin reviewing recommendations on whether or not each CAP/NAP baseline activity would be appropriate to implement (or continue to implement) Bay-wide and how reporting might best be conducted in the future.

summary tables for the *FY 06-07 Annual Report*. Co-permittees will conduct their own effectiveness evaluations based on their own data. The Program will work with the Co-permittees to construct IND and IC/ID summary tables using individual Co-permittee data.

Compile, Maintain and Share Program Watershed Data

The Program conducts the following activities relating to data management:

Program's Website

Program staff continually updates and maintains the Program's web site (www.scvurppp.org) to ensure the effective distribution and review of draft and final products; and internal communication with the MC and other interested parties. In July 2005, Program staff released an updated version of the Program's website. The updated version allows easy navigation and location of final work products and other relevant information. Since 1997, the Program has completed 319 work products or major reports. The vast majority of these documents are available on the website as downloadable documents.

Streams Studies Inventory

The Watershed Assessment and Monitoring Subgroup (WAMS), an entity within the Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAMS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The *Inventory of Santa Clara Basin Stream Studies* (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0), November 2003 (version 5.0) and June 2005 (version 6.0). The Program funded the initial development of the SSI and each of the annual updates. The Program funded the initial development of the SSI and each of the annual updates. During FY 06-07, a general update of the SSI (version 7.0) will occur. In FY 07-08, the second substantial update of the SSI (version 8.0) will occur. The first substantial update previously occurred with version 4.0.

Watershed Data Management

To comply with its NPDES permit, the Program also compiles, develops and analyzes a variety of data sets and reports. Most of this data is collected and generated as part of the Program's environmental monitoring and assessment activities. A majority of the information collected and used by the Program originates from different municipalities and agencies that conduct studies within Program jurisdictional boundaries.

The Program developed a relational database as an initial task to systematically describe and document data used for its activities. The intent of the database is to demonstrate its usefulness of how to systematically and efficiently collect and document all of the relevant data used in the Program's activities. In addition, the database was designed to explore the feasibility of eventually expanding and coordinating its maintenance and use with other agencies and organizations in the Program.

The SCVURPPP metadata database currently stores information on watershed studies described in the updated SSI version 6.0 and archived information from previous versions of the SSI. The database was also developed to produce a report listing current projects information in a format similar to previous SSI Reports. In addition, the Program database provides querying capabilities for watershed information listed in both the SSI and SCBWMI's Metadata database.

Planned FY 06-07 Activities

During FY 06-07, a general update of the SSI (version 7.0) will occur. In FY 07-08, the second substantial update of the SSI (version 8.0) will occur. Program staff will collect information on new projects and update information on existing projects (See project scope within Attachment 4-3). This data will also be entered into the Program's database. Program staff will continue to update and maintain the Program's web site (www.scvurppp.org).

Watershed Management Initiative- Support for Land Use Subgroup and Watershed Assessment and Monitoring Subgroup

To implement the Program's Monitoring Priority 3c, develop strategies for controlling impacts of land use on beneficial uses, the Program supports the SCBWMI Land Use Subgroup (LUS). While providing administrative support and leadership for the LUS, the Program also assists SCBWMI LUS with specific technical and training projects consistent with URMP goals and objectives. In addition, the Program has provided administrative support to the SCBWMI Watershed Assessment and Monitoring Subgroup (WAMS).

Planned FY 06-07 Activities

In FY 06-07, the Program will continue to provide limited support to the SCBWMI LUS by providing administrative support and direction; assist in training workshops regarding the impacts of development on creeks; and incorporate water quality friendly designs in development projects which are consistent with the top five priorities identified by the SCBWMI. In FY 05-06, the Program will continue to provide limited administrative support to the SCBWMI WAMS.

Attachment 4-1

Attachment 4-1

Table 4-1. FY 06-07 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 06-07				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Coyote Creek	***Chemical***						
	Contaminants-Water [3]	S (2)		S (2)		• Baseline: Metals (dissolved and total) were measured at eight stream locations in Coyote Creek during summer season in 1999-2001 and organophosphate pesticides were sampled at 2-3 sites during summer 2000-01 as part of Stream Augmentation Study. • FY 06-07: Conduct screening level monitoring of dissolved and total metals and organophosphate pesticides concentrations at two sites during summer and winter seasons. Hardness of water samples will be measured synoptically.	SCVURPPP
	Contaminants-Sediment[4]	S (8)			S (8)	• Baseline: Metal concentrations were measured in sediment samples at nine stream locations in Coyote Creek during summer season in 1999 as part of SEIDP project. PCB and mercury concentrations in sediment were measured in selected catchments of Coyote Creek watershed during 2000-01 as part of Regional Project. • FY 06-07: Conduct screening level monitoring of metals, PCBs and pyrethroids at eight stream locations during summer and spring season. TOC, percent solids and sediment grain size will be measured synoptically.	SCVURPPP
	General Water Quality[5]	S(10)		S (2)	S(18)	• Baseline: General water quality sampling was measured at eight stream locations in Coyote Creek during summer season in 1999-2001. Continuous temperature monitoring conducted by SCVWD as part of FAHCE project. • FY 06-07: Screening level measurements of general water quality using probes will be conducted synoptically with water sampling (two sites), sediment sampling (eight sites) and bioassessment (ten sites). Continuous temperature monitoring will be conducted by SCVWD as part of Mid-Coyote Flood Control Project.	SCVURPPP/ SCVWD
	Biological						
	Toxicity-Sediment[6]	S (4)			S (4)	• Baseline: No existing baseline data. • FY 06-07: Sediment toxicity testing will be conducted at four sites during summer and spring season, synoptically with sediment chemistry sampling.	SCVURPPP
	Pathogen Indicator Organisms [7]	S (4)		S (4)		• Baseline: Bacterial indicators concentrations in water were measured at eight stream locations in Coyote Creek during summer season in 1999-2001 as part of Stream Augmentation Study. • FY 06-07: Conduct monitoring of bacterial indicators at four stream sites located in city and county parks during summer and winter season.	SCVURPPP

Attachment 4-1

Table 4-1. FY 06-07 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 06-07				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment – Macroinvertebrates[8]				S(10)	• Baseline: Benthic macroinvertebrate (BMI) bioassessments were conducted at eleven sites in Coyote Creek mainstem during 1997 as part of USGS study. BMI assessments were also conducted at nine sites during 1999 as part of SEIDP and six sites during 2000 as part of Stream Augmentation Study. • FY 06-07: Benthic macroinvertebrate bioassessment will be conducted at ten sites synoptically with physical habitat assessment. BMI sampling will occur at all sediment sampling sites.	SCVURPPP
	Bioassessment – Fish[9]					• Baseline: Existing fish survey data were collected within the Coyote mainstem in the following studies: 12 sites by Rob Leidy during 1995-97, 18 sites by SCVURPPP during 1999 and five sites by SCVWD during 2000. Downstream migrant trapping was also conducted by SCVWD during 1998-2000. • FY 06-07: Fish community sampling and out-stream migrant trapping for steelhead is planned in the Coyote mainstem starting in spring 2007 by SCVWD as part of Mid-Coyote Flood Control Project.	SCVWD
	Physical						
	Physical Habitat[10]				S(10)	• Baseline: Continuous aquatic habitat survey was conducted in 1999 as part of FAHCE Project by SCVWD. Habitat surveys were also conducted at 18 stream locations in Coyote mainstem in 1999 as part of SEIDP. • FY 06-07: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at ten sites. Aquatic habitat surveys are planned in Coyote mainstem starting in fall 2006 by SCVWD as part of Mid-Coyote Flood Control Project.	SCVURPPP/ SCVWD
	Sediment Characterization[11]				S (4)	• Baseline: Substrate composition and embeddedness was visually estimated in Coyote mainstem in 1999 as part of FAHCE Project. • FY 06-07: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at ten sites in Coyote mainstem. Collection of surface/subsurface sediment samples are planned in Coyote mainstem starting in fall 2006 by SCVWD as part of Mid-Coyote Flood Control Project.	SCVURPPP/ SCVWD
	Channel Dynamics and Hydrology					• Baseline: Historical ecology study was conducted in the Coyote Creek watershed by SFEI in 2005-06. • FY 06-07: Longitudinal profiles, suspended and bedload sediment sampling, and bankfull discharge measurements will be measured by SCVWD as part of Mid-Coyote Flood Control Project.	SCVWD

Attachment 4-1

Table 4-1. FY 06-07 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 06-07				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Riparian Vegetation					• Baseline: Bankside and canopy cover was estimated as part of FAHCE Project (1999). • FY 06-07: Bankside cover, canopy cover and qualitative assessment of riparian vegetation will be conducted in fall 2006 by SCVWD as part of Mid-Coyote Flood Control Project.	SCVWD
Stevens Creek	***Chemical***						
	Contaminants – Water Quality	S (2)		S (2)		• Baseline: Screening level monitoring of dissolved and total metals and organophosphate pesticides concentrations was conducted by SCVURPPP during FY 05-06 at two sites synoptically with toxicity testing during dry and wet seasons. Metals and pesticides were also measured in 2003 by RWQCB as part of SWAMP. • FY 06-07: Continue screening level monitoring of dissolved and total metals and organophosphate pesticides concentrations at two sites during dry and wet seasons.	SCVURPPP
	General Water Quality	S (2)		S (2)	S (7)	• Baseline: Screening level measurements of general water quality was conducted by SCVURPPP synoptically with water chemistry (2 sites) and BMI bioassessment (6 sites) in FY 05-06.General water quality sampling (both probe and continuous) was conducted in 2002-03 by RWQCB at three sites during three seasonal time periods. • FY 06-07: Screening level measurements of general water quality will be conducted synoptically with water chemistry (2 sites) and bioassessment sampling (7 sites).	SCVURPPP
	Biological						
	Toxicity - Water Quality	S (2)		S (2)		• Baseline: Toxicity of water was conducted by SCVURPPP at two sites in FY 05-06 during dry and wet season synoptically with water chemistry samples. Water toxicity testing was also conducted in 2002-03 by RWQCB at two sites during three seasonal time periods. • FY 06-07: Toxicity of water will be conducted at two sites during dry and wet season, synoptically with water chemistry sampling.	SCVURPPP
	Pathogen Indicator Organisms	S (2)		S (2)		• Baseline: Screening level monitoring of bacterial indicators was conducted by SCVURPPP in FY 05-06 at two sites during two seasonal time periods. • FY 06-07: Continue screening level monitoring of bacterial indicators at two sites during two seasonal time periods.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (7)	• Baseline: BMI bioassessment study was conducted at seven sites during spring season of FY 05-06. BMI bioassessments were also conducted in Stevens Creek during April 2002 by RWQCB at eight sites and by USGS in spring and fall 1997 at seven sites. • FY 06-07: Continue BMI bioassessment study at seven sites during spring season.	SCVURPPP

Attachment 4-1

Table 4-1. FY 06-07 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 06-07				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment - Fish					• Baseline: Fish surveys were conducted at five stream locations between 1994 and 1996 by Rob Leidy. Additional fish survey information was collected by the SCVWD at selected locations between 1998 and 2000. • FY 06-07: No sampling is planned.	SCVURPPP
	Physical						
	Physical Habitat				S (7)	• Baseline: Visual physical habitat assessments, concurrent with macroinvertebrate sampling, were conducted in April 2006 at six sites by SCVURPPP, and at eight sites by RWQCB in April 2002. • FY 06-07: Visual physical habitat assessments will be conducted, concurrent with macroinvertebrate sampling, at six sites.	SCVURPPP
	Sediment Characterization				S (7)	• Baseline: Substrate composition and embeddedness was visually estimated in April 2006 by SCVURPPP at six sites and in 2002 by RWQCB at eight sites. • FY 06-07: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at six sites.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Geomorphic assessment conducted in 2004 as part of SCVWD Stream Stewardship Project. • FY 06-07: Monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: Bankside and canopy cover was estimated as part of FAHCE Project (1999). • FY 06-07: Specific monitoring objectives have not been identified at this time.	SCVURPPP
Permanente Creek	***Chemical***						
		S (2)		S (2)		• Baseline: Screening level monitoring of dissolved and total metals and organophosphate pesticides concentrations was measured at two sites in FY 05-06 by SCVURPPP during dry and wet seasons. Dissolved and total metals and pesticide suite were also measured in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 06-07: Continue screening level monitoring of dissolved and total metals and organophosphate pesticides concentrations at two sites during dry and wet seasons.	SCVURPPP
	General Water Quality	S (2)		S (2)	S (6)	• Baseline: Screening level measurements of general water quality was conducted synoptically with water chemistry (2 sites) and bioassessment sampling (5 sites). General water quality sampling (both probe and continuous) was conducted in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 06-07: Continue screening level measurements of general water quality during water chemistry (2 sites) and bioassessment sampling (6 sites).	SCVURPPP

Attachment 4-1

Table 4-1. FY 06-07 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 06-07				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Biological						
	Toxicity - Water Quality					• Baseline: Toxicity of water was conducted at two sites in FY 05-06 by SCVURPPP during dry and wet season. Water toxicity testing was conducted in 2002 and 2003 by RWQCB at two sites during three seasonal time periods. • FY 06-07: No toxicity testing is planned.	SCVURPPP
	Pathogen Indicator Organisms					• Baseline: Screening level monitoring of bacterial indicators was conducted by SCVURPPP in FY 05-06 at two sites during two seasonal time periods. • FY 06-07: No monitoring of bacterial indicators is planned.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (6)	• Baseline: BMI bioassessment study was conducted at six sites in April 2006 by SCVURPPP and at seven sites by RWQCB in April 2002. • FY 06-07: Conduct benthic macroinvertebrate bioassessment at six sites in April 2007.	SCVURPPP
	Bioassessment - Fish					• Baseline: Fish bioassessments were conducted at four sites in October 2005 by SCVURPPP. Previous fish surveys were conducted at two stream locations between 1994 and 1996 by Rob Leidy. • FY 06-07: No fish bioassessment monitoring is planned.	SCVURPPP
	Physical						
	Physical Habitat				S (6)	• Baseline: Visual physical habitat assessment was conducted at six sites in April 2006 by SCVURPPP and at seven sites in April 2002 by RWQCB. • FY 06-07: Visual physical habitat assessment will be conducted, concurrent with macroinvertebrate sampling, at six sites.	SCVURPPP
	Sediment Characterization				S (6)	• Baseline: Substrate composition and embeddedness was visually estimated at five sites in April 2006 by SCVURPPP at seven sites in April 2002 by RWQCB. • FY 06-07: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at five sites.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Existing channel conditions downstream of Foothill Expresway described by SCVWD as part of flood planning study. • FY 06-07: Monitoring objectives have not been identified at this time.	SCVURPPP
	Riparian Vegetation					• Baseline: No existing data sources identified. • FY 06-07: Monitoring objectives have not been identified at this time.	SCVURPPP

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) investigative, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. Sampling locations are described in separate table and figure attached to Plan.

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology.

Attachment 4-1

3 Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg and organophosphate pesticides; sampling conducted during dry and wet seasons (summer/fall and winter/spring).

4 Sediment Chemistry: Total metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg, PCBs and pyrethroids; sampling conducted during dry and spring seasons.

5 General Water Quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted during dry and wet seasons.

6 Sediment Toxicity: Sediment bioassays on *Hyella azteca*.

7 Pathogen Indicator Organisims: total and fecal coliform, *Enterococcus, and E. coli*; sampling conducted during dry and wet seasons.

8 Bioassessment - Macroinvertebrates: following CSBP methodology and conducted in the spring season.

9 Bioassessment – Fish: Rapid assessment of fish communities will be done using EPA Rapid Bioassessment Protocols; sampling conducted in the fall season.

10 Habitat survey physical habitat assessment using CSBP methodology.

11 Creek substrate sediment composition and embeddedness is qualitatively estimated by visual observation during bioassessment and habitat survey.

12 Toxicity Testing: Aquatic bioassays on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted during dry and wet seasons.

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Table 4-2. Sampling locations, frequency and data types for SCVURPPP's FY 06-07 monitoring plan.

Station Id	Station Name	Sediment Chemistry	Sediment Toxicity	Water Chemistry	Water Toxicity	General Water Quality	Pathogen Indicators	Benthic Macroinvertabrate Bioassessment	Physical Habitat Assessment
Coyote Creek									
COY-1	Coyote Creek at Montague Expressway	2	2			3		1	1
COY-2	Coyote Creek downstream Berryessa Rd	2		2		3		1	1
COY-3	Coyote Creek at Watson Park					1	2	1	1
COY-4	Coyote Creek at William Street Park	2	2			3	2	1	1
COY-5	Coyote Creek upstream Story Road			2		3	2	1	1
COY-6	Coyote Creek at Yerba Buena	2	2			3	2	1	1
COY-7	Coyote Creek at Silver Creek Valley Rd	2				1		1	1
COY-8	Coyote Creek at Metcalf Rd	2				1		1	1
COY-9	Coyote Creek at Miramonte	2				1		1	1
COY-10	Coyote Creek at Cochrane	2	2			3		1	1
Stevens Creek									
SV-1	Stevens Creek at La Avenida					1		1	1
SV-2	Stevens Creek downstream Diversion Channel					1		1	1

ATTACHMENT 4-1

Table 4-2. Sampling locations, frequency and data types for SCVURPPP's FY 06-07 monitoring plan.

Station Id	Station Name	Sediment Chemistry	Sediment Toxicity	Water Chemistry	Water Toxicity	General Water Quality	Pathogen Indicators	Benthic Macroinvertabrate Bioassessment	Physical Habitat Assessment
SV-3	Stevens Creek at Barranca			2	2	3		1	1
SV-3.5	Stevens Creek at Stevens Creek Blvd			2	2	3		1	1
SV-4	Stevens Creek at Blackberry Farm						2		
SV-5	Stevens Creek at McClellan Ranch						2		
SV-6	Stevens Creek at USGS Gage Station					1		1	1
SV-7	Stevens Creek at Mossrock					1		1	1
SV-8	Stevens Creek at Upper Stevens Cr County Park					1		1	1
Permanente Creek									
P-1	Permanente Creek at Charleston			2		3		1	1
P-2	Permanente Creek at Barbara Ave					1		1	1
P-3	Permanente Creek at Fremont Ave					1		1	1
P-4	Permanente Creek upstream I-280					1		1	1
P-5	Permanente Creek at Rancho San Antonio park			2		3		1	1

ATTACHMENT 4-1

Table 4-2. Sampling locations, frequency and data types for SCVURPPP's FY 06-07 monitoring plan.

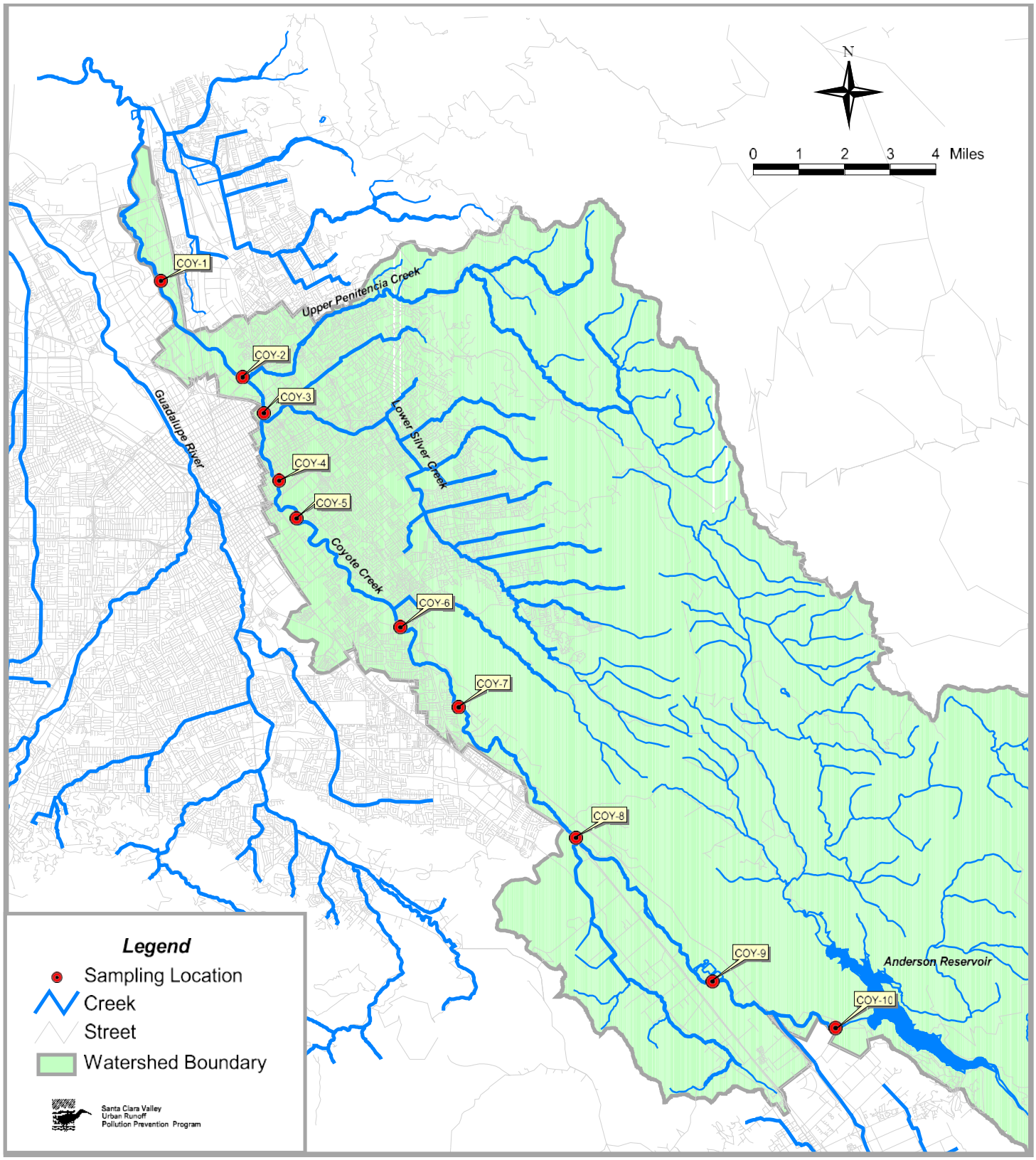
Station Id	Station Name	Sediment Chemistry	Sediment Toxicity	Water Chemistry	Water Toxicity	General Water Quality	Pathogen Indicators	Benthic Macroinvertabrate Bioassessment	Physical Habitat Assessment
P-6	West Branch Permanente Creek at Open Space					1		1	1
Total Number Samples		**16**	**8**	**12**	**4**	**43**	**12**	**23**	**23**

Sediment Chemistry: Total metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg, PCBs and pyrethroids; sampling conducted during dry and spring seasons.
Sediment Toxicity: Sediment bioassays on Hyella azteca.
Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg and organophosphate pesticides; sampling conducted during dry and wet seasons (summer/fall and winter/spring).
Water Toxicity: Aquatic bioassays on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted during dry and wet seasons.
General Water Quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted during dry and wet seasons.
Pathogen Indicators: total and fecal coliform, Enterococcus, and E. coli; sampling conducted during dry and wet seasons.
Bioassessment - Macroinvertebrates: following CSBP methodology and conducted in the spring season.
Physical Habitat Assessment: survey physical habitat assessment using CSBP methodology.

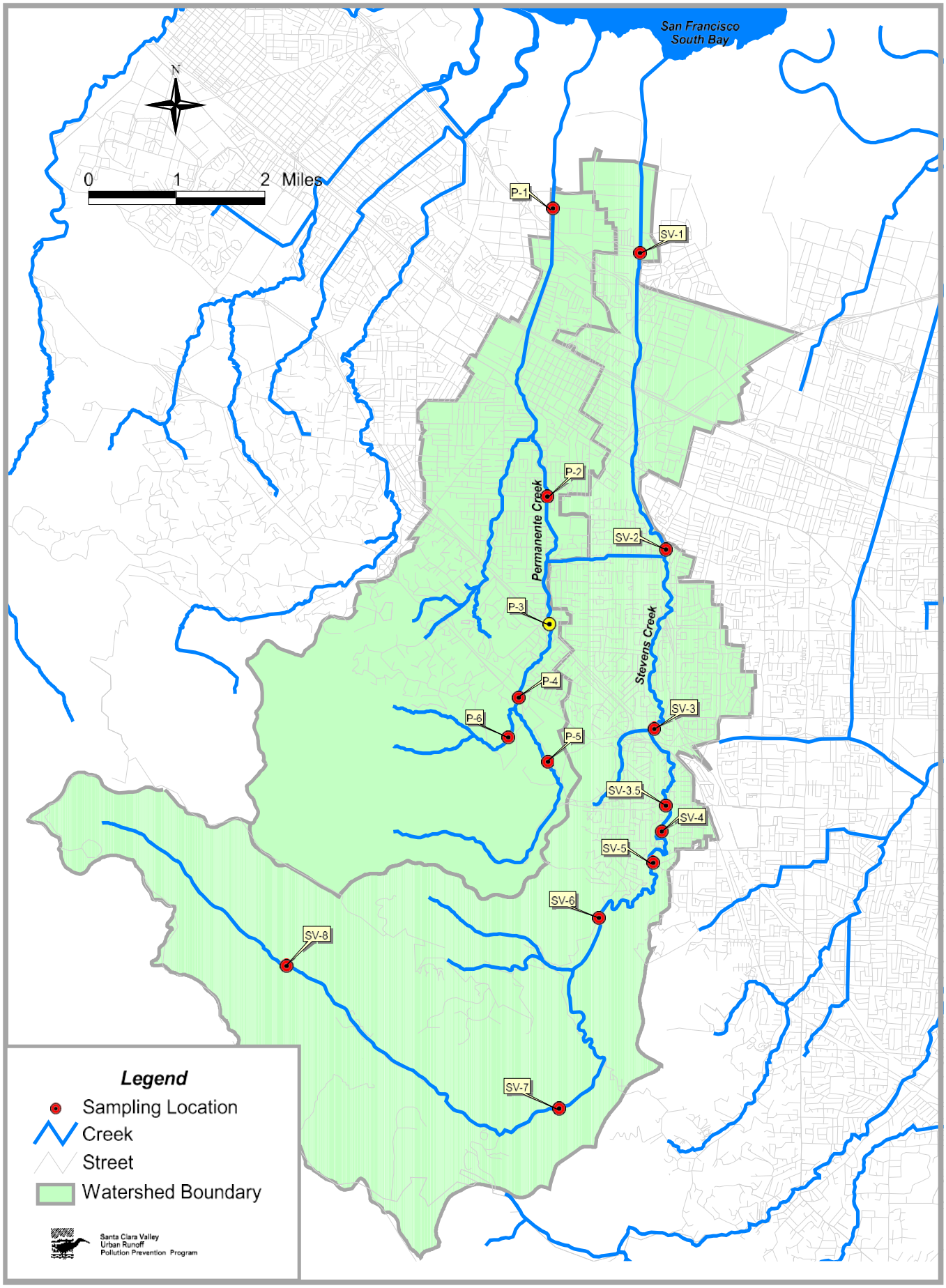
Attachment 4-1

Table 4-3. Analytical methods used in SCVURPPP Multi-Year Monitoring Plan.

Description of data parameters	Analytical Methods
Water Chemistry	
Pesticides (water) - Organophosphate suite	EPA 8141A
ICPMS metals suite (water)--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se)	EPA 200.8, 206.3TR, 270.3
ICPMS metals suite (water)--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se)	EPA 200.8, 206.3D, 270.3
Total mercury (water)	EPA 245.7
Boron	EPA 200.8
Hardness	EPA 130.2
Sediment Chemistry	
Pyrethroid Pesticides (sediment)	EPA 8270C(SIM)
PCBs (sediment) - Congeners	EPA 8270C(m)
PBDEs (sediment)	EPA 8270C(m)
ICPMS metals suite (sediment) (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As)	EPA 6020
Total mercury (sediment)	EPA 245.7/1631M
Percent moisture (sediment)	EPA 160.3
TOC (sediment)	EPA 9060
Sediment grain size - full analysis (phi scale)	Plumb/PSEP
Bacterial Indicators	
Total coliform	SM 9221B&E
Fecal coliform	SM 9221B&E
E. coli	SM 9221B&E
Enterococcus	EPA 1600
Toxicity Testing	
Ceriodaphnia 7-day Survival & Reproduction	EPA-821-R-02-013
Pimephales (fathead minnow) 7 - day	EPA-821-R-02-013
Selenastrum (algae) test	EPA-821-R-02-013
Hyella azteca (10 day Survival & Growth)	EPA-600-R-99-064



Attachment 4-1 Figure 4-1. SCVURPPP FY 06-07 Sampling Site Locations in Coyote Creek Watershed.



Attachment 4-1 Figure 4-2. SCVURPPP FY 06-07 Sampling Site Locations in Stevens and Permanente Creek Watersheds

Attachment 4-2

DRAFT
Technical Memorandum

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

TO: **Management Committee**

FROM: **Program Staff**

DATE: **March 1, 2006**

SUBJECT: **Watershed Characterization and Sampling Design Rationale - *Coyote Creek Watershed***

Introduction and Background

Environmental monitoring and waterbody assessments are key components in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program). Environmental monitoring provides information needed to: (1) assist the San Francisco Bay Regional Water Quality Control Board (Water Board) in characterizing receiving water quality in urban watersheds consistent with the priorities of the Santa Clara Basin Watershed Management Initiative (SCBWMI) and the Program; (2) develop an understanding of baseline conditions in waterbodies; (3) identify the need for site-specific water quality investigations to address questions that might arise while conducting screening-level monitoring efforts; and, (4) conduct waterbody assessments aimed at determining the condition of, and potential impacts to water bodies and Beneficial Uses (Uses).

Since FY 02-03, the Program has developed and implemented Annual Monitoring Program Plans (Annual Plans) in fulfillment of Provision C.7 of its National Pollution Discharge Elimination System (NPDES) Permit. The Annual Plans identify monitoring activities that are implemented each year as part of the Program's Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan). The Multi-Year Plan is based on a rotating watershed approach designed to monitor all watersheds in Program's jurisdiction during an eight year period, while maximizing available resources in any given year (SCVURPPP 2004). Monitoring activities conducted under the Multi-Year Plan are part of a monitoring and assessment process, which provides a formalized structure for conducting environmental monitoring and assessment activities over a number of years. The process includes the following steps: 1) Watershed characterization (e.g., characterization memo); 2) Screening level monitoring (i.e., status and trends); 3) Waterbody assessment; and, 4) Investigative monitoring projects (e.g., watershed/sediment analyses and HMP pilot monitoring project).

The Program implemented its first Annual Plan during FY 02-03 in Coyote Creek watershed. At that time, the Program decided to focus its FY 02-03 monitoring activities

in Coyote Creek subwatersheds (i.e., Upper Penitencia Creek and Lower Silver-Thompson Creek) because the City of San Jose had recently conducted extensive monitoring in the Coyote Creek mainstem during 1999-2001 as part of the Stream Augmentation Project. As described in the Program's FY 06-07 Annual Plan, the Program is now rotating back to Coyote Creek to conduct status and trends monitoring and investigative monitoring projects.

Watershed Characterization Memo

The main purpose of the memo is to provide a brief summary and update of pertinent water quality data and watershed information collected to-date in the watershed(s) that are scheduled to be monitored during the subsequent year (i.e., Coyote Creek watershed in FY 06-07). The watershed characterization memo includes a compilation of existing data sources and a summary of the geologic and geomorphic setting, vegetation, land uses and associated water quality issues. The status of biological communities and relevant beneficial uses in the watershed(s) is also provided. This watershed characterization memo includes a summary of existing data and information resources; descriptions of the relevant watershed attributes, and lists key issues relevant to the development of the proposed sampling design for Coyote Creek watershed in FY 06-07.

Information Resources

Several data and information resources from Coyote Creek (with focus on watershed area downstream of Anderson Dam) were evaluated to identify baseline data for a range of environmental indicators. Existing watershed monitoring and assessment information originated from the following projects:

Monitoring Data

First Flush Study (Soller et al. 2005)
The City of San Jose investigated how the occurrence and magnitude of first flush events in stormwater may influence the effective management of urban runoff pollution. Concentrations of pollutants were characterized from sites in Coyote and Guadalupe Creek Watersheds during eight storms. Pollutants included total and dissolved metals, pesticides and PAHs.

Mercury, PCB and Organochlorine Pesticide Monitoring (KLI 2002)
The SCVURPPP collected PCBs, mercury, and organochlorine pesticide data in 2000 and 2001 in several stormwater catchment locations within the Coyote Creek Watershed as part of the Joint Stormwater Agency Program (JSAP), a San Francisco Bay region wide pollutant study.

Stream Maintenance Program (SCVWD 2001, 2002)
The SCVWD conducted sediment removal activities (dredging) within Lower Silver-Thompson Creek between 2001 and 2005 as part of its Stream Maintenance Program. The SCVWD characterizes the sediment material to be removed to satisfy waste discharge requirements established by the RWQCB and local sanitary landfills. Sediment characterization includes analysis for concentrations of metals (includes mercury), organics (includes pesticides, PAHs and PCBs) and sediment grain size.

Results of the sediment analysis are documented in the SCVWD's Annual Sediment Characterization Report.

Stream Channel Geomorphology Monitoring (SCVWD unpublished)
The SCVWD surveyed channel cross sections, surveyed continuous longitudinal profiles and conducted pebble counts in Upper Penitencia Creek and Thompson Creek. The baseline geomorphic data was collected to assist in bank erosion and sediment removal projects associated with the Stream Maintenance Program and to provide information necessary for designing stream channels that maintains stream function and flood protection as part of Capital Improvement Projects.

Stream Augmentation Study (Tetra Tech 1999, 2000 and Hopkins et al. 2002)
The City of San Jose, as part of the Stream Augmentation Study, collected water samples at ten stream locations during the dry season months between 1999 and 2001. Water samples were analyzed for general water quality, metals, nutrients, pathogens, pesticides, and acute and chronic toxicity for all three years. Organic compounds (e.g., PAH, PCBs and Dioxin) and algal biomass were only collected in the last year of the study. Fish and benthic macroinvertebrate communities were also sampled at selected sites as part of the study.

Stormwater Environmental Indicator Demonstration Project (SCVURPPP 2001)
The SCVURPPP collected continuous general water quality data, aquatic habitat survey data and fish populations (eighteen sites) and benthic macroinvertebrate community assemblages (nine sites) and pollutant concentrations in bedded sediment samples (nine sites) in the Coyote Creek watershed in 1999 as part of the Stormwater Environmental Indicator Demonstration Project (SEIDP).

Bay Area Stream Fisheries Project (Leidy unpublished stream survey data)
Rob Leidy of U.S. EPA conducted stream surveys for 79 streams in the San Francisco Bay Area between 1992 and 2002. Fish community assemblage information was collected at twenty-eight stream locations in Coyote Creek watershed; twelve of the locations were located in the Coyote mainstem below Anderson Reservoir, and sixteen locations were located in Coyote Creek above Coyote Reservoir and tributaries to Anderson Reservoir. Stream survey results were documented in a report published on the San Francisco Estuary Institute (SFEI) website and released as an Access database.

Benthic Macroinvertebrate Study (Carter and Fend 2000)
The U.S. Geological Survey (USGS) sampled benthic macroinvertebrate (BMI) community assemblages at eleven stream sites along Coyote Creek and seven stream sites along Upper Penitencia Creek in the spring and fall of 1997. The USGS also generated biological metrics that describe the characteristics of the BMI assemblages.

Fisheries Aquatic Habitat Collaborative Effort (SCVWD 1999)
The aquatic habitat along Coyote Creek (from Montague to Anderson Dam) and Upper Penitencia Creek (from mouth to 1 mile below Cherry Flat Reservoir) was surveyed by the SCVWD as part of the Fisheries Aquatic Habitat Collaborative Effort (FAHCE). Water temperature data and a survey of fish barriers were also collected as part of the study.

Waterbody Assessments

Limiting Factors Analysis (LFA) (Stillwater 2005)

The Upper Penitencia Creek LFA was conducted by Stillwater Sciences for the SCVURPPP to fulfill the Program's NPDES permit requirements to conduct watershed analysis of creeks that are potentially impaired by sediment from anthropogenic activities. The objectives of the Upper Penitencia Creek LFA were to identify and fill information gaps related to physical and biological factors controlling population dynamics of steelhead (*Oncorhynchus mykiss*) and to identify the impacts of sediment on steelhead relative to other potential limiting factors. Based on the available existing information and reconnaissance surveys, focused studies were developed to test hypotheses regarding potential limiting factors for steelhead in Upper Penitencia Creek. The focused studies addressed the following factors: fish passage barriers, gravel permeability, pool filling, overwintering habitat, and summer rearing and growth.

Field data collected for the Upper Penitencia Creek LFA included: 1) snorkel survey of steelhead population during spring and fall season; 2) physical habitat assessment in Arroyo Aguague; 3) permeability measurements at potential steelhead spawning sites; 4) volume of fine sediment within pools; and 5) estimated embeddedness of large substrate at potential juvenile overwintering sites. The study assessed existing aquatic habitat data, fish passage impediments, and water temperature data collected in the FAHCE study (see below).

Preliminary findings, as identified in the December 7, 2005 Draft Upper Penitencia Creek LFA Report, included: 1) No barriers to upstream migration below natural waterfalls in Upper Penitencia Creek and Arroyo Aguague were identified, although a passage impediment in Alum Rock Park may limit passage opportunities at some flow levels; 2) Seasonal low flows in the downstream reaches may limit steelhead outmigration success in some years, especially if channel drying occurs before the end of the outmigration period (typically March–May); 3) Gravel permeability is low but not likely limiting smolt production due to habitat limitations at other life stages; 4) Pool filling is low, indicating high sediment transport capacity relative to sediment supply; 5) Preliminary analysis suggests that overwintering habitat is likely the key limiting factor for steelhead prior to smolt outmigration; 6) Potential limitations to steelhead density and fish growth may exist in Upper Penitencia Creek due to low streamflows and warm water temperatures during the summer period.

The above findings indicate that the lack of overwintering habitat for juvenile steelhead is likely to have the greatest influence on the steelhead population. In addition, juvenile outmigration may be impeded by season drying of the channel. The study identified important data gaps that are needed to reduce uncertainty associated with development and testing of the key hypotheses. These include conducting additional steelhead population surveys (at minimum, during spring 2006), outmigrant trapping of steelhead during the spring season, and detailed analysis to determine timing and magnitude of flows necessary for downstream passage for smolts.

The Fisheries and Aquatic Habitat Collaborative Effort (FAHCE) (SCVWD 2003)

FAHCE is a multi-agency endeavor convened by the SCVWD and the Department of Fish and Game to develop an interim fisheries and aquatic habitat management plan. The goals for FAHCE include: 1) identify the contribution of SCVWD facilities and operations to existing fishery habitat conditions within the context of the variety of factors

impacting salmon and steelhead populations; and 2) identify reasonable flow and non-flow measures that will improve habitat conditions for such fish populations within the context of competing water and land use demands. The FAHCE study area included Stevens Creek below the reservoir. The FAHCE project quantified the following factors: 1) diversity, abundance, and condition of existing salmon and steelhead resources; 2) habitat quantity and quality that may limit these target fish populations; 3) types and locations of non-flow measures that could change existing conditions; and 4) alternative flow regimes that could change the conditions that limit the target fish populations.

The SCVWD conducted an extensive aquatic habitat survey for the Coyote mainstem (between Highway 237 and Anderson Dam) and Upper Penitencia Creek (between Coyote confluence and approximately 1 mile downstream Cherry Flat Dam) using a modified California Department of Fish and Game Level 4 Salmonid Habitat Classification. The survey identified the location and extent of critical salmonid habitat, including spawning gravels and juvenile habitat, and quantified potential impacts to these areas (e.g., substrate embeddedness). The SCVWD also conducted an inventory of fish passage impediments in the project area. Other data collected included continuous water temperature measurements at selected stream locations and fish population surveys.

The FAHCE Summary Report summarizes specific issues and actions for Coyote Creek watershed (SCVWD 2003). Phase I work objectives included creating a suitable spawning and rearing habitat for approximately five miles both below Anderson Dam and in Upper Penitencia Creek by, 1) releasing reservoir flows for fish; 2) improve passage at Priority 1 fish barriers (i.e., Singleton Road and Ogier Pond Quarry Ponds); 3) restoring spawning and rearing areas; 4) stabilizing banks and 5) identify and restore areas where geomorphic function is impaired. The report also recommends the following specific actions or investigations: 1) coordinated operating strategy for Cherry Flat Dam with City of San Jose needed to enhance streamflow conditions for steelhead; 2) investigate remedies to the high groundwater conditions in the Laguna Seca area (i.e., strategy that minimizes water diversion through Coyote Canal) so that a free-flowing stream can continue through Coyote Creek; 3) investigate remedies to Metcalf Percolation Ponds to reduce potential risks of entrainment and predation of salmonids.

Assessment of Stream Ecosystem Functions for the Coyote Creek Watershed (SCVURPPP 2003)

This Program evaluated stream ecosystem functions in the Coyote Creek Watershed using available data. The study area for this project was limited to data-rich portions of the two largest creeks in the watershed: Upper Penitencia Creek below Cherry Flat Dam, and Coyote Creek below Anderson Dam. Stream reaches were classified using factors related to geomorphology and urbanization. The existing capacities of study area reaches to support the following four physical ecosystem functions were assessed using hydrogeomorphic models: hydrologic processes and channel dynamics, aquatic habitat, riparian habitat, and landscape-level connectivity. The existing capacities of study area reaches to support aquatic fauna (macroinvertebrates and fishes) were assessed using indices of biological integrity. Selected water quality parameters were examined to assist interpreting model results.

Future capacities of stream ecosystem functions were assessed by estimating the relative positive and negative impacts of existing and near-term factors that may continue or soon influence the distribution and viability of fish and macroinvertebrate

assemblages, their habitats, and the functional capacities of supporting stream processes. Potential capacities of stream ecosystem functions were assessed by identifying where existing and future stream ecosystem functional capacities could be maintained or improved by practical, strategic management actions that have not been planned yet. Potential management actions were prioritized based on which would have the greatest positive impact on cold and warmwater fish and macroinvertebrate communities. Monitoring activities to address data gaps identified through the assessment are also described and prioritized. The final report was published in May 1, 2003.

Planned Monitoring and Assessment Studies

Mid-Coyote Flood Control Project

The SCVWD is planning to conduct an assessment of the existing condition of the fish population and physical habitat within a six mile reach of Coyote Creek (between Montague and I-280) as part of the Mid-Coyote Flood Control Project. Associated monitoring activities include physical-chemical water quality, continuous temperature measurements, fish community assemblage, out-stream migrant trapping for steelhead, aquatic habitat typing and riparian vegetation assessment. The project also includes a historical ecology study, a geomorphic stability analysis, which will include some evaluation of channel cross section and pebble count data, and suspended and bedload sampling for sediment transport analysis. Data collection is expected to begin in the fall of 2006. A draft report of the historical ecology study is expected to be available in February 2006.

Beneficial Use Designation

The 1995 Basin Plan (SFRWQCB 1995) designated the following beneficial uses for Coyote Creek Watershed:

	Beneficial Uses	Coyote Creek	San Felipe Creek	Anderson Reservoir	Coyote Reservoir	Cherry Flat Creek Reservoir
AGR	Agricultural Supply				E	E
COLD	Cold Freshwater Habitat	E	P	E	E	
GWR	Groundwater Recharge			E		
MIGR	Fish Migration	E				
MUN	Municipal and Domestic Supply			E	E	E
RARE	Preservation of Rare & Endangered Species	E				
REC-1	Water Contact Recreation	P	P	L	E	L
REC-2	Non-contact Water Recreation	E	P	E	E	E
SPWN	Fish Spawning	P	P	E	E	E
WARM	Warm Freshwater Habitat	E	E	E	E	E
WILD	Wildlife Habitat	E	E	E	E	E

E=Existing P=Potential L= Limited

Coyote Creek mainstem is the only waterbody listed in the 1995 Basin Plan that occurs within the urban portion of the watershed.

Coyote Creek Watershed Characterization

The following information characterizing the Coyote Creek watershed originates from the Coyote Creek Watershed Integrated Pilot Assessment Final Report (EOA 2003) and the Aquatic Resource Characterization of Western Mt. Hamilton Stream Fisheries (EOA 1999).

Hydrology and Geomorphology

The hydrology and geomorphology of Coyote Creek along the valley floor has been highly modified. At the base of the Diablo Range, the Creek is impounded by two dams, which form Coyote and Anderson Reservoirs. Coyote Dam was built in 1936 and its reservoir has a capacity of 22,925 acre-feet. Two miles downstream the creek empties into Anderson Reservoir, which was built in 1950 and has a capacity of 89,073 acre-feet. Streamflow from both dams is regulated between April and October and runoff above Coyote Dam accounts for about 75 percent of the total runoff for the entire Anderson/Coyote watershed (SCVURPPP 2003). Nine tributaries drain to the two reservoirs and transport large amounts of sediment; however the dams effectively reduce the amount of sediment transported downstream. Management of flows released from the dams have also reduced peak flows and increased summer flows for groundwater recharge.

Water has been historically diverted about 0.5 miles below Anderson Dam by the Coyote Creek Diversion Dam (April – October) and into a concrete channel (Coyote Canal), which bypasses the natural channel. Water is reintroduced to the natural channel approximately six miles downstream at the Coyote Narrows, just upstream of the Coyote Percolation Ponds. In the past, water diversion has caused dryback zones in the natural channel during the summer months. A fish screen was installed in 1999 to prevent downstream passage of fish into the Coyote Canal (SCVURPPP 2003). Water diversions have not occurred since 2001.

Two major pond systems are located within the Coyote Creek mainstem between Anderson Dam and the Creek-mouth. The Ogier Road Quarry Pond Complex, located two miles below Anderson Dam in Santa Clara County Park property, was historic gravel quarry pits (SCVURPPP 2003). These ponds were isolated from the natural channel, but connected to the creek in 1997 when the levee was breached. The SCVWD does not manage these ponds for groundwater recharge. The Coyote Percolation Ponds, located approximately 10 miles downstream of the dam, are pits originally created by gravel mining in the natural channel and are now managed by the SCVWD as a ground water recharge system. A permanent concrete dam was built in the 1930's to increase the size of these ponds. In 1999, a fish ladder was constructed to allow passage over the dam.

The boundary between the Diablo Range and the alluvial plain that forms the valley floor is sharply defined. At least four major tributaries flow from the mountains across this alluvial plain to Coyote Creek. In addition, there are at least eighty-four storm drain outfalls (> 18 inches in diameter) along the Coyote Creek mainstem contribute flow to reaches of Coyote Creek below Anderson Dam (Master Outfalls GIS shapefile developed by William Lettis and Associates, August 2003).

As Coyote Creek nears the South Bay a transition occurs from a freshwater environment to an estuarine environment where the channel and adjacent baylands contain many acres of brackish marsh, salt marsh and mudflats. Originally, an earthen dam was constructed to prevent saltwater intrusion into agricultural lands. In 1995, the SCVWD installed a replacement steel dam several hundred feet downstream of the original dam site. The reach of Coyote Creek downstream of Standish Dam receives fresh water discharged from the San Jose-Santa Clara Water Pollution Control Plant.

Land Use and Land Cover

Much of the riparian corridor below Anderson Dam is intact. Orchards, farmlands and urban development have replaced the original riparian vegetation that occurred in the high terraces of the channel. The middle terrace remains mostly intact. Riparian cover is dominated by cottonwoods, oaks, and sycamores are interspersed. Much of this riparian corridor is managed by the Santa Clara County Parks and receives some recreational use. The lower Coyote Creek is considered to be one of the highest quality riparian corridors remaining in the southern San Francisco Bay region (SCVURPPP 2003).

The urbanized area of Coyote Creek watershed has dramatically increased since the 1960's. During this time, population has increased greatly, and agricultural and grazing land have been converted to residential communities in the southern region of the Santa Clara Valley, and along the base of the Western Diablo range.

The lower reaches of Coyote Creek have been partially modified for flood protection. Setback levees and a high bypass channel have been constructed in the section of lower Coyote Creek between Montague Expressway and Dixon Landing Road. In addition, several miles of tributary stream channels have been similarly modified, including the lower portions of Upper and Lower Penitencia, Berryessa, Lower and Upper Silver Creeks.

Fish Community Assemblages

The Coyote Creek mainstem downstream the Coyote Percolation Ponds supports 10 to 11 native fish species out of the original 18 (EOA 1999). Species known to occur currently include Pacific lamprey, steelhead/resident rainbow trout, chinook salmon, California roach, hitch, Sacramento blackfish, Sacramento pikeminnow, Sacramento sucker, threespine stickleback, prickly sculpin, riffle sculpin, and staghorn sculpin (EOA 1999). Three species, the thicktail chub, splittail, and Sacramento perch have been extirpated from the drainage; the thicktail chub is extinct.

The Coyote Creek mainstem upstream of the Coyote Percolation Ponds supports at least eight native fish species out of the original 14. Species include Pacific lamprey, steelhead/resident rainbow trout, hitch, California roach, hitch x California roach hybrid, Sacramento sucker, threespine stickleback, prickly sculpin, and tule perch (EOA 1999). Two additional cyprinids, the Sacramento pikeminnow and Sacramento blackfish were last collected in 1981, but these species may persist in low numbers within this Reach. A third cyprinid, the speckled dace, was last recorded in 1978 near the Riverside Golf Course (EOA 1999). Additional sampling is necessary to confirm its status. Of particular interest is the recent confirmation of reproducing populations of tule perch, as evidenced by the presence of juvenile and adult specimens. The tule perch was last recorded within Coyote Creek in 1925.

Sampling Design Rationale

Several key issues relevant to the development of a sampling design for the Program's FY 06-07 Monitoring Plan were identified based on the information sources described above. These include:

- Pilot testing of the Sediment Quality Triad (SQT) as screening-level monitoring tool in the FY 06-07 (Chapman 1990; Winger et al. 2005). The SQT consists of sampling and analyzing bedded creek sediment for pollutant concentrations (i.e., metals and organics) synoptically with BMI bioassessments and sediment toxicity testing (i.e., 10 day growth and survival of *Hyella azteca*).

- The SEIDP monitoring data collected in the Coyote Creek mainstem (16 sites below Anderson Reservoir) during 1999 provides baseline data to potentially study status and trends over a seven year time period. In particular, metal concentrations in sediment and BMI bioassessments (screening-level indicators of interest to the Program) were conducted at nine sites on the mainstem of Coyote Creek.

- Address recommendation in SEIDP report to conduct sampling of bedded sediment for contaminant analysis at more stream locations in urban portion of Coyote Creek. In addition, conduct bioassessments at sites in urban reaches using low gradient protocol as described in the California Stream Bioassessment Protocol (CSBP) (i.e., urban reaches of Coyote Creek were not sampled in other studies due to limited riffle habitat).

- Previous benthic macroinvertebrate bioassessment conducted in Coyote Creek utilized methods different than the CSBP. Bioassessments will be conducted in FY 06-07 using a combination of low and high gradient protocols established in the CSBP. These BMI bioassessments will provide a baseline data set using a standardized approach being implemented region-wide.

- Coordinate monitoring activities with SCVWD Mid-Coyote project. The SCVWD is planning to measure water quality, sample fish community assemblages and assess physical habitat at many of the locations that will be monitored by Program for bedded sediment contaminants, toxicity and BMI bioassessments (personnel communication, SCVWD staff). The SCVWD is also planning to conduct a geomorphic stability and sediment transport analysis, which will assist Program staff in the interpretation of its data.

- The data collected in the Coyote Creek mainstem as part of the Stream Augmentation Study during 1999-2001 provides baseline data to potentially study status and trends over a 5-7 year time period. In particular, metal concentrations and bacterial indicators (screening-level indicators of interest to Program) were conducted at ten sites across the urban gradient.

- Monitoring locations in the upper reaches of Coyote Creek mainstem will provide useful baseline data to measure potential creek impacts from new development planned in the Coyote Valley.

- Potential water contact recreation areas were identified at several city and county parks with public access. These areas include Watson Park, William Park, Kelley Park and

Hellyer Park. Water samples will be measured for microbial indicators at these locations.

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Attachment 4-3

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Watershed Monitoring & Assessment Summary and Water Body/Watershed Characterization

Purpose: To analyze data collected during implementation of the Program's FY 05-06 Annual Monitoring Program Plan, summarize results and recommend next steps regarding data collection and watershed management; and to characterize watersheds and associated water bodies that are scheduled to be monitored in FY 07-08, according to the Program's Multi-Year Receiving Waters Monitoring Plan.

Background: Since FY 02-03, the Program has developed and implemented Annual Monitoring Program Plans (Annual Plans) in fulfillment of Provision C.7 of its NPDES Permit. The Annual Plans identify monitoring activities that are implemented each year as part of the Program's Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan). Annual Plans have previously been implemented in the Lower Penitencia and Coyote Creek watersheds (FY 02-03); San Tomas and Adobe Creek watersheds (FY 03-04 and FY 04-05); Matadero/Barron Creeks, Calabazas Creek and Sunnyvale Channel watersheds (FY 04-05 and FY 05-06); and Stevens and Permanente Creeks (FY 05-06).

In accordance with Provision C.10 (b), the Program annually develops a Watershed Monitoring and Assessment Summary Report (Summary Assessment Report) that summarizes the results and analyses of baseline data collected during the implementation of the Program's Annual Plans. These data are generated through ambient surface water quality monitoring; physical habitat assessment studies and bioassessment studies. The Summary Assessment Reports provide information on possible beneficial use impacts to the extent possible (based on the study design and available data) and suggests next steps for monitoring/assessments and developing strategies to control potential impacts. In September 2005, the Program developed a Summary Assessment Report for monitoring activities that occurred during FY 04-05 in the San Tomas, Adobe, Calabazas and Matadero/Barron Creek watersheds and Sunnyvale East and West Channels.

In FY 06-07, the Program will summarize and analyze data collected during FY 06-07 in the Stevens, Permanente, Calabazas and Matadero/Barron Creek watersheds and Sunnyvale East and West Channels. In addition, the Program will conduct a brief characterization of Adobe and/or Matadero/Barron Creek watersheds, which have been identified in the Multi-Year Plan as water bodies the Program will monitor in FY 07-08. Watershed characterization will consist of compilation of existing data sources and a stream survey to understand the physical and biological attributes of these water bodies and watersheds. The characteristics may include the geologic and geomorphic setting, vegetation, land uses and associated water quality issues, status of biological communities and relevant beneficial uses that occur in each watershed. These data sources will be used to identify appropriate monitoring parameters and locations for implementation of the Program's FY 07-08 Annual Plan.

Scope Summary:

1. Analyze data collected in Stevens, Permanente, Calabazas and Matadero/Barron Creek watersheds and Sunnyvale East and West Channels as part of the FY 05-06 Annual Monitoring Program Plan and summarize results.
2. Compile and collect information to characterize the general physical and biological attributes of Adobe and/or Matadero/Barron Creek watersheds.

Products: Technical Memorandum (Watershed Characterization); Technical Report (Watershed Monitoring and Assessment Summary)

Schedule: July 2006 – June 2007

Program Staff: Chris Sommers, Paul Randall, Lucy Buchan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Watershed Analysis (i.e., Sediment Assessment) in Coyote Creek Watershed

Purpose: To conduct watershed analyses by: 1) initiating a rapid sediment budget in Upper Penitencia Creek if results of the limiting factors analysis warrant further investigation of sediment sources in the watershed; 2) beginning to conduct a limiting factors analysis (or similar method) and sediment management practice assessment in Coyote Creek to determine if the watershed is impaired by sediment production from erosion due to anthropogenic activities; and, 3) initiating planning, development and implementation of a pilot monitoring approach in Coyote Creek designed to begin assessing the effectiveness of hydromodification management plan (HMP) controls.

Background: In fulfillment of SCVURPPP NPDES Permit Order No. 01-024 Provision C.9.f.iii paragraph two, the Program submitted a sediment assessment work plan to RWQCB staff on August 30, 2002. The sediment assessment work plan contains two separate phases. Phase I includes conducting a Limiting Factors Analysis (LFA) and sediment management practices assessment. Phase II includes conducting a rapid sediment budget, which will only be conducted when the Phase I study results indicate that excessive sediment from anthropogenic sources is impairing beneficial uses in the watershed. In FY 03-04, Phase I was implemented in the Stevens Creek watershed. Based on results of the LFA, the Watershed Analysis AHTG recommended that Phase II was not warranted in the Stevens Creek watershed. The Upper Penitencia Creek watershed was identified as the next high priority watershed for a sediment assessment. As a result, a LFA was initiated in this watershed in November 2004. During FY 05-06, Program staff will conduct a sediment management practices assessment for the Upper Penitencia Creek watershed. In addition, the Watershed Analysis AHTG will review results of the Upper Penitencia Creek LFA to determine if Phase II is warranted. If sediment is determined to not be a significant limiting factor in the Upper Penitencia Creek watershed, analyses will be initiated in the Coyote Creek watershed. All Watershed Analysis AHTG recommendations will be reviewed and approved by the Management Committee prior to implementation.

Scope Summary:

1. If sediment from anthropogenic sources in the Program's jurisdiction is determined to be a significant limiting factor in the Upper Penitencia Creek watershed, the Program will initiate work on a rapid sediment budget within the watershed.
2. Coyote Creek sediment analyses to include:
    a. Begin conducting watershed analysis of anthropogenic sediment impacts (described in Task 1 of Work Plan).
    b. Inventorying, documenting and evaluating the effectiveness of existing sediment management practices (described in Task 2 of Work Plan).
    c. Initiating planning, development and implementation of a pilot monitoring approach designed to assess the effectiveness of controls implemented through the Program's Hydromodification Management Plan (HMP).
3. Plan, organize and facilitate meetings with consultants and Watershed Analysis AHTG members.

Products: As related to Upper Penitencia Creek - Technical Report (Rapid Sediment Budget), or, as related to Coyote Creek - Technical Report (Limiting Factors Analysis) and Technical Memorandum (Sediment Management Assessment).

Schedule: July 2006 – June 2007

Program Staff: Chris Sommers and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Purpose: Provide coordination assistance and staff support to the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Background: In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in stormwater programs that include rapid bioassessments in their watershed monitoring and assessment programs. Since the initial workshop, the Program has assisted (with planning and coordination) and participated in four annual BAMBI workshops (through 2005).

Each workshop has included presentations of technical information on existing and planned bioassessment studies conducted within the San Francisco Bay Area. Workshop participants also reviewed and discussed potential BABMI goals and objectives in the development of an Index of Biotic Integrity (IBI) for Bay Area Creeks, with the goal of developing a regional bioassessment tool necessary to provide context to data collected in Santa Clara Basin creeks. A draft BAMBI IBI Work Plan was presented at the 2005 BAMBI Workshop. Since FY 04-05, Program staff has provided in-kind services to implement specific tasks identified in the work plan.

Scope Summary:

1. Assist in the planning and coordination of the sixth annual BAMBI workshop.
2. Continue to provide in-kind services to implement specific tasks identified in the BAMBI IBI Work Plan.
3. Coordinate with other agencies and stormwater programs in further development and implementation of bioassessment tools and sharing of bioassessment data.

Products:

- BAMBI meeting summary(s) and staff presentations
- Draft IBI for San Francisco Bay Area Creeks

Schedule: July 2006 – June 2007

Program Staff: Chris Sommers, Paul Randall, Lucy Buchan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Implement Trash Work Plan

Purpose: Implement Trash Work Plan

Background: On November 14, 2001, the Water Board released the document entitled Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region Report. This report states that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …", Water Board staff will review information concerning trash in the next listing cycle to determine whether specific water bodies warrant 303(d) listing. In a proactive response to the 303(d) Staff Report, the Program's Management Committee formed a Trash AHTG (first meeting on February 21, 2002). The Trash AHTG developed a Work Plan (submitted March 1, 2003) to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways of the Santa Clara Basin.

During FY 03-04, the Program assisted Co-permittees in completing the following Work Plan tasks: 1) document existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) identify and map high priority trash problem areas and sources of trash in Santa Clara Basin watersheds; 3) develop a strategy to conduct trash evaluations in or near creeks; 4) sponsor a training workshop on how to use existing trash assessment tools (i.e., RWQCB Rapid Trash Assessment Protocol (Version 7.0) and Keep America Beautiful (KAB) Litter Index); and 5) develop standardized reporting format for documenting and evaluating trash management and monitoring activities.

During FY 04-05, Co-permittee staff and volunteers from watershed stakeholder groups conducted trash evaluations at a subset of the identified trash problem areas. The RWQCB Rapid Trash Assessment Protocol (Version 7.0) was used to qualitatively assess trash conditions in wadeable creeks and the Keep America Beautiful Litter Index was used to evaluate trash problem areas not located in creeks. Summary results from Co-permittee trash evaluations conducted during FY 04-05 were provided within the FY 04-05 Annual Report. Work Plan tasks identified for FY 05-06 included the following: 1) continue conducting trash evaluations in a subset of identified trash problem areas; 2) identify and begin to implement or refine existing trash control measures, as appropriate, to address trash problem areas within high priority areas; and 3) begin to develop a long-term strategy for trash conditions in urban streams and waterways.

The Work Plan tasks for FY 06-07 will focus on continued implementation and evaluation of trash evaluations and management practices.

Scope Summary

- Implement Pilot Demonstration Project which focuses on documenting type and volume of trash that can potentially be conveyed through the storm drain system;
- Assist Co-permittees with evaluating trash problem areas in urban streams and waterways and other potential sources that may contribute trash to those areas;
- Report information on trash evaluation results and trash management practices implemented by Co-permittees using standardized reporting format.
- Develop an effective strategy for reducing trash in urban streams and waterways;
- Revise trash problem areas list, as appropriate; and
- Develop Trash Fact Sheets, as appropriate.

Products: Technical memorandum providing implementation strategy for Pilot Demonstration Project; technical memorandum providing enhanced trash evaluation and reporting formats; technical memorandum providing trash evaluation results and analyses; enhanced and updated database.

Schedule: July 2006 – June 2007

Program Staff: John Fusco and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Stream Studies Inventory Update

Purpose: Provide update to the Santa Clara Basin Watershed Management Initiative's (SCBWMI) Stream Studies Inventory (SSI) database.

Background: The Watershed Assessment and Monitoring Subgroup (WAMS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAMS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0), November 2003 (version 5.0) and June 2005 (version 6.0). The Program funded the initial development of the SSI and each of the annual updates. During FY 06-07, a general update of the SSI (version 7.0) will occur. In FY 07-08, the second substantial update of the SSI (version 8.0) will occur. The first substantial update previously occurred with version 4.0.

Scope Summary

- The Program will update, revise and reissue a Stream Studies Inventory (SSI) in coordination with the SCBWMI.

Products: Updated Stream Studies Inventory

Schedule: July 2006 – June 2007

Program Staff: Paul Randall and Chris Sommers

Attachment 4-4

Attachment 4-4
FY 2006-2007 Programmatic Monitoring Indicators

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Trash Work Plan	MP#2 & 3c	303d Threatened Listing	The Program will implement a Pilot Demonstration Project which focuses on documenting type and volume of trash that can potentially be conveyed through the storm drain system; assist Co-permittees with evaluating trash problem areas in urban streams and waterways and other potential sources that may contribute trash to those areas; report information on trash evaluation results and trash management practices implemented by Co-permittees using standardized reporting format; develop an effective strategy for reducing trash in urban streams and waterways; revise trash problem areas list, as appropriate; and develop Trash Fact Sheets, as appropriate.	Technical memorandum providing implementation strategy for Pilot Demonstration Project; technical memorandum providing enhanced trash evaluation and reporting formats; technical memorandum providing trash evaluation results and analyses; revised trash problem areas list; and enhanced and updated database.	July 2006 - June 2007
Continued Implementation of Enhanced IC/ID and IND Tracking and Reporting	Follow-up/ Continuous Improvement MP#2 Provision 6.a.i.	SEIDP #21	Continue Implementation and Reporting of Enhanced Reporting;	Database and annual report summary	September 2006

[1] Monitoring Priorities (updated at Monitoring AHTG meeting November 8, 1999):

1) New projects needed to implement the results, and achieve the goals, of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
   a) Investigate Beneficial Uses and Causes of Impairment (including field work)
   b) Review and Compile Environmental Data and Make it Accessible
   c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
   d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4) Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA

Attachment 4-4
FY 2006-2007 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Mercury Pollution Prevention	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.c	NPDES permit	Coordinate implementation of Program's Mercury Pollution Prevention Plan. (See separate FY06-07 Work Pan)	Status Report and internal guidance	See Plan for details
Copper and Nickel Baseline Activities	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.a & b	NPDES permit	The FY 06-07 Copper and Nickel Action Plan Baseline Activity Work Plans and summary of certain FY 05-06 accomplishments are provided within Attachment 4-5.	Revised Copper and Nickel Action Plans	TBD
Pesticide Plan Coordination, Implementation, and Reporting	Follow-up/Continuous Improvement MP#1,2 Provision C.9.d	Implement URMP Pesticide Management Efforts	Coordinate implementation of Program's Pesticide Plan. (See separate FY06-07 Work Pan)	Status Report and internal guidance	See Plan for details
Compile, Maintain and Share Program/ Watershed Data	Follow-up MP#1	Continuation of Project SC22.63	Data management for the SCVURPPP Program. Coordinate data collected and analyzed by Program-sponsored projects. Insure that data is quality-assured, comparable across projects and comparable across watersheds (where possible). Where feasible, make data accessible to Co-permittees and to the public. Maintain and update website. Summarize available information on the background, purpose, and activities of planned and ongoing studies of the physical, chemical and biological characteristics of creeks and wetlands in the Santa Clara Basin.	Updated inventory of data and metadata generated by the Program and by Program-sponsored studies.	Ongoing

Attachment 4-4
FY 2006-2007 Monitoring Projects, continued

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Support for Land Use Subgroup	WMI Subgroups MP# 1, 3c, 3d Provision C.10.	Continue WMI support	Provide administrative support and leadership for the Land Use Subgroup. Maintain the subgroup mailing list; prepare and distribute agendas; chair meetings; edit and distribute meeting summaries; liaison to, and correspond with, the SCBWMI Core Group other subgroups as needed; update workplans; facilitate interaction between consultants and the subgroup; summarize, compile, and convey subgroup products.	Meeting agendas and summaries, Work Plans and other products as directed by the subgroup.	July 2006 – June 2007

Attachment 4-5

Future CAP/NAP Approach

On December 9, 2003, the Bay Modeling and Monitoring (BMM) subgroup met and collectively determined that further efforts at fine-tuning the CAP baseline activities would likely be unproductive due to certain remaining inherent challenges with the original CAP/NAP language. To assist in the identification of key baseline copper control activities that are most effective in the removal of copper, the CEP prepared a document entitled *Copper Sources in Urban Runoff and Shoreline Activities: Information Update* (dated November 2004). This report, which was prepared as part of North of Dumbarton Cu/Ni site-specific objective (SSO) project funded through the CEP, summarizes urban runoff and shoreline activity copper source load estimates and the uncertainties in these estimates.

On November 10, 2004, the subgroup reviewed the current CAP using the adaptive management process built into the CAP. This process involved reviewing tables which described how each baseline activity had either been completed or been incorporated into another on-going Program or POTW activity. The tables also contained proposed revised CAP activities reporting approaches, describing where and how annual CAP activity information could be found within other reports. The goal of the effort was to reduce the increasingly voluminous and generally duplicative CAP reporting by changing reporting by reference to other reports to the greatest extent possible. The tables also included a column with recommendations on whether or not each baseline activity would be appropriate to implement (or continue to implement) Bay-wide and how reporting might best be conducted. The subgroup agreed that the majority of baseline activities are being addressed by on-going stormwater program required activities or on-going POTW required activities. Agreement was not reached on what activities could be considered “completed” or how to move towards CAP reporting by reference. It was suggested that an actual Bay-wide Copper Action Plan would not necessarily need to be developed if all the pertinent CAP activities were otherwise included and conducted as stormwater and POTW NPDES permit conditions (e.g., pursuant to pollutant reduction plans). Water Board staff is in the process of reviewing the proposed revised CAP activities reporting approach tables and providing comments on the recommendations.

On April 22, 2005, the subgroup continued discussions about how the transition would likely occur to a bay-wide Copper Management Strategy (CMS). Water Board staff would like a uniform level of effort bay-wide (by agencies) and an effectiveness level at least as great as that achieved in the CAP/NAP. Ambient monitoring and trigger criteria need to be revisited so that there is a consistent and equivalent level of effort expended North and South of the Dumbarton Bridge. The proposed approach North of the Dumbarton Bridge is to rely on RMP data that is collected once per year versus the monthly dry season data collected south of the Dumbarton Bridge. The City of Palo Alto proposed to convert its Copper Indicators Report to a model for a bay-wide indicators report, if provided the necessary information. New funding mechanisms will need to be identified for on-going implementation of these bay-wide CMS components (stormwater and POTW annual reporting, indicators reporting and ambient monitoring). CMS requirements may be implemented through a blanket (watershed) permit. Currently, timing is uncertain. It is believed that the Basin Plan Amendment adopting the North of Dumbarton Bridge Copper/Nickel (Cu/Ni) site-specific water quality objectives (SSOs) and the CMS would likely be completed and adopted before the Stormwater Regional General Permit.

In January 2006, the CEP started work to support development of the stormwater-related sections of the Copper Management Strategy (CMS). The work will consists of developing CMS elements ("expert write-up") from sources categories identified and discussed in the *Copper Sources in Urban Runoff and Shoreline Activities: Information Update*. The elements to be developed, as identified the CEP Copper-Nickel workgroup or subgroup designated by the workgroup, include architectural copper, vehicle brake pads, copper pesticides and marine antifouling coatings. In addition, a write up regarding incorporation of existing permit requirements and public outreach into the CMS will be prepared. The CMS elements are scheduled to be completed by June 30, 2006.

SECTION 5

PESTICIDE MANAGEMENT WORK PLAN

5. FY 06-07 PESTICIDE MANAGEMENT WORK PLAN

INTRODUCTION

The goals and objectives of the SCVURPPP Urban Runoff Management Plan (URMP) include effectively prohibiting non-storm water discharges to storm drains and watercourses; reducing pollutants in storm water discharges to the "maximum extent practicable" (MEP); and not causing or contributing to violations of water quality standards, as required by the Program's NPDES permit. The Program's approach to meeting these goals and objectives focuses on the use of best management practices (BMPs) for source control and pollution prevention; and public education and outreach.

The Program's approach to pesticide management has a similar focus on source control and pollution prevention. Program BMPs for pesticide management have included significant outreach efforts to residents, businesses, and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide issues; and development of performance standards and local pest management plans.

BACKGROUND

Diazinon and chlorpyrifos have been identified in recent studies as causing toxicity in local creeks and wastewater treatment plant effluent. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA). The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies. In November 2005, the Water Board adopted a TMDL and Water Quality Attainment Strategy (WQAS) for diazinon and pesticide-related toxicity in San Francisco Bay Area urban creeks. The TMDL/WQAS provides a source assessment and pollutant allocation scheme; and discusses implementation actions relevant to urban runoff management programs, including the SCVURPPP. The TMDL/WQAS must be approved by the State Water Resources Control Board (State Board) and the USEPA before being included in the San Francisco Bay Water Quality Control Plan and municipal stormwater permits. These approvals are likely to occur during 2006.

The Program's reissued NPDES permit (Order No. 01-024, February 21, 2001) includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticides by others within municipal jurisdictions. The Program will also continue to work with the Urban Pesticide Committee and the California Stormwater Quality Association Pesticide Work Group to assess impacts of pesticide use and encourage actions by other state and federal agencies.

As required by Permit Provision C.9.d., the Program developed a Pesticide Management Plan and submitted it to the Water Board by July 1, 2001 (June 26, 2001). The submittal to the Water Board included a preliminary draft Pest Management Performance Standard as well as municipal pesticide use surveys completed by each Co-permittee. The Pesticide Management Plan was revised in response to Water Board staff comments dated August

15, 2001 and December 21, 2001, and the revised version (dated February 15, 2002) submitted to the Water Board as Attachment 5-1 to the Program's *FY 02-03 Work Plan*. The Pest Management Performance Standard was also revised based on Water Board Staff comments emailed in November 2001. The final performance standard was submitted to the Water Board as Attachment 2-2 of the Program's *FY 02-03 Work Plan* and included as part of the updated URMP and permit application (per Permit Provisions C.2.b and C.14).

The purpose of the Pesticide Plan is to control pesticide-related toxicity in urban runoff, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Plan identifies the goals of each work plan element, actions, monitoring mechanisms and schedules. The Plan also identifies whether actions will be implemented at the Program level, municipality level, or both. Program-level actions in the Plan form the basis of this FY 06-07 Pesticide Management Work Plan. The details of municipality actions and schedules were provided in individual Co-permittee pest management plans submitted with the Co-permittees' FY 00-01 Annual Reports and future tasks are provided in the Co-permittees' FY 06-07 work plans (Section 9 of this Work Plan).

PAST PESTICIDE MANAGEMENT ACTIVITIES

The Program has, since its inception, actively participated in a number of activities aimed at understanding water quality problems in creeks and San Francisco Bay and reducing pollutants, including pesticides, to the MEP. Beginning with the FY 99-00 Work Plan, every Work Plan and Annual Report has presented the history of the Program's and Co-permittee's pesticide-related activities in the areas of monitoring and science, outreach and education and URMP implementation.

All of the Program tasks in the Pesticide Plan were scheduled to be completed or begin by FY 02-03. Table 5-1 presents the status of these tasks. Details of the FY 06-07 Pesticide User Outreach activities are provided within Section 3, Attachment 3-3.

FY 06-07 PESTICIDE MANAGEMENT TASKS

No new Pesticide Plan tasks have been identified for FY 06-07. The Program will continue implementing the ongoing Pesticide Plan tasks listed in Table 5-1. In addition, Program staff will focus efforts on working with Water Board staff on the Municipal Regional Permit; and begin to plan for any new pesticide-related requirements that may be contained in that permit.

Table 5-1
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
I. Municipal Pesticide Use		
I.A.1 Develop and implement a process for tracking pesticide use on municipally owned property (PS#8). Include in the process reporting and justification for the use of OP pesticide and BMPs employed during OP pesticide use.	Ongoing	The Pest Management Performance Standard includes a suggested reporting process that, for FY 01-02, is focused on reporting use of organophosphate pesticides, particularly chlorpyrifos and diazinon. All Co-permittees submit information on pesticide use in their Annual Reports. Program staff will work with the Co-permittees to review and improve the reporting process as needed.
I.A.3 Assist Co-permittees to develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM policy (PS #3). BMPs will include special precautions to reduce water quality impacts when applying pesticides.	Done	Program guidance completed as part of Model Pest Management Performance Standard, submitted to Water Board March 1, 2002. Guidance to Co-permittees included a packet of example IPM policies and practices.
I.A.4. Assist Co-permittees to update local URMPs to incorporate/adapt the model Pest Management Performance Standard, including a description of the legal authority (IPM policy/ordinance, contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done	See notes for Action I.A.3. The Program held a workshop on March 20, 2002 on how to implement the performance standard.
I.B.4. Conduct a workshop for municipal staff on least-toxic pest control methods and pesticide management BMPs.	Done	Workshop held March 20, 2002. Program also co-sponsored ACCWP IPM Symposium held on 2/5/03, and the Regional IPM Conference on June 6, 2004
II. Public Education and Outreach		
II.A.1 Implement the Watershed Education & Outreach (WE&O) Campaign, which will target the general public and include messages about less-toxic pest control and proper disposal. The Campaign will include extensive media campaign with South Bay English- and Spanish-language radio stations, newspapers, and bus posters.	Done/Ongoing	An article on impacts of pesticide use to water quality and less toxic pest control was written and sent through the campaign distribution list. Pesticides are listed as a concern in the campaign brochure and the Watershed Watch song. The campaign web site added several new pages on IPM and IPM fact sheets are available to download. Print, radio and transit ads with less toxic pest management messages were developed in FY 02-03. Advertising has been conducted since FY 02-03.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.A.2 Develop simple, effective, targeted messages regarding proper pesticide use and disposal, effects on water quality, and IPM.	Done/Ongoing	See above for Watershed Watch activities. The Program continues to participate in regional IPM partnership and media relations efforts. The regional IPM partnership committee develops new fact sheets as needed.
II.A.3 Prepare appropriate outreach materials (e.g., fact sheets or a consumer guide regarding pest control services) to address target groups.	Done	Program developed landscape maintenance fact sheet. A PCO fact sheet has been developed through BASMAA participation. This fact sheets educates consumers on hiring pest control professionals who practice IPM.
II.A.4 Identify and attend community events and distribute outreach materials. (Program will attend events strategic to the WE&O campaign.)	Done/Ongoing	Program staff and Watershed Watch consultant staff attend 4-5 events each year. Brochures such as IPM fact sheets, "Grow It!" guide, "Pests Bugging You?", and "Backyard Bugs" are distributed.
II.A.6. Create, update, and publicize web sites to promote IPM and reduce pesticide use.	Done/Ongoing	The Watershed Watch website was launched in September 2001 and is continually updated. The website directs browsers to call the toll-free number to the Program office for information on less-toxic pest control. A web page specifically for IPM was completed in June 2002 and is updated regularly. The web page also includes links to other sites with information on IPM.
II.A.7 Coordinate with the Master Gardeners program and use their services to train residents. Provide IPM training and information on water quality impacts of pesticide use to Master Gardeners as needed.	Done	The Program funded a proposal by Master Gardeners and San Jose Community Gardens staff to conduct an IPM training program for community gardeners. Four workshops were conducted and training materials were purchased with SCVURPPP funds. From FY 02-03 to FY 04-05, the Program conducted community IPM workshops in coordination with Watershed Watch, United Neighborhoods, Guadalupe Gardens, the Santa Clara County Household Hazardous Waste Program and Master Gardeners.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.A.8 Create and/or publicize existing IPM demonstration gardens (such as the garden at the San Francisco Bay Wildlife Refuge in Alviso).	Done/Ongoing	The Watershed Watch campaign has partnered with the Don Edwards San Francisco Bay Wildlife Refuge at Alviso. The Alviso site has a pesticide-free native plant demonstration garden. Garden workshops at this garden are promoted on the Watershed Watch website. In addition, the Watershed Watch consultant is working with Don Edwards staff to develop page on the website specific to the demonstration garden. The Program provided promotional support for the Going Native Garden Tour held on April 18, 2004 and April 17, 2005. Approximately 4,000 people attended the 2005 tour. The tour featured 32 gardens in 2004 and 28 in 2005. Featured gardens demonstrate environmentally sensitive gardening practices including use of native plants, water conservation, landscaping to prevent urban runoff, reducing pesticide and fertilizer use, etc. The Program will provide support in FY 05-06.
II.A.9 Continue to fund BASMAA Regional Media Relations Campaign featuring pitches to Bay Area media and responses to breaking news on pesticide-related topics.	Ongoing	The Program funds this campaign as part of its BASMAA baseline dues. Program staff participates in meetings of the work group and review draft products.
II.A.11 Identify consumer and business publications that could include articles about IPM or less toxic pest management, submit articles or letters to the editor, and encourage them to print them.	Done/ Ongoing	An article describing impacts of pesticide use to water quality and containing hints for pesticide-free pest control was developed in December 2004 and sent to select publications. The article was included in the April 2005 issue of *Tideline* magazine and also placed on the Friends of Guadalupe Gardens website in October 2004.
II.A.12 Develop a work plan for and implement a "Pesticide User Outreach" project targeting residential and commercial users, which will include continuing the IPM Store Partnership Program and selected Household Chemical Management project tasks. Include an evaluation component in the work plan.	Ongoing (Complete Annually)	Work Plan implemented since FY 02-03; and ongoing for FY 05-06. Activities included: • Media advertising • IPM Store Partnership Program • IPM Community Workshop • Outreach at Community Events

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.A.13 Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	Done	VTA and open space and vector control district staff were invited to the Program's IPM Workshop in March 2003 and provided copies of the Program's Pest Management Performance Standard. In January 2005, the Program conducted a mailing (letter and IPM fact sheets) to these groups to provide them information about less-toxic pest control.
Monitoring Mechanism II.A.1 Document or estimate numbers of residents reached by outreach efforts, including events, web site promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts through documentation of calls to the Program's general and watershed campaign hotlines.	Ongoing (Completed Annually)	Number of residents reached and outreach materials distributed are documented after each event. Response to outreach efforts is tracked by documenting calls to hotline and website visits. This information is provided in the Annual Report each year.
Monitoring Mechanism II.A.2 Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages. (Program will conduct countywide survey as part of evaluation of WE&O campaign. Program may also conduct surveys to evaluate effectiveness of specific projects.)	Done	A Countywide survey was conducted in September 2003 to evaluate the success of the WE&O campaign. The final evaluation report was included in the Program's FY 03-04 Annual Report. Some of the survey questions tracked the publics' knowledge about various pollutants, including pesticides, affecting the water quality in the Bay. 19% of the respondents in 2003 say that pesticides affect the water quality of the Bay compared to 7% in 1991. About 23% of residents say that they use less –toxic ways to control pests in their home and garden. The BASMAA Regional IPM Committee conducted a customer intercept survey in September and October 2004 to evaluate the Store Partnership Project. Five stores from Santa Clara County were included in this survey. The survey indicates that about 23% of Santa Clara County residents are aware of the Our Water Our World promotion. The final survey report was included with the FY 04-05 Annual Report.
II.B.1 Continue to fund and participate in the BASMAA Regional IPM Partnership.	Ongoing	The Program annually funds this program as part of its BASMAA baseline dues. These funds cover the Program's

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
		supply of IPM Fact Sheets. Program staff participates in meetings of the work group and review draft products.
II.B.2 Continue to implement cost-effective elements of the IPM Store Partnership Program. Create and provide fact sheets and other materials to pesticide retailers to facilitate point-of-purchase outreach. Visit stores as necessary to ensure ongoing participation.	Ongoing	The IPM store partnership program expanded in FY 02-03 to include 29 stores in the Santa Clara Valley. Program staff routinely visits the stores and ensure that they are well stocked with fact sheets and shelf talkers. In addition, the Program provides trainings to store employees on selling less-toxic products.
II.B.3 Offer IPM training opportunities to pesticide retailer employees through coordination with Master Gardener-taught educational programs.	Task Eliminated (covered under Action Item II.A.12.)	It was not possible to arrange for Master Gardeners to train store employees due to staff shortages within the Master Gardener program. The Program has contracted with Annie Joseph to provide training to pesticide retailers, as she has been successful in getting store participation. The Community Gardeners project has been a successful way to work with the Master Gardener program and may be repeated if there is sufficient demand and resources available.
Monitoring Mechanism II.B.1. Document number of participating stores, materials distributed and employees trained. Evaluate the cost-effectiveness of the IPM Store Partnership Program each year. Implement the evaluation component of the Pesticide User Outreach work plan each year	Ongoing	Data on number of participating stores, materials distributed and employees trained is documented and reported in the Annual Report each year. Evaluation of other work plan tasks is also reported.
III. Pest Control Operators (PCOs)		
III.A.1 Develop a database of licensed structural and landscape maintenance PCOs.	Done	The list was obtained from the County Agricultural Commissioner's office prior to the PCO workshop of November 4, 2003
III.A.2. Identify active PCO and landscape maintenance organizations in the South Bay and conduct awareness-raising presentations at their meetings	Done	The Program contracted with Bart Brandenburg, consultant, to plan and conduct a PCO Workshop. To increase attendance, awareness-raising presentations were made at the two local PCO associations prior to the PCO workshop.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
III.A.3. Develop and conduct accredited workshops for PCOs that focus on IPM techniques.	Done	The workshop was conducted on November 4, 2003. Approximately 30 PCOs from 19 companies attended this workshop. The workshop was very well received by attendees.
III.A.4 Require PCOs contracted for municipal applications to use pest control methods consistent with the municipality's IPM policy (through contract specifications). Specifically, municipalities will require contractors to: a) follow the agency's IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on agency property to the agency in a timely manner (PS#5).	Program Guidance Done	Guidance was completed in December 2001 as part of the Pest Management Performance Standard. Co-permittees are beginning or continuing to implement the guidance. The IPM workshop on March 20, 2002 included a section on contracting for IPM services from professional pest control businesses.
Monitoring Mechanism III.A.1. Document the number of PCOs receiving presentations and/or training and pesticide use by PCOs on municipal property.	Done/ Ongoing	Approximately 30 PCOs from 19 companies attended the Program's PCO workshop. Co-Permittees track their own trainings and report results in Annual Reports.
III.B.1. Identify and work with PCO trade organizations to develop industry standards for BMPs to protect water quality, through participation in UPC and BASMAA.	Complete June 2006	Standards are being developed for IPM certification for structural pests as part of the PCO IPM Partnership project being implemented by the Bio Integral Research Center (BIRC). The first IPM Certification Workshop for PCOs was held on January 24, 2006.
IV. Commercial Businesses		
IV.A.1 Research reports and surveys of commercial business pesticide use and other stormwater programs' and POTWs' efforts to address this issue. Develop recommendations and a work plan (including an evaluation component) to provide outreach on less toxic pest control to target businesses in the South Bay, as appropriate and cost-effective.	Done/Ongoing	Program staff surveyed Co-permittees, BASMAA members, and Monterey County programs for IPM materials specific to restaurants. Very little IPM restaurant outreach material was found. Several programs reported using San Francisco's "Don't Set a Table for Pests" poster. In FY 02-03 County Health Inspectors began distributing this poster to restaurants during routine inspections. The poster was reprinted in FY 03-04. The number of posters distributed by County Health Inspectors is reported in the Annual Report each year.
IV.A.2. Develop and implement education programs that target	Ongoing	See Action Item IV.A.1.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
commercial businesses, per recommendations from Action IV.A.1.		
Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, as recommended in the work plan to be developed by the Program. Implement the evaluation component of the work plan.	Ongoing	The number of posters distributed and the number of businesses receiving them is documented and reported in the Annual Report each year.
V. Household Hazardous Waste Collection		
V.A.3 Work with HHW collection agencies to support, enhance, and help publicize programs for proper pesticide disposal (PS #7).	Ongoing	The Program is working closely with the HHW Program to publicize proper pesticide disposal. The Program's "Got Paint" advertising campaign focused on the proper disposal of paints, pesticides and other hazardous wastes.
Monitoring Mechanism V.A.2. Document quantities of pesticide disposal at household hazardous waste collection facilities (only possible on a county-wide basis at present)	Ongoing	Reported in the Annual Report each year
VI. County Agricultural Commissioners		
VI.A.1 Keep County Agricultural Commissioners informed of Program goals and activities and regional water quality issues through periodic meetings.	Ongoing	County Agricultural commissioners were involved in the development and review of the pest management performance standards. Contact is ongoing.
VI.A.2 Involve County Agricultural Commissioners in education and outreach efforts targeting PCOs.	Done	Program staff worked with County Agricultural Commissioners for planning and conducting the PCO workshop.
Monitoring Mechanism VI.A.2 Document meetings with County Agricultural Commissioner and staff involvement in outreach efforts	Done	Program staff met with County Agricultural Commissioners to plan the PCO workshop. Workshop information was published in their newsletters. Outreach staff from the Ag. Commissioner's office made a presentation at the PCO workshop.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
VII. New Development		
VII.A.1. Coordinate with municipal arborists or other relevant municipal staff to identify landscaping techniques less likely to attract pests, including a list of pest-resistant plants, and develop model conditions of approval for pest resistant landscaping features and practices.	Done	Program completed model conditions of approval, a landscape maintenance fact sheet, guidance on landscaping techniques for stormwater treatment, and a draft pest-resistant plant list. The plant list proved not to be a useful tool, as plant resistance depends highly on local planting conditions.
VII.A.2. Assist Co-permittees to consider pest-resistant landscaping and design features in the design, landscaping, and environmental reviews of proposed development projects.	Done	Model conditions of approval provided to Co-permittees, and a form developed to track projects for which education or conditions of approval were required.
VII.A.3. Assist Co-permittees to train staff responsible for design review on pest-resistant landscaping techniques and model conditions of approval (see Actions VII.A.1. and VII.A.2.) and the importance of minimizing pesticide use in runoff from development sites.	Done	The topic was presented at the December 11, 2002 New Development workshop.
VII.A.4. Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites.	Done	A section for documenting pesticide reduction measures required of project applicants is included in the Program's model data collection form for collecting other development project data prior to implementing C.3. (i.e., impervious surface area) and the Planning Procedures PS Reporting Form.
VIII. Monitoring and Science		
VIII.A.1. Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP advisory and technical committees to focus RMP resources on 303(d) problem pollutants, including OP pesticides.	Ongoing	The Program annually contributes its share to the RMP. Program staff attends the RMP Technical Review Committee meetings and prepare meeting summaries for Management Committee.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
VIII.A.2. Work with Water Board staff to refine the problem statement for the diazinon TMDL and determine data needs.	Ongoing	Program staff attends the Urban Pesticide Committee meetings, at which the diazinon TMDL has been discussed. Staff is also working on the TMDL with Water Board staff as part of the Clean Estuary Program (CEP).
VIII.A.3. Participate in a coordinated regional plan to collect data for the diazinon TMDL.	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX. Regional, State, and Federal Coordination		
IX.A.1. Support actions by the California Stormwater Quality Association (CASQA) Pesticide Work Group to comment on and assist with USEPA's pesticide risk assessments and to assist USEPA in development of a scope for a diazinon TMDL case study.	Ongoing; Case study TBD	The Program provides funding to the CASQA's consultant contract, which funded Geoff Brosseau and Kelly Moran's efforts to review risk assessments and provide comments on behalf of the CASQA member agencies. The EPA case study has not yet been planned or discussed.
IX.A.2. Through participation in the UPC and CASQA, work with the U.S.EPA, the California Department of Pesticide Regulation, and the pesticide industry to eliminate uses of pesticides likely to enter surface water from those listed on product labels.*	Ongoing	Program staff regularly participates in the UPC and CASQA, and support efforts to eliminate uses of pesticides that cause risk to water quality.
IX.B.1. Participate in the activities of BASMAA, CASQA, and UPC, and communicate Program efforts.	Ongoing	Program staff regularly attends BASMAA, the CASQA and its Executive Committee, and the UPC and communicate Program efforts.
IX.B.2. Collaborate in technical studies to support TMDL development and implementation. (See Action VIII.A.3.)	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX.B.3. Continue to participate in the BASMAA Pesticide Work Group to evaluate implementation of and continuously improve the Pesticide Strategy and report on the results of the evaluation.	Task Eliminated	The BASMAA Pesticide Work Group is no longer active, as each municipal stormwater program has its own pesticide plan in place of the Pesticide Strategy.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
X. Review and Revision of Work Plan		
X.A.1. Review and continuously improve the goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings if any.	Ongoing (Annually)	The Pesticide Plan was revised twice in FY 01-02 based on comments from Water Board staff and interested parties (specifically RWQCB letters dated 8/15/01 and 12/21/01) and submitted to the RWQCB on October 15, 2001 and March 1, 2002, respectively. The Plan will continue to be evaluated and improved each year.

SECTION 6

MERCURY POLLUTION PREVENTION WORK PLAN

6. MERCURY POLLUTION PREVENTION WORK PLAN

INTRODUCTION

The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Water Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires the Program to develop and implement a mercury pollution prevention plan. The Program developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with the permit provisions. The Mercury Plan was submitted to the Water Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan. This section of the FY 06-07 Work Plan summarizes Mercury Plan tasks completed during FY 05-06 and describes the tasks that will be developed, continued, or completed during FY 06-07.

SUMMARY OF MERCURY POLLUTION PREVENTION PLAN

The Mercury Plan is based on the premise that a Bay area-wide approach (and coordination) in addressing mercury pollution prevention will be most successful. For this reason, many of the actions identified in the Plan are for Program-level participation in regional efforts. These efforts are supplemented by countywide and local efforts.

The Mercury Pollution Prevention Plan addresses five general goals:

I. **Municipal Use of Mercury-Containing Products** – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

II. **Household Hazardous Waste Collection** – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

III. **Monitoring and Science** – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

IV. **Regional, State, and Federal Coordination** – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

V. **Public Education and Outreach** –Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

The Mercury Plan identifies actions that will be implemented at the Program level, municipality level, or both, as well as the schedule for initiation and/or completion of Program-level actions. The details of municipality actions and schedules are included in the individual Co-permittee Work Plans and/or Annual Reports, as appropriate.

STATUS OF FY 05-06 MERCURY POLLUTION PREVENTION ACTIVITIES

The status of Program tasks in the Mercury Plan is presented in Table 6-1. Highlights of Program accomplishments during FY 05-06, as developed and/or implemented by the Mercury Pollution Prevention Plan Ad Hoc Task Group (Mercury P2 Plan AHTG), Mercury Pollution Prevention Outreach Work Group, Program staff and municipalities are provided below.

Monitoring and Science

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is serving as the stakeholder forum for the development of the Guadalupe River TMDL Report. The Guadalupe River Watershed encompasses parts of San Jose, Los Gatos, Campbell, Monte Sereno and Santa Clara. SCVURPPP is a stakeholder in the Guadalupe River TMDL process. The Santa Clara Valley Water District (SCVWD) is taking a lead role in the TMDL development process by solely funding a $900,000 study and as Co-Chair of the TMDL Work Group and Stakeholder Group. Program staff is also participating in the TMDL process. The final product of the SCVWD funded study was the *Data Collection Report Volume 1 and Volume 2* (Tetra Tech, February 8, 2005). Under a contract with the Water Board, the consultant has incorporated the data collection results into the *Final Conceptual Model Report* (Tetra Tech, May 22, 2005). Water Board staff are currently developing a draft TMDL report.

The Program continued to provide financial support to the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study funded by the City of San Jose. In addition, Program and Co-permittee staffs actively participate in RMP Technical Review Committee (TRC) and Steering Committee (SC) meetings and provide meeting summaries to the Management Committee. Staff reviewed available reports and provided comments on the proposed 2006 RMP Draft Monitoring Plan.

A Memorandum of Understanding (MOU) regarding development of a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries was entered into by the Water Board, Bay Area Clean Water Agencies (BACWA), and Bay Area Stormwater Management Agencies Association (BASMAA) on August 6, 2001, and includes the development of TMDLs for 303(d) pollutants including mercury. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program is involved in the development and funding of potential projects for the San Francisco Bay mercury TMDL (mercury TMDL). Program staff has been participating in the CEP technical committee meetings, CEP Board meetings (as needed) and CEP Mercury Risk Reduction Work Group.

Guidelines for Reduction and Management of Mercury-Containing Products

During FY 02-03, the Mercury P2 Plan AHTG and Program staff developed guidelines for the reduction and management of mercury-containing products identified for virtual elimination.

The goals of the *Guidelines for Mercury-Containing Products Reduction and Management* are to work towards the virtual elimination of mercury from controllable sources that may affect urban runoff due to agency operations; and establish proper recycling and disposal methods for products that cannot be eliminated due to technological, safety or economic factors. Co-

permittees continued implementing the *Guidelines for Mercury-Containing Products Reduction and Management* in FY05-06.

Mercury Pollution Prevention Outreach Workgroup

In December 2002, Program staff established a new Work Group called the Mercury Pollution Prevention Outreach Work Group. This Work Group is implementing the Public Education and Outreach element of the Mercury Plan by organizing a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products.

Santa Clara County Household Hazardous Program (CoHHW Program) staff is implementing (with SCVURPPP) the outreach requirements of a $300,000, three-year California Integrated Waste Management Board (CIWMB) grant, specifically the store partnership program for collecting spent fluorescent lamps.

NEXT STEPS FOR MERCURY PLAN IN FY 06-07

During FY 06-07, the Program will continue to implement ongoing Mercury Pollution Prevention Plan activities. A summary of Mercury Plan tasks that will be implemented during FY 06-07 include:

- Guidelines for Reduction and Management of Mercury-Containing Products: Co-permittees will continue implementing the Program's guidelines for reduction and management of mercury-containing products identified for virtual elimination. An evaluation regarding the effectiveness of implementation will also occur.

- Mercury Pollution Prevention Outreach: As municipal budgets/resources permit, outreach on the negative health and environmental impacts of mercury and the methods available for properly disposing of FLTs to residents and small businesses will continue. The three Co-permittees with industrial wastewater inspection programs (San Jose, Sunnyvale and Palo Alto) will continue to integrate mercury outreach for industrial businesses into their existing pretreatment, source control, and/or hazardous materials inspection programs. The mercury outreach articles designed for the worldwide web and local agency newsletters will continue to be made accessible to the public and updated appropriately. In addition, the Program will continue to conduct outreach to promote the CoHHW Program's store partnership program; specifically the used fluorescent lamp drop off locations. Outreach may be conducted using media advertising, in-store displays (posters, banners) and newsletter articles. The Program may also coordinate its outreach activities with other Regional groups/programs that are planning to conduct mercury outreach in FY 06-07.

- Coordination efforts with regional organizations (Clean Estuary Partnership TMDL): Program staff will continue to attend CEP TMDL meetings, Guadalupe Watershed Mercury TMDL Workgroup and Stakeholder meetings, and Regional Monitoring Program (RMP) Steering Committee and Technical Review Committee meetings. In addition, Program staff will continue to work with BASMAA and the Water Board to address urban stormwater runoff actions included in the mercury TMDL.

- Monitoring and Science: Planned FY 06-07 monitoring and science activities relating to mercury are discussed in Section 4 (i.e., resources to CEP and RMP).

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

I. Municipal Use of Mercury-Containing Products **Goal I.** Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated. **Actions –**	SCVURPPP	Municipality	Completion Date
I.F. Implement guidelines developed under Action I.E.	N	X	**On-going –** Co-permittees began implementation in FY 03-04. See individual Co-permittee annual reports for local program activities.
Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines (to be developed under Action I.E).	A	X	Annually (beginning in FY 02-03 Annual Report)

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
II.B. Provide mercury-containing products disposal services for residents and small businesses.	X	X	**Ongoing -** Disposal services are provided by the County HHW Program, Palo Alto Regional Water Pollution Control Plant and the Sunnyvale Materials Recovery and Transfer (SMaRT®) Station.
II.D. Implement guidelines developed under Action II.C.	X	X	**On-going –** Co-permittees began implementation in FY03-04
II.F. Work with HHW collection agencies to develop and help publicize fluorescent light recycling program.[1]	X	X	**Completed/Ongoing –** Began effort in FY 02-03. The Mercury Pollution Prevention Outreach Work Group collaborated with the Santa Clara County HHW Program on a two-year, two-phase fluorescent light tube (FLT) recycling campaign. The first phase of the campaign, which was developed in FY 02-03, targeted residents. The second phase, which began in FY 03-04, targeted small

[1] Action II.F may be conducted in conjunction with Public Education and Outreach Actions (see Section V of this Work Plan). Completion date for Action II.F is contingent upon award of a Prop 13 Program grant.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
			businesses. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs. During FY 04-05 and FY 05-06, the Program conducted outreach to promote used fluorescent bulb drop off locations (local hardware stores) provided by the County HHW Program.
Monitoring Mechanism II.A. Evaluate whether household hazardous waste collection programs adequately serve residents and businesses.	X	N	**Completed/Ongoing** – Survey results indicate an increase in HHW facility use for mercury products (48% first time users). There were no problems with facility capacity. This issue is important to stormwater and wastewater pollution prevention activities. BACWA began ongoing discussions (2004) with a HHW Information Exchange group on regional campaigns directing new pollutant-containing products to HHW facilities versus HHW facilities' staffing, capacity and budget issues. In FY 04-05, the CoHHW Program collected 166,000 feet of spent fluorescent lamps at participating hardware stores.
Monitoring Mechanism II.B. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis (see Action II.C). [1]	X	N	Annually (beginning in FY 03-04 Annual Report)

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment. **Actions –**	SCVURPPP	Municipality	Completion Date
III.A. Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee.	X	A	**Ongoing** – Program and Co-permittee staff actively participated in RMP TRC and SC meetings and provided meeting summaries to Management Committee. Staff reviews available reports and provide comments. Program and Co-permittees' staffs are actively involved with the CEP technical and management committees; review proposed Work Plans and study scopes; and participate in the CEP Mercury Work Group.
• The City of San Jose will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San Jose.	N	O[2]	**Ongoing** (through 2006).
III.B. Provide financial and staff support for a coordinated regional plan to collect data for the mercury TMDL, as defined in the CEP MOU.	X	A	**Ongoing** (Program participation in the CEP)
III.D. Develop and implement a five-year program of monitoring efforts.	X	N	**Completed**- Draft completed March 2002; implementation began July 2002.
Monitoring Mechanism III. Submit monitoring data and reports to the Regional Water Quality Control Board and other interested parties (such as USEPA). Review monitoring data and reports and develop follow-up recommendations.	X	N	Ongoing, when available.

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
IV.A. Participate in the activities of the Bay Area Stormwater Management Agencies Association, the California Storm Water Quality Task Force, and the San Francisco Estuary Institute	X	N	**Ongoing** – Program staff continue to attend BASMAA, CASQA and SFEI RMP

[2] Participation in this action by municipalities is limited to the City of San Jose.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
and communicate Program efforts.			meetings.
IV.B. Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup.	X	O[3]	**Ongoing** – Program and Co-permittee staffs actively participate in the Guadalupe Watershed Mercury TMDL Work Group and Stakeholder group.
IV.D. Support, participate in and advocate increased regional collaboration with the RWQCB and the Bay Area Air Quality Management District (BAAQMD).	X	N	**Ongoing** – The Program will support the RWQCB in collaborating with the BAAQMD but will not directly work with the BAAQMD. The Program supports the RWQCB through participation in the CEP. Mercury air deposition is being addressed regionally.
IV.F. Support and track the progress of the U.S. Department of Energy (DOE) Office of Building Technology's Vision 2020 Lighting Technology Roadmap.[4]	X	N	**Ongoing**--DOE's Building Technologies Program continues to move forward on their Vision 2020 Roadmap. Progress includes seven strategies to address the challenges of transforming the lighting marketplace and developing new technologies that enhance lighting quality, efficiency and cost effectiveness.
Monitoring Mechanism IV. Document participation of Program staff in collaborative efforts and progress of these efforts.	X	N	Annually (beginning in FY 02-03 Annual Report)

[3] The City of San Jose and the Santa Clara Valley Water District are participating in the development of the Guadalupe River Mercury TMDL.

[4] DOE's Vision 2020 Lighting Technology Roadmap includes the following as one of its goals for the year 2020, "Highly efficient, reduced-mercury fluorescent sources will come to market." Sustainable Conservation's September 27, 2000 report entitled "Reducing Mercury Releases From Fluorescent Lamps: Analysis of Voluntary Approaches," concluded that " we do not believe that starting a new collaborative approach with manufacturers to create mercury-free fluorescent lamps is the most effective use of resources at this time." Instead, Sustainable Conservation recommends focusing on voluntary recycling of mercury-containing lamps.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
V.A. Develop various outreach programs to educate target audiences about proper disposal of mercury-containing products and alternative non-mercury containing products. Outreach programs will include, but may not be limited to, the following:	X	A	**Completed/Ongoing**[5] **–** In FY 05-06, the Mercury Pollution Prevention Outreach Work Group continued its mercury pollution prevention outreach. Outreach was coordinated with the County HHW Program's Mercury Grant implementation plan.
• Develop and begin to implement a fluorescent light recycling outreach program to educate residential users and encourage proper disposal of fluorescent lights.	X	A	**Completed/Ongoing**[5] **–** In FY 02-03, the Work Group formed and developed a Work Plan. Phase I of the two-year, two-phase Work Plan, focused on residential outreach. Phase I outreach began in Spring 2003 and continued in FY 04-05 and FY 05-06.
• Develop and begin to implement a fluorescent light recycling outreach program to educate small businesses and conditionally exempt small quantity generators and encourage proper disposal of fluorescent lights. (For example, the small business outreach program might include coordination with local chapters of the Building Owners and Managers Association [BOMA] or the National Association of Industrial and Office Properties [NAIOP].)	X	A	**Completed/Ongoing**[5] **–** In FY 03-04, the Work Group implemented Phase II of the two-year, two-phase Work Plan. Phase II outreach efforts were focused on small businesses and CESQGs. Additional annual coordination will continue, as appropriate.
• Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	A	X	**Completed --** Co-permittees began coordination efforts with municipal inspectors in FY 03-04.
V.B. Develop or adapt existing mercury outreach materials, as needed, for outreach programs.	X	A	**Completed/Ongoing**[5] **–** Development of materials began in FY 02-03, as part of outreach Work Plan for Action V.A. To date, the following outreach pieces have been developed by the Outreach Work Group – fact sheets, newsletter articles, press release, video public service

[5] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			announcement, newspaper ads, radio ads, transit ad, and in-store signage. All outreach pieces aim to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs. (See also Action II.F.).
V.C. Attend community events and distribute outreach materials.	X	X	**Completed/Ongoing**[5] **–** Distribution of outreach materials as part of outreach Work Plan for Action V.A.
Monitoring Mechanism V.A. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis. (See Monitoring Mechanism II.B.)	X	N	Annually (beginning FY 02-03)
Monitoring Mechanism V.B. In the Annual Report, document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	X	X	Annually (beginning FY 02-03)
Monitoring Mechanism V.C. Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages (coordinate survey with Watershed Watch Campaign Survey).	X	A	**Completed** - A Countywide survey was conducted in September 2003 to evaluate the success of the Program's Watershed Watch Campaign. In FY 02-03, survey cards were developed for evaluating the success of the Program's mercury outreach media campaign. People who brought in mercury containing wastes to Santa Clara County Household Hazardous Waste disposal events from April – June 2003 were requested to fill out surveys. The survey results were included in the FY 02-03 Annual Report. Survey results showed that: • 48.0% of the users bringing in mercury containing wastes to the HHW event were first time

[5] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			users of the facility. • 86.4% of the people indicated that they were bringing in fluorescent lamps for the first time. • 17.3% of the people indicated that they had read about safe disposal of mercury containing wastes in the San Jose Mercury News, 5.3% had heard about this on the radio and 1.4% had found out about it from the Watershed Watch website. Others indicated that they had found out about it from utility bill inserts, garbage companies, flyers, city publications, friends and relatives, internet etc.

Legend:

"X" = will implement at this level (SCVURPPP or municipality)
"N" = not being implemented at this level
"A" = assist with or develop guidance for implementation
"R" = coordinate with regional effort
"O" = optional
"FY" = fiscal year
"TBD" = to be decided

SECTION 7

NEW AND REDEVELOPMENT WORK PLAN

7. FY 06-07 NEW AND REDEVELOPMENT (C.3.) WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 06-07 to continue to assist Co-permittees to control the impacts of development on stormwater quality and flow through the development project planning, review and approval process.

BACKGROUND

On October 17, 2001, the Water Board adopted Order 01-119 which amended the Program's Permit Provision C.3. (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharges from new or redevelopment sites that may increase erosion in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

The Program and Co-permittees submitted work plans for implementing all C.3. requirements to the Water Board on March 1, 2002 (as part of the Program's *FY 02-03 Work Plan*, Volume II). These included the Program's "Guidance for Work Plan Tasks Related to Implementation of Permit Provision C.3." (referred to herein as C.3. Work Plan Guidance) which identifies proposed actions to meet the requirements of Provision C.3. and whether the actions will be implemented at the Program level, Co-permittee level or both. Most of the tasks in the C.3 Work Plan Guidance were completed by the end of FY 04-05. Additional implementation-phase tasks identified by the C3 Provision Oversight (C3PO) Ad Hoc Task Group and the Management Committee for FY 06-07 and ongoing support tasks are the basis of this work plan section.

Since the October 17, 2001 adoption by the Water Board of Order 01-119, there have been several changes to the requirements of Provision C.3. The first change, authorized by the Water Board Executive Officer, was an extension of three of the permit deadlines, as shown below, in order to be consistent with other Bay Area stormwater permits adopted subsequent to SCVURPPP Order 01-119[1].

[1] Letter to Beau Goldie, SCVURPPP Management Committee Chair, from Loretta Barsamian, Executive Officer, San Francisco Bay Regional Water Quality Control Board, re: Extension of Specified Deadlines in Order 01-119, May 12, 2003.

Provision	Activity	Original Deadline	New Deadline
C.3.c.i.	Require stormwater treatment BMPs at Group 1 Projects	July 15, 2003	October 15, 2003
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects in addition to Group 1 Projects	October 15, 2004	April 15, 2005
C.3.f.	Submit HMP for Regional Board approval	October 15, 2003	January 15, 2004

The second change relates to the definition of Group 2 projects. The Program requested Water Board approval of an Alternative Group 2 Project Definition, as allowed under Provision C.3.c.iii. of the Program's permit (Order No. 01-119). In a letter dated September 22, 2003, the Program proposed an Alternative Group 2 Project Definition that would make its Provision C.3. project size requirements consistent with the other Bay Area stormwater permit requirements (i.e., minimum project size of 10,000 square feet of impervious surface). At the Water Board's October 15, 2003, meeting, the Water Board authorized the Executive Officer to approve the Program's proposal.

The third change relates to the implementation date for Group 2 projects. Order R2-2005-0035, adopted July 20, 2005, contains revisions to Order 01-119 that recognize two types of Group 2 projects and extends the implementation dates for both. Group 2A includes projects that are more likely to contribute pollutants to stormwater (e.g., gas stations, auto wrecking yards, loading docks) and parking lots with 10,000 square feet or more of impervious surface. Group 2B includes all other Group 2 projects. The Group 2A implementation date was effective on October 20, 2005. The Group 2B implementation date was extended to August 15, 2006 to be consistent with other Bay area permits. In addition, Order R2-2005-0035 incorporated key provisions of the Program's *Hydromodification Management Plan Report* (April 2005) into the SCVURPPP permit.

A summary of the subsequent changes in permit deadlines resulting from the adoption of Order R2-2005-0035 is presented below:

Provision	Activity	Previous Deadline	New Deadline
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects: • Group 2A (special land use categories) • Group 2B	April 15, 2005	 October 20, 2005 August 15, 2006
C.3.f.	Implement HMP Key Provisions	Following Water Board approval	October 20, 2005

PAST AND CURRENT ACTIVITIES TO IMPLEMENT C.3.

Section 8 of the Program's *FY 04-05 Annual Report* described the progress of the Program (up to September 15, 2005) in completing Program tasks in the C.3 Work Plan and assisting Co-permittees to prepare for implementation of the C.3. requirements. With most of the preparation tasks completed, Co-permittees are now focusing on the implementation of C.3. requirements for Group 1 projects (those creating or replacing one acre or more of impervious surface) and Group 2a (as described above). The Program has continued to hold meetings of the C.3. Provision Oversight Ad Hoc Task Group (C3PO AHTG) to keep Co-permittees updated on current issues and promote exchange of ideas on and experience with C.3. implementation.

The Program also completed its Hydromodification Management Plan (HMP) in April 2005, and submitted it to the Water Board on May 4, 2005. Key provisions of the HMP were adopted by the Water Board on July 20, 2005 (as described above), and Co-permittees began implementation on October 20, 2005. Chapter 7 of the HMP Report identifies a number of action items that Program and Co-permittee staff will complete to address remaining HMP implementation issues. These action items and other related tasks are listed with anticipated start and completion dates within Attachment 7-1, "SCVURPPP HMP - Summary of Next Steps" (revised February 1, 2006).

To make it easier for developers to design flow control facilities to comply with the HMP, the Program investigated an automated modeling and flow control facility sizing tool called the Western Washington Hydrology Model, and collaborated with several other Bay Area stormwater programs to develop a version of the tool adapted to the Bay Area called the Bay Area Hydrology Model (BAHM). Development of the regional portion of the model began in February 2006. Calibration of the tool to specific watersheds within the Santa Clara Valley will be initiated in late FY 05-06 and completed during FY 06-07.

During the fall and winter of FY 05-06, Program staff was involved with Water Board staff and NGO representatives in a process to develop a Municipal Regional Permit for the Bay-area Phase 1 countywide stormwater programs. A Program staff person served on the New Development Work Group and assisted the group in establishing the current baseline activities conducted by municipal agencies and developing a list of options for the future permit. Work on the Municipal Regional Permit is expected to continue during FY 06-07.

FY 05-06 C.3. IMPLEMENTATION TASKS

General C.3. Tasks

Table 7-1 presents the list of tasks from the C.3. Work Plan and other tasks that will be implemented in FY 06-07. Most of the tasks in the original multi-year C.3. Work Plan have been completed, except for ongoing reporting and implementation assistance. Some tasks identified for FY 05-06 were delayed due to unexpected time spent on the Municipal Regional Permit. As a result, some will carry over to the beginning of FY 06-07. Tasks in FY 06-07 will focus on continuing assistance with implementation of the current permit provisions, and guidance on implementation of any changes made in the Municipal Regional Permit (assuming it will be completed mid-fiscal year.)

Anticipated needs for implementation assistance in FY 06-07 include:

- Guidance on implementing changes to Provision C.3. in the Municipal Regional Permit, and updates to the C.3. Handbook to reflect those changes;
- Development of model standards and specifications for certain BMPs;
- Workshop on implementation and design of certain BMPs (e.g., bioretention, planter boxes, green roofs, etc.); and
- Continued assistance with SCVURPPP agencies' implementation of BMP O&M verification programs and development of a Program-wide database (ongoing);
- Regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience, facilitated through the BASMAA New Development Committee (ongoing);
- Continued assistance with the C3PO AHTG meetings and action items (ongoing);
- Continued guidance and assistance with annual reporting of C.3. information (ongoing).

HMP Tasks

The focus in FY 06-07 will be to continue providing assistance to local agencies and the development community with outreach and implementation. Most of the tasks listed within the document entitled "Summary of Next Steps" (Attachment 7-1) are scheduled for completion during FY 05-06. However, some tasks will not be completed or will begin in FY 06-07. Anticipated tasks for FY 06-07 include:

- Provide guidance on any changes to HMP requirements in the Municipal Regional Permit, and update the HMP and C.3. Stormwater Handbook to reflect these changes;
- Collect data on HMP implementation at small sites and plan to re-evaluate the small site size threshold after two years of implementation (HMP Next Steps Task 9 (ongoing)– may be superseded by changes to the permit);
- Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation -- annually);
- Continue to develop approach for quantifying the flow control benefits of site design measures and other BMPs, and implement through modifications to the BAHM (begun in FY 05-06);
- Conduct one or more workshops on HMP implementation (annually); and
- Conduct additional implementation studies for example sites in Santa Clara Valley (ongoing).

ATTACHMENTS

Attachment 7-1 SCVURPPP HMP - Summary of Next Steps (revised March 1, 2006)

Table 7-1
Schedule and Deliverables for FY 06-07 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Schedule	Deliverables
C.3.c. Requirements for Group 1 and Group 2 Projects		
All C.3. Work Plan tasks completed. Other tasks:		
• Promote/facilitate regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience;	Ongoing	• Regional meetings and summaries
• Guidance on implementing changes to Provision C.3. in the Regional Permit, and updates to the C.3. Handbook to reflect those changes;	TBD, pending adoption of MRP	• C.3. Handbook updates
• Develop model standards and specifications for certain BMPs;	6/07	• Model standards and specifications
• Continued assistance with the C3PO AHTG meetings and action items;	Ongoing	• C3PO AHTG meetings and summaries
• Conduct workshop on implementation and design of BMPs, such as bioretention, planter boxes, green roofs, etc.;	6/07	• Workshop
C.3.e. Operation and Maintenance of Treatment BMPs		
e.1. Assist Co-permittees to report on treatment BMP O&M verification program in each annual report, including organizational structure, evaluation of effectiveness, and planned improvement to the program.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
Other Tasks:		
• Continue assistance with SCVURPPP agencies' implementation of BMP O&M verification programs and develop a Program-wide database.	Ongoing	• Program-wide database (6/07)

Table 7-1, continued
Schedule and Deliverables for FY 06-07 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Schedule	Deliverables
C.3.f. Hydromodification Management Plan		
f.2. Develop guidance to the Co-permittees on implementation of the HMP as part of requirements for Group 1 projects that may cause increased erosion or other related impacts (See also Attachment 7-1).		
• Conduct one or more workshops on HMP implementation;	6/07	• Workshop and handouts
• Provide guidance on any changes to HMP requirements in the Regional Permit, and update the HMP and C.3. Stormwater Handbook to reflect these changes;	TBD, pending adoption of MRP	• Updates to C.3. Handbook
• Continue to develop approach for quantifying the flow control benefits of site design measures and other BMPs, and implement through modifications to the BAHM;	6/07	• BAHM modifications and guidance
f.3. Upon adoption by the Water Board, begin implementation of HMP requirements for Group 1 projects that may cause increased erosion or other related impacts.	FY 06-07	• Program to assist Co-permittees with questions about implementation
• Conduct additional implementation studies for example sites in Santa Clara Valley.	6/07	• Technical memorandum on one or more studies
• Collect data on HMP implementation at small sites and plan to re-evaluate the small site size threshold after two years of implementation (HMP Next Steps Task 9 – may be superseded by changes to the permit);	9/07	• Data collection and analysis provided in FY 06-07 Annual Report
• Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation);	9/07	• Monitoring results provided in FY 06-07 Annual Report

Table 7-1, continued
Schedule and Deliverables for FY 06-07 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan		Schedule	Deliverables
C.3.g. Waiver and Compensatory Mitigation Program			
g.3.	Assist Co-permittees to track and report information on waivers granted, including project name, location, type, percent impervious surface, reasons for and terms of waiver, and the alternative benefit project and completion date.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
C.3.j. Site Design Measures Guidance and Standards Development			
j.2.	Assist Co-permittees to prepare and submit reports summarizing the status of review, revision, and implementation of local site design guidance and standards, as part of their annual reports.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
C.3.n. Reporting Requirements			
n.1.	Provide information described in Table 1 of Provision C.3. in annual reports	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation
n.2.	Assist Co-permittees to collect information and report a summary of types of pesticide reduction measures required for development projects, and the percentage of projects for which pesticide reduction measures were required.	Ongoing - FY 03-04 Annual Report and future ARs	• Guidance on Annual Report preparation

Attachment 7-1

Attachment 7-1

SCVURPPP HMP - Summary of Next Steps[1] - March 1, 2006

(from Chapter 7 of April 2005 HMP Report – *tasks in italics added*)

Task	Anticipated Completion Date
1. Develop the following: a. a funding mechanism[2] such that projects can utilize in-stream control options b. a methodology for determining developer contributions based on the stream changes expected to result from changes in project runoff conditions.	 6/06 draft; 12/06 final 6/06 draft; 12/06 final
2. Work with City/County planning and public works departments and the Water District to determine the timing and method of notifying District staff during the development review process about HMP projects that may need in-stream controls, in a manner that does not unreasonably prolong the review process. Further, look at ways to improve method to provide early communication on group 1 projects reporting.	6/06
3. Facilitate review of District's MDL analysis, both by the Co-permittees and the Expert Panel, and work with the Management Committee to determine the need to integrate some or all of the MDL analyses into implementation of the HMP.	6/06
4. Conduct additional studies of implementation of site design, integrated management practices, and/or basins at example development sites in Santa Clara Valley.	12/06
5. *BAHM Development Project* *Regional* (Conducted over 2 FYs) *Local Calibration*	6/06 05-06& 06-07
6. During implementation of the HMP, obtain feedback/suggestions for further refinement and implementation guidance	As needed/ Ongoing
7. Coordinate with other Bay Area stormwater programs to work toward a consistent approach for the Bay Area (via participation in development of the Municipal Regional Permit; see 8.a.).	Ongoing
8. Coordinate additional Co-permittee, Bay Area stormwater program, and Water Board staff review process and progress meetings, including: a. The development of a schedule for Bay Area-wide HMP implementation in the upcoming Municipal Regional Permit. *b. Public outreach – HMP updates, workshop* *c. HMP Work Group Meetings*	 TBD pending completion of MRP Ongoing Ongoing
9. Collect data on the implementation of the HMP at small sites (<20 acres) for a period of two years after the start of implementation, and plan to re-evaluate the small site size threshold and approach at that time. *Conduct and document reevaluation.*	10/07
10. Make additional refinements per: 1) lessons learned from implementation efforts based on the draft HMP; 2) the need for consistency with HMPs being developed by other Bay Area stormwater programs; and 3) development community, Co-permittee, and Water Board feedback.	Report in ARs beginning with FY 05-06 AR

[1] All dates depend on availability of resources and cooperation/collaboration of numerous staff from different agencies and may change because of circumstances beyond the control of the Program. The Program periodically updates the Management Committee regarding schedule changes and will transmit updates schedules to Water Board staff.

[2] The intent is to describe a mechanism agreeable to Co-permittees and next steps for implementation.

SECTION 8

FINAL BUDGET REPORT: FISCAL YEAR 2006-2007

SCVURPPP budget distributed to BATG and MC on January 20, 2006
SCVURPPP BATG met on January 25, 2006, approved budget and recommended approval by MC at their February meeting. MC approved budget at February 16, 2006 meeting.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Final Budget Report:

Fiscal Year 2006-2007

February 16, 2006

SCVURPPP budget distributed to BATG and MC on January 20, 2006
SCVURPPP BATG met on January 25, 2006, approved budget and recommended approval by MC at their February meeting

Final Budget Report for FY 06-07

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TOTAL PROGRAM FY 06-07 BUDGET
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OPERATIONAL GROUP

A summary of the tasks to be performed by the Program Manager (EOA), based on the Program Manager's current contract with the SCVURPPP Contract/Fiscal Agent (City of Sunnyvale on behalf of the SCVURPPP), is provided in Items (1.), (2.), and (3.) below. The overall program budget is included in Table 1. The resource requirements are based, in part, on the requirements contained in the RWQCB Order No. 01-024 adopted February 21, 2001, Order No. 01-119 adopted October 17, 2001 (new and redevelopment requirements) and Order No. R2-2005-0035 adopted July 20, 2005 (HMP and Group 2A and 2B) and on meeting the SCVURPPP *Mission and Goals Statement* (see Attachment 1).

A summary of the key budget assumptions is shown below and additional detail that defines the basis for the budget are identified in the following sections.

- The Total SCVURPPP FY 06-07 budget is essentially the same as the FY 04-05 and FY 05-06 total budgets.
- Hourly labor rates are increased by 4% above FY 05-06 labor rates (budget line items are essentially that same as last year), consistent with the Program Manager contract.
- Annual interest accrued is available to cover additional legal assistance as needed unless otherwise modified by the BATG and MC for additional projects.
- The monitoring budget assumes one sediment assessment will be conducted consistent with 2002 sediment control plan submission (Provision 9fiii). (Note: the Program conducts watershed and sediment assessments in alternating years).
- Assumes no Co-permittee performance reviews.
- Includes the same budgeted amount for CEP related work as FY 03-04, FY 04-05 and FY 05-06. (Goal is to redefine CEP mission and more closely link to stormwater and BASMAA needs).
- Includes resources to assist with implementing the approved Trash Work Plan (assumes limited assistance with key trash assessments, tracking and reporting, and resources for limited pilot study).
- Includes resources to assist with finalizing guidance for implementation of HMP tasks, holding workshops, continuing development of the regional Bay Area Hydrology Model (BAHM) in collaboration with the Alameda and San Mateo County Programs, and coordination with Co-permittees and assisting Co-permittees with implementation.
- Includes resources for permit renewal negotiations as part of regional permit.
- Assumes all permit fees will be paid by individual Co-permittees. The permit fee has been absorbed into the overall SCVURPPP budget, however additional increases beyond the estimated fees shown will not be adsorbed. To absorb these fees as was done in past years would require further reductions in Program tasks that would significantly impact meeting permit requirements and further result in a reduction of contributions to regional collaborative programs. Thus the permit fees are shown for information only as a direct line item for planning purposes only, are not included in the SCVURPPP budget used to estimate assessments (only shown on assessment sheet for Co-permittee planning purposes) and will be paid directly by the individual Co-permittees.
- All Regional Collaboration projects/fees are shown in the Collaborative Group (projects are listed in order of priority, i.e., lowest priority first if budget modifications need to be made).
- The RMP fee is increased by 1.5%.
- Includes a budget of $50,000 to reimburse the fiscal/contract agent for services.

- The BASMAA fee is increased by 2%.

The Budget Ad Hoc Task Group met on January 25, 2006 to review and discuss Program budget issues. The BATG made some minor changes to the draft budget and approved the budget for recommendation to the MC for their approval.

1. Program Management/Administration

a. Administrative Assistance

- General administrative assistance
- Maintain Program 800 number
- Distribute PIP and other materials
- Develop partnerships with external organizations

b. Management Committee (MC) and Ad-Hoc Task Group (AHTG) Support

- Monthly MC meetings (up to 12) - develop, distribute, and post agendas; prepare and mail meeting materials; facilitate meetings; draft and finalize minutes; and conduct follow-up activities
- AHTG meetings (up to 40) - support groups formed to address specific tasks (meeting number and times vary)

c. Program Budget Administration

- Develop, draft, and finalize FY 2007-2008 budget; organize and facilitate quarterly Budget AHTG meetings
- Coordinate with Fiscal Agent, track expenditures, and prepare quarterly status reports

d. Coordinate with Legal Consultant

- Communicate with and assist Program legal counsel as needed (up to 5 meetings and 10 extended telephone discussions) on General Program issues.

e. Develop and Manage Program PI/P Program

- Conduct long-range planning for Program PI/P activities
- Manage development of PI/P work plan for FY 2007-2008
- Provide support, as needed, to Co-permittee's requests for public education assistance
- Manage subcontracts
- Coordinate and work with the WMI Communications Subgroup and various other adhoc and work groups to address numerous new people and "pollutants of concern".[1]

f. Performance Evaluation

[1] Over the past several years, the PI/P and WE&O elements have been a key component of the SCVURPPP. As TMDL programs move forward to address new "pollutants of concern" outreach will be important and Program staff will need to spend additional time working as part of a regional effort to address these new needs

- Limited budget to assist Co-permittee response.

g. Expenses

- Approximately 10 percent of labor costs

2. Permit Management

a. Report Preparation and Submittal

- Prepare annual report for FY 2005-2006 and submit to Regional Board by September 15, 2006 (includes preparation of 1 draft for MC review, reproduction/distribution of up to15 copies)
- Review results of Program activities and recommend improvements
- Prepare Program Work Plan (or equivalent) for FY 2007-2008 (includes up to 2 drafts for MC review, response to Regional Board comments, reproduction and distribution of up to15 copies)
- Provide guidance for Co-permittees' work plans and SCVURPPP work plans
- Review all Co-permittee Work Plans and Annual Reports for completeness and consistency.

b. Internal Co-permittee Liaison

- Develop guidance on permit requirements
- Provide assistance to Co-permittees as needed.
- Conduct up to four training workshops for co-permittee staff

c. External Organization Liaison

- Represent Program at Regional Board, State Board, BASMAA, Regional Monitoring Program, CEP, REF, CASQA, Urban Pesticide Committee, SCBWMI core and relevant subgroups, environmental group/public (up to 88 meetings)
- Obtain and transmit updates from state NOI database, as reasonably available.

d. New NDC Permit Compliance Issues (Non-HMP)

- Meet with Regional Board staff, Program legal counsel, Program ad hoc task group and/or environmental groups as needed
- Prepare responses to comments and supplementary documentation as needed.
- Conduct the tasks to comply with permit provision C.3. The estimated budgets are based on and consistent with the C3 Work Plan.
- Assist Co-Permitees with implementation of C.3 on projects and with tracking and reporting on C.3 projects.

e. Implement Continuous Improvement Items

- Investigate, develop implementation plans, and implement items for Program continuous improvement identified in Co-permittee reviews, work plan, and annual report within the allocated resources
- Summarize for Program annual report

f. TMDL Tracking, Review and Reporting

- Program staff participation in TMDL tracking, review and reporting to MC.

g. Expenses

- Approximately 10 percent of cost

3. Technical Program Management

a. Prepare RFPs, Technical Project Management

- Develop up to 4 RFPs for technical services
- Implement Multi-Year Monitoring Plan including selection of subcontractors (budget assumes that sediment and receiving water mointoring subcontractors (i.e., Stillwater and KLI) will remain the same for FY 06-07).
- Oversee contractors' work
- Coordinate with BATG/MC/Monitoring Ad Hoc Group/WAMS and hold up to four Monitoring Ad Hoc meetings annually (quarterly basis) in association with WAMS.

b. Technical Review of Work Products

- Provide technical review of contractor work products
- Make recommendations to BATG/MC/Monitoring Ad Hoc Task Group regarding quality of work and any modifications needed for improvement.

c. Develop/Revise Performance Standards

- Assist MC in development of one new performance standard, or substantially improve one or more existing performance standards at the same level of effort.

d. Expenses

- Approximately 10 percent of cost

4. Legal Services

Budget assumes that the Program will retain the services of Morrison and Foerster (Robert Falk, Esq.) to provide legal advice. The working assumption is that the majority of the legal budget is earmarked for assistance with TMDL, HMP, and permit renewal issues (i.e., work on regional general permit). In addition, implementation issues associated with C3 will also arise and, as appropriate, will be addressed with the available budget.

5. Fiscal Agent

The budget assumes that the City of Sunnyvale will continue to serve as the Contract/Fiscal Agent. The line item represents the amount to be reimbursed to the contract/fiscal agent carrying out this task. All Program staff time required to coordinate with the Fiscal Agent is included under Budget Item 1.c.

6. Fees (SEE Collaborative Group)

PROJECTS GROUP

7. Monitoring Projects

The purpose of this item is to fund projects that satisfy the monitoring requirements of the Program's NPDES permit (Provisions C8, C9 f, and C10). The estimate of the resource requirements are based on implementation of the Multi-Year Monitoring Plan (MY-RWMP) March 1, 2004 (update - originally submitted to the RWQCB by the MC on August 5, 2002) and is consistent with Program's implementation of the fourth year of MY-RWMP. In addition, the budget estimate includes resources to cover the following tasks/projects: SCVURPPP data management including updating the SSI, copper & nickel baseline actions and reporting and update of the website, participation in the LUS[2], TMDL technical support/liaison/critic (Hg, PCB, Dioxin, other pesticides), other monitoring consistent with the permit will be conducted to the extent that budget allows, one sediment assessment (limiting factors assessment) consistent with the MC sediment with the MC September 1, 2002 Work Plan, resources for assisting the Co-permittees implementation the Trash Work Plan (limited resources to assist with key trash assessments and conduct trash pilot demonstration project) and investigating and reporting on trash as a "pollutant of concern" within the urban boundary, resources for updating and developing the necessary annual sampling plans, QA plans and reporting the surface water monitoring results (as defined within the MY-RWMP), and limited resources to coordinate/participate with the CEP. No additional watershed assessments will be conducted this FY (this year is the sediment assessment FY). The proposed budget breakdown for major categories is as follows:

- Implement Multi-Year Monitoring Plan (includes receiving water monitoring including QA plans, bioassessment, sediment toxicity, BAMBI, workgroup I) $335,000
- Program Data Management and Reporting $115,000
- Trash/CAP-NAP/WMI-Landuse/TMDL Tech Review $165,000
- Sediment Assessment & Management Report[3] and Regional Collaborative Monitoring $265,000

8. C3 and HMP Implementation (technical Assistance, Guidance and Workshops)

This task covers the budget requirements for SCVURPPP related to assisting Co-permittees implement Permit Provision C.3. (New and Redevelopment) and in particular, the Hydromodification Management Plan (HMP, C.3.f.).

a. C.3. Tasks and Budget (Not Including HMP)

Most of the tasks in the original multi-year C.3. Work Plan have been completed, except for ongoing reporting and implementation assistance. Some tasks identified for FY 05-06 were delayed due to unexpected time spent on the Municipal Regional Permit, and may carry over to

[2] The estimated LU Budget includes $15,000 to administratively assist the subgroup and $25,000 work with the subgroup to sponsor training workshop(s) towards meeting the WMI objectives.

[3] Budget assumes that only a limited phase 2 assessment will be initiated in Upper Penitencia (if necessary), that a Phase I sediment assessment will be initiated in Coyote (complete assessment and management report over two FYs) and that work will be initiated on developing a pilot level program to determine what type of HMP monitoring is needed and pilot test the approach.

the beginning of FY 06-07. Tasks in FY 06-07 will focus on continuing assistance with implementation of the current permit provisions, and guidance on implementation of any changes made in the Regional Permit (assuming it will be completed mid-fiscal year.)

Anticipated needs for implementation assistance in FY 06-07 include:

- Continued assistance with SCVURPPP agencies' implementation of BMP O&M verification programs and development of a Program-wide database;
- Regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA New Development Committee);
- Guidance on implementing changes to Provision C.3. in the Regional Permit, and updates to the C.3. Handbook to reflect those changes;
- Development of model standards and specifications for certain BMPs;
- Continued assistance with the C3PO AHTG meetings and action items (meetings covered by AHTG budget);
- Workshop (one) on implementation and design of certain BMPs, such as bioretention, planter boxes, green roofs, etc. (replaced by other workshops in FY 05-06; will be covered by workshops budget);
- Continued guidance and assistance with annual reporting of C.3. information (covered by annual reporting budget).

(Note that for the last two bullet items it is assumed that they will be accomplished under the separate program management task budgets, assuming the level of effort remains at about the same level as FY 05-06.)

b. HMP Tasks

The focus in FY 06-07 will be continue to be on assistance to the Co-permitttees and the local development community with outreach and implementation. Most of the tasks listed on the "Summary of Next Steps" (rev. 8/29/05) are scheduled for completion in FY 05-06; however, some will remain to be completed or begun in FY 06-07. Anticipated tasks for FY 06-07 include the following:

- Provide guidance on any changes to HMP requirements in the Regional Permit, and update the HMP and C.3. Stormwater Handbook to reflect these changes;
- Collect data on HMP implementation at small sites and plan to re-evaluate the small site size threshold after two years of implementation (HMP Next Steps Task 9 – may be superseded by changes to the permit);
- Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation);
- Continue to develop approach for quantifying the flow control benefits of site design measures/IMPs and implement through modifications to the BAHM;
- Conduct one or more workshops on HMP implementation (covered by workshops budget);

- Conduct additional implementation studies for example sites in SC Valley (using FY 04-05 and FY 05-06 funds).

The table below contains a summary of the budget breakdown:

Budget Line Item	FY 06-07 Budget	Comments
NDC (C.3.) Implementation Assistance, Tracking and Reporting	$52,000	Covers first four bulleted items under (a) above. (see Operational Group 2d)
HMP Technical Assistance, Guidance, Data Collection and Programmatic Monitoring	$130,000	As noted, Workshops to be covered under Program workshops budget (see Projects Group 8)
Bay Area Hydrology Model enhancements for modeling site design measures (1)	$30,000	This budget estimate is in addition to the original development cost (see Note 1). (See Projects Group 8).
TOTAL	**$212,000**	

Notes: (1) The total estimated BAHM development budget was $192,000 (is included in the FY 05-06 budget): $30K for contribution to BAHM modifications, $100K for watershed calibration, and $30K for BAHM support/training in FY 05-06 (which will now be conducted in early FY 06-07), plus 20% for administration and project management.

9. Public Information and Watershed Education Budget

Watershed Watch Campaign (Campaign) – In November 2005, the Program selected Carl and Manor Advertising as the new consultants for the Watershed Watch Campaign. The WEO AHTG is reviewing the ideas and creative concepts presented by the consultant for FY 06-07 Campaign implementation. The AHTG recommended that the Campaign should be funded at least at the FY 05-06 level. This level of funding will enable the Program to maintain the momentum gained by the past Campaign, to continue increasing the public's awareness of watersheds and stormwater pollution prevention activities/controls and to achieve the goals and objectives described in the Watershed Education and Outreach Strategy.

Other Watershed Education and Outreach (WEO) activities - The other WEO projects include the BASMAA Regional Ad Campaign, Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso (Alviso Education Center) and Schools Outreach using ZunZun. Also, the budget includes support for one creek clean up in FY 06-07. The WEO AHTG will be asked to make a recommendation on which clean up should be funded.

The following is a summary of the budget breakdown:

- Regional Advertising Campaign (RAC via BASMAA) - $40,000
- Alviso Ed. - $82,000
- Schools Outreach - $25,000
- Advertising to support for Creek Cleanup - $7,500
- Program staff WE&O & future planning - $50,000
- Watershed Watch Campaign (via SCVURPPP) - $103,700

a. Pesticide User (PU) Outreach

This project continues implementation of the cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. The project scope includes items in Program's Pesticide Management Plan (2-15-02), based on provision C.9.d. of the permit, for outreach to residents, commercial businesses, and pest control operators. These include providing staff support for the Regional OWOW Store Partnership project, purchasing fact sheets and other promotional material, store employee training, staffing outreach events and media advertising.

b. Mercury Pollution Prevention Outreach

This project encompasses several tasks in the Program's Mercury Pollution Prevention Plan (3-1-02), provision C.9.c. of the permit. It involves public education regarding the effects of mercury on the environment, products containing mercury and proper disposal of such products. The project is in the fifth year of implementing the Program's Mercury Pollution Prevention Plan, is consistent with the Program's public education tasks and is consistent with previous year's budget. The Program coordinates with the County Household Hazardous Waste Disposal Program for implementing this project.

c. Program Supplies

Estimated budget for reprints of materials for Program use and other Program supplies.

10. Project Monitoring Special Studies (see collaborative group)

11. NPDES Permit Renewal

This task includes resources for permit negotiation and renewal. The estimated budget assumes no additional work is required for the application and that the level of Program support at the work group and Steering Committee levels remains about the same. It assumes a level of effort to cover up to three stakeholder meetings and Water Board workshops and two full scale Water Board Public Hearings. It also assumes that the level of Co-permittee involvement with the work groups and the steering committee remain at approximately the same level of effort. The estimated level of effort does not include resources to address additional administrative action beyond Water Board approvals as noted above.

COLLABORATIVE GROUP

a. **Program Monitoring Special Studies**: The Program MOA requires that an amount be set at approximately 10 percent of the total budget of the Projects Group (excluding the PI/P tasks). SCVURPPP resources are not currently available to met this requirement. Therefore a limited budget has been allocated to cover any necessary changes in scope of the projects.

b. **CASQA Dues (Regional Collaboration)**: Statewide stormwater Organization dues. No increase in dues is included.

c. **TMDL CEP (Regional Collaboration):** These resources are used to fund the participation (i.e., technical participation annual cost) in the Clean Estuary Program (TMDL MOU between the RWQCB, BASMAA and BACWA). The CEP has requested $147,000 per year, however, because of other higher priority items all Bay area storm water programs reduced their contributions by approximately 1/3 and plan to continue participation at this reduced rate for the

next FY. The CEP is currently under review and redesign. The Program's and BASMAA's intent is to develop a method to split the contribution of CEP resources between the CEP and BASMAA to more appropriately and effectively address regional projects of concern to both BACWA and BASMAA and to also address projects that are specifically of more concern to BASMAA.

d. **RMP fee (Regional Collaboration):** The RMP is a program initiated by the Regional Board to monitor the water quality of San Francisco Bay. The San Francisco Estuary Institute has a contract to conduct sampling in the Bay and administer the program with oversight from the Regional Board. The Program is one of a number of dischargers contributing to the cost of the program. It is expected that the Program will continue to fund the RMP at about the same level for each fiscal year for the term of the permit.

e. **BASMAA Fee (Regional Collaboration):** BASMAA is the local regional stormwater association. The Program has and expected to continue to fund the organization at about the same level for each fiscal year for the term of the permit. The budget remains the same as FY 05-06 and includes some limited collaborative (in kind) resources for technical and/or legal services in anticipation of development of the RGP. BASMAA will be working with the BACWA to redesign the mission and objectives of the CEP to more closely respond to public agency needs. BASMAA will be looking into developing a coordinated stormwater regional effort to address technical and implementation questions (e.g., TMDL implementation).

f. **WERF Dues:** Covers the Programs costs as member of WERF.

Notes:

NPDES Fee: This is the annual fee imposed by the State Water Resources Control Board for NPDES municipal storm water permits in the San Francisco Bay area. It is not included in the total SCVURPPP budget this year and will be paid directly by th individual Co-permittees. For Co-permittee budgeting purposes, in FY 02-03 the SWRCB increased the annual fee from $10,000 to $54,000, which was absorbed into the overall Program budget. During FY 03-04, the SWRCB increased the fees to $161,000, which again was absorbed into the overall Program budget. The SWRCB individually billed the Co-permittees approximately $162,000 for FY 04-05. In FY05-06 the SWRCB billed the Co-permittees approximately $162,000 but returned an overcharge $21,800 to the Program (one time refund). No information is currently available from the SWRCB regarding FY 06-07 fees. Co-permittees should assume that annual fees will be on the order of approximately $162,000. The Program budget can not continue to absorb these fees as was done in past years and to do so would require further reductions in Program tasks that would significantly impact meeting permit requirements and further result in a reduction of contributions to regional collaborative programs.

Attachment 1 – SCVURPPP Mission and Goals Statement
2 – Overall program Budget Table 1
3 - Revised Co-permittee Assessments

Attachment 1: SCVURPPP Mission and Goals Statement

Mission Statement

"To assist in the protection of beneficial uses of receiving waters by preventing pollutants generated from activities in urban service areas from entering runoff to the maximum extent practicable."

The Mission Statement:

- Targets pollutant reduction measures that are needed to help protect beneficial uses
- Focuses on urban pollutant sources (as opposed to nonpoint sources generally)
- Sets a specific benchmark for implementation (as opposed to doing "anything and everything" related to pollutant sources)

This focused approach is consistent with the Program's idea of working with other parties or institutions that are better equipped to carry out specific pollution control strategies. The Program concentrates its own efforts on identifying pollution sources, and implementing pollution prevention measures, that are clearly within the authority and ability of the Co-permittees.

The Program's goals and objectives also stress this practical, focused approach.

GOAL 1: Comply with Permit

- Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)
- Reduce, to the maximum extent practicable, pollutants in stormwater runoff
- Comply with permit submittal requirements

GOAL 2: Determine Success

- Periodically evaluate the attainment of beneficial uses in selected waterways
- Evaluate changes in public awareness and behavior
- Evaluate effectiveness of specific control measures at pollution reduction.

GOAL 3: Adjust Activities to Meet Changes

- Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP
- Utilize what we learn to plan the next steps

GOAL 4: Achieve Acceptance of

- Urban Runoff Management Activities
- Effectively facilitate public input into Program planning process
- Integrate urban runoff goals at various intra-agency levels
- Develop and maintain a proactive interrelationship with regulatory authorities
- Publicize the efforts of the Co-permittees (Program)

GOAL 5: Integrate Urban Runoff Program Elements into other Programs

- Promulgate an understanding of the role of the urban runoff program
- Encourage other agencies to become involved in urban runoff issues
- Encourage action by the appropriate agencies

The Co-permittees intend to continue to utilize the Program's preferred approach of achieving consensus to resolve issues and reach decisions, and to rely on the Majority Vote mechanism set forth in Section 2.08 of the Agreement at the Management Committee level only when consensus-based resolutions appear or become elusive.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Draft Distributed to BATG and MC on January 20, 2006, approved by BATG on January 25, 2006 and MC ??

TABLE 1: TOTAL PROGRAM FY 06-07 BUDGET
Budget Summary

Item	Staff Hours	Total Cost
Operational Group		
1. Program Management/Administration (EOA)	3054	$454,168
2. Permit Management (EOA)	3304	$492,496
3. Technical Program Management (EOA)	962	$143,000
4. Legal Service (MOFO)	0	$87,818
5. Fiscal Agent (City of Sunnyvale))	0	$50,000
6. RMP Contribution (SFEI) (see Collaborative Budget)		
Sub-total: Operational Group	**7320**	**$1,227,482**
Projects Group		
7. Monitoring Projects (EOA/Subs)	1479	$880,000
8. C3/HMP Implementation Assistance (EOA/Subs)	370	$160,000
9. Public Information and Watershed Education budget (EOA/Subs)	555	$383,200
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)		
11. NPDES Permit Renewal Negotiation & Hearing Process (EOA)	555	$75,000
Sub-total: Project Group	**2959**	**$1,498,200**
Collaborative Group		
A. Program Monitoring Special Studies		$27,000
B. CASQA Dues (Regional Collaboration)		$15,000
C. TMDL CEP Participation (Regional Collaboration)		$97,000
D. RMP Fee (Regional Collaboartion)		$168,480
E. BASMAA Fee (Regional Collaboration)		$85,000
F. WERF Dues		$8,000
Subtotal Collaborative Group		**$400,480**
TOTAL PROGRAM BUDGET (NO SWRCB PERMIT FEE) (Used for Assessment)	**10278**	**$3,126,162**
NPDES Permit fee - Estimated (Paid Directly By Co-permittees)		$161,456
TOTAL PROGRAM BUDGET (includes est. permit fee)		**$3,287,618**

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TOTAL PROGRAM FY 06-07 BUDGET

Budget Summary

Item	Staff Hours	Total Cost	Budget
Operational Group			
1. Program Management/Administration (EOA)			
a. Administrative Assistance	738	$99,840	$99,840
b. Management Committee and Task Group Support			$177,840
i. Management Committee	554	$74,880	
ii. Task Groups	762	$102,960	
c. Program Budget Administration			$51,480
i. Develop Budgets	135	$18,200	
ii. Prepare Expenditure Reports[1]	246	$33,280	
d. Coordinate with Legal Consultant	177	$23,920	$23,920
e. Develop and Manage PI/P Program (non-watershed watch campaign tasks)	385	$52,000	$52,000
f. Performance Evaluation	58	$7,800	$7,800
g. Expenses		$41,288	$41,288
Subtotal	**3054**	**$454,168**	**$454,168**
2. Permit Management (EOA)			
a. Report Preparation and Submittal			$106,800
i. Annual Report	444	$60,000	
ii. Work Plans	346	$46,800	
b. Internal Co-permittee Liaison			
i. Develop Guidance	138	$18,720	$68,640
ii. Local Program Reviews (delay until FY 04-05)		$0	
iii. Conduct Training (4 Workshops)	369	$49,920	
c. External Organization Meetings[2]	1023	$138,320	$138,320
d. NDC Implementation Assistance, Tracking & Reporting	385	$52,000	$52,000
e. Implement Continuous Improvement Items	229	$31,000	$31,000
f. TMDL Program Tracking, Review & Reporting	370	$50,000	$50,000
g. Expenses		$45,736	$45,736
Subtotal	**3304**	**$492,496**	**$492,496**

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TOTAL PROGRAM FY 06-07 BUDGET
Budget Summary

Item	Staff Hours	Total Cost	Budget
3. Technical Program Management (EOA)			
a. Prepare RFPs, Technical Project Management	385	$52,000	$52,000
b. Technical Review of Work Products	385	$52,000	$52,000
c. Develop/Revise Performance Standards	192	$26,000	$26,000
d. Expenses		$13,000	$13,000
Subtotal	**962**	**$143,000**	**$143,000**
4. Legal Services	0	$87,818	$87,818
5. Fiscal Agent	0	$50,000	$50,000
6. Fees			
a. NPDES Permit Fee (SWRCB) (Paid By Co-permittees)			
b. Regional Monitoring Program Contribution (moved to collaborative)			
Subtotal	**962**	**$137,818**	**$137,818**
Operational Group Total		**$1,227,482**	**$1,227,482**
Projects Group			
7. Monitoring Projects[1]	1479	$880,000	$880,000
8. HMP Technical Assistance/Guidance/Workshops	370	$160,000	$160,000
9. PI/P & WEO budget[2,3]			
a. Watershed Education and Outreach Campaign	370	$308,200	$308,200
b. Pesticide User (PU) Outreach		$40,000	$40,000
c. Mercury Pollution Prevention Outreach	185	$25,000	$25,000
d. BASMAA Regional Collaboration (See Collaborative)			
e. Program Supplies		$10,000	$10,000
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)			
11. Permit Renewal			
a. RGP Negotiations	555	$75,000	$75,000
		$0	$0
		$0	$0
Projects Group Total	**2959**	**$1,498,200**	**$1,498,200**

[1] Scope is based on the Program's Multi-Year (8-year) Monitoring Plan.

[2] On February 15, 2001 the MC approved the Budget Adhoc Task Groups recommendation to incorporate certain elements of the PI/P budget into the Projects Group budget.

[3] Budget based on WE&O Ad Hoc Task Group draft memo dated December 17, 2003 regarding workplan options and budgets.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TOTAL PROGRAM FY 06-07 BUDGET
Budget Summary

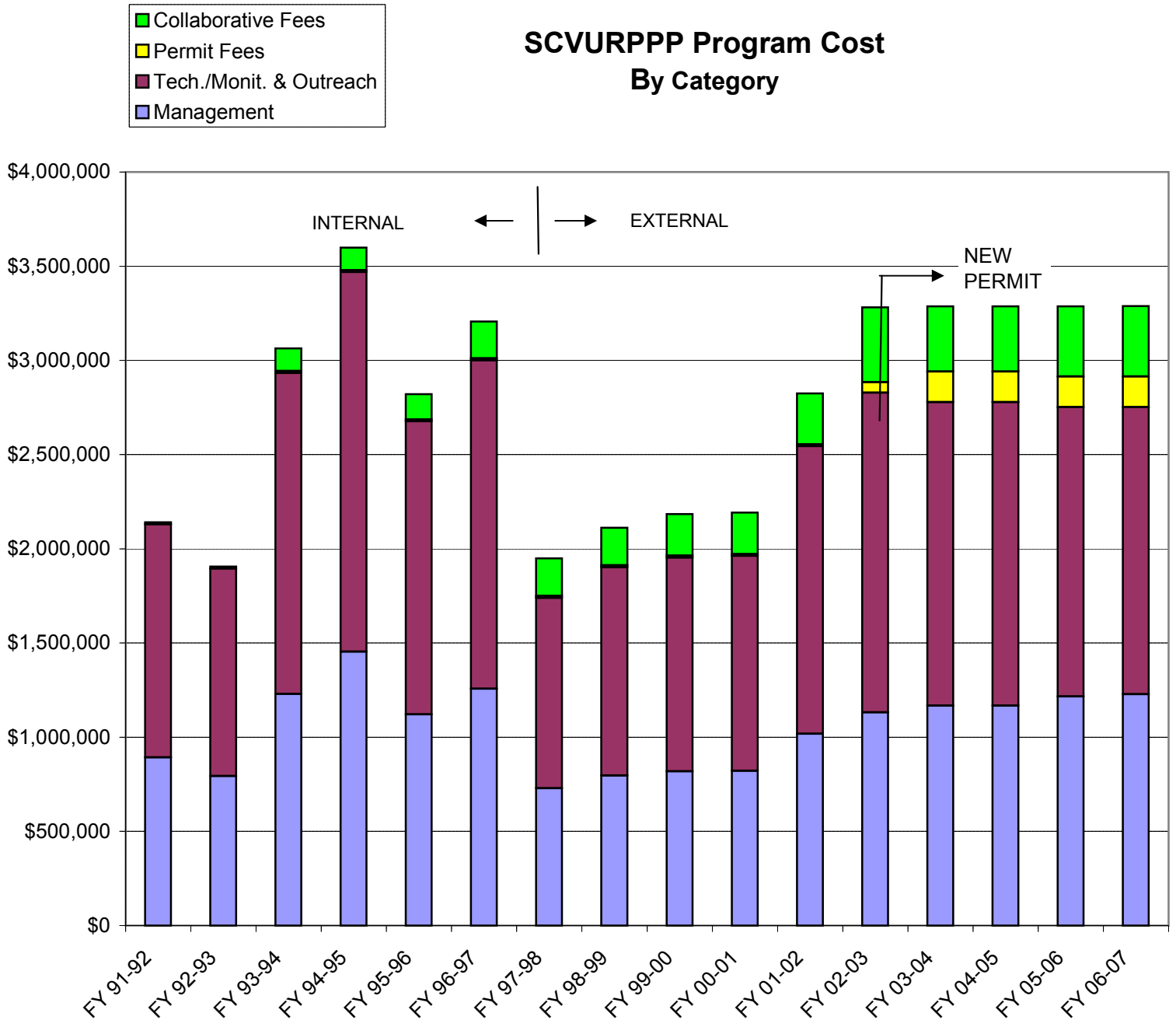
Item	Staff Hours	Total Cost	Budget
Collaborative Group			
A. Program Monitoring Special Studies (1)	0	$27,000	$27,000
B. CASQA Dues (Regional Collaboration)	0	$15,000	$15,000
C. TMDL CEP Participation (Regional Collaboration)	0	$97,000	$97,000
D. RMP Fee (Regional Collaboartion)	0	$168,480	$168,480
E. BASMAA Fee (Regional Collaboration)	0	$85,000	$85,000
F. WERF Member Dues	0	$8,000	$8,000
Subtotal: Collaborative Group	**0**	**$400,480**	**$400,480**
TOTAL PROGRAM BUDGET (NO PERMIT FEES)		**$3,126,162**	**$3,126,162**
Estimated NPDES Fee (Paid Directly by Co-permittees)		$161,456	$161,456
		$3,287,618	

Note: (1) MOA Requires 10% of Operating Group - budget not available

FY 06-07 Budget Assessments

(1/20/05)

		PROGRAM ASSESSMENT *PROGRAM BUDGET TOTAL FY 06-07 OPER / PROJ/COLL CONTRIBUTION* **$3,126,162**	*ESTIMATED PERMIT FEE* ***$161,456***	*TOTAL* ***Program & Permit Costs***
Co-Permittee	Program Contribution			
Campbell	1.88%	$58,772	$7,406	$66,178
Cupertino	2.46%	$76,904	$11,109	$88,013
Los Altos	1.59%	$49,706	$7,406	$57,112
Los Altos Hills	0.43%	$13,442	$2,963	$16,405
Los Gatos	1.74%	$54,395	$7,406	$61,801
Milpitas	2.75%	$85,969	$11,109	$97,078
Monte Sereno	0.14%	$4,377	$2,963	$7,340
Mountain View	3.91%	$122,233	$11,109	$133,342
Palo Alto	4.06%	$126,922	$11,109	$138,031
San Jose	30.01%	$938,161	$29,625	$967,786
Santa Clara	6.23%	$194,760	$18,516	$213,276
Saratoga	1.59%	$49,706	$7,406	$57,112
Sunnyvale	7.25%	$226,647	$18,516	$245,163
County of Santa Clara	5.94%	$185,694	$14,813	$200,507
SCVWD	30.02%	$938,474	$0	$938,474
	100.00%	***$3,126,162***	***$161,456***	***$3,287,618***
** Permit Fee estimate for budget purposes*				


Collaborative Fees
Permit Fees
Tech./Monit. & Outreach
Management
SCVURPPP Program Cost
By Category
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0
INTERNAL
EXTERNAL
NEW
PERMIT
FY 91-92
FY 92-93
FY 93-94
FY 94-95
FY 95-96
FY 96-97
FY 97-98
FY 98-99
FY 99-00
FY 00-01
FY 01-02
FY 02-03
FY 03-04
FY 04-05
FY 05-06
FY 06-07

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
2006 NATIONAL
CLEAN WATER ACT
RECOGNITION
AWARD
OUTSTANDING
STORM WATER MANAGEMENT

March 1, 2007

FY 2007-2008 Draft Work Plan

Sections 1-9
Program and Co-permittee Activities

Submitted in Compliance
with NPDES Permit Order No. 01-024 and 01-119
(as amended by R2-2005-0035)

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Hand Delivered on March 1, 2007

March 1, 2007

Mr. Bruce H. Wolfe
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Wolfe,

I am pleased to submit a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2007-2008. This Work Plan, which consists of Program and Co-permittee Activities, fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order:

- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement Program and other local PI/P activities (Provision C.4.)
- Contains the Program's FY 07-08 Annual Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 07-08 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of certain actions accomplished in FY 06-07;
- Includes the Program's FY 07-08 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 07-08 (Provision C.9.d);
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

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- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan also considers the implementation status of FY 06-07 activities and actions, in order to plan FY 07-08 activities.

We look forward to working with you and your staff to implement the actions contained in the attached plans.

Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: Trish Mulvey, CLEAN South Bay
David Chesterman (SCVWD), SCVURPPP Management Committee Chair
SCVURPPP Management Committee Members
Robert Falk, Morrison & Foerster

Attachments: --FY 2007-2008 Draft Work Plan (including Co-permittee Work Plans) - one (1) hard copy
--FY 2007-2008 Draft Work Plan (including Co-permittee Work Plans) -three (3) compact discs

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Certification

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Submitted on behalf of the
Santa Clara Valley Urban Runoff Pollution Prevention Program
March 1, 2007

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

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G. SAN JOSE
H. SANTA CLARA
I. SUNNYVALE
J. WEST VALLEY COMMUNITIES (CAMPBELL, LOS GATOS, MONTE SERENO, SARATOGA)
K. SANTA CLARA COUNTY
L. SANTA CLARA VALLEY WATER DISTRICT

INTRODUCTION

This document comprises a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2007-2008. This Work Plan fulfills Provision C.6.b. of the Program's NPDES permit (Order 01-024) reissued February 21, 2001.

The Work Plan also fulfills the following additional permit requirements of the Order, consistent with Permit Provision C.6.b:

- Describes the development of new or modification of existing Performance Standards (Provisions C.2.b. and C.5.);
- Includes a Program PI/P Work Plan and Co-permittee work plans that describe the planned efforts to implement Program and local PI/P activities (Provision C.4.)
- Contains the Program's Annual FY 07-08 Monitoring Plan (Provision C.7.c.), which addresses data collection and control programs for specific pollutants (Provision C.9.);
- Includes the Program's FY 07-08 Copper/Nickel Work Plan (Provisions C.9.a and b), which provides descriptions of the proposed Work Plan actions and the status of actions accomplished in FY 06-07;
- Includes the Program's FY 07-08 Mercury Outreach Activities (Provision C.9.c.), as described in the Program's Mercury Pollution Prevention Plan;
- Contains the Program's Pesticide Management Work Plan tasks for FY 07-08 (Provision C.9.d);
- Defines the Program's role relative to watershed management efforts and involvement in the Santa Clara Basin Watershed Management Initiative (SCBWMI), as described in the Annual Monitoring Plan (Provision C.10.).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Work Plan builds on the baseline routine efforts conducted by the Program and Co-permittees through its "continuous improvement" process. The Work Plan also considers the implementation status of FY 06-07 activities and actions, in order to plan FY 07-08 activities.

The Work Plan is comprised of nine sections, as follows:

1. **Program Continuous Improvement Tasks:** Section 1 describes continuous improvement tasks and provides a schedule for their completion.

2. **Performance Standard Revisions:** Section 2 provides future efforts for revising the Program's performance standards.

3. **Public Involvement and Participation:** The Program's PI/P Work Plan (Section 3) includes a list and description of projects planned for FY 07-08 and the process used to select them. A Pollutant Matrix is included which illustrates how on-going and planned PI/P efforts are directly linked to pollutants of concern.

4. **Monitoring Program:** The Program's FY 07-08 Annual Monitoring Plan is presented in Section 4. The monitoring strategy describes how monitoring projects are linked to Program goals, SCBWMI goals and permit requirements. The section identifies those on-going projects that are related to permit requirements along with a description and tentative schedule for FY 07-08 projects. The Monitoring Plan also includes watershed management measures.

5. **Pesticide Management Work Plan:** Section 5 contains a status report on the Program's pesticide management tasks, consistent with the Program's Pesticide Management Plan (2/15/02), and planned tasks for FY 07-08.

6. **Mercury Pollution Prevention Work Plan:** Section 6 contains the Program's mercury pollution prevention tasks for FY 07-08, consistent with the Program's Mercury Pollution Prevention Work Plan (3/1/02). The status of Mercury Pollution Prevention Plan tasks is also provided.

7. **New and Redevelopment Work Plan:** Section 7 describes the Program's progress in assisting Co-permittees in preparing to implement the requirements for new and redevelopment control measures (Provision C.3.) and the Program tasks planned for FY 07-08.

8. **FY 07-08 Program Budget:** The Program's Final FY 07-08 Budget Report, as approved by the Management Committee, is included in Section 8.

9. **Co-permittee Work Plan Summary Tables:** Section 9 contains the individual Co-permittee Work Plans for FY 07-08 developed consistent with the FY 00-01 Work Plan format approved by Water Board staff.

SECTION 1

PROGRAM CONTINUOUS IMPROVEMENT TASKS

1. PROGRAM CONTINUOUS IMPROVEMENT WORK PLAN

INTRODUCTION

The 2004 Urban Runoff Management Plan (URMP)[1] commits the Program and Co-permittees to a process of continuous improvement. The concept of continuous improvement acknowledges that the definition of "maximum extent practicable" evolves over time. Through continuous improvement, the Program will continue to develop and implement reasonable control measures to help advance the goal of achieving water quality objectives in South San Francisco Bay.

The continuous improvement process is described on pages 37-39 of the Program URMP. As shown in Figure 2 of the 2004 URMP, areas for continuous improvement are identified through the Program and Co-permittees' participation in the Santa Clara Basin Watershed Management Initiative (SCBWMI) and the Program and Co-permittees' annual evaluations and annual reports.

Water Board staff and representatives of interested parties (including CLEAN South Bay) review the Program and Co-permittee annual reports and work plans, and participate in Co-permittee performance review meetings. Comments from these reviews and meetings help identify specific Co-permittee and Program continuous improvement (CI) tasks.

FY 07-08 CONTINUOUS IMPROVEMENT WORK PLAN

FY 07-08 Program Continuous Improvement Items

Program staff will work with the Co-permittees to address the revised expectations in the Municipal Regional Permit, which the Water Board expects to adopt sometime during FY 07-08.

On-Going Continuous Improvement Items

There are a few remaining continuous improvement tasks from previous years, and their status and updated schedules are provided in Table 1-1.

[1] In accordance with Permit Provision C.2.b., the Program submitted the 2004 URMP (dated September 1, 2004) to the Water Board on September 1, 2004. In accordance with Permit Provision C.14., the 2004 URMP was resubmitted to the Water Board on February 24, 2005 as part of the *Report of Waste Discharge* (NPDES Permit Application for Re-issuance of SCVURPPP NPDES Permit).

Table 1-1
Status of Ongoing Program Continuous Improvement (CI) Tasks

Tasks	Updated Schedule	Status[1]
New Development and Redevelopment		
1. Develop design guidance containing stormwater control opportunities for small road modifications.	August 2007	**Update** – The Program's permit requirements were made consistent with other Bay Area permits, which exempt road reconstruction (within the same footprint) from C.3. C3PO AHTG members have expressed interest in the development of stormwater control design guidance for small road and right-of-way modifications and other tight spaces. This was a lower priority than other C.3. tasks. It will be addressed during the first quarter of FY 07-08.
Program Management		
1. Conduct a workshop for municipal staff based on the municipal training protocols being developed by an ad hoc task group. (Priority – Medium)	September 2007	**Update** – Five Power Point presentations have been developed on BMPs for corporation yards, storm drain O&M, road maintenance, pest management and mercury pollution prevention. Program staff will repackage each training protocol into smaller, focused modules. This approach will allow Co-permittees to train municipal staff on certain key municipal elements in shorter blocks on time (e.g., 15 minutes). Once finalized, each module will be distributed to Co-permittee staff through the Program's website (www.scvurppp.org). This task was delayed due to Program staff focus on higher priority items. It will be addressed during the first quarter of FY 07-08.
2. Consider developing, with the help of an ad hoc task group, a fact sheet addressing common construction BMP problems, like drain inlet protection and dewatering. (Priority – Medium)	December 2007	**Update** – Management Committee approved having the Program adapt an existing brochure on dewatering (created by Palo Alto, Mountain View and San Jose) for the other Co-permittees' use. The C3PO AHTG confirmed its interest in this project at its September 26, 2005 meeting, but it was a lower priority than other C.3. tasks.

[1] Tasks reported as completed in the FY 05-06 Annual Report have been removed from the list.

SECTION 2

PERFORMANCE STANDARD REVISIONS

2. PERFORMANCE STANDARD REVISIONS

Background

The Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) developed model Performance Standards (PSs) in 1996. The model PSs were accepted by the Water Board in June 1997. Each Co-permittee adopted the model PSs or tailored them to their local community characteristics and conditions. The original PSs were incorporated into the Program's 1997 *Urban Runoff Management Plan* (URMP)[1]. Revised PSs are included in the 2004 Program URMP and the Co-permittees' local URMPs, in accordance with NPDES permit Provision C.2.b

Future Efforts- FY 07-08 Activities

Priorities for recent efforts to revise or create new performance standards have been driven by the requirements in the Program's NPDES permit and/or continuous improvement tasks. All new or revised PSs required by the current permit have been completed. Future decisions to revise or update existing PSs will be based on the requirements of the Municipal Regional Permit, expected to be adopted sometime during FY 07-08.

[1] In accordance with Permit Provision C.2.b., the Program submitted the 2004 URMP (dated September 1, 2004) to the Water Board on September 1, 2004. In accordance with Permit Provision C.14., the 2004 URMP was resubmitted to the Water Board on February 24, 2005 as part of the *Report of Waste Discharge* (NPDES Permit Application for Re-issuance of SCVURPPP NPDES Permit).

SECTION 3

PUBLIC INFORMATION/PARTICIPATION WORK PLAN

3. PUBLIC INFORMATION/PARTICIPATION WORK PLAN

INTRODUCTION

The goals of the Public Information/Participation (PI/P) element are to identify and change behaviors that adversely affect water quality; and to increase the understanding and appreciation of streams and San Francisco Bay. To accomplish these goals, Co-permittees pursue PI/P activities jointly through the Program, on a countywide basis, and individually in their own jurisdictions.

Each year, the Watershed Education and Outreach Ad Hoc Task Group, which consists of Program staff, Co-permittees representatives and consultants, identifies, prioritizes and selects countywide projects for implementation. Table 3-1 presents the updated Pollutant Matrix, which links past, current, and future PI/P projects with pollutants of concern. The projects are developed and implemented each year by Work Groups.

The Program provides resources to conduct countywide PI/P tasks through approval (by the Management Committee) of an annual Program budget and Work Plan. All Co-permittees contribute resources to conduct annual Program Work Plan tasks consistent with the Co-permittee assessment procedure contained in the SCVURPPP Memorandum of Agreement[1].

FY 07-08 PI/P WORK PLAN

The Program conducts its public education and outreach through three projects: Watershed Education and Outreach, Pesticide User Outreach and Mercury Pollution Prevention Outreach. The Program has completed all tasks planned for these projects under the current Permit. During FY 07-08, ongoing tasks will be implemented. In addition, Program staff and the WEO AHTG will focus efforts on working with Water Board staff on the Municipal General Permit; and begin to plan for any new outreach-related requirements that may be contained in that permit.

Watershed Education and Outreach

The FY 07-08 Watershed Education and Outreach tasks include the following:

Watershed Watch Campaign

Watershed Watch Campaign elements that will be implemented in FY 07-08 include media advertising, outreach events, media relations, website maintenance and Campaign evaluation. The detailed FY 07-08 Watershed Watch Campaign Work Plan is included within Attachment 3-1.

Regional Ad Campaign

The Program plans to continue with its participation in the Regional Ad Campaign (RAC) in FY 07-08. From FY 02-03 through FY 04-05, the RAC implemented the “Beautiful Watersheds” advertising campaign for increasing the public’s awareness about watersheds and problems

[1] On February 1, 2001, the Management Committee directed Program staff to include all Program-Wide PI/P activities as part of the Projects Group budget and thus eliminated any confusion regarding selective Co-permittee participation.

caused by litter. The advertisements were broadcast on radio and television. Preliminary plans call for the RAC to focus on litter in FY 07-08.

Schools Outreach

During FY 07-08, the Program plans to continue to sponsor up to 50 ZunZun assemblies at elementary schools in the Santa Clara Valley. Outreach to schools will also be continued through the *Wacky Watersheds* teachers training workshop. This workshop is offered free of charge to teachers by the City of San Jose.

Advertising to Support Creek Cleanup Events

Each year the Creek Connection Action Group sponsors two creek clean-up events: Coastal Clean-up Day in September and National Rivers Clean-up Day in May. In FY 07-08, the Program will continue to provide funds to advertise one of these events.

Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso (Alviso Education Center)

The Program provides resources to the Alviso Education Center to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. This is an on-site educational program conducted primarily on weekends. The activities focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The Program will continue to support these activities in FY 07-08. Attachment 3-2 describes the activities offered in the Watershed Watchers Program.

Pesticide User Outreach

This project combines elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements of the Program's NPDES permit. Outreach is coordinated with other pollution prevention programs separately funded by Co-permittees (e.g., County's Household Hazardous Waste Program). During FY 07-08, ongoing outreach tasks from the Program's Pesticide Plan will be implemented (see Section 5 of this Work Plan).
The tasks for FY 07-08 include:

- Task 1 – IPM Store Partnership Program - Continue IPM participation in Santa Clara County stores. At a minimum, visit each store once every two months; maintain an ongoing relationship with participating stores through in-store contacts; refresh/restock literature racks (as needed); and update "shelf talker" labels (as needed). Using the services of Annie Joseph, IPM consultant, provide training to store employees on selling less-toxic pesticides; and work with two stores to increase shelf-space for less-toxic products
- Task 2 –Regional IPM Partnership –Support the Regional IPM Partnership program and participate in meetings and regional activities. Review and approve products.
- Task 3 – Outreach Events - Participate in selected community outreach events for conducting IPM outreach. Possible events may include:
    - Pumpkins in the Park
    - Spring in Guadalupe Gardens

- San Jose Spring Home and Garden Show

Program, Watershed Watch and Co-permittee staff will staff these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures. An IPM community workshop for the general public may also be conducted at one of these events.

- Task 4 – Media Advertising - Conduct media advertising in coordination with the Watershed Watch campaign. Advertising will include messages that promote "OWOW shelf-talkers" for selecting less-toxic products.
- Task 5 – Outreach to businesses - Continue distributing the "Don't set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors. Identify and implement an IPM training/certification program for landscape maintenance professionals.
- Task 6– Support the Regional IPM Conference - Provide funding to support the Regional IPM Conference, if required.
- Task 7 – Support the Going Native Garden Tour - Provide funding to support promotional activities for the 2007 Going Native Garden Tour.

Mercury Pollution Prevention Outreach

To implement the Public Education and Outreach element of the Mercury Plan, Program staff established a new work group called the Mercury Pollution Prevention Outreach Work Group in December 2002. The objective of this group is to implement a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products. The Mercury Plan identifies the development of a fluorescent light tube (FLT) recycling public outreach and education plan as a priority and recommends conducting outreach in two phases. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of fluorescent light tubes.

The Program has completed the implementation of all Mercury Plan tasks. The focus of FY 07-08 tasks will be implementation of ongoing tasks. As in previous years, outreach in FY 07-08 will be continued coordinated with the County HHW Program. Outreach efforts will focus on promoting fluorescent lamps collection locations to residents. Outreach may be conducted using media advertising, in-store displays (posters, banners) and newsletter articles. The Program may also coordinate its outreach activities with other Regional groups/program that are planning to conduct mercury outreach in FY 07-08.

Table 3-2 lists all of the PI/P projects to be funded during FY 07-08. Preliminary descriptions ("Development Strategy Checklists") for the Pesticide User Outreach and Mercury Pollution Prevention Outreach projects are provided in Attachment 3-3. The scopes of work will be finalized in more detail by Program staff and Co-permittees prior to implementation of the projects.

ATTACHMENTS

Attachment 3-1 Watershed Watch Campaign Work Plan

Attachment 3-2 Alviso Education Center Work Plan Tasks

Attachment 3-3 Development Strategy Checklists (Project Descriptions for FY 07-08 PI/P Projects)

Table 3-1
Pollutant Matrix for FY 07-08 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 07-08 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Diazinon[2] and pesticides in general	Pesticides (residential, commercial and municipal use)	• Home gardeners • Pest control professionals • Landscapers • Municipal Employees • Residents who hire pest control professionals	Information on Watershed Watch website, IPM Store Partnership Program (regional and local), Pesticide User Outreach activities, distribution of restaurant brochure "Don't Set a Table for Pests" through County Health Inspectors, media advertising.	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "When Ants Invade" Self-Mailer, "Landscaping, Gardening and Pool Maintenance" tri-fold, "Don't Set a Table for Pests", IPM Store Partnership Program Fact Sheets, "Control It", HHW programs, BASMAA Media Relations Campaign topic, Got Bugs magnet, Watershed Watch media advertisements.
Sediment	Erosion from new construction, grading, road wear	• Construction companies/contractors • Architects/engineers • Municipal inspectors • Residents (home improvement projects, remodels)	Outreach to developers via RWQCB Construction Site Management Workshops or other mechanism.	Construction BMP Tri-folds in English, Spanish and Vietnamese, "Blueprint for a Clean Bay" (revised 1-04), Construction Site Management workshops, Dewatering Brochure.
Mercury	Tailpipe emissions (i.e., diesel-powered vehicles), consumer products (thermometers, fluorescent lighting)	• Residents (auto use, general awareness, proper selection and disposal of products) • Industry (fleet use) • Commercial (fleet use)	Information/fact sheets on Watershed Watch website, BASMAA Media Relations Campaign (potential topic), Mercury P2 Outreach (Residential and business fluorescent light recycling),	"Spare the Air and Water Too" campaign press release and public service announcements, bill stuffers, Program and local co-permittee fact sheets (e.g., Palo Alto and Sunnyvale), Watershed Watch radio,

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.
[2] Under terms of an agreement between EPA and pesticide manufacturers, as of December 31, 2004, residential outdoor and indoor uses and sales of Diazinon are prohibited. Program outreach on other pesticides is continuing.

Table 3-1
Pollutant Matrix for FY 07-08 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 07-08 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
			media advertising.	transit and print ads, store signage, posters, newsletter articles.
Copper	Brake pads, industrial discharge, copper algaecides, coolant leaks, illegal dumping	• Industry (scrubbers, roofs, cooling towers, piping) • Residents (illegal dumping, pools and spas) • Commercial business (pool, spa, fountain maintenance) • Municipal maintenance staff	BASMAA Media Relations Campaign (potential topic), Information on Watershed Watch website, support of Brake Pad partnership through BASMAA.	Brake Pad Partnership, "Keep Pool/Spa Water Out of Storm Drains, Streets, and Creeks" (older pool and spa brochure), "Keeping It All In Tune", Industrial BMPs, storm drain stencils, "Draining Pools & Spas – Keep Pool, Spa and Fountain Water Out of Storm Drains, Creeks and the Bay", Palo Alto's fact sheet on architectural use of copper.
Nickel	Industrial discharges, tailpipe emissions, construction-related erosion	• See sediment and mercury target audiences	See sediment and mercury projects.	See sediment and mercury projects.
Trash	Intentional littering (cigarette butts, throwing objects from automobiles, illegal dumping), trucks hauling poorly secured materials, uncovered or overflowing garbage cans	• General public • Children • Drivers • Smokers	BASMAA media relations campaign (potential topic), Information on Watershed Watch website, BASMAA Regional Ad Campaign topic.	"The Bay Begins at Your Front Door" brochure, Watershed Watch magnets, Watershed Watch Kit brochure, Watershed Watch web site, BASMAA's "Beautiful watersheds/trash" TV and radio ads.

Table 3-2
FY 07-08 PI/P Projects

Project Title	Project Description	Comments
Non-Discretionary PI/P Projects		
1. Watershed Education and Outreach Campaign (Year 8)	Funding for the Watershed Education and Outreach Campaign. Includes: • Funding for the Watershed Watch Campaign • Funding for educational programs at the Alviso Ed Center coordinated with the Watershed Watch Campaign; • Funding for ZunZun to perform a watershed – themed show at schools in Santa Clara Valley. • BASMAA Regional Ad Campaign • Advertising to support Creek Cleanup Activities	Proposed Activities: • Watershed Watch Campaign • BASMAA RAC • School Outreach • Alviso Education Center • Advertising to support Creek Cleanup Activities
2. Pesticide User (PU) Outreach (Year 6)	Project combines cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. Scope to include items in Program's Pesticide Management Plan for outreach to residents, commercial businesses, and pest control operators.	SCVURPPP will continue to support the Regional IPM Partnership Program, and consider supporting other pesticide related projects through its participation in BASMAA. Program will continue to maintain the stores participating in the store partnership program. Additional outreach will be made locally to pesticide users, potentially residential and commercial users, residents hiring pest control professionals, and/or other audiences. Outreach will be conducted at community events, advertising and by conducting IPM workshops for residents.
3. Mercury Pollution Prevention Outreach (Year 5)	Continuing outreach on proper disposal of mercury containing wastes and education on low-mercury products.	Program will continue its mercury outreach and coordinate its efforts with the County HHW Program in implementing its mercury grant. The Program may also coordinate its outreach activities with other Regional groups/programs that are planning to conduct mercury outreach in FY 07-08.
4. Program Supplies	Estimated budget for reprints of materials for Program use and other Program supplies.	

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

FY 07-08 Watershed Watch Campaign Work Plan

BACKGROUND

The primary goals of the Watershed Watch Campaign are to:

1. Change behaviors that negatively impact the watershed.
2. Encourage behaviors that protect, preserve and restore the watershed.
3. Inform audiences about activities that impact the watershed.
4. Build awareness of watershed issues in general.

In fiscal year FY 06-07, Carl & Manor Advertising was contracted to:

- Implement plans and creative developed in FY 05-06
- Develop conceptual plans and ongoing strategies to meet the goals of the campaign
- Maintain and develop partnership relationships that benefit the Program
- Coordinate campaign activities and consult the WEO AHTG

Creative executions included radio (English & Spanish), print and outdoor with the "Watch Out" theme focused on Mercury and Pesticides messages, and additional general awareness/campaign branding ads were developed to run in donated media.

FY 06-07 media focused on community newspapers, South Bay radio stations, and Santa Clara County transit, plus donated (value-added) space.

FY 07-08 Watershed Watch Campaign Work Plan

The FY 07-08 Work Plan is based on a campaign budget similar to the FY 06-07 budget. If additional funds become available, they will be allocated according to the prioritized needs of the campaign. The Work Plan may be modified per requirements of the new Municipal Regional Permit.

Whenever possible, Watershed Watch Campaign activities will be coordinated with activities of other local and regional outreach programs (e.g., the BASMAA Regional Ad Campaign and the BASMAA Media Relations Campaign). Campaign activities will be evaluated on an ongoing basis, and changes made as required.
The following tasks will be implemented in FY 07-08 to achieve the Campaign goals:

TASK 1: Baseline Evaluation

The FY 06-07 campaign implemented new creative and a new long-term awareness community-based media approach.

To date, the campaign effectiveness has been measured through

- Preliminary focus group evaluation of creative
- Hits on the www.MyWatershedWatch.org website
- Inquiries on the phone hotline
- Hits on the www.HHW.org website

- Requests for information
- Actual measurement of fluorescent bulbs dropped off at participating hardware stores

Spring '07 campaign activities potentially include partner promotional activities, such as media-promoted events at Classic Car Wash, Santa Clara County Parks, Bonfante Gardens, Guadalupe River Park and Gardens, and participating Silicon Valley Auto Dealers Association locations. Whenever possible, measurable components will be worked into the promotions to provide further effectiveness measurement.

In addition to these measured results, a "mini-survey" will be conducted early in the FY 07-08 to assess the effectiveness of the FY 06-07 Campaign. Rather than investing a major portion of campaign resources to the baseline market study, an alternative html/email-based survey approach will be employed:

- A short quantitative survey will be developed, likely using an online survey service such as Survey Monkey to collect data.
- An online list service will be utilized to reach their double opt-in[1] list members within our primary target audience (educated Santa Clara County homeowners aged 35+); current data suggest more than 1 million names in this list
- At least one incentive may be developed via a campaign partner, or from the research budget, to aid in generating response
- Test message lines will be used to small portions of the list to determine the most effective message/reference line
- At least one email blast will be sent to the entire list
- Results will be tabulated, evaluated and reported
- Depending upon the outcome, campaign creative and/or media strategies may be adjusted and implemented for the remainder of FY 07-08

A more detailed, traditional phone-survey will be conducted in FY 08-09, as required by the Watershed Education and Outreach Strategy.

TASK 1 DELIVERABLES:

Deliverables shall include:

- Evaluation and measurement of FY 06-07 campaign effectiveness through measurable campaign activities
- HTML/EMAIL Survey
    - Survey development
    - Incentive development or procurement
    - List service selection / List development
    - HTML and Text-only email development

[1] Double opt-in vs. single opt-in: Opt-in email is defined as an email that has been requested by the recipient. Single opt-in simply means that actions were taken to sign up for the email in question. The term *double opt-in* means that the subscriber has actively confirmed their subscription, typically by responding to an automatically-generated message sent to the email address.

- Test email blasts / evaluation
- Survey email blast(s)
- Compile, evaluate and report results

TASK 1 BUDGET: $7,500

TASK 2: Creative Development

A modest creative development budget has been allocated to allow for minor revisions to existing messages or the development of an additional message (e.g. anti-litter or automotive related message). Depending upon the needs of the campaign, additional budget may be required.

The creative development process involves determining the factors that lead to behavior changes in the Program's target audiences. The target audiences are:

Primary target audience:

- Santa Clara County residents
- Homeowners
- Aged 35+
- College educated

Secondary target audiences:

- Spanish-speaking or bilingual Santa Clara County residents
- All Santa Clara County residents aged 15-34
- High school students
- Lower income residents ($35,000 total household income or less)

For example, the motivating factors for the primary target audience could be their children's welfare (if applicable), property values, economic factors, and convenience / time.

The secondary (long-term) audiences are greatly diverse and therefore may have widely varying issues and motivations. The motivating factors for them could be:

- For Spanish-speaking or bilingual Santa Clara County residents - family values / children's welfare, economic factors.
- For Santa Clara County residents aged 15-34, high school students - making their mark on the world, economy / employment, and pleasure / having fun
- For lower income residents ($35,000 total household income or less) - economy / security, housing.

The Campaign will attempt to understand and answer the inherent questions that the target audience will ask upon hearing our message(s):

- How or why does this impact me?
- What should I do?
- What difference will it make?

Campaign messages will answer these target audiences' questions; inform them and show benefits. Each of the messages will get their attention, be clearly understandable, focused on one action or desired outcome, appeal to the audience's values and concerns, demonstrate the relevance of their participation/action, and make it seem easy.

Messages and executions will be consistent with the currently developed "Watch Out" ads, unless otherwise advised by the results of the baseline survey evaluation.

Final execution will be determined by media selections, the needs of partners and participating jurisdictions, and available budget, but may include:

- Print media (newspaper ads)
- Transit media (bus board posters)
- Radio (recorded messages, public service announcements)
- Collateral (point-of-purchase displays/prompts, materials for distribution)

TASK 2 DELIVERABLES:

Final deliverables are contingent upon media plans and WEO AHTG agreement about the message focus for each campaign flight. Deliverables may include:

- Either 1 new print ad message or minor revisions to existing Mercury, Pesticide and general awareness ads.
- Either 1 new radio ad message produced in English & Spanish, or minor revisions to existing productions.
- If transit ads are included in the media plan, production costs will be adjusted from another part of the budget.
- If point-of-purchase / prompts collateral or signage is to be included in any partnership activities, production costs will be adjusted from another part of the budget, and/or negotiated as partnership added-value.

TASK 2 BUDGET: $6,000

TASK 3: Media Advertising

As much as possible, media partnerships, schedules / flight plans and budget allocations will be determined in FY 06-07, so they are ready for implementation early in FY 07-08 pending Task 1 (baseline campaign evaluation) results. In developing these plans, the consultants will work with the WEO AHTG to clearly identify and define their media goals and preferences, and obtain their approval.

Requests for proposals will be developed to clearly define the goals of the campaign, the prospective media schedule(s)/plan, budget, and the criteria on which proposals will be judged. RFPs will be distributed to media in the geographic target area, defined as Santa Clara County geographic area, also known as the area of dominant influence (ADI). San Francisco media will also be included with the instruction that comparative data is based on coverage of Santa Clara County audiences.

Media Allocation

The consultants will allocate the media budget proportionate to language/population of our target audiences, and the media's effectiveness in delivering reach, frequency and added-value to the campaign. They will create an appropriate balance and synergy of radio, outdoor/transit, print and collateral, based on the goals and budget for the campaign.

Media Selection

Media will be evaluated for: its effective reach in the ADI (ratings); efficiency based on cost per point, reach & frequency to target audience(s), added value, and partnership opportunities.

Media selection will be based on creating a desirable balance of reach and frequency; limited duplication in programming and formats for maximum reach; maximum impact weighing rating points and impressions; and adequate frequency to create impact. Selection will also consider the proportion of media in English and Spanish relative to the population, effectiveness in delivery of the message, the messages the Campaign wants to deliver, partnerships and value-added media and promotions.

Media Schedule

To develop the media plan, the consultants will determine the flight dates and weight of media for the flights. Schedules may be determined by the seasonality of the message(s) that may impact effectiveness of the campaign. For example, gardening and home improvement projects may be more popular in the spring and summer/fall, so pest control, gardening and household hazardous waste disposal messages may be more effective if delivered in those seasons.

Schedules may also be influenced by partnership activities and relevant event considerations. To maximize partnership opportunities, a campaign message may be tagged with a relevant partner/partnership event announcement. This added-media value could be offered in trade for in-kind Program promotion at the events, and in event marketing (co-sponsorship). A partnership and event calendar will be developed to aid in the media planning.

The FY 06-07 media was a "top of mind awareness" (TOMA) campaign modified to the limitations of the media budget. Based on the results of Task 1, the TOMA approach may be continued through FY 07-08 or modified to provide one or two high-impact 3- or 4-week promotions-oriented schedules, depending upon allocation of the additional pesticide and mercury outreach media budgets.

The consultants will present the recommended detailed media plan to WEO AHTG for approval. The media plan will be revised as needed to meet or exceed approval.

Upon approval of the media plan, the consultants will confirm schedules with the media and secure contracts, including written commitments of added value and promotions. All creative materials and traffic instructions/insertion orders will be distributed to the media.

Task 3 DELIVERABLES:

- RFP to Media (Media Negotiation)
- Media Recommendations

- Media Plan
- Traffic/Distribution to Media
- Billing / Reconciliation / Documentation
- Media Campaign Summary (Report)

Task 3 BUDGET: $48,000
(This may be supplemented with approximately $30,000 from the Pesticide User Outreach and Mercury Pollution Prevention Outreach media budget)

Task 4: Partner Development and Coordination

Ongoing effort will be devoted to supporting relationships with current partners / pursuing previous partnership opportunities including:

CURRENT

- Guadalupe River Park & Gardens
- Santa Clara County HHW Program
- Children's Discovery Museum
- Don Edwards San Francisco Bay Wildlife Refuge at Alviso
- Santa Clara County Integrated Waste Management Division
- Summerwinds Nursery
- Classic Car Wash
- Creek Connections Action Group
- Keep California Beautiful (donations for Creek Connections)
- Happy Hollow Park & Zoo
- Bonfante Gardens
- Santa Clara County Parks & Recreation Department (pending/new FY 06-07)
- Silicon Valley Auto Dealers Association (pending/new FY 06-07)
- BASMAA / Our Water Our World
- Paramount's Great America (new FY 06-07)
- Surfrider Foundation (local chapters / new FY 06-07)
- Media
    - KRTY/KLIV Radio
    - KUFX, KSJO and KCNL (ClearChannel) Radio
    - KEZR/KBAY Radio
    - Times Media, Inc.

  - Silicon Valley Community Newspapers
  - CBS Outdoor (VTA buses)
  - *Auto Shopper South Bay*
  - Santa Clara Weekly
  - ANG - Alameda Newspaper Group (*Milpitas Post, Berryessa Sun*)
  - Embarcadero Publishing (*Palo Alto Weekly, Mountain View Voice*)
  - *Metro News*

PREVIOUS / PENDING

- Kelly Moore Paints (via media partner)
- Jiffy Lube / Quality Tune Ups
- The Watershed Program
- United Neighborhoods of Santa Clara County
- RAFT (Resource Area For Teachers)
- Strong Neighborhoods
- Hispanic Chamber of Commerce Silicon Valley
- San Jose Chamber of Commerce
- San Francisco Bay Bird Observatory
- Greenbelt Alliance
- Chinese American Mutual Assistance Association
- San Jose Conservation Corps
- Pick Up San Jose
- Going Native Garden Tours
- Pure Water Stores
- Media
  - Telemundo – KSTS Channel 48 Spanish TV
  - *San Jose Mercury News* + MercuryCenter.com
  - *Bay Area Parent Magazine*
  - ClearChannel Outdoor (bus shelters, billboards)
  - KPIX – CBS 5 and CW TV
  - KNTV – NBC 11
  - KRZZ “La Raza” Radio
  - KLOK/KBRG Univision Radio
  - KFOG/KFFG Radio

The consultants will also explore development of new partnerships. They will contact

those who were previously sought that didn't materialize (VTA, Sierra Club), and pursue new ones like

- Additional or alternate media partners - VietUSA, Cinemas, Pennysaver, ValPak, (direct mail media), movie theaters, etc.
- Water-related / Outdoor activity businesses or sporting retailers – Fishing, boating, rafting, kayaking
- Hardware/Garden/home improvement – OSH (currently through BASMAA), Ace
- Automotive – dealers, oil change / service centers, auto parts / targeting do-it-yourself oil changes

The consultants will distribute a partnership kit to all partners and potential partners, which presents partnership benefits and opportunities and tools for displaying their support of WW, and thanks them for their partnership.

Other resources may be developed as new methods or logistics for distributing the Program messages.

The support of these relationships includes coordinating outreach materials or messages, promoting the partner's interests that are shared with the Program, participating in key activities and events, and suggesting or developing win-win opportunities. A calendar of events will be developed to keep all partnership activities "on the same page."

Changes and developments in media from the previous year may impact the availability or recommended change in partnership pursuits.

Many of the previous partnerships were primarily based on the distribution of Watershed Watch Kits to the public or to the partners' audiences (e.g. teachers via RAFT). Since the WW Kits have been discontinued, a new partnership plan is needed to re-engage each of those partners.

If needed, consultants will help the WEO AHTG review other local and regional campaigns (e.g., the BASMAA Regional Ad Campaign), and provide feedback.

Task 4 DELIVERABLES:

- Ongoing contact with partners; work with existing partners and renew previous partners
- Maintain updated contact data and partnership details
- Development of creative partnership opportunities / scenarios
- Monthly written report of results or activities
- 2 new community partnerships

Task 4 BUDGET: $5,500

Task 5: Development of Value-Added Resources

The media offers excellent value added opportunities. The consultants will negotiate media buys and partnerships for added media exposure, requesting innovative partnerships and sponsorship opportunities with the media and their advertisers. When media proposals lack relevance or inspiration, the consultants will develop and propose concepts, beginning with additional media.

Opportunities include but are not limited to:

- Contests to provide public awareness and incentive
- Public Service Announcements / donated airtime or space
- Sponsorships
- On-site Events
- Cross-promotions with other media clients and with the stations/publications
- Web links, etc.

The consultants will also explore new methods and channels of distribution for campaign messages, as well as activities or opportunities to encourage desired outcome from the audience, and reinforce the positive impact of that action.

Events offering relevant opportunities may be:

- Earth Day events throughout the region
- Home & Garden Shows
- Garden Tours
- Santa Clara County Parks & Recreation's "Go Outside and Play Day" and/ Health Fair
- Beach/Creek Clean-up days
- Outdoor events/activities that take place in a watershed recreation area

Task 5 DELIVERABLES:

- Partnership kit (ongoing)
- Value-added as negotiated with media and partners
- Monthly written report of results or activities

Task 5 BUDGET: $7,000

Task 6: Website Maintenance

The consultants will maintain the Watershed Watch website on an ongoing basis, encouraging partners to provide news.

This plan does not call for any additional creative (creating new pages), but for maintenance of the current site. They will update it regularly with the latest news/ articles, creative, partnership links, and events/announcements, including removal of expired or past events and news in a timely manner.

Any unused maintenance budget will be allocated to translation and development of Spanish pages to link to the Spanish site. Currently, many pages linked to the Spanish site are English Watershed Watch pages.

The consultants will track web activity and comment on any potentially relevant trends they observe.

Task 6 DELIVERABLES:

- Monthly/ongoing maintenance
- Monthly written report of results or activities

Task 6 BUDGET: $6,500

Task 7: Outreach Events

The consultants will develop a comprehensive calendar of events including

- Partner events
- Relevant holidays or observances (Earth Day, Arbor Day, etc.)
- Media schedules

They will work with WEO AHTG to create an Event Plan for prioritizing events, determine the goals of the events (general or specific to the event), and determine who will represent the Program at key events. The available resources will be reviewed to determine the need for any outreach materials, exhibits or activities.

A survey will be utilized to evaluate the events and determine the value of Program participation in the selected events. Based on the survey and staff experiences, the consultants will examine and recommend any changes or improvements to the event plan for FY 08-09 Work Plan.

Task 7 DELIVERABLES:

- Event Plan development and maintenance
- Event Survey / Written report of results or activities
- Participation / representation at events (2 full days)

Task 7 BUDGET: $3,000

Task 8: Media and Public Relations

Depending upon the effectiveness of PR activities in the FY 06-07, as perceived by the WEO AHTG, this task may be eliminated and the associated budget may be reallocated to other campaign activities.

Public and Press Relations can potentially increase audience awareness and understanding of current events and activities that affect the watersheds. Public relations can be proactive or reactive. Opportunities sometimes present themselves by the actions of nature, politicians or local citizens. The consultants will communicate to the media, items of interest or potential relevance to the goals/messages of the Program, in case a timely reaction could be relevant news.

Other times, they will craft a relevant news story based on general conditions, planned or anticipated events, or current trends. PR can also be an important option to creating awareness of something specific that is not covered in the media plan / paid messages, or in support of the Program's participation in a partner event. Examples are:

- "Preserving Property Value" as a spin on creek clean up days or pollution prevention
- Promoting an event at the Don Edwards SF Bay Refuge Education Center in Alviso

Materials will also be emailed to partners and co-permittees for their use and distribution, and/or loaded to the website for download.

The consultants will seek participation from community calendars in print, TV and radio for no-cost announcements of events, programs and activities.

Task 8 DELIVERABLES:

- PR plan development and execution (up to 2 news stories or equivalent)
- Ongoing maintenance of press contact data
- Clippings when available

Task 8 BUDGET: $5,150

Task 9: FY 08-09 Work Plan Development

The consultants will compile and submit monthly campaign activity reports, indicating the basis of their invoices, for all applicable tasks. Details will include measurable results of campaign activities and estimated added-value amounts.

FY 07-08 mid-year and year-end reports will be developed to assist the WEO AHTG in evaluating the effectiveness of the implemented creative, media and outreach strategies.

The consultants will develop the FY 08-09 Work Plan and Media Plan, consistent with the 3-year conceptual plan and adapting to the outcome of the FY 07-08 campaign.

Task 9 DELIVERABLES:

- FY 08-09 Work Plan
- FY 07-08 mid-year and end of year report
- Monthly reports

Task 9 BUDGET: $5,500

BUDGET SUMMARY:

TASK 1 Baseline Evaluation	$7,500
TASK 2 Creative Development	$6,000
TASK 3 Media Advertising	$48,000*
TASK 4 Partnership Development	$5,500
TASK 5 Added-Value Development	$7,000
TASK 6 Website Maintenance	$6,500
TASK 7 Event Coordination	$3,000
TASK 8 Media/Public Relations	$5,150
TASK 9 FY 08-09 Work Plan	$5,500
TOTAL CONSULTANT BUDGET	$94,150
EOA Mark Up	$9,415
TOTAL CAMPAIGN BUDGET	**$103,565**

*Media Buys will be supplemented with approximately $30,000 if available under Pesticide User Outreach and Mercury Pollution Prevention Outreach.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Attachment 3.2: "Watershed Watchers: Keeping Our Waterways Clean" Program with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso.

The Program provides resources to the Don Edwards San Francisco Wildlife Refuge Environmental Education Center in Alviso to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. Watershed Watcher activities, which are conducted on-site and primarily on the weekends, focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (general public, weekend visitors, families with children etc.).

The Watershed Watchers Program conducts more than a hundred activities for children and adults each year. These include:

Wildlife in Our Watershed Depends on You: Interpretive programs focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed. Examples include children's bird walks, adult birdwatching, live animal presentations, twilight walks and general nature hikes. All programs include a segment addressing runoff pollution covering causes, resulting problems, and identifying actions visitors can take at home to prevent or lessen the problems.

Gardening without Chemicals: Stewardship activities encourage and inspire visitors to create wildlife habitats and use chemical-free garden techniques in their own backyards. Garden work days are offered emphasizing chemical-free gardening techniques. Native plant gardening workshops begin in the classroom and end with a tour of the EEC native plant demonstration gardens while discussing chemical-free gardening techniques and implementation methods for the home garden.

Our Role in Preventing Urban Runoff: Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. This is usually done with groups that make reservations (e.g., Scouts, Lyceum, Sierra Club, and senior groups).

Special Events: These events are designed to attract at least 200 people to the EEC for various activities including games and crafts. Urban runoff pollution prevention messages are incorporated into several of the activities featured during the event.

Other Watershed Watcher program tasks include:

Developing and Maintaining Partnerships with Local Community Organizations: Partners include Santa Clara Valley Audubon Society, Friends of Guadalupe River Park & Gardens, the San Francisco Bay Bird Observatory, Happy Hollow Park & Zoo, and volunteer coordinators at local companies (e.g., Cisco and Hands On Bay Area, etc.).

Coordinating Refuge Volunteers for Interpretive Programs/Gardens: Contacting volunteers to lead programs, training, and maintaining relationships with volunteers; and scheduling volunteers for special events.

Informal Indoor Visitor Contact: Includes interaction at the Center and answering visitor questions over phone.

Outreach to Local Media: Includes contacting local newspapers and other publications; posting program and event announcements in online calendars (e.g., Acterra and Craigs List); and creating appropriate event descriptions for press releases.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

FY 07-08 Development Strategy Checklist
Mercury Pollution Prevention Outreach

1. **Project Title: Pesticide User (PU) Outreach**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:**
   Toxicity due to organophosphate pesticides (diazinon and chlorpyrifos) in local creeks and San Francisco Bay. Selection, use and disposal of pesticides by residential and commercial users, pest control operators and pesticide retailers.

4. **General Project Description:**
   This project combines the best elements of the previous IPM Store Partnership and Household Chemical Management Projects to focus on the outreach requirements in the Program's NPDES permit. The approach will be coordinated with other pollution prevention programs funded by Co-permittees (e.g., County's Household Hazardous Waste Program). Scope to be developed based on the Program's Pesticide Management Work Plan and the results of the FY 06-07 outreach work. Activities may include:
   - IPM Store Partnership Program - Continue the program in participating Santa Clara County stores. Visit each store once every three months at a minimum; maintain ongoing relationship with participating stores through in-store contacts, refresh/restock literature racks as needed, and update "shelf talker" labels as needed. Using the services of Annie Joseph, IPM consultant, provide training to store employees on selling less-toxic pesticides; and work with two stores to increase shelf-space for less-toxic products.
   - Regional IPM Partnership –Support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. Review and approve products.
   - Outreach Events - Participate in selected community outreach events for conducting IPM outreach.
   - Outreach to commercial businesses - Continue distributing the "Don't Set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors. Identify and implement an IPM training/certification program for landscape maintenance professionals.
   - Media Advertising - Conduct media advertising in coordination with the Watershed Watch campaign. Include messages that promote "OWOW shelf-talkers" for selecting less-toxic products.
   - Support the Regional IPM Conference - Provide funding to support the Regional IPM Conference, if required.
   - Support the Going Native Garden Tour - Provide funding to support promotional activities for the 2007 Going Native Garden Tour.

FY 07-08 Development Strategy Checklist
Pesticide User Outreach

5. **Outreach/Activity Areas and Communication Goals:**
   PI/P Communication Goals include Increasing Awareness and Changing Behavior, particularly with respect to pesticide use and disposal.

6. **Target Audience:** To be determined, may include:
   (X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools, ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education, (X) Store Employees

7. **Distribution Strategy:**
   To be determined.

8. **Describe how the success of the project will be measured:**
   - Number of hotline calls and website visits
   - Number of people reached at outreach events
   - Quantity of fact sheets and other IPM related brochures distributed
   - Gross impressions of media advertising
   - Pounds of pesticides collected by the County HHW collection program.
   - Feedback from store employee trainings

9. **Have similar projects been done by other agencies?**
   Yes.

10. **Schedule:**
    FY 07-08.

11. **Budget:**

    See Program Budget.

12. **Identify the evaluation criteria that the project meets:**

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    (X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    (X) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

13. **Implementer(s):** (X) Work Group, (X) Program Staff, (X) Consultant, ( ) Other:_____

Santa Clara Valley Urban Runoff Pollution Prevention Program

FY 07-08 Development Strategy Checklist
Mercury Pollution Prevention Outreach

1. **Title:** Mercury Pollution Prevention Outreach

2. **Project Proposer:** SCVURPPP Mercury Pollution Prevention Ad Hoc Task Group

3. **Specific Pollutant or Behavior Project Addresses:** Mercury

4. **General Project Description:** The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedance of water quality standards for mercury.

   Mercury has been found in sediment from the South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

   The goal of the Mercury Pollution Prevention Outreach Work Plan is to develop and implement an outreach plan designed to encourage proper disposal of fluorescent lamps.

   The Program has completed the implementation of all Mercury Plan tasks. The focus of FY 07-08 tasks will be implementation of ongoing tasks. As in previous years, outreach in FY 07-08 will be coordinated with the County HHW Program. During FY 07-08, the Program will continue to conduct outreach to promote fluorescent lamps collection locations to residents. Outreach may be conducted using media advertising, in-store displays (posters, banners) and newsletter articles. The Program may also coordinate its outreach activities with other Regional groups/program that are planning to conduct mercury outreach in FY 07-08.

4. **Outreach/Activity Areas and Communication Goal:** Develop a plan to increase outreach efforts to residents and businesses on recycling of mercury containing wastes.

5. **Target Audience:**
   (X) Residential, (X) General Public, ( ) Industrial, (X) Commercial, ( ) Schools, ( ) Municipal Employee Training, ( ) Public Officials, ( ) Multi-cultural Education, ( ) Other_____

6. **Distribution Strategy:** Media advertising, newsletter articles.

FY 07-08 Development Strategy Checklist
Mercury Pollution Prevention Outreach

7. **Describe how the success of the project will be measured:** Number or amount of mercury-containing products (i.e.,fluorescent lamps, thermometers) collected by Household Hazardous Waste facilities; description of outreach methods used; number of outreach materials distributed.

8. **Have similar projects been done by other agencies?** City of Palo Alto has conducted a FLT recycling program. Smaller projects (i.e., thermometer take-back programs) have been conducted by other agencies.

9. **Schedule:** FY 07-08.

10. **Budget:**

    See Program Budget.

11. **Identify the evaluation criteria that the project meets:**

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    (X) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

12. **Implementer(s):** SCVURPPP Mercury Pollution Prevention Outreach Work Group for FLT recycling in coordination with the Watershed Watch campaign and the SCVURPPP PIP/WEO Ad Hoc Task Group.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

FY 07-08 Development Strategy Checklist
Program Supplies

1. **Project Title:** **Program Supplies**

2. **Proposer:** Program Staff

3. **Specific Pollutant or Behavior Project Addresses:** Varies

4. **General Project Description:**
   To provide a budget to support requests by the public and Co-permittees for Program materials and supplies. This budget allows Program staff to reprint materials and reorder supplies as needed.

5. **Outreach/Activity Areas and Communication Goal:** N/A

6. **Target Audience:** To be determined, as needed.
   (X) Residential, (X) General Public, (X) Industrial, (X) Commercial, (X) Schools, (X) Municipal Employee Training, (X) Public Officials, (X) Multi-cultural Education, (X) Other_____

7. **Distribution Strategy:**
   Program staff will coordinate material reprints, reordering supplies and distribution to Co-permittees, as appropriate. Program staff distributes materials at public events and in response to telephone, e-mail or web site requests.

8. **Describe how the success of the project will be measured:** The Program logs all requests for materials and tracks the amount of materials distributed. The need for reprints is based on successful distribution of existing stock.

9. **Have similar projects been done by other agencies?** N/A

10. **Schedule:** As needed.

11. **Budget:**

    See Program Budget.

12. **Identify the evaluation criteria that the project meets:** N/A

    (X) The project addresses a pollutant or behavior identified by the Management Committee as a priority.
    ( ) Contemplated messages of the project are consistent with Program goals and can be effectively communicated.
    (X) County-wide implementation will be more cost-effective than local implementation.
    ( ) The project supplements a regional project and/or program.
    (X) The success of the project is measurable.
    (X) The targeted audience is consistent with targeted PI/P activities and audiences.

SECTION 4

FY 07-08 ANNUAL MONITORING PLAN & WATERSHED MANAGEMENT MEASURES

4. MONITORING PROGRAM

INTRODUCTION

Section 4 serves as the Annual Monitoring Program Plan for the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program). The monitoring plan provides brief descriptions of receiving water monitoring and assessment activities that will be conducted by the Program in FY 07-08. The goals and objectives of the Program's monitoring program are provided within the Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan). In addition, activities associated with the implementation of control measures for specific pollutants of concern (POCs) not discussed in Sections 5 and 6, and activities designed to support the Santa Clara Basin Watershed Management Initiative (WMI) are also described.

RECEIVING WATERS MONITORING AND ASSESSMENT

In 2002, the Program developed and began implementing a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) in compliance with Provision C.7 of the Program's NPDES Permit. The Multi-Year Plan is intended to assist the Program in:

- Developing a better understanding of the chemical, biological, and physical characteristics of water bodies and watersheds relevant to the Program, which will help inform decisions about future management actions and help clarify and resolve urban runoff related issues within watersheds;
- Assessing baseline water quality conditions in representative watersheds within Program boundaries to evaluate urban runoff impacts and help solve creek drainage basin-specific water quality problems;
- Assessing whether specific pollutants of concern are found in urban runoff discharges and impact water quality in local water bodies and the San Francisco Bay; and,
- Evaluating overall Program effectiveness over time.

The Multi-Year Plan was designed to assess water bodies in the Santa Clara Basin using an iterative rotating watershed approach similar to the Water Board's Surface Water Ambient Monitoring Program (SWAMP). In 2004, the Multi-Year Plan was revised (i.e., Revised Multi-Year Plan) to include a decision framework linking receiving water monitoring and watershed assessment, which includes the following steps/categories 1) Watershed Characterization; 2) Screening-Level (Status/Condition) Ambient Water Quality Monitoring; 3) Water Body Assessment; 4) Investigative Studies; and 5) Trends/Effectiveness Monitoring.

Since FY 02-03, the Program has also developed and implemented Annual Monitoring Program Plans (Annual Plans) in fulfillment of Provision C.7 of its NPDES Permit. The Annual Plans identify monitoring activities that are implemented each year as part of the Program's Revised Multi-Year Monitoring Plan. Annual Plans have previously been implemented in the Lower Penitencia and Coyote Creek watersheds (FY 02-03); San Tomas and Adobe Creek watersheds (FY 03-04 and FY 04-05); Matadero/Barron Creeks, Calabazas Creek and Sunnyvale East and West Channels (FY 04-05 and FY 05-06); Stevens and Permanente Creeks (FY 05-06 and FY 06-07); and Coyote Creek Mainstem (FY 06-07).
The following paragraphs describe receiving water body monitoring and assessment activities that are scheduled for implementation by the Program during FY 07-08. These activities are consistent with the Revised Multi-Year Monitoring Plan.

Watershed Characterization

Watershed characterization is intended to assist the Program in evaluating and documenting the current understanding of beneficial use condition and potential impacts in local water bodies. As defined, watershed characterization entails two tasks. First, water quality data and watershed information collected to-date are summarized in a watershed characterization memorandum. The memorandum includes a compilation of existing data sources and a summary of the geologic and geomorphic setting, vegetation, land uses and associated water quality issues. An evaluation of the status of biological communities and relevant beneficial uses in the watershed(s) is also provided. Second, a creek survey is conducted to identify potential impacts to beneficial uses and to assess the quality of the physical habitat. Field data collected is entered into a database and evaluated. The Program has previously used the Unified Stream Assessment (USA) method (Center for Watershed Protection) when conducting creek surveys. Watershed characterizations have been previously conducted in Saratoga Creek (FY 05-06) and are underway in Matadero Creek (FY 06-07).

During FY 05-06, the Program developed a watershed characterization memorandum summarizing data collected to-date and watershed attributes for the Stevens and Permanente Creek watersheds. To complete the watershed characterization stage of the Program's water body monitoring and assessment process, the Program intends to conduct creek surveys in one of these watersheds in FY 07-08. The Program intends to coordinate this effort with the Stevens/Permanente Creek Watershed Council. Once the survey is complete, a technical memorandum characterizing the existing condition of beneficial uses and potential impacts in Stevens or Permanente Creek watersheds will be produced. A summary of scheduled watershed characterization activities are included within Attachment 4-2.

Screening-Level Monitoring (Status and Trends)

An ecological indicator is a measure, an index of measures, or a model that characterizes an ecosystem or one of its critical components. An indicator may reflect biological, chemical and/or physical attributes of ecological condition. The primary uses of an indicator are to characterize current status and to track or predict significant change. With a foundation of analytical research, an ecological indicator may also be used to identify major ecosystem stress.

Consistent with the Revised Multi-Year Plan, the Program intends to collect two types of screening-level indicators in FY 07-08: (1) aquatic life use indicators (e.g., benthic macroinvertebrates and fish assemblages) and (2) water recreation use indicators (e.g., pathogen indicators). Screening-level indicators will be measured for a second year in the Coyote Creek mainstem and selected tributaries. The Program's Annual Screening-Level Monitoring Plan is provided within Attachment 4-1. Table 4-1 within Attachment 4-1 was prepared consistent with the Program's Revised Multi-Year Plan. Table 4-1 identifies planned receiving water monitoring activities for FY 07-08, the proposed schedule (by fiscal year quarter) for conducting the work, the rationale for the proposed item and the lead party. The locations and frequencies of sampling events scheduled during FY 07-08 are provided within Table 4-2 of Attachment 4-1. A site map (Figure 4-1) detailing sampling locations within the Coyote Creek and Lower Penitencia Creek watersheds is also provided within Attachment 4-1. Table 4-3 of Attachment 4-1 provides a description of data parameters and analytical methods to be used in FY 07-08.

In accordance with Provision C.10 (b), the Program annually develops a Watershed Monitoring and Assessment Summary Report (Summary Assessment Report) that summarizes the results and analyses of screening-level data collected during the implementation of the Program's Annual Plan. The Summary Assessment Reports provide information on possible beneficial use impacts to the extent possible (based on the study design and available data) and suggest next steps for monitoring/assessments and developing strategies to control potential impacts. The Summary Assessment Report for FY 07-08 will be included in the Program's FY 07-08 Annual Report.

Water Body Assessments (Sediment and Ecosystem Function)

Water body assessments are the systematic review of specific resources (e.g., benthic macroinvertebrates or fish) and their habitat and riparian areas in a watershed-scale context. Water body assessment is a stage-setting process based primarily on existing information. Assessments typically address cumulative effects within a watershed; provide for more ecologically sound resource planning; and identify and help protect environmentally sensitive areas. The Program uses the results of water body assessments to identify data gaps that provide context for subsequent monitoring and follow-up studies; and to recommend feasible management actions. In the recent past, the Program has conducted two types of water body assessments in Santa Clara Basin watersheds – ecosystem functional and sediment assessments.

Assessment of Ecosystem Functions

In FY 02-03, the Program conducted a watershed assessment in the Coyote Creek watershed. The Coyote Creek water body assessment evaluated the condition of stream ecosystem functions using available data sources. The final report identified high-priority potential management and monitoring actions to improve the potential capacity of stream ecosystem functions in defined segments of Coyote and Upper Penitencia Creeks. In addition, the report assessed the relationship between the stream functional assessment methodology and others applied in the Bay Area.

In FY 07-08, the Program intends to conduct an assessment of ecosystem functions in the Matadero Creek watershed. Steps outlined in the Program's monitoring and assessment process (i.e., watershed characterization and screening-level monitoring) have been completed for these watersheds. The assessment will be based on existing data and information, and use similar methodologies to those in Coyote Creek. At the conclusion of the analysis, a technical memorandum will be prepared that identifies high-priority potential management and monitoring actions to improve the potential capacity of stream ecosystem functions in these watersheds.

Sediment Assessments

In fulfillment of the Permit Provision C.9.f.iii paragraph two, the Program identified four watershed areas in FY 02-03 that may be impacted by anthropogenic sources of sediment. These watershed areas include Stevens Creek (below Stevens Creek Dam), Upper Penitencia Creek, Saratoga Creek and Coyote Creek mainstem (below Anderson Dam). In accordance with the permit provision, the Program developed and submitted a Sediment Assessment Work Plan to Water Board staff (see Attachment 4-5 of the Program's FY 03-04 Work Plan).

The Sediment Assessment Work Plan contains two separate phases. Phase I includes conducting a limiting factors analysis (LFA) and sediment management practices assessment.

Phase II includes conducting a rapid sediment budget. Phase II will only be conducted if Phase I study results indicate that excessive sediment from anthropogenic sources is adversely impacting beneficial uses in the watershed.

In FY 03-04, the Program began conducting watershed (sediment) analyses and sediment management practice assessments in the first high priority watershed, Stevens Creek. The Program completed an LFA and sediment management practices assessment in Stevens Creek on September 10, 2004. The Watershed Analysis Ad Hoc Task Group (Watershed Analysis AHTG) reviewed the documents developed in Phase I of the Stevens Creek watershed assessment and made recommendations to the Management Committee to not conduct Phase II. In addition, the Watershed Analysis AHTG identified Upper Penitencia Creek as the next high priority watershed to conduct Phase I.

In FY 04-05, the Program initiated a LFA in Upper Penitencia Creek. A Final LFA Technical Report was released in August 2006. Based on the results of the LFA, the Program agreed to conduct a sediment source assessment and management practices assessment, which will identify predominant sediment sources to reaches with high quality steelhead habitat, existing management practices associated with sediment, and recommend new and/or improved management actions which may reduce the impacts of sediment in the Upper Penitencia Creek watershed. The sediment source and management practices assessment report is scheduled to be completed in FY 06-07.

During FY 05-06, the Program also conducted a water body assessment of Saratoga Creek as part of the Revised Multi-Year Plan. One of the objectives of the water body assessment is to investigate potential impacts of sediment to rainbow trout populations and aquatic habitat. The results will be evaluated to help determine if aquatic life uses are being impaired by sediment and whether or not further investigation is warranted. The Saratoga Creek Water Body Assessment Report is schedule for completion in June 2006. A watershed management practices assessment, and possibly a sediment source assessment (dependant on the results of Water Body Assessment Report) will be conducted in FY 07-08. A project summary is included within Attachment 4-2.

The Program is currently reevaluating the criteria used to identify high priority watershed areas where sediment assessments are needed. Based on this evaluation, the Program may start a sediment assessment in Coyote Creek in FY 06-07 and complete the assessment during FY 07-08. The assessment would include an inventory and evaluation of the effectiveness of existing sediment management practices in Coyote Creek during FY 07-08.

Regional Collaborative Monitoring Efforts

Regional Monitoring Program for Water Quality (RMP)

In accordance with the Program's NPDES permit, the Program contributes approximately $165, 000 annually to the Regional Monitoring Program for Water Quality (RMP), which monitors contaminants in water, sediments, and fish and shellfish tissue in San Francisco Bay and the Delta. The San Francisco Estuary Institute (SFEI) administers the RMP. This funding is in addition to separate funding provided by the three South Bay POTWs (which are operated by SCVURPPP Co-permittees) to SFEI. The RMP has approved a two percent budget increase for FYs 2007, 2008 and 2009. Program staff participates on the RMP Steering Committee, Technical Review Committee, Contaminant Fate Work Group, and Sources, Pathways and

Loading Work Group (SPLWG). The Program Manager serves as the BASMAA representative to the RMP Steering Committee.

Clean Estuary Partnership (CEP)

On August 6, 2001, a Memorandum of Understanding (MOU) regarding development of: 1) a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries and 2) TMDLs for 303(d) pollutants (including mercury), was entered into by the Water Board, BACWA and BASMAA. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program assisted in developing and funding potential projects for the Bay TMDLs. The CEP is currently under review and will be redesigned to better meet the goals and objectives of the funding agencies. During FY 07-08, Program staff will participate in the redesign process and continue to track ongoing TMDL projects.

Bay Area Stormwater Management Agencies Association (BASMAA)

The Program is a member of BASMAA, a consortium of seven San Francisco Bay Area municipal storm water programs. The goal of BASMAA is to promote regional collaboration on developing consistent monitoring and watershed assessment methodologies and to facilitate efficient use of public resources. Program staff participates in the following BASMAA activities: Executive Board, Monitoring Committee, New Development Committee, Public Information/Participation Committee and Operational Permits Committee and serves as the Vice-chair of the BASMAA Executive Board. The Program expects to continue participating in BASMAA activities during FY 07-08.

Regional Biological Assessment Network (BAMBI)

In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in storm water programs that include rapid bioassessments in their watershed monitoring and assessment programs. Since the initial workshop, the Program has assisted (with planning and coordination) and participated in four annual BAMBI workshops (through 2007).

In support of BAMBI, Program staff has assisted the development of an Index of Biotic Integrity (IBI) for Bay Area Creeks, with the goal of developing a regional bioassessment tool necessary to provide context to data collected in Santa Clara Basin creeks. A draft BAMBI IBI Work Plan was presented at the 2005 BAMBI Workshop. Program staff has provided in-kind services to implement specific tasks identified in the work plan. For additional information regarding these activities, refer to the BAMBI monitoring project summary within Attachment 4-2.

Brake Pad Partnership (BPP)

After studies in the South Bay indicated that automobile brake pads may be the most significant source of copper in urban runoff, the Brake Pad Partnership (BPP) was initiated in 1996 as a collaboration between regulators, storm water programs, brake material manufacturers, scientists and environmentalists to address environmental problems from brake wear debris. The BPP's work includes research and monitoring, and is an integral part of the Program's Copper Action Plan. In addition, the Program participates (via BASMAA) by funding a BPP

technical representative and a stakeholder process managed by Stainable Conservation. Contingent upon available funding, the Program may continue to participate in the BPP through BASMAA.

POLLUTANT OF CONCERN CONTROL PROGRAMS AND MONITORING ACTIVITIES

The FY 07-08 Pollutant of Concern Control Programs and Additional Activities Table (see Attachment 4-3) illustrates all existing commitments and priorities established by the Program, including ongoing activities meant to fulfill Water Board Order Provisions C.9. "Water Quality-Based Requirements for Specific Pollutants of Concern" and C.10. "Watershed Management" of the NPDES permit. A brief capsule scope is provided for each project along with the anticipated products and expected timeframe for completion. For some projects, specifically those that are being conducted to directly respond to a specific pollutant of concern referenced in the NPDES permit, a separate one-page scope was developed and is presented within Attachment 4-2. Pesticide management activities planned for FY 07-08 are presented within Section 5 of this Work Plan.

PCBs, Dioxins, and Legacy Pesticides

The 1998 and 2002 Clean Water Act Section 303(d) lists designate all segments of San Francisco Bay as impaired by certain dioxin-like compounds, mercury, polychlorinated biphenyls (PCBs) and certain chlorinated pesticides referred to as legacy pesticides (DDTs, dieldrin and chlordanes). The listings were in response to an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment (OEHHA). OEHHA issued the advisory after these pollutants were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. It should be noted that the Water Board opposed the 1998 listing of dioxins in the Bay, but was overruled by the United States Environmental Protection Agency (USEPA).

The 2002 303(d) list designates the TMDL priority for mercury and PCBs as high. As a result, the Water Board is currently implementing TMDLs for these pollutants. The 303(d) list designates the TMDL priority for dioxins, dieldrin, chlordanes and DDTs as low. Bay TMDLs are not currently planned for these pollutants.

Previous Work

During the past several years, monitoring program activities related to dioxins, mercury, PCBs, and chlorinated pesticides have included:

Multiple Pollutants

- The Program led a regional study, referred to as the Joint Stormwater Agency Project (JSAP), which characterized the distribution of mercury, PCBs and chlorinated pesticides in storm water conveyance sediments in Bay Area watersheds.
- The Program has provided funding to BASMAA, the Clean Estuary Partnership (CEP), and the San Francisco Estuary Regional Monitoring Program (RMP). These regional programs help monitor pollutants of concern and/or assist in the development of management strategies.
- Program staff has participated in selected stakeholder, BASMAA, CEP and RMP committees and work groups.

- Program staff represented BASMAA on the RMP Technical Review Committee and the Sources, Pathways and Loadings Work Group; and CEP mercury and PCBs work groups.
- The Program has collected and analyzed water and sediment samples from selected Santa Clara Valley watersheds as part of its receiving waters monitoring and assessment program. Additional information is available in the Revised Multi-Year Plan.

PCBs

- The Program and the City of San Jose performed PCBs case study work in six urban areas in San Jose where elevated concentrations of PCBs were found during the JSAP study. The case studies were aimed at identifying PCBs sources and beginning to develop controls.
- To assist other Bay Area storm water agencies, the Program developed guidance documents on performing PCBs case studies. The guidance documents outlined case study objectives, typical methodologies and tasks, locations and schedules.
- Program staff facilitated a work group of representatives from BASMAA and Water Board staff to coordinate the JSAP study and PCBs cast studies. The work group met periodically to facilitate information sharing, coordination of field activities and regional planning.
- The Program prepared a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County.
- The Program completed a review of efforts to develop methods of controlling discharges of PCBs from Bay Area urban runoff conveyances. The review:
    - Summarizes and discusses past, current and planned efforts to identify PCBs control options in the Bay Area in coordination with the Bay PCBs TMDL, including the PCBs case studies performed by Bay Area storm water agencies.
    - Describes existing Bay Area urban runoff management practices that may help control discharges of PCBs.
    - Reviews potential new management practices for controlling discharges of PCBs and qualitatively discusses the pros and cons of each practice.

Dioxins

- The Program reviewed readily available data on methods used to characterize dioxin compounds in storm water runoff and surface waters and concentrations typically found in the Bay Area and other areas.
- The Program collaborated with other Bay area storm water management agencies to develop a “synthesis” document on dioxin-like compounds. This document summarizes the current state of knowledge regarding dioxin-like compounds in relation to storm water runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, impacts, sources, pathways, review of relevant Bay Area, national and international studies, and qualitative review of potential storm water controls.
- Program staff has tracked regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Program staff also began encouraging Co-permittees to track and participate in these programs; and evaluate the feasibility of performing public

outreach activities and developing policies and ordinances (e.g., City of Palo Alto's Dioxin Elimination Policy).

- Program staff developed and distributed a survey to identify dioxins pollution prevention actions currently implemented by Co-permittees and any related policies, resolutions or ordinances already adopted. The survey revealed that Co-permittees currently implement a wide range of activities that help prevent the formation of dioxins or their release to the environment. Measures implemented may help address potentially larger contemporary sources of dioxins in the Bay Area, including diesel exhaust, residential wood burning and use of the pesticide 2,4-D. For example, most Co-permittees are implementing policies for purchasing alternative fuel vehicles and equipment (e.g., compressed natural gas, biodiesel, and electric). Additional policies and ordinances limit or prohibit the use of wood-burning appliances and fireplaces. Co-permittees also generally have well-established Integrated Pest Management programs that discourage the use of pesticides such as 2,4-D.

FY 07-08 Activities

During FY 07-08, the Program will continue to work with other Bay area dischargers and Water Board staff through BASMAA and the RMP to implement regional projects related to dioxins, mercury, PCBs, and chlorinated pesticides.[1] This may include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by BASMAA, the RMP and Water Board staff. Program staff will continue to represent BASMAA on the RMP Steering and Technical Review Committee and the RMP Sources, Pathways and Loadings Work Group.

Program staff will continue to track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Co-permittees will be encouraged to track and participate in these activities and evaluate the feasibility of performing public outreach activities and developing related policies and ordinances. Relevant regional, state and federal efforts include the Bay Area Dioxins Project managed by the Association of Bay Area Governments and multi-faceted efforts by USEPA to assess dioxin risks and monitor and control dioxins.

Copper and Nickel

The majority of baseline actions are implemented at the Program level (except for those assigned to San Jose, Sunnyvale and Palo Alto), and are included in the Program's Annual Reports and Work Plans. However, the Water Board expects Co-permittees to implement applicable actions at the local level. The Program has identified the following copper/nickel control activities that are feasible to implement at the Co-permittee level:

- CB-1: Measures to reduce copper discharges from vehicle washing operations;
- CB-3: Measures to control copper in discharges of stormwater in targeted industrial sources;
- CB-6, 7: Measures to reduce traffic congestion/promote alternative transportation;
- CB-8: Measures to classify and assess watersheds and improve institutional arrangements for watershed protection;

[1]The Program is separately implementing a mercury pollution prevention program. See Section 6 of the Program's Work Plan and past Annual Reports for additional information.

- CB-11: Measures to improve street sweeping controls and stormwater system operation and Maintenance;
- CB-12: Measures to control copper discharges from pools and spas;
- CB-21: Measures to discourage architectural use of copper; and
- NB-1: Measures to control nickel discharges from construction sites (sediment).

Individual Co-permitees included measures to address each of these activities, as applicable, within their Work Plans provided in Section 9. Currently, the Program's Copper/Nickel Activity Tables contain 21 copper and 7 nickel baseline actions. Certain copper actions (e.g. measures to improve street sweeping controls, measures to control copper from targeted industrial sources, measures to evaluate effectiveness of performance standards) closely relate to existing performance standards requirements or are otherwise independently mandated by the Program's NPDES permit (e.g., Permit Provision C.6.a.i and ii). Since late 2004[2], the Bay Modeling and Monitoring (BMM) subgroup has been working to transition from the current Program CAP/NAP approach to a bay-wide Copper Management Strategy (CMS). A detailed summary of these efforts was provided within Attachment 4-5 of the FY 06-07 Work Plan.

FY 07-08 Work Plan Content

The Program's FY 07-08 Copper/Nickel Activity Tables are consistent with the previously agreed upon format as first used in the Program's *Revised FY 03-04 Copper/Nickel Work Plan*, (i.e., tabular format with columns listing the activity, the FY 07-08 tasks, status/comments, due date, and responsible party). In addition, it provides updates for FY 06-07 accomplishments reported to date; the originally proposed work plan tasks for FY 06-07; and actions accomplished in FY 06-07 (if applicable). The FY 07-08 Copper/Nickel Activity Tables are provided within Appendix A. A complete report of FY 06-07 accomplishments will be included within the Program's *FY 06-07 Annual Report*. In addition, the City of San Jose will continue to monitor and report on dissolved copper and nickel concentrations during the dry season in Lower South San Francisco Bay as part of the CAP/NAP ambient monitoring and trigger program. This continued independent sampling effort needs to be evaluated as part of the changes made to the overall RMP Bay-wide sampling effort.

Trash Investigations and Plan Implementation

On November 14, 2001, the Water Board released the document entitled Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region Report. This report states that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …" In a proactive response to the 303(d) Staff Report, the Program's Management Committee formed a Trash AHTG that developed a Work Plan (submitted March 1, 2003) to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways of the Santa Clara Basin.

Since FY 03-04, the Program has completed the following Work Plan tasks: 1) Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in or near

[2] On November 10, 2004, the BMM subgroup agreed to begin reviewing recommendations on whether or not each CAP/NAP baseline activity would be appropriate to implement (or continue to implement) Bay-wide and how reporting might best be conducted in the future.

creeks; 3) Assist municipalities in identifying trash problem areas and sources of trash; 4) Conduct trash evaluations at a subset of identified trash problem areas; 5) Identify and begin to implement or refine existing trash control measures, where feasible, to address trash problem areas; and 6) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

In October 2006, Program staff developed a *Draft Trash Management and Effectiveness Assessment Strategy* (Strategy), which was reviewed by the Trash AHTG. The Strategy includes four main areas of Program activity associated with trash: 1) identifying trash problem areas and sources; 2) selecting and implementing appropriate control measures at high priority problem areas; 3) assessing the effectiveness of control measure implementation; and, 4) providing administrative support to the Trash AHTG. The tasks scheduled for completion in FY 07-08 focus on assisting Co-permittees on: a) trash pilot demonstration project implementation, b) developing long-term trash management strategies for high priority watersheds, which will include current and future trash management activities, and c) continuing to evaluate creek condition and the effectiveness of management practices. Additional information of Program tasks associated with trash management and assessment are included in the project summary within Attachment 4-2.

Watershed Data Management

The Program is prepared to conduct the following activities in FY 07-08 related to data management:

Program's Website

Program staff continually updates and maintains the Program's web site (www.scvurppp.org) to ensure the effective distribution and review of draft and final products; and internal communication with the MC and other interested parties. In 2005, Program staff released an updated version of the Program's website. An additional update is currently underway and will be completed in 2007. In FY 07-08, the Program will continue to manage the website and post information and documents as they are completed. To date, the Program has completed 368 work products or major reports. The vast majority of these documents are available on the website as downloadable documents.

Streams Studies Inventory and Metadata Database

The Watershed Assessment and Monitoring Subgroup (WAMS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAMS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0), November 2003 (version 5.0), June 2005 (version 6.0) and September 2006 (version 7.0). The Program funded the initial development of the SSI and each of the annual updates.

In FY 06-07, the Program began to develop a new process for obtaining and displaying information on current projects that would typically be described in a SSI report. Beginning in FY 07-08, the SSI will be web-based and allow users to query information on current and historical environmental data collection and assessment efforts that are included within the Program's metadata database. Beginning in FY 07-08, the SSI will be available through the Program's website.

To comply with its NPDES permit, the Program also compiles, develops and analyzes a variety of data sets and reports. Most of the data are collected and generated as part of the Program's environmental monitoring and assessment activities. A majority of the information collected and used by the Program originates from different municipalities and agencies that conduct studies within Program jurisdictional boundaries.

The Program developed a relational database as an initial task to systematically describe and document data used for its activities. The intent of the database is to demonstrate its usefulness of how to systematically and efficiently collect and document all of the relevant data used in the Program's activities. In addition, the database was designed to explore the feasibility of eventually expanding and coordinating its maintenance and use with other agencies and organizations in the Program.

The SCVURPPP metadata database currently stores information on watershed studies described in the updated SSI version 6.0 and archived information from previous versions of the SSI. The database was also developed to produce a report listing current projects information in a format similar to previous SSI Reports. In addition, the Program database provides querying capabilities for watershed information listed in both the SSI and SCBWMI's Metadata database.

ADDITIONAL ACTIVITIES

Enhanced Reporting - Industrial/Commercial Discharger Control and Illicit Connection/Illegal Dumping Elimination

Since October 2001, Program staff has been assisting each Co-permittee (on an individual basis) with the implementation of enhanced reporting requirements for IND and IC/ID. Since FY 01-02, Co-permittees have submitted raw IND and ICID inspection data to Program staff. To demonstrate consistency and compliance (on a Program-wide basis) with the strategy provided in the Program's technical memoranda regarding IND and IC/ID reporting (dated September 7, 2001) and the approved MC approach, Program staff has been constructing IND and IC/ID summary tables using individual Co-permittee data. The summary tables are double checked with the Co-permittees to ensure that the results are reasonably consistent with their internal data and their interpretation of the data; provided to the Co-permittees for inclusion in their annual reports; and included in the Program's Annual Report. The overall goal of the effort has been to capture the full extent and the results of the Co-pemittees efforts in a consistent format and on a Program-wide basis. Overall, this effort has been very successful.

To ensure consistent and overall Program reporting of IND and IC/ID data, Co-permittees will continue submitting inspection and incident data so Program staff can construct IND and IC/ID summary tables for the *FY 07-08 Annual Report*. Co-permittees will conduct their own effectiveness evaluations based on their own data. The Program will work with the Co-permittees to construct IND and IC/ID summary tables using individual Co-permittee data.

Support for SCBWMI Land Use and Watershed Assessment and Monitoring Subgroups

To implement the Program's Monitoring Priority 3c, develop strategies for controlling impacts of land use on beneficial uses, the Program supports the SCBWMI Land Use Subgroup (LUS). While providing administrative support and leadership for the LUS, the Program also assists SCBWMI LUS with specific technical and training projects consistent with URMP goals and objectives. In addition, the Program has provided administrative support to the SCBWMI Watershed Assessment and Monitoring Subgroup (WAMS).

In FY 07-08, the Program will continue to provide limited support to the SCBWMI LUS by providing administrative support and direction; assist with training workshops for municipal staff on the connection between land development and water quality; and incorporate water quality friendly designs in development projects which are consistent with the top five priorities identified by the SCBWMI. In FY 07-08, the Program will continue to provide limited administrative support to the SCBWMI WAMS.

Attachment 4-1

Table 4-1. FY 07-08 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 07-08				Rationale	Lead Agency
		1st	2nd	3rd	4th		
Coyote Creek	***Chemical***						
	Contaminants-Sediment[3]				S(10)	• Baseline: Metal concentrations were measured in sediment samples in Coyote Creek during dry season in 1999 at nine stream locations as part of SEIDP project. PCB and mercury concentrations in sediment were measured in selected catchments of Coyote Creek watershed during 2000-01 as part of Regional Project. Metal, PCBs and pyrethroids concentrations were measured by SCVURPPP during dry and spring season in FY 06-07 at eight sites. • FY 07-08: Conduct second year of screening level monitoring of metals, PCBs and pyrethroids at ten stream locations during spring season. TOC, percent solids and sediment grain size will be measured synoptically.	SCVURPPP
	General Water Quality[4]				S(20)	• Baseline: General water quality sampling was measured in Coyote Creek during summer season in 1999-2001 at eight stream locations. Continuous temperature monitoring conducted by SCVWD as part of FAHCE and Mid-Coyote Flood Control Projects. General water quality was measured using probes during sediment sampling (8 sites) and bioassessment sampling (10 sites) in FY 06-07. • FY 07-08: Conduct second year of screening level measurements of general water quality using probes during sediment sampling (ten sites) and bioassessment (ten sites). Continuous temperature monitoring will be conducted by SCVWD as part of Mid-Coyote Flood Control Project.	SCVURPPP/ SCVWD
	Biological						
	Toxicity-Sediment[5]				S(10)	• Baseline: Sediment toxicity testing was conducted in FY 06-07 by SCVURPPP during dry and spring season at six sites. • FY 07-08: Conduct second year of sediment toxicity testing at ten sites during spring season, synoptically with sediment chemistry sampling.	SCVURPPP
	Pathogen Indicator Organisms [6]	S (4)			S (4)	• Baseline: Bacterial indicators concentrations in water were measured at eight stream locations in Coyote Creek during summer season in 1999-2001 as part of Stream Augmentation Study. Bacterial indicator concentrations were measured by SCVURPPP during dry and spring season in FY 06-07 at four stream sites. • FY 07-08: Conduct second year of monitoring of bacterial indicators at four stream sites located in city and county parks during summer and spring season.	SCVURPPP

Attachment 4-1

Table 4-1. FY 07-08 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 07-08				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Bioassessment – Macroinvertebrates[7]				S(10)	• Baseline: Benthic macroinvertebrate (BMI) bioassessments were conducted at eleven sites in Coyote Creek mainstem during 1997 as part of USGS study. BMI assessments were also conducted at nine sites during 1999 as part of SEIDP and six sites during 2000 as part of Stream Augmentation Study. BMI bioassessment is planned by SCVURPPP in spring season during FY 06-07 at 10 sites. • FY 07-08: Conduct second year of benthic macroinvertebrate bioassessment at ten sites synoptically with physical habitat assessment. BMI sampling will occur at all sediment sampling sites.	SCVURPPP
	Bioassessment – Fish					• Baseline: Existing fish survey data were collected within the Coyote mainstem in the following studies: 12 sites by Rob Leidy during 1995-97, 18 sites by SCVURPPP during 1999 and five sites by SCVWD during 2000. Downstream migrant trapping was also conducted by SCVWD during 1998-2000. • FY 07-08: Fish community sampling is planned during summer and fall season 2007 in the Coyote mainstem by SCVWD as part of Mid-Coyote Flood Control Project.	SCVWD
	Physical						
	Physical Habitat[8]				S(10)	• Baseline: Continuous aquatic habitat survey was conducted in 1999 as part of FAHCE Project by SCVWD. Habitat surveys were also conducted at 18 stream locations in Coyote mainstem in 1999 as part of SEIDP. Aquatic habitat surveys were conducted in Coyote mainstem during summer 2006 by SCVWD as part of Mid-Coyote Flood Control Project. • FY 07-08: Conduct second year visual physical habitat assessment, concurrent with macroinvertebrate sampling, at ten sites.	SCVURPPP
	Sediment Characterization[9]				S(10)	• Baseline: Substrate composition and embeddedness was visually estimated in Coyote mainstem in 1999 as part of FAHCE Project. Collection of surface/subsurface sediment samples was conducted in Coyote mainstem in summer 2006 by SCVWD as part of Mid-Coyote Flood Control Project. • FY 07-08: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at ten sites in Coyote mainstem.	SCVURPPP/ SCVWD

Attachment 4-1

Table 4-1. FY 07-08 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 07-08				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Channel Dynamics and Hydrology					• Baseline: Historical ecology study was conducted in the Coyote Creek watershed by SFEI in 2005-06. Longitudinal profiles, suspended and bedload sediment sampling and bankfull discharge measurements was measured during summer 2006 by the SCVWD as part of Mid-Coyote Flood Control Project. • FY 07-08: Sediment sampling to determine bed load and suspended sediment rating curves will be conducted by the SCVWD as part of Mid-Coyote Flood Control Project.	SCVWD
Upper Penitencia Creek	***Chemical***						
	Contaminants-Sediment				S (4)	• Baseline: Metals, organochlorine pesticide suite, PCB and PAH concentrations were measured in sediment samples collected at one stream location during summer season in FY 02-03. • FY 07-08: Conduct screening level monitoring of metals, PCBs and pyrethroids at four stream locations during spring season. TOC, percent solids and sediment grain size will be measured synoptically.	SCVURPPP
	General Water Quality				S(10)	• Baseline: Screening level measurements of general water quality was conducted by SCVURPPP in FY 02-03 synoptically with water chemistry (3 sites) and BMI bioassessment (6 sites). Continuous temperature monitoring conducted by SCVWD from 1999 to present. • FY 07-08: Conduct screening level measurements of general water quality using probes during sediment sampling (four sites) and bioassessment (six sites).	SCVURPPP
	Biological						
	Toxicity-Sediment				S (4)	• Baseline: No baseline data currently exists. • FY 07-08: Conduct testing of sediment toxicity at four sites during spring season, synoptically with sediment chemistry sampling.	SCVURPPP
	Pathogen Indicator Organisms	S (3)			S (3)	• Baseline: Screening level monitoring of bacterial indicators was conducted by SCVURPPP during three seasonal time periods in FY 02-03 at three sites. • FY 07-08: Conduct screening level monitoring of bacterial indicators during summer and spring season at three stream sites located in city and county parks.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (6)	• Baseline: Benthic macroinvertebrate (BMI) bioassessments were conducted at seven sites during 1997 as part of USGS study. BMI bioassessments were conducted by SCVURPPP during April 2003 at six sites. • FY 07-08: Conduct benthic macroinvertebrate bioassessment at six sites synoptically with physical habitat assessment. BMI sampling will occur at all sediment sampling sites.	SCVURPPP

Attachment 4-1

Table 4-1. FY 07-08 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 07-08				Rationale	Lead Agency
		1st	2nd	3rd	4th		
	Physical						
	Bioassessment – Fish					• Baseline: Existing fish survey data were collected in Upper Penitencia Creek by Stacy Li (2000) and Stillwater Sciences (2005). • FY 07-08: Fish community sampling is planned during summer and fall season 2007 in Upper Penitencia Creek by SCVWD as part of Mid-Coyote Flood Control Project.	SCVWD
	Physical Habitat				S (6)	• Baseline: Continuous aquatic habitat survey was conducted in 1999 as part of FAHCE Project by SCVWD. • FY 07-08: Conduct visual physical habitat assessment, concurrent with macroinvertebrate sampling, at six sites.	SCVURPPP
	Sediment Characterization				S (6)	• Baseline: Substrate composition and embeddedness was visually estimated in Coyote mainstem in 1999 as part of FAHCE Project. Collection of surface/subsurface sediment samples was conducted in 2005 as part of SCVWD geomorphic survey. • FY 07-08: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at six sites.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Channel morphology and hydrology data collected by SCVWD as part of Upper Penitencia Creek Flood Control Project. • FY 07-08: Monitoring channel morphology and hydrology is not planned.	SCVURPPP
Lower Silver -Thompson Creek	***Chemical***						
	Contaminants-Sediment				S (4)	• Baseline: Metals, organochlorine pesticide, PCB and PAH concentrations were measured in sediment samples collected at one stream location during summer season in FY 02-03. • FY 07-08: Conduct screening level monitoring of metals, PCBs and pyrethroids at four stream locations during spring season. TOC, percent solids and sediment grain size will be measured synoptically.	SCVURPPP
	General Water Quality				S(10)	• Baseline: Screening level measurements of general water quality was conducted by SCVURPPP synoptically with water chemistry (3 sites) and BMI bioassessment (4 sites) in FY 02-03. • FY 07-08: Conduct screening level measurements of general water quality using probes during sediment sampling (four sites) and bioassessment (six sites).	SCVURPPP

Attachment 4-1

Table 4-1. FY 07-08 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 07-08				Rationale	Lead Agency
	Biological						
	Toxicity-Sediment				S (4)	• Baseline: No baseline data currently exists. • FY 07-08: Conduct testing of sediment toxicity during spring season, synoptically with sediment chemistry sampling, at four sites.	SCVURPPP
	Pathogen Indicator Organisms	S (3)			S (3)	• Baseline: Screening level monitoring of bacterial indicators was conducted by SCVURPPP during three seasonal time periods in FY 02-03 at three sites. • FY 07-08: Conduct screening level monitoring of bacterial indicators located in city and county parks during summer and spring season at three stream sites.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (6)	• Baseline: BMI bioassessments were conducted by SCVURPPP in Thompson Creek during April 2003 at four sites. • FY 07-08: Conduct benthic macroinvertebrate bioassessment at six sites synoptically with physical habitat assessment. BMI sampling will occur at all sediment sampling sites.	SCVURPPP
	Bioassessment – Fish					• Baseline: No existing baseline fish community data. • FY 07-08: Fish community sampling is planned during summer and fall season 2007 in Lower Silver Creek by SCVWD as part of Mid-Coyote Flood Control Project.	SCVWD
	Physical						
	Physical Habitat				S (6)	• Baseline: No baseline data exists. • FY 07-08: Conduct visual physical habitat assessment, concurrent with macroinvertebrate sampling, at six sites.	SCVURPPP
	Sediment Characterization				S (6)	• Baseline: No baseline data exists. • FY 07-08: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at six sites.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Channel morphology and hydrology data collected by SCVWD as part of Lake Cunningham Flood Control Project. • FY 07-08: Monitoring channel morphology and hydrology is not planned.	SCVURPPP

Attachment 4-1

Table 4-1. FY 07-08 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	Quarter in FY 07-08				Rationale	Lead Agency
Lower Penitencia Creek	***Chemical***						
	Contaminants-Sediment				S (5)	• Baseline: Metals, organochlorine pesticide, PCB and PAH concentrations were measured in sediment samples collected at one location in Lower Penitencia and one location in Berryessa Creek during summer season in FY 02-03. • FY 07-08: Conduct screening level monitoring of metals, PCBs and pyrethroids at five stream locations during spring season. TOC, percent solids and sediment grain size will be measured synoptically.	SCVURPPP
	General Water Quality				S(10)	• Baseline: Screening level measurements of general water quality was conducted by SCVURPPP synoptically with water chemistry (5 sites) in FY 02-03. • FY 07-08: Conduct screening level measurements of general water quality using probes during sediment sampling (five sites) and bioassessment (five sites).	SCVURPPP
	Biological						
	Toxicity-Sediment				S (5)	• Baseline: No baseline data currently exists. • FY 07-08: Conduct testing of sediment toxicity at five sites during spring season, synoptically with sediment chemistry sampling.	SCVURPPP
	Pathogen Indicator Organisms	S (1)			S (1)	• Baseline: Screening level monitoring of bacterial indicators was conducted by SCVURPPP at three sites during three seasonal time periods in FY 02-03. • FY 07-08: Conduct screening level monitoring of bacterial indicators located in city and county parks during summer and spring season at one stream site.	SCVURPPP
	Bioassessment - Macroinvertebrates				S (5)	• Baseline: BMI bioassessments were conducted at four sites in Thompson Creek during April 2003 by SCVURPPP. • FY 07-08: Conduct benthic macroinvertebrate bioassessment at five sites synoptically with physical habitat assessment. BMI sampling will occur at all sediment sampling sites.	SCVURPPP
	Physical						
	Physical Habitat				S (5)	• Baseline: No baseline data exists. • FY 07-08: Conduct visual physical habitat assessment, concurrent with macroinvertebrate sampling, at five sites.	SCVURPPP
	Sediment Characterization				S (5)	• Baseline: No baseline data exists. • FY 07-08: Substrate composition and embeddedness will be visually estimated, concurrent with habitat assessment, at five sites.	SCVURPPP
	Channel Dynamics and Hydrology					• Baseline: Channel morphology and hydrology data collected by SCVWD as part of Lower Penitencia and Berryessa Creek Flood Control Projects. • FY 07-08: Monitoring channel morphology and hydrology is not planned.	SCVURPPP

Attachment 4-1

Table 4-1. FY 07-08 SCVURPPP monitoring plan for Santa Clara Basin Watersheds[1].

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) investigative, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. Sampling locations are described in separate table and figure attached to Plan.

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology.

3 Sediment Chemistry: Total metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg, PCBs and pyrethroids; sampling conducted during spring season.

4 General Water Quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted during spring season.

5 Sediment Toxicity: Sediment bioassays on *Hyella azteca*.

6 Pathogen Indicator Organisims: total and fecal coliform, *Enterococcus, and E. coli*; sampling conducted during dry and spring seasons.

7 Bioassessment - Macroinvertebrates: following CSBP methodology and conducted during the spring season.

8 Habitat survey physical habitat assessment using CSBP methodology.

9 Creek substrate sediment composition and embeddedness is qualitatively estimated by visual observation during bioassessment and habitat survey.

ATTACHMENT 4-1

Table 4-2. Sampling locations, frequency and data types for SCVURPPP's FY 07-08 monitoring plan.

Station Id	Station Name	Sediment Chemistry	Sediment Toxicity	General Water Quality	Pathogen Indicators	Benthic Macroinvertabrate Bioassessment	Physical Habitat Assessment
Coyote Creek							
COY-1	Coyote Creek at Montague Expressway	1	1	2		1	1
COY-2	Coyote Creek at Oakland Ave (North Coyote Park)	1	1	2		1	1
COY-3	Coyote Creek at Watson Park	1	1	2		1	1
COY-4	Coyote Creek at William Street (William City Park)	1	1	2	2	1	1
COY-5	Coyote Creek at Story Road (Kelley City Park)	1	1	2	2	1	1
COY-6	Coyote Creek at Yerba Buena (Hellyer County Park)	1	1	2	2	1	1
COY-7	Coyote Creek at Coyote Rd (Shady Oaks City Park)	1	1	2		1	1
COY-7.5	Coyote Creek at Forsum Rd (Metcalf Ponds)				2		
COY-8	Coyote Creek upstream Metcalf Rd (at powerstation)	1	1	2		1	1
COY-9	Coyote Creek above Osier Ponds (Model Airplane Park)	1	1	2		1	1
COY-10	Coyote Creek at Cochrane	1	1	2		1	1
UP-1	Upper Penitencia Creek at Flea Market	1	1	2		1	1

ATTACHMENT 4-1

Table 4-2. Sampling locations, frequency and data types for SCVURPPP's FY 07-08 monitoring plan.

Station Id	Station Name	Sediment Chemistry	Sediment Toxicity	General Water Quality	Pathogen Indicators	Benthic Macroinvertabrate Bioassessment	Physical Habitat Assessment
UP-2	Upper Penitencia Creek at Jackson Rd (Penitencia Creek Park)	1	1	2	2	1	1
UP-3	Upper Penitencia Creek at Kyle Street (Penitencia Creek Park)	1	1	2	2	1	1
UP-4	Upper Penitencia Creek at Talent Drive			1		1	1
UP-5	Upper Penitencia Creek at Alum Rock Park at Quail Hollow Bridge	1	1	2	2	1	1
UP-6	Upper Penitencia Creek at Alum Rock Park at Live Oak Bridge			1		1	1
LS-1	Lower Silver Creek at Wooster Ave	1	1	2		1	1
LS-1.5	Lower Silver Creek at McKee (Plata Arroyo Park)				2		
LS-1.75	Lower Silver Creek at San Antonio (Mayfair Park)	1	1	2	2	1	1
LS-2	Lower Silver Creek at Murtha Dr	1	1	2		1	1
T-1	Thompson Creek at Quimby	1	1	2		1	1
T-2	Thompson Creek at Villages Parkway			1		1	1
T-3	Thompson Creek at Meadowlands Lane			1		1	1
Lower Penitencia Creek							
LP-1	Lower Penitencia Creek at Corning Ave.	1	1	2		1	1

ATTACHMENT 4-1

Table 4-2. Sampling locations, frequency and data types for SCVURPPP's FY 07-08 monitoring plan.

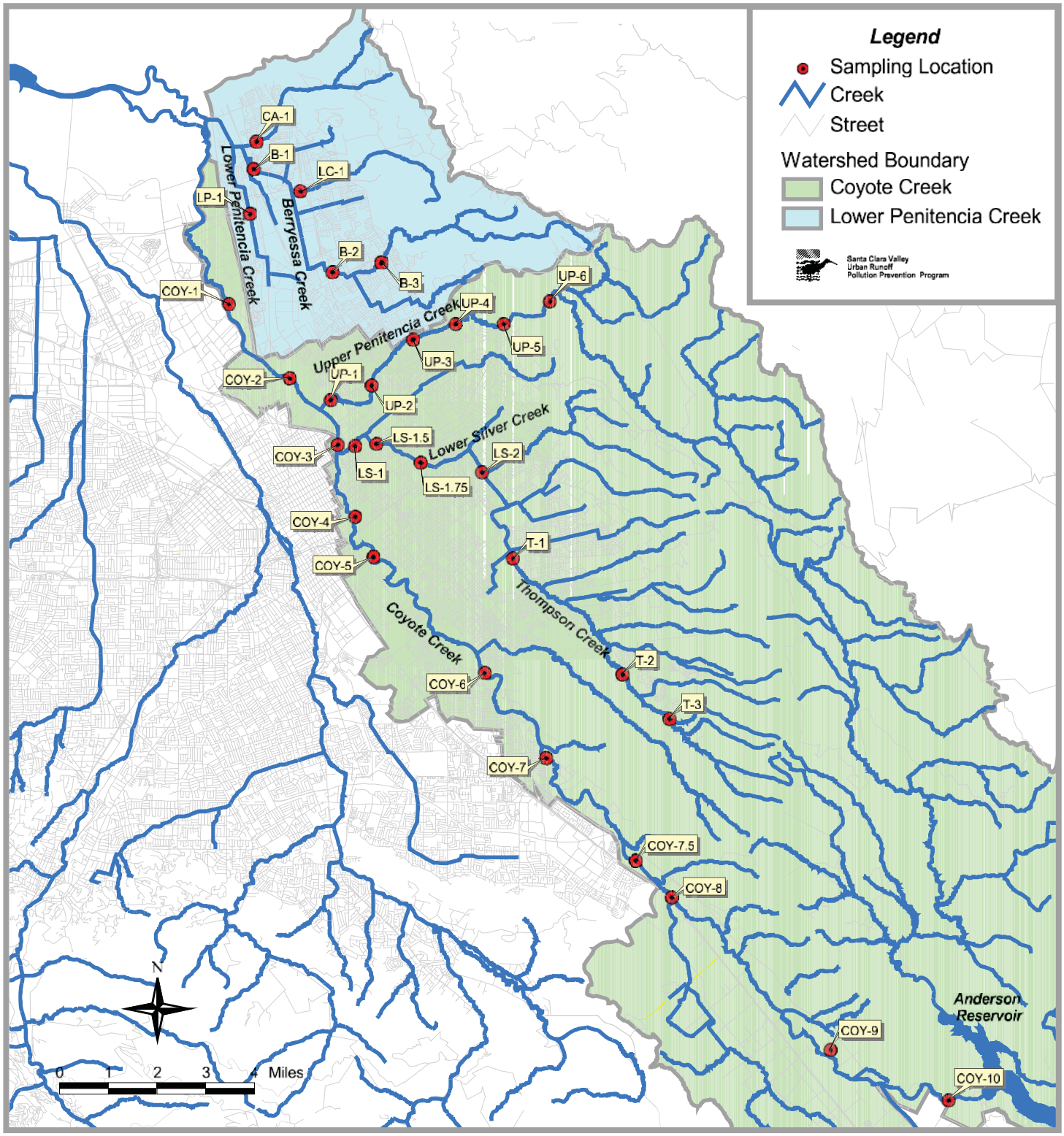
Station Id	Station Name	Sediment Chemistry	Sediment Toxicity	General Water Quality	Pathogen Indicators	Benthic Macroinvertabrate Bioassessment	Physical Habitat Assessment
B-1	Berryessa Creek at Milpitas Blvd	1	1	2		1	1
B-2	Berryessa Creek at Cropley Ave	1	1	2		1	1
B-3	Berryessa Creek at Messina Dr (Berryessa Creek Park)				2		
CA-1	Calera Creek at Milpitas Blvd	1	1	2		1	1
LC-1	Los Coches Creek along Los Coches Street	1	1	2		1	1
Total Number Samples		**23**	**23**	**50**	**20**	**27**	**27**

Sediment Chemistry: Total metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se), Hg, PCBs and pyrethroids; sampling conducted during dry and spring seasons.
Sediment Toxicity: Sediment bioassays on *Hyella azteca*.
General Water Quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted during dry and wet seasons.
Pathogen Indicators: total and fecal coliform, Enterococcus, and E. coli; sampling conducted during dry and wet seasons.
Bioassessment - Macroinvertebrates: following CSBP methodology and conducted in the spring season.
Physical Habitat Assessment: survey physical habitat assessment using CSBP methodology.

Attachment 4-1

Table 4-3. Analytical methods used in SCVURPPP Multi-Year Monitoring Plan.

Description of data parameters	Analytical Methods
Sediment Chemistry	
Pyrethroid Pesticides (sediment)	EPA 8270C(SIM)
PCBs (sediment) - Congeners	EPA 8270C(m)
PBDEs (sediment)	EPA 8270C(m)
ICPMS metals suite (sediment) (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As)	EPA 6020
Total mercury (sediment)	EPA 245.7/1631M
Percent moisture (sediment)	EPA 160.3
TOC (sediment)	EPA 9060
Sediment grain size - full analysis (phi scale)	Plumb/PSEP
Bacterial Indicators	
Total coliform	SM 9221B&E
Fecal coliform	SM 9221B&E
E. coli	SM 9221B&E
Enterococcus	EPA 1600
Toxicity Testing	
Hyella azteca (10 day Survival & Growth)	EPA-600-R-99-064



Attachment 4-1 Figure 4-1. SCVURPPP FY 07-08 Sampling Site Locations in Coyote and Lower Penitencia Creek Watersheds.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Annual Receiving Water Body Monitoring

Purpose: To analyze data collected during implementation of the Program's FY 07-08 Annual Monitoring Program Plan, summarize results and recommend next steps regarding data collection and watershed management.

Background: Since FY 02-03, the Program has developed and implemented Annual Monitoring Program Plans (Annual Plans) in fulfillment of Provision C.7 of its NPDES Permit. The Annual Plans identify monitoring activities that are implemented each year as part of the Program's Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan). In accordance with Provision C.10 (b), the Program annually develops a Watershed Monitoring and Assessment Summary Report (Summary Assessment Report) that summarizes the results and analyses of baseline data collected during the implementation of the Program's Annual Plans. These data are generated through ambient surface water quality monitoring; physical habitat assessment studies and bioassessment studies. The Summary Assessment Reports provide information on possible beneficial use impacts to the extent possible (based on the study design and available data) and suggests next steps for monitoring/assessments and developing strategies to control potential impacts.

In FY 07-08, the Program will summarize and analyze data collected during FY 07-08 in the Coyote Creek watershed, including its tributaries. Findings and recommendations will be included within the Program's FY 07-08 Annual Report.

Scope Summary:

- Collect and analyze data collected in the Coyote Creek watershed, including tributaries as part of the FY 07-08 Annual Monitoring Program Plan and summarize results.

Products:

- Technical Report (Watershed Monitoring and Assessment Summary)

Schedule: July 2007 – June 2008

Program Staff: Chris Sommers, Paul Randall, Jen Kovecses

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Receiving Water Body Characterization (i.e., Existing Data Evaluation and Stream Survey)

Purpose: To collect existing information and analyze field data collected during stream surveys; and to identify potential impacts to beneficial uses and inform future receiving water monitoring efforts according to the Program's Revised Multi-Year Receiving Waters Monitoring Plan.

Background: The Program's Multi-Year Receiving Water Monitoring Plan was revised in 2004 to include a systematic monitoring and assessment process. This process includes the follow steps/categories: 1) Watershed Characterization; 2) Screening-Level (Status/Condition) Monitoring; 3) Water Body Assessment; 4) Investigative Studies; and 5) Trends/Effectiveness Monitoring. Watershed characterization is intended to assist the Program in evaluating and documenting our current understanding of beneficial use condition and potential impacts in local water bodies.

As defined, watershed characterization entails two tasks. First, water quality data and watershed information collected to-date are summarized in a watershed characterization memorandum. The memorandum includes a compilation of existing data sources and a summary of the geologic and geomorphic setting, vegetation, land uses and associated water quality issues. An evaluation of the status of biological communities and relevant beneficial uses in the watershed(s) is also provided. Second, a creek survey is conducted to identify potential impacts to beneficial uses and to assess the quality of the physical habitat. Field data collected is entered into a database and evaluated. The Program has previously used the Unified Stream Assessment (USA) method (Center for Watershed Protection) when conducting creek surveys. Watershed characterizations have been previously conducted in Saratoga Creek (FY 05-06) and are underway in Matadero Creek (FY 06-07).

During FY 05-06, the Program developed a watershed characterization memorandum summarizing data collected to-date and watershed attributes for the Stevens and Permanente Creek watersheds. To complete the watershed characterization stage of the Program's water body monitoring and assessment process, the Program intends to conduct creek surveys in one of these watersheds in FY 07-08. The Program intends to coordinate this effort with the Stevens/Permanente Creek Watershed Council.

Scope Summary:

- Compile and collect information to characterize the general physical and biological attributes of the Stevens or Permanente Creek watershed.

Products:

- Technical memorandum characterizing the existing condition of beneficial uses; and
- Potential impacts in Stevens or Permanente Creek watersheds.

Schedule: July 2007 – June 2008

Program Staff: Lucy Buchan, Chris Sommers, Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Watershed (i.e., Sediment) Analyses

Purpose: Initiate a sediment source and management practice assessment in the Saratoga Creek watershed and possibly the Coyote Creek watershed, consistent with the Program's Watershed Analysis Work Plan.

Background: In fulfillment of SCVURPPP NPDES Permit Order No. 01-024 Provision C.9.f.iii paragraph two, the Program submitted a watershed analysis work plan to RWQCB staff on August 30, 2002. The work plan identified four watershed areas where watershed analysis associated with sediment would be conducted. The work plan also identified a two-phase process for completing the analyses. Phase I includes conducting a watershed analysis and sediment management practices assessments to determine if excessive sediment from anthropogenic sources is impairing beneficial uses in the watershed. Phase II includes conducting a rapid sediment budget, which will only be conducted when the Phase I study results indicate that anthropogenic sediment sources are impairing beneficial uses.

In FY 03-04, Phase I was implemented in the Stevens Creek watershed. Based on results of the analysis (i.e., limiting factors analysis (LFA)), the Watershed Analysis AHTG recommended that Phase II was not warranted in the Stevens Creek watershed. In FY 05-06, an LFA was completed in the Upper Penitencia Creek watershed. Based on the results, a limited Phase II (i.e., sediment source assessment) was recommended to be completed in FY 06-07 in parallel to completing a sediment management practices assessment. A watershed analysis will also be complete for the Saratoga Creek watershed in FY 06-07. A sediment management practices assessment is scheduled for completion in the Saratoga Creek watershed in FY 07-08. Depending on the results of the watershed analysis, a sediment source assessment/budget may also be required in FY 07-08.

The final watershed area scheduled for analysis is Coyote Creek (mainstem). The Program is conducting an assessment of current information in FY 06-07 to determine the need to conduct a watershed analysis, based on a reevaluation of criteria used to develop the watershed analysis work plan. Depending on the results, a LFA (or similar analysis) may begin during FY 06-07 within the Coyote Creek watershed. If an LFA is warranted or feasible, a sediment source and management practices assessment may need to be completed in future fiscal years.
All Watershed Analysis AHTG recommendations will be reviewed and approved by the Management Committee prior to implementation.

Scope Summary:

- Conduct a sediment management practices assessment in the Saratoga Creek watershed.
- If sediment from anthropogenic sources in the Program's jurisdiction is determined to be a significant limiting factor in the Saratoga watershed, the Program will initiate work on a rapid sediment budget (or similar analysis) within the watershed.
- Plan, organize and facilitate meetings with consultants and Watershed Analysis AHTG members.

Products:

- Sediment Management Practices Assessment Technical Memorandum; and (if warranted)
- Rapid Sediment Budget Technical Memorandum.

Schedule: July 2007 – June 2008

Program Staff: Chris Sommers and Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Trash Management and
Effectiveness Assessment Strategy

Purpose: Implement Trash Management and Assessment Strategy

Background: On November 14, 2001, the Water Board released the document entitled Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region Report. This report states that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …", Water Board staff will review information concerning trash in the next listing cycle to determine whether specific water bodies warrant 303(d) listing. In a proactive response to the 303(d) Staff Report, the Program's Management Committee formed a Trash AHTG (first meeting on February 21, 2002). The Trash AHTG developed a Work Plan (submitted March 1, 2003) to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways of the Santa Clara Basin.

During FY 03-04, the Program assisted Co-permittees in completing the following Work Plan tasks: 1) document existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) identify and map high priority trash problem areas and sources of trash in Santa Clara Basin watersheds; 3) develop a strategy to conduct trash evaluations in or near creeks; 4) sponsor a training workshop on how to use existing trash assessment tools (i.e., RWQCB Rapid Trash Assessment Protocol (Version 7.0) and Keep America Beautiful (KAB) Litter Index); and 5) develop standardized reporting format for documenting and evaluating trash management and monitoring activities.

From FY 03-04 to FY 06-07, the Program completed tasks described in the Trash Work Plan and Monitoring Project Summaries provided in previous Work Plans. In October 2006, Program staff developed a *Draft Trash Management and Effectiveness Assessment Strategy* (Strategy), which was reviewed by the Trash AHTG. The Strategy includes four main areas of Program activity associated with trash: 1) identifying trash problem areas and sources; 2) selecting and implementing appropriate control measures at high priority problem areas; 3) assessing the effectiveness of control measure implementation; and, 4) providing administrative support to the Trash AHTG. The tasks scheduled for completion during FY 07-08 focus on assisting Co-permittees on: a) trash pilot demonstration project implementation, b) developing long-term trash management strategies for high priority watersheds, which will include current and future trash management activities, and c) continuing to evaluate creek condition and the effectiveness of management practices.

Scope Summary:

- Assist Co-permittees in implementing trash pilot demonstration projects which focuses on assessing the effectiveness and costs of structural treatment controls in the Santa Clara Basin;
- Assist Co-permittees in developing effective strategies for reducing trash in urban streams and waterways in high priority watersheds;
- Report information on trash evaluation results and trash management practices implemented by Co-permittees using standardized reporting format;
- Revise trash problem areas list, as appropriate; and,
- Update Trash Fact Sheets, as appropriate.

Products:

- Technical memorandum summarizing the results of the trash pilot demonstration projects including an evaluation of effectiveness and lessons learned;
- Draft and final long-term trash management strategies for high priority watersheds;
- Technical memorandum providing trash evaluation results and analyses;
- Enhanced and updated database; and,
- Updated trash fact sheets.

Schedule: July 2007 – June 2008
Program Staff: Chris Sommers, John Fusco, Paul Randall and Jen Kovecses

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING PROJECT SUMMARY

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Purpose: Provide coordination assistance and staff support to the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

Background: In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in stormwater programs that include rapid bioassessments in their watershed monitoring and assessment programs. Since the initial workshop, the Program has assisted (with planning and coordination) and participated in five annual BAMBI workshops (through 2006).

Each workshop has included presentations of technical information on existing and planned bioassessment studies conducted within the San Francisco Bay Area. Workshop participants also reviewed and discussed potential BABMI goals and objectives in the development of an Index of Biotic Integrity (IBI) for Bay Area Creeks, with the goal of developing a regional bioassessment tool necessary to provide context to data collected in Santa Clara Basin creeks. A draft BAMBI IBI Work Plan was presented at the 2005 BAMBI Workshop. Since FY 04-05, Program staff has provided in-kind services to implement specific tasks identified in the work plan.

Scope Summary:

- Assist in the planning and coordination of the seventh annual BAMBI workshop.
- Continue to provide in-kind services to implement specific tasks identified in the BAMBI IBI Work Plan.
- Coordinate with other agencies and stormwater programs in further development and implementation of bioassessment tools and sharing of bioassessment data.

Products:

- BAMBI meeting summary(s) and staff presentations
- Draft IBI for San Francisco Bay Area Creeks

Schedule: July 2007 – June 2008

Program Staff: Chris Sommers, Jen Kovecses, Paul Randall

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MONITORING
PROJECT SUMMARY

Stream Studies Inventory Update

Purpose: Provide update to the Santa Clara Basin Watershed Management Initiative's (SCBWMI) Stream Studies Inventory (SSI) database.

Background: The Watershed Assessment and Monitoring Subgroup (WAMS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAMS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0), November 2003 (version 5.0), June 2005 (version 6.0) and September 2006 (version 7.0). The Program funded the initial development of the SSI and each of the annual updates.

In FY 06-07, the Program has begun to develop a new process for obtaining and displaying information on current projects that would typically be described in a SSI report. Beginning in FY 07-08, the SSI will be web-based and allow users to query information on current and historical environmental data collection and assessment efforts that are included within the Program's metadata database. Beginning in FY 07-08, the SSI will be available through the Program's website and maintained by Program staff.

Scope Summary:

- The Program will develop a Web-based Stream Studies Inventory (SSI) pilot, which will include updating and maintaining information contained within the Program's existing metadata database.

Products:

- Stream Studies Inventory – Web-based Stream Information Querying Tool

Schedule: July 2007 – June 2008

Program Staff: Paul Randall and Chris Sommers

Attachment 4-3
FY 2007-2008 Pollutant of Concern Control Programs and Additional Activities

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
PCBs, Dioxins and Legacy Pesticides Control Programs	MP #2 and 4	NPDES Permit 303(d) List	Continue to work with other Bay area dischargers and Water Board staff through BASMAA and the RMP to implement regional projects related to dioxins, PCBs, and chlorinated pesticides. This may include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by BASMAA, the RMP and Water Board staff. Program staff will continue to represent BASMAA on the RMP Technical Review Committee and the RMP Sources, Pathways and Loadings Work Group.	Meeting summary reports; Comment letters on TMDL Reports and Proposed Basin Plan Amendments	TBD
Copper and Nickel Baseline Activities	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.a & b	NPDES permit	The FY 07-08 Copper and Nickel Action Plan Baseline Activity Work Plans and summary of certain FY 06-07 accomplishments are provided within Appendix A.	Revised Copper and Nickel Action Plans	TBD

[1] Monitoring Priorities (updated at Monitoring AHTG meeting November 8, 1999):

1) New projects needed to implement the results, and achieve the goals, of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
   a) Investigate Beneficial Uses and Causes of Impairment (including field work)
   b) Review and Compile Environmental Data and Make it Accessible
   c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
   d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4) Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA

Attachment 4-3
FY 2007-2008 Pollutant of Concern Control Programs and Additional Activities

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Trash Investigations and Plan Implementation	MP#2 & 3c	303d Threatened Listing	The Program will focus on assisting Co-permittees on: a) trash pilot demonstration project implementation, b) developing long-term trash management strategies for high priority watersheds, which will include current and future trash management activities, and c) continuing to evaluate creek condition and the effectiveness of management practices. Additional information of Program tasks associated with trash management and assessment are included in the project summary (Attachment 4-2).	Technical memorandum summarizing the results of the trash pilot demonstration projects including an evaluation of effectiveness and lessons learned; Draft and final long-term trash management strategies for high priority watersheds; Technical memorandum providing trash evaluation results and analyses; Enhanced and updated database; and updated trash fact sheets.	July 2007 - June 2008
Watershed Data Management	Follow-up MP#1	Continuation of Project SC22.63	Data management for the SCVURPPP Program. Coordinate data collected and analyzed by Program-sponsored projects. Insure that data is quality-assured, comparable across projects and comparable across watersheds (where possible). Where feasible, make data accessible to Co-permittees and to the public. Maintain and update website. Summarize available information on the background, purpose, and activities of planned and ongoing studies of the physical, chemical and biological characteristics of creeks and wetlands in the Santa Clara Basin.	Web-based inventory of metadata generated by the Program and other organizations in the Santa Clara Basin.	Ongoing
Continued Implementation of Enhanced IC/ID and IND Tracking and Reporting	Follow-up/ Continuous Improvement MP#2 Provision 6.a.i.	SEIDP #21	Continue Implementation and Reporting of Enhanced Reporting;	Database and annual report summary	September 2008

Attachment 4-3
FY 2007-2008 Pollutant of Concern Control Programs and Additional Activities

Title	Category/ Monitoring Priority (MP)[1]	Origin	Capsule Scope	Product(s)	Schedule
Mercury Pollution Prevention	Follow-up/ Continuous Improvement MP#1, 3a Provision C.9.c	NPDES permit	Coordinate implementation of Program's Mercury Pollution Prevention Plan. (See separate FY07-08 Work Pan)	Status report and internal guidance	See Plan for details
Pesticide Plan Coordination, Implementation, and Reporting	Follow-up/Continuous Improvement MP#1,2 Provision C.9.d	Implement URMP Pesticide Management Efforts	Coordinate implementation of Program's Pesticide Plan. (See separate FY07-08 Work Pan)	Status report and internal guidance	See Plan for details
Support for Land Use and Watershed Assessment and Monitoring SubGroups	WMI Subgroups MP# 1, 3c, 3d Provision C.10.	Continue WMI support	Provide administrative support and leadership for the Land Use Subgroup. Maintain the subgroup mailing list; prepare and distribute agendas; chair meetings; edit and distribute meeting summaries; liaison to, and correspond with, the SCBWMI Core Group other subgroups as needed; update workplans; facilitate interaction between consultants and the subgroup; summarize, compile, and convey subgroup products.	Meeting summaries, Work Plans and other products as directed by the subgroups.	July 2007 – June 2008

SECTION 5

PESTICIDE MANAGEMENT WORK PLAN

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 2007-2008 Work Plan

5. FY 07-08 PESTICIDE MANAGEMENT WORK PLAN

INTRODUCTION

The goals and objectives of the SCVURPPP Urban Runoff Management Plan (URMP) include effectively prohibiting non-storm water discharges to storm drains and watercourses; reducing pollutants in storm water discharges to the "maximum extent practicable" (MEP); and not causing or contributing to violations of water quality standards, as required by the Program's NPDES permit. The Program's approach to meeting these goals and objectives focuses on the use of best management practices (BMPs) for source control and pollution prevention; and public education and outreach.

The Program's approach to pesticide management has a similar focus on source control and pollution prevention. Program BMPs for pesticide management have included significant outreach efforts to residents, businesses, and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide issues; and development of performance standards and local pest management plans.

BACKGROUND

Diazinon and chlorpyrifos have been identified in recent studies as causing toxicity in local creeks and wastewater treatment plant effluent. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA). The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies. In November 2005, the Water Board adopted a TMDL and Water Quality Attainment Strategy (WQAS) for diazinon and pesticide-related toxicity in San Francisco Bay Area urban creeks. The TMDL/WQAS provides a source assessment and pollutant allocation scheme; and discusses implementation actions relevant to urban runoff management programs, including the SCVURPPP. The TMDL/WQAS was approved by the State Water Resources Control Board (State Board) at its November 15, 2006 Board meeting.

The Program's reissued NPDES permit (Order No. 01-024, February 21, 2001) includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticides by others within municipal jurisdictions. The Program will also continue to work with the Urban Pesticide Committee and the California Stormwater Quality Association Pesticide Work Group to assess impacts of pesticide use and encourage actions by other state and federal agencies.

As required by Permit Provision C.9.d., the Program developed a Pesticide Management Plan and submitted it to the Water Board by July 1, 2001 (June 26, 2001). The submittal to the Water Board included a preliminary draft Pest Management Performance Standard as well as municipal pesticide use surveys completed by each Co-permittee. The Pesticide Management Plan was revised in response to Water Board staff comments dated August 15, 2001 and December 21, 2001, and the revised version (dated February 15, 2002)

submitted to the Water Board as Attachment 5-1 to the Program's *FY 02-03 Work Plan*. The Pest Management Performance Standard was also revised based on Water Board Staff comments emailed in November 2001. The final performance standard was submitted to the Water Board as Attachment 2-2 of the Program's *FY 02-03 Work Plan* and included as part of the updated URMP and permit application (per Permit Provisions C.2.b and C.14).

The purpose of the Pesticide Plan is to control pesticide-related toxicity in urban runoff, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Plan identifies the goals of each work plan element, actions, monitoring mechanisms and schedules. The Plan also identifies whether actions will be implemented at the Program level, municipality level, or both. Program-level actions in the Plan form the basis of this FY 06-07 Pesticide Management Work Plan. The details of municipality actions and schedules were provided in individual Co-permittee pest management plans submitted with the Co-permittees' FY 00-01 Annual Reports and future tasks are provided in the Co-permittees' FY 06-07 work plans (Section 9 of this Work Plan).

PAST PESTICIDE MANAGEMENT ACTIVITIES

The Program has, since its inception, actively participated in a number of activities aimed at understanding water quality problems in creeks and San Francisco Bay and reducing pollutants, including pesticides, to the MEP. Beginning with the FY 99-00 Work Plan, every Work Plan and Annual Report has presented the history of the Program's and Co-permittee's pesticide-related activities in the areas of monitoring and science, outreach and education and URMP implementation. Table 5-1 contains the implementation status of all Pesticide Plan tasks. A summary of FY 07-08 activities is provided below. Details of the FY 07-08 Pesticide User Outreach activities are provided in Section 3, Attachment 3-3.

FY 07-08 PESTICIDE MANAGEMENT TASKS

The Program will continue implementing the ongoing Pesticide Plan tasks listed in Table 5-1. These include:

- Municipal Pesticide Use: Co-permittees will continue to track their pesticide use and report it in the FY 07-08 Annual Report.

- Public Education and Outreach: The Program's Pesticide User Outreach Work Group will continue to conduct outreach to residents, store employees and businesses on less-toxic pesticide use. Details of the FY 07-08 Pesticide User Outreach activities are provided within Section 3, Attachment 3-3. The Program's Watershed Watch Campaign will also continue to promote IPM messages.

- IPM Training Program for Landscape Maintenance Professionals: The FY 07-08 Pesticide User Outreach (PUO) Work Plan includes implementation of a training program for small gardening businesses (less than five employees) that conduct landscape maintenance activities for homeowners and some commercial entities throughout the Bay Area. The PUO Work Group is presently evaluating two existing training and certification programs for implementation within Santa Clara County. These include: 1) the Bay Friendly Gardening Program, developed by the Alameda County StopWaste.org Program (now being expanded Bay-area wide); and 2) the Green Gardener Program, developed through a grant program for the City and County of Santa

Barbara. The PUO Work Group plans to work with the Bay Friendly Gardening Program to include the demographic focus of the Green Gardener Program (Spanish speaking, small businesses). Since the region-wide expansion of the Bay Friendly Gardening Program may take some time, the PUO Work Group is exploring the possibility of holding a "pilot" Green Gardener 20-hour training class in fall 2008.

- Household Hazardous Waste (HHW) Collection: The Program will work with the County HHW Program to publicize proper pesticide disposal, as needed. The quantities of pesticide disposed at County HHW collection sites are tracked annually and will be reported in the FY 07-08 Annual Report.

- Monitoring and Science: The Program will continue to participate and contribute to the Regional Monitoring Program and implement the Revised Multi-Year Monitoring Plan.

- Regional Coordination: Program staff will continue to participate in CASQA, Urban Pesticide Committee and the BASMAA Regional IPM Partnership project.

In addition, Program staff will focus efforts on working with Water Board staff on the Municipal Regional Permit; and begin to plan for any new pesticide-related requirements that may be contained in that permit.

Table 5-1
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
I. Municipal Pesticide Use		
I.A.1 Develop and implement a process for tracking pesticide use on municipally owned property (PS#8). Include in the process reporting and justification for the use of OP pesticide and BMPs employed during OP pesticide use.	Ongoing	The Pest Management Performance Standard includes a suggested reporting process, which the Co-permittees implemented for the FY 01-02 Annual Report. The first year was focused on reporting use of organophosphate pesticides, particularly chlorpyrifos and diazinon. For the FY 02-03 Annual Report, Water Board staff requested Co-permittees to submit pesticide use summaries and not actual data. This practice has been continued since the initial submittal.
I.A.3 Assist Co-permittees to develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM policy (PS #3). BMPs will include special precautions to reduce water quality impacts when applying pesticides.	Done	Program guidance completed as part of Model Pest Management Performance Standard, submitted to Water Board March 1, 2002. Guidance to Co-permittees included a packet of example IPM policies and practices.
I.A.4. Assist Co-permittees to update local URMPs to incorporate/adapt the model Pest Management Performance Standard, including a description of the legal authority (IPM policy/ordinance, contract language), work plan elements, BMPs, and SOPs needed for implementation.	Done	See notes for Action I.A.3. The Program held a workshop on March 20, 2002 on how to implement the performance standard.
I.B.4. Conduct a workshop for municipal staff on least-toxic pest control methods and pesticide management BMPs.	Done	Workshop held March 20, 2002. Program also co-sponsored ACCWP IPM Symposium held on 2/5/03, and the Regional IPM Conferences held in 2004, 2005 and 2006.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II. Public Education and Outreach		
II.A.1 Implement the Watershed Education & Outreach (WE&O) Campaign, which will target the general public and include messages about less-toxic pest control and proper disposal. The Campaign will include extensive media campaign with South Bay English- and Spanish-language radio stations, newspapers, and bus posters.	Done/Ongoing	An article on impacts of pesticide use to water quality and less toxic pest control was written and sent through the campaign distribution list. Pesticides are listed as a concern in the campaign brochure and the Watershed Watch song. The campaign web site includes information on IPM, and IPM fact sheets are available to download. The campaign has also been utilizing print, radio and transit ads with less toxic pest management messages.
II.A.2 Develop simple, effective, targeted messages regarding proper pesticide use and disposal, effects on water quality, and IPM.	Done/Ongoing	See above for Watershed Watch activities. The Program continues to participate in regional IPM partnership and media relations efforts. The regional IPM partnership committee develops new fact sheets as needed.
II.A.3 Prepare appropriate outreach materials (e.g., fact sheets or a consumer guide regarding pest control services) to address target groups.	Done	Program developed landscape maintenance fact sheet. A PCO fact sheet has been developed through BASMAA participation. This fact sheets educates consumers on hiring pest control professionals who practice IPM.
II.A.4 Identify and attend community events and distribute outreach materials. (Program will attend events strategic to the WE&O campaign.)	Done/Ongoing	Program staff and Watershed Watch consultant staff attend outreach events each year. Brochures such as IPM fact sheets, “Grow It!” guide, “Pests Bugging You?”, and “Backyard Bugs” are distributed.
II.A.6. Create, update, and publicize web sites to promote IPM and reduce pesticide use.	Done/Ongoing	The Watershed Watch website was launched in September 2001 and is continually updated. The website directs browsers to call the toll-free number to the Program office for information on less-toxic pest control. A web page specifically for IPM was completed in June 2002 and is updated regularly. The web page also includes links to other sites with information on IPM.
II.A.7 Coordinate with the Master Gardeners program and use their services to train residents. Provide IPM training and	Done	The Program funded a proposal by Master Gardeners and San Jose Community Gardens staff to conduct an IPM

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

	Action	Status	Notes
	information on water quality impacts of pesticide use to Master Gardeners as needed.		training program for community gardeners. Four workshops were conducted and training materials were purchased with SCVURPPP funds. From FY 02-03 to FY 04-05, the Program conducted community IPM workshops in coordination with Watershed Watch, United Neighborhoods, Guadalupe Gardens, the Santa Clara County Household Hazardous Waste Program and Master Gardeners.
II.A.8	Create and/or publicize existing IPM demonstration gardens (such as the garden at the San Francisco Bay Wildlife Refuge in Alviso).	Done/Ongoing	Since FY 01-02, the Watershed Watch Campaign has partnered with the Don Edwards San Francisco Bay Wildlife Refuge at Alviso. The Alviso site has a pesticide-free native plant demonstration garden. Workshops at this location are promoted on the Watershed Watch website. Since FY 03-04, the Program has been providing promotional support for the Going Native Garden Tour. In FY 05-06, approximately 3,000 people attended the tour which featured 46 gardens. Featured gardens demonstrate environmentally sensitive gardening practices which include the use of native plants, water conservation, landscaping to prevent urban runoff, reducing pesticide and fertilizer use, etc.
II.A.9	Continue to fund BASMAA Regional Media Relations Campaign featuring pitches to Bay Area media and responses to breaking news on pesticide-related topics.	Ongoing	The Program funds this campaign as part of its BASMAA baseline dues. Program staff participates in meetings of the work group and review draft products.
II.A.11	Identify consumer and business publications that could include articles about IPM or less toxic pest management, submit articles or letters to the editor, and encourage them to print them.	Done/ Ongoing	An article describing impacts of pesticide use to water quality and containing hints for pesticide-free pest control was developed in December 2004 and sent to select publications. The article was included in the April 2005 issue of *Tideline* magazine and also placed on the Friends of Guadalupe Gardens website in October 2004.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
II.A.12 Develop a work plan for and implement a "Pesticide User Outreach" project targeting residential and commercial users, which will include continuing the IPM Store Partnership Program and selected Household Chemical Management project tasks. Include an evaluation component in the work plan.	Ongoing (Complete Annually)	Work Plan implemented since FY 02-03; and ongoing for FY 07-08. Activities included: • Media advertising • IPM Store Partnership Program • IPM Community Workshop • Outreach at Community Events
II.A.13 Provide information on less toxic pest control (e.g., IPM techniques, municipal IPM policies, model contract language, training opportunities, etc.) to neighboring special districts (e.g., Valley Transportation Authority, sanitary and utility districts, open space districts, vector control districts, and school districts) as appropriate.	Done	VTA and open space and vector control district staff were invited to the Program's IPM Workshop in March 2003 and provided copies of the Program's Pest Management Performance Standard. In January 2005, the Program conducted a mailing (letter and IPM fact sheets) to these groups to provide them information about less-toxic pest control.
Monitoring Mechanism II.A.1 Document or estimate numbers of residents reached by outreach efforts, including events, web site promotion, municipal employee outreach, and media advertising. Monitor responses to outreach efforts through documentation of calls to the Program's general and watershed campaign hotlines.	Ongoing (Completed Annually)	Number of residents reached and outreach materials distributed are documented after each event. Response to outreach efforts is tracked by documenting calls to hotline and website visits. This information is provided in the Annual Report each year.
Monitoring Mechanism II.A.2 Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages. (Program will conduct countywide survey as part of evaluation of WE&O campaign. Program may also conduct surveys to evaluate effectiveness of specific projects.)	Done	A Countywide survey was conducted in September 2003 to evaluate the success of the WE&O campaign. The final evaluation report was included in the Program's FY 03-04 Annual Report. Some of the survey questions tracked the publics' knowledge about various pollutants, including pesticides, affecting the water quality in the Bay. 19% of the respondents in 2003 say that pesticides affect the water quality of the Bay compared to 7% in 1991. About 23% of residents say that they use less –toxic ways to control pests in their home and garden. The BASMAA Regional IPM Committee conducted a

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
		customer intercept survey in September and October 2004 to evaluate the Store Partnership Project. Five stores from Santa Clara County were included in this survey. The survey indicates that about 23% of Santa Clara County residents are aware of the Our Water Our World promotion. The final survey report was included with the FY 04-05 Annual Report.
II.B.1 Continue to fund and participate in the BASMAA Regional IPM Partnership.	Ongoing	The Program annually funds this program as part of its BASMAA baseline dues. These funds cover the Program's supply of IPM Fact Sheets. Program staff participates in meetings of the work group and review draft products.
II.B.2 Continue to implement cost-effective elements of the IPM Store Partnership Program. Create and provide fact sheets and other materials to pesticide retailers to facilitate point-of-purchase outreach. Visit stores as necessary to ensure ongoing participation.	Ongoing	The IPM store partnership program expanded in FY 02-03 to include 30 stores in the Santa Clara Valley. Program staff routinely visits the stores and ensure that they are well stocked with fact sheets and shelf talkers. In addition, the Program provides trainings to store employees on selling less-toxic products.
II.B.3 Offer IPM training opportunities to pesticide retailer employees through coordination with Master Gardener-taught educational programs.	Task Eliminated (covered under Action Item II.A.12.)	It was not possible to arrange for Master Gardeners to train store employees due to staff shortages within the Master Gardener program. The Program has contracted with Annie Joseph to provide training to pesticide retailers, as she has been successful in getting store participation. The Community Gardeners project has been a successful way to work with the Master Gardener program and may be repeated if there is sufficient demand and resources available.
Monitoring Mechanism II.B.1. Document number of participating stores, materials distributed and employees trained. Evaluate the cost-effectiveness of the IPM Store Partnership Program each year. Implement the evaluation component of the Pesticide User Outreach work plan each year	Ongoing	Data on number of participating stores, materials distributed and employees trained is documented and reported in the Annual Report each year. Evaluation of other work plan tasks is also reported.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
III. Pest Control Operators (PCOs)		
III.A.1 Develop a database of licensed structural and landscape maintenance PCOs.	Done	The list was obtained from the County Agricultural Commissioner's office prior to the PCO workshop of November 4, 2003
III.A.2. Identify active PCO and landscape maintenance organizations in the South Bay and conduct awareness-raising presentations at their meetings	Done	The Program contracted with Bart Brandenburg, consultant, to plan and conduct a PCO Workshop. To increase attendance, awareness-raising presentations were made at the two local PCO associations prior to the PCO workshop.
III.A.3. Develop and conduct accredited workshops for PCOs that focus on IPM techniques.	Done/ongoing	The workshop was conducted on November 4, 2003. Approximately 30 PCOs from 19 companies attended this workshop. The workshop was very well received by attendees. The Program is exploring IPM training/certification programs for landscape maintenance professionals. The trainings will be implemented in FY 07-08 and FY 08-09.
III.A.4 Require PCOs contracted for municipal applications to use pest control methods consistent with the municipality's IPM policy (through contract specifications). Specifically, municipalities will require contractors to: a) follow the agency's IPM policy, BMPs, and SOPs; b) provide evidence of current IPM training, when feasible; and c) provide documentation of pesticide use on agency property to the agency in a timely manner (PS#5).	Program Guidance Done	Guidance was completed in December 2001 as part of the Pest Management Performance Standard. Co-permittees are beginning or continuing to implement the guidance. The IPM workshop on March 20, 2002 included a section on contracting for IPM services from professional pest control businesses.
Monitoring Mechanism III.A.1. Document the number of PCOs receiving presentations and/or training and pesticide use by PCOs on municipal property.	Done/ Ongoing	Approximately 30 PCOs from 19 companies attended the Program's PCO workshop. Co-Permittees track their own trainings and report results in Annual Reports.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
III.B.1. Identify and work with PCO trade organizations to develop industry standards for BMPs to protect water quality, through participation in UPC and BASMAA.	Complete June 2006	Standards have been developed for IPM certification for structural pests as part of the PCO IPM Partnership project being implemented by the Bio Integral Research Center (BIRC). The first IPM Certification Workshop for PCOs was held on January 24, 2006.
IV. Commercial Businesses		
IV.A.1 Research reports and surveys of commercial business pesticide use and other stormwater programs' and POTWs' efforts to address this issue. Develop recommendations and a work plan (including an evaluation component) to provide outreach on less toxic pest control to target businesses in the South Bay, as appropriate and cost-effective.	Done/Ongoing	Program staff surveyed Co-permittees, BASMAA members, and Monterey County programs for IPM materials specific to restaurants. Very little IPM restaurant outreach material was found. Several programs reported using San Francisco's "Don't Set a Table for Pests" poster. In FY 02-03 County Health Inspectors began distributing this poster to restaurants during routine inspections. The poster was reprinted in FY 03-04. The number of posters distributed by County Health Inspectors is reported in the Annual Report each year.
IV.A.2. Develop and implement education programs that target commercial businesses, per recommendations from Action IV.A.1.	Ongoing	See Action Item IV.A.1.
Monitoring Mechanism IV.A.1. Document outreach efforts targeting businesses, as recommended in the work plan to be developed by the Program. Implement the evaluation component of the work plan.	Ongoing	The number of posters distributed and the number of businesses receiving them is documented and reported in the Annual Report each year.
V. Household Hazardous Waste Collection		
V.A.3 Work with HHW collection agencies to support, enhance, and help publicize programs for proper pesticide disposal (PS #7).	Ongoing	The Program is working closely with the HHW Program to publicize proper pesticide disposal. The Program's "Got Paint" advertising campaign focused on the proper disposal of paints, pesticides and other hazardous wastes.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
Monitoring Mechanism V.A.2. Document quantities of pesticide disposal at household hazardous waste collection facilities (only possible on a county-wide basis at present)	Ongoing	Reported in the Annual Report each year
VI. County Agricultural Commissioners		
VI.A.1 Keep County Agricultural Commissioners informed of Program goals and activities and regional water quality issues through periodic meetings.	Ongoing	County Agricultural commissioners were involved in the development and review of the pest management performance standards. Contact is ongoing.
VI.A.2 Involve County Agricultural Commissioners in education and outreach efforts targeting PCOs.	Done	Program staff worked with County Agricultural Commissioners for planning and conducting the PCO workshop.
Monitoring Mechanism VI.A.2 Document meetings with County Agricultural Commissioner and staff involvement in outreach efforts	Done	Program staff met with County Agricultural Commissioners to plan the PCO workshop. Workshop information was published in their newsletters. Outreach staff from the Ag. Commissioner's office made a presentation at the PCO workshop.
VII. New Development		
VII.A.1. Coordinate with municipal arborists or other relevant municipal staff to identify landscaping techniques less likely to attract pests, including a list of pest-resistant plants, and develop model conditions of approval for pest resistant landscaping features and practices.	Done	Program completed model conditions of approval, a landscape maintenance fact sheet, guidance on landscaping techniques for stormwater treatment, and a draft pest-resistant plant list. The plant list proved not to be a useful tool, as plant resistance depends highly on local planting conditions.
VII.A.2. Assist Co-permittees to consider pest-resistant landscaping and design features in the design, landscaping, and environmental reviews of proposed development projects.	Done	Model conditions of approval provided to Co-permittees, and a form developed to track projects for which education or conditions of approval were required.
VII.A.3. Assist Co-permittees to train staff responsible for design	Done	The topic was presented at the December 11, 2002 New

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
review on pest-resistant landscaping techniques and model conditions of approval (see Actions VII.A.1. and VII.A.2.) and the importance of minimizing pesticide use in runoff from development sites.		Development workshop.
VII.A.4. Develop and propose enhanced reporting format for documenting use of pesticide reduction measures at development sites.	Done	A section for documenting pesticide reduction measures required of project applicants is included in the Program's model data collection form for collecting other development project data prior to implementing C.3. (i.e., impervious surface area) and the Planning Procedures PS Reporting Form.
VIII. Monitoring and Science		
VIII.A.1. Continue financial support of the Regional Monitoring Program (RMP). Continue to actively participate in the RMP advisory and technical committees to focus RMP resources on 303(d) problem pollutants, including OP pesticides.	Ongoing	The Program annually contributes its share to the RMP. Program staff attends the RMP Technical Review Committee meetings and prepare meeting summaries for Management Committee.
VIII.A.2. Work with Water Board staff to refine the problem statement for the diazinon TMDL and determine data needs.	Ongoing	Program staff attends the Urban Pesticide Committee meetings, at which the diazinon TMDL has been discussed. Staff is also working on the TMDL with Water Board staff as part of the Clean Estuary Program (CEP).
VIII.A.3. Participate in a coordinated regional plan to collect data for the diazinon TMDL.	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX. Regional, State, and Federal Coordination		
IX.A.1. Support actions by the California Stormwater Quality Association (CASQA) Pesticide Work Group to comment on and assist with USEPA's pesticide risk assessments and to assist USEPA in development of a scope for a diazinon TMDL case study.	Ongoing; Case study TBD	The Program provides funding to the CASQA's consultant contract, which funded Geoff Brosseau and Kelly Moran's efforts to review risk assessments and provide comments on behalf of the CASQA member agencies. The EPA case study has not yet been planned or discussed.

Table 5-1, continued
Status of SCVURPPP Pesticide Management Plan Tasks

Action	Status	Notes
IX.A.2. Through participation in the UPC and CASQA, work with the U.S.EPA, the California Department of Pesticide Regulation, and the pesticide industry to eliminate uses of pesticides likely to enter surface water from those listed on product labels.*	Ongoing	Program staff regularly participates in the UPC and CASQA, and support efforts to eliminate uses of pesticides that cause risk to water quality.
IX.B.1. Participate in the activities of BASMAA, CASQA, and UPC, and communicate Program efforts.	Ongoing	Program staff regularly attends BASMAA, the CASQA and its Executive Committee, and the UPC and communicate Program efforts.
IX.B.2. Collaborate in technical studies to support TMDL development and implementation. (See Action VIII.A.3.)	Ongoing	The Program participates in and annually contributes to the CEP, which includes data collection for the diazinon TMDL.
IX.B.3. Continue to participate in the BASMAA Pesticide Work Group to evaluate implementation of and continuously improve the Pesticide Strategy and report on the results of the evaluation.	Task Eliminated	The BASMAA Pesticide Work Group is no longer active, as each municipal stormwater program has its own pesticide plan in place of the Pesticide Strategy.
X. Review and Revision of Work Plan		
X.A.1. Review and continuously improve the goals, actions, and monitoring mechanisms of the work plan considering results of self-evaluations, comments from Water Board staff and other interested parties, and results of local performance review meetings if any.	Ongoing (Annually)	The Pesticide Plan was revised twice in FY 01-02 based on comments from Water Board staff and interested parties (specifically RWQCB letters dated 8/15/01 and 12/21/01) and submitted to the RWQCB on October 15, 2001 and March 1, 2002, respectively. The Plan will continue to be evaluated and improved each year.

SECTION 6

MERCURY POLLUTION PREVENTION WORK PLAN

6. MERCURY POLLUTION PREVENTION WORK PLAN

INTRODUCTION

The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Water Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires the Program to develop and implement a mercury pollution prevention plan. The Program developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with the permit provisions. The Mercury Plan was submitted to the Water Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan. This section of the FY 07-08 Work Plan summarizes Mercury Plan tasks completed during FY 06-07 and describes the tasks that will be developed, continued, or completed during FY 07-08.

SUMMARY OF MERCURY POLLUTION PREVENTION PLAN

The Mercury Plan is based on the premise that a Bay area-wide approach (and coordination) in addressing mercury pollution prevention will be most successful. For this reason, many of the actions identified in the Plan are for Program-level participation in regional efforts. These efforts are supplemented by countywide and local efforts.

The Mercury Pollution Prevention Plan addresses five general goals:

I. **Municipal Use of Mercury-Containing Products** – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

II. **Household Hazardous Waste Collection** – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

III. **Monitoring and Science** – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

IV. **Regional, State, and Federal Coordination** – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

V. **Public Education and Outreach** –Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

The Mercury Plan identifies actions that will be implemented at the Program level, municipality level, or both, as well as the schedule for initiation and/or completion of Program-level actions. The details of municipality actions and schedules are included in the individual Co-permittee Work Plans and/or Annual Reports, as appropriate.

STATUS OF FY 06-07 MERCURY POLLUTION PREVENTION ACTIVITIES

The status of Program tasks in the Mercury Plan is presented in Table 6-1. Highlights of Program accomplishments during FY 06-07, as developed and/or implemented by the Mercury Pollution Prevention Outreach Work Group, Program staff and municipalities are provided below.

Monitoring and Science

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is serving as the stakeholder forum for the development of the Guadalupe River TMDL Report. The Guadalupe River Watershed encompasses parts of San Jose, Los Gatos, Campbell, Monte Sereno and Santa Clara. SCVURPPP is a stakeholder in the Guadalupe River TMDL process. The Santa Clara Valley Water District (SCVWD) is taking a lead role in the TMDL development process by solely funding a $900,000 study and as Co-Chair of the TMDL Work Group and Stakeholder Group. Program staff is also participating in the TMDL process.

Water Board staff produced the Guadalupe River Watershed Mercury TMDL Project Report (January 2006). Program staff, along with other Co-permittee staff, have reviewed the report and attended work group meetings to discuss the draft report and implementation plan.

The Program continued to provide financial support to the Regional Monitoring Program for Water Quality (RMP), including the Mercury Deposition Network Pilot Study funded by the City of San Jose. In addition, Program and Co-permittee staffs actively participate in RMP Technical Review Committee (TRC) and Steering Committee (SC) meetings and provide meeting summaries to the Management Committee. Staff reviewed available reports and provided comments on the proposed 2007 RMP Draft Monitoring Plan.

A Memorandum of Understanding (MOU) regarding development of a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries was entered into by the Water Board, Bay Area Clean Water Agencies (BACWA), and Bay Area Stormwater Management Agencies Association (BASMAA) on August 6, 2001, and includes the development of TMDLs for 303(d) pollutants including mercury. This group is referred to as the Clean Estuary Partnership (CEP). As a member agency of BASMAA, the Program is involved in the development and funding of potential projects for the San Francisco Bay mercury TMDL (mercury TMDL). Program staff has been participating in the CEP technical committee meetings, CEP Board meetings (as needed) and CEP Mercury Risk Reduction Work Group.

In addition, Program staff is tracking the results of the “historic” meeting between the State Air Resources Board and State Water Quality Control Board in February 2006. During the meeting, the idea of cross media (water and air) coordination in the investigation of the aerial deposition of pollutants from air to land was discussed. Once deposited on land, pollutants can enter water bodies through stormwater runoff. The priorities of future work groups will be to identify an inventory of the original sources of various pollutants and develop an action plan to address those pollutants at the source. Future Water Board-Air Board meetings are anticipated.

Guidelines for Reduction and Management of Mercury-Containing Products

During FY 02-03, the Mercury P2 Plan AHTG and Program staff developed guidelines for the reduction and management of mercury-containing products identified for virtual elimination.

The goals of the *Guidelines for Mercury-Containing Products Reduction and Management* are to work towards the virtual elimination of mercury from controllable sources that may affect urban runoff due to agency operations; and establish proper recycling and disposal methods for products that cannot be eliminated due to technological, safety or economic factors. Co-permittees continued implementing the *Guidelines for Mercury-Containing Products Reduction and Management* in FY06-07.

Mercury Pollution Prevention Outreach Workgroup

In December 2002, Program staff established a new Work Group called the Mercury Pollution Prevention Outreach Work Group. This Work Group is implementing the Public Education and Outreach element of the Mercury Plan by organizing a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products.

Santa Clara County Household Hazardous Program (CoHHW Program) staff completed implementing (with SCVURPPP) the outreach requirements of a $300,000, three-year California Integrated Waste Management Board (CIWMB) grant, specifically the store partnership program for collecting spent fluorescent lamps. The Program also completed the FY05-06 Work Plan tasks to develop signage materials and conduct media advertising.

NEXT STEPS FOR MERCURY PLAN IN FY 07-08

During FY 07-08, the Program will continue to implement ongoing Mercury Pollution Prevention Plan activities. A summary of Mercury Plan tasks that will be implemented during FY 07-08 include:

- Guidelines for Reduction and Management of Mercury-Containing Products: Co-permittees will continue implementing the Program's guidelines for reduction and management of mercury-containing products identified for virtual elimination, and report annually on the effectiveness of implementation of the guidelines. Some criteria used for evaluating effectiveness include:
  - Development of a Mercury Virtual Elimination Policy or Ordinance;
  - Measures implemented for reducing and disposing mercury containing products;
  - Training provided to municipal staff on use and disposal of these products; and
  - Coordination with Household Hazardous Waste (HHW) collection agencies to support, and help publicize programs for proper mercury-containing product recycling.

- Mercury Pollution Prevention Outreach: As municipal budgets/resources permit, outreach on the negative health and environmental impacts of mercury and the methods available for properly disposing of FLTs to residents and small businesses will continue. The three Co-permittees with industrial wastewater inspection programs (San Jose, Sunnyvale and Palo Alto) will continue to integrate mercury outreach for industrial businesses into their existing pretreatment, source control, and/or hazardous materials inspection programs. The mercury outreach articles designed for the worldwide web and local agency newsletters will continue to be made accessible to the public and updated appropriately. In addition, the Program will continue to conduct outreach to promote the CoHHW Program's store partnership program; specifically the used fluorescent lamp drop off locations. Outreach may be conducted using

media advertising, in-store displays (posters, banners) and newsletter articles. The Program may also coordinate its outreach activities with other Regional groups/programs that are planning to conduct mercury outreach in FY 07-08.

- Coordination efforts with regional organizations (Clean Estuary Partnership TMDL): Program staff will continue to attend CEP TMDL meetings, Guadalupe Watershed Mercury TMDL Workgroup and Stakeholder meetings, and Regional Monitoring Program for Water Quality (RMP) Steering Committee and Technical Review Committee meetings. Program staff will continue to monitor the progress of the Air Board-Water Board meetings. In addition, Program staff will continue to work with BASMAA and the Water Board to address urban stormwater runoff actions included in the mercury TMDL.

- Monitoring and Science: Planned FY 07-08 monitoring and science activities relating to mercury are discussed in Section 4 (i.e., resources to CEP and RMP).

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

I. Municipal Use of Mercury-Containing Products **Goal I.** Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated. **Actions –**	SCVURPPP	Municipality	Completion Date
I.F. Implement guidelines developed under Action I.E.	N	X	**On-going –** Co-permittees began implementation in FY 03-04. See individual Co-permittee annual reports for local program activities.
Monitoring Mechanism I. Document completion of tasks in annual reports. Use mercury-containing product reporting guidelines (to be developed under Action I.E).	A	X	Annually (beginning in FY 02- 03 Annual Report)

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
II.B. Provide mercury-containing products disposal services for residents and small businesses.	X	X	**Ongoing -** Disposal services are provided by the County HHW Program, Palo Alto Regional Water Pollution Control Plant and the Sunnyvale Materials Recovery and Transfer (SMaRT®) Station.
II.C. Develop guidelines for documenting and reporting quantities of mercury containing products disposed of by city.	X	A	**Ongoing** – Co-permittees began implementation in FY 02-03
II.D. Implement guidelines developed under Action II.C.	X	X	**Ongoing –** Co-permittees began implementation in FY03-04
II.F. Work with HHW collection agencies to develop and help publicize fluorescent light recycling program.[1]	X	X	**Completed/Ongoing –** Began effort in FY 02-03. The Mercury Pollution Prevention Outreach Work Group collaborated with the Santa Clara County HHW Program on a two-year,

[1] Action II.F may be conducted in conjunction with Public Education and Outreach Actions (see Section V of this Work Plan). Completion date for Action II.F is contingent upon award of a Prop 13 Program grant.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

II. Household Hazardous Waste Collection **Goal II.** Provide mercury-containing products disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs. **Actions –**	SCVURPPP	Municipality	Completion Date
			two-phase fluorescent light tube (FLT) recycling campaign. The first phase of the campaign, which was developed in FY 02-03, targeted residents. The second phase, which began in FY 03-04, targeted small businesses. The main objective of both phases is to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs. In subsequent years, the Program continued to conduct outreach to promote used fluorescent bulb drop off locations (local hardware stores) provided by the County HHW Program. This outreach effort will continue in FY 07-08.
Monitoring Mechanism II.A. Evaluate whether household hazardous waste collection programs adequately serve residents and businesses.	X	N	**Completed/Ongoing** – Survey results indicate an increase in HHW facility use for mercury products (48% first time users). There were no problems with facility capacity. This issue is important to stormwater and wastewater pollution prevention activities. BACWA began ongoing discussions (2004) with a HHW Information Exchange group on regional campaigns directing new pollutant-containing products to HHW facilities versus HHW facilities' staffing, capacity and budget issues. In FY 05-06, the CoHHW Program collected 277,000 feet of spent fluorescent lamps at participating hardware stores.
Monitoring Mechanism II.B. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis (see Action II.C).	X	N	Annually (beginning in FY 03-04 Annual Report)

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

III. Monitoring and Science **Goal III.** Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment. **Actions –**	SCVURPPP	Municipality	Completion Date
III.A. Continue financial support of the Regional Monitoring Program (RMP), including the Mercury Deposition Network Pilot Study. Continue to actively participate in the RMP steering committee and technical review committee.	X	A	**Ongoing** – Program and Co-permittee staff actively participated in RMP TRC and SC meetings and provided meeting summaries to Management Committee. Staff reviews available reports and provide comments. Program and Co-permittee staff is actively involved with the CEP technical and management committees; review proposed Work Plans and study scopes; and participates in the CEP Mercury Work Group.
• The City of San Jose will continue to provide in-kind services for the maintenance of the Mercury Deposition Network site near San Jose.	N	O[2]	**Ongoing** (through 2006).
III.B. Provide financial and staff support for a coordinated regional plan to collect data for the mercury TMDL, as defined in the CEP MOU.	X	A	**Ongoing** (Program participation in the CEP)
III.D. Develop and implement a five-year program of monitoring efforts.	X	N	**Completed**- Draft completed March 2002; implementation began July 2002.
Monitoring Mechanism III. Submit monitoring data and reports to the Regional Water Quality Control Board and other interested parties (such as USEPA). Review monitoring data and reports and develop follow-up recommendations.	X	N	Ongoing, when available.

[2] Participation in this action by municipalities is limited to the City of San Jose.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

IV. Regional, State, and Federal Coordination **Goal IV.** Actively participate in regional, state, and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions. **Actions –**	SCVURPPP	Municipality	Completion Date
IV.A. Participate in the activities of the Bay Area Stormwater Management Agencies Association, the California Storm Water Quality Task Force, and the San Francisco Estuary Institute and communicate Program efforts.	X	N	**Ongoing** – Program staff continue to attend BASMAA, CASQA and SFEI RMP meetings.
IV.B. Collaborate in technical studies to support TMDL development and implementation including the Santa Clara Basin WMI Guadalupe River Mercury TMDL Workgroup.	X	O[3]	**Ongoing** – Program and Co-permittee staffs actively participate in the Guadalupe Watershed Mercury TMDL Work Group and Stakeholder group.
IV.D. Support, participate in and advocate increased regional collaboration with the RWQCB and the Bay Area Air Quality Management District (BAAQMD).	X	N	**Ongoing** – The Program will support the RWQCB in collaborating with the BAAQMD but will not directly work with the BAAQMD. The Program supports the RWQCB through participation in the CEP. Mercury air deposition is being addressed regionally. The first Air Board-Water Board meeting was held in February 2006.
IV.F. Support and track the progress of the U.S. Department of Energy (DOE) Office of Building Technology's Vision 2020 Lighting Technology Roadmap.[4]	X	N	**Ongoing**--DOE's Building Technologies Program continues to move forward on their Vision 2020 Roadmap. Progress includes seven strategies to address the challenges of transforming the lighting marketplace and developing new technologies that enhance lighting quality, efficiency and cost effectiveness.
Monitoring Mechanism IV. Document participation of Program staff in collaborative efforts and progress of these efforts.	X	N	Annually (beginning in FY 02-03 Annual Report)

[3] The City of San Jose and the Santa Clara Valley Water District are participating in the development of the Guadalupe River Mercury TMDL.

[4] DOE's Vision 2020 Lighting Technology Roadmap includes the following as one of its goals for the year 2020, "Highly efficient, reduced-mercury fluorescent sources will come to market." Sustainable Conservation's September 27, 2000 report entitled "Reducing Mercury Releases From Fluorescent Lamps: Analysis of Voluntary Approaches," concluded that " we do not believe that starting a new collaborative approach with manufacturers to create mercury-free fluorescent lamps is the most effective use of resources at this time." Instead, Sustainable Conservation recommends focusing on voluntary recycling of mercury-containing lamps.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
V.A. Develop various outreach programs to educate target audiences about proper disposal of mercury-containing products and alternative non-mercury containing products. Outreach programs will include, but may not be limited to, the following:	X	A	**Completed/Ongoing**[5] **–** In FY 06-07, the Mercury Pollution Prevention Outreach Work Group continued its mercury pollution prevention outreach.
• Develop and begin to implement a fluorescent light recycling outreach program to educate residential users and encourage proper disposal of fluorescent lights.	X	A	**Completed/Ongoing**[5] **–** In FY 02-03, the Work Group formed and developed a Work Plan. Phase I of the two-year, two-phase Work Plan, focused on residential outreach. Phase I outreach began in Spring 2003 and has been implemented each year since then.
• Develop and begin to implement a fluorescent light recycling outreach program to educate small businesses and conditionally exempt small quantity generators and encourage proper disposal of fluorescent lights. (For example, the small business outreach program might include coordination with local chapters of the Building Owners and Managers Association [BOMA] or the National Association of Industrial and Office Properties [NAIOP].)	X	A	**Completed/Ongoing**[5] **–** In FY 03-04, the Work Group implemented Phase II of the two-year, two-phase Work Plan. Phase II outreach efforts were focused on small businesses and CESQGs. Additional annual coordination has been continuing, as appropriate.
• Coordinate with municipal inspectors to integrate mercury outreach to industrial businesses into their existing routine pretreatment, source control, and/or hazardous materials inspection processes.	A	X	**Completed --** Co-permittees began coordination efforts with municipal inspectors in FY 03-04.
V.B. Develop or adapt existing mercury outreach materials, as needed, for outreach programs.	X	A	**Completed/Ongoing**[5] **–** Development of materials began in FY 02-03, as part of outreach Work Plan for Action V.A. To date, the following outreach pieces have been developed by the Outreach Work Group – fact sheets, newsletter articles, press release, video public

[5] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			service announcement, newspaper ads, radio ads, transit ad, and in-store signage. All outreach pieces aim to show the negative health and environmental impacts of mercury and the methods available to the public for the proper disposal of FLTs. (See also Action II.F.).
V.C. Attend community events and distribute outreach materials.	X	X	**Completed/Ongoing**[5] **–** Distribution of outreach materials as part of outreach Work Plan for Action V.A.
Monitoring Mechanism V.A. Document quantities of mercury-containing products disposed at household hazardous waste collection facilities on a county-wide basis. (See Monitoring Mechanism II.B.)	X	N	Annually (beginning FY 02-03)
Monitoring Mechanism V.B. In the Annual Report, document and evaluate each outreach activity, including the target audience and number of residents and/or businesses reached.	X	X	Annually (beginning FY 02-03)
Monitoring Mechanism V.C. Survey local public attitudes and behavior to evaluate the success of outreach efforts and the saturation of outreach messages (coordinate survey with Watershed Watch Campaign Survey).	X	A	**Completed** - A Countywide survey was conducted in September 2003 to evaluate the success of the Program's Watershed Watch Campaign. In FY 02-03, survey cards were developed for evaluating the success of the Program's mercury outreach media campaign. People who brought in mercury containing wastes to Santa Clara County Household Hazardous Waste disposal events from April – June 2003 were requested to fill out surveys. The survey results were included in the FY 02-03 Annual Report. Survey results showed that: • 48.0% of the users bringing in mercury containing wastes to the HHW event were first time users of the facility. • 86.4% of the people indicated that they were bringing in fluorescent

[5] These tasks were marked both Completed and Ongoing because while the specific public education and outreach task was completed, outreach is an ongoing activity. Articles will continue to be posted and updated, as needed, and as resources allow, the Program will continue to assist the CoHHW with public outreach activities.

Table 6-1
Status of Mercury Pollution Prevention Plan Tasks

V. Public Education and Outreach **Goal V.** Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives. Target audiences include residential, commercial, and industrial users and municipal employees. **Actions** –	SCVURPPP	Municipality	Completion Date
			lamps for the first time. • 17.3% of the people indicated that they had read about safe disposal of mercury containing wastes in the San Jose Mercury News, 5.3% had heard about this on the radio and 1.4% had found out about it from the Watershed Watch website. Others indicated that they had found out about it from utility bill inserts, garbage companies, flyers, city publications, friends and relatives, internet etc. A similar survey will be conducted in FY 06-07.

Legend:

"X" = will implement at this level (SCVURPPP or municipality)
"N" = not being implemented at this level
"A" = assist with or develop guidance for implementation
"R" = coordinate with regional effort
"O" = optional
"FY" = fiscal year
"TBD" = to be decided

SECTION 7

NEW AND REDEVELOPMENT WORK PLAN

7. FY 07-08 NEW AND REDEVELOPMENT (C.3.) WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 07-08 to continue to assist Co-permittees to control the impacts of development on stormwater quality and flow through the development project planning, review and approval process.

BACKGROUND

On October 17, 2001, the Water Board adopted Order 01-119 which amended the Program's Permit Provision C.3. (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharges from new or redevelopment sites that may increase erosion in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

The Program and Co-permittees submitted work plans for implementing all C.3. requirements to the Water Board on March 1, 2002 (as part of the Program's *FY 02-03 Work Plan*, Volume II). These included the Program's "Guidance for Work Plan Tasks Related to Implementation of Permit Provision C.3." (referred to herein as C.3. Work Plan Guidance) which identifies proposed actions to meet the requirements of Provision C.3. and whether the actions will be implemented at the Program level, Co-permittee level or both. Most of the tasks in the C.3 Work Plan Guidance were completed by the end of FY 04-05. Additional implementation-phase tasks identified by the C3 Provision Oversight (C3PO) Ad Hoc Task Group and the Management Committee for FY 07-08 and ongoing support tasks are the basis of this work plan section.

Since the October 17, 2001 adoption by the Water Board of Order 01-119, there have been several changes to the requirements of Provision C.3. The first change, authorized by the Water Board Executive Officer, was an extension of three of the permit deadlines, as shown below, in order to be consistent with other Bay Area stormwater permits adopted subsequent to SCVURPPP Order 01-119[1].

[1] Letter to Beau Goldie, SCVURPPP Management Committee Chair, from Loretta Barsamian, Executive Officer, San Francisco Bay Regional Water Quality Control Board, re: Extension of Specified Deadlines in Order 01-119, May 12, 2003.

Provision	Activity	Original Deadline	New Deadline
C.3.c.i.	Require stormwater treatment BMPs at Group 1 Projects	July 15, 2003	October 15, 2003
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects in addition to Group 1 Projects	October 15, 2004	April 15, 2005
C.3.f.	Submit HMP for Regional Board approval	October 15, 2003	January 15, 2004

The second change relates to the definition of Group 2 projects. The Program requested Water Board approval of an Alternative Group 2 Project Definition, as allowed under Provision C.3.c.iii. of the Program's permit (Order No. 01-119). In a letter dated September 22, 2003, the Program proposed an Alternative Group 2 Project Definition that would make its Provision C.3. project size requirements consistent with the other Bay Area stormwater permit requirements (i.e., minimum project size of 10,000 square feet of impervious surface). At the Water Board's October 15, 2003, meeting, the Water Board authorized the Executive Officer to approve the Program's proposal.

The third change relates to the implementation date for Group 2 projects. Order R2-2005-0035, adopted July 20, 2005, contains revisions to Order 01-119 that recognize two types of Group 2 projects and extends the implementation dates for both. Group 2A includes projects that are more likely to contribute pollutants to stormwater (e.g., gas stations, auto wrecking yards, loading docks) and parking lots with 10,000 square feet or more of impervious surface. Group 2B includes all other Group 2 projects. The Group 2A implementation date was effective on October 20, 2005. The Group 2B implementation date was extended to August 15, 2006 to be consistent with other Bay area permits. In addition, Order R2-2005-0035 incorporated key provisions of the Program's *Hydromodification Management Plan Report* (April 2005) into the SCVURPPP permit.

A summary of the subsequent changes in permit deadlines resulting from the adoption of Order R2-2005-0035 is presented below:

Provision	Activity	Previous Deadline	New Deadline
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects: • Group 2A (special land use categories) • Group 2B	April 15, 2005	 October 20, 2005 August 15, 2006
C.3.f.	Implement HMP Key Provisions	Following Water Board approval	October 20, 2005

PAST AND CURRENT ACTIVITIES TO IMPLEMENT C.3.

Section 8 of the Program's *FY 05-06 Annual Report* described the progress of the Program (up to September 15, 2006) in completing Program tasks in the C.3 Work Plan and assisting Co-permittees to prepare for implementation of the C.3. requirements. With all of the preparation tasks completed, Co-permittees are now focusing on the implementation of C.3. requirements for Group 1 and Group 2 projects (i.e., those creating or replacing 10,000 square feet or more of impervious surface). The Program has continued to hold meetings of the C.3. Provision Oversight Ad Hoc Task Group (C3PO AHTG) to keep Co-permittees updated on current issues and promote exchange of ideas on and experience with C.3. implementation.

The Program also completed its Hydromodification Management Plan (HMP) in April 2005, and submitted it to the Water Board on May 4, 2005. Key provisions of the HMP were adopted by the Water Board on July 20, 2005 (as described above), and Co-permittees began implementation on October 20, 2005. Chapter 7 of the HMP Report identifies a number of action items that Program and Co-permittee staff will complete to address remaining HMP implementation issues. These action items and other related tasks are listed with anticipated start and completion dates within Attachment 7-1, "SCVURPPP HMP - Summary of Next Steps" (revised September 15, 2006). An internal HMP Instream Work Group, consisting of City of San Jose, Santa Clara Valley Water District and Program staff, has been meeting to discuss and work toward implementation of the tasks related to instream control measures for hydromodification.

To make it easier for developers to design flow control facilities to comply with the HMP, the Program is developing an automated modeling and flow control facility sizing tool called the Bay Area Hydrology Model (BAHM), in collaboration with several other Bay Area stormwater programs. Development of the regional portion of the model has been completed, and calibration of the tool to specific watersheds within the Santa Clara Valley is in progress and will be completed by March 2007.

Since the fall 2005, Program staff has been involved with Water Board staff and environmental NGO representatives in a process to develop a Municipal Regional Permit (MRP) for the Bay-area Phase 1 municipal stormwater programs. A Program staff person served on the New Development Work Group and assisted the group in establishing the current baseline activities conducted by municipal agencies and developing a list of options for the future permit. Initial drafts of the MRP included a number of changes to the C.3. Provision requirements. Work on the Municipal Regional Permit is expected to continue through FY 06-07 and into the beginning of FY 07-08.

FY 07-08 C.3. IMPLEMENTATION TASKS

General C.3. Tasks

Table 7-1 presents the list of tasks from the C.3. Work Plan and other tasks that will be implemented in FY 07-08. Most of the tasks in the original multi-year C.3. Work Plan have been completed, except for ongoing reporting and implementation assistance. Tasks in FY 06-07 focused on continuing assistance with implementation of the current permit provisions. Tasks in FY 07-08 will also provide continuing assistance with current provisions, as well as guidance on implementation of any changes made in the MRP, assuming it will be completed near the beginning of the fiscal year.

Anticipated needs for implementation assistance in FY 07-08 include:

- Continued assistance with SCVURPPP agencies' implementation of BMP O&M verification programs and the Program-wide database;
- Continuing regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA New Development Committee);
- Guidance on implementing changes to Provision C.3. in the MRP, and updates to the C.3. Handbook to reflect those changes;
- Continued development of model standards and specifications for certain BMPs;
- Continued assistance with the C3PO AHTG meetings and action items;
- Workshop on C.3. implementation, with the topic to be determined by the C3PO AHTG;
- Continued guidance and assistance with annual reporting of C.3. information.

HMP Tasks

The focus in FY 07-08 will be continue to be on assistance to the local agencies and the development community with outreach and implementation, and guidance on any changes that are required by the MRP. Anticipated tasks for FY 07-08 include the following:

- Provide guidance on any changes to HMP requirements in the MRP, and update the HMP and C.3. Stormwater Handbook to reflect these changes;
- Continue to assist with the HMP Implementation Phase (HIP) Work Group meetings and action items
- Continue to meet with the HMP Instream Measures Work Group and work toward progress on HMP "next steps" (Attachment 7-1);
- Continue data collection on HMP implementation at small sites and plan to re-evaluate the small site size threshold after two years of implementation (HMP Next Steps Task 9 – may be superseded by changes to the permit);
- Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation);
- Continue to provide guidance and conduct trainings on the Bay Area Hydrology Model (BAHM); and
- Conduct one workshop on HMP implementation.

ATTACHMENTS

Attachment 7-1 SCVURPPP HMP - Summary of Next Steps (revised March 1, 2007)

Table 7-1
Schedule and Deliverables for FY 07-08 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Schedule	Deliverables
C.3.c. Requirements for Group 1 and Group 2 Projects		
All C.3. Work Plan tasks completed. Other tasks:		
• Promote/facilitate regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience;	Ongoing	• Regional meetings and summaries
• Prepare guidance on implementing changes to Provision C.3. in the Regional Permit, and updates to the C.3. Handbook to reflect those changes;	TBD, pending adoption of MRP	• C.3. Handbook updates
• Continue development of model standards and specifications for certain BMPs;	6/08	• Model standards and specifications
• Continue assistance with the C3PO AHTG meetings and action items;	Ongoing	• C3PO AHTG meetings and summaries
• Conduct one workshop on a C.3-related topic (to be determined).	6/08	• Workshop
C.3.e. Operation and Maintenance of Treatment BMPs		
e.1. Assist Co-permittees to report on treatment BMP O&M verification program in each annual report, including organizational structure, evaluation of effectiveness, and planned improvement to the program.	Ongoing - FY 06-07 Annual Report and future ARs	• Guidance on Annual Report preparation
Other Tasks:		
• Continue assistance with SCVURPPP agencies' implementation of BMP O&M verification programs and the Program-wide database.	Ongoing	• Updated Program-wide database

Table 7-1, continued
Schedule and Deliverables for FY 07-08 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Schedule	Deliverables
C.3.f. Hydromodification Management Plan		
f.2. Develop guidance to the Co-permittees on implementation of the HMP as part of requirements for Group 1 projects that may cause increased erosion or other related impacts (See also Attachment 7-1).		
• Provide guidance on any changes to HMP requirements in the Regional Permit, and update the HMP and C.3. Stormwater Handbook to reflect these changes;	TBD, pending adoption of MRP	• Updates to C.3. Handbook
• Conduct one workshop on HMP implementation and hydromodification control measures;	6/08	• Workshop and handouts
• Continue to provide guidance and conduct trainings on the Bay Area Hydrology Model (BAHM);	6/08	• BAHM guidance/handouts
• Continue to assist with the HMP Implementation Phase (HIP) Work Group meetings and action items	Ongoing	• Work Group meeting notes
• Continue to meet with the HMP Instream Measures Work Group and work toward progress on HMP "next steps" (Attachment 7-1)	Ongoing	• Work Group meeting notes
f.3. Continue implementation of HMP requirements for Group 1 projects that may cause increased erosion or other related impacts.	FY 07-08	• Program to assist Co-permittees with questions about implementation
• Continue to collect data on HMP implementation at small sites and plan to re-evaluate the small site size threshold after two years of implementation (HMP Next Steps Task 9 – may be superseded by changes to the permit);	9/08	• Data collection and analysis provided in FY 07-08 Annual Report
• Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation);	9/08	• Monitoring results provided in FY 07-08 Annual Report

Table 7-1, continued
Schedule and Deliverables for FY 07-08 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan		Schedule	Deliverables
C.3.g. Waiver and Compensatory Mitigation Program			
g.3.	Assist Co-permittees to track and report information on alternative compliance, including project name, location, type, percent impervious surface, reasons for impracticability, and the alternative benefit project and completion date.	Ongoing - FY 06-07 Annual Report and future ARs	• Guidance on Annual Report preparation
C.3.j. Site Design Measures Guidance and Standards Development			
j.2.	Assist Co-permittees to prepare and submit reports summarizing the status of review, revision, and implementation of local site design guidance and standards, as part of their annual reports.	Ongoing - FY 06-07 Annual Report and future ARs	• Guidance on Annual Report preparation
C.3.n. Reporting Requirements			
n.1.	Provide information described in Table 1 of Provision C.3. in annual reports (and any additional information required by the MRP)	Ongoing - FY 06-07 Annual Report and future ARs	• Guidance on Annual Report preparation
n.2.	Assist Co-permittees to collect information and report a summary of types of pesticide reduction measures required for development projects, and the percentage of projects for which pesticide reduction measures were required.	Ongoing - FY 06-07 Annual Report and future ARs	• Guidance on Annual Report preparation

Attachment 7-1
SCVURPPP HMP - Summary of Next Steps
(Revised March 1, 2007)

Task[1]	Anticipated Completion Date[2]	Status
1. Develop the following: a. a funding mechanism[3] such that projects can utilize in-stream control options b. a methodology for determining developer contributions based on the stream changes expected to result from changes in project runoff conditions.	6/07 6/07	**In Progress** - District, San Jose, and Program staff have formed a HMP Instream Work Group, and the group has met several times to review funding mechanisms and approaches for identifying and funding instream projects.
2. Work with City/County planning and public works departments and the Water District to determine the timing and method of notifying District staff during the development review process about HMP projects that may need in-stream controls, in a manner that does not unreasonably prolong the review process. Further, look at ways to improve method to provide early communication on Group 1 project reporting.	6/07	**In Progress** – Some Co-permittees already have a process for involving District staff in development project review. SCVURPPP staff will document current practices and develop guidance for other Co-permittees, in consultation with District staff.
3. Facilitate review of District's MDL analysis, both by the Co-permittees and the Expert Panel, and work with the Management Committee to determine the need to integrate some or all of the MDL analyses into implementation of the HMP.	6/07	**In Progress** – The MC authorized budget for review by a member of the Expert Panel and arrangements for the review will be made. The MDL approach is being considered by the HMP Instream Work Group.
4. Conduct additional studies of implementation of site design, integrated management practices, and/or basins at example development sites in Santa Clara Valley.	6/08	**In Progress** – The Program recently contracted with GeoSyntec Consultants to conduct studies comparing flow basin sizing using the HEC-HMS and HSPF models, in order to provide guidance on model use and sizing procedures and to assist development of the BAHM. This work will be completed in March 2007. Additional studies will be conducted in FY 07-08.

[1] Tasks are from Chapter 7 of April 2005 HMP Report. *Tasks in italics have been added.*

[2] All dates depend on availability of resources and cooperation/collaboration of numerous staff from different agencies and may change because of circumstances beyond the control of the Program. The Program periodically updates the Management Committee regarding schedule changes and will transmit updates schedules to Water Board staff.

[3] The intent is to describe a mechanism agreeable to Co-permittees and next steps for implementation.

Attachment 7-1
SCVURPPP HMP - Summary of Next Steps (continued)
(Revised March 1, 2007)

Task[1]	Anticipated Completion Date[2]	Status
Bay Area Hydrology Model (BAHM) Development Project – Regional Model, Local Calibration, Training	3/07	**In Progress** – The Program participated in the development of the regional component of the BAHM by Clear Creek Solutions (CCS), which is near completion. The Program also contracted with CCS to perform local calibration of the model to two watersheds. Local calibration is anticipated to be completed by March 2007. Training workshops on the BAHM were conducted in November 2006. The BAHM will include the ability to model common site design and treatment control measures and quantify the reduction in flow duration due to these measures.
5. During implementation of the HMP, obtain feedback/suggestions for further refinement and implementation guidance	As needed/ Ongoing	**In Progress** – The HMP Implementation Phase Work Group (HIP) has been meeting on a regular basis, and has been an effective forum to share experience with HMP implementation and obtain suggestions for additional HMP guidance. Members of the development community have also attended these meetings. Program staff have had the opportunity to review several conceptual design submittals to meet HMP requirements for projects in San Jose and discussed these with the work group.

Attachment 7-1
SCVURPPP HMP - Summary of Next Steps (continued)
(Revised March 1, 2007)

Task[1]	Anticipated Completion Date[2]	Status
6. Coordinate with other Bay Area stormwater programs to work toward a consistent approach for the Bay Area (via participation in development of the Municipal Regional Permit (MRP).	Ongoing until completion of MRP	**In Progress** – Program and San Jose staff have attended several meetings with other Bay Area stormwater program representatives and Water Board staff to discuss strategies for implementation of the HMP and differences between program approaches. Program staff also served on the MRP New Development Work Group and discussed the need for a consistent approach in the MRP. Since that time, the Contra Costa HMP was adopted by the Water Board on July 12, 2006, and that HMP contains different provisions than the SCVURPPP HMP. Program staff will continue to work with other Bay Area programs and Water Board staff until the MRP is completed to resolve these differences.
7. Coordinate additional Co-permittee, Bay Area stormwater program, and Water Board staff review process and progress meetings, including: a. The development of a schedule for Bay Area-wide HMP implementation in the upcoming Municipal Regional Permit. *b. Public outreach – HMP updates, workshop* *c. HMP Work Group Meetings*	6/07 Ongoing Ongoing	**Completed/Ongoing** – a.) Done -- HMPs are being adopted individually. SCVURPPP HMP amendment will be part of the MRP, expected to be adopted in Summer 2007. b.) The Program has completed: 1) a HMP fact sheet for training Co-permittee staff and outreach to the development community; 2) an update to Chapter V of the *C.3. Stormwater Handbook* that includes the key provisions of the HMP and implementation guidance; 3) three "HMP 101" workshops for Co-permittee staff that covered the basic principles of hydromodification; 4) two BAHM trainings. c) There have been seven meetings of the HIP Work Group since FY 05-06.
8. Collect data on the implementation of the HMP at small sites for a period of two years after the start of implementation, and plan to re-evaluate the small site size threshold and approach at that time. *Conduct and document reevaluation.*	9/08 (FY 07-08 AR)	FY 06-07: Define and start data collection process FY 07-08: Continue data collection

Attachment 7-1
SCVURPPP HMP - Summary of Next Steps (continued)
(Revised March 1, 2007)

Task[4]	Anticipated Completion Date[5]	Status
9. Make additional refinements per: 1) lessons learned from implementation efforts based on the draft HMP; 2) the need for consistency with HMPs being developed by other Bay Area stormwater programs; and 3) development community, Co-permittee, and Water Board feedback.	Report in ARs beginning with FY 06-07 AR	**In Progress** – See Task 5. Additional refinements will be made pending completion of the BAHM, adoption of the MRP, and continuing input from Co-permittee staff and developers.

[4] Tasks are from Chapter 7 of April 2005 HMP Report. *Tasks in italics have been added.*

[5] All dates depend on availability of resources and cooperation/collaboration of numerous staff from different agencies and may change because of circumstances beyond the control of the Program. The Program periodically updates the Management Committee regarding schedule changes and will transmit updates schedules to Water Board staff.

SECTION 8

FINAL BUDGET REPORT: FISCAL YEAR 2007-2008

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 2007-2008 Work Plan

SCVURPPP budget distributed to BATG and MC on December 21, 2006
Revised and re-distributed on January 17, 2007
Approved by the Management Committee on January 18, 2007

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Final Budget Report:

Fiscal Year 2007-2008

Approved
January 18, 2007

SCVURPPP budget distributed to BATG and MC on December 21, 2006
Revised and re-distributed on January 17, 2007
Approved by the Management Committee on January 18, 2007

Final Budget Report for FY 07-08

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TOTAL PROGRAM FY 07-08 BUDGET
Background Information

OPERATIONAL GROUP

A summary of the tasks to be performed by the Program Manager (EOA), based on the Program Manager's current contract with the SCVURPPP Contract/Fiscal Agent (City of Sunnyvale on behalf of the SCVURPPP), is provided in Items (1.), (2.), and (3.) below. The overall program budget is included in Table 1. The resource requirements are based, in part, on the requirements contained in the RWQCB Order No. 01-024 adopted February 21, 2001, Order No. 01-119 adopted October 17, 2001 (new and redevelopment requirements) and Order No. R2-2005-0035 adopted July 20, 2005 (HMP and Group 2A and 2B) and on meeting the SCVURPPP *Mission and Goals Statement* (see Attachment 1).

A summary of the key budget assumptions is shown below and additional detail that defines the basis for the budget are identified in the following sections.

- The Total SCVURPPP FY 07-08 budget is approximately the same as the FY 04-05, FY 05-06 and FY 06-07 total budgets. To maintain the budget within the MC resource requirements, various tasks have been prioritized and spread out over 8 years rather than the usual permit cycle of 5 years.
- Assumes all annual State permit fees will be paid directly by individual Co-permittees as done in FY 06-07. The permit fee has been absorbed into the overall SCVURPPP budget, however additional increases beyond the estimated fees shown will not be adsorbed. To absorb these fees, as done in past years, would require further reductions in Program tasks that would significantly impact meeting permit requirements and further result in a reduction of contributions to regional collaborative programs.
- Hourly labor rates are increased by 4% above FY 06-07 labor rates, consistent with the Program Manager contract.
- Annual interest accrued is available to cover additional legal and municipal permit related assistance, as needed, unless otherwise modified by the BATG and MC for additional projects.
- The monitoring budget assumes one water body assessment will be conducted consistent with the MC approved work plan submission to implement permit requirements (Provision 9f). (Note: the Program conducts watershed and sediment assessments in alternating years, and no sediment assessment will be conducted in FY 07-08).
- Assumes no Co-permittee annual performance reviews.
- Includes the same budgeted amount for CEP related work as FY 03-04, FY 04-05, FY 05-06 and FY 06-07. (Goal is to redefine CEP mission and more closely link to stormwater and BASMAA needs).
- Includes resources to assist with implementing the approved Trash Work Plan (assumes limited assistance with key trash assessments, tracking and reporting, and resources for limited pilot study and data analysis/reporting and development of a long-term strategy for high priority waterheds).
- Includes resources to assist with finalizing guidance for implementation of HMP tasks, holding workshops, continuing development of the regional Bay Area Hydrology Model (BAHM) in collaboration with the Alameda and San Mateo County Programs, and coordination with Co-permittees and assisting Co-permittees with implementation.
- Includes specific resources for permit renewal negotiations as part of municipal regional permit.

- All Regional Collaboration projects/fees are shown in the Collaborative Group (projects are listed in order of priority, i.e., lowest priority first if revised budget allocations are needed.)
- The RMP fee is increased by 1.5%.
- Includes a budget of $50,000 to reimburse the fiscal/contract agent for services.

. The MC met and approved the budget on January 18, 2007.

1. Program Management/Administration

a. Administrative Assistance

- General administrative assistance
- Maintain Program 800 number
- Distribute PIP and other materials
- Develop partnerships with external organizations

b. Management Committee (MC) and Ad-Hoc Task Group (AHTG) Support

- Monthly MC meetings (up to 12) - develop, distribute, and post agendas; prepare and mail meeting materials; facilitate meetings; draft and finalize minutes; and conduct follow-up activities
- AHTG meetings (up to 40) - support groups formed to address specific tasks (meeting number and times vary)

c. Program Budget Administration

- Develop, draft, and finalize FY 2008-2009 budget; organize and facilitate up to four Budget AHTG meetings.
- Coordinate with Fiscal Agent, track expenditures, and prepare quarterly status reports to MC

d. Coordinate with Legal Consultant

- Communicate with and assist Program legal counsel as needed (up to 5 meetings and 10 extended telephone discussions) on General Program issues.

e. Develop and Manage Program PI/P Program

- Implement PI/P Work Plan for FY 2007-2008
- Conduct long-range planning for Program PI/P activities
- Manage development of PI/P work plan for FY 2008-2009
- Provide support, as needed, to Co-permittee's requests for public education assistance
- Manage subcontracts
- Coordinate and work with the WMI Communications Subgroup and various other adhoc and work groups to address numerous new target audiences and "pollutants of concern".[1]

[1] Over the past several years, the PI/P and WE&O elements have been a key component of the SCVURPPP. As TMDL programs move forward to address new "pollutants of concern" outreach will be important and Program staff will need to spend additional time working as part of a regional effort to address these new needs

f. Performance Evaluation

- No budget for current FY.

g. Expenses

- Approximately 10 percent of labor costs

2. Permit Management

a. Report Preparation and Submittal

- Prepare annual report for FY 2006-2007 and submit to Regional Board by September 15, 2007 (includes preparation of 1 draft for MC review, reproduction/distribution of up to 5 hard copies, distribution of CDs to MC, and posting on website)
- Review results of Program activities and recommend improvements
- Prepare Program Work Plan (or equivalent) for FY 2008-2009 (includes up to 2 drafts for MC review, response to Regional Board comments, reproduction and distribution of up to5 copies, distribution of CDs to MC, and posting on website)
- Provide guidance for Co-permittees' work plans and SCVURPPP work plans
- Review all Co-permittee Work Plans and Annual Reports for completeness and consistency.

b. Internal Co-permittee Liaison

- Develop guidance on permit requirements
- Provide assistance to Co-permittees as needed.
- Conduct up to four training workshops for co-permittee staff

c. External Organization Liaison

- Represent Program at Regional Board, State Board, BASMAA (Vice Chair), Regional Monitoring Program (Steering Committee and Technical Committee representatives), CEP, REF, CASQA (Board Member), Urban Pesticide Committee, SCBWMI Core Group and relevant subgroups (WAMS and LUS), environmental group/public (up to 88 meetings)
- Obtain and transmit updates from state NOI database, as reasonably available.

d. NDC Implementation Assistance, Tracking & Reporting (Non-HMP)

- Meet with Regional Board staff, Program legal counsel, Program ad hoc task group and/or environmental groups as needed
- Prepare responses to comments and supplementary documentation as needed.
- Conduct the tasks to comply with permit provision C.3. The estimated budgets are based on and consistent with the C3 Work Plan.
  - Continued assistance with SCVURPPP agencies' implementation of BMP O&M verification programs and the Program-wide database;
  - Continuing regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA New Development Committee);
  - Guidance on implementing changes to Provision C.3. in the MRP, and updates to the C.3. Handbook to reflect those changes;

- Continued development of model standards and specifications for certain BMPs;
- Continued assistance with the C3PO AHTG meetings and action items (meetings covered by AHTG budget assuming FY 06-07 level of effort);
- Workshop on C.3. implementation, exact topic to be determined by the C3PO AHTG (covered by the workshops budget);
- Continued guidance and assistance with annual reporting of C.3. information (covered by the annual reporting budget assuming FY 06-07 level of effort).

- Assist Co-Permitees with implementation of C.3 on projects and with tracking and reporting on C.3 projects.

e. Implement Continuous Improvement Items

- Investigate, develop implementation plans, and implement items for Program continuous improvement identified in Co-permittee reviews, work plan, and annual report within the allocated resources
- Summarize for Program annual report

f. TMDL Tracking, Review and Reporting

- Program staff participation in TMDL tracking, review and reporting to MC.

g. Expenses

- Approximately 10 percent of cost

3. Technical Program Management

a. Prepare RFPs, Technical Project Management

- Develop up to 4 RFPs for technical services (as required by Workplan)
- Implement Multi-Year Monitoring Plan including subcontractors (budget assumes that sediment and receiving water monitoring subcontractors (i.e., Stillwater and KLI) will remain the same for FY 07-08).
- Oversee contractors' work
- Coordinate with BATG/MC/Monitoring Ad Hoc Group/WAMS and hold up to four Monitoring Ad Hoc meetings annually (quarterly basis) in association with WAMS.

b. Technical Review of Work Products

- Provide technical review of contractor work products
- Make recommendations to BATG/MC/Monitoring Ad Hoc Task Group regarding quality of work and any modifications needed for improvement.

c. Develop/Revise Performance Standards

- Assist MC in development of one new performance standard, or substantially improve one or more existing performance standards at the same level of effort.

d. Expenses

- Approximately 10 percent of cost

4. Legal Services

Budget assumes that the Program will retain the services of Morrison and Foerster (Robert Falk, Esq.) to provide legal advice. The working assumption is that the majority of the legal budget is earmarked for assistance with TMDL, HMP, and permit renewal issues (i.e., work on municipal regional permit). In addition, implementation issues associated with C3 will also arise and, as appropriate, will be addressed with the available budget.

5. Fiscal Agent

The budget assumes that the City of Sunnyvale will continue to serve as the Contract/Fiscal Agent. The line item represents the amount to be reimbursed to the contract/fiscal agent carrying out this task. All Program staff time required to coordinate with the Fiscal Agent is included under Budget Item 1.c.

6. Fees (See Collaborative Group)

PROJECTS GROUP

7. Monitoring Projects

The purpose of this item is to fund projects that satisfy the monitoring requirements of the Program's NPDES permit (Provisions C8, C9 f, and C10). The estimate of the resource requirements are based on implementation of the Multi-Year Monitoring Plan (MY-RWMP) March 1, 2004 (update - originally submitted to the RWQCB by the MC on August 5, 2002) and is consistent with Program's implementation of the fifth year of MY-RWMP. In addition, the budget estimate includes resources to cover the following tasks/projects: SCVURPPP data management (includes website maintenance and updating), resources to conduct update of the SSI (full 3rd year update), limited resources to track and report on copper & nickel baseline actions, participation in the LUS[2], TMDL technical support/liaison/comment (Hg, PCB, Dioxin, other pesticides), other monitoring consistent with the permit (i.e., follow-up monitoring related to prior year status and trends monitoring) will be conducted to the extent that budget allows, the Saratoga Creek sediment assessment management practices assessment (consistent with the permit requirements and MC approved Work Plan dated September 1, 2002 implementing the Permit requirements), resources for assisting the Co-permittees implement the Trash Work Plan (limited resources to assist with key trash assessments, assist Co-permittees conduct and report on the results of a trash pilot demonstration project, and assist develop long-term management strategy for high priority watersheds), resources for updating and developing the necessary annual sampling plans, QA plans and reporting the surface water monitoring results (as defined within the MY-RWMP), resources to conduct a watershed water body assessment in Matadero and/or Adobe Creeks (consistent with MC work plan submitted to implement the Permit), and limited resources to coordinate/participate

[2] The estimated LUS Budget includes $15,000 to administratively assist the subgroup and $25,000 to work with the subgroup to sponsor two training workshops towards meeting the WMI objectives.

with the CEP and RMP. No additional sediment assessments (LFA) will be conducted this FY budget (FY 07-08 is the watershed/waterbody assessment FY). The proposed budget breakdown for major categories is as follows:

- Implement Multi-Year Monitoring Plan (includes receiving water monitoring including QA plans, bioassessment, sediment toxicity, BAMBI, regional coordination) $350,000
- Program Data Management/full SSI update/IND-ICID Reporting $150,000
- Trash/CAP-NAP/WMI-Landuse/TMDL Tech Review $180,000
- Watershed Assessment & Sediment Management Report [3] $200,000

8. HMP Implementation (Technical Assistance, Guidance and Workshops)

This task covers the budget requirements for SCVURPPP related to assisting Co-permittees implement Permit Provision C.3.f., the Hydromodification Management Plan (HMP). The focus in FY 07-08 will be continue to be on assistance to the local agencies and development community with outreach and implementation, and guidance on any changes that are required by the MRP. Anticipated tasks for FY 07-08 include the following:

- Provide guidance on any changes to HMP requirements in the MRP, and update the HMP and C.3. Stormwater Handbook to reflect these changes;
- Continue to assist with the HMP Implementation Phase (HIP) Work Group meetings and action items;
- Continue data collection on HMP implementation at small sites and plan to re-evaluate the small site size threshold after two years of implementation (HMP Next Steps Task 9 – may be superseded by changes to the permit);
- Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation);
- Continue to provide guidance and conduct trainings on the Bay Area Hydrology Model (BAHM);
- Conduct one workshop on HMP implementation (covered by workshops budget);

9. Public Information and Watershed Education Budget

Watershed Watch Campaign (Campaign) – In November 2005, the Program selected Carl and Manor Advertising as the new consultants for the Watershed Watch Campaign. To maintain the momentum gained by the Campaign in increasing the public's awareness of watersheds and stormwater pollution prevention and to achieve the goals and objectives described in the Watershed Education and Outreach Strategy, the Campaign is funded at the FY 06-07 level.

[3] Any cost savings related to modification of the sediment assessment program will be considered for use with the trash program efforts if directed to do so by the MC.

Other Watershed Education and Outreach (WEO) activities - The other WEO projects include the BASMAA Regional Ad Campaign, Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso (Alviso Education Center) and Schools Outreach using ZunZun. Resources for the Regional Ad Campaign and the ZunZun performances are at the same level as FY 06-07 and resources for the Alviso Education Center have been increased by 4% using some funds from the Program Supplies budget.

Creek Clean up Event Advertising - Resources to support one creek clean up in FY 07-08 are included in the budget. The WEO AHTG will make a recommendation on which clean up should be funded.

The following is a summary of the budget breakdown:

Task	FY 07-08 Budget
WW Campaign	103,700
Regional Ad Campaign	$40,000
Schools Outreach	$25,000
Creek Clean up support	$7,500
Alviso Ed Center	$85,280
Program staff	$50,000
Program supplies	$6,720
Total	**$318,200**

a. Pesticide User (PU) Outreach

This project continues implementation of the cost-effective elements of past IPM Store Partnership and Household Chemical Management Projects. The project scope includes items in Program's Pesticide Management Plan (2-15-02), based on provision C.9.d. of the permit, for outreach to residents, commercial businesses, and pest control operators. These include providing staff support for the Regional OWOW Store Partnership project, purchasing fact sheets and other promotional material, store employee training, staffing outreach events and media advertising.

b. Mercury Pollution Prevention Outreach

This project encompasses several tasks in the Program's Mercury Pollution Prevention Plan (3-1-02), provision C.9.c. of the permit. It involves public education regarding the effects of mercury on the environment, products containing mercury and proper disposal of such products. The project is in the fifth year of implementing the Program's Mercury Pollution Prevention Plan, is consistent with the Program's public education tasks and is consistent with previous

year's budget. The Program coordinates with the County Household Hazardous Waste Disposal Program for implementing this project.

c. Program Supplies

Estimated budget for reprints of materials for Program use and other Program supplies.

10. Project Monitoring Special Studies (see Collaborative Group)

11. NPDES Permit Renewal

This task includes resources for permit negotiation and renewal. The estimated budget assumes no additional work is required for the application. It assumes a level of effort to cover up to three stakeholder meetings and Water Board workshops and two full scale Water Board Public Hearings. It also assumes that the level of Co-permittee involvement with BASMAA and the Water Board staff remains at approximately the same level of effort. The estimated level of effort does not include resources to address additional administrative action beyond Water Board approvals as noted above.

COLLABORATIVE GROUP

a. **Program Monitoring Special Studies**: The Program MOA requires that an amount be set at approximately 10 percent of the total budget of the Projects Group (excluding the PI/P tasks). SCVURPPP resources are not currently available to meet this requirement. Therefore a limited budget has been allocated to cover any necessary changes in scope of the projects. High priority items for use of these resources include trash related projects (e.g., possible restaurant inspection form), green gardener training program, and preliminary investigation of possible collaborative implementation strategies regarding HHW issues.

b. **CASQA Dues (Regional Collaboration)**: Statewide stormwater organization dues. No increase in dues is included.

c. **TMDL CEP (Regional Collaboration):** These resources are used to fund the participation (i.e., technical participation annual cost) in the Clean Estuary Program (TMDL MOU between the RWQCB, BASMAA and BACWA). The CEP requested $147,000 per year, however, because of other higher priority items all Bay area storm water programs reduced their contributions by approximately 1/3 and plan to continue participation at this reduced rate for the next FY. The CEP is currently under review and redesign. The Program's and BASMAA's intent is to develop a method to split the contribution of CEP resources between the CEP and BASMAA to more appropriately and effectively address regional projects of concern to both BACWA and BASMAA and to also address projects that are specifically of more concern to BASMAA. BASMAA will continue to work with BACWA to redesign the mission and objectives of the CEP and to implement the redesign to more closely respond to public agency needs.

d. **RMP Fee (Regional Collaboration):** The RMP is a program initiated by the Regional Board to monitor the water quality of San Francisco Bay. The San Francisco Estuary Institute has a contract to conduct sampling in the Bay and administer the program with oversight from the Regional Board. The Program is one of a number of dischargers contributing to the cost of the program. It is expected that the Program will continue to fund the RMP at about the same level (includes a 1.5% increase) for each fiscal year for the term of the permit.

e. **BASMAA Fee (Regional Collaboration):** BASMAA is the local regional stormwater association. The Program has and expects to continue to fund the organization at about the same level for each fiscal year for the term of the permit. The budget remains the same as FY 06-07 and includes some limited collaborative (in kind) resources for technical and/or legal services. BASMAA is developing a coordinated stormwater regional effort to address technical and implementation questions related to monitoring (including collaboration with SWAMP) and TMDL implementation.

f. **WERF Dues:** Covers the Programs costs as member of WERF.

Notes:

NPDES Fee: This is the annual fee imposed on each Co-permittee by the State Water Resources Control Board for NPDES municipal storm water permits in the San Francisco Bay area. It is not included in the total SCVURPPP budget this year and will be paid directly by the individual Co-permittees as was done in FY 06-07. For Co-permittee budgeting purposes, in FY 02-03 the SWRCB increased the annual fee from $10,000 to $54,000, which was absorbed into the overall Program budget. During FY 03-04, the SWRCB increased the fees to $161,000, which again was absorbed into the overall Program budget. The SWRCB individually billed the Co-permittees approximately $162,000 for FY 04-05. In FY05-06 the SWRCB billed the Co-permittees approximately $162,000 but returned an overcharge $21,800 to the Program (one time refund). The FY 06-07 fees were consistent with the FY 05-06 fees. No information is currently available from the SWRCB regarding FY 07-08 fees. Co-permittees should assume that annual fees will be on the order of those assessed in FY 06-07 which totaled approximately $162,000. The Program budget for FY 07-08 does not include payment of Co-permittee fees.

Attachment 1 – SCVURPPP Mission and Goals Statement
2 – Overall Program Budget Tables 1 and 2
3 - Revised Co-permittee Assessments

Attachment 1: SCVURPPP Mission and Goals Statement

Mission Statement

"To assist in the protection of beneficial uses of receiving waters by preventing pollutants generated from activities in urban service areas from entering runoff to the maximum extent practicable."

The Mission Statement:

- Targets pollutant reduction measures that are needed to help protect beneficial uses
- Focuses on urban pollutant sources (as opposed to nonpoint sources generally)
- Sets a specific benchmark for implementation (as opposed to doing "anything and everything" related to pollutant sources)

This focused approach is consistent with the Program's idea of working with other parties or institutions that are better equipped to carry out specific pollution control strategies. The Program concentrates its own efforts on identifying pollution sources, and implementing pollution prevention measures, that are clearly within the authority and ability of the Co-permittees.

The Program's goals and objectives also stress this practical, focused approach.

GOAL 1: Comply with Permit

- Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)
- Reduce, to the maximum extent practicable, pollutants in stormwater runoff
- Comply with permit submittal requirements

GOAL 2: Determine Success

- Periodically evaluate the attainment of beneficial uses in selected waterways
- Evaluate changes in public awareness and behavior
- Evaluate effectiveness of specific control measures at pollution reduction.

GOAL 3: Adjust Activities to Meet Changes

- Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP
- Utilize what we learn to plan the next steps

GOAL 4: Achieve Acceptance of Urban Runoff Management Activities

- Effectively facilitate public input into Program planning process
- Integrate urban runoff goals at various intra-agency levels
- Develop and maintain a proactive interrelationship with regulatory authorities
- Publicize the efforts of the Co-permittees (Program)

GOAL 5: Integrate Urban Runoff Program Elements into other Programs

- Promulgate an understanding of the role of the urban runoff program
- Encourage other agencies to become involved in urban runoff issues
- Encourage action by the appropriate agencies

The Co-permittees intend to continue to utilize the Program's preferred approach of achieving consensus to resolve issues and reach decisions, and to rely on the Majority Vote mechanism set forth in Section 2.08 of the Agreement at the Management Committee level only when consensus-based resolutions appear or become elusive.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Draft Distributed to BATG and MC on December 21, 2006 and January 17, 2007 and approved MC on January 18, 2007

TABLE 1: TOTAL PROGRAM FY 07-08 BUDGET
Budget Summary

Item	Staff Hours	Total Cost
Operational Group		
1. Program Management/Administration (EOA)	2940	$454,124
2. Permit Management (EOA)	3196	$494,608
3. Technical Program Management (EOA)	926	$143,000
4. Legal Service (MOFO)	0	$87,818
5. Fiscal Agent (City of Sunnyvale))	0	$50,000
6. RMP Contribution (SFEI) (see Collaborative Budget)		
Sub-total: Operational Group	**7062**	**$1,229,550**
Projects Group		
7. Monitoring Projects (EOA/Subs)	1425	$880,000
8. HMP Implementation Assistance (EOA/Subs)	356	$130,000
9. Public Information and Watershed Education (EOA/Subs)	534	$383,200
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)		
11. NPDES Permit Renewal Negotiation & Hearing Process (EOA)	605	$85,000
Sub-total: Project Group	**2920**	**$1,478,200**
Collaborative Group		
A. Program Monitoring Special Studies		$42,000
B. CASQA Dues (Regional Collaboration)		$15,000
C. TMDL CEP Participation (Regional Collaboration)		$97,000
D. RMP Fee (Regional Collaboration)		$170,910
E. BASMAA Fee (Regional Collaboration)		$85,000
F. WERF Dues		$8,000
Subtotal Collaborative Group		**$417,910**
TOTAL PROGRAM BUDGET (NO SWRCB PERMIT FEE) (TOTAL USED TO CALCULATE ASSESSMENTS)	**9982**	**$3,125,660**
NPDES Permit fee - Estimated (Paid Directly By Co-permittees) (NOT IN PROGRAM ASSESSMENTS)		*$161,456*
TOTAL (includes est. permit fee)		*$3,287,116*

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TABLE 2: TOTAL PROGRAM FY 07-08 BUDGET

Budget Detail

Item	Staff Hours	Subtask Budget	Total Budget
Operational Group			
1. Program Management/Administration (EOA)			
a. Administrative Assistance	711	$99,840	$99,840
b. Management Committee and Task Group Support			$184,680
i. Management Committee	554	$77,760	
ii. Task Groups	762	$106,920	
c. Program Budget Administration			$51,480
i. Develop Budgets	130	$18,200	
ii. Prepare Expenditure Reports	237	$33,280	
d. Coordinate with Legal Consultant	177	$24,840	$24,840
e. Develop and Manage PI/P Program (non-Watershed Watch Campaign tasks)	370	$52,000	$52,000
f. Performance Evaluation	0	$0	$0
g. Expenses		$41,284	$41,284
Subtotal	**2940**	**$454,124**	**$454,124**
2. Permit Management (EOA)			
a. Report Preparation and Submittal			$106,800
i. Annual Report	427	$60,000	
ii. Work Plans	333	$46,800	
b. Internal Co-permittee Liaison			
i. Develop Guidance	133	$18,720	$70,560
ii. Local Program Reviews (none in FY07-08)	0	$0	
iii. Conduct Training (4 Workshops)	369	$51,840	
c. External Organization Meetings	985	$138,320	$138,320
d. NDC Implementation Assistance, Tracking & Reporting	370	$52,000	$52,000
e. Implement Continuous Improvement Items	221	$31,000	$31,000
f. TMDL Program Tracking, Review & Reporting	356	$50,000	$50,000
g. Expenses		$45,928	$45,928
Subtotal	**3196**	**$494,608**	**$494,608**

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Table 2: TOTAL PROGRAM FY 07-08 BUDGET
Budget Detail

Item	Staff Hours	Subtask Budget	Total Budget
3. Technical Program Management (EOA)			
a. Prepare RFPs, Technical Project Management	370	$52,000	$52,000
b. Technical Review of Work Products	370	$52,000	$52,000
c. Develop/Revise Performance Standards (part of MRP)	185	$26,000	$26,000
d. Expenses		$13,000	$13,000
Subtotal	**926**	**$143,000**	**$143,000**
4. Legal Services	0	$87,818	$87,818
5. Fiscal Agent	0	$50,000	$50,000
6. Fees			
a. NPDES Permit Fee (SWRCB) (Paid directly by Co-permittees)			
b. Regional Monitoring Program Contribution (moved to Collaborative Group)			
Subtotal	**926**	**$137,818**	**$137,818**
Operational Group Total		**$1,229,550**	**$1,229,550**
Projects Group			
7. Monitoring Projects[1]	1425	$880,000	$880,000
8. HMP Technical Assistance/Guidance/Workshops	356	$130,000	$130,000
9. PI/P & WEO budget[2]			
a. Watershed Education and Outreach Campaign	356	$311,480	$311,480
b. Pesticide User (PU) Outreach		$40,000	$40,000
c. Mercury Pollution Prevention Outreach	178	$25,000	$25,000
d. BASMAA Regional Collaboration (See Collaborative)			
e. Program Supplies		$6,720	$6,720
10. Project Monitoring Special Study (10% per MOA - moved to Collaborative Group)			
11. Permit Renewal			
a. MRP Negotiations	605	$85,000	$85,000
Projects Group Total	**2920**	**$1,478,200**	**$1,478,200**

[1] Scope is based on the Program's Multi-Year (8-year) Monitoring Plan.

[2] On February 15, 2001 the MC approved the Budget Adhoc Task Groups recommendation to incorporate certain elements of the PI/P budget into the Projects Group budget.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

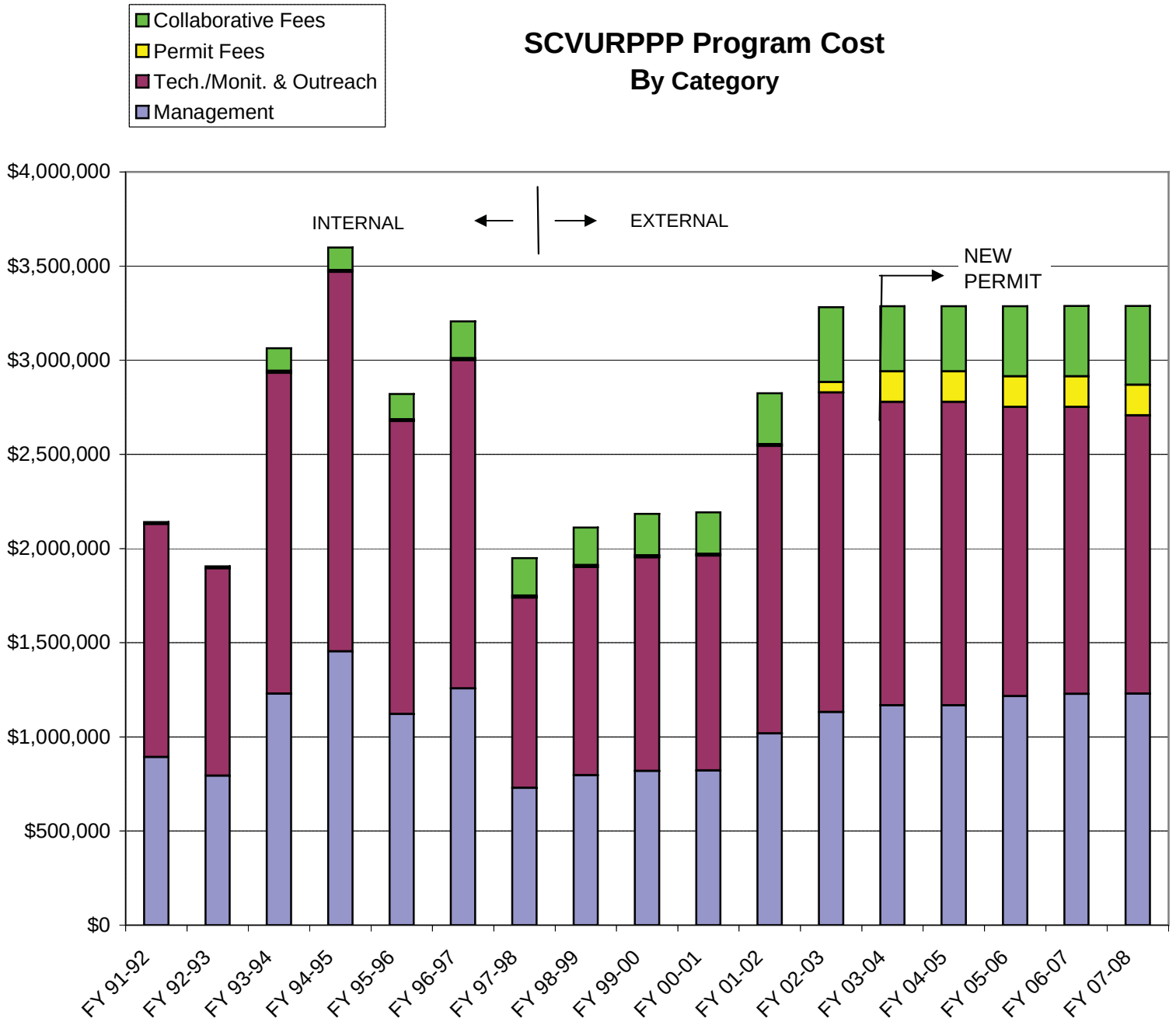
Table 2: TOTAL PROGRAM FY 07-08 BUDGET
Budget Detail

Item	Staff Hours	Subtask Budget	Total Budget
Collaborative Group			
A. Program Monitoring Special Studies (1)	0	$42,000	$42,000
B. CASQA Dues (Regional Collaboration)	0	$15,000	$15,000
C. TMDL CEP Participation (Regional Collaboration)	0	$97,000	$97,000
D. RMP Fee (Regional Collaboartion)	0	$170,910	$170,910
E. BASMAA Fee (Regional Collaboration)	0	$85,000	$85,000
F. WERF Member Dues	0	$8,000	$8,000
Subtotal: Collaborative Group	**0**	**$417,910**	**$417,910**
TOTAL PROGRAM BUDGET (NO PERMIT FEES) (DOES NOT INCLUDED PERMIT FESS)		**$3,125,660**	**$3,125,660**
Estimated NPDES Fee (Paid Directly by Co-permittees) (Not Included in Assessments and Program Budget)		*$161,456*	*$161,456*
Total		*$3,287,116*	

Note: (1) MOA Requires 10% of Operating Group - budget not available

FY 07-08 Budget Assessments

		PROGRAM ASSESSMENT *PROGRAM BUDGET TOTAL FY 06-07 OPER / PROJ/COLL CONTRIBUTION* **$3,125,660**	*ESTIMATED PERMIT FEE* ***$161,456***	*TOTAL* ***Program & Permit Costs***
Co-Permittee	Program Contribution			
Campbell	1.88%	$58,762	$7,406	$66,168
Cupertino	2.46%	$76,891	$11,109	$88,000
Los Altos	1.59%	$49,698	$7,406	$57,104
Los Altos Hills	0.43%	$13,440	$2,963	$16,403
Los Gatos	1.74%	$54,386	$7,406	$61,792
Milpitas	2.75%	$85,956	$11,109	$97,065
Monte Sereno	0.14%	$4,376	$2,963	$7,339
Mountain View	3.91%	$122,213	$11,109	$133,322
Palo Alto	4.06%	$126,902	$11,109	$138,011
San Jose	30.01%	$938,011	$29,625	$967,636
Santa Clara	6.23%	$194,729	$18,516	$213,245
Saratoga	1.59%	$49,698	$7,406	$57,104
Sunnyvale	7.25%	$226,610	$18,516	$245,126
County of Santa Clara	5.94%	$185,664	$14,813	$200,477
SCVWD	30.02%	$938,323	$0	$938,323
	100.00%	***$3,125,660***	***$161,456***	***$3,287,116***
** Permit Fee estimate for budget purposes*				


Collaborative Fees
Permit Fees
Tech./Monit. & Outreach
Management
SCVURPPP Program Cost
By Category
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0
INTERNAL
EXTERNAL
NEW
PERMIT
FY 91-92
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Santa Clara Valley
Urban Runoff
Pollution Prevention Program

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
2006 NATIONAL
CLEAN WATER ACT
RECOGNITION
AWARD
OUTSTANDING
STORM WATER MANAGEMENT

March 1, 2008

FY 2008-2009 Draft Work Plan

Sections 1-12

Program and Co-permittee Activities

Submitted in Compliance
with NPDES Permit Order No. 01-024 and 01-119
(as amended by R2-2005-0035)

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Santa Clara Valley
Urban Runoff
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San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Hand Delivered on February 29, 2008

February 29, 2008

Mr. Bruce H. Wolfe
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Wolfe,

I am pleased to submit a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2008-2009. This Work Plan fulfills Provision C.6.b. of the Program's current NPDES permit (No.CAS029718), Order 01-024 (as amended by Order 01-119 and R2-2005-0035).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Program's Work Plan was developed to include some but not all of the new, expanded, or redirected activities contemplated in the Tentative Order for the Municipal Regional Permit (MRP) currently released for comment. The Co-permittees' Work Plans are based on the current NPDES permit and do not include new, expanded, or redirected efforts. Until the MRP is adopted, it is not practical for Co-permittees to specify additional tasks given the scope and pervasiveness of the proposed requirements across the Co-permittee's programs. Rather, the Co-permittees are prepared to revise work plans as needed to reflect the MRP after adoption. If necessary, the Program will also revise their Work Plan to reflect the final requirements in the MRP after adoption.

The Management Committee is extremely concerned about the availability of resources to conduct all FY 08-09 tasks because of the dramatically increased levels of service included in the draft MRP and the uncertainty of available resources, particularly given the State budget condition and potential repercussions on local agency budgets. As circumstances become more clear, the Management Committee may have to revisit the priorities and resources

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1410 Jackson Street • Oakland, CA 94612 • tel: (510) 832-2852 • fax: (510) 832-2856
1-800-794-2482

assigned to the collaborative tasks. We request that the Water Board assist the local agencies by reviewing the MRP requirements and assigning priorities as well as phasing in some requirements over the next couple of permit cycles. We would be pleased to work with you and your staff on this issue.

Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: Trish Mulvey, CLEAN South Bay
SCVURPPP Management Committee Members
Robert Falk, Morrison & Foerster

Attachments: --FY 2008-2009 Draft Work Plan (including Co-permittee Work Plans) - one (1) hard copy
--FY 2008-2009 Draft Work Plan (including Co-permittee Work Plans) -three (3) compact discs

FY 08-09 Draft Work Plan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Certification

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Submitted on behalf of the
Santa Clara Valley Urban Runoff Pollution Prevention Program
March 1, 2008

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

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FY 08-09 Draft Work Plan
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F. PALO ALTO
G. SAN JOSE
H. SANTA CLARA
I. SUNNYVALE
J. WEST VALLEY COMMUNITIES (CAMPBELL, LOS GATOS, MONTE SERENO, SARATOGA)
K. SANTA CLARA COUNTY
L. SANTA CLARA VALLEY WATER DISTRICT

INTRODUCTION

This document comprises a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2008-2009. This Work Plan fulfills Provision C.6.b. of the Program's current NPDES permit (No.CAS029718), Order 01-024 (as amended by Order 01-119 and R2-2005-0035). The Work Plan development was coordinated with development of the Program's FY 08-09 budget, and is consistent with the level of effort represented by the budget items.

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. It was developed to include new, expanded, or redirected efforts (i.e., "Anticipated MRP Tasks") contemplated in the Tentative Order for the Municipal Regional Permit (MRP) currently released for comment. The Work Plan also considers the implementation status of ongoing activities and actions, in order to plan FY 08-09 activities. If necessary, the Program is prepared to revise the Work Plan to reflect the final requirements in the MRP after adoption.

The Work Plan is comprised of twelve sections, as follows:

1. **Municipal Operations:** Section 1 provides the Program's planned tasks to assist Co-permittees in reducing or eliminating adverse water quality impacts of operations and maintenance activities conducted by municipal staff.

2. **New Development and Redevelopment:** Section 2 describes the Program's progress in assisting Co-permittees to implement the requirements for new and redevelopment control measures (Provision C.3.) and the Program tasks planned for FY 08-09.

3. **Industrial and Commercial Site Control:** Section 3 provides the Program's planned tasks to assist Co-permittees in controlling the discharge of pollutants in stormwater from industrial and commercial sources.

4. **Illicit Discharge Detection and Elimination:** Section 4 provides the Program's planned tasks to assist Co-permittees in identifying and eliminating non-permissible non-storm water discharges associated with illegal dumping or illicit connections to the storm drain system.

5. **Construction Site Control:** The Program's planned tasks for assisting Co-permittees in controlling the impacts of construction activities on stormwater quality and flow through their construction inspection programs is presented within Section 5.

6. **Public Information/Participation Work Plan:** The Program's PI/P Work Plan (Section 6) includes a list and description of public education and outreach projects planned for FY 08-09 and how they relate to anticipated requirements in the MRP.

7. **FY 08-09 Annual Water Quality Monitoring Plan:** Section 7 provides the Program's Annual Monitoring Plan. Planned activities include implementation of the Program's

Multi-Year Receiving Waters Monitoring Plan, participation and financial support to the RMP, BAMBI network and BASMAA Monitoring Committee.

8. **Pollutants of Concern Control:** The Program's planned tasks for assisting Co-permittees in reducing and/or controlling the discharge of pollutants of concern (POCs) in stormwater is presented within Section 8.

9. **Exempted and Conditionally Exempted Discharges:** Section 9 describes the Program's planned tasks to assist Co-permittees in developing and implementing BMPs for the control of conditionally exempted (non-stormwater) discharges, as well as requiring businesses, contractors, and residents to control these discharges.

10. **Reporting Work Plan:** Section 10 provides the Program's proposed approach.

11. **FY 08-09 Program Budget:** The Program's Final FY 08-09 Budget Report, as approved by the Management Committee, is included in Section 11.

12. **Co-permittee Work Plan Summary Tables:** Section 12 contains the individual Co-permittee Work Plans for FY 08-09 developed consistent with the FY 00-01 Work Plan format approved by Water Board staff.

SECTION 1

MUNICIPAL OPERATIONS

1. MUNICIPAL OPERATIONS

INTRODUCTION

This section describes the Program's planned tasks during FY 08-09 to assist Co-permittees in reducing or eliminating adverse water quality impacts of operations and maintenance activities conducted by municipal staff. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.2 Provisions on the Municipal Regional Permit.

BACKGROUND

The goals of the Municipal Operations element are to maximize the removal of pollutants while sweeping streets, cleaning storm drain inlets/basins, and conducting other routine municipal maintenance activities; and to minimize non-stormwater discharges to storm drains and watercourses from maintenance-related activities.

Since 1996, the Program has developed and implemented the following performance standards which address reducing or eliminating water quality impacts of operations and maintenance activities conducted by municipal staff. They include:

Public Streets, Roads and Highways (PSRH) Operation and Maintenance (November 1996) – Defines the level of implementation that municipal agencies must attain to demonstrate that their local PSRH operation and maintenance activities reduce pollutants in stomwater to the maximum extent practicable;

Storm Drain System Operation and Maintenance (December 1996, updated March 1999) – Identifies maintenance activity implementation levels to optimize control of pollutants in stormwater during the performance of storm drain system operation and maintenance;

Water Utility Operation and Maintenance (January 1997) – Defines the level of implementation necessary to demonstrate the control of pollutants discharged from the operation and maintenance of municipal water supply utilities. See Section 9 for a description of FY 08-09 tasks relating to the Water Utility Operation and Maintenance Performance Standard.

Pest Management (February 2002) – Provides control measures which minimize pesticide use, particularly organophosphate pesticides, and reduce the amount of pesticides in stormwater and landscape runoff. See Section 8 for a description of pesticide toxicity control programs planned for FY 08-09.

Rural Public Works Maintenance and Support Activities (December 2002) –Defines the level of implementation necessary to ensure that required control measures are implemented while performing maintenance activities adjacent to streams.

The draft Municipal Regional Permit (MRP) contains requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The MRP Tentative Order was released on December 4, 2007. Provision C.2. in the Tentative Order contains requirements for operation and maintenance activities conducted by municipal staff, including requirements for:

- Street and road sweeping and cleaning;
- Sweeping equipment selection and operation;
- Street and road repair and maintenance;
- Sidewalk/plaza maintenance and pavement washing;
- Bridge and structure maintenance and graffiti removal;
- Catch basin or storm drain inlet inspection and cleaning;
- Operating and maintaining stormwater pump stations;
- Rural public works construction and maintenance; and
- Corporation yard BMP implementation.

PAST AND CURRENT ACTIVITIES RELATED TO MUNICIPAL OPERATIONS

Co-permitees continue to implement the performance standards described above while performing municipal operation and maintenance activities. Best management practices and control measures are incorporated into standard operating procedures for municipal operations. Training plays a major role in ensuring that Co-permittee staff use proper techniques during the course of their duties and is conducted annually.

Since the fall 2005, Program staff has been involved with Water Board staff and environmental NGO representatives in a process to develop the MRP. Work on the MRP is expected to continue through FY 07-08.

FY 08-09 IMPLEMENTATION TASKS

Table 1-1 presents a list of ongoing and anticipated MRP tasks that will be implemented in FY 08-09, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

Ongoing tasks:

- Continue developing Co-permittee street sweeping summary tables. Include types of sweepers used, swept curb miles, volume or weight of materials collected and estimated pollutant load reductions for copper, nickel, lead and zinc.

Anticipated MRP Tasks:

- Develop guidance on the proper selection and operation of replacement street sweeping equipment which meets particulate removal performance requirements.
- Conduct operator training on efficient street sweeping methods. Include training which enhances operations for water quality benefit. Training will be conducted in concert with other maintenance training needs.
- Update and/or develop model BMPs for street and road repair and/or maintenance sites, as necessary.
- Update and/or develop model BMPs for sidewalk/plaza maintenance and pavement washing, as necessary. Encourage implementation of BMPs included in BASMAA's Mobile Surface Cleaner Program.

- Develop Co-permittee summary tables which report on all storm drain inlet/catch basin maintenance activities, including inspection and cleaning.
- Develop guidance on developing an inventory of pump stations within the Program's jurisdiction. Include locations, key characteristics and inspection frequencies. Develop maps depicting locations.
- Develop guidance on conducting investigations (Provision C.8.e.iii) that identify which pump stations are the most significant sources of dry weather pollutants within the Program's jurisdiction.
- Develop Co-permittee summary tables which report Co-permittee inspection results and maintenance activities at pump stations. Include volume of mass of waste materials removed from pump stations.
- Review current BMPs for Rural Roads and road and culvert construction and maintenance, and recommended revisions, if necessary.
- Develop education and outreach piece on permitting requirements for rural public works activities that stresses the importance of proper planning and construction.
- Conduct workshop for rural public works maintenance staff on implementation of performance standards and support activities, including reporting on increased maintenance in priority areas.
- Develop Co-permittee summary tables which report inspection results at all corporation yards.

Table 1-1
Schedule and Deliverables for FY 08-09 Municipal Operations Tasks

Task from MRP Tentative Order	Schedule	Deliverables
Street and Road Sweeping and Cleaning		
Ongoing tasks • Continue developing Co-permittee street sweeping summary tables. Include types of sweepers used, swept curb miles, volume or weight of materials collected and estimated pollutant load reductions for copper, nickel, lead and zinc. Submit in the FY08-09 Annual Report.	Ongoing- FY 07-08 Annual Report and future ARs	• Guidance on data collection and submittal for inclusion in Annual Report.
Sweeping Equipment Selection and Operation		
• Develop guidance on the proper selection and operation of replacement street sweeping equipment which meets particulate removal performance requirements. • Conduct operator training on efficient street sweeping methods. Include training which enhances operations for water quality benefit. Training will be conducted in concert with other maintenance training needs.	6/09 6/09	• Memorandum on the proper selection and operation of replacement street sweeping equipment • Training session, guidance materials, evaluation summary
Street and Road Repair and Maintenance		
• Update and/or develop model BMPs for street and road repair and/or maintenance sites, as necessary.	6/09	• Updated Performance Standards
Sidewalk/Plaza Maintenance and Pavement Washing		
• Update and/or develop model BMPs for sidewalk/plaza maintenance and pavement washing, as necessary. Encourage implementation of BMPs included in BASMAA's Mobile Surface Cleaner Program.	6/09	• Updated Performance Standards • Guidance on data collection and submittal for inclusion in Annual Report
Catch Basin or Storm Drain Inlet Inspection and Cleaning		
• Develop Co-permittee summary tables which report on all storm drain inlet/catch basin maintenance activities, including inspection and cleaning. Submit in the FY08-09 Annual Report.	6/09	• Guidance on data collection and submittal for inclusion in Annual Report

Table 1-1, continued
Schedule and Deliverables for FY 08-09 Municipal Operations (C.2.)

Task from MRP Tentative Order	Schedule	Deliverables
Storm Water Pump Stations		
• Develop guidance on developing an inventory of pump stations within the Program's jurisdiction. Include locations, key characteristics and inspection frequencies. Develop maps depicting locations. Submit maps and inventory in the FY 08-09 Annual Report.	3/09 6/09	• Guidance on data collection and submittal for inclusion in Annual Report • Pump Station Inventory • Pump Station Maps
• Develop guidance on conducting investigations (Provision C.8.e.iii) that identify which pump stations are the most significant sources of dry weather pollutants within the Program's jurisdiction.	12/08	• Memorandum on investigations at pump stations
• Develop Co-permittee summary tables which report Co-permittee inspection results and maintenance activities at pump stations. Include volume of mass of waste materials removed from pump stations. Submit in the FY 08-09 Annual Report	6/09	• Guidance on data collection and submittal for inclusion in Annual Report
Rural Public Works Construction and Maintenance		
• Review current BMPs for Rural Roads and road and culvert construction and maintenance, and recommended revisions, if necessary.	6/09	• Updated Performance Standards
• Develop education and outreach piece on permitting requirements for rural public works activities that stresses the importance of proper planning and construction.	6/09	• Fact Sheet
• Conduct workshop for rural public works maintenance staff on implementation of performance standards and support activities, including reporting on increased maintenance in priority areas.	6/09	• Workshop, guidance materials, evaluation summary
Corporation Yard BMP Implementation		
• Develop Co-permittee summary tables which report inspection results at all corporation yards. Submit in the FY08-09 Annual Report.	6/09	• Guidance on data collection and submittal for inclusion in Annual Report

SECTION 2

NEW DEVELOPMENT AND REDEVELOPMENT (C.3)

2. FY 08-09 NEW AND REDEVELOPMENT (C.3.) WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 08-09 to continue to assist Co-permittees to control the impacts of development on stormwater quality and flow through the development project planning, review and approval process. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.3. Provisions of the Municipal Regional Permit.

BACKGROUND

On October 17, 2001, the Water Board adopted Order 01-119 which amended the Program's Permit Provision C.3. (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharges from new or redevelopment sites that may increase erosion in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

The Program and Co-permittees submitted work plans for implementing all C.3. requirements to the Water Board on March 1, 2002 (as part of the Program's *FY 02-03 Work Plan*, Volume II). These included the Program's "Guidance for Work Plan Tasks Related to Implementation of Permit Provision C.3." (referred to herein as C.3. Work Plan Guidance) which identifies proposed actions to meet the requirements of Provision C.3. and whether the actions will be implemented at the Program level, Co-permittee level or both. Most of the tasks in the C.3 Work Plan Guidance were completed by the end of FY 04-05. Additional implementation-phase tasks identified by the C3 Provision Oversight (C3PO) Ad Hoc Task Group and the Management Committee for FY 08-09 and ongoing support tasks are the basis of this work plan section.

Since the October 17, 2001 adoption by the Water Board of Order 01-119, there have been several changes to the requirements of Provision C.3. The first change, authorized by the Water Board Executive Officer, was an extension of three of the permit deadlines, as shown below, in order to be consistent with other Bay Area stormwater permits adopted subsequent to SCVURPPP Order 01-119.

Provision	Activity	Original Deadline	New Deadline[1]
C.3.c.i.	Require stormwater treatment BMPs at Group 1 Projects	July 15, 2003	October 15, 2003
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects in addition to Group 1 Projects	October 15, 2004	April 15, 2005
C.3.f.	Submit HMP for Regional Board approval	October 15, 2003	January 15, 2004

The second change relates to the definition of Group 2 projects. The Program requested Water Board approval of an Alternative Group 2 Project Definition, as allowed under Provision C.3.c.iii. of the Program's permit (Order No. 01-119). In a letter dated September 22, 2003, the Program proposed an Alternative Group 2 Project Definition that would make its Provision C.3. project size requirements consistent with the other Bay Area stormwater permit requirements (i.e., minimum project size of 10,000 square feet of impervious surface). At the Water Board's October 15, 2003, meeting, the Water Board authorized the Executive Officer to approve the Program's proposal.

The third change relates to the implementation date for Group 2 projects. Order R2-2005-0035, adopted July 20, 2005, contains revisions to Order 01-119 that recognize two types of Group 2 projects and extends the implementation dates for both. Group 2A includes projects that are more likely to contribute pollutants to stormwater (e.g., gas stations, auto wrecking yards, loading docks) and parking lots with 10,000 square feet or more of impervious surface. Group 2B includes all other Group 2 projects. The Group 2A implementation date was effective on October 20, 2005. The Group 2B implementation date was extended to August 15, 2006 to be consistent with other Bay area permits. In addition, Order R2-2005-0035 incorporated key provisions of the Program's *Hydromodification Management Plan Report* (April 2005) into the SCVURPPP permit.

A summary of the subsequent changes in permit deadlines resulting from the adoption of Order R2-2005-0035 is presented below:

Provision	Activity	Previous Deadline	New Deadline
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects: • Group 2A (special land use categories) • Group 2B	April 15, 2005	 October 20, 2005 August 15, 2006
C.3.f.	Implement HMP Key Provisions	Following Water Board approval	October 20, 2005

The draft Municipal Regional Permit (MRP) contains requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The MRP Tentative Order was released on December 4, 2007.. Provision C.3. in the Tentative Order contains similar requirements for new and redevelopment projects with some enhancements that will likely need to be addressed in FY 08-09.

[1] Letter to Beau Goldie, SCVURPPP Management Committee Chair, from Loretta Barsamian, Executive Officer, San Francisco Bay Regional Water Quality Control Board, re: Extension of Specified Deadlines in Order 01-119, May 12, 2003.

PAST AND CURRENT ACTIVITIES TO IMPLEMENT C.3.

Section 8 of the Program's *FY 06-07 Annual Report* described the progress of the Program (up to September 15, 2007) in completing Program tasks in the C.3 Work Plan and assisting Co-permittees with implementation of the C.3. requirements. With all of the preparation tasks completed, Co-permittees are now focusing on the implementation of C.3. requirements for Group 1 and Group 2 projects (i.e., those creating or replacing 10,000 square feet or more of impervious surface). The Program has continued to hold meetings of the C.3. Provision Oversight Ad Hoc Task Group (C3PO AHTG) to keep Co-permittees updated on current issues and promote exchange of ideas on and experience with C.3. implementation.

The Program also completed its Hydromodification Management Plan (HMP) in April 2005, and submitted it to the Water Board on May 4, 2005. Key provisions of the HMP were adopted by the Water Board on July 20, 2005 (as described above), and Co-permittees began implementation on October 20, 2005. Chapter 7 of the HMP Report identifies a number of action items that Program and Co-permittee staff will complete to address remaining HMP implementation issues. These action items and other related tasks are listed with anticipated start and completion dates within Attachment 7-1, "SCVURPPP HMP - Summary of Next Steps" (revised September 15, 2006). An internal HMP Instream Work Group, consisting of City of San Jose, Santa Clara Valley Water District and Program staff, has been meeting to discuss and work toward implementation of the tasks related to instream control measures for hydromodification.

To make it easier for developers to design flow control facilities to comply with the HMP, the Program developed an automated modeling and flow control facility sizing tool called the Bay Area Hydrology Model (BAHM), in collaboration with several other Bay Area stormwater programs. Development of the regional portion of the model and calibration of the tool to specific watersheds within the Santa Clara Valley has been completed, and several training sessions for municipal staff and consultants have been held.

Since the fall 2005, Program staff has been involved with Water Board staff and environmental NGO representatives in a process to develop the MRP. A Program staff person served on the New Development Work Group and assisted the group in establishing the current baseline activities conducted by municipal agencies and developing a list of options for the future permit. Initial drafts of the MRP included a number of changes to Provision C.3., some of which remain in the December 4, 2007 Tentative Order. Work on the MRP is expected to continue through FY 07-08.

FY 08-09 C.3. IMPLEMENTATION TASKS

General C.3. Tasks

Table 2-1 presents a list of ongoing tasks from the C.3. Work Plan and anticipated MRP tasks that will be implemented in FY 08-09. These tasks will provide continuing assistance with current provisions, as well as guidance on implementation of any changes made in the MRP, assuming it will be adopted near the beginning of the fiscal year.

Tasks for implementation assistance in FY 08-09 include:

- Continue to assist with Co-permittee implementation of C.3. on projects, and with BMP O&M verification programs;

- Continue to assist with the C3PO AHTG meetings and action items;
- Update the C.3. Handbook and Planning Procedures Performance Standards to reflect changes to Provision C.3. in the MRP, including source control and site design measure guidance;
- Conduct workshop on C.3. implementation, with the topic to be determined by the C3PO AHTG;
- Continue to provide guidance and assistance with annual reporting of C.3. information.
- Continue regional roundtable meetings with Co-permittee staff and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA New Development Committee);
- Provide additional guidance on proper design/construction of pervious paving systems and use of pervious areas for infiltration;
- Develop Program-wide database to assist with BMP O&M verification reporting and effectiveness analysis;
- Begin to work with BASMAA and/or other stormwater programs to develop standard specifications for lot-scale treatment BMPs for single family homes;
- If needed, prepare pilot study plan for collection of impervious surface data for Water Board submittal, and assist designated Co-permittees with guidance on data collection and reporting.

HMP Tasks

The focus in FY 08-09 will be continue to be assistance to the local agencies and the development community with outreach and implementation, and guidance on any changes that are required by the MRP. Tasks for FY 08-09 include the following:

- Provide guidance on changes to HMP requirements in the MRP, and update the HMP and C.3. Stormwater Handbook to reflect these changes;
- Continue to assist with the HMP Implementation Phase (HIP) Work Group meetings and action items;
- Continue to meet with the HMP Instream Measures Work Group and work toward progress on HMP “next steps” (Table 2-2);
- Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation);
- Continue to provide guidance and conduct trainings on the Bay Area Hydrology Model (BAHM); and
- Conduct one workshop on HMP implementation.
- Assist Co-permittees with impervious surface data analysis, as needed, to revised the HMP applicability map, prepare submittal to Water Board on map changes, and create Co-permittee specific HM applicability maps.

Table 2-1
Schedule and Deliverables for FY 08-09 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Schedule	Deliverables
C.3.a. Performance Standards		
• Update the model Planning Procedures Performance Standards to reflect the requirements in the MRP.	12/08	• Updated Performance Standards
C.3.c. Requirements for Group 1 and Group 2 Projects		
• Prepare guidance on implementing changes to Provision C.3. in the MRP, and updates to the C.3. Handbook to reflect those changes, including: ○ updating list of source control measures; ○ updating guidance on site design issues; ○ updating fact sheets and website.	12/08	• Updated sections of the C.3. Handbook and updated fact sheets.
• Provide additional guidance on proper design/construction of pervious paving systems and use of pervious areas for infiltration	6/09	Section for C.3. Handbook on pervious paving and use of pervious areas
Ongoing Tasks:		
• Promote/facilitate regional roundtable meetings with agency staff from SCVURPPP and other stormwater programs to share information about implementation strategies and experience;	Ongoing	• Meeting summaries
• Continue assistance with the C3PO AHTG meetings and action items;	Ongoing	• C3PO AHTG meetings and summaries
• Conduct one workshop on a C.3-related topic (to be determined).	6/09	• Workshop
C.3.e. Operation and Maintenance of Treatment BMPs		
• Assist Co-permittees to report on treatment BMP O&M verification program in each annual report, including inspection results, evaluation of effectiveness, and planned improvement to the program.	Ongoing - FY 07-08 Annual Report and future ARs	• Guidance on Annual Report preparation
• Develop Program-wide database to assist with BMP O&M verification reporting and effectiveness analysis.	12/08	• Updated Program-wide database

Table 2-1, continued
Schedule and Deliverables for FY 08-09 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Schedule	Deliverables
Ongoing Tasks: • Continue assistance with SCVURPPP agencies' implementation of BMP O&M verification programs.	Ongoing	
C.3.f. Hydromodification Management Plan		
• Assist Co-permittees with impervious surface data analysis, as needed, to revise the HMP applicability map.	12/08	• Guidance on impervious surface data analysis
• Prepare submittal to Water Board on map changes.	6/09	• Memo to Water Board
• Create Co-permittee-specific HMP applicability maps.	TBD, pending WB approval of map	• BAHM guidance/handouts
Ongoing Tasks: • Provide guidance on any changes to HMP requirements in the Regional Permit, and update the HMP and C.3. Stormwater Handbook to reflect these changes;	12/08	• Updated section of C.3. Handbook
• Conduct one workshop on HMP implementation and hydromodification control measures;	6/09	• Workshop
• Continue to provide guidance and conduct trainings on the Bay Area Hydrology Model (BAHM);	Ongoing, as needed	• Training(s)
• Continue to assist with the HMP Implementation Phase (HIP) Work Group meetings and action items	Ongoing	• Meeting summaries
• Continue to meet with the HMP Instream Measures Work Group and work toward progress on HMP "next steps" (Attachment 7-1)	Ongoing	• Meeting summaries

Table 2-1, continued
Schedule and Deliverables for FY 08-09 New and Redevelopment (C.3) Tasks

Task from C.3. Work Plan	Schedule	Deliverables
• Continue to assist Co-permittees with implementation of HMP requirements for Group 1 projects that may cause increased erosion or other related impacts.	FY 08-09	• Assistance with questions about implementation
• Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation);	FY 08-09	• Monitoring results provided in FY 08-09 Annual Report
C.3.j. Site Design Measures Guidance and Standards Development		
• (New C.3.i.): Begin to work with BASMAA and/or other stormwater programs to develop standard specifications for lot-scale treatment BMPs.	Complete by July 1, 2010	• Regional standard specifications and guidance
C.3.n. Reporting Requirements		
• (New C.3.j.): If needed, prepare pilot study plan for collection of impervious surface data for Water Board submittal, and assist designated Co-permittees with guidance on data collection and reporting.	11/30/08	• Memo on pilot study
Ongoing Tasks:		
• Provide information described in Table 1 of Provision C.3. in annual reports (and any additional information required by the MRP)	Ongoing - FY 08-09 Annual Report and future ARs	• Guidance on Annual Report preparation

Table 2-2

SCVURPPP HMP - Summary of Next Steps (Updated 3/1/08)

Task[1]	Anticipated Completion Date[2]	Status
1. Develop the following: a. a funding mechanism[3] such that projects can utilize in-stream control options b. a methodology for determining developer contributions based on the stream changes expected to result from changes in project runoff conditions.	6/08 6/08	**In Progress** - The HMP Instream Projects Work Group, consisting of Water District, City of San Jose and Program staff, continues to meet regularly.
2. Work with City/County planning and public works departments and the Water District to determine the timing and method of notifying District staff during the development review process about HMP projects that may need in-stream controls, in a manner that does not unreasonably prolong the review process. Further, look at ways to improve method to provide early communication on Group 1 project reporting.	6/08	**In Progress** – This task was delayed pending decisions by the HMP Instream Projects Work Group. Some Co-permittees already have a process for involving Water District staff in development project review. Program staff will document current practices and develop guidance for other Co-permittees, in consultation with Water District staff.
3. Facilitate review of District's MDL analysis, both by the Co-permittees and the Expert Panel, and work with the Management Committee to determine the need to integrate some or all of the MDL analyses into implementation of the HMP.	N.A.	**Eliminated** – This task is no longer needed to implement the HMP. A revised HMP applicability map was developed by the Program based on other criteria, negotiated with Water Board staff, and will likely be adopted. The Management Committee voted to remove this action item from the list at its December 20, 2007 meeting.
4. Conduct additional studies of implementation of site design, integrated management practices, and/or basins at example development sites in Santa Clara Valley.	6/08	**In Progress** – In FY 06-07, the Program contracted with GeoSyntec Consultants to do a comparison of flow basin sizing using the HEC-HMS and HSPF models. The results will provide guidance on model use and sizing procedures and to assist development of the BAHM. The draft comparison report was completed and is under going review by Program staff.

[1] Tasks are from Chapter 7 of April 2005 HMP Report. *Tasks in italics have been added.*

[2] All dates depend on availability of resources and cooperation/collaboration of numerous staff from different agencies and may change because of circumstances beyond the control of the Program. The Program periodically updates the Management Committee regarding schedule changes and will transmit updates schedules to Water Board staff.

[3] The intent is to describe a mechanism agreeable to Co-permittees and next steps for implementation.

Table 2-2
SCVURPPP HMP - Summary of Next Steps (continued)

Task[1]	Anticipated Completion Date[2]	Status
		In addition, the Program also contracted with GeoSyntec to develop a methodology for estimating costs for the purpose of determining impracticability of hydromodification management measures (i.e. the 2% cost cap). This work is underway and a draft report will be completed by March 2008.
Bay Area Hydrology Model (BAHM) Development Project – Regional Model, Local Calibration, Training	Completed 7/07; Ongoing	**Completed/Ongoing** –The BAHM was completed in July 2007 The Program participated with the Alameda and San Mateo countywide stormwater programs in the development of the regional component of the BAHM, and also contracted with the software developer, Clear Creek Solutions, to calibrate the model to two watersheds in Santa Clara Valley. Local calibration was completed in May 2007. A series of trainings were conducted in July and November, 2007. The BAHM includes the ability to model common site design and treatment control measures and quantify the reduction in flow duration due to these measures. Additional testing will be conducted in FY 07-08 and FY 08-09 to fine tune and improve guidance on the use of the BAHM for this purpose.
5. During implementation of the HMP, obtain feedback/suggestions for further refinement and implementation guidance	As needed/ Ongoing	**Completed/Ongoing** – The HMP Implementation Work Group has been meeting on a regular basis, and has been an effective forum to share experience with HMP implementation and obtain suggestions for additional HMP guidance. Members of the development community have also attended these meetings. Program staff have reviewed several conceptual design submittals to meet HMP requirements for projects in San Jose and discussed these with the work group. Additional guidance will be prepared on HMP implementation following adoption of new requirements in the MRP (expected mid-2008).

Table 2-2
SCVURPPP HMP - Summary of Next Steps (continued)

Task[1]	Anticipated Completion Date[2]	Status
6. Coordinate with other Bay Area stormwater programs to work toward a consistent approach for the Bay Area (via participation in development of the Municipal Regional Permit (MRP).	Ongoing until completion of MRP	**In Progress** –The MRP Tentative Order (December 4, 2007) contains consistent HMP requirements for all Permittees except those in Contra Costa County. During FY 08-09, Program staff will continue to work with other Bay Area programs and Water Board staff to address these differences.
7. Coordinate additional Co-permittee, Bay Area stormwater program, and Water Board staff review process and progress meetings, including: a. The development of a schedule for Bay Area-wide HMP implementation in the upcoming Municipal Regional Permit.	6/07	**Completed** – Hydromodification management (HM) requirements for the San Mateo, Alameda and Fairfield-Suisun stormwater programs were adopted by the Water Board on March 14, 2007. Implementation began in June 2007. The Contra Costa program began implementation in October 2006. Under the MRP, these programs will continue implementation of their current requirements. SCVURPPP began implementation in October 2005. However, the MRP contains new requirements for SCVURPPP that will take effect upon MRP adoption.
b. Public outreach – HMP updates, workshop *c. HMP Work Group Meetings*	Ongoing Ongoing	**Completed/Ongoing** – Program staff have conducted two "HMP 101" workshops for Co-permittee staff covering basic principles of hydromodification management. Additional workshops and meetings of the HMP Implementation Phase Work Group will be conducted as needed.
8. Collect data on the implementation of the HMP at small sites for a period of two years after the start of implementation, and plan to re-evaluate the small site size threshold and approach at that time. Conduct and document the reevaluation.	N.A.	**Eliminated** -- To date there have been no small sites required to implement HMP requirements. The MRP will likely reduce the threshold for projects subject to HMP requirements to one acre of impervious surface. As a result, this task is no longer needed.
9. Make additional refinements per: 1) lessons learned from implementation efforts based on the draft HMP; 2) the need for consistency with HMPs being developed by other Bay Area stormwater programs; and 3) development community, Co-permittee, and Water Board feedback.	Report in ARs beginning with FY 05-06 AR	**In Progress** – See Task 5. Additional refinements to the HMP will be made pending adoption of the MRP, and continuing input from Co-permittee staff and developers.

SECTION 3

INDUSTRIAL AND COMMERCIAL SITE CONTROL

3. INDUSTRIAL AND COMMERCIAL SITE CONTROLS

INTRODUCTION

This section describes the Program's planned tasks during FY 08-09 to assist Co-permittees in controlling the discharge of pollutants in stormwater from industrial and commercial sources. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.4. Provisions of the Municipal Regional Permit.

BACKGROUND

In December 1996, the Program developed the Industrial/Commercial Discharger Control (IND) Performance Standards to define the level of implementation that Co-permittees should attain to demonstrate that their IND activities reduce pollutants to the maximum extent practicable. The IND Performance Standards were developed to meet an earlier permit requirement and were incorporated into the Program's *Urban Runoff Management Plan* (dated September 1, 1997).
In October 2000, the performance standards were also updated to include the reporting of stormwater infiltration devices (SWIDs) and the preparation of internal summaries which include the type and number of violations reported, and the type of facilities with reported violations.

In early 2001, the Program's Management Committee approved the formation of the Industrial Reporting Ad hoc Task Group (Industrial Inspection AHTG) to develop a Program-wide strategy to comply with the enhanced reporting requirements of the Program's newly adopted NPDES permit dated February 21, 2001. On September 7, 2001, the Industrial Inspection AHTG recommended the adoption of Program-wide categories and enforcement actions developed by the Industrial Inspection AHTG. These categories and procedures are described in the *Continuous Improvement of Industrial Reporting Technical Memorandum.* The Management Committee approved the memorandum as the Program's strategy to implement IND reporting requirements (as required in Permit Provisions C.6.a.i.). The memorandum was included as an attachment within the Program's *FY 00-01 Annual Report* and submitted to the Water Board on September 17, 2001. Each Co-permittee began implementing these procedures immediately thereafter. Implementation of the enhanced reporting requirements by the Co-permittees has been very successful as shown in the past five Program annual reports.

In accordance with the Program's *FY 04-05 Work Plan* submitted to the Water Board on March 1, 2004, the Program committed to updating the IND Performance Standards during FY 04-05. The updates were essentially administrative (e.g., incorporating enhanced reporting requirements and results of Co-permittee evaluations) and were directed at modifying the Program's model IND Performance Standards to reflect Management Committee direction and actual Co-permittee implementation. These administrative updates were provided to the Industrial Inspection AHTG for review during January 2005. The Management Committee approved final updated performance standards on February 17, 2005.

The draft Municipal Regional Permit (MRP) contains requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The MRP Tentative Order was released on December 4, 2007. Provision C.4. in the Tentative Order contains requirements for industrial and commercial site controls, including requirements for:

- Sufficient legal authority for effective site management;

- Development and implementation of an Industrial and Commercial Business Inspection Plan;
- Development and implementation of an enforcement response plan; and
- Staff training.

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PAST AND CURRENT ACTIVITIES RELATED TO INDUSTRIAL AND COMMERCIAL SITE CONTROLS

Co-permitees continue to implement the IND Performance Standards by conducting inspections of specific industrial and commercial facilities which may be a source of pollutants to stormwater. When necessary, Co-permittees initiate enforcement actions against responsible parties. In addition, Co-permittees continue to provide information on the type of facilities inspected and the level of enforcement taken at inspected facilities, as well as an evaluation of IND program effectiveness, in their annual reports. To supplement individual Co-permittee IND inspection data, Program staff prepares IND summary tables for Co-permittee inspections that have occurred during a specific fiscal year. The categories presented within the summary tables are consistent with the strategy provided in the IND Performance Standards dated February 17, 2005. IND summary tables have been included in each annual report since September 2002.

Since the fall 2005, Program staff has been involved with Water Board staff and environmental NGO representatives in a process to develop the MRP. Work on the MRP is expected to continue through FY 07-08.

FY 08-09 IMPLEMENTATION TASKS

Table 3-1 presents a list of ongoing and anticipated MRP tasks that will be implemented in FY 08-09, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

- Summarize Co-permittee reports of industrial/commercial inspections conducted, including types of violations and enforcement actions, through problem resolution.
- Develop guidance for developing or updating current Industrial and Commercial Business Inspection Plans. A description of the process for prioritizing inspections and frequency of inspection will be included.
- Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.
- Review existing Program industrial/commercial database and revise, as appropriate.
- Maintain Program database to ensure current list of industrial/commercial facilities with Program's jurisdiction. List will include date of previous inspection, inspection priority and inspection comments.
- Assist Co-permittees with development of or revisions to their Enforcement Response Plans (ERP) to include a range of enforcement actions and guidelines.
- Conduct training on urban runoff pollution prevention, inspection procedures, illicit discharge detection and elimination, BMP implementation, lessons learned, local agency requirements and other inspection-related topics.

Table 3-1
Schedule and Deliverables for FY 08-09 Industrial and Commercial Site Control Tasks

Task from MRP Tentative Order	Schedule	Deliverables
Industrial and Commercial Business Inspection Plan		
• Develop guidance for developing or updating current Industrial and Commercial Business Inspection Plans. A description of the process for prioritizing inspections and frequency of inspection will be included. Submit in FY 08-09 Annual Report.	12/08	• Memorandum on developing an Industrial and Commercial Business Inspection Plan.
• Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.	12/08	• Standard inspection form, model database fields, annual report guidance
• Review existing Program database and revise, as appropriate.	12/08	• Revised Program database
• Maintain Program database to ensure current list of industrial/commercial facilities within Program's jurisdiction. List will include date of previous inspection, inspection priority and inspection comments. Submit in FY 08-09 Annual Report.	Ongoing- future Annual Reports starting with FY 08-09 Annual Report Ongoing	• Updated Program database • Guidance on data collection and submittal for inclusion in Annual Report.
Enforcement Response Plan		
• Assist Co-permittees with development of or revisions to their Enforcement Response Plan (ERP) to include a range of enforcement actions and guidelines.	12/08	• Model Enforcement Response Plan
• Summarize Co-permittee reports of industrial/commercial inspections conducted, including types of violations and enforcement actions, through problem resolution.	Ongoing- FY 07-08 Annual Report and future ARs	• Guidance on data collection and submittal for inclusion in Annual Report.
Staff Training		
• Conduct training on urban runoff pollution prevention, inspection procedures, illicit discharge detection and elimination, BMP implementation, lessons learned, local agency requirements and other inspection-related topics. Report in FY 08-09 Annual Report.	6/09	• Workshop, guidance materials, evaluation summary

SECTION 4

ILLICIT DISCHARGE DETECTION AND ELIMINATION

4. ILLICIT DISCHARGE DETECTION AND ELIMINATION

INTRODUCTION

This section describes the Program's planned tasks during FY 08-09 to assist Co-permittees in identifying and eliminating non-permissible non-storm water discharges associated with illegal dumping or illicit connections to the storm drain system. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.5. Provisions of the Municipal Regional Permit.

BACKGROUND

In December 1996, the Program developed the Illicit Connection and Illegal Dumping (ICID) Performance Standards to effectively prohibit the discharge of illicit, non-stormwater discharges to the municipal storm drain system by regularly inspecting storm drains and watercourses and correcting problems in a timely manner. The ICID Performance Standards were developed to meet an earlier permit requirement and were incorporated into the Program's *Urban Runoff Management Plan* (dated September 1, 1997). In October 2000, the performance standards were also updated to include conducting inspections and reporting the presence of stormwater infiltration devices (SWIDs); and reporting significant conditionally exempt discharges that are not properly managed.

In early 2001, the Program's Management Committee approved the formation of the ICID Reporting Ad hoc Task Group (ICID Reporting AHTG) to develop a Program-wide strategy to comply with the enhanced reporting requirements of the Program's newly adopted NPDES permit dated February 21, 2001. On September 7, 2001, the ICID Reporting AHTG recommended the adoption of Program-wide categories and enforcement actions developed by the ICID Reporting AHTG. These categories and procedures are described in the *Continuous Improvement of Illicit Connection/Illegal Dumping Reporting Technical Memorandum.* The Management Committee approved the memorandum as the Program's strategy to implement IC/ID reporting requirements (as required in Permit Provision C.6.a.ii). The memorandum was included as an attachment within the Program's *FY 00-01 Annual Report* and submitted to the Water Board on September 17, 2001. Each Co-permittee began implementing these procedures immediately thereafter. Implementation of the enhanced reporting requirements by the Co-permittees has been very successful as shown in the past six Program annual reports.

In accordance with the Program's *FY 04-05 Work Plan* submitted to the Water Board on March 1, 2004, the Program committed to updating the ICID Performance Standards during FY 04-05. The updates were essentially administrative (e.g., incorporating enhanced reporting requirements and results of Co-permittee evaluations) and were directed at modifying the Program's model ICID Performance Standards to reflect Management Committee direction and actual Co-permittee implementation. These administrative updates were provided to the ICID Reporting AHTG for review during January 2005. The Management Committee approved final updated performance standards on February 17, 2005.

The draft Municipal Regional Permit (MRP) contains requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The MRP Tentative Order was released on December 4, 2007. Provision C.5. of the Tentative Order contains requirements for illicit discharge detection and elimination, including requirements for:

- Sufficient legal authority to fully implement an enforcement response plan;

- Development and implementation of an enforcement response plan;
- Spill and dumping response, complaint response, and frequency of inspections;
- Routine collection system screening to determine illicit discharges and illegal dumping;
- Making maps of the MS4 publicly available;
- Tracking and case follow-up of incidents;
- Illicit discharge control planning for the following year based on lessons learned; and
- Staff training.

PAST AND CURRENT ACTIVITIES RELATED TO ILLICIT DISCHARGE DETECTION AND ELIMINATION

Co-permitees continue to implement the ICID Performance Standards by responding to illicit discharges and illegal dumping incidents, conducting proactive investigations and initiating enforcement actions against responsible parties. In addition, Co-permittees continue to provide information on the origin of the report, source of incident, type of incident and enforcement actions for each ICID incident, as well as an evaluation of ICID program effectiveness, in their annual reports. To supplement individual Co-permittee ICID inspection data, Program staff prepares ICID summary tables for Co-permittee inspections that have occurred during a specific fiscal year. The categories presented within the summary tables are consistent with the strategy provided in the ICID Performance Standards dated February 17, 2005. ICID summary tables have been included in each annual report since September 2002.

Since the fall 2005, Program staff has been involved with Water Board staff and environmental NGO representatives in a process to develop the MRP. Work on the MRP is expected to continue through FY 07-08.

FY 08-09 IMPLEMENTATION TASKS

Table 4-1 presents a list tasks that will be implemented in FY 08-09, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

- Summarize Co-permittee reports of illicit discharge cases/investigations conducted, including types of violations and enforcement actions, through problem resolution.
- Maintain Program database to include most recent Co-permittee illicit discharge data.
- Assist Co-permittees with development of or revisions to their Enforcement Response Plans (ERP) to include a range of enforcement actions and guidelines.
- Conduct training on ERPs as part of staff training on illicit discharge detection and elimination. Include training on quick and appropriate response, enforcement actions and the progressive enforcement response policy.
- Update illicit discharge contact list (main contact for each Co-permittee).
- Summarize availability of MS4 maps (in either electronic or physical means) and Co-permittee contact person in the FY 08-09 Annual Report.
- Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.

- Review existing Program database and revise, as appropriate.
- Conduct training on illicit discharge detection and elimination. Include training on inspection procedures, BMP implementation, lessons learned, local agency requirements and other inspection-related topics.

Table 4-1
Schedule and Deliverables for FY 08-09 Illicit Discharge Detection and Elimination Tasks

Task from MRP Tentative Order	Schedule	Deliverables
Create and Maintain ERP		
• Assist Co-permittees with development of or revisions to their Enforcement Response Plan (ERP) to include a range of enforcement actions and guidelines.	12/08	• Model Enforcement Response Plan
• Conduct training on ERPs as part of staff training on illicit discharge detection and elimination. Include training on quick and appropriate response, enforcement actions and the progressive enforcement response policy.	6/09	• Training session, guidance materials, evaluation summary
Spill and Dumping Response, Complaint Response and Frequency of Inspections		
• Update illicit discharge contact list (main contact for each Co-permittee). Submit in FY 08-09 Annual Report.	12/08	• Updated contact list
Collection System Screening- MS4 Map Availability		
• Summarize availability of MS4 maps (in either electronic or physical means) and Co-permittee contact person in the FY 08-09 Annual Report.	6/09	• Summary of map availability and contacts • Placement of map contacts on SCVURPPP website.
Tracking and Case Follow-up		
• Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.	12/08	• Standard inspection form, model database fields, annual report guidance
• Review existing Program database and revise, as appropriate.	12/08	Revised Program database
• Summarize Co-permittee reports of illicit discharge cases/investigations conducted, including types of violations and enforcement actions, through problem resolution.	Ongoing- FY 07-08 Annual Report and future ARs	• Guidance on data collection and submittal for inclusion in Annual Report
• Maintain Program database to include most recent Co-permittee illicit discharge data	Ongoing	• Up-to-date Program database

Table 4-1, continued
Schedule and Deliverables for FY 08-09 Illicit Discharge Detection and Elimination (C.5.) Tasks

Task from MRP Tentative Order	Schedule	Deliverables
Staff Training		
• Conduct training on illicit discharge detection and elimination. Include training on inspection procedures, BMP implementation, lessons learned, local agency requirements and other inspection-related topics. Report in FY 08-09 Annual Report.	6/09	• Training session, guidance materials, evaluation summary

SECTION 5

CONSTRUCTION SITE CONTROL

5. FY 08-09 CONSTRUCTION SITE CONTROL MEASURES WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 08-09 to assist Co-permittees to control the impacts of construction activities on stormwater quality and flow through their construction inspection programs. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.6. Provisions of the Municipal Regional Permit.

BACKGROUND

In 1997, the Program developed Construction Inspection Performance Standards (CIPS) to define the level of implementation that Co-permittees should attain to demonstrate that their construction inspection programs control stormwater quality impacts to the maximum extent practicable. The CIPS were developed to meet a earlier permit requirement and were incorporated into the Program's *Urban Runoff Management Plan*. The CIPS were updated in 2001 (completed January 2002) to include more details on inspection frequency, enforcement procedures, and inspector training, based on discussions with Water Board staff.

The current permit requires implementation of the CIPS and lists some, but not all, of the standards in Provision C.3.a.. Co-permitees continue to implement the CIPS and provide summaries of enforcement and follow-up actions at construction sites, as well as information on inspector training, in their annual reports.

The draft Municipal Regional Permit (MRP) contains requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The MRP Tentative Order was released on December 4, 2007. Provision C.6. in the Tentative Order contains specific requirements for construction site controls, including requirements for:

- Sufficient legal authority for effective site management;
- Development and implementation of an enforcement response plan;
- Designation of a minimum set of required BMPs;
- Review of erosion control plans and Construction General Permit coverage, and outreach to developers and contractors as part of the plan approval process;
- Types, content and frequency of inspections;
- Staff training; and
- Tracking and reporting of construction site inspection results.

PAST AND CURRENT ACTIVITIES RELATED TO CONSTRUCTION SITE CONTROLS

As described above, the Co-permittees continue to implement the Program's performance standards by conducting reviews of erosion control plans, requiring General Permit coverage, conducting routine (including pre-wet season) and as-needed construction site inspections, documenting and reporting violations and enforcement response, and training inspectors. The Program annually co-sponsors and/or conducts a Construction Site Management Workshop to assist Co-permittees with inspector training needs, provides

guidance on annual reporting requirements, and assists Co-permittees with construction-related questions and issues as needed.

Since the fall of 2005, Program and Co-permittee staff have been involved with Water Board staff and environmental NGO representatives in a stakeholder process to develop the MRP. Work on the MRP is expected to continue through FY 07-08.

FY 08-09 IMPLEMENTATION TASKS

Table 5-1 presents a list of tasks that will be implemented in FY 08-09, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

- Conduct annual workshop on Construction Site Management, in coordination with the San Franscisco Estuary Program and/or CASQA. Include training on inspection type and frequency, minimum BMPs, BMP installation and maintenance, and implementation of enforcement response plans.
- Update the Construction Inspection Performance Standards as needed to be consistent with Provision C.6., including adding:
  - list of minimum BMPs;
  - guidance on different types of inspections;
  - implementation requirements for different types of sites and times of year (wet or dry season);
- Develop educational piece on minimum BMPs for use by Co-permittees;
- Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.

Table 5-1
Schedule and Deliverables for FY 08-09 Construction Site Control Tasks

Task from MRP Tentative Order	Schedule	Deliverables
Minimum Required Management Practices		
• Update the Construction Inspection Performance Standards as needed to be consistent with Provision C.6., including adding: o list of minimum BMPs; o guidance on different types of inspections; o implementation requirements for different types of sites and times of year (wet or dry season);.	12/08	• Updated Performance Standards
Plan Approval Process		
• Develop educational piece on minimum BMPs for use by Co-permittees	12/08	• Updated sections of the C.3. Handbook and updated fact sheets.
Staff Training		
• Conduct annual workshop on Construction Site Management, in coordination with the San Franscisco Estuary Program and/or CASQA. Include training on inspection type and frequency, minimum BMPs, BMP installation and maintenance, and implementation of enforcement response plans.	6/09	• Workshop, guidance materials, evaluation summary
Tracking and Reporting		
• Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.	6/09	• Standard inspection form, model database, annual report guidance

SECTION 6

PUBLIC INFORMATION/ PARTICIPATION WORK PLAN

6. PUBLIC INFORMATION/PARTICIPATION WORK PLAN

INTRODUCTION

The goals of the Public Information/Participation (PI/P) element are to identify and change behaviors that adversely affect water quality; and to increase the understanding and appreciation of streams and San Francisco Bay. To accomplish these goals, Co-permittees pursue PI/P activities jointly through the Program, on a countywide basis, and individually in their own jurisdictions.

Each year, the Watershed Education and Outreach Ad Hoc Task Group, which consists of Program staff, Co-permittees representatives and consultants, identifies, prioritizes and selects countywide projects for implementation. Table 6-1 presents the updated Pollutant Matrix, which links past, current, and future PI/P projects with pollutants of concern. The projects are developed and implemented each year by Work Groups.

The Program provides resources to conduct countywide PI/P tasks through approval (by the Management Committee) of an annual Program budget and Work Plan. All Co-permittees contribute resources to conduct annual Program Work Plan tasks consistent with the Co-permittee assessment procedure contained in the SCVURPPP Memorandum of Agreement[1].

FY 08-09 PI/P WORK PLAN

In FY 08-09, the Program will continue to conduct its PI/P activities through the following projects:

- Watershed Education and Outreach (this includes funding for three projects: Watershed Watch Campaign, School Outreach activities and the Watershed Watchers Program at the Don Edwards San Francisco Bay National Wildlife Refuge).
- Pesticide User Outreach
- Mercury Pollution Prevention Outreach
- Regional Coordination (participation in BASMAA PI/P Work Groups, described at the end of Section 6)
- Other Ongoing Program PI/P Support Activities

It is anticipated that implementing the above mentioned projects will meet most of the outreach requirements described in the Municipal Regional Permit (MRP). Some additional tasks may be implemented within these projects to address potential MRP requirements; these are identified within the project descriptions below.
Details of the Program's FY 08-09 PI/P projects are provided below:

<u>Watershed Education and Outreach</u>

The FY 08-09 Watershed Education and Outreach project includes implementation of the Watershed Watch Campaign, School Outreach activities, and the Watershed Watchers Program

[1] On February 1, 2001, the Management Committee directed Program staff to include all Program-Wide PI/P activities as part of the Projects Group budget and thus eliminated any confusion regarding selective Co-permittee participation.

at the Don Edwards San Francisco Bay National Wildlife Refuge. Details of these projects are provided below:

Watershed Watch Campaign

In FY 08-09, the Watershed Watch Campaign will include the following tasks:

- Media advertising
- Partnerships with community and business organizations (e.g., Classic Car Wash)
- Community outreach events
- Website and telephone hotline maintenance
- Media relations
- Conduct more media relations locally to supplement work done by the BASMAA Media Relations Committee.

The detailed FY 08-09 Watershed Watch Campaign Work Plan is being developed and will be available at a later date. As described in the Program's Watershed Education and Outreach Strategy[2], a public opinion survey will be conducted in FY 08-09 to evaluate effectiveness of the Watershed Watch Campaign. The feedback from this evaluation may be used to modify messages, advertising, promotions and other Campaign strategies.

Schools Outreach

The Schools Outreach project includes funding for ZunZun school assemblies and support for the *Wacky Watersheds* teacher training workshop. Details are below:

- *Elementary School Outreach:* During FY 08-09, the Program will continue to sponsor up to 50 ZunZun assemblies at elementary schools in the Santa Clara Valley. These musical assemblies educate students (in grades K-5) and their teachers on watersheds and urban runoff pollution prevention
- *Middle School Outreach* - Outreach to middle schools will be continued through the *Wacky Watersheds* teachers training workshop. This workshop is offered free of charge to teachers by the City of San Jose. In the last few years, the Program's Schools and Youth Outreach Work Group worked with the *Wacky Watersheds* group to identify three lessons on watersheds, correlate them to State Standards and integrate them in the workshop binder. In FY 04-05, the Program purchased tote bags for packaging the workshop materials (binder, video tapes and a map) and began offering stipends to teachers as an incentive for attending the workshop. Efforts are ongoing to make this workshop available to teachers at their in-service training days. In FY 06-07, the Wacky Watersheds workshop staff held 2 workshops and trained 40 teachers. Three teachers applied for and received the *Wacky Watersheds* stipend.
- High School Outreach – The Program's Schools and Youth Outreach Work Group will begin discussions on how to develop and implement an outreach program for high school students.

[2] SCVURPPP Watershed Education and Outreach Strategy, June 2004

Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso

- The Program provides resources to the Alviso Education Center to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. This is an on-site educational program conducted primarily on weekends. The activities focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The Program will continue to support these activities in FY 08-09. Attachment 6-1 describes the activities offered in the Watershed Watchers Program.

Additional Tasks

- Include more citizen involvement activities in the Watershed Watchers program
- Develop and implement more activities geared toward high school students

Pesticide User Outreach

This project focuses on implementing outreach requirements for pesticides toxicity control. Tasks for FY 08-09 include the following:

IPM Store Partnership Program

The Program will continue "point-of-purchase" outreach at Santa Clara County stores using "shelf talkers" and "Less-toxic Pest Control" fact sheets. Program staff will visit each participating store approximately every three months, maintain an ongoing relationship with participating stores through in-store contacts; refresh/restock literature racks (as needed); and update "shelf talker" labels (as needed). Using the services of Annie Joseph, IPM consultant, the Program will provide training to store employees on selling less-toxic pesticides; and work with two stores to increase shelf-space for less-toxic products.

Outreach Events) – The Program will participate in selected community outreach events for conducting IPM outreach. Possible events are:

- Pumpkins in the Park
- Spring in Guadalupe Gardens
- San Jose Home and Garden Show

Program, Watershed Watch, and Co-permittee staff will staff these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures.

Media Advertising– The Program's Watershed Watch Campaign will conduct media advertising to include messages that promote "OWOW shelf-talkers" for selecting less-toxic products. In addition, new messages, encouraging residents to hire IPM certified Pest Control Operators will be developed and used.

Support the Regional IPM Conference – The Program will provide funding to support the Regional IPM Conference, if required.

Green Gardener Training– In FY 07-08, the Program is partnering with the Metropolitan Adult Education District, City of San Jose, and the Santa Clara County Master Gardeners to conduct a "Green Gardener" training for landscape maintenance workers. Each training session (10 classes) provides hand-on training to attendees on principals of sustainable landscaping. Depending on the success of this training, the Program will continue to offer this training in FY 08-09. The Program will also conduct outreach to residents encouraging them to hire trained "Green Gardeners".

Outreach to businesses - Continue distributing the "Don't set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.

Support the Going Native Garden Tour - Provide funding to support promotional activities for the Going Native Garden Tour 2008.

Mercury Pollution Prevention Outreach

The focus of the Program's Mercury Pollution Prevention Outreach is to promote the proper disposal of fluorescent light bulbs. Since FY 02-03, the Program has partnered with the Santa Clara County HHW Program to conduct outreach to residents and businesses on this issue. Outreach is conducted using media advertising, in-store displays (posters, banners), newsletter articles, and at community events.

In FY 08-09, the Program will continue to conduct outreach to promote the fluorescent lamps disposal locations.

Regional Collaboration

The Bay Area Stormwater Management Agencies Association (BASMAA) conducts regional through three committees: Media Relations, Regional IPM Store Partnership Program and Regional Advertising Campaign. In FY 08-09, Program staff will continue to participate in these committees to implement various outreach tasks. Anticipated activities for these committees are described below:

Regional Advertising Campaign

The Program plans to continue with its participation in the BASMAA Regional Advertising Campaign (RAC) in FY 08-09. From FY 02-03 through FY 04-05, the RAC implemented the "Beautiful Watersheds" advertising campaign for increasing the public's awareness about watersheds and problems caused by litter. The advertisements were broadcast on radio and television. In August 2007, the RAC Committee together with the BASMAA IPM Partnership Committee conducted advertising to promote the Our Water Our World logo and website. Currently, the RAC is planning a multi-year advertising campaign focusing on litter. The first set of advertising will begin in April or May 2008.

Media Relations Campaign

The Media Relations Campaign is a joint effort supported by BASMAA and the Bay Area Clean Water Association (BACWA). The primary goals of the campaign are to develop long-term relationships with the media and to generate media coverage that would encourage individuals to adopt behavior changes to prevent water pollution. The Program will continue to participate in this campaign to develop pitch stormwater related articles/PSAs.

Regional IPM Partnership

The Program will continue to support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. This Regional Program, with input from IPM experts and participating stormwater programs, provides fact sheets, promotional materials, training sessions, display materials for stores, and an alternative products list. The Program and Co-permittees are responsible for recruiting stores, arranging training sessions for store employees, in-store display set-up, display maintenance, and on-going contact with participating stores.

Tasks for FY 08-09 include development of new fact sheets, reprinting existing fact sheets, and conducting an advertising campaign (in coordination with the RAC Committee), to promote the Our Water Our World (OWOW) logo and website.

Other Ongoing Program PI/P Support Activities

Advertising to Support Creek Cleanup Events

Each year the Creek Connection Action Group sponsors two creek clean-up events: Coastal Clean-up Day in September and National Rivers Clean-up Day in May. In FY 08-09, the Program will continue to provide funds to advertise one of these events.

Program's Toll-Free Telephone Numbers

The Program maintained two toll free telephone numbers, the Program's information number (800-794-2482) and the Watershed Watch hotline (866-WATERSHED), for calls from the general public and requests for information.

PI/P Material Reprints and Supplies

The Program purchases materials (brochures, giveaways, etc,) as needed for the Program and Co-permittee use.

Distribution of Restaurant BMP Materials

In FY 00-01, the Program developed a restaurant wash water BMPs kit (letter, list of BMPs and a poster) to educate restaurant workers on proper disposal of wash water. Santa Clara County Department of Environmental Health inspectors (Consumer Protection Division) have been handing out this kit to restaurant managers during inspections. In FY 08-09, they will continue to distribute this kit to every newly constructed and remodeled food facility in the County.

ATTACHMENTS

Attachment 6-1 Watershed Watchers Program Work Plan Tasks

Table 6-1
Pollutant Matrix for FY 08-09 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 08-09 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Diazinon[2] and pesticides in general	Pesticides (residential, commercial and municipal use)	• Home gardeners • Pest control professionals • Landscapers • Municipal Employees • Residents who hire pest control professionals	Information on Watershed Watch website, IPM Store Partnership Program (regional and local), Pesticide User Outreach activities, distribution of restaurant brochure "Don't Set a Table for Pests" through County Health Inspectors, media advertising.	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "When Ants Invade" Self-Mailer, "Landscaping, Gardening and Pool Maintenance" tri-fold, "Don't Set a Table for Pests", IPM Store Partnership Program Fact Sheets, "Control It", HHW programs, BASMAA Media Relations Campaign topic, Got Bugs magnet, Watershed Watch and BASMAA media advertisements.
Sediment	Erosion from new construction, grading, road wear	• Construction companies/contractors • Architects/engineers • Municipal inspectors • Residents (home improvement projects, remodels)	Outreach to developers via RWQCB Construction Site Management Workshops or other mechanism.	Construction BMP Tri-folds in English, Spanish and Vietnamese, "Blueprint for a Clean Bay" (revised 1-04), Construction Site Management workshops, Dewatering Brochure.
Mercury	Tailpipe emissions (i.e., diesel-powered vehicles), consumer products (thermometers, fluorescent lighting)	• Residents (auto use, general awareness, proper selection and disposal of products) • Industry (fleet use) • Commercial (fleet use)	Information/fact sheets on Watershed Watch website, BASMAA Media Relations Campaign (potential topic), Mercury P2 Outreach (Residential and business fluorescent light recycling),	"Spare the Air and Water Too" campaign press release and public service announcements, bill stuffers, Program and local co-permittee fact sheets (e.g., Palo Alto and Sunnyvale),

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.
[2] Under terms of an agreement between EPA and pesticide manufacturers, as of December 31, 2004, residential outdoor and indoor uses and sales of Diazinon are prohibited. Program outreach on other pesticides is continuing.

Table 6-1
Pollutant Matrix for FY 08-09 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 08-09 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
			media advertising.	Watershed Watch radio, transit and print ads, store signage, posters, newsletter articles.
Copper	Brake pads, industrial discharge, copper algaecides, coolant leaks, illegal dumping	• Industry (scrubbers, roofs, cooling towers, piping) • Residents (illegal dumping, pools and spas) • Commercial business (pool, spa, fountain maintenance) • Municipal maintenance staff	BASMAA Media Relations Campaign (potential topic), Information on Watershed Watch website, support of Brake Pad partnership through BASMAA.	Brake Pad Partnership, "Keep Pool/Spa Water Out of Storm Drains, Streets, and Creeks" (older pool and spa brochure), "Keeping It All In Tune", Industrial BMPs, storm drain stencils, "Draining Pools & Spas – Keep Pool, Spa and Fountain Water Out of Storm Drains, Creeks and the Bay", Palo Alto's fact sheet on architectural use of copper.
Nickel	Industrial discharges, tailpipe emissions, construction-related erosion	• See sediment and mercury target audiences	See sediment and mercury projects.	See sediment and mercury projects.
Trash	Intentional littering (cigarette butts, throwing objects from automobiles, illegal dumping), trucks hauling poorly secured materials, uncovered or overflowing garbage cans	• General public • Children • Drivers • Smokers	BASMAA media relations campaign (potential topic), Information on Watershed Watch website, BASMAA Regional Ad Campaign topic.	"The Bay Begins at Your Front Door" brochure, Watershed Watch magnets, Watershed Watch Kit brochure, Watershed Watch web site, BASMAA's "Beautiful watersheds/trash" TV and radio ads.

Table 6-2
FY 08-09 PI/P Projects

Project Title	Project Description	Comments
1. Watershed Education and Outreach Campaign (Year 8)	Funding for the Watershed Education and Outreach Campaign. Includes: • Funding for the Watershed Watch Campaign • Funding for educational programs at the Alviso Ed Center coordinated with the Watershed Watch Campaign; • Funding for ZunZun to perform a watershed – themed show at schools in Santa Clara Valley. • BASMAA Regional Ad Campaign • Advertising to support Creek Cleanup Activities	Proposed Activities: • Watershed Watch Campaign • BASMAA RAC • School Outreach • Alviso Education Center • Advertising to support Creek Cleanup Activities
2. Pesticide User (PU) Outreach (Year 6)	Includes outreach to residents, commercial businesses, and pest control operators/landscapers.	SCVURPPP will continue to support the Regional IPM Partnership Program, and consider supporting other pesticide related projects through its participation in BASMAA. Program will continue to maintain the stores participating in the store partnership program. Additional outreach will be done locally to pesticide users, potentially residential and commercial users, residents hiring pest control professionals, and/or other audiences. Outreach will be conducted at community events and through media advertising.
3. Mercury Pollution Prevention Outreach (Year 5)	Continuing outreach on proper disposal of mercury containing wastes and education on low-mercury products.	Program will continue its mercury outreach and coordinate its efforts with the County HHW Program in implementing its mercury grant.
4. Program Supplies	Estimated budget for reprints of materials for Program use and other Program supplies.	

Attachment 6-1

Attachment 6.1: "Watershed Watchers: Keeping Our Waterways Clean" Program with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso.

The Program provides resources to the Don Edwards San Francisco Wildlife Refuge Environmental Education Center in Alviso to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. Watershed Watcher activities, which are conducted on-site and primarily on the weekends, focus on building watershed awareness, promote watershed stewardship, and encourage stormwater pollution prevention behaviors among attendees (general public, weekend visitors, families with children etc.).

The Program's Alviso Work Group will meet with Alviso Ed Center staff to work toward including more citizen involvement activities in the Watershed Watchers program.

The Watershed Watchers Program conducts more than a hundred activities for children and adults each year. These include:

Wildlife in Our Watershed Depends on You: Interpretive programs focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed. Examples include children's bird walks, adult birdwatching, live animal presentations, twilight walks and general nature hikes. All programs include a segment addressing runoff pollution covering causes, resulting problems, and identifying actions visitors can take at home to prevent or lessen the problems.

Gardening without Chemicals: Stewardship activities that encourage and inspire visitors to create wildlife habitats and use chemical-free garden techniques in their own backyards. Garden work days are offered emphasizing chemical-free gardening techniques. Native plant gardening workshops begin in the classroom and end with a tour of the EEC native plant demonstration gardens while discussing chemical-free gardening techniques and implementation methods for the home garden.

Our Role in Preventing Urban Runoff: Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. This is usually done with groups that make reservations (e.g., Scouts, Lyceum, Sierra Club, and senior groups).

Special Events: These events are designed to attract at least 200 people to the EEC for various activities including games and crafts. Urban runoff pollution prevention messages are incorporated into several of the activities featured during the event.

Other Watershed Watcher program tasks include:

Developing and Maintaining Partnerships with Local Community Organizations: Partners include Santa Clara Valley Audubon Society, Friends of Guadalupe River Park & Gardens, the San Francisco Bay Bird Observatory, Happy Hollow Park & Zoo, and volunteer coordinators at local companies (e.g., Cisco and Hands On Bay Area, etc.).

Coordinating Refuge Volunteers for Interpretive Programs/Gardens: Contacting volunteers to lead programs, training, and maintaining relationships with volunteers; and scheduling volunteers for special events.

Informal Indoor Visitor Contact: Includes interaction at the Center and answering visitor questions over phone.

Outreach to Local Media: Includes contacting local newspapers and other publications; posting program and event announcements in online calendars (e.g., Acterra and Craigs List); and creating appropriate event descriptions for press releases.

SECTION 7

WATER QUALITY MONITORING PROGRAM PLAN

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 2008-2009 Work Plan

7. WATER QUALITY MONITORING PROGRAM PLAN

INTRODUCTION

This section serves as the Annual Monitoring Program Plan for the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program). The monitoring plan provides brief descriptions of receiving water monitoring and assessment activities that will be conducted by the Program in FY 08-09. Planned activities described in this section include implementation of the sixth year of the SCVURPPP *Multi-Year Receiving Waters Monitoring Plan* (Multi-Year Plan), participation and financial support to the Regional Monitoring Program (RMP) for Water Quality in the San Francisco Bay Estuary, the Bay Area Macroinvertebrate Bioassessment Information (BAMBI) network and the BASMAA Monitoring Committee.

ONGOING AND PLANNED MONITORING ACTIVITIES

In recent years, the Program has conducted and/or actively participated in water quality monitoring activities focused on local creeks, the San Francisco Bay and the linkage between the two (i.e., tributary loading studies). These activities have been generally conducted by the three programs described in following paragraphs.

Santa Clara Valley Receiving Water (Creek) Monitoring

In 2002, the Program developed and began implementing its' Multi-Year Plan in compliance with Provision C.7 of the Program's current NPDES Permit. The Multi-Year Plan is intended to assist the Program in:

- Developing a better understanding of the chemical, biological, and physical characteristics of water bodies and watersheds relevant to the Program, which will help inform decisions about future management actions and help clarify and resolve urban runoff related issues within watersheds;
- Assessing baseline water quality conditions in representative watersheds within Program boundaries to evaluate urban runoff impacts and help solve creek drainage basin-specific water quality problems;
- Assessing whether specific pollutants of concern are found in urban runoff discharges and impact water quality in local water bodies and the San Francisco Bay; and
- Evaluating overall Program effectiveness over time.

The Multi-Year Plan was designed to assess water bodies in the Santa Clara Basin using an iterative rotating watershed approach similar to the San Francisco Bay Water Board's Surface Water Ambient Monitoring Program (SWAMP). In 2004, the Multi-Year Plan was revised (i.e., Revised Multi-Year Plan) to include a decision framework linking receiving water monitoring and watershed assessment, which includes the following steps/categories 1) Watershed Characterization; 2) Screening-Level (Status/Condition) Ambient Water Quality Monitoring; 3) Water Body Assessment; 4) Investigative Studies; and 5) Trends/Effectiveness Monitoring. The following paragraphs briefly summarize the tasks completed to-date by the Program through the Revised Multi-Year Plan. Table 7-1 lists the watersheds where monitoring and assessment activities have been conducted between FY02-03 and FY 07-08.

- Watershed Characterization is intended to assist the Program in evaluating and documenting the current understanding of beneficial use condition and potential impacts in local water bodies. As defined, watershed characterization entails two tasks. First, water quality data and watershed information collected to-date are summarized in a watershed characterization memorandum. The memorandum includes a compilation of existing data sources and a summary of the geologic and geomorphic setting, vegetation, land uses and associated water quality issues. An evaluation of the status of biological communities and relevant beneficial uses in the watershed(s) is also provided. Second, a creek survey using a Unified Stream Assessment (USA) method (Center for Watershed Protection) is conducted to identify potential impacts to beneficial uses and to assess the quality of the physical habitat. As part of this effort, field data collected is entered into a database and evaluated.
- Screening-Level Monitoring (Status and Trends) is conducted to asses the condition of aquatic life use and recreational uses in Santa Clara creeks. The program has identified and collected ecological indicators in local creeks to serve as measures that characterize ecosystems or one of its critical components. An indicator may reflect biological, chemical and/or physical attributes of ecological condition. The primary uses of an indicator are to characterize current status and to track or predict significant change. With a foundation of analytical research, an ecological indicator may also be used to identify major ecosystem stress.

Table 7-1. Summary of monitoring and assessment activities conducted between FY 03-04 and FY 07-08 by SCVURPPP.

Activity	Watershed												
	Lower Penitencia	Lower Silver-Thompson	Upper Penitencia	Stevens	Coyote Maintstem	San Tomas Aquino	Calabazas	Sunnyvale East and West	Adobe	Permanente	Matadero/Barron	San Francisquito (1)	Guadalupe (2)
Watershed Characterization				X	X	X			X	X	X		
Screening-Level Monitoring (Status and Trends)	X	X	X	X	X	X	X	X	X	X	X		
Water Body Assessments			X	X	X	X							
Investigative Studies				X									

(1) Monitoring is conducted through the San Francisquito Creek Joint Powers Authority (JPA), which includes data collected by the City of Palo Alto. Program staff track and data collected via this effort and coordinate as needed with the Program's monitoring program.

(2) Monitoring has previously been conducted by the SCVWD, the City of San Jose and the RMP/CEP. In addition, the Program and the City of San Jose conducted a first flush monitoring and analysis effort (see Journal of Environmental Management 76(2005) 309-318.)

- Water Body Assessments (Sediment and Ecosystem Function) are systematic reviews of specific resources (e.g., benthic macroinvertebrates or fish) and their habitat and riparian areas in a watershed-scale context. Water body assessment is a stage-setting process based primarily on existing information. Assessments typically address cumulative effects within a watershed; provide for more ecologically sound resource planning; and identify and help protect environmentally sensitive areas. The Program uses the results of water body assessments to identify data gaps that provide context for subsequent monitoring and follow-up studies; and to recommend feasible management actions. In the recent past, the Program has conducted two types of water body assessments in Santa Clara Basin watersheds – ecosystem functional and sediment assessments.
- Investigative Studies are conducted when water quality data indicate that a water quality impact may be occurring. Investigative studies are typically more focused in comparison to status and trends monitoring, and are designed to collect additional information that is needed to better understand the magnitude and extent impacts that may be occurring.

FY 08-09 Implementation Tasks

Regional Monitoring Collaborative (RMC)

In current and previous municipal stormwater NPDES permits, large and medium sized municipalities in the San Francisco Bay area have been required to implement monitoring programs to measure stormwater impacts on receiving waters, determine sources of pollutants and measure effectiveness. Some activities, such as participation in the San Francisco Bay Regional Monitoring Program (RMP) and more recent TMDL-related special studies, have been coordinated consistently among permitees. Building on these experiences, the Program intends to begin participating in the development of a Regional Monitoring Collaborative (RMC) in FY 08-09. Activities that will be conducted as part of the development of the RMC may include, but are not limited to, those summarized below. As the RMC is better defined, more detailed work plans will likely be developed to better define tasks, deliverables and schedules for completion.

1. RMC Organizational Structure – Program staff will actively participate in the development of an organizational structure that will define tasks to be completed by the RMC, the decision-making process and membership, and communication structure. It is anticipated that Program staff will participate in a series of meetings between BASMAA member agencies and actively participate in the development of materials and deliverables.
2. Development of Monitoring (Experimental) Design – Although not fully clear at the time this work plan was completed, it is assumed that the RMC will undergo a development of a regional monitoring design for the following monitoring activities: 1) Status Monitoring; 2) Long-Term Trends Monitoring; 3) Monitoring Projects; and 4) Pollutant of Concern Monitoring. The monitoring design will likely include input and/or direct involvement from scientists and statisticians (i.e., subcontractors) heavily experienced in designing monitoring programs. Deliverables for this activity are expected to include sampling and analysis plans (SAPs), presentations and meeting summaries.
3. Quality Assurance and Control Programs – To ensure that the highest quality of data are being collected through the RMC, the Program will actively participate in the

development of a data quality assurance and control program. Tasks completed through this program will likely include the development of field and laboratory standard operating procedures (SOPs) and forms; data quality objectives specific to the RMC; and data entry and review procedures.

4. Information Management System – As data are collected by RMC participants and received from laboratories, it must be stored and managed in a cost effective manner that allows data users to easily access data and information. It is highly likely that the most cost effective way to develop this system is collectively through the RMC. Therefore, it is assumed that Program staff will actively participate in the development of an information management system that will serve as a regional data center for water quality monitoring data collected by BASMAA member agencies. Deliverables will likely include data structures, technical user manuals and databases.
5. Data Analysis and Reporting – Based on the tasks agreed to by RMC members, regional data analysis tools and reporting structures may also be developed in FY 08-09. Program staff will likely be heavily involved in the develop of such tools and reporting formats, considering our experience in developing annual monitoring reports, multi-year data summaries and fact sheets.

San Francisco Estuary Receiving Water Monitoring

The Regional Monitoring Program (RMP) for Water Quality in the San Francisco Estuary is a long-term monitoring program that shares financial support, direction, and participation by regulatory agencies and the regulated community with the goal of assessing water quality in the Bay. In accordance with the Program's NPDES permit, the Program has contributed approximately $175,000 annually to the RMP in recent years. This funding is in addition to separate funding provided by the three South Bay POTWs (which are operated by SCVURPPP Co-permittees) to SFEI. In addition, Program staff participates on the RMP Steering Committee, Technical Review Committee, Contaminant Fate Work Group, and Sources, Pathways and Loading Work Group (SPLWG). The Program Manager serves as the BASMAA representative to the RMP Steering Committee.

FY 08-09 Implementation Tasks

The Program plans to continue to financially support the RMP in FY 08-09 at a cost of approximately $175,000. In addition, Program staff plan to continue to participate on the RMP Steering Committee, Technical Review Committee, Contaminant Fate Work Group, and Sources, Pathways and Loading Work Group (SPLWG).

Regional Biological Assessment Network (BAMBI)

In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in storm water programs that include rapid bioassessments in their watershed monitoring and assessment programs. Since the initial workshop, the Program has assisted (with planning and coordination) and participated in six annual BAMBI workshops (through 2008).

In support of BAMBI, Program staff has assisted in the development of a Benthic Index of Biotic Integrity (B-IBI) for Bay Area Creeks, with the goal of developing a regional bioassessment tool necessary to provide context to data collected in Santa Clara Basin creeks. A draft BAMBI IBI Work Plan was presented at the 2005 BAMBI Workshop and Program staff has provided in-kind services to implement specific tasks identified in the work plan in recent years.

FY 08-09 Implementation Tasks

The Program plans to continue to assist in the completion of the B-IBI for Bay Area Creeks in FY 08-09. In addition, Program staff also plan to take the lead on planning and coordinating the 2009 Annual BAMBI meeting that allows local agencies (including SCVURPPP) to exchange information and discussion bioassessment related research conducted in the Bay Area.

Watershed Data Management

The Program is prepared to conduct the following activities in FY 08-09 related to data management:

Program's Website

Program staff continually updates and maintains the Program's web site (www.scvurppp.org) to ensure the effective distribution and review of draft and final products; the distribution of available water quality monitoring data and analysis; and internal communication with the Management Committee and other interested parties. In 2005, Program staff released an updated version of the Program's website. An additional update is currently underway and will be completed in 2008. In FY 08-09, the Program will continue to manage the website and post information and documents as they are completed. To date, the Program has completed over 375 work products or major reports. The vast majority of these documents are available on the website as downloadable documents.

Streams Studies Inventory

The Watershed Assessment and Monitoring Subgroup (WAMS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAMS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0), November 2003 (version 5.0), June 2005 (version 6.0) and September 2006 (version 7.0). The Program funded the initial development of the SSI and each of the annual updates.

In FY 07-08, the Program began to develop a new process for obtaining and displaying information on current projects that would typically be described in a SSI report. Beginning

in FY 08-09, the SSI will be web-based and allow users to query information on current and historical environmental data collection and assessment efforts that are included within the Program's metadata database. Beginning in FY 08-09, the SSI will be available through the Program's website.

SCBWMI Land Use Subgroup

In recent years, the Program supported the SCBWMI Land Use Subgroup (LUS) to assist in developing strategies for controlling impacts of land use on beneficial uses. While providing administrative support and leadership for the LUS, the Program also assisted with specific technical and training projects consistent with Program goals and objectives.

In FY 08-09, the Program will continue to provide limited support to the LUS by providing administrative support and direction; assist with training workshops for municipal staff on the connection between land development and water quality; and incorporate water quality friendly designs in development projects which are consistent with the top five priorities identified by the SCBWMI.

SECTION 8

POLLUTANTS OF CONCERN CONTROL PROGRAMS

8. POLLUTANTS OF CONCERN CONTROL PROGRAMS WORK PLAN

INTRODUCTION

This section summarizes Program tasks planned for FY 08-09 that are designed to assist Co-permittees in reducing and/or controlling the discharge of pollutants of concern (POCs) in stormwater. Task summaries are included for pesticide toxicity, trash, mercury, polychlorinated biphenyls (PCBs) and copper control programs. Tasks described build upon previously submitted work plans and strategies, and include those that will likely assist Co-permittees in complying with provisions in the Municipal Regional Permit (MRP), which is scheduled for adoption in 2008.

PESTICIDE MANAGEMENT PROGRAM

The Program's approach to pesticide management focuses on source control and pollution prevention. Program BMPs for pesticide management have included significant outreach efforts to residents, businesses, and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide issues; and development of local pest management plans.

The Program submitted its original Pesticide Management Plan (Pesticide Plan) to the Water Board in 2001. The Pesticide Plan was then revised several times in subsequent fiscal years. The objective of the Pesticide Plan is to control pesticide-related toxicity in urban water bodies in the Santa Clara Valley, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Pesticide Plan identifies the goals of each work plan element, actions, monitoring mechanisms and schedules; and indicates whether actions will be implemented at the Program or Co-permittee level. Program-level actions in the Plan form the basis of the Program's Work Plan. The details of municipality actions and schedules are provided in individual Co-permittee pest management plans submitted with the Co-permittees' Annual Reports and future tasks are provided in the Co-permittees' work plans.

FY 08-09 Implementation Tasks

Building on tasks completed in previous fiscal years, the following will be completed by the Program in FY 08-09 during implementation of the SCVURPPP Pesticide Management Plan:

- The Program will continue to assist Co-permittees in developing or revising IPM policies or ordinances as needed, and revising model standard operating procedures (SOPs) for implementing IPM policies or ordinances.
- Program will coordinate with BASMAA and/or other agencies to conduct training for municipal staff as needed.
- Program will assist Co-permittees in developing and/or modifying model contract specifications for municipal contractors as needed.
- Program will participate and track CASQA, BASMAA, and UPC activities, and if requested, submit comment letters on pesticide and water quality related policies in

development by the USEPA and California Department of Pesticide Regulation (DPR).

- Program staff will assist Co-permittees in evaluating the effectiveness of control measures through the assessment of water quality and sediment quality data collected in Santa Clara Valley Creeks and the Bay Area.
- The Program will continue implementing the following outreach tasks:
  - Implement Our Water Our World Store Partnership Program in participating Santa Clara County stores.
  - Provide information on how to hire a structural or landscape pest control operator.
  - Provide information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention.
  - Conduct outreach about the OWOW program.
  - Continue to coordinate with County HHW Program to facilitate appropriate pesticide water disposal, conduct education and outreach, and promote appropriate disposal.
  - Provide IPM training to landscapers through the "Green Gardener" program, if resources are available.

TRASH REDUCTION

On November 14, 2001, the Water Board released the document entitled Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region Report. This report stated that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …" In a proactive response to the 303(d) Staff Report, the Program's Management Committee formed a Trash AHTG that developed a Work Plan (submitted March 1, 2003) to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways of the Santa Clara Basin.

Since FY 03-04, the Program has completed the following Work Plan tasks: 1) Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in or near creeks; 3) Assist municipalities in identifying trash problem areas and sources of trash; 4) Conduct trash evaluations at a subset of identified trash problem areas; 5) Identify and begin to implement or refine existing trash control measures, where feasible, to address trash problem areas; and 6) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

In October 2006, Program staff developed a *Draft Trash Management and Effectiveness Assessment Strategy* (Strategy), which was reviewed by the Trash AHTG. The Strategy includes four main areas of Program activity associated with trash:

1) Identifying trash problem areas and sources;
2) Selecting and implementing appropriate control measures at high priority problem areas;

3) Assessing the effectiveness of control measure implementation; and
4) Providing administrative support to the Trash AHTG.

Recent and current activities related to these tasks are briefly summarized below.

Identification of Trash Sources and Pathways

To gain a better understanding of the sources, pathways, extent and effects of trash on urban creeks and waterways within the Santa Clara Basin, the Program developed a summary of its conceptual understanding ("Conceptual Model") of potential trash sources and pathways to urban creeks. Defining source and pathway categories will assist the Program in:

- Developing consistent terminology for effective communication between Co-permittees, regulatory agencies and other stakeholders;
- Continuing to build its conceptual understanding of trash source types present in watersheds; and how these sources enter creeks and waterways; and,
- Determining the most optimal and cost effective control points to implement control measures.

Source and pathway categories are based on knowledge gained through numerous trash evaluations conducted in Santa Clara County creeks and the Program's general knowledge of how trash is deposited and transported to local waterways. The Conceptual Model includes an easy-to-read illustration of trash sources and pathways to urban creeks.

Prioritization of Trash Problem Areas

Program staff is currently developing a memorandum that will begin to assist Co-permittees in the identification and prioritization (for future evaluation) of on-land trash problem areas (i.e., source areas) and watersheds based on risks to creeks. This information will be used to inform future control measure implementation at the most problematic areas; and help to identify successful future monitoring and effectiveness assessment methods and sites. The initial memorandum will be completed in 2008.

Pilot Demonstration Projects (Trash Full Capture Devices)

Co-permittees with assistance from Program staff, have launched two (San Jose and Sunnyvale) Pilot Trash Structural Treatment Control Studies (Pilot Studies) in the Santa Clara Valley where approximately 75 StormTek™ "full capture" treatment devices have been purchased and installed within the Cities of San Jose and Sunnyvale. Both studies are designed to answer the following management questions:

1) What are the trash loading rates from specific land uses to the stormwater conveyance systems?
2) What is percentage of different types of materials (e.g., trash, sediment, leaves, grass) removed by selected treatment devices?
3) What is the maintenance frequency needed for proper operation of selected BMPs?
4) What are the overall costs of treatment per amount (volume or weight) of trash removed?

Findings to-date from the Pilot Studies will be included in the Program's FY 07-08 Annual Report.

FY 08-09 Implementation Tasks

Building on tasks completed in previous fiscal years, the following will be completed by the Program in FY 08-09 during implementation of the SCVURPPP *Trash Management and Effectiveness Strategy*:

- Program staff will continue to assist Co-permittees in identifying high priority trash loading areas and opportunities where BMPs can be implemented. Task includes GIS-related tasks, modeling, field visits and meetings with individual Co-permittees.
- Program staff will assist Co-permitees in selecting catchments where full capture treatment devices would be best sited, and where enhanced trash treatment controls would be most effectively implemented.
- Program staff will develop guidance on the implementation of enhanced trash management practices and full capture devices.
- Program will provide on-going technical and management support to Co-permittees on issues associated with trash control measures and implementation.

MERCURY AND PCBs CONTROL PROGRAMS

The Program's current NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury and PCBs. Both contaminants have been found in relatively high concentrations in some types of fish caught in the Bay and may threaten the health of humans consuming those fish. These concerns prompted the Program to develop ongoing work plans for controlling PCBs and mercury. Brief descriptions of these work plans and summaries of recent tasks are described below. FY 08-09 tasks are also provided.

Mercury Pollution Prevention

In an attempt to reduce the concentration of mercury in fish and wildlife, a total maximum daily load (TMDL) for mercury in the San Francisco Bay has been adopted and approved. Consistent with implementation actions for urban runoff in the TMDL and current permit requirements, the Program continues to revise and implement the SCVURPPP Mercury Pollution Prevention Plan (Mercury Plan). The Mercury Plan includes the goals of each work plan element, actions, monitoring mechanisms and schedules; and, indicates whether actions will be implemented at the Program or Co-permittee level. Program-level actions in the Plan form the basis of the Program's Work Plan. The details of municipality actions and schedules are provided in individual Co-permittee pest management plans submitted with the Co-permittees' Annual Reports and future tasks are provided in the Co-permittees' work plans.

The Mercury Plan addresses five general goals:

1) **Municipal Use of Mercury-Containing Products** – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

2) **Household Hazardous Waste Collection** – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

3) **Monitoring and Science** – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

4) **Regional, State, and Federal Coordination** – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

5) **Public Education and Outreach** –Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

Mercury Plan tasks recently completed by the Program include:

- Guidelines for Reduction and Management of Mercury-Containing Products;
- Conducting mercury pollution prevention outreach activities;
- Collecting and analyzing water and sediment samples from selected Santa Clara Valley watersheds as part of its receiving waters monitoring and assessment program. and,
- Financially and technically supporting special studies completed via the Clean Estuary Partnership (CEP) and the RMP.

PCBs Control Program

During the past several years, the Program has annually described tasks our work plans to reduce PCBs in urban runoff. These tasks included:

- Leading a regional study, referred to as the Joint Stormwater Agency Project (JSAP), which characterized the distribution of mercury, PCBs and chlorinated pesticides in storm water conveyance sediments in Bay Area watersheds.
- Funding BASMAA, the Clean Estuary Partnership (CEP), and the San Francisco Estuary Regional Monitoring Program (RMP).
- Participating in selected stakeholder, BASMAA, CEP and RMP committees and work groups.
- Collecting and analyzing water and sediment samples from selected Santa Clara Valley watersheds as part of its receiving waters monitoring and assessment program.
- Performing PCBs case study work with the City of San Jose in six urban areas in where elevated concentrations of PCBs were found during the JSAP study.
- Developing guidance documents on performing PCBs case studies to assist other Bay Area storm water agencies.
- Preparing a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County.

- Completing a review of efforts to develop methods of controlling discharges of PCBs from Bay Area urban runoff conveyances.

FY 08-09 Implementation Tasks

Building on tasks completed in previous fiscal years, the following will be completed by the Program in FY 08-09 during implementation of the SCVURPPP Mercury and PCBs Control Programs. Many of these tasks are regional in scope and may likely be coordinated through a Regional Monitoring Collaborative (RMC). As the RMC is better defined, more detailed work plans will likely be developed to better define tasks, deliverables and schedules for completion.

Mercury and PCBs

- Program will develop (likely thorough a regional project) training materials for industrial inspections and incorporate into training work shops for industrial inspectors conducted by the Program.
- Program plans to identify and begin conducting pilot projects in drainage area(s) with elevated concentration of PCBs and/or mercury. Pilot projects will likely include:
  - Identifying potential PCB/Hg source areas and areas where PCB/Hg contaminated sediment accumulates;
  - Ranking and mapping potential PCB/Hg source areas within each drainage; and
  - Conducting sampling and analysis in selected drainage areas as needed to identify more specific source areas and potential BMPs.
- Program plans to begin conducting (likely through participation in a regional project) a study to evaluate the cost-effectiveness of high-efficiency street sweepers in reducing pollutant loads and developing recommendations for follow-up studies.
- Program plans to begin conducting (likely through participation in a regional project) a study to evaluate the feasibility and potential effectiveness of implementing on-site stormwater treatment through retrofits.
- Program plans to begin conducting (likely through participation in a regional project) a study to evaluate the feasibility and potential effectiveness of diverting dry weather and/or first flush flows to public owned treatment works (POTWs).
- Program plans to continue participating (likely through regional project) in a risk reduction program implemented throughout the region.
- Program will assist in developing (likely a regional study through BASMAA) methods for calculating mercury prevented from entering the San Francisco Bay through Co-permittee implementation of pollution prevention, and source and treatment controls.

PCBs

- Program plans to provide a staff person to represent BASMAA in PCBs portion of Proposition 50-funded Taking Action for Clean Water project, which is designed to assist Co-permittees in evaluating ways to manage PCB-containing wastes/materials during building demolition and renovations.

COPPER CONTROL PROGRAM

In FY 05-06, Program staff, in consultation with Water Board staff, decided that the SCBWMI Bay Modeling and Monitoring (BMM) Subgroup did not need to conduct semi-annual reviews of the Copper Action Plan (CAP) due to the pending related activities of the Clean Estuary Partnership (CEP) and Water Board regarding the Municipal Regional Permit (MRP). In addition, the Basin Plan Amendment adopting the North of Dumbarton Bridge Copper site-specific water quality objectives (SSOs) and translators, and the Bay-wide Copper Management Strategy (CMS) was approved by the Water Board in June 2007. The Bay-wide CMS is intended to replace the language that was adopted in the Basin Plan in 2002 as part of the South San Francisco Bay copper and nickel SSO project. The copper control measures and monitoring program has a Bay-wide scope. Therefore, the majority of existing Basin Plan language pertaining to the implementation of copper and nickel objectives in South San Francisco Bay will be replaced by the CMS.

FY 08-09 Implementation Tasks

Building on tasks completed in previous fiscal years, the following tasks, which are consistent with the requirements in the CMS, will be completed by the Program in FY 08-09.

- The Program plans to continue assisting Co-permittees in establishing local ordinance authority to prohibit discharges from copper architectural features and pools/spas, and developing/revising BMPs.
- Program will assist Co-permittees in updating (likely thorough a regional project) training materials for industrial inspections to identify facilities which may use and discharge copper, and incorporate into training workshops for industrial inspectors conducted by the Program.
- Program plans to discuss the need to begin developing/conducting a study (likely thorough a regional project) to assess copper-related sediment toxicity in the San Francisco Bay and sub-lethal effects of copper on salmonids.

SECTION 9

EXEMPTED AND CONDITIONALLY EXEMPTED DISCHARGES

9. FY 08-09 CONDITIONALLY EXEMPTED DISCHARGES WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 08-09 to assist Co-permittees to develop and implement BMPs for control of conditionally exempted (non-stormwater) discharges, as well as require businesses, contractors, and residents to control these discharges. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with potential requirements of the Municipal Regional Permit.

BACKGROUND

All municipal stormwater permits require municipalities to effectively prohibit the discharge of non-stormwater into storm drains. Certain non-stormwater discharges, such as flows from riparian habitats, wetlands, springs, or unpolluted groundwater, are exempted from this provision outright (i.e., allowed to discharge to storm drains with no control measures). Other non-stormwater discharges, known as conditionally exempted discharges (CEDs), are allowed to discharge to storm drains only if certain measures are taken to control potential pollutants in the discharge.

Provision C.8.b. of the Program's current permit provides a list of CEDs that are not prohibited from discharge to storm drains, if they are identified as not being sources of pollutants to receiving waters or if appropriate control measures are developed and implemented to prevent or eliminate adverse impacts of such sources. Provision C.8.c. requires the Co-permittees to identify the categories of CEDs from this list that they want to exempt, and describe for each category either why it is not a source of pollutants or what control measures will be used to eliminate adverse impacts from that category. In compliance with this provision, the Program developed a *Conditionally Exempted Discharges Report* (June 15, 2000) that describes the approach for each category of discharge. The report covers the following CEDs:

- Uncontaminated pumped groundwater;
- Foundation drains;
- Water from crawl space pumps;
- Footing drains;
- Air conditioning condensate;
- Irrigation water;
- Landscape irrigation;
- Lawn or garden watering;
- Planned and unplanned discharges from potable water sources;
- Water line and hydrant flushing;
- Individual residential car washing; and
- Discharges or flows from emergency fire fighting activities.

In the CED Report, control measures for the discharge of uncontaminated pumped groundwater and potable water sources are based on information from the Program's Water Utility Operation and Maintenance Performance Standard and the Water Utility Operation and Maintenance Discharge Pollution Prevention Plan (WUDPPP) dated June 1998. The Performance Standard and the WUDPPP were developed for and are implemented by Co-permittees who operate municipal water utilities. They also serve as guidelines for private water companies who operate water systems within the Co-permittees' jurisdictions.

The draft Municipal Regional Permit (MRP) contains requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The MRP Tentative Order was released on December 4, 2007. Provision C.15. in the Tentative Order contains a list of exempted discharges as well as specific requirements for control of the same CEDs as the current permit, except that it adds swimming pool, hot tub, spa, and fountain water discharges.

PAST AND CURRENT ACTIVITIES RELATED TO CONDITIONALLY EXEMPTED DISCHARGES

The Co-permittees are currently implementing the BMPs described in the CED Report. They have made the BMPs part of their standard operating procedures for municipal activities. They are requiring businesses and contractors and encouraging residents to comply with these BMPs, and they have included the BMPs in conditions of approval for development projects where applicable. They are not currently required to report these discharges to the Water Board.

Since completing the CED Report, the Program's primary activities related to CEDs have involved preparation of outreach materials to educate residents about appropriate BMPs for car washing, and assisting Co-permittees as needed. Messages about proper car washing have also been included in the media advertising and outreach materials associated with the Watershed Watch Campaign. These activities have been described in the PI/P section of Program work plans and annual reports. There has not been a Conditionally Exempted Discharges section of the Program work plan in the past.

Since 2005, Program and Co-permittee staff has been involved with Water Board staff and environmental NGO representatives in a stakeholder process to develop the MRP. Program staff, as part of BASMAA, attended several meetings with Water Board staff to discuss the CED requirements, which are more prescriptive and require more tracking and reporting than current requirements. Work on the MRP is expected to continue through FY 07-08.

FY 08-09 IMPLEMENTATION TASKS

A list of tasks that will be implemented in FY 08-09 is provided below. There are no ongoing tasks, aside from continuing outreach to residents about car washing as part of the Watershed Watch Campaign (see Section 6 of this Work Plan).

- Update the Conditionally Exempted Discharges Report, as needed.
- Update the Water Utility Operation and Maintenance Performance Standard and the Water Utility Operation and Maintenance Discharge Pollution Prevention Plan, as needed.
- Prepare guidance and assist Co-permittees, as needed.

SECTION 10

REPORTING WORK PLAN

Santa Clara Valley Urban Runoff Pollution Prevention Program
FY 2008-2009 Work Plan

10. REPORTING

INTRODUCTION

During FY 08-09, the Program will conduct the following activities:

- Prepare Program's FY 07-08 Annual Report and submit to the Water Board by October 15, 2008.
- Maintain the Program's website (www.scvurppp.org).
- Work with the Management Committee and other Bay area stormwater programs through BASMAA to streamline the proposed Water Board standardized reporting format.

SECTION 11

FINAL BUDGET REPORT: FISCAL YEAR 2008-2009

SCVURPPP budget distributed to BATG and MC on December 24, 2007
Revised and re-distributed on February 12, 2008
Approved by the Management Committee on February 21, 2008

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Final Budget Report:

Fiscal Year 2008-2009

Approved
February 21, 2008

SCVURPPP budget distributed to BATG and MC on December 24, 2007
Revised and re-distributed on February 12, 2008
Approved by the Management Committee on February 21, 2008

Final Budget Report for FY 08-09

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2. Assumed SCVURPPP MRP Tasks (separate file)
3. Revised Co-permittee Assessments

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OPERATIONAL GROUP

A summary of the tasks to be performed by the Program Manager (EOA), based on the Program Manager's current contract with the SCVURPPP Contract/Fiscal Agent (City of Sunnyvale on behalf of the SCVURPPP), is provided in Items (1.), (2.), and (3.) below. The overall program budget is included in Table 1. The resource requirements are based, in part, on the requirements contained in the RWQCB Draft MRP Tentative Order, implementation of programs developed as part of Order No. 01-024 adopted February 21, 2001, Order No. 01-119 adopted October 17, 2001 (new and redevelopment requirements) and Order No. R2-2005-0035 adopted July 20, 2005 (HMP and Group 2A and 2B) and on meeting the SCVURPPP *Mission and Goals Statement* (see Attachment 1).

A summary of the key budget assumptions is shown below and additional detail that defines the basis for the budget are identified in the following sections.

- Assumes all annual State permit fees will be billed to and paid directly by individual Co-permittees.
- The Project Group estimated budgets are based on the tasks and assumptions shown in Attachment 2 (see separate file).
- Hourly labor rates are increased by 4% above FY 07-08 labor rates, consistent with the Program Manager contract.
- Annual interest accrued is available to cover additional legal and municipal permit related assistance, as needed, unless otherwise modified by the BATG and MC for additional projects.

1. Operational Group - Program Management

a. Administrative Assistance

- General administrative assistance
- Maintain Program 800 number
- Distribute PIP and other materials
- Develop partnerships with external organizations

b. Management Committee (MC) and Ad-Hoc Task Group (AHTG) Support

- Monthly MC meetings (up to 12) - develop, distribute, and post agendas; prepare and mail meeting materials; facilitate meetings; draft and finalize minutes; and conduct follow-up activities
- AHTG meetings (up to 40) - support groups formed to address specific tasks (meeting number and times vary)

c. Program Budget Administration

- Develop, draft, and finalize FY 2009-2010 budget; organize and facilitate up to four Budget AHTG meetings.
- Coordinate with Fiscal Agent, track expenditures, and prepare quarterly status reports to MC

- Prepare Program Work Plan (or equivalent) for FY 2008-2009 (includes up to 2 drafts for MC review, response to Regional Board comments, reproduction and distribution of up to5 copies, distribution of CDs to MC, and posting on website)
- Provide guidance for Co-permittees' work plans and SCVURPPP work plans
- Review all Co-permittee Work Plans and Annual Reports for completeness and consistency.

d. Coordinate with Legal Consultant

- Communicate with and assist Program legal counsel as needed (up to 5 meetings and 10 extended telephone discussions) on General Program issues.

e. Prepare RFPs, Technical Project Management

- Develop up to 4 RFPs for technical services (as required by Workplan)
- Implement Monitoring Plan including subcontractors
- Oversee contractors' work
- Coordinate with BATG/MC/Monitoring Ad Hoc Group/WAMS and hold up to four Monitoring Ad Hoc meetings annually (quarterly basis) and participate/assist in up to four separate WAMS meetings.

g. Expenses

- Approximately 10 percent of labor costs

2. Fiscal Agent: The budget assumes that the City of Sunnyvale will continue to serve as the Contract/Fiscal Agent. The line item represents the amount to be reimbursed to the contract/fiscal agent carrying out this task. All Program staff time required to coordinate with the Fiscal Agent is included under Budget Item 1.c. ii.

3. Legal Services: Budget assumes that the Program will retain the services of Morrison and Foerster (Robert Falk, Esq.) to provide legal advice. The working assumption is that the majority of the legal budget is earmarked for assistance with TMDL, HMP, and permit issues. In addition, implementation issues associated with C3 will also arise and, as appropriate, will be addressed with the available budget.

4. CASQA Dues (Regional Collaboration): Statewide stormwater organization dues. No increase in dues is included.

5. BASMAA Fee (Regional Collaboration): BASMAA is the local regional stormwater association. The Program has and expects to continue to fund the organization at about the same level for each fiscal year for the term of the permit. The budget includes some limited collaborative (in kind) resources for technical and/or legal services. BASMAA is developing a coordinated stormwater regional effort to address technical and implementation questions related to monitoring (including collaboration with SWAMP) and TMDL implementation.

6. WERF Dues: Covers the Programs costs as member of WERF

7. Contingency (MOA Requires 10% of Operating group): The contingency budget includes estimated resources to cover certain trash and PCB tasks that will be further reviewed and approved by the MC as the draft MRP requirements are further refined.

PROJECTS GROUP

The Project Group budget is developed to correspond to the specific MRP Tentative Order Provision. The working assumption is that implementation of the draft MRP will occur during FY 08-09. The SCVURPPP workplan will be developed to overlap with the draft MRP requirements where feasible. The SCVURPPP program tasks and assumptions are shown in Attachment 2. In addition to the tasks shown in Attachment 2, the following summarizes some of the additional effort contained in the various Project Group Tasks.

Regulatory Permit Assistance

a. Annual Report Preparation and Submittal

- Prepare annual report for FY 2007-2008 and submit to Regional Board by October 15, 2008 (includes preparation of 1 draft for MC review, reproduction/distribution of up to 5 hard copies, distribution of CDs to MC, and posting on website)
- Review results of Program activities and recommend improvements

b. Develop and Manage Program PI/P Program

- Implement PI/P Work Plan for FY 2008-2009
- Conduct long-range planning for Program PI/P activities
- Manage development of PI/P work plan for FY 2009-2010
- Provide support, as needed, to Co-permittee's requests for public education assistance
- Manage subcontracts

c. External Organization Liaison

- Represent Program at Regional Board, State Board, BASMAA (Vice Chair), Regional Monitoring Program (Steering Committee and Technical Committee representatives), REF, CASQA (Board Member), Urban Pesticide Committee, SCBWMI Core Group and relevant subgroups (WAMS and LUS), environmental group/public (up to 88 meetings)
- Obtain and transmit updates from state NOI database, as reasonably available.

d. Technical Review of Work Products

- Provide technical review of contractor work products
- Make recommendations to BATG/MC/Monitoring Ad Hoc Task Group regarding quality of work and any modifications needed for improvement.

e. Expenses

- Approximately 10 percent of labor costs

C3. New and Redevelopment

a. Implementation Assistance, Tracking & Reporting (Non-HMP)

- Continue to assist Co-Permittees with implementation of C.3 on projects, and with implementation of BMP O&M verification programs;
- Continue to assist with the C3PO AHTG meetings and action items;
- Develop guidance on implementing changes to Provision C.3. in the MRP, and updates to the C.3. Handbook to reflect those changes;
- Conduct workshop on C.3. implementation, exact topic to be determined by the C3PO AHTG (covered by the workshops budget);
- Continue to provide guidance and assistance with annual reporting of C.3. information.
- Continue regional roundtable meetings with Co-permittee staff and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA New Development Committee);
- Meet with Regional Board staff, Program legal counsel, Program ad hoc task group and/or environmental groups as needed;
- Conduct Program tasks to comply with permit provision C.3. (see separate Project Group budget and SCVURPPP task table).

RMP Fee (Regional Collaboration): The Regional Monitoring Program (RMP) was initiated by the Regional Board to monitor the water quality of San Francisco Bay. The San Francisco Estuary Institute has a contract to conduct sampling in the Bay and administer the program with oversight from the Regional Board and a Steering Committee. The Program is one of a number of dischargers contributing to the cost of the program. It is expected that the Program will continue to fund the RMP at about the same level (includes a 2% increase) for each fiscal year for the term of the permit.

Note:

NPDES Fee: This is the annual fee imposed on each Co-permittee by the State Water Resources Control Board for NPDES municipal storm water permits in the San Francisco Bay area. It is not included in the total SCVURPPP budget this year and is paid directly by the individual Co-permittees. During past years the Program covered these within the overall Program budget. Unfortunately, the Program can not absorb these costs this year because of new anticipated requirements. Thus, the Program has not included the estimated permit fees in the Program budget.

Attachment:

1. SCVURPPP Mission and Goals Statement
2. Assumed SCVURPPP MRP Tasks
3. Revised Co-permittee Assessments

Attachment 1: SCVURPPP Mission and Goals Statement

Mission Statement

"To assist in the protection of beneficial uses of receiving waters by preventing pollutants generated from activities in urban service areas from entering runoff to the maximum extent practicable."

The Mission Statement:

- Targets pollutant reduction measures that are needed to help protect beneficial uses
- Focuses on urban pollutant sources (as opposed to nonpoint sources generally)
- Sets a specific benchmark for implementation (as opposed to doing "anything and everything" related to pollutant sources)

This focused approach is consistent with the Program's idea of working with other parties or institutions that are better equipped to carry out specific pollution control strategies. The Program concentrates its own efforts on identifying pollution sources, and implementing pollution prevention measures, that are clearly within the authority and ability of the Co-permittees.

The Program's goals and objectives also stress this practical, focused approach.

GOAL 1: Comply with Permit

- Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)
- Reduce, to the maximum extent practicable, pollutants in stormwater runoff
- Comply with permit submittal requirements

GOAL 2: Determine Success

- Periodically evaluate the attainment of beneficial uses in selected waterways
- Evaluate changes in public awareness and behavior
- Evaluate effectiveness of specific control measures at pollution reduction.

GOAL 3: Adjust Activities to Meet Changes

- Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP
- Utilize what we learn to plan the next steps

GOAL 4: Achieve Acceptance of Urban Runoff Management Activities

- Effectively facilitate public input into Program planning process
- Integrate urban runoff goals at various intra-agency levels
- Develop and maintain a proactive interrelationship with regulatory authorities
- Publicize the efforts of the Co-permittees (Program)

GOAL 5: Integrate Urban Runoff Program Elements into other Programs

- Promulgate an understanding of the role of the urban runoff program
- Encourage other agencies to become involved in urban runoff issues
- Encourage action by the appropriate agencies

The Co-permittees intend to continue to utilize the Program's preferred approach of achieving consensus to resolve issues and reach decisions, and to rely on the Majority Vote mechanism set forth in Section 2.08 of the Agreement at the Management Committee level only when consensus-based resolutions appear or become elusive.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TABLE 1: TOTAL PROGRAM FY 08-09 BUDGET

Item	Staff Hours	Budget
Operational Group		
1. Program Management (EOA)		
Subtotal		**$578,513**
2. Fiscal Agent Expenses (City of Sunnyvale)	0	$50,000
3. Legal Services (MOFO)	0	$90,000
4. CASQA Dues	0	$15,000
5. BASMAA Fee	0	$85,000
6. WERF Member Dues	0	$8,000
7. Contingency (MOA Requires 10% of Operating Group)(3)		$364,000
Subtotal		**$612,000**
Subtotal Operational Group	**3506**	**$1,190,513**
Projects Group (1)		
Subtotal Projects Group	**10930**	**$2,673,704**
TOTAL PROGRAM BUDGET (NO SWRCB PERMIT FEE)	**14436**	**$3,864,217**

[1] Scopes for the following MRP provisions are estimates based on the summary in attachment 3. The estimates for monitoring assume participation at a regional level via BASMAA. The budget includes assumptions regarding use of subcontractors to assist with program-wide tasks.
[2] Includes Program representation at selected BASMAA (Board, New Development Committee, PI/P Committee, and Monitoring Committee), California Stormwater Quality Association, Regional Monitoring Program/SFEI, WMI (Core Group, Watershed Assessment, Regulatory and Bay Monitoring/Modeling Subgroups), Urban Pesticide Committee, and Regional and State Board meetings, and meetings with environmental/public interest groups.

3 The contingency budget includes estimated resources to cover certain trash and PCB tasks that will be furether reveiwed and approved by the MC as the draft MRP requirements are furtther refined.

FY 08-09 Budget Assessments

		PROGRAM ASSESSMENT ***PROGRAM BUDGET TOTAL FY 07-08 OPER / PROJ/COLL CONTRIBUTION*** **$3,864,217**
Co-Permittee	Program Contribution	
Campbell	1.88%	$72,647
Cupertino	2.46%	$95,060
Los Altos	1.59%	$61,441
Los Altos Hills	0.43%	$16,616
Los Gatos	1.74%	$67,237
Milpitas	2.75%	$106,266
Monte Sereno	0.14%	$5,410
Mountain View	3.91%	$151,091
Palo Alto	4.06%	$156,887
San Jose	30.01%	$1,159,652
Santa Clara	6.23%	$240,741
Saratoga	1.59%	$61,441
Sunnyvale	7.25%	$280,156
County of Santa Clara	5.94%	$229,534
SCVWD	30.02%	$1,160,038
	100.00%	***$3,864,217***

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
2006 NATIONAL
CLEAN WATER ACT
RECOGNITION
AWARD
OUTSTANDING
STORM WATER MANAGEMENT

March 1, 2009

FY 2009-2010 Draft Work Plan

Sections 1-12

Program and Co-permittee Activities

Submitted in Compliance
with NPDES Permit Order No. 01-024 and 01-119
(as amended by R2-2005-0035)

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Hand Delivered on February 27, 2009

February 27, 2009

Mr. Bruce H. Wolfe
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Bruce,

I am pleased to submit a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2009-2010. This Work Plan fulfills Provision C.6.b. of the Program's current NPDES permit (No.CAS029718), Order 01-024 (as amended by Order 01-119 and R2-2005-0035).

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. The Program's Work Plan was developed to include some but not all of the new, expanded, or redirected activities contemplated in the final Tentative Order for the Municipal Regional Permit (MRP). The Co-permittees' Work Plans are based on the current NPDES permit and do not include new, expanded, or redirected efforts. Until the MRP is adopted, it is not practical for Co-permittees to specify additional tasks given the scope and pervasiveness of the proposed requirements across the Co-permittee's programs. Rather, the Co-permittees are prepared to revise work plans as needed to reflect the MRP after adoption. If necessary, the Program will also revise their Work Plan to reflect the final requirements in the MRP after adoption.

The Management Committee is extremely concerned about the availability of resources to conduct all FY 09-10 tasks because of the dramatically increased levels of service included in the MRP and the uncertainty of available resources, particularly given the State budget condition and potential repercussions on local agency budgets. As circumstances become clearer, the Management Committee may have to revisit the priorities and resources assigned to the collaborative tasks. We request that the Water Board assist the local agencies by reviewing the MRP requirements and assigning priorities as well as phasing in some

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requirements over the next couple of permit cycles. We would be pleased to work with you and your staff on this issue.

Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: Trish Mulvey, CLEAN South Bay
SCVURPPP Management Committee Members
Robert Falk, Morrison & Foerster

Attachments: --FY 2009-2010 Draft Work Plan (including Co-permittee Work Plans) - one (1) hard copy
--FY 2009-2010 Draft Work Plan (including Co-permittee Work Plans) – one (1) compact disc

FY 09-10 Draft Work Plan

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Certification

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Submitted on behalf of the
Santa Clara Valley Urban Runoff Pollution Prevention Program
March 1, 2009

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

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FY 09-10 Draft Work Plan
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F. PALO ALTO
G. SAN JOSE
H. SANTA CLARA
I. SUNNYVALE
J. WEST VALLEY COMMUNITIES (CAMPBELL, LOS GATOS, MONTE SERENO, SARATOGA)
K. SANTA CLARA COUNTY
L. SANTA CLARA VALLEY WATER DISTRICT

INTRODUCTION

This document comprises a draft Work Plan for implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's or Program's) Urban Runoff Management Plan (URMP) for fiscal year (FY) 2009-2010. This Work Plan fulfills Provision C.6.b. of the Program's current NPDES permit (No.CAS029718), Order 01-024 (as amended by Order 01-119 and R2-2005-0035). The Work Plan development was coordinated with development of the Program's FY 09-10 budget, and is consistent with the level of effort represented by the budget items.

The Work Plan includes clearly defined tasks, responsibilities, and schedules to be implemented by the Co-permittees, in each individual jurisdiction and collectively through the Program. It was developed to include new, expanded, or redirected efforts contemplated in the final Tentative Order for the Municipal Regional Permit (MRP). The Work Plan also considers the implementation status of ongoing activities and actions, in order to plan FY 09-10 activities. In developing the FY 09-10 Draft Work Plan, the Program has taken into account the December 2008 discussions with Water Board staff on the draft revised MRP. We encourage Water Board staff to carefully evaluate and consider how the Program has prioritized and phased efforts into the FY 09-10 Draft Program Work Plan. If absolutely necessary, the Program, within the current identified resources, is prepared to revise the Work Plan to reflect the final requirements in the MRP after adoption.

The Work Plan is comprised of twelve sections, as follows:

1. **Municipal Operations:** Section 1 provides the Program's planned tasks to assist Co-permittees in reducing or eliminating adverse water quality impacts of operations and maintenance activities conducted by municipal staff.

2. **New Development and Redevelopment:** Section 2 describes the Program's progress in assisting Co-permittees to implement the requirements for new and redevelopment control measures (Provision C.3.) and the Program tasks planned for FY 09-10.

3. **Industrial and Commercial Site Control:** Section 3 provides the Program's planned tasks to assist Co-permittees in controlling the discharge of pollutants in stormwater from industrial and commercial sources.

4. **Illicit Discharge Detection and Elimination:** Section 4 provides the Program's planned tasks to assist Co-permittees in identifying and eliminating non-permissible non-storm water discharges associated with illegal dumping or illicit connections to the storm drain system.

5. **Construction Site Control:** The Program's planned tasks for assisting Co-permittees in controlling the impacts of construction activities on stormwater quality and flow through their construction inspection programs is presented within Section 5.

6. **Public Information/Participation Work Plan:** The Program's PI/P Work Plan (Section 6) includes a list and description of public education and outreach projects planned for FY 09-10 and how they relate to anticipated requirements in the MRP.

7. **FY 09-10 Annual Water Quality Monitoring Plan:** Section 7 provides the Program's Annual Monitoring Plan. Planned activities include implementation of the Program's Multi-Year Receiving Water Monitoring Plan, participation and financial support to the RMP, BAMBI network and participation in the BASMAA Monitoring Committee.

8. **Pollutants of Concern Control:** The Program's planned tasks for assisting Co-permittees in reducing and/or controlling the discharge of pollutants of concern (POCs) in stormwater is presented within Section 8. In addition, the Program will work with BASMAA to develop a coordinated stormwater regional monitoring effort to initiate addressing draft MRP requirements in a prioritized and phased manner.

9. **Exempted and Conditionally Exempted Discharges:** Section 9 describes the Program's planned tasks to assist Co-permittees in developing and implementing BMPs for the control of conditionally exempted (non-stormwater) discharges, as well as requiring businesses, contractors, and residents to control these discharges.

10. **Reporting Work Plan:** Section 10 provides the Program's proposed approach to data management and reporting for FY 09-10.

11. **FY 09-10 Program Budget:** The Program's Final FY 09-10 Budget Report, as approved by the Management Committee, is included in Section 11.

12. **Co-permittee Work Plan Summary Tables:** Section 12 contains the individual Co-permittee Work Plans for FY 09-10 developed consistent with the FY 00-01 Work Plan format approved by Water Board staff.

1. MUNICIPAL OPERATIONS

INTRODUCTION

This section describes the Program's planned tasks during FY 09-10 to assist Co-permittees in reducing or eliminating adverse water quality impacts of operations and maintenance activities conducted by municipal staff. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.2 Provisions of the Municipal Regional Permit.

BACKGROUND

The goals of the Municipal Operations element are to maximize the removal of pollutants while sweeping streets, cleaning storm drain inlets/basins, and conducting other routine municipal maintenance activities; and to minimize non-stormwater discharges to storm drains and watercourses from maintenance-related activities.

Since 1996, the Program has developed and implemented the following performance standards which address reducing or eliminating water quality impacts of operations and maintenance activities conducted by municipal staff. They include:

Public Streets, Roads and Highways (PSRH) Operation and Maintenance (November 1996) – Defines the level of implementation that municipal agencies must attain to demonstrate that their local PSRH operation and maintenance activities reduce pollutants in stomwater to the maximum extent practicable;

Storm Drain System Operation and Maintenance (December 1996, updated March 1999) – Identifies maintenance activity implementation levels to optimize control of pollutants in stormwater during the performance of storm drain system operation and maintenance;

Water Utility Operation and Maintenance (January 1997) – Defines the level of implementation necessary to demonstrate the control of pollutants discharged from the operation and maintenance of municipal water supply utilities. See Section 9 for a description of FY 09-10 tasks relating to the Water Utility Operation and Maintenance Performance Standard.

Pest Management (February 2002) – Provides control measures which minimize pesticide use, particularly organophosphate pesticides, and reduce the amount of pesticides in stormwater and landscape runoff. See Section 8 for a description of pesticide toxicity control programs planned for FY 09-10.

Rural Public Works Maintenance and Support Activities (December 2002) –Defines the level of implementation necessary to ensure that required control measures are implemented while performing maintenance activities adjacent to streams.

The Municipal Regional Permit (MRP) will contain requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The draft MRP was released on December 4, 2007. It is anticipated that the revised draft MRP Tentative Order will be released in February 2009. Provision C.2. in the revised Tentative Order will most likely contain requirements for operation and maintenance activities conducted by municipal staff, including requirements for:

- Street and road repair and maintenance;
- Sidewalk/plaza maintenance and pavement washing;
- Bridge and structure maintenance and graffiti removal;
- Operating and maintaining stormwater pump stations;
- Rural public works construction and maintenance; and
- Corporation yard BMP implementation.

PAST AND CURRENT ACTIVITIES RELATED TO MUNICIPAL OPERATIONS

Co-permitees continue to implement the performance standards described above while performing municipal operation and maintenance activities. Best management practices and control measures are incorporated into standard operating procedures for municipal operations. Training plays a major role in ensuring that Co-permittee staff uses proper techniques during the course of their duties.

FY 09-10 IMPLEMENTATION TASKS

Table 1-1 presents the list of tasks that will be implemented in FY 09-10, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

- Continue developing Co-permittee street sweeping summary tables. Include types of sweepers used, swept curb miles, volume or weight of materials collected and estimated pollutant load reductions for copper, nickel, lead and zinc.
- Develop guidance on pump station operation, maintenance and inspection for pollution prevention.
- Develop Co-permittee summary tables which report Co-permittee inspection results and maintenance activities at pump stations. Include volume or mass of waste materials removed from pump stations.
- Review current BMPs for Rural Roads, particularly road and culvert construction and maintenance, and make revisions, if necessary.
- Develop guidance on corporation yard BMPs and stormwater pollution prevention plans.
- Develop Co-permittee summary tables which report inspection results at all corporation yards.

Table 1-1
Schedule and Deliverables for FY 09-10 Municipal Operations Tasks

Tasks	Schedule	Deliverables
Street and Road Sweeping and Cleaning		
Ongoing tasks • Continue developing Co-permittee street sweeping summary tables. Include types of sweepers used, swept curb miles, volume or weight of materials collected and estimated pollutant load reductions for copper, nickel, lead and zinc. Submit in the FY 08-09 Annual Report.	Ongoing- FY 08-09 Annual Report and future ARs	• Guidance on data collection and submittal for inclusion in Annual Report.
Storm Water Pump Stations		
• Develop guidance on pump station operation, maintenance and inspection for pollution prevention.	12/09	• Technical memorandum
• Develop Co-permittee summary tables which report Co-permittee inspection results and maintenance activities at pump stations. Include volume or mass of waste materials removed from pump stations. Submit in the FY 09-10 Annual Report	9/10	• Guidance on data collection and submittal for inclusion in Annual Report
Rural Public Works Construction and Maintenance		
• Review current BMPs for Rural Roads, particularly road and culvert construction and maintenance, and make revisions, if necessary.	6/10	• Updated Performance Standards
Corporation Yard BMP Implementation		
• Develop guidance on corporation yard BMPs and stormwater pollution prevention plans.	3/10	• Guidance materials
• Develop Co-permittee summary tables which report inspection results at all corporation yards. Submit in the FY 09-10 Annual Report.	9/10	• Guidance on data collection and submittal for inclusion in Annual Report

2. FY 09-10 NEW AND REDEVELOPMENT (C.3.) WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 09-10 to continue to assist Co-permittees to control the impacts of development on stormwater quality and flow through the development project planning, review and approval process. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.3. Provisions of the Municipal Regional Permit.

BACKGROUND

On October 17, 2001, the Water Board adopted Order 01-119 which amended the Program's Permit Provision C.3. (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharges from new or redevelopment sites that may increase erosion in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

Since adoption of Order 01-119, there have been several changes to the requirements of Provision C.3., including:

- Extension by the Water Board Executive Officer of three of the permit deadlines, in order to be consistent with other Bay Area stormwater permits adopted subsequent to SCVURPPP Order 01-119;
- Approval by the Water Board of an Alternative Group 2 Project Definition that would make the Program's Provision C.3. project size requirements consistent with the other Bay Area stormwater permit requirements (i.e., minimum project size of 10,000 square feet of impervious surface);
- Adoption of Order R2-2005-0035 on July 20, 2005, which contains revisions to Order 01-119 that recognize two types of Group 2 projects and extends the implementation dates for both. Group 2A includes projects that are more likely to contribute pollutants to stormwater (e.g., gas stations, auto wrecking yards, loading docks) and parking lots with 10,000 square feet or more of impervious surface. Group 2B includes all other Group 2 projects.

- Also as part of adoption of Order R2-2005-0035, incorporation of key provisions of the Program's Hydromodification Management Plan Report (April 2005) into the SCVURPPP permit.

The Municipal Regional Permit (MRP) will contain requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The draft MRP was released on December 4, 2007. It is anticipated that the revised draft MRP Tentative Order will be released in February 2009. Provision C.3. in the Tentative Order contains similar requirements for new and redevelopment projects with some enhancements that will likely need to be addressed in FY 09-10. Tasks to address these enhancements began in FY 08-09 and are the basis for this work plan section.

PAST AND CURRENT ACTIVITIES TO IMPLEMENT C.3.

The Program and Co-permittees submitted work plans for implementing all C.3. requirements to the Water Board on March 1, 2002 (as part of the Program's *FY 02-03 Work Plan*, Volume II). These included the Program's "Guidance for Work Plan Tasks Related to Implementation of Permit Provision C.3." which identifies proposed actions to meet the requirements of Provision C.3. and whether the actions will be implemented at the Program level, Co-permittee level or both. Most of the tasks in the C.3 Work Plan Guidance were completed by the end of FY 04-05. With all of the preparation tasks completed, Co-permittees then focused on the implementation of C.3. requirements for Group 1 and Group 2 projects (i.e., those creating or replacing 10,000 square feet or more of impervious surface). Additional implementation-phase tasks identified by the C3 Provision Oversight (C3PO) Ad Hoc Task Group and the Management Committee and ongoing support tasks have been performed during subsequent years. The Program has also continued to hold meetings of the C.3. Provision Oversight Ad Hoc Task Group (C3PO AHTG) to keep Co-permittees updated on current issues and promote exchange of ideas on and experience with C.3. implementation.

The Program completed its Hydromodification Management Plan (HMP) in April 2005, and submitted it to the Water Board on May 4, 2005. Key provisions of the HMP were adopted by the Water Board on July 20, 2005 (as described above), and Co-permittees began implementation on October 20, 2005. Chapter 7 of the HMP Report identifies a number of action items that Program and Co-permittee staff will complete to address remaining HMP implementation issues. These action items and other related tasks have been tracked with anticipated start and completion dates in a table entitled "SCVURPPP HMP - Summary of Next Steps", which has been included in each annual report and work plan since 2006.

FY 09-10 C.3. IMPLEMENTATION TASKS

Table 2-1 presents the list of tasks that will be implemented in FY 09-10. These tasks will provide continuing assistance with current implementation tasks, as well as guidance on implementation of new or enhanced requirements in the MRP. An updated "SCVURPPP HMP – Summary of Next Steps" is presented as Table 2-2 of this Work Plan.

Tasks for implementation assistance in FY 09-10 include:

- Continue to assist Co-Permittees with implementation of C.3 on projects, and with implementation of BMP O&M verification programs;
- Continue to assist with the C.3. Provision Oversight (C3PO) AHTG and work group meetings and action items;
- Continue to provide guidance and assistance with annual reporting of C.3. information;
- Continue regional roundtable meetings with Co-permittee staff and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA New Development Committee);
- Meet with Regional Water Board staff, Program legal counsel, Program AHTG and/or environmental groups as needed;
- Research and develop recommendations for setting up an incentive program for retrofits of existing development, targeted to home owners, for stormwater quality protection as well as water conservation benefits. Evaluate educational aspects and grant funding opportunities;
- Work with BASMAA and/or other stormwater programs to develop standard specifications for lot-scale treatment BMPs for single family homes, guidance on proper design/construction of pervious paving systems, and other C.3. regional guidance as needed;
- Continue to update and manage Program database for BMP O&M verification inspection reporting and effectiveness analysis;.
- Update lists of qualified consultants for third party review of C.3. calculations and designs;
- Continue to assist Co-permittees with impervious surface data analysis, as needed, to revise the HMP applicability map, prepare submittal to Water Board on map changes, and create Co-permittee specific HM applicability maps.
- Make improvements to the Bay Area Hydrology Model to further integrate low impact development techniques and provide options for implementation of HMP requirements at smaller development sites.
- Conduct annual workshop on C.3. implementation and one separate workshop on HMP implementation.
- Work with the HMP Instream Measures Work Group to select and develop a pilot regional project for hydromodification management, including project siting, funding strategy, and how to assign regulatory credits;
- Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, and self-evaluation).

Table 2-1
Schedule and Deliverables for FY 09-10 New and Redevelopment (C.3) Tasks

Task	Schedule	Deliverables
C.3. Implementation Assistance		
• Continue to assist Co-Permittees with implementation of C.3 on projects, and with implementation of BMP O&M verification programs.	Ongoing	• Meeting summaries
• Continue to assist with the C.3. Provision Oversight (C3PO) AHTG and work group meetings and action items.	FY 09-10	• Meeting summaries
• Meet with Regional Water Board staff, Program legal counsel, Program AHTG and/or environmental groups as needed on C.3. issues.	Ongoing, as needed	• Meeting summaries
• Research and develop recommendations for setting up an incentive program for retrofits of existing development, targeted to home owners, for stormwater quality protection as well as water conservation benefits. Evaluate educational aspects and grant funding opportunities.	6/10	• Technical Memorandum on Retrofit Incentive Program
• Update lists of qualified consultants for third party review of C.3. calculations and designs.	6/10	• Updated Qualified Consultants List
• Conduct one workshop on a C.3-related topic (to be determined).	6/10	• Workshop
modification Management Plan (HMP) Implementation Assistance		
• Continue to assist Co-permittees with impervious surface data analysis, as needed, to revise the HMP applicability map, prepare submittal to Water Board on map changes, and create Co-permittee specific applicability maps.	6/10	• Impervious surface data analyses and HMP map revisions • Co-permittee specific applicability maps
• Conduct one workshop on HMP implementation and hydromodification control measures.	6/10	• Workshop
• Make improvements to the Bay Area Hydrology Model to further integrate low impact development techniques and provide options for implementation of HMP requirements at smaller development sites.	6/10	• Guidance on BAHM improvements and how to apply the model for small sites

Table 2-1, continued
Schedule and Deliverables for FY 08-09 New and Redevelopment (C.3) Tasks

Task	Schedule	Deliverables
• Continue to assist with the HMP Implementation Phase (HIP) Work Group meetings and action items	Ongoing	• Meeting summaries
• Work with the HMP Instream Measures Work Group to select and develop a pilot regional project for hydromodification management, including project siting, funding strategy, and how to assign regulatory credits.	6/10	• Report on pilot regional project
• Continue to assist Co-permittees with implementation of HMP requirements for applicable projects.	FY 09-10	• Assistance with questions about implementation
• Conduct programmatic monitoring tasks identified in Section 7.8 of the HMP Report (tracking projects, documenting BMP design and inspection, self-evaluation)	FY 09-10	• Monitoring results provided in FY 08-09 Annual Report
Regional Coordination		
• Continue regional roundtable meetings with Co-permittee staff and other stormwater programs to share information about implementation strategies and experience (facilitate through BASMAA New Development Committee).	Ongoing	• Meeting summaries
• Work with BASMAA and/or other stormwater programs to develop standard specifications for lot-scale treatment BMPs for single family homes, guidance on proper design/construction of pervious paving systems, and other C.3. regional guidance as needed.	6/10	• Standard specs for treatment BMPs for single family homes; • Guidance on pervious paving
C.3. Reporting Requirements		
• Continue to provide guidance and assistance with annual reporting of C.3. information.	Ongoing - FY 08-09 Annual Report and future ARs	• Guidance on Annual Report preparation.
• Continue to update and manage Program database for BMP O&M verification inspection reporting and effectiveness analysis	Ongoing - FY 08-09 Annual Report and future ARs	• Guidance on Annual Report preparation

Table 2-2

SCVURPPP HMP - Summary of Next Steps (Updated 3/1/09)

Task[1]	Anticipated Completion Date[2]	Status
1. Develop the following: a. a funding mechanism[3] such that projects can utilize in-stream control options b. a methodology for determining developer contributions based on the stream changes expected to result from changes in project runoff conditions.	6/10 6/10	**In Progress** - The HMP Instream Projects Work Group, consisting of Water District, City of San Jose and Program staff, will continue to meet in FY 09-10. The Work Group will focus on development of a pilot regional project for hydromodification management, including project siting, funding strategy, and how to assign regulatory credits
2. Work with City/County planning and public works departments and the Water District to determine the timing and method of notifying District staff during the development review process about HMP projects that may need in-stream controls, in a manner that does not unreasonably prolong the review process. Further, look at ways to improve method to provide early communication on Group 1 project reporting.	6/10	**In Progress** – This task was delayed pending decisions by the HMP Instream Projects Work Group. Some Co-permittees already have a process for involving Water District staff in development project review. Program staff will document current practices and develop guidance for other Co-permittees, in consultation with Water District staff.
3. Facilitate review of District's MDL analysis, both by the Co-permittees and the Expert Panel, and work with the Management Committee to determine the need to integrate some or all of the MDL analyses into implementation of the HMP.	N.A.	**Eliminated** – This task is no longer needed to implement the HMP. A revised HMP applicability map was developed by the Program based on other criteria, negotiated with Water Board staff, and will likely be adopted. The Management Committee voted to remove this action item from the list at its December 20, 2007 meeting.
4. Conduct additional studies of implementation of site design, integrated management practices, and/or basins at example development sites in Santa Clara Valley.	6/09	**In Progress** – In FY 06-07, the Program contracted with GeoSyntec Consultants to do a comparison of flow basin sizing using the HEC-HMS and HSPF models. The results will provide guidance on model use and sizing procedures and to assist development of the BAHM. The draft comparison report was completed and is under going review by Program staff.

[1] Tasks are from Chapter 7 of April 2005 HMP Report. *Tasks in italics have been added.*

[2] All dates depend on availability of resources and cooperation/collaboration of numerous staff from different agencies and may change because of circumstances beyond the control of the Program. The Program periodically updates the Management Committee regarding schedule changes and will transmit updates schedules to Water Board staff.

[3] The intent is to describe a mechanism agreeable to Co-permittees and next steps for implementation.

Table 2-2
SCVURPPP HMP - Summary of Next Steps (continued)

Task[1]	Anticipated Completion Date[2]	Status
		In addition, the Program also contracted with GeoSyntec to develop a methodology for estimating costs for the purpose of determining impracticability of hydromodification management measures (i.e. the 2% cost cap). This work is underway and a draft report will be completed by March 2009.
Bay Area Hydrology Model (BAHM) Development Project – Regional Model, Local Calibration, Training	Completed 7/07; Ongoing	**Completed/Ongoing** –The BAHM was completed in July 2007 The Program participated with the Alameda and San Mateo countywide stormwater programs in the development of the regional component of the BAHM, and also contracted with the software developer, Clear Creek Solutions, to calibrate the model to two watersheds in Santa Clara Valley. Local calibration was completed in May 2007. A series of trainings were conducted in July and November, 2007. The BAHM includes the ability to model common site design and treatment control measures and quantify the reduction in flow duration due to these measures. A BAHM Project Book that provides design examples was completed and distributed to Co-permittees in August 2008.
5. During implementation of the HMP, obtain feedback/suggestions for further refinement and implementation guidance	As needed/ Ongoing	**Completed/Ongoing** – The HMP Implementation Work Group has been meeting on a regular basis, and has been an effective forum to share experience with HMP implementation and obtain suggestions for additional HMP guidance. Members of the development community have also attended these meetings. Program staff have reviewed several conceptual design submittals to meet HMP requirements for projects in San Jose and discussed these with the work group. Additional guidance will be prepared on HMP implementation following adoption of new requirements in the MRP (expected mid-2009).

Table 2-2
SCVURPPP HMP - Summary of Next Steps (continued)

Task[1]	Anticipated Completion Date[2]	Status
6. Coordinate with other Bay Area stormwater programs to work toward a consistent approach for the Bay Area (via participation in development of the Municipal Regional Permit (MRP).	12/07	**Completed** –The MRP Tentative Order (December 4, 2007) contains consistent HMP requirements for all Permittees except those in Contra Costa County. These are not likely to change for the final MRP.
7. Coordinate additional Co-permittee, Bay Area stormwater program, and Water Board staff review process and progress meetings, including: a. The development of a schedule for Bay Area-wide HMP implementation in the upcoming Municipal Regional Permit. *b. Public outreach – HMP updates, workshop* *c. HMP Work Group Meetings*	6/07 Ongoing Ongoing	**Completed** – Hydromodification management (HM) requirements for the San Mateo, Alameda and Fairfield-Suisun stormwater programs were adopted by the Water Board on March 14, 2007. Implementation began in June 2007. The Contra Costa program began implementation in October 2006. Under the MRP, these programs will continue implementation of their current requirements. SCVURPPP began implementation in October 2005. However, the MRP contains new requirements for SCVURPPP that will take effect upon MRP adoption. **Completed/Ongoing** – Program staff have conducted two "HMP 101" workshops for Co-permittee staff covering basic principles of hydromodification management. Additional workshops and meetings of the HMP Implementation Phase Work Group will be conducted as needed.
8. Collect data on the implementation of the HMP at small sites for a period of two years after the start of implementation, and plan to re-evaluate the small site size threshold and approach at that time. Conduct and document the reevaluation.	N.A.	**Eliminated** -- To date there have been no small sites required to implement HMP requirements. The MRP will likely reduce the threshold for projects subject to HMP requirements to one acre of impervious surface. As a result, this task is no longer needed.
9. Make additional refinements per: 1) lessons learned from implementation efforts based on the draft HMP; 2) the need for consistency with HMPs being developed by other Bay Area stormwater programs; and 3) development community, Co-permittee, and Water Board feedback.	Report in ARs beginning with FY 05-06 AR	**In Progress** – See Task 5. Additional refinements to the HMP will be made pending adoption of the MRP, and continuing input from Co-permittee staff and developers.

3. INDUSTRIAL AND COMMERCIAL SITE CONTROLS

INTRODUCTION

This section describes the Program's planned tasks during FY 09-10 to assist Co-permittees in controlling the discharge of pollutants in stormwater from industrial and commercial sources. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.4. Provisions of the Municipal Regional Permit.

BACKGROUND

In December 1996, the Program developed the Industrial/Commercial Discharger Control (IND) Performance Standards to define the level of implementation that Co-permittees should attain to demonstrate that their IND activities reduce pollutants to the maximum extent practicable. The IND Performance Standards were developed to meet an earlier permit requirement and were incorporated into the Program's *Urban Runoff Management Plan* (dated September 1, 1997).
In October 2000, the performance standards were also updated to include the reporting of stormwater infiltration devices (SWIDs) and the preparation of internal summaries which include the type and number of violations reported, and the type of facilities with reported violations. The performance standards were again updated in February 2005 with administrative changes (e.g., incorporating enhanced reporting requirements and results of Co-permittee evaluations).

In early 2001, the Program's Management Committee formed the Industrial Inspection Ad hoc Task Group (Industrial Inspection AHTG) to develop a Program-wide strategy to comply with the enhanced reporting requirements of the Program's newly adopted NPDES permit dated February 21, 2001. On September 7, 2001, the Industrial Inspection AHTG recommended the adoption of Program-wide categories and enforcement actions developed by the Industrial Inspection AHTG. These categories and procedures are described in the *Continuous Improvement of Industrial Reporting Technical Memorandum.* The Management Committee approved the memorandum as the Program's strategy to implement IND reporting requirements (as required in Permit Provisions C.6.a.i.). The memorandum was included as an attachment within the Program's *FY 00-01 Annual Report* and submitted to the Water Board on September 17, 2001. Each Co-permittee began implementing these procedures immediately thereafter. Implementation of the enhanced reporting requirements by the Co-permittees has been very successful as shown in the past five Program annual reports.

The Municipal Regional Permit (MRP) will contain requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The draft MRP was released on December 4, 2007. It is anticipated that the revised draft MRP Tentative Order will be released in February 2009. Provision C.4. in the Tentative Order contains requirements for industrial and commercial site controls, including requirements for:

- Sufficient legal authority for effective site management;
- Development and implementation of an Industrial and Commercial Business Inspection Plan;
- Development and implementation of an enforcement response plan; and
- Staff training.

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PAST AND CURRENT ACTIVITIES RELATED TO INDUSTRIAL AND COMMERCIAL SITE CONTROLS

Co-permitees continue to implement the IND Performance Standards by conducting inspections of specific industrial and commercial facilities which may be a source of pollutants to stormwater, and providing outreach to facility owners. When necessary, Co-permittees initiate enforcement actions against responsible parties. In addition, Co-permittees continue to provide information on the type of facilities inspected and the level of enforcement taken at inspected facilities, as well as an evaluation of IND program effectiveness, in their annual reports. To supplement individual Co-permittee IND inspection data, Program staff prepares IND summary tables for Co-permittee inspections that have occurred during a specific fiscal year. IND summary tables have been included in each annual report since September 2002.

FY 09-10 IMPLEMENTATION TASKS

Table 3-1 presents the list of tasks that will be implemented in FY 09-10, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

- Update the Program's Industrial/Commercial Discharger Control Program Performance Standards, as necessary.
- Continue to summarize Co-permittee reports of industrial/commercial inspections conducted, including types of violations and enforcement actions.
- Continue to assist Co-permittees with updating current Industrial and Commercial Business Inspection Plans. A description of the process for prioritizing inspections and frequency of inspection will be included.
- Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting, once annual reporting requirements are defined for the MRP.
- Continue to maintain the Program database to include the current list of industrial/commercial facilities with Program's jurisdiction and modify to reflect new reporting requirements/formats, as appropriate.
- Continue to assist Co-permittees with evaluating and strengthening Enforcement Response Plans (ERPs), as appropriate.
- Continue to provide training on urban runoff pollution prevention, inspection procedures, illicit discharge detection and elimination, BMP implementation, lessons learned, local agency requirements and other inspection-related topics.

Table 3-1
Schedule and Deliverables for FY 09-10 Industrial and Commercial Site Control Tasks

Task	Schedule	Deliverables
Update Industrial/Commercial Discharger Control Performance Standards		
• Update the Program's Industrial/Commercial Discharger Control Program Performance Standards, as necessary.	6/10	• Updated Performance Standards
Industrial and Commercial Business Inspection Plan		
• Continue to assist Co-permittees with updating current Industrial and Commercial Business Inspection Plans. A description of the process for prioritizing inspections and frequency of inspection will be included.	12/09	• Memorandum on developing an Industrial and Commercial Business Inspection Plan.
• Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting, once annual reporting requirements are defined for the MRP.	6/10	• Standard inspection form, model database fields, annual report guidance
• Continue to maintain the Program database to include current list of industrial/commercial facilities within Program's jurisdiction and modify to reflect new reporting requirements/formats, as appropriate.	Ongoing- future Annual Reports starting with FY 09-10 Annual Report if required	• Updated Program database • Guidance on data collection and submittal for inclusion in Annual Report, if necessary.
Enforcement Response Plan		
• Continue to assist Co-permittees with evaluating and strengthening Enforcement Response Plans (ERPs), as appropriate.	12/09	• Model Enforcement Response Plan
• Continue to summarize Co-permittee reports of industrial/commercial inspections conducted, including types of violations and enforcement actions.	Ongoing- FY 08-09 Annual Report and future ARs	• Guidance on data collection and submittal for inclusion in Annual Report.
Inspector Training		
• Continue to provide training on urban runoff pollution prevention, inspection procedures, illicit discharge detection and elimination, BMP implementation, lessons learned, local agency requirements and other inspection-related topics.	6/10	• Guidance materials, workshop

4. ILLICIT DISCHARGE DETECTION AND ELIMINATION

INTRODUCTION

This section describes the Program's planned tasks during FY 09-10 to assist Co-permittees in identifying and eliminating non-permissible non-storm water discharges associated with illegal dumping or illicit connections to the storm drain system. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.5. Provisions of the Municipal Regional Permit.

BACKGROUND

In December 1996, the Program developed the Illicit Connection and Illegal Dumping (ICID) Performance Standards to effectively prohibit the discharge of illicit, non-stormwater discharges to the municipal storm drain system by regularly inspecting storm drains and watercourses and correcting problems in a timely manner. The ICID Performance Standards were developed to meet an earlier permit requirement and were incorporated into the Program's *Urban Runoff Management Plan* (dated September 1, 1997). In October 2000, the performance standards were also updated to include conducting inspections and reporting the presence of stormwater infiltration devices (SWIDs); and reporting significant conditionally exempt discharges that are not properly managed.

In early 2001, the Program's Management Committee approved the formation of the ICID Reporting Ad hoc Task Group (ICID Reporting AHTG) to develop a Program-wide strategy to comply with the enhanced reporting requirements of the Program's newly adopted NPDES permit dated February 21, 2001. On September 7, 2001, the ICID Reporting AHTG recommended the adoption of Program-wide categories and enforcement actions developed by the ICID Reporting AHTG. These categories and procedures are described in the *Continuous Improvement of Illicit Connection/Illegal Dumping Reporting Technical Memorandum.* The Management Committee approved the memorandum as the Program's strategy to implement IC/ID reporting requirements (as required in Permit Provision C.6.a.ii). The memorandum was included as an attachment within the Program's *FY 00-01 Annual Report* and submitted to the Water Board on September 17, 2001. Each Co-permittee began implementing these procedures immediately thereafter. Implementation of the enhanced reporting requirements by the Co-permittees has been very successful as shown in the past six Program annual reports.

In accordance with the Program's *FY 04-05 Work Plan* submitted to the Water Board on March 1, 2004, the Program committed to updating the ICID Performance Standards during FY 04-05. The updates were essentially administrative (e.g., incorporating enhanced reporting requirements and results of Co-permittee evaluations) and were directed at modifying the Program's model ICID Performance Standards to reflect Management Committee direction and actual Co-permittee implementation. These administrative updates were provided to the ICID Reporting AHTG for review during January 2005. The Management Committee approved final updated performance standards on February 17, 2005.

The Municipal Regional Permit (MRP) will contain requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The draft MRP was released on December 4, 2007. It is anticipated that the revised draft MRP Tentative Order will be released in February 2009. Provision C.5. of the Tentative Order contains requirements for illicit discharge detection and elimination, including requirements for:

- Sufficient legal authority to fully implement an enforcement response plan;
- Development and implementation of an enforcement response plan;
- Spill and dumping response, complaint response, and frequency of inspections;
- Routine collection system screening to determine illicit discharges and illegal dumping;
- Making maps of the MS4 publicly available;
- Tracking and case follow-up of incidents;
- Illicit discharge control planning for the following year based on lessons learned; and
- Staff training.

PAST AND CURRENT ACTIVITIES RELATED TO ILLICIT DISCHARGE DETECTION AND ELIMINATION

Co-permitees continue to implement the ICID Performance Standards by responding to illicit discharges and illegal dumping incidents, conducting proactive investigations and initiating enforcement actions against responsible parties. In addition, Co-permittees continue to provide information on the origin of the report, source of incident, type of incident and enforcement actions for each ICID incident, as well as an evaluation of ICID program effectiveness, in their annual reports. To supplement individual Co-permittee ICID inspection data, Program staff prepares ICID summary tables for Co-permittee inspections that have occurred during a specific fiscal year. ICID summary tables have been included in each annual report since September 2002.

FY 09-10 IMPLEMENTATION TASKS

Table 4-1 presents the list of tasks that will be implemented in FY 09-10, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

- Update the Program's Illicit Connection & Illegal Dumping Elimination Activities Performance Standards, as necessary.
- Continue to summarize Co-permittee reports of illicit discharge cases/investigations conducted, including types of violations and enforcement actions.
- Continue to maintain the Program database to include the most recent Co-permittee illicit discharge data.
- Continue to assist Co-permittees with evaluating and strengthening Enforcement Response Plans (ERPs), as needed.
- Continue to provide staff training on illicit discharge detection and elimination. Include training on quick and appropriate response, inspection procedures, enforcement actions, BMP implementation, local agency requirements and other inspection-related topics.
- Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting, once annual reporting requirements are defined for the MRP.

Table 4-1
Schedule and Deliverables for FY 09-10 Illicit Discharge Detection and Elimination Tasks

Tasks	Schedule	Deliverables
Update Illicit Connection & Illegal Dumping Elimination Activities Performance Standards		
• Update the Program's Illicit Connection & Illegal Dumping Elimination Activities Performance Standards, as necessary.	6/10	• Updated Performance Standards
Create and Maintain ERP		
• Continue to assist Co-permittees with evaluating and strengthening Enforcement Response Plans (ERPs), as needed.	12/09	• Model Enforcement Response Plan
Tracking and Case Follow-up		
• Work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting, once annual reporting requirements are defined for the MRP.	6/10	• Standard inspection form, model database fields, annual report guidance
• Continue to summarize Co-permittee reports of illicit discharge cases/investigations conducted, including types of violations and enforcement actions.	Ongoing- FY 08-09 Annual Report and future ARs	• Guidance on data collection and submittal for inclusion in Annual Report
• Continue to maintain the Program database to include most recent Co-permittee illicit discharge data	Ongoing	• Up-to-date Program database
Inspector Training		
• Continue to provide staff training on illicit discharge detection and elimination. Include training on quick and appropriate response, inspection procedures, enforcement actions, BMP implementation, local agency requirements and other inspection-related topics.	6/10	• Guidance materials, workshop

5. FY 09-10 CONSTRUCTION SITE CONTROL MEASURES WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 09-10 to assist Co-permittees to control the impacts of construction activities on stormwater quality and flow through their construction inspection programs. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with the C.6. Provisions of the Municipal Regional Permit.

BACKGROUND

In 1997, the Program developed Construction Inspection Performance Standards (CIPS) to define the level of implementation that Co-permittees should attain to demonstrate that their construction inspection programs control stormwater quality impacts to the maximum extent practicable. The CIPS were developed to meet a earlier permit requirement and were incorporated into the Program's *Urban Runoff Management Plan*. The CIPS were updated in 2001 (completed January 2002) to include more details on inspection frequency, enforcement procedures, and inspector training, based on discussions with Water Board staff.

The current permit requires implementation of the CIPS and lists some, but not all, of the standards in Provision C.3.a. Co-permitees continue to implement the CIPS and provide summaries of enforcement and follow-up actions at construction sites, as well as information on inspector training, in their annual reports.

The Municipal Regional Permit (MRP) will contain requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The draft MRP was released on December 4, 2007. It is anticipated that the revised draft MRP Tentative Order will be released in February 2009. Provision C.6. in the Tentative Order contains specific requirements for construction site controls, including requirements for:

- Sufficient legal authority for effective site management;
- Development and implementation of an enforcement response plan;
- Designation of a minimum set of required BMPs;
- Review of erosion control plans and Construction General Permit coverage, and outreach to developers and contractors as part of the plan approval process;
- Types, content and frequency of inspections;
- Staff training; and
- Tracking and reporting of construction site inspection results.

PAST AND CURRENT ACTIVITIES RELATED TO CONSTRUCTION SITE CONTROLS

As described above, the Co-permittees continue to implement the Program's performance standards by conducting reviews of erosion control plans, requiring General Permit coverage, conducting routine (including pre-wet season) and as-needed construction site inspections, documenting and reporting violations and enforcement response, and training inspectors. The Program annually co-sponsors and/or conducts a Construction Site

Management Workshop to assist Co-permittees with inspector training needs, provides guidance on annual reporting requirements, and assists Co-permittees with construction-related questions and issues as needed.

FY 09-10 IMPLEMENTATION TASKS

Table 5-1 presents a list of tasks that will be implemented in FY 09-10, their associated due dates, and the deliverables that will be completed for each task. These tasks include:

- Conduct annual workshop on Construction Site Management, in coordination with the San Francisco Estuary Program and/or CASQA. Include training on inspection type and frequency, minimum BMPs, BMP installation and maintenance, and implementation of enforcement response plans.
- Continue to update the Construction Inspection Performance Standards as needed to be consistent with Provision C.6., including adding:
  - list of minimum BMPs;
  - guidance on different types of inspections;
  - implementation requirements for different types of sites and times of year (wet or dry season);
- Continue to work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.

Table 5-1
Schedule and Deliverables for FY 09-10 Construction Site Control Tasks

Task from MRP Tentative Order	Schedule	Deliverables
Minimum Required Management Practices		
• Continue to update the Construction Inspection Performance Standards as needed to be consistent with Provision C.6., including adding: o list of minimum BMPs; o guidance on different types of inspections; o implementation requirements for different types of sites and times of year (wet or dry season).	12/09	• Updated Performance Standards
Staff Training		
• Conduct annual workshop on Construction Site Management, in coordination with the San Francisco Estuary Program and/or CASQA. Include training on inspection type and frequency, minimum BMPs, BMP installation and maintenance, and implementation of enforcement response plans.	6/10	• Workshop, guidance materials, evaluation summary
Tracking and Reporting		
• Continue to work with Co-permittees on standardizing inspection forms and data collection, data management, and reporting.	6/10	• Standard inspection form, model database, annual report guidance

6. PUBLIC INFORMATION/PARTICIPATION WORK PLAN

INTRODUCTION

The goals of the Public Information/Participation (PI/P) element are to identify and change behaviors that adversely affect water quality; and to increase the understanding and appreciation of streams and San Francisco Bay. To accomplish these goals, Co-permittees pursue PI/P activities jointly through the Program, on a countywide basis, and individually in their own jurisdictions.

Each year, the Watershed Education and Outreach Ad Hoc Task Group, which consists of Program staff, Co-permittees representatives and consultants, identifies, prioritizes and selects countywide projects for implementation. Table 6-1 presents the updated Pollutant Matrix, which links current and future PI/P projects and outreach materials with pollutants of concern. The projects are developed and implemented each year by Work Groups.

The Program provides resources to conduct countywide PI/P tasks through approval (by the Management Committee) of an annual Program budget and Work Plan. All Co-permittees contribute resources to conduct annual Program Work Plan tasks consistent with the Co-permittee assessment procedure contained in the SCVURPPP Memorandum of Agreement[1].

FY 09-10 PI/P WORK PLAN

In FY 09-10, the Program will continue to conduct its PI/P activities through the following projects:

- Watershed Watch Campaign
- Watershed Watchers Program at the Don Edwards San Francisco Bay National Wildlife Refuge
- School-Age Children Outreach
- Pesticide, Mercury and Illicit Discharge Outreach
- Santa Clara Valley Green Gardener Training
- Creek Clean-up Activities
- BASMAA Regional Ad Campaign
- Land Use Subgroup Activities
- Other Ongoing Program PI/P Support Activities

It is anticipated that implementing the above mentioned projects will meet most of the outreach requirements described in the Municipal Regional Permit (MRP). Some additional tasks may be implemented within these projects to address potential MRP requirements; these are identified within the project descriptions below.

Details of the Program's FY 09-10 PI/P projects are provided below:

[1] On February 1, 2001, the Management Committee directed Program staff to include all Program-Wide PI/P activities as part of the Projects Group budget and thus eliminated any confusion regarding selective Co-permittee participation.

Watershed Watch Campaign

In FY 09-10, the Watershed Watch Campaign will include the following tasks:

- Media advertising
- Partnerships with community and business organizations (e.g., Classic Car Wash)
- Community outreach events
- Website maintenance
- Media relations
- Additional local media relations to supplement work done by the BASMAA Media Relations Committee.

The detailed FY 09-10 Watershed Watch Campaign Work Plan is included within Attachment 6-1. As described in the Program's Watershed Education and Outreach Strategy[2], a public opinion survey will be conducted in FY 08-09 to evaluate effectiveness of the Watershed Watch Campaign. The feedback from this evaluation may be used to modify messages, advertising, promotions and other Campaign strategies.

Watershed Watchers Program at the San Francisco Bay National Wildlife Refuge at Alviso

The Program provides resources to the Alviso Education Center to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. This is an on-site educational program conducted primarily on weekends. The activities focus on building watershed awareness and encourage stormwater pollution prevention behaviors among attendees (youth groups, Boy/Girl Scout Troops, families with children etc.). The Program will continue to support these activities in FY 09-10. Attachment 6-2 describes the activities offered in the Watershed Watchers Program.

Additional Tasks

- Include more citizen involvement activities in the Watershed Watchers program
- Develop and implement more activities geared toward high school students

School-Age Children Outreach

The Schools Outreach project includes funding for ZunZun school assemblies and support for the *Wacky Watersheds* teacher training workshop. Details are below:

- *Elementary School Outreach:* During FY 09-10, the Program will continue to sponsor up to 50 ZunZun assemblies at elementary schools in the Santa Clara Valley. These musical assemblies educate students (in grades K-5) and their teachers on watersheds and urban runoff pollution prevention
- *Middle School Outreach* - Outreach to middle schools will be continued through the *Wacky Watersheds* teachers training workshop. This workshop is offered free of charge

[2] SCVURPPP Watershed Education and Outreach Strategy, June 2004

to teachers by the City of San Jose. The Program provides stipends to teachers that attend the workshop and complete a classroom project based on it. In FY 07-08, the *Wacky Watersheds* workshop staff held 2 workshops and trained 38 teachers. One teacher applied for and received the stipend.

Pesticide, Mercury and Illicit Discharge Outreach

The following projects will be implemented under this task:

Pesticide User Outreach

This project focuses on implementing outreach requirements for pesticides toxicity control. Tasks for FY 09-10 include the following:

- *IPM Store Partnership Program* - The Program will continue "point-of-purchase" outreach at Santa Clara County stores using "shelf talkers" and "Less-toxic Pest Control" fact sheets. Program staff will visit each participating store approximately every three months, maintain an ongoing relationship with participating stores through in-store contacts; refresh/restock literature racks (as needed); and update "shelf talker" labels (as needed). Using the services of Annie Joseph, IPM consultant, the Program will provide training to store employees on selling less-toxic pesticides; and work with two stores to increase shelf-space for less-toxic products.

- *Outreach Events* – The Program will participate in selected community outreach events for conducting IPM outreach. Possible events are:

    - Pumpkins in the Park
    - Spring in Guadalupe Gardens
    - Master Gardener Spring Garden Market
    - Santa Clara County Health and Wellness Fair

  Program, Watershed Watch, and Co-permittee staff will staff these events. The pesticide display and/or the beanbag game will be used. Outreach material distributed may include IPM fact sheets and other brochures.

- *Media Advertising* – The Program's Watershed Watch Campaign will conduct media advertising to include messages promoting the use of less-toxic pesticides.

- *Support the Regional IPM Conference* – The Program will provide funding to support the Regional IPM Conference, if required.

- *Outreach to businesses* - Continue distributing the "Don't set a Table for Pests" poster to restaurants through County Health Inspectors. Provide the poster to Co-permittees for distribution through City stormwater inspectors.

- *Support the Going Native Garden Tour* – The Program may provide funding to support promotional activities for the Going Native Garden Tour 2010 or a similar event.

Mercury Pollution Prevention Outreach

The focus of the Program's Mercury Pollution Prevention Outreach is to promote the proper disposal of fluorescent light bulbs. Since FY 02-03, the Program has partnered with the Santa Clara County HHW Program to conduct outreach to residents and businesses on this issue. Outreach is conducted using media advertising, in-store displays (posters, banners), newsletter articles, and at community events.

In FY 09-10, the Program will continue to conduct outreach to promote the fluorescent lamps disposal locations.

The Program will also continue to evaluate the need to conduct outreach on health risks associated with the consumption of Bay fish that contain high levels of mercury. Discussions will include the identification of target audience and appropriate outreach mechanisms.

The Program may also coordinate outreach with other agencies such as BACWA, BASMAA, County Department of Environmental Health, and local community groups. BACWA is currently working with the San Francisco Estuary Institute (SFEI) to develop a Risk Reduction Program that targets consumers of San Francisco Bay caught fish. In FY 08-09, Program staff met with SFEI staff to provide input on existing local outreach programs and mechanisms. The recommendations of this report may be used to develop the outreach plan.

Illicit Discharge Outreach

The Program will develop outreach products to address one illicit discharge activity identified by the WEO AHTG or other Program Work Groups.

Santa Clara Valley Green Gardener Training

The Program will continue to offer the Santa Clara Valley Green Gardener Training. Depending on availability of budget, the Program will also conduct outreach to residents encouraging them to hire trained "Green Gardeners".

Advertising to Support Creek Cleanup Events

Each year the Creek Connection Action Group sponsors two creek clean-up events: Coastal Clean-up Day in September and National Rivers Clean-up Day in May. In FY 09-10, the Program will continue to provide funds to advertise one or both of these events, up to the available budget.

Santa Clara Basin Watershed Management Initiative (SCBWMI) Land Use Subgroup

The Santa Clara Basin Watershed Management Initiative (SCBWMI) coordinates existing regulatory activities on a basin wide scale, ensuring that problems are addressed efficiently and cost-effectively. This is accomplished through various SCBWMI subgroups consisting of Co-permittee and Program staff. The SCBWMI Land Use Subgroup (LUS) develops strategies that minimize impacts of land use on beneficial uses of local water bodies.

In FY 09-10, the Program will continue to provide limited support to the LUS by providing administrative support and direction; assist with training workshops for municipal staff on the connection between land development and water quality; and incorporate water quality friendly

designs in development projects which are consistent with the top five priorities identified by the SCBWMI.

Regional Collaboration

The Bay Area Stormwater Management Agencies Association (BASMAA) conducts regional through three programs: Media Relations, Regional IPM Store Partnership and Regional Advertising Campaign. The Media Relations and Regional IPM Store Partnership Program are funded as part of BASMAA member dues; the Regional Advertising Campaign is funded through additional contributions from participating members. In FY 09-10, Program staff will continue to participate in these programs to implement various outreach tasks. Anticipated activities for these programs are described below:

Regional Advertising Campaign

The Program plans to continue with its participation in the BASMAA Regional Advertising Campaign (RAC) in FY 09-10. From FY 02-03 through FY 04-05, the RAC implemented the "Beautiful Watersheds" advertising campaign for increasing the public's awareness about watersheds and problems caused by litter. The advertisements were broadcast on radio and television. In August 2007, the RAC Committee together with the BASMAA IPM Partnership Committee conducted advertising to promote the Our Water Our World logo and website. Currently, the RAC is planning a multi-year advertising campaign focusing on litter.

Media Relations Campaign

The Media Relations Campaign is a joint effort supported by BASMAA and the Bay Area Clean Water Agencies (BACWA). The primary goals of the campaign are to develop long-term relationships with the media and to generate media coverage that would encourage individuals to adopt behavior changes to prevent water pollution. The Program will continue to participate in this campaign to develop and pitch stormwater related articles/PSAs.

Regional IPM Partnership

The Program will continue to support the Regional IPM Partnership program through contributions to BASMAA and participation in meetings and regional activities. This Regional Program, with input from IPM experts and participating stormwater programs, provides fact sheets, promotional materials, training sessions, display materials for stores, and an alternative products list. The Program and Co-permittees are responsible for recruiting stores, arranging training sessions for store employees, in-store display set-up, display maintenance, and on-going contact with participating stores.

Tasks for FY 09-10 include development of new fact sheets, reprinting existing fact sheets, and advertising to promote the Our Water Our World (OWOW) logo and website.

Other Ongoing Program PI/P Support Activities

Program's Toll-Free Telephone Numbers

The Program will continue to maintain two toll free telephone numbers, the Program's information number (800-794-2482) and the Watershed Watch hotline (866-WATERSHED), for calls from the general public and requests for information.

PI/P Material Reprints and Supplies

The Program will purchase materials (brochures, giveaways, etc,) as needed for the Program and Co-permittee use.

Distribution of Restaurant BMP Materials

In FY 00-01, the Program developed a Restaurant Wash Water BMPs Kit (letter, list of BMPs and a poster) to educate restaurant workers on proper disposal of wash water. The kit is provided to Santa Clara County Department of Environmental Health inspectors (Consumer Protection Division) who have been handing it out to restaurant managers during inspections. In FY 09-10, they will continue to distribute this kit to every newly constructed and remodeled food facility in the County.

ATTACHMENTS

Attachment 6-1 Watershed Watch Campaign Work Plan
Attachment 6-2 Watershed Watchers Program Work Plan Tasks

Table 6-1
Pollutant Matrix for FY 09-10 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 09-10 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Diazinon[2] and pesticides in general	Pesticides (residential, commercial and municipal use)	• Home gardeners • Pest control professionals • Landscapers • Municipal Employees • Residents who hire pest control professionals	Information on Watershed Watch website, IPM Store Partnership Program (regional and local), Pesticide User Outreach activities, Santa Clara Valley Green Gardener Training Program, distribution of restaurant brochure "Don't Set a Table for Pests" through County Health Inspectors, media advertising.	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "Don't Set a Table for Pests", IPM Store Partnership Program Fact Sheets, "Control It", BASMAA Media Relations Campaign topic, Got Bugs magnets, Watershed Watch and BASMAA media advertisements, Most Wanted Bugs for Your Garden
Sediment	Erosion from new construction, grading, road wear	• Construction companies/contractors • Architects/engineers • Municipal inspectors • Residents (home improvement projects, remodels)	Outreach to developers via RWQCB Construction Site Management Workshops or other mechanism.	Construction BMP Tri-folds in English, Spanish and Vietnamese, "Blueprint for a Clean Bay" (revised 1-04), Construction Site Management workshops, Dewatering Brochure.
Mercury	Tailpipe emissions (i.e., diesel-powered vehicles), consumer products (thermometers, fluorescent lighting)	• Residents (auto use, general awareness, proper selection and disposal of products) • Industry (fleet use) • Commercial (fleet use)	Information/fact sheets on Watershed Watch website, BASMAA Media Relations Campaign (potential topic), Mercury P2 Outreach (Residential and business fluorescent light recycling), media advertising.	"Spare the Air and Water Too" campaign press release and public service announcements, Program and local co-permittee fact sheets (e.g., Palo Alto and Sunnyvale), Watershed Watch radio, transit and print ads, store signage, posters, newsletter articles.

[1] Per reissued SCVURPPP NPDES Permit, Order No. 01-024, with the exception of trash.
[2] Under terms of an agreement between EPA and pesticide manufacturers, as of December 31, 2004, residential outdoor and indoor uses and sales of Diazinon are prohibited. Program outreach on other pesticides is continuing.

Table 6-1
Pollutant Matrix for FY 08-09 PI/P Projects

Pollutant of Concern[1]	Primary Sources of Pollutant in Urban Runoff	Potential Target Audience(s)	FY 09-10 Projects and Continuing Activities	Existing Program PI/P Materials and Programs
Copper	Brake pads, industrial discharge, copper algaecides, coolant leaks, illegal dumping	• Industry (scrubbers, roofs, cooling towers, piping) • Residents (illegal dumping, pools and spas) • Commercial business (pool, spa, fountain maintenance) • Municipal maintenance staff	BASMAA Media Relations Campaign (potential topic), Information on Watershed Watch website, support of Brake Pad partnership through BASMAA.	Brake Pad Partnership, "Keeping It All In Tune", Industrial BMPs, storm drain stencils, "Draining Pools & Spas – Keep Pool, Spa and Fountain Water Out of Storm Drains, Creeks and the Bay", Palo Alto's fact sheet on architectural use of copper.
Nickel	Industrial discharges, tailpipe emissions, construction-related erosion	• See sediment and mercury target audiences	See sediment and mercury projects.	See sediment and mercury projects.
Trash	Intentional littering (cigarette butts, throwing objects from automobiles, illegal dumping), trucks hauling poorly secured materials, uncovered or overflowing garbage cans	• General public • Children • Drivers • Smokers	BASMAA media relations campaign (potential topic), Information on Watershed Watch website, BASMAA Regional Ad Campaign topic, Watershed Watch media topic.	Watershed Watch web site, BASMAA's "Beautiful watersheds/trash" TV and radio ads, Watershed Watch litter ads (print and radio), "You are the solution to stormwater pollution" brochure.

Table 6-2
FY 09-10 PI/P Projects

Project Title	Project Description	Comments
1. Watershed Watch Campaign (Year 9)	• Implement the Watershed Watch Campaign	Proposed Activities: Creative development • Media advertising • Outreach events • Partner development • Website maintenance • Advertising to support Creek Cleanup Activities
2. Educational programs at the Don Edwards National Wildlife Refuge (Alviso Ed Center)	Support a staff position at the Alviso Ed Center to the conduct Watershed Watchers Program.	The Watershed Watchers Program includes classes, tours and events for adults and children.
3. School-Age Children Outreach	Funding for educational assemblies at elementary school and support for the "Wacky Watersheds" training for middle-school teachers.	The Program funds the musical troupe ZunZun to perform 50 assemblies at elementary schools in Santa Clara Valley. The Program provides stipends to teachers that attend the workshop and complete a classroom project based on it.
4. Pesticide, Mercury and Illicit Discharge Outreach	Funding for the following projects: • Pesticide User Outreach • Mercury Pollution Prevention Outreach • Illicit Discharge Outreach	Proposed Activities: Pesticide User Outreach - Continue the IPM Store Partnership Program, attend outreach events, and support other local programs such as the Regional IPM Conference and the Going Native Garden Tour. Mercury Pollution Prevention Outreach - Continue outreach in coordination with the County HHW

Table 6-2
FY 09-10 PI/P Projects

Project Title	Project Description	Comments
		Program. Continue to evaluate the need to conduct outreach on health risks associated with the consumption of Bay fish that contain high levels of mercury. Discussions will include the identification of target audience and appropriate outreach mechanisms. Illicit Discharge Outreach – Develop outreach products to focus on one type of illicit discharge.
5. Green Gardener Training Program	Bilingual training program for professional landscape maintenance workers.	Conduct two or more trainings in coordination with the Metropolitan Adult Education Center.
6. Creek Cleanup	Support local Creek Cleanup events	Providing funding to advertise one or both Creek Clean-up days.
7. Santa Clara Basin Watershed Management Initiative (SCBWMI) Land Use Subgroup	Provide staff support for Land Use Subgroup (LUS) Activities	The Program will continue to provide limited support to the LUS by providing administrative support and direction; assist with training workshops for municipal staff on the connection between land development and water quality; and incorporate water quality friendly designs in development projects which are consistent with the top five priorities identified by the SCBWMI.
8 BASMAA Regional Ad Campaign (RAC)	Participate in the BASMAA RAC which will consist of a multi-year advertising campaign focusing on litter.	Attend meetings, review products and provide funds to support media advertising pending concept development and completion of media plan.
9 Program Supplies	Estimated budget for reprints of materials for Program use and other Program supplies.	

Attachment 6-1

FY 09-10 Watershed Watch Campaign Work Plan - DRAFT

BACKGROUND

The primary goals of the Watershed Watch Campaign are to:

1. Change behaviors that negatively impact the watershed.
2. Encourage behaviors that protect, preserve and restore the watershed.
3. Inform audiences about activities that impact the watershed.
4. Build awareness of watershed issues in general.

In fiscal year FY 08-09, the Watershed Watch consultant AdManor, Inc.:

- Implemented the FY 08-09 Watershed Watch Campaign work plan
- Maintained and developed partnership relationships that benefit the Program
- Maximized campaign resources through value-added development and effective media implementation
- Coordinated campaign activities in consultation with the Watershed Education and Outreach Ad Hoc Task Group (WEO AHTG)
- Developed new outreach collateral and litter messages

The Campaign's FY 08-09 media buys focused on community newspapers and South Bay radio stations. Messages included problem-specific IPM messages from FY 07-08, newly developed litter messages and Mercury pollution prevention messages.

Each year, the campaign effectiveness has been measured through

- Hits on the www.MyWatershedWatch.org website
- Inquiries on the phone hotline
- Requests for information on the hotline and website
- Quantity of fluorescent bulbs dropped off at participating hardware stores and household hazardous waste collection events.
- Media gross impressions
- Spot surveys conducted at community events
- Attendance at Watershed Watch promotional events

In February 2009, the Program is contracting with a research firm to conduct a public opinion survey to evaluate the effectiveness of the Campaign. The FY 09-10 media and creative plans will be refined based on the finding of the public opinion survey.

FY 09-10 Watershed Watch Campaign Work Plan

The FY 09-10 Work Plan is based on a campaign budget of $150,000. If additional funds become available, they will be allocated according to the prioritized needs of the campaign and feedback from the WEO AHTG.

Whenever possible, Watershed Watch Campaign activities will be coordinated with activities of other local and regional outreach programs (e.g., the BASMAA Regional Ad Campaign, HHW Program and the County Integrated Waste Management Program campaigns, and the BASMAA/BACWA Media Relations Committee). Campaign activities will be evaluated on an ongoing basis, and changes made as required for effectiveness.

In FY 09-10, AdManor Inc. ("consultant") will implement the following tasks to achieve the goals of the Campaign.

TASK 1: Creative Development

This task includes revisions to existing messages or the development of an additional message (e.g. automotive related message). Creative needs will be determined by results of evaluations and as dictated by the priorities of the Campaign (media selection, messages, and all applicable production).

TASK 1 DELIVERABLES:

Final deliverables are contingent upon media plans and WEO AHTG agreement about the message focus for each campaign flight. Deliverables may include creative materials for:

- Print media (newspaper, magazine, coupon ads)
- Transit media (bus board posters)
- Radio (recorded messages, public service announcements)
- Collateral (point-of-purchase displays/prompts, materials for distribution)
- New media (internet, social media, or other new media production)
- Cable television

A part of the budget will be used to develop and produce giveaways (e.g., flyswatter, pencils)

TASK 1 BUDGET: $8,500

TASK 2: Media Advertising

The FY 09-10 media plan will be reflective of the recommendations, evaluations and any trends found in the 2009 public opinion survey. For example, focus group research from 2003 and 2006 suggested that a top of mind awareness (TOMA) approach to media could be more effective than concentrated media campaigns, as a consistent reminder to "do the right thing." After two complete campaign years and media schedules with this approach, the public opinion survey may indicate whether TOMA is being achieved.

The consultant will develop media partnerships, schedules / flight plans and budget allocations in a comprehensive media plan. In developing these plans, the consultant will work with the WEO AHTG to clearly identify and define their media goals and preferences, and obtain their approval.

Requests for proposals will be developed to educate the media regarding the goals of the campaign, the prospective media schedule(s)/plan, budget, and the criteria on which proposals will be judged. RFPs will be distributed to media in the geographic target area, defined as Santa Clara County geographic area, also known as the area of dominant influence (ADI). San Francisco media may also be included with the instruction that comparative data is based on coverage of Santa Clara County audiences.

"New media" or online and mobile phone advertising messaging will be explored in

addition to traditional media.

Media Allocation

The consultant will allocate the media budget proportionate to language/population of the target audiences, and the media's effectiveness in delivering audiences and added-value to the campaign. The consultant will create an appropriate balance based on the goals, budget for the campaign, any timely circumstances and/or other campaign partner activities relevant to Watershed Watch goals and messages.

Media Selection

Media selection may be impacted by the outcome of the public opinion survey, and whether the TOMA approach is effective. The TOMA campaign has focused on delivering more consistent messages to a narrower, more targeted audience. The alternate is utilizing media with a broader reach and more "high-impact" short-term schedule.

Media will be evaluated for its: effective reach in the ADI (ratings); efficiency based on cost per point, reach & frequency to target audience(s), added value, and partnership opportunities.

Media will be selected to create a desirable balance of reach and frequency; limited duplication in programming and formats for maximum reach; maximum impact weighing rating points and impressions; and adequate frequency to create impact.

Selection will consider the proportion of media in English and Spanish relative to the population, effectiveness in delivery of the message, the messages the Campaign wants to deliver, partnerships and value-added media and promotions.

Media Schedule

The FY 09-10 media schedule will be reflective of the results of the public opinion survey (TOMA/ongoing vs. concentrated schedules) and in support of Campaign events and seasonal messages.

The consultant will present the recommended detailed media plan to the WEO AHTG for approval. The media plan will be revised as needed based on comments received.

Upon approval of the media plan, the consultant will confirm schedules with the media and secure contracts, including written commitments of added value and promotions. All creative materials and traffic instructions/insertion orders will be distributed to the media.

Task 2 DELIVERABLES:

- RFP to Media (Media Negotiation)
- Media Recommendations
- Media Plan
- Traffic (creative and scheduling instructions) / Distribution to Media
- Billing / Reconciliation / Documentation
- Media Campaign Summary (Report)

Task 2 BUDGET: $82,850

Task 3: Partner Development and Coordination

Developing partners has proven successful in augmenting campaign resources. Partners have distributed Watershed Watch materials through educational and promotional activities and events, offered web site links, sponsorship status for events, and shared other resources. The consultant will continue to work with past and existing partners so that the list of partners continues to grow each year.

The consultant will explore development of additional partnerships, such as:

- Additional or alternate media partners – Comcast Cable, VietUSA, Cinemas, Pennysaver, ValPak (direct mail media), movie theaters, etc.
- Water-related / outdoor activity businesses or sporting retailers – Fishing, boating, rafting, kayaking, parks and open space groups
- Hardware/garden/home improvement – OSH (currently through BASMAA), Ace Hardware.
- Educational - San Jose Tech Museum, San Jose State University Environmental Studies Department, Santa Clara University Environmental Sciences Institute; encourage student studies and projects focused on watershed protection and pollution prevention in cooperation with Watershed Watch.
- Automotive – dealers, oil change / service centers, auto parts / targeting do-it-yourself oil changes

The consultant will distribute a partnership kit to all new partners and potential partners, which presents partnership benefits and opportunities and tools for displaying their support of WW, and thanks them for their partnership. In pursuing new partners, when appropriate, the consultant will develop customized proposals with specific benefits and creative partnering opportunities, developing mutually beneficial relationships and activities. The consultant will continue to seek partners that provide discounts on products and services to patrons using the Watershed Watch card.

The support of these relationships includes coordinating outreach materials or messages, promoting the partner's interests that are shared with the Program, participating in key activities and events, and suggesting or developing win-win opportunities. A calendar of events will be maintained to keep all partnership activities "on the same page."

Changes and developments in media from the previous year may impact the availability or recommended change in partnership pursuits.

If needed, the consultant will help the WEO AHTG review other local and regional campaigns (e.g., the BASMAA Regional Ad Campaign), and provide feedback.

Task 3 DELIVERABLES:

- Ongoing contact with partners; work with existing partners and renew previous partners
- Partnership kits (ongoing)
- Maintain updated contact data and partnership details
- Development of new creative partnership opportunities / scenarios

- Monthly written report of results or activities
- 2 new community/business partnerships

Task 3 BUDGET: $5,000

Task 4: Development of Value-Added Resources

The media offers excellent value added opportunities. The consultant will negotiate media buys and partnerships for added media exposure, requesting innovative partnerships and sponsorship opportunities with the media and their advertisers. When media proposals lack relevance or inspiration, the consultant will develop and propose concepts, beginning with additional media.

Opportunities include but are not limited to:

- Contests to provide public awareness and incentive
- Donations of products or services to use as incentive
- Signage or space to provide prompts
- Public Service Announcements / donated airtime or space
- Sponsorships
- On-site events
- Cross-promotions with other media clients and with the stations/publications
- Web links, etc.

The consultant will also explore new methods and channels of distribution for campaign messages, as well as activities or opportunities to encourage desired outcome from the audience, and reinforce the positive impact of that action.

Events offering relevant opportunities may be:

- Earth Day events throughout the region
- Home & Garden Shows
- Garden Tours
- Santa Clara County Parks & Recreation events and venues
- Beach/Creek Clean-up days
- Outdoor events/activities that take place in a watershed recreation area
- “Green” living/sustainability or health-related events

Task 4 DELIVERABLES:

- Value-added as negotiated with media and partners
- Monthly written report of results or activities
- Two third-party promotions

Task 4 BUDGET: $5,000

Task 5: Website Maintenance

The consultant will maintain the Watershed Watch website on an ongoing basis, encouraging partners to provide news, and creating more ways and reasons for the public to use the site.

The consultant will edit the site to maximize the usability of the site and help people easily and quickly find the information they seek, and maximize the educational impact and effectiveness of the site. As budget allows, this will involve streamlining the functionality of the site to eliminate extraneous files, and translating more features of the site into Spanish (relevant Watershed Watch pages linked to the Spanish site).

The consultant will update it regularly with the latest news/ articles, creative, partnership links, and events/announcements, including removal of expired or past events and news in a timely manner.

The consultant will track web activity and comment on any potentially relevant trends observed.

Task 5 DELIVERABLES:

- Monthly/ongoing maintenance
- Monthly written report of results or activities

Task 5 BUDGET: $7,000

OPTIONAL: WEBSITE REDESIGN
Please see Addendum I with an optional website redesign proposal.

If the website redesign proposal is approved, the regular maintenance cost would be reduced to $6,000 and other changes will be completed within the scope of site redesign. Website redesign estimate: $11,500

TOTAL TASK 5 + Addendum I Budget: $17,500

Task 6: Outreach Events

The consultant will maintain a comprehensive calendar of events including:

- Partner events (car wash events, garden/gardening, HHW, etc.)
- Relevant holidays or observances (Earth Day, Arbor Day, etc.)
- Media schedules

The consultant will work with WEO AHTG to create an event plan for prioritizing events according to budget, resources and Campaign goals.

The consultant will evaluate and recommend relevant events in the FY 09-10 to reach greater numbers of people, support campaign partners, promote messages/areas of focus (litter, IPM, etc.), and take advantage of added-value / media opportunities when possible.

Task 6 DELIVERABLES:

- Event plan development and maintenance
- Coordination of events (applications, registration fees, materials, etc.)

- Participation / representation at events (equivalent to 5 days)
- Event survey / written report of results or activities

Task 6 BUDGET: $7,000

Task 7: Media and Public Relations

Public and press relations, both proactive and reactive, will be utilized to increase audience awareness and understanding of current events and activities that affect the watersheds.

News created by the actions of nature, politicians and local citizens, and BASMAA media outreach activities may be maximized to promote watershed awareness and public education opportunities. When appropriate, the consultant will craft a relevant news story based on general conditions, campaign events or partner events, or current trends.

Specifically, the recruitment and public awareness of Santa Clara Valley Green Gardeners will be promoted.

The consultant will pitch stories to the local press promoting the Program's perspective.

Materials will be emailed to partners and co-permittees for their approval, use and distribution, and/or loaded to the website for download.

The consultant will also utilize community calendars in internet, print, TV and radio for no-cost announcements of events, programs and activities.

Task 7 DELIVERABLES:

- PR plan development and execution (3 pitches/PSAs)
- Ongoing maintenance of press contact data
- Clippings when available

Task 7 BUDGET: $5,000

Task 8: FY 10-11 Work Plan Development

The consultant will compile and submit monthly, mid-year and year-end campaign activity reports for all applicable tasks. Details will include measurable results of campaign activities and estimated added-value amounts.

The consultant will develop the FY 10-11 Work Plan and Media Plan, consistent with the 3-year conceptual plan and adapting to the outcome of the FY 09-10 campaign.

Task 8 DELIVERABLES:

- FY 10-11 Work Plan
- FY 09-10 mid-year and year-end reports

- Monthly reports

Task 8 BUDGET: $5,500

BUDGET SUMMARY:

BUDGET SUMMARY:

TASK 1 Creative Development	$8,500
TASK 2 Media Advertising	$82,850
TASK 3 Partnership Development	$5,000
TASK 4 Added-Value Development	$5,000
TASK 5 Website Maintenance plus Redesign	$17,500
TASK 6 Event Coordination	$7,000
TASK 7 Media/Public Relations	$5,000
TASK 8 FY 10-11 Work Plan	$5,500
TOTAL CONSULTANT BUDGET	$136,350
EOA Mark Up	$13,635
TOTAL CAMPAIGN BUDGET	**$149,985**

Attachment 6-2

Attachment 6.2: "Watershed Watchers: Keeping Our Waterways Clean" Program with the U.S. Fish and Wildlife Environmental Education Center (EEC) in Alviso.

The Program provides resources to the Don Edwards San Francisco Wildlife Refuge Environmental Education Center in Alviso to support a full-time interpretive specialist position for conducting the Watershed Watchers Program. Watershed Watcher activities, which are conducted on-site and primarily on the weekends, focus on building watershed awareness, promote watershed stewardship, and encourage stormwater pollution prevention behaviors among attendees (general public, weekend visitors, families with children etc.).

The Program's Alviso Work Group will meet with Alviso Ed Center staff to work toward including more citizen involvement activities in the Watershed Watchers program.

The Watershed Watchers Program conducts more than a hundred activities for children and adults each year. These include:

Wildlife in Our Watershed Depends on You: Interpretive programs focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed. Examples include children's bird walks, adult birdwatching, live animal presentations, twilight walks and general nature hikes. All programs include a segment addressing runoff pollution covering causes, resulting problems, and identifying actions visitors can take at home to prevent or lessen the problems.

Gardening without Chemicals: Stewardship activities that encourage and inspire visitors to create wildlife habitats and use chemical-free garden techniques in their own backyards. Garden work days are offered emphasizing chemical-free gardening techniques. Native plant gardening workshops begin in the classroom and end with a tour of the EEC native plant demonstration gardens while discussing chemical-free gardening techniques and implementation methods for the home garden.

Our Role in Preventing Urban Runoff: Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. This is usually done with groups that make reservations (e.g., Scouts, Lyceum, Sierra Club, and senior groups).

Special Events: These events are designed to attract at least 200 people to the EEC for various activities including games and crafts. Urban runoff pollution prevention messages are incorporated into several of the activities featured during the event.

Other Watershed Watcher program tasks include:

Developing and Maintaining Partnerships with Local Community Organizations: Partners include Santa Clara Valley Audubon Society, Friends of Guadalupe River Park & Gardens, the San Francisco Bay Bird Observatory, Happy Hollow Park & Zoo, and volunteer coordinators at local companies (e.g., Cisco and Hands On Bay Area, etc.).

Coordinating Refuge Volunteers for Interpretive Programs/Gardens: Contacting volunteers to lead programs, training, and maintaining relationships with volunteers; and scheduling volunteers for special events.

Informal Indoor Visitor Contact: Includes interaction at the Center and answering visitor questions over phone.

Outreach to Local Media: Includes contacting local newspapers and other publications; posting program and event announcements in online calendars (e.g., Acterra and Craigs List); and creating appropriate event descriptions for press releases.

7. WATER QUALITY MONITORING PROGRAM PLAN

INTRODUCTION

This section serves as the Annual Monitoring Program Plan for the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program). The monitoring plan provides brief descriptions of receiving water monitoring and assessment activities that will be conducted by the Program in FY 09-10. Planned activities described in this section include implementation of the seventh year of the SCVURPPP *Multi-Year Receiving Waters Monitoring Plan* (Multi-Year Plan), participation and financial support to the Regional Monitoring Program (RMP) for Water Quality in the San Francisco Bay Estuary, the Bay Area Macroinvertebrate Bioassessment Information (BAMBI) network and the BASMAA Monitoring Committee.

ONGOING AND PLANNED MONITORING ACTIVITIES

In recent years, the Program has conducted and/or actively participated in water quality monitoring activities focused on local creeks, the San Francisco Bay and the linkage between the two (i.e., tributary loading studies). These activities have been generally conducted as described below.

Santa Clara Valley Receiving Water (Creek) Monitoring

In 2002, the Program developed and began implementing its' Multi-Year Plan in compliance with Provision C.7 of the Program's current NPDES Permit. The Multi-Year Plan is intended to assist the Program in:

- Developing a better understanding of the chemical, biological, and physical characteristics of water bodies and watersheds relevant to the Program, which will help inform decisions about future management actions and help clarify and resolve urban runoff related issues within watersheds;
- Assessing baseline water quality conditions in representative watersheds within Program boundaries to evaluate urban runoff impacts and help solve creek drainage basin-specific water quality problems;
- Assessing whether specific pollutants of concern are found in urban runoff discharges and impact water quality in local water bodies and the San Francisco Bay; and
- Evaluating overall Program effectiveness over time.

The Multi-Year Plan was designed to assess water bodies in the Santa Clara Basin using an iterative rotating watershed approach similar to the San Francisco Bay Water Board's Surface Water Ambient Monitoring Program (SWAMP). In 2004, the Multi-Year Plan was revised (i.e., Revised Multi-Year Plan) to include a decision framework linking receiving water monitoring and watershed assessment, which includes the following steps/categories 1) Watershed Characterization; 2) Screening-Level (Status/Condition) Ambient Water Quality Monitoring; 3) Water Body Assessment; 4) Investigative Studies; and 5) Trends/Effectiveness Monitoring. The following paragraphs briefly summarize the tasks completed to-date by the Program through the Revised Multi-Year Plan. Table 7-1 lists the watersheds where monitoring and assessment activities have been conducted between FY02-03 and FY 08-09.

- Watershed Characterization is intended to assist the Program in evaluating and documenting the current understanding of beneficial use condition and potential impacts in local water bodies. As defined, watershed characterization entails two tasks. First, water quality data and watershed information collected to-date are summarized in a watershed characterization memorandum. The memorandum includes a compilation of existing data sources and a summary of the geologic and geomorphic setting, vegetation, land uses and associated water quality issues. An evaluation of the status of biological communities and relevant beneficial uses in the watershed(s) is also provided. Second, a creek survey using a Unified Stream Assessment (USA) method (Center for Watershed Protection) is conducted to identify potential impacts to beneficial uses and to assess the quality of the physical habitat. As part of this effort, field data collected is entered into a database and evaluated.
- Screening-Level Monitoring (Status and Trends) is conducted to asses the condition of aquatic life use and recreational uses in Santa Clara creeks. The program has identified and collected ecological indicators in local creeks to serve as measures that characterize ecosystems or one of its critical components. An indicator may reflect biological, chemical and/or physical attributes of ecological condition. The primary uses of an indicator are to characterize current status and to track or predict significant change. With a foundation of analytical research, an ecological indicator may also be used to identify major ecosystem stress.

Table 7-1. Summary of monitoring and assessment activities conducted between FY 03-04 and FY 08-09 by SCVURPPP.

Activity	Watershed												
	Lower Penitencia	Lower Silver-Thompson	Upper Penitencia	Stevens	Coyote Maintstem	San Tomas Aquino	Calabazas	Sunnyvale East and West	Adobe	Permanente	Matadero/Barron	San Francisquito (1)	Guadalupe (2)
Watershed Characterization				X	X	X			X	X	X		
Screening-Level Monitoring (Status and Trends)	X	X	X	X	X	X	X	X	X	X	X		X
Water Body Assessments			X	X	X	X							
Investigative Studies				X									

(1) Monitoring is conducted through the San Francisquito Creek Joint Powers Authority (JPA), which includes data collected by the City of Palo Alto. Program staff track and data collected via this effort and coordinate as needed with the Program's monitoring program.

(2) Monitoring has previously been conducted by the SCVWD, the City of San Jose and the RMP/CEP. In addition, the Program and the City of San Jose conducted a first flush monitoring and analysis effort (see Journal of Environmental Management 76(2005) 309-318.)

- Water Body Assessments (Sediment and Ecosystem Function) are systematic reviews of specific resources (e.g., benthic macroinvertebrates or fish) and their habitat and riparian areas in a watershed-scale context. Water body assessment is a stage-setting process based primarily on existing information. Assessments typically address cumulative effects within a watershed; provide for more ecologically sound resource planning; and identify and help protect environmentally sensitive areas. The Program uses the results of water body assessments to identify data gaps that provide context for subsequent monitoring and follow-up studies; and to recommend feasible management actions. In the recent past, the Program has conducted two types of water body assessments in Santa Clara Basin watersheds – ecosystem functional and sediment assessments.
- Investigative Studies are conducted when water quality data indicate that a water quality impact may be occurring. Investigative studies are typically more focused in comparison to status and trends monitoring, and are designed to collect additional information that is needed to better understand the magnitude and extent of impacts that may be occurring.

FY 09-10 Implementation Tasks

Regional Monitoring Collaborative (RMC)

In current and previous municipal stormwater NPDES permits, large and medium sized municipalities in the San Francisco Bay area have been required to implement monitoring programs to measure stormwater impacts on receiving waters, determine sources of pollutants and measure effectiveness. Some activities, such as participation in the San Francisco Bay Regional Monitoring Program (RMP) and more recent TMDL-related special studies, have been coordinated consistently among permitees. Building on these experiences, the Program intends to continue participating in the development of a Regional Monitoring Collaborative (RMC) in FY 09-10. Activities that will be conducted as part of the development of the RMC may include, but are not limited to, those summarized below. As the RMC is better defined, more detailed work plans will likely be developed to better define tasks, deliverables and schedules for completion.

1. RMC Organizational Structure – Program staff will continue to actively participate in the development of an organizational structure that will define tasks to be completed by the RMC, the decision-making process and membership, and communication structure. It is anticipated that Program staff will participate in a series of meetings between BASMAA member agencies and actively participate in the development of materials and deliverables.
2. Development of Monitoring Design – During FY 08-09, the Program began planning the development of a design for future monitoring efforts in coordination with the RMC. In FY 09-10, the Program will continue to participate in the development of a regional monitoring design for the following monitoring activities: 1) Status Monitoring; 2) Long-Term Trends Monitoring; 3) Monitoring Projects; and 4) Pollutant of Concern Monitoring (which may include preparation for monitoring loads to the Bay from the Guadalupe River). The monitoring design will include input and/or direct involvement from scientists and statisticians (i.e., subcontractors) heavily experienced in designing monitoring programs. Interim deliverables (e.g., presentations and meeting summaries) for this activity and the final deliverable

(Sampling and Analysis Plan, or SAP) are expected to be completed in 2010. This SAP will guide monitoring conducted by the Program over the next permit term.

3. Quality Assurance and Control Programs – It is anticipated that the Program's new NDPES permit will require all monitoring data collected by the Program to be "SWAMP comparable" and accessible via the Program's website. To comply with this requirement, the Program intends to (in coordination with BASMAA) continue: 1) developing a data quality assurance and control program to meet "SWAMP comparable" requirements in the MRP, including the development of quality assurance project plans (QAPPs), region-wide trainings on field and laboratory protocols and data quality assurance procedures; and, 2) developing field data collection standard operating procedures, laboratory data management templates and data structures.
4. Information Management System – As data are collected by RMC participants and received from laboratories, they must be stored and managed in a cost effective manner that allows data users to easily access data and information. It is highly likely that the most cost effective way to develop this system is collectively through the RMC. Therefore, it is assumed that Program staff will actively participate in the development of an information management system that will serve as a regional data center for water quality monitoring data collected by BASMAA member agencies. Deliverables will likely include data structures, technical user manuals and databases.
5. Data Analysis and Reporting – Based on the tasks agreed to by RMC members, regional data analysis tools and reporting structures may also be developed in FY 09-10. Program staff will likely be heavily involved in the development of such tools and reporting formats, considering our experience in developing annual monitoring reports, multi-year data summaries and fact sheets.

Characterization and Investigative Studies

In FY 09-10, the Program will begin developing plans to carry out studies required by the MRP. Tasks will include developing nutrient characterization plans and creek monitoring plans for status/long-term trends. Additionally, as a follow-up to screening level monitoring conducted from FY 02-03 through FY 08-09, the Program intends to conduct an investigative study in Coyote Creek in FY 09-10. The study will attempt to determine the potential causes of water quality conditions observed in the mainstem between Highways 101 and 280 via recent sampling conducted by the Program and the SCVWD. Tasks will include collating data and information collected within this reach and within the associated drainage area, developing a conceptual model of potential impacts, identifying data gaps, and developing recommended management and monitoring activities to improve water quality conditions.

The Program will also conduct a second year of benthic macroinvertebrate bioassessments in the Guadalupe River watershed (first year was FY 08-09).

Pollutants of Concern (POC) Monitoring (Loading Station)

It is expected that the MRP will require the Program to set up a POC loading station in at least one creek location in FY 09-10 (in addition to RMP loading stations), in preparation for monitoring to begin in the fall of 2010. This task includes Program staff and subcontractor

time to establish a feasible monitoring site and estimate resource needs for monitoring field equipment and setup of the equipment at the selected station.

Data Analysis and Reporting

This task pertains to the Reporting sub-provision in the MRP. Tasks intended to be completed by Program staff include: 1) reporting on monitoring efforts conducted in FY 08-09; and, 2) participating in the development of a region-wide model reporting format (in coordination with BASMAA) for the Urban Creeks Monitoring Report required by the MRP beginning in FY 10-11.

Liaison to Volunteer Monitoring Programs

In FY 09-10, Program staff will continue to serve as a liaison between certain high profile and effective citizen/volunteer monitoring programs in the Santa Clara Basin and the Program on monitoring-related activities. Tasks may include coordination with volunteer programs on monitoring site selection, methods and data interpretation; data management and analysis; presentation of results and conclusions; and designing follow-up studies.

San Francisco Estuary Receiving Water Monitoring

The Regional Monitoring Program (RMP) for Water Quality in the San Francisco Estuary is a long-term monitoring program that shares financial support, direction, and participation by regulatory agencies and the regulated community with the goal of assessing water quality in the Bay. In accordance with the Program's NPDES permit, the Program has contributed approximately $180,000 annually to the RMP in recent years. This funding is in addition to separate funding provided by the three South Bay POTWs (which are operated by SCVURPPP Co-permittees) to the RMP. In addition, Program staff participates on the RMP Steering Committee, Technical Review Committee, Contaminant Fate Work Group, Sources, Pathways and Loading Work Group (SPLWG), and the Small Tributaries Work Group. The Program Manager serves as the BASMAA representative to the RMP Steering Committee (SC), and is currently the Interim Chairperson of the SC.

FY 09-10 Implementation Tasks

The Program plans to continue to financially support the RMP in FY 09-10 with its designated contribution of approximately $180,000. In addition, Program staff plan to continue to participate on the RMP Steering Committee, Technical Review Committee, Contaminant Fate Work Group, and Sources, Pathways and Loading Work Group (SPLWG). A key effort will be to continue to work with the RMP to prioritize efforts to focus on monitoring that is consistent with the MRP; and work with other regional stormwater programs to pool resources for long-term monitoring and loads assessments efforts which appropriately address MRP requirements within resource constraints.

Regional Biological Assessment Network (BAMBI)

In February 2002, Program staff participated in a workshop for information sharing and discussion of recent and ongoing rapid bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area. In particular, BAMBI is interested in storm water programs that include rapid bioassessments in

their watershed monitoring and assessment programs. Since the initial workshop, the Program has assisted (with planning and coordination) and participated in seven annual BAMBI workshops (through 2009).

In support of BAMBI, Program staff has assisted in the development of a Benthic Index of Biotic Integrity (B-IBI) for Bay Area Creeks, with the goal of developing a regional bioassessment tool necessary to provide context to data collected in Santa Clara Basin creeks. A draft BAMBI IBI Work Plan was presented at the 2005 BAMBI Workshop and Program staff has provided in-kind services to implement specific tasks identified in the work plan in recent years.

FY 09-10 Implementation Tasks

The Program will continue working with participants of BAMBI Network in testing, revising and publishing the B-IBI and supporting efforts to share bioassessment data through annual BAMBI meetings.

8. POLLUTANTS OF CONCERN CONTROL PROGRAMS WORK PLAN

INTRODUCTION

This section summarizes Program tasks planned for FY 09-10 that are designed to assist Co-permittees in reducing and/or controlling the discharge of pollutants of concern (POCs) in stormwater. Task summaries are included for pesticide toxicity, trash, mercury, polychlorinated biphenyls (PCBs) and copper control programs. Tasks described build upon previously submitted work plans and strategies, and include those that will likely assist Co-permittees in complying with provisions in the Municipal Regional Permit (MRP), which is scheduled for adoption in 2009.

PESTICIDE MANAGEMENT PROGRAM

The Program's approach to pesticide management focuses on source control and pollution prevention. Program BMPs for pesticide management have included significant outreach efforts to residents, businesses, and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide issues; and development of local pest management plans.

The Program submitted its original Pesticide Management Plan (Pesticide Plan) to the Water Board in 2001. The Pesticide Plan was then revised several times in subsequent fiscal years. The objective of the Pesticide Plan is to control pesticide-related toxicity in urban water bodies in the Santa Clara Valley, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Pesticide Plan identifies the goals of each work plan element, actions, monitoring mechanisms and schedules; and indicates whether actions will be implemented at the Program or Co-permittee level. Program-level actions in the Plan form the basis of the Program's Work Plan. The details of municipality actions and schedules are provided in individual Co-permittee pest management plans submitted with the Co-permittees' Work Plans and Annual Reports.

FY 09-10 Implementation Tasks

The Diazinon TMDL and Pesticide Toxicity Water Quality Attainment Strategy for Urban Creeks in the San Francisco Bay Area establishes minimal implementation requirements for Bay area stormwater programs, including SCVURPPP, and the proposed MRP further defines these requirements. In an effort to meet these requirements, and well as implement ongoing tasks in the Pesticide Plan, the Program intends to conduct the following tasks::

- Survey and review existing Co-permittee IPM policies/ordinances and develop suggested improvements, as needed, along with modifications to written standard operating procedure for pesticide use for implementation of the IPM ordinance/policies, as needed;.
- Coordinate with BASMAA and/or other agencies to conduct training for municipal staff as needed.
- Track the California Department of Pesticide Regulation (DPR) pesticide evaluation activities as they relate to surface water quality and, when necessary, encourage

DPR to coordinate implementation of the California Food and Agriculture Code with California Water Code and to accommodate water quality concerns within its pesticide evaluation process.

- Support, participate in, and track CASQA's Pesticide Subcommittee, BASMAA, and UPC activities and develop letters of support to USEPA and California DPR on re-registration, reevaluation and other actions relating to pesticides of concern for water quality..
- Assist Co-permittees in evaluating the effectiveness of control measures through the assessment of water quality and sediment quality data collected in Santa Clara Valley Creeks and the Bay Area.
- Continue implementing the following outreach tasks (see Section 6 for more detail):
  - Implement Our Water Our World Store Partnership Program in participating Santa Clara County stores.
  - Provide information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest control.
  - Continue to coordinate with County HHW Program to conduct outreach about and promote appropriate disposal of pesticides.
  - Provide IPM training to landscape maintenance workers through the "Santa Clara Valley Green Gardener Program".

TRASH REDUCTION

On November 14, 2001, the Water Board released the document entitled Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region Report. This report stated that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …" In a proactive response to the 303(d) Staff Report, the Program's Management Committee formed a Trash AHTG that developed a Work Plan (submitted March 1, 2003) to identify a strategy for addressing trash problem areas that occur in or near urban streams and waterways of the Santa Clara Basin.

Since FY 03-04, the Program has completed the following Work Plan tasks: 1) Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction; 2) Develop a strategy to conduct trash evaluations in or near creeks; 3) Assist municipalities in identifying trash problem areas and sources of trash; 4) Conduct trash evaluations at a subset of identified trash problem areas; 5) Identify and begin to implement or refine existing trash control measures, where feasible, to address trash problem areas; and 6) Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

In October 2006, Program staff developed a *Draft Trash Management and Effectiveness Assessment Strategy* (Strategy), which was reviewed by the Trash AHTG. The Strategy includes four main areas of Program activity associated with trash:

1) Identifying trash problem areas and sources;
2) Selecting and implementing appropriate control measures at high priority problem areas;

3) Assessing the effectiveness of control measure implementation; and
4) Providing administrative support to the Trash AHTG.

Recent and current activities related to these tasks are briefly summarized below.

Identification of Trash Sources and Pathways

To gain a better understanding of the sources, pathways, extent and effects of trash on urban creeks and waterways within the Santa Clara Basin, the Program developed a summary of its conceptual understanding ("Conceptual Model") of potential trash sources and pathways to urban creeks. Defining source and pathway categories will assist the Program in:

- Developing consistent terminology for effective communication between Co-permittees, regulatory agencies and other stakeholders;
- Continuing to build its conceptual understanding of trash source types present in watersheds; and how these sources enter creeks and waterways; and,
- Determining the most optimal and cost effective control points to implement control measures.

Source and pathway categories are based on knowledge gained through numerous trash evaluations conducted in Santa Clara County creeks and the Program's general knowledge of how trash is deposited and transported to local waterways. The Conceptual Model includes an easy-to-read illustration of trash sources and pathways to urban creeks.

Pilot Demonstration Projects (Trash Full Capture Devices)

Co-permittees, with assistance from Program staff, have launched two Pilot Trash Structural Treatment Control Studies (Pilot Studies) within the Cities of San Jose and Sunnyvale. Both studies, which involve the purchase and installation of approximately 95 StormTek™ "full capture" treatment devices within catch basins in both Cities, are designed to answer the following management questions:

1) What are the trash loading rates from specific land uses to the stormwater conveyance systems?
2) What is percentage of different types of materials (e.g., trash, sediment, leaves, grass) removed by selected treatment devices?
3) What is the maintenance frequency needed for proper operation of selected BMPs?
4) What are the overall costs of treatment per amount (volume or weight) of trash removed?

Findings to-date from the Pilot Studies will be included in the Program's FY 08-09 Annual Report.

FY 09-10 Implementation Tasks

As described by Water Board staff and presented in the draft MRP (12/14/07 version), trash assessment and management should be considered a high priority in FY 09-10. Based on recent discussions with Water Board staff, MRP requirements are likely to fall into two broad

categories: 1) identification, cleanup and assessments of trash hotspots; and, 2) installation of trash full capture treatment devices to effectively treat a minimum land area. The Program intends to conduct the following tasks:

- *Identify Trash Hotspots and Dominate Pathways* - The MRP will likely require each Co-permittee to identify a minimum number of "in-creek" trash hotspots that will be the focus of required future trash cleanups and assessments. In coordination with Co-permittee staff, Program staff intend to select trash hotspots and identify dominate pathways of trash to these sites, which will help direct effective management activities. This task will include the analysis of existing data and may involve some additional field work to identify and verify appropriate hotspots and pathways.

- *Conduct On-going Trash Assessments -* Based on discussion with Water Board staff, it is assumed that at least one trash assessment per year will be required at each trash hotspot. Therefore, the Program intends to conduct trash assessments at selected hotspots, develop quality assurance plans, manage trash data, and develop an initial technical report on the condition and trends of trash at selected hotspots.

- *Identify and Prioritize Trash Full Capture Treatment Areas* - It is assumed that a majority of Co-permittees will be required to implement trash full capture devices during the term of the MRP. As a first step to identifying the most optimal and feasible locations to implement trash full capture devices, Program staff will assist and guide applicable Co-permittees by analyzing existing information and prioritizing land areas based on information such as estimated trash loading rates, site specific features and feasibility. Program staff will coordinate this task with direct input from Co-permittees via the Trash AHTG.

- *Develop a Pilot Watershed Management and Assessment Plan for Trash -* Throughout discussions with Co-permittees on the proposed MRP Trash requirements, the concept of utilizing a "watershed approach" to managing and assessing trash impacts on creeks was consistently supported. As a follow-up to trash source and pathway analyses conducted in FY 08/09 and proposed for FY 09/10, the Program intends to develop Pilot Watershed Management and Assessment Plans (and guidance) for Trash in two watersheds (i.e., one within San Jose, such as Coyote Creek, and Stevens Creek). To the extent possible, these watershed-based trash plans will identify trash hotspots, sources and pathways of trash to the creek, recommended management activities to reduce trash, and key stakeholders and participants, as well as develop a robust trash assessment strategy aimed at tracking and evaluating effectiveness over time. These pilot watershed plans will serve as models and guidance for all Co-permittees to use in other watersheds in the Santa Clara Basin. (The Program will seek input from the county-wide trash work group and incorporate such input, where appropriate, to help guide future county-wide efforts.)

MERCURY AND PCBs CONTROL PROGRAMS

The Program's current NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury and PCBs. Both contaminants have been found in relatively high concentrations in some types of fish caught in the Bay and may threaten the health of humans consuming those fish. These concerns prompted the Program to develop ongoing work plans for controlling PCBs and

mercury. Brief descriptions of these work plans and summaries of recent tasks are described below.

Mercury Pollution Prevention

In an attempt to reduce the concentration of mercury in fish and wildlife, a total maximum daily load (TMDL) for mercury in the San Francisco Bay has been adopted and approved. Consistent with implementation actions for urban runoff in the TMDL and current permit requirements, the Program continues to revise and implement the SCVURPPP Mercury Pollution Prevention Plan (Mercury Plan). The Mercury Plan includes the goals of each work plan element, actions, monitoring mechanisms and schedules; and, indicates whether actions will be implemented at the Program or Co-permittee level. Program-level actions in the Plan form the basis of the Program's Work Plan. The details of municipality actions and schedules are provided in individual Co-permittee mercury pollution prevention plans submitted with the Co-permittees' Work Plans and Annual Reports.

The Mercury Plan addresses five general goals:

1) **Municipal Use of Mercury-Containing Products** – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.
2) **Household Hazardous Waste Collection** – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.
3) **Monitoring and Science** – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.
4) **Regional, State, and Federal Coordination** – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.
5) **Public Education and Outreach** – Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

Mercury Plan tasks recently completed by the Program include:

- Guidelines for Reduction and Management of Mercury-Containing Products;
- Mercury pollution prevention outreach activities (see Section 6);
- Collection and analysis of water and sediment samples from selected Santa Clara Valley watersheds as part of the Program's receiving waters monitoring and assessment program; and
- Financial and technical support of special studies completed via the Clean Estuary Partnership (CEP) and the RMP.

PCBs Control Program

During the past several years, the Program has annually described tasks in its work plans to characterize PCBs in urban runoff and develop methods to reduce their discharge. These tasks included:

- Leading a regional study, referred to as the Joint Stormwater Agency Project (JSAP), which characterized the distribution of mercury, PCBs and chlorinated pesticides in storm water conveyance sediments in Bay Area watersheds.
- Providing funding to BASMAA, the Clean Estuary Partnership (CEP), and the San Francisco Estuary Regional Monitoring Program (RMP).
- Participating in selected stakeholder, BASMAA, CEP and RMP committees and work groups.
- Collecting and analyzing water and sediment samples from selected Santa Clara Valley watersheds as part of the Program's receiving waters monitoring and assessment program.
- Performing PCBs case study work within the City of San Jose in urban areas where elevated concentrations of PCBs were found during the above-described JSAP study.
- Developing guidance documents on performing PCBs case studies to assist other Bay Area storm water agencies.
- Preparing a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County.
- Completing a review of efforts to develop methods of controlling discharges of PCBs from Bay Area storm water conveyances.
- Representing BASMAA during the Taking Action for Clean Water Proposition 50 project. This project is partnering with BASMAA and its member cities to develop Bay Area-specific Best Management Practices to prevent release of PCBs from building materials into urban runoff during renovation, maintenance and demolition of structures.
- Representing BASMAA's interests during development of the San Francisco Bay PCBs TMDL, including reviewing the latest revisions of the staff report and Basin Plan Amendment, assisting BASMAA to prepare comments, working with Regional Water Board staff to revise these documents, and testifying on behalf of BASMAA at Regional Water Board hearings on the PCBs TMDL.

FY 09-10 Implementation Tasks

Building on tasks completed in previous fiscal years, the following will be completed by the Program in FY 09-10 during implementation of the SCVURPPP Mercury and PCBs Control Programs. Many of these tasks are regional in scope and will likely be coordinated and implemented through a Regional Monitoring Collaborative (RMC) that will include the Program and other BASMAA agencies. As the RMC and MRP requirements are better defined, more detailed work plans will likely be developed to better define levels of regional collaboration, tasks, deliverables and schedules for completion.

- *Develop training materials and train municipal inspection staff to identify PCBs and PCB-containing equipment* - The Program intends to work with BASMAA agencies on developing training materials and conducting training workshops for municipal staff on how to identify PCBs and PCB-containing equipment during routine commercial/industrial facility inspections.

- *Evaluate PCBs Management Opportunities during Building/Structure Demolition and Renovation* Activities - Program staff intends to continue to provide in-kind support to the above-mentioned Taking Action for Clean Water Proposition 50 project that is intended to characterize PCBs in building materials and (if needed) develop BMPs that can be reasonably implemented by Co-permittees in the future.

- *Conduct Pilot Projects to Investigate Mercury and PCBs Sources in High Priority Drainages* - In FY 09-10, Program staff intends to identify and prioritize drainages for pilot projects. Proposed activities included in this task are: 1) interviewing municipal staff and reviewing municipal databases, other agency files, and available information to identify potential PCBs source areas and areas where PCB-contaminated sediment accumulates, including within stormwater conveyances; 2) Qualitatively ranking and mapping potential PCBs source areas within the pilot project drainage(s); and, 3) Conducting surveys of the drainage(s) and collecting information concerning past or current use of PCBs to further identify potential source areas and determine whether runoff from such locations is likely to convey soils/sediments with PCBs to municipal stormwater conveyances. These efforts will be driven by identifying PCBs source areas, but investigation of mercury (Provision C.11.c.) shall be included where appropriate.

- *Conduct Pilot Projects to Evaluate Enhanced Sediment Management* - Program staff intend to evaluate ways to enhance sediment management practices and the effectiveness of high efficiency street sweepers for PCBs and mercury removal. This task will likely be conducted in collaboration with BASMAA.

- *Conduct Pilot Projects to Evaluate Dry Weather Diversion Feasibility* - Program staff intends to select potential locations where diversions of dry weather flows to sanitary sewers would appear to have the highest potential to be most beneficial for PCBs and mercury removal (possibly other POCs as well). Program staff intends to work with local POTWs on a watershed, Program, or regional level on the feasibility of diverting such flows. The feasibility analysis shall include, but not be limited to, costs, benefits, and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather flows.

- *Develop a Risk Reduction Work Plan* - Program staff intends to participate in a regional project to manage human health risks from PCBs in Bay fish consumed by humans. In FY 09-10, as an initial step, Program staff (likely in collaboration with BASMAA) will submit a work plan that defines information needs and describes the studies to be performed with a schedule. This work effort will be coordinated with the Program's public education and outreach efforts (see Section 6).

- *Develop a Mercury and PCBs Fate and Transport Studies Work Plan* - As required by the Mercury and PCBs TMDLs, Program staff, working with Co-permittees, intends to develop a pollutant fate and transport studies work plan, focused on PCBs and mercury. This task will need to be completed at the regional level, in coordination with BASMAA.

- *Develop a Loads-Avoided Formula for PCBs and Mercury* - As required by the Mercury and PCBs TMDLs, Program staff, working with Co-permittees, intend to develop a loads-avoided calculation methodology that is intended to assess progress towards waste load allocations included in the TMDLs. This task will need to be completed at the regional level, in coordination with BASMAA.

COPPER CONTROL PROGRAM

In FY 05-06, Program staff, in consultation with Water Board staff, decided that the SCBWMI Bay Modeling and Monitoring (BMM) Subgroup did not need to conduct semi-annual reviews of the Copper Action Plan (CAP) due to the pending related activities of the Clean Estuary Partnership (CEP) and Water Board regarding the Municipal Regional Permit (MRP). In addition, the Basin Plan Amendment adopting the North of Dumbarton Bridge Copper site-specific water quality objectives (SSOs) and translators, and the Bay-wide Copper Management Strategy (CMS) was approved by the Water Board in June 2007. The Bay-wide CMS is intended to replace the language that was adopted in the Basin Plan in 2002 as part of the South San Francisco Bay copper and nickel SSO project. The copper control measures and monitoring program has a Bay-wide scope. Therefore, the majority of existing Basin Plan language pertaining to the implementation of copper and nickel objectives in South San Francisco Bay will be replaced by the CMS.

The Bay-wide CMS establishes minimal implementation requirements for Bay area stormwater programs, including SCVURPPP, and the proposed MRP further defines these requirements.

FY 09-10 Implementation Tasks

The Program will implement the following tasks for copper control in FY 09-10:

- Continue to track and participate in the Brake Pad Partnership efforts for developing state legislation; and

- Investigate the need for and alternatives to model ordinances prohibiting copper architectural features and identify appropriate BMPs to minimize copper discharges from these sources (in coordination with BASMAA).

9. FY 09-10 CONDITIONALLY EXEMPTED DISCHARGES WORK PLAN

INTRODUCTION

This section describes the Program's planned tasks during FY 09-10 to assist Co-permittees to develop and implement BMPs for control of conditionally exempted (non-stormwater) discharges, as well as require businesses, contractors, and residents to control these discharges. The planned tasks include Program efforts that are likely to be needed to assist the Co-permittees with compliance with potential requirements of the Municipal Regional Permit.

BACKGROUND

All municipal stormwater permits require municipalities to effectively prohibit the discharge of non-stormwater into storm drains. Certain non-stormwater discharges, such as flows from riparian habitats, wetlands, springs, or unpolluted groundwater, are exempted from this provision outright (i.e., allowed to discharge to storm drains with no control measures). Other non-stormwater discharges, known as conditionally exempted discharges (CEDs), are allowed to discharge to storm drains only if certain measures are taken to control potential pollutants in the discharge.

Provision C.8.b. of the Program's current permit provides a list of CEDs that are not prohibited from discharge to storm drains, if they are identified as not being sources of pollutants to receiving waters or if appropriate control measures are developed and implemented to prevent or eliminate adverse impacts of such sources. Provision C.8.c. requires the Co-permittees to identify the categories of CEDs from this list that they want to exempt, and describe for each category either why it is not a source of pollutants or what control measures will be used to eliminate adverse impacts from that category. In compliance with this provision, the Program developed a *Conditionally Exempted Discharges Report* (June 15, 2000) that describes the approach for each category of discharge. The report covers the following CEDs:

- Uncontaminated pumped groundwater;
- Foundation drains;
- Water from crawl space pumps;
- Footing drains;
- Air conditioning condensate;
- Irrigation water;
- Landscape irrigation;
- Lawn or garden watering;
- Planned and unplanned discharges from potable water sources;
- Water line and hydrant flushing;
- Individual residential car washing; and
- Discharges or flows from emergency fire fighting activities.

In the CED Report, control measures for the discharge of uncontaminated pumped groundwater and potable water sources are based on information from the Program's Water Utility Operation and Maintenance Performance Standard and the Water Utility Operation and Maintenance Discharge Pollution Prevention Plan (WUDPPP) dated June 1998. The Performance Standard and the WUDPPP were developed for and are implemented by Co-permittees who operate municipal water utilities. They also serve as guidelines for private water companies who operate water systems within the Co-permittees' jurisdictions.

The Municipal Regional Permit (MRP) will contain requirements for all six Phase 1 municipal stormwater (MS4s) programs in the San Francisco Bay Area. The draft MRP was released on December 4, 2007. It is anticipated that the revised draft MRP Tentative Order will be released in February 2009. Provision C.15. in the Tentative Order contains a list of exempted discharges as well as specific requirements for control of the same CEDs as the current permit, except that it adds swimming pool, hot tub, spa, and fountain water discharges as well as significant reporting requirements. While discussions with Water Board staff on December 5, 2008 clarified some of the anticipated revisions to the MRP in response to local agency concerns, it was not clear what the final requirements will be relative to conditionally exempted discharges.

PAST AND CURRENT ACTIVITIES RELATED TO CONDITIONALLY EXEMPTED DISCHARGES

The Co-permittees are currently implementing the BMPs described in the CED Report. They have made the BMPs part of their standard operating procedures for municipal activities. They are requiring businesses and contractors and encouraging residents to comply with these BMPs, and they have included the BMPs in conditions of approval for development projects where applicable. They are not currently required to report these discharges to the Water Board.

Since completing the CED Report, the Program's primary activities related to CEDs have involved preparation of outreach materials to educate residents about appropriate BMPs for car washing, and assisting Co-permittees as needed. Messages about proper car washing have also been included in the media advertising and outreach materials associated with the Watershed Watch Campaign. These activities have been described in the PI/P section of Program work plans and annual reports. The first time that the Program Work Plan contained a Conditionally Exempted Discharges section was the FY 08-09 Work Plan. Since that time, the Program has begun some of the early implementation tasks anticipated to be in the MRP.

FY 09-10 IMPLEMENTATION TASKS

A list of anticipated tasks that will be implemented in FY 09-10 is provided below. Modifications to these tasks may be necessary depending on revised MRP requirements. There are no ongoing tasks, aside from continuing outreach to residents about car washing as part of the Watershed Watch Campaign (see Section 6 of this Work Plan).

- Continue to update the Conditionally Exempted Discharges Report, as needed.
- Continue to update the Water Utility Operation and Maintenance Performance Standard and the Water Utility Operation and Maintenance Discharge Pollution Prevention Plan, as needed.

- Continue to prepare guidance on BMPs for various types of discharges and assist Co-permittees, as needed.

10. REPORTING

FY 09-10 TASKS

During FY 09-10, the Program will conduct the following activities:

- Prepare Program's FY 08-09 Annual Report and submit to the Water Board by September 15, 2009. (Note that this date is based on the current permit and is one month earlier than the due date in the draft MRP. The due date will be adjusted to be consistent with the final MRP).
- Continue data management and reporting tasks to support MRP provisions, including Municipal Operations, C.3. (BMP O&M verification inspections), Industrial/Commercial and Illicit Discharge Elimination. Tasks include collecting data from Co-permittees, entering data into data management system and performing QA/QC procedures, conducting analyses and generating summary reports and graphics for the Annual Report.
- Update and maintain the Program's website (www.scvurppp.org).
- After adoption of the MRP, work with the Management Committee, other Bay area stormwater programs through BASMAA and the Water Board to finalize a standardized Annual Report template. (Anticipated to be used for the FY 10-11 Annual Report. Some reporting modifications may be used as part of FY 09-10 Annual Report).

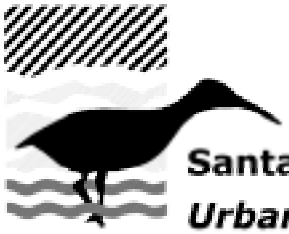
Santa Clara Valley
Urban Runoff
Pollution Prevention Program

TABLE 1: TOTAL PROGRAM FY 09-10 BUDGET

Item		Budget
Operational Group - Program Management		
	Subtotal	**$601,084**
Legal/Dues/Fiscal Agent Costs		
2. Fiscal Agent Expenses (City of Sunnyvale)		$50,000
3. Legal Services (MOFO)		$90,000
4. CASQA Dues		$16,500
5. BASMAA Fee		$85,000
6. WERF Member Dues		$8,000
7. Contingency		$0
8. RMP Fee		$178,000
9. CPSC Fee		$1,000
		$428,500
Subtotal Operational Group		**$1,029,584**
Projects Group - Permit Compliance		
Project Group - Regulatory Assistance		
10. Regulatory Permit Assistance		**$464,200**
Project Group - Performance Standards		**$265,000**
Project Group - PIP/WEO		
17. C.7 Public Information and Participation		**$557,500**
Project Group - Monitoring		
18. C.8 Monitoring		**$615,500**
Project Group - POCs Controls		**$635,000**
Subtotal Projects Group		$2,537,200
TOTAL PROGRAM BUDGET		**$3,566,784**

FY 09-10 Budget Assessments

		PROGRAM ASSESSMENT *PROGRAM BUDGET TOTAL FY 09-10 OPER / PROJ/COLL CONTRIBUTION* **$3,566,784**	PROGRAM ASSESSMENT *PROGRAM BUDGET TOTAL FY 08-09 OPER / PROJ/COLL CONTRIBUTION* **$3,500,000**
Co-Permittee	Program Contribution	**FY09-10**	**FY08-09**
Campbell	1.88%	$67,056	$65,800
Cupertino	2.46%	$87,743	$86,100
Los Altos	1.59%	$56,712	$55,650
Los Altos Hills	0.43%	$15,337	$15,050
Los Gatos	1.74%	$62,062	$60,900
Milpitas	2.75%	$98,087	$96,250
Monte Sereno	0.14%	$4,993	$4,900
Mountain View	3.91%	$139,461	$136,850
Palo Alto	4.06%	$144,811	$142,100
San Jose	30.01%	$1,070,392	$1,050,350
Santa Clara	6.23%	$222,211	$218,050
Saratoga	1.59%	$56,712	$55,650
Sunnyvale	7.25%	$258,592	$253,750
County of Santa Clara	5.94%	$211,867	$207,900
SCVWD	30.02%	$1,070,749	$1,050,700
	100.00%	***$3,566,784***	***$3,500,000***



Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MULTI-YEAR RECEIVING WATERS MONITORING PLAN

Prepared in Compliance with Permit Provisions C.7.a and b

(Appendix B contains detailed information on the environmental monitoring plan)

March 1, 2002

(Revised August 5, 2002)

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MULTI-YEAR RECEIVING WATERS MONITORING PLAN

PURPOSE

The Multi-Year Receiving Waters Monitoring Plan (MY-RWMP) was prepared to fulfill the monitoring requirements of the NPDES permit contained in Provision C.7 and specifically Provision 7b of the SCVURPPP's Order adopted February 21, 2001by the Regional Board. That provision reads:

> **Multi-Year Receiving Waters Monitoring Plan.** In conjunction with the submissions required by Provision 9 the Dischargers shall submit by July 1, 2001, an interim draft of a Five-Year Receiving Waters Monitoring Plan, and, by March 1, 2002, a final Five-Year Receiving Waters Monitoring Plan acceptable to the Executive Officer, designed to comply with these Monitoring Program requirements. The Receiving Waters Monitoring Plan shall include provisions for monitoring South San Francisco Bay by participating in the San Francisco Estuary Regional Monitoring Program for Trace Substances or an acceptable alternative monitoring program. The Receiving Waters Monitoring Plan activities shall be coordinated with SCBWMI assessment activities.

MY-RWMP covers the entire spectrum of SCVURPPP monitoring activities, both programmatic and environmental. Readers specifically interested in the environmental monitoring activities (i.e., surface water monitoring activities) are referred to Appendix B. While MY-RWMP has been developed to meet the objectives of the NPDES permit, it also addresses the guidance contained in several RWQCB letters written to both the Program and members of the BASMAA monitoring committee.[1]

Road Map

The Multi-Year Receiving Waters Monitoring Plan (MY-RWMP)[2] contains four main elements:

1. Comprehensive Timeline: The timeline illustrates all existing commitments and priorities established by the Program, including ongoing activities meant to fulfill Regional Board Order Provisions related to C9 "Water Quality-Based

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[1] RWQCB letter from Tom Mumley to BASMAA monitoring committee entitled *"Urabn Runoff Monitoring Needs/Recommendations"* dated February 2, 2001.
RWQCB letter from Loretta Barsamian to Adam Oliveiri entitled *"FY2002-2003 Syromwater Municipal NPDES Program Priorities"* dated December 7, 2001.
The water quality monitoring comments in the RWQCB from Bruce Wolfe to Beau Goldie entitled *"Pesticide-Related Components of 2000/01 Annual Report"* postmarked December 28, 2001.

[2] The Program, consistent with the NPDES permit, initiated work on the Multi-Year Receiving Waters Monitoring Plan (MY-RWMP) in January 2001. The first draft was released for review by the Monitoring Adhoc Group on January 15, 2001. Based on the review and response to comments a draft was formally submitted to the RWQCB on March 1, 2001 as part of the Program's FY01-02 Work plan. Comments were solicited from the WAS during April and May of 2001 and two additional Adhoc meetings were held on March 6 and April 19. A "Interim Draft" (fourth draft) was produced and submitted to the RWQCB on July 1, 2001, consistent with the NPDES permit. Minor revisions were made to the March darft and a final draft was submitted to the RWQCB on September 15, 2001 with the Program's FY00-01 Annual Report. Since the September submittal, three joint WAS and Monitoring Adhoc meetings were held on November 19, December 18 and January 24 (the last two included an EPA moderator/facilitator) to seek input from various stakeholders. In addition, a separate Co-permittee Adhoc meeting was held on December 16, 2001.

Requirements for Specific Pollutants of Concern" and C10 "Watershed Management" of the NPDES permit.

2. Summary matrix of Programmatic Monitoring Indicators (PMIs): The PMIs are used to gauge how well Performance Standards are being met and control measures are being implemented.

3. Summary matrix of Environmental Monitoring Measures (EMMs): The EMMs 1) assist the RWQCB characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program[3], 2) identifies where and what type of status and trend type monitoring is appropriate, 3) recognizes the need for site-specific water quality investigations to address questions that might arise during the conduct of the routine monitoring efforts, and 4) allows for determining if control measures are having the intended effect.

4. Continuous Improvement: The continuous improvement element helps the SCVURPPP integrate urban runoff management and watershed management. It is based on the principles of adaptive management, thereby incorporating a systematic review of the monitoring results to improve future efforts and provides opportunities for stakeholder input into the continuous improvement process.

BACKGROUND

The word monitoring is applied to a wide range of activities; therefore, it is important that a monitoring program begins by defining the types of monitoring that will be employed to achieve its objectives. Nonpoint source programs, including urban runoff management programs, generally employ several types of monitoring depending on the type of observation that is desired. The types of monitoring employed by the SCVURPPP fall into five categories:[4]

1. Baseline monitoring: monitoring used to characterize existing water quality conditions, and to establish a database for planning or future comparisons. Where baseline monitoring is repeated at well-spaced time intervals, it can be used to indicate long term trends.

2. Assessment monitoring: observations made to estimate a particular parameter.

3. Implementation monitoring: monitoring used to assess whether an activity or activities were carried out as planned.

[3] The SCVURPPP's watershed assessment priorities are described in the Program's report entitled " Watershed Management and Urban Runoff Management Integration Report – Permit Provision C.10, June 29, 2001."

[4] These definitions were largely paraphrased from "*Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest" USEPA Region 10 1991 and EPA's Monitoring Guidelines. 1994, EPA National Guidance.*

4. Effectiveness monitoring: monitoring used to evaluate whether the specific activities accomplished the desired objective, such as the usefulness of a particular BMP or set of BMPs.

5. Project monitoring: monitoring used to assess the impact of a particular activity or project. This approach most often uses a combination of implementation and effectiveness monitoring to indicate the overall outcome of the project.

Of these five types of monitoring, typically only the first two are directly linked to water quality. However, many studies have shown that implementation and effectiveness monitoring are the most cost-effective approaches to reduce nonpoint source pollution because these types of monitoring provide immediate feedback on whether the activity or program is achieving the intended results. Monitoring types 3-5 form the basis for a 'continuous improvement process' that is central to the implementation principles of the Urban Runoff Program.

Development of the SCVURPPP's Approach to Monitoring

From its inception in 1990 through 1995, the Program's monitoring activities focused on establishing baseline information through sampling and analysis of runoff from various land uses and ambient waters. A summary of the products produced as part of the SCVURPPP's previous monitoring efforts is contained in the 1997 URMP. In addition to gathering baseline information, the Program's annual monitoring plans have also included assessments intended to enhance understanding of the sources and extent of urban runoff pollution, its effects, and methods for its control.

In August 1996[5] the Regional Water Quality Control Board (RWQCB) requested that the SCVURPPP redirect its monitoring resources and develop a new approach:

> Specific monitoring activities that should be considered within the strategy include characterization of drainage areas (watershed monitoring) including land use characteristics (general, such as open, residential, commercial, or industrial areas, or specific sources) and consideration of physical and biological, as well as chemical indicators to assess the drainage areas. We strongly encourage you to use community-based (volunteer) monitoring as an inexpensive and effective means to conduct this type of monitoring. The strategy should also establish a mechanism or process for effective use of special or pilot studies by your program or those conducted by other programs.

The SCVURPPP's Monitoring Plan implements the goals and objectives that were set by the Program's Management Committee in 1996. These goals and objectives were incorporated into the SCVURPPP's 1997 Urban Runoff Management Plan (URMP). In particular, the monitoring program implements Goals 2 and 3 (see highlighted text in box).

Since 1997 the Program's emphasis has been on integrating urban runoff and watershed management. This emphasis continues to be a major condition of the urban runoff permit. The results of this integration effort include the Program's and individual

[5] Loretta K. Barsamian, Executive Officer. August 30, 1996 letter to Frank Maitski.

Co-permittee assistance on managing various subgroups of the WMI, preparing the abridged and unabridged Watershed Characteristics Report, the conduct of various projects related at review of development policies and the completion of the national Stormwater Enivronmental Indicators Demonstration Project. A more detailed discussion of these efforts is contained the Program's Annual Reports (i.e., see FY 97-98, 98-99, 99-00, and 00-01).

Annual Project Funding Process

To achieve these goals, during its annual budgeting cycle, the Program identifies specific monitoring projects through the Program's continuous improvement process described in the 1997 Program URMP (Figure 1). As shown in the figure, projects are developed through:

- Evaluation of opportunities for improvement in Program (joint) activities. This evaluation is documented in the Program's annual performance review meeting and in the Program portion of the annual report.
- Co-permittee performance reviews. Specific items for improvement (by the Program or the Co-permittee) are identified during the annual review meetings and are documented in the summaries of these meetings.
- Participation in regional efforts (e.g. the BASMAA Regional Monitoring Strategy and the Regional Monitoring Program).
- Participation in the Santa Clara Basin Watershed Management Initiative (SCBWMI). As SCBWMI subgroups identify specific tasks related to creating the Watershed Management Plan, participating Program and Co-permittee staff consider whether the Program is the stakeholder that can most effectively implement these tasks. To determine which of these projects submitted by stakeholders from the SCBWMI receive funding, the Program uses a process described below under *Priorities for Assisting the Watershed Management Initiative.*

Regional Board staff and interested parties participate in the Program and Co-permittee performance review meetings and in the SCBWMI subgroups to provide input into the process for prioritizing and selecting projects.

1997 Urban Runoff Management Plan
Goals and Objectives

GOAL 1: Comply with Permit

- Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)
- Reduce, to the maximum extent practicable, pollutants in stormwater runoff
- Comply with permit submittal requirements

GOAL 2: Determine Success

- Periodically evaluate the attainment of beneficial uses in selected waterways
- Evaluate changes in public awareness and behavior
- Evaluate effectiveness of specific control measures at pollution reduction.

GOAL 3: Adjust Activities to Meet Changes

- Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP
- Utilize what we learn to plan the next steps

GOAL 4: Achieve Acceptance of Urban Runoff Management Activities

- Effectively facilitate public input into Program planning process
- Integrate urban runoff goals at various intra-agency levels
- Develop and maintain a proactive relationship with regulatory authorities
- Publicize the efforts of the Co-permittees (Program)

GOAL 5: Integrate Urban Runoff Program Elements into other Programs

- Promulgate an understanding of the role of the urban runoff program
- Encourage other agencies to become involved in urban runoff issues
- Encourage action by the appropriate agencies

Priorities for Assisting the Watershed Management Initiative

The Program's Monitoring Ad-hoc Task Group (AHTG), composed of Co-permittee representatives, works with Program staff to review proposed projects and allocate available funds. Regional Board staff and interested parties attend the AHTG meetings. Figure 2, "Linking SCVURPPP and SCBWMI Goals," shows the four general areas of SCVURPPP support for the SCBWMI.

Summary of Program Monitoring Priorities

The Program's Monitoring AHTG uses the following monitoring priorities to determine which projects are funded for a given year:

1) New projects needed to implement the results, and achieve the goals, of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
   a) Investigate Beneficial Uses and Causes of Impairment (including field work)
   b) Review and Compile Environmental Data and Make it Accessible
   c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses

   d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4. Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA.

Each of these priorities is intended to fulfill specific provisions of the Program's 2001 NPDES permit and the 1997 URMP and to provide a strong basis for both program improvement and the next round of permit requirements. A more detailed summary, generally covering FYs 00-01 through 02-03, of how the SCVURPPP has addressed priority number 3 is contained in Appendix A. For additional information on this particular item, please see the Program's monitoring element contained the annual Work Plans.

Accomplishments

Complying with the Regional Board directive to redirect monitoring resources from a baseline monitoring approach, the Program has, since 1997, moved toward assessment of specific pollutants and conditions of designated beneficial uses. To improve the effectiveness of our special studies and those conducted by other programs, in 1996 and 1997, the SCVURPPP co-sponsored, and participated in, the Bay Area Stormwater Management Agencies Association's (BASMAA's) development of a BASMAA Regional Monitoring Strategy (BRMS). The SCVURPPP continues to coordinate its monitoring activities with other BASMAA member agencies.

In recent years, the Program has conducted substantial original research and investigations into the sources, fate, transport, and effects of urban runoff pollutants, the characteristics of Santa Clara Basin watersheds, the effects of urbanization on watersheds, and the effectiveness of various control measures. Beginning in 1993-1994, the SCVURPPP has funded efforts to assess the condition of beneficial uses of creeks within the Santa Clara Basin, including a pilot volunteer monitoring program for local creeks (Streamkeepers) and through the SCBWMI.

The SCVURPPP recently completed a two year research project entitled "The Stormwater Environmental Indicators Demonstration Project (SEIDP). The SEIDP is part of USEPA's Environmental Indicators/Measures of Success Project and is part of the third phase of EPA's project, which focuses on local demonstration projects and testing of the indicators. The Water Environment Research Foundation sponsored the SEIDP jointly with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP).

The project objectives were to:

- Evaluate the usefulness of the Center for Watershed Protection's (CWP) Stormwater Indicator Methodology under semi-arid conditions.
- Evaluate the applicability of environmental indicators under semi-arid conditions in two different situations: at a watershed level that includes a variety of chemical, physical and biological indicators and in an industrial watershed that emphasizes programmatic indicators.
- Select, test, and refine protocols for monitoring environmental indicators in semi-arid conditions.

- Develop guidance on selection and use of environmental indicators, and disseminate guidance to other stormwater programs in California, Oregon and the west to assist in validation of environmental indicators throughout the west.

Consistent with these objectives, the CWP's stormwater indicator methodology was applied at two distinct geographic scales: the 310-square-mile watershed of Coyote Creek (which includes the eastern portion of the City of San Jose) and a 28-acre industrial catchment along Walsh Avenue in the City of Santa Clara. The semi-arid climate is typical of California's coast from the San Francisco Bay area southward.

In Coyote Creek, the baseline was a 1979-1981 EPA-sponsored study that sought to identify the effects of urban runoff on water quality, sediment, fish, macroinvertebrates, attached algae, and rooted aquatic vegetation. In addition, the SCVURPPP monitored stormwater constituents and toxicity in the creek 1987-1996. In 1999, the SEIDP sampled fish and the physical habitat at 18 locations in Coyote Creek, sampled surficial sediment at six locations, and sampled benthic macroinvertebrates at nine locations. The SEIPD analyzed flooding, changes to stream morphology, and sources of imperviousness in the surrounding watershed. Georeferenced reports of illegal dumping and known industrial and construction sites were also generated.

The Program, as part of the Annual Reports, updates a summary of memoranda and reports published as a result of their research and investigative efforts. The most recent update is contained in Table 4-2 of the 1999-2000 Program Annual Report.

Regional Board staff has been thoroughly involved in these projects through participation in the Program's Monitoring Ad-hoc Task Group, through SCBWMI subgroups, and through special review groups such as the Stormwater Environmental Indicators Demonstration Project Review Committee and other technical advisory groups facilitated by Program staff.

The Program has contributed to the Regional Monitoring Program for Trace Substances (RMP) since1993 and has contributed approximately $140,000 a year to the RMP over the past four years. In addition, the three South Bay municipal wastewater treatment plants (i.e., City of Palo Alto, City of Sunnyvale, and the San Jose-Santa Clara facility) annually contribute between $200,000 and $250,000 a year to the RMP. Thus, local communities (which are urban runoff Co-permittees) contribute approximately $340,000 to $390,0000 a year to a regional monitoring program (consistent with Permit Provision C.7b). The results of the RMP's research and investigations have been published by the San Francisco Estuary Institute.

MULTI-YEAR RECEIVING WATERS MONITORING PLAN

As described previously, there are four key components to the Multi-Year Receiving Waters Monitoring Plan (MY-RWMP). Each of these components are discussed in the following sections. The MY-RWMP seeks to extend and continue implementation of the Program's monitoring priorities. The MY-RWMP also details how projects previously planned within these priorities, plus some new projects, will seek to fulfill the provisions of the reissued NPDES permit.

Comprehensive Monitoring Plan Timeline

A comprehensive monitoring timeline is shown in the Table 1 and is organized by the Program's monitoring priorities (Column A). Table 1 includes all projects (i.e., programmatic and environmental monitoring) funded through the Program's monitoring budget. Column B shows references to specific provisions in either Order No. 95-180 and/or the new Order No. 01.024 (where applicable). Column C lists descriptive titles for each task; Column D references current projects (also listed in the FY99-00 & FY00-01 Program Annual Reports) that are implementing the tasks.

The preliminary summary has been grouped according to the Program's monitoring priorities that were previously discussed. These include the following categories:

1) New projects needed to implement the results, and achieve the goals, of current projects.
2) New projects that implement continuous improvement items identified through the annual review process.
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
    a) Investigate Beneficial Uses and Causes of Impairment (including field work)
    b) Review and Compile Environmental Data and Make it Accessible
    c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
    d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4) Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA.

Programmatic Monitoring Indicators - Summary Matrix

Based on the Program's experience in implementing the Performance Standards, monitoring projects and continuous improvement process, the Program believes that a key element of its strategy should focus on developing better programmatic indicators and on collecting and analyzing programmatic data. A summary matrix of the various ongoing and planned projects relative to how they address the four major components of the RWQCB's long-term monitoring goals is shown in Table 2. The purpose of this table is to give the reader a perspective on the various projects that the SCVURPPP has underway or planned. Additional detail on the expected schedule for conducting a particular project is contained in the comprehensive monitoring plan timeline, Table 1, previously discussed. Appendix A contains a brief summary and discussion of the projects underway to develop strategies for controlling impacst of land use on beneficial uses (Program Monitoring Goal 3c).

In general, specific details on the project scope, expected or completed products and overall due dates can be found in several other reports produced by the Program and are not reproduced in this report. Please see the following areas noted below for additional information:

- Project Scopes & Schedules: see the annual monitoring plan contained in the Annual Program Workplan[6]
- Completed Products: see Table 4-2 contained in the monitoring section of the Program's Annual Report
- Status Reports: distributed to Adhoc Monitoring Group and Management Committee at least on a quarterly basis. In addition, the Program discusses the status of various projects on an as needed basis at the BASMAA monitoring subcommittee meetings, special workshops, and various WMI subgroup meetings, in particular the Land Use Subgroup. The results of those presentations and discussions are contained in meeting notes that are distributed to the Management Committee and members of the specific workgroup.

Environmental Monitoring Measures – Summary Matrix

While continuing the programmatic approach to measuring compliance, the Program and Co-permittees are committed to monitoring and assessing their creeks and wetlands, and San Francisco Bay. A summary matrix of the various ongoing and planned projects relative to how they address the four major components of the RWQCB's long-term monitoring goals (i.e., status and trends monitoring, surveillance monitoring, management effectiveness monitoring, and monitoring to help set realistic standards) is shown in Table 3. The purpose of this table is to give the reader a perspective on the various projects that the SCVURPPP has underway or planned. Additional detail on the expected schedule for conducting a particular project is contained in the comprehensive monitoring plan timeline, Table 1, previously discussed.

In addition to the summary matrix shown in Table 3, a detailed set of tables and figures that identifies the SCVURPPP's proposed surface water monitoring program for the next eight years is contained in Appendix B. Appendix B is a standalone section that: 1) assists the RWQCB characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program, 2) identifies where and what type of status and trend type monitoring is appropriate, 3) recognize sthe need for site-specific water quality investigations to address questions that might arise during the conduct of the routine monitoring efforts, and 4) allows for determining if control measures are having the intended effect.

Appendix B contains the following tables and figures:

- Table B-1Existing Monitoring Data for Coyote Creek Watershed: Table B-1 contains a description of parameters, sampling locations and number of sites, along with the agency and specific project where the data have been collected within the Coyote Watershed. The information is based on a summary of the information contained in the *"Santa Clara Basin Stream Studies Inventory, July 24, 2001"* prepared by the Program to assist the WMI, as well as more recent date from ongoing Program efforts (The Program will be producing a quick update of the SSI during the fall of

[6] Please note that for some projects a very detailed workplan is developed and reviewed and approved by the Adhoc Monitoring Work Group. For example, the SEIDP, Coyote Pilot Assessment, Policy project on tax incentives and compare and contrast all have detailed project scopes. These have been and will continue to be incorporated to the appropriate submittals to the RWQCB staff.

2002. That project is part of the WAS workplan and the Program's FY02-03 Annual Monitoring Plan).

- Figure B-1 Pilot Assessment and Monitoring Efforts (1997 to Present) Occurring in Watersheds of the Santa Clara Basin: Figure B-1 illustrates the spatial coverage of investigations as well as the type (i.e, benthic , macroinvertebrate, salmonid habitat, biological, sediment, and water quality) of investigations conducted over the past four years throughout the Santa Clara Basin.

- Figure B-2 Existing Chemical, Biological and Physical Data Collection Efforts in Coyote Creek Watershed: Figure B-2 illustrates, in greater detail the spatial coverage of data and type of data available specifically in the Coyote Watershed[7].

- Table B-2 Preliminary SCVURPPP 8-Year Monitoring Plan for the Santa Clara Basin (excluding the Coyote Watershed): Table B-2 contains the following information: watershed location (prioritized based on WMI and SCVURPPP assessment priorities), data type (chemical, biological, physical, and trash), FYs (8 years starting with FY02-03 through FY09-10), rationale, and lead agency. The information on data type utilizes a tiered monitoring approach discussed by the RWQCB staff in its RMAS memo (February 8, 2001 Draft Monitoring Design in Regional Board-lead Pilot Watersheds, Spring 2001) that includes the following monitoring categories: screening level, detailed investigation, and status and trends.

- Table B-3 provides a description of data parameters and analytical methods used in the SCVURPPP FY 02-03 and Multi-Year Waters Monitoring Plan.

The investigation of beneficial uses and causes of impairment will be greatly facilitated by implementation of the Regional Board's Regional Monitoring and Assessment Strategy (RMAS). The Program is committed to continuing its efforts to facilitate technical and stakeholder workgroups that will assist Regional Board staff to implement the RMAS.

With appropriate policy and guidance from the Regional Board, it should be possible to develop practical, implementable indicators (including physical and biological indicators) and protocols to assess beneficial uses in creeks, wetlands, and the Bay. These indicators and protocols are a necessary step toward establishing a sound regulatory basis for locally based watershed management.

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[7] The high priority assigned to the Coyote watershed is based on the fact that, relative other watersheds in the Santa Clara Basin (as well as others), the watershed has the least amount of developed land (and thus the least amount of imperviousness), has the least amount of development within riparian corridors, and has one of the highest areas for projected future development. In addition, a significant amount of available work is ongoing or recently completed which allows the Program to build upon. The high priority given to the Coyote Watershed is consistent with the WMI's assessment priorities described in Work Group D products entitled *"Combined Technical Memoranda #29, #30, #13 – Management Issues to be Considered in Watershed Selection; Process and Objective Criteria for Incorporating Management Issues into the Selection of Watersheds, and Watershed Suite Selection and Reevaluation , dated April 18, 2000."* In addition, the high priority assigned to the Coyote Watershed is further described in the SCVURPPP" report entitled *" Watershed Management and Urban Runoff Management Integration Report, C.10, June 29, 2001."*

Continuous Improvement – Effectively Integrating Urban Runoff and Watershed Management

The requirement to investigate, consider, and implement watershed management measures first appeared in the Program's 1995 NPDES permit and is also a requirement of the Program's current NPDES permit. As part of its application for the current permit, the Program developed a "Watersheds 2000 Vision" (December 1999) that outlines the principles and approaches that the Program and its Co-permittees will use to support better management of the Santa Clara Basin through the implementation of urban runoff control measures. The vision statement also defines the relationship between and the roles of the Program and the SCBWMI in this context.

The Program's approach for supporting watershed management and the SCBWMI is based on the following principles:

- The goal of the Program and its Co-permittees is to maintain water quality and protect the beneficial uses of the waterbodies in the Santa Clara Basin through the implementation of control measures to the maximum extent practicable.

- Successful watershed management must be a community-wide, stakeholder-driven effort that includes regulatory agencies, the business community, environmental advocates, and local government.

- The Co-permittees recognize it can be difficult to separate many urban runoff "issues" from the general impacts of urbanization resulting from the cumulative effects of land development.

- The Co-permittees understand that municipal agency activities have the potential to impact water quality and beneficial uses; conversely such activities can create opportunities to improve water quality and enhance aquatic resources.

Given those principles, the Co-permittees envision the roles of the Program and that of the SCBWMI as follows:

- The Program's activities pursuant to the NPDES permit assist Co-permittees and other local agencies to incorporate appropriate watershed management recommendations into their decision-making and specific watershed protection approaches into their day-to-day operations.

- The SCBWMI, as a stakeholder process, provides the tools to identify community goals and issues, and facilitates the development of common ground between stakeholders to recommend to policy-makers the actions needed to better manage watershed resources.

The Program seeks to create an avenue by which the SCBWMI's broad stakeholder goals and objectives can be incorporated into the daily operations of the Co-permittees. The Co-permittees will strive to apply their resources and powers to preserve and enhance the watershed. To do this most effectively, the Program and Co-permittees

need to translate SCBWMI stakeholder recommendations into specific actions that are reasonable, practical, and that can be incorporated into their missions and services. In addition, the Program will work with Regional Board staff to apply a regulatory strategy that allows Co-permittees to find ways to coordinate with other agencies within a specific watershed — to protect and enhance beneficial uses.

Continuous Improvement Process: An important feature of a mature Phase I municipal stormwater management program like the Santa Clara Valley Program is a process for continuous improvement. As shown in Figure 1 from the Program's 1997 URMP, continuous improvement is implemented through two feedback "loops." The loop on the left emphasizes programmatic measures to gage the performance of the Co-permittees and the overall Program (and includes participation in regional efforts such as the San Francisco Bay Regional Monitoring Program for Trace Substances). The loop on the right emphasizes watershed assessment and management conducted jointly with other stakeholders in the SCBWMI[8].

This two-pronged approach facilitates the Regional Board's responsibility for fairly measuring regulatory compliance while encouraging a watershed management approach. The continuous improvement process has been utilized by the Program over the past five years to successfully integrate programmatic monitoring indicators, which provide the best basis for measuring permit compliance, with watershed management measures (including environmental monitoring), which provides the best context for considering the effects of stormwater runoff on the environment and measures to improve the health of the watershed.

Stakeholder Involvement & Input: A significant factor in the success of the continuous improvement program is the active involvement and input from the various watershed stakeholders. Over the past 5 years, this involvement and input has principally come through the Program's and Co-permittees significant involvement in the Santa Clara Basin Watershed Management Initiative. For example, the Program's involvement involved a major role preparing both the abridged and unabridged versions of the Watershed Characteristics Report, the lead role in conducting the assessment of Coyote Watershed, a continuing leadership role in the Landuse Subgroup as well as the Bay Monitoring and Modeling and Regulatory Subgroups, and it's continued support of the Core Group efforts. As described below, a number of the Co-permittees have and continue to provide leadership and resources to the success of the WMI.

- The SCVWD's role managing the report preparation team, acting as co-chair of the watershed subgroup and providing significant staff leadership and resources to conduct the assessments in the Upper Penitencia, Guadalupe and San Francisquito watersheds.
- The City of San Jose staff chairing the Core Group, providing significant staff and technical resources to assist all subgroups including Co-chairing the BMM and WAS, and providing significant resources to conduct the assessments in the Upper Penitencia, Guadalupe and San Francisquito watersheds.

[8] The continuous improvement process concept was developed as part of the Program's 1997 Urban Runoff Management Plan to more effectively integrate urban runoff and watershed management.

- The City of Sunnyvale staff acting as the administrative chair of the Core Group, the Co-chair of the WAS, and providing significant technical resources in support of the BMM and WAS workplans.
- The City of Palo Alto staff acting as the finance chair for the Core Group and providing significant resources in support of the regulatory subgroup.

As the urban runoff program and WMI move forward towards completing ongoing assessments, initiating new assessments, identifying impediments to maintaining and improving water quality, and identifying actions to improve water quality the "continuous improvement" process and input from stakeholders will become even more important to shape the actions and priorities for the future. As illustrated in Figure 1, the most advantageous time to provide effective input to the Program and Co-permittees is through the review of the Annual Report. The Annual Report is submitted to the RWQCB on September 15 each year. Budget and Annual Workplan discussions for the next fiscal year are initiated in early November of each year. Thus, the most effective opportunity to provide input into the Program's budget and Workplan cycle is through timely review and comment on the Annual Report. To be useful, the review and comment needs to occur during the latter half of September and October of each year with comments available by the first of November.

While review of the Annual Report is the most effective means to influence future efforts, the Program and Co-permittees continued involvement in the WMI will also generate new ideas and avenues to improve the management of urban runoff and the effective and efficient integration[9] of urban runoff management into the overall management of the Santa Clara basin watersheds.

[9] See the Program's report entitled "Watershed Management and Urban Runoff Management Integration Report-Permit Provision C.10, June 29, 2001" for a further discussion.

APPENDIX A

SUMMARY OF CATEGORY #3
ENVIRONMENTAL MONITORING MEASURES

APPENDIX A

SUMMARY OF
CATEGORY #3 ENVIRONMENTAL MONITORING MEASURES

There are four key subcategories of projects in Category #3 projects that are directed at "supporting the SCBWMI." In particular, the specific field assessment and monitoring activities that the SCVURPPP is conducting individually and in conjunction with the SCBWMI are described under Subcategory 3(a) "Investigate Beneficial Uses and Causes of Impairment."

Subcategory 3(a): Investigate Beneficial Uses and Causes of Impairment
SCBWMI Support: The Program and Co-permittees have assisted the SCBWMI since it was initiated by the Regional Board and USEPA in 1996. The Program has consistently coordinated its watershed management activities (which were mandated in the 1995 permit) with the SCBWMI.

The SCBWMI stakeholders, including the Regional Board and the Program, have agreed on goals and objectives and on a phased process for developing a watershed management plan. The first of these phases was to characterize the overall status of watersheds within the Santa Clara Basin; this phase was essentially completed with publication, during 2000, of a Watershed Characteristics Report. As is discussed in detail in the Program's 1999-2000 Annual Report, the report was prepared almost entirely by Program staff, Program subcontractors, or contractors retained directly by Co-permittees.

Program and Co-permittee staff and contractors have also helped the SCBWMI to develop and adopt a "Framework for Conducting Watershed Assessments" which is currently being employed to conduct assessments in three representative watersheds: the watersheds of San Francisquito Creek, of the Guadalupe River, and of Upper Penitencia Creek.

Regional Monitoring and Assessment Strategy Assistance: During 1999 Regional Board staff, in coordination with the BASMAA Monitoring Committee, developed a Regional Monitoring and Assessment Strategy (RMAS) (Version 1.0, October 1, 1999). The purpose of the RMAS is to improve the technical content of the Regional Board's policies and regulatory actions. The specific regulatory focus of the RMAS relates to the Regional Board's obligation to complete biennial water quality assessments under the Clean Water Act's 305(b) and 303(d) requirements. The RMAS endorses several approaches to monitoring and assessment, including incorporation of bioassessment data and physical measurements in Regional Board decision making (supported by the 1997 USEPA 305(b) guidelines), coordination of consistent monitoring and assessment efforts and protocols both regionally and nationally, and enhancement of waterbody classification to help improve sampling design. The RMAS is being carried out in a phased approach, beginning with "pilot-scale implementation in selected watersheds", and establishing a rotating basin approach that will eventually result in "comprehensive assessment of surface and ground waters in the San Francisco Bay Region."

To assist Regional Board staff with the development of the RMAS, the Program

- organized and facilitated a technical panel, comprised of experts in macroinvertebrate and fish sampling, analysis of assemblages, and use of multimetric indices to assess water bodies; assessments of physical habitat to support fish and other aquatic life;

- applied fluvial geomorphology; use of metrics and statistical analysis;

- discussed the management of geographically referenced physical, chemical and biological data and information;

- discussed the use of scientific data and information in applying water-quality regulations; and

- facilitated discussions with stakeholders as part of meetings of the BASMAA Monitoring Committee.

The technical panel reached consensus to recommend initial use of a functional approach to assessing urban streams. By linking stream hydrogeomorphic functions to habitat functions and to beneficial uses the Regional Board will be better able to place ecological information into the regulatory context. The approach is summarized in the Coyote Pilot Assessment Workplan (previously submitted to the RWQCB)

The functional/pragmatic approach provides a common technical and regulatory perspective for three Regional Board Initiatives that were being developed during 2000:

1. The RMAS.
2. Sediment TMDLs and Regional Watershed Assessment.
3. Stream Protection Policy.

The Program will continue to assist Regional Board staff to improve the technical content of its 305(b) water quality assessments and 303(d) listings, with a focus on developing and refining the methodology for assessing urban streams. The Program is also willing to pull the expert panel together to further assist the Regional Board staff.

To test this approach, and to contribute to the SCBWMI's assessment of Santa Clara Basin watersheds, the Program is also implementing an Integrated Pilot Assessment in the Coyote Creek Watershed. The pilot assessment will facilitate continuous improvement of the SCBWMI's watershed assessment framework, integrate that methodology with that being used by the RMAS and other Regional Board initiatives, develop a list of appropriate initial management actions to preserve and enhance the Coyote watershed, and identify appropriate monitoring locations and provide baseline information for a long-term monitoring program for continued watershed assessment. Additional monitoring within the Coyote Watershed is specifically recognized within the proposed 8 year monitoring cycle (see Appendix B). The proposed additional efforts will be reviewed as part of Task 7 & 8 the Coyote Pilot Assessment Work Plan (see March 1, 2001 Work Plan, Attachment 4-3) which call for developing a long-term monitoring strategy by September 2002.

While expansion of the assessment and monitoring effort beyond the current pilot investigations in the Coyote Watershed are specifically recognized in the MY-RWMP, The intent is to constructively build the future years' monitoring and assessment efforts on the past years' work and lessons learned.

Pollutant-Specific Provisions C9: The recent emphasis on enforcement of long-standing Federal requirements that the states develop and implement TMDLs has led the Regional Board to request, and then require, assistance with estimating pollutant loads and with identifying control measures.

As described in the 1990 stormwater regulations, the intent of USEPA's mandate that stormwater pollution prevention programs incorporate a monitoring element was to help determine the effectiveness of these programs. Various studies, including the SEIDP, have demonstrated that pollutant loadings may not be the best indicator of the effectiveness of municipal stormwater programs. The Program's current Performance Standards provide for the control of urban runoff pollutants to the maximum extent practicable, and the Program's Continuous Improvement process provides for timely and orderly updates of the Performance Standards as new technology and information becomes available.

The Program has scoped and budgeted monitoring projects to comply with the new Permit's provisions that require the Program to assist Regional Board staff to prepare TMDLs. Many of these projects continue and expand on current efforts to assist the Regional Board.

Provisions C9a and b. Copper and Nickel Control Measures

The Metals Control Measures Plan, was first created in FY00-01 (SC27.05) to assist implementation of baseline activities contained in the Lower South San Francisco Bay Copper and Nickel Action Plans, to track and report activities, and to continue to work with the SCBWMI Bay Monitoring and Modeling (BMM) and Regulatory Subgroups regarding BMM Work Plan Updates. Descriptions of copper control program activities and nickel control program activities are included in the Copper and Nickel Action Plans approved by the SCBWMI and transmitted to the RWQCB as part of the Copper and Nickel TMDL Project. In addition, those baseline activities that are specifically related to the stormwater program are listed in Appendix B of the recently adopted NPDES permit. The Program's activities to support baseline activities was carried into FY 01-02 (see FY001-02 Workplan monitoring section project descriptions #9, 10 and 11) and is continued into the FY02-03 Workplan.

Provisions C9c and e. Mercury and PCB Control Measures

The Mercury Rising (FY00-01, Project SC27.06), was created to assist Regional Board staff with preparation of TMDLs and Implementation Plans to address potential effects of mercury and PCBs on beneficial uses of San Francisco Bay. The focus of the first phase of this project has been to respond to a May 2000 Regional Board letter request for information by leading a joint project, with other

Bay Area stormwater programs, to study mercury and PCBs in storm drain sediments.

The joint stormwater agencies project, which the Program contributes to through Project SC27.06, assesses the occurrence and distribution of PCBs, as well as that of mercury, in Bay Area storm drain sediments. The results of the first year of this project have been published. Based on the results of the technical review and discussions with the RWQCB staff and other stormwater programs through the BASMAA Monitoring Committee, the SCVURPPP's FY 01-02 projects scope is being defined (FY01-02 Workplan Project #12 & 14).

Program staff is currently working with the RWQCB staff and other storm water programs to complete the second year (FY01-02) of the project and developing the third year workplan (FY02-03). The three year investigation is being conducted consistent with Provisions 9ei,ii and iii requirements and guidance from the RWQCB staff. The scope for the third year investigations will be submitted to the RWQCB, consistent with the year two workplan, by July 1, 2002.

Provision 9c requires submission of a Mercury Plan by March 1, 2002. This document has been developed and is contained in Volume II of the FY 02-03 Work Plan.

Provision 9ei&ii requires submission of a workplan to characterize the representative distribution of dioxin-like compoundsand provide information to allow calcaulation of loadings by March 1, 2002. The workplan needs to be implemented by October 1, 2002. The workplan is contained in Volume II of the FY02-03 Workplan.

Provision 9eiv require submission of a plan and implementation schedule by March 1, 2002 that addresses actions to eliminat or reduce dischargesm of PCBs from urban runoff conveyance systems from controllable sources (if any). The plan is contained in Volume II of the FY02-02 Work Plan.

Provisions C9d. Pesticide Control Measures

Regional Pesticide Strategy Coordination and Implementation, provides for the Program to continue involvement with the BASMAA Pesticide Work Group and Urban Pesticide Committee to coordinate, evaluate, and report on storm water management plan actions outlined in the BASMAA Pesticide Strategy and in the Program's Pesticide Work Plan.

Provision C9d required the Program to submit, by July 1, 2001, a "pesticide toxicity control plan (Pesticide Plan) that addresses their own use of pesticides including diazinon, and, other lower priority pesticides no longer in use such as chlordane, dieldrin and DDT and the use of such pesticides by other sources within their jurisdictions. The Dischargers may address this requirement by building upon their prior submissions to the Regional Board. They may also coordinate with BASMAA, the Urban Pesticide Committee, and other agencies and organizations." It is the SCVURPPP's intent to collaboratively work with the RWQCB, it's staff, and other stormwater programs to develop enhancements to and continually improve the Program's Pesticide Management Plan.

Provision C 9f. Control Program for Sediment

Requirements in the new Order mandate a different approach to assessing the effects of urbanization and other land uses on the hydrogeomorphic and habitat functions of streams. In particular, Provision C9fi of the Order requires submittal of a plan and time schedule, by September 2001, to conduct an assessment of San Francisquito Creek that provides for:

1. Quantitative characterization of sediment and water inputs to the creek.
2. Relative roles of sediment associated with natural and anthropogenic land use discharges.
3. Sediment conveyance from headwaters to the Bay.
4. Development of a rapid sediment budget."

The SCVWD (onbehalf or the SCVURPPP) and MC STOPP submitted the plana nd time schedule as part of the FY00-01 Annual Report this past September 15, 2001.

Provision C9fii requires "an assessment of management practices that are currently being implemented to reduce excess sediment impairment in urban creeks, and implement any additional management practices to prevent or reduce excess sediment impairment in urban San Francisquito Creeks. Such management practices may include but are not limited to: management and/or removal of large woody debris and live vegetation from channels; streambank stabilization projects; road construction, operation, maintenance, and repairs to prevent road-related erosion; management of construction related sediment; and management of post-construction sediment from areas of new development or redevelopment." A plan and time schedule for implementation are required by March 1, 2002. The Santa Clara Valley Water District has taken the lead on these two provisions.

Provision C9fiii requires the Program to submit, by March 1, 2002, a report that identifies other creeks that may be impaired by excessive sediment production from erosion due to anthropogenic activities. This submittal is contained in Volume II of the FY02-03 Work Plan.
Provision C9fiii also requires submittal, by September 1, 2002, of a plan and schedule "to conduct a watershed analysis and management practice assessment in other creeks which may be impaired by excessive sediment production from erosion due to anthropogenic activities."

Watershed Management Provision C.10: Provision C10 requires submittal to the Regional Board by July 1, 2001, a report concerning the integration of watershed management activities into the Management Plan. The report shall, at a minimum:

a) Identify the watersheds that are relevant to each Discharger;
b) Identify key characteristics related to urban runoff in each watershed and program elements related to such characteristics; and
c) Provide a priority listing of watersheds to be assessed and a schedule for conducting such assessments in conjunction with the SCBWMI.

As previously described, the Program has consistently coordinated its watershed management activities (which were mandated in the 1995 permit) with the SCBWMI. The Program, as a stakeholder in the SCBWMI, has agreed with the Regional Board and numerous other Santa Clara Valley stakeholders on goals and objectives and on a phased process for developing a watershed management plan. That approach is contained in the SCBWMI "Watersheds Characteristics Report, May 2000[1]."

The above approach addresses the broader aspects of watershed management goals and activities and provides baseline information on the identification of Basin watersheds and characteristics. How these goals and activities are reflected and further integrated into the ongoing daily implementation of the stormwater performance standards by the Co-permittees should be further clarified. Consistent with the permit, the Program and the Co-permittees during FY 01-02 prepared a report on the integration of watershed activities into the Program URMP. (see FY 01-02 Project #6.) The report is entitled "Watershed Management and Urban Runoff Management Integration Report, Provision C.10, June 29, 2001." The recommendations from that report regarding the priorities for future assessment efforts has been incorporated into the proposed surface monitoring efforts described in Appendix B.

During FY01-02 the Program's support of Monitoring Priority 3a, Investigate Beneficial Uses and Causes of Impairment, included completion of a project for the SCBWMI Wetland Advisory Group's Baylands Assessment (FY00-01 Project SC27.13). Program staff l compiled additional baylands metadata for incorporation into the Santa Clara Basin Watershed Management Initiative (SCBWMI) Metadata Database (MDDB) and submitted the final report to the WAG on February 5, 2002.

Subcategory 3(b): Compile and Maintain Environmental Data and Make it Accessible.

To implement this priority, the Program will continue ongoing projects, including development and improvement of data libraries and project report libraries and their incorporation into the Program website. The SCVURPPP website has been completely updated and can be found at www.SCVURPPP.org. The Program's waterwatch website is located at www.waterwatch.org.

Subcategory 3(c): Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses

To implement this priority, the Program supports the SCBWMI Land Use Subgroup (LUS). The Program's participation in the LUS is intended to fulfil a commitment in the 1997 URMP to "translate SCBWMI goals and objectives into model local-jurisdiction policies and procedures." The LUS includes stakeholders representing business interests, developers, environmental advocates, and Regional Board staff, as well as SCVURPPP Co-permittees. As documented in the LUS "Consensus Points" and in Chapter 4 of the SCBWMI Watershed Characteristics Report ("Land Use in the Basin"), the LUS has reviewed and discussed at length the potential effectiveness of various

[1] As is discussed in detail in the Program's 1999-2000 Annual Report, the Watershed Characteristics Report was prepared almost entirely by Co-permittee and Program staff, Program subcontractors, or contractors retained directly by Co-permittees.

approaches to controlling urban runoff pollutants and other effects of urbanization on streams. A specific approach to integrating municipal land use planning and watershed management is described in Section 4.1 of the Watershed Characteristics Report (unabridged). Continuation of the Program's support for the LUS is shown in the MY_RWMP.

In addition to administrative support and leadership for the LUS, the Program has also created additional projects to support the LUS' development of policies and watershed management measures. As shown below, two projects are underway which are intimately connected to the new development issues. These projects include:

Economic and Tax Incentives in Watershed Management, is intended to identify ways that Federal, state and local economic policies, including taxation, affect land use patterns and to explore ways that the Santa Clara Basin Watershed Management Initiative (SCBWMI) might be able to promote economic and tax policies that encourage more environmentally beneficial development decisions.

Compare and Contrast Development Policies, is intended to develop model municipal planning principles that would assist municipalities in developing effective policies, ordinances, or procedures to provide for long-term effective watershed protection and/or enhancement. In addition, the intent is to compare municipalities' existing policies, ordinances, or procedures against these model municipal planning principles to indicate areas where improvements can be made. The work provides for a re-examination of the previous work and additional research to be conducted in cooperation with Santa Clara Basin local and to build consensus within the WMI on the methods used in the comparison.

The Program encourages the RWQCB staff, as part of developing the revised permit language for new development, to integrate the results of the LUS' work to date, to continue RWQCB staff participation in the LUS, and to work with the Program and LUS to implement consensus recommendations reached within the LUS.

Category #4 – Regional Collaborative Efforts

As is mandated in the SCVURPPP's NPDES Permit, the Program pays over $140,000 annually to SFEI for expenditures on the Regional Monitoring Program for Trace Substances (RMP). In recent years the RMP has expanded its scope beyond periodic water-quality sampling into a broad range of special studies which are periodically reviewed by a steering committee and various technical advisory committees.

The Program, strictly from a volunteer perspective, has been working with the Regional Board staff and Executive Officer along with BASMAA and BACWA to develop a Memorandum of Understanding (MOU) to memorialize the understandings of the various parties regarding the development of Water Quality Attainment Strategies (WQASP) including Total Maximum Daily Loads (TMDLs) for the San Francisco Bay-Delta and its tributaries. The intent of the MOU is to outline the various parties desire to work collaboratively on the development and implementation of water quality attainment strategies including TMDLs. In order to facilitate these goals, the various parties are looking a mechanisms to develop work plans, schedules for implementing the work plans, funding sources and monitoring programs. The Program believes that this a key document that can be used to cost-effectively address water quality problems. The

Program is looking for this MOU to also provide some regulatory stability and certainty regarding the identification of resource needs over the next 5 years.

The Program has provided funds during FY01-02 from its contingency budget to assist with Year 0 of the WQASP. While the Program supports the concept of the WQASP, several questions remain to be addressed as part of the developing the WQASP project management plan. These questions include:

1. Various memos show estimated budgets varying from 7.5 million to 10.5 million. What are the WQASP plans for better defining and refining the estimates?

2. As the WQASP gets a better handle on the budget, questions regarding the overall timing of the program also should be discussed. What are the WQASP plans to review the reasonableness of the original proposed schedules given the availability of resources, technical practicalities, and regulatory realities?

3. The assumption has been that the POTW and Stormwater agencies will provide most of the resources. However, many of the POTWs and Stormwater agencies are one and the same and the proposed resources requirements are not insignificant. Thus, the costs to conduct the WQASP needs to be spread to more than the public. What are the WQASP plans to bring in other resources?

4. The RWQCB is a key player in the MOU and, as such, it was our understanding would also contribute resources to the budget. What are the RWQCB's plans for providing financial resources to the WQASP?

5. Stormwater Programs have been participating in funding various TMDL associated investigations over the past several years. Specifically, a significant amount of resources have already been expended on PCBs and mercury investigations throughout the San Francisco Bay Area. More efforts are also currently planned and will be shortly underway. This is not to mention the North Bay and South Bay copper and nickel efforts. How do agencies get credit for the work that has been completed, ongoing and will continue to go on outside of the WQASP but coordinated with the overall effort?

6. Public agencies have been providing resources to regional monitoring activities (Regional Monitoring Program) for a number of years and with WQASP are being asked to fund another regional activity. What are the WQASP plans to clearly define the linkages and overlaps between the RMP and WQASP programs and how these programs address all of the RWQCB's regional monitoring needs?

The Program has discussed these question with the Executive Board of BASMAA, has requested BASMAA to transmit them to the WQASP Executive Management Board, and has transmitted them directly to the EMB.

APPENDIX B

ENVIRONMENTAL MONITORING MEASURES

APPENDIX B

ENVIRONMENTAL MONITORING MEASURES

The Multi-Year Receiving Waters Monitoring Plan (MY-RWMP)[1] contains four main elements:

1. Comprehensive Timeline: The timeline illustrates all existing commitments and priorities established by the Program, including ongoing activities meant to fulfill Regional Board Order Provisions related to C9 "Water Quality-Based Requirements for Specific Pollutants of Concern" and C10 "Watershed Management" of the NPDES permit.

2. Summary matrix of Programmatic Monitoring Indicators (PMIs): The PMIs are used to gauge how well Performance Standards are being met and control measures are being implemented.

3. Summary matrix of Environmental Monitoring Measures (EMMs): The EMMs 1) assist the RWQCB characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program[2], 2) identifies where and what type of status and trend type monitoring is appropriate, 3) recognizes the need for site-specific water quality investigations to address questions that might arise during the conduct of the routine monitoring efforts, and 4) allows for determining if control measures are having the intended effect.

4. Continuous Improvement: The continuous improvement element helps the SCVURPPP integrate urban runoff management and watershed management. It is based on the principles of adaptive management, thereby incorporating a systematic review of the monitoring results to improve future efforts and provides opportunities for stakeholder input into the continuous improvement process.

Environmental Monitoring Measures – Summary Matrix

While continuing the programmatic approach to measuring compliance, the Program and Co-permittees are committed to monitoring and assessing their creeks and wetlands,

[1] The Program, consistent with the NPDES permit, initiated work on the Multi-Year Receiving Waters Monitoring Plan (MY-RWMP) in January 2001. The first draft was released for review by the Monitoring Adhoc Group on January 15, 2001. Based on the review and response to comments a draft was formally submitted to the RWQCB on March 1, 2001 as part of the Program's FY01-02 Work plan. Comments were solicited from the WAS during April and May of 2001 and two additional Adhoc meetings were held on March 6 and April 19. A "Interim Draft" (fourth draft) was produced and submitted to the RWQCB on July 1, 2001, consistent with the NPDES permit. Minor revisions were made to the March darft and a final draft was submitted to the RWQCB on September 15, 2001 with the Program's FY00-01 Annual Report. Since the September submittal, three joint WAS and Monitoring Adhoc meetings were held on November 19, December 18 and January 24 (the last two included an EPA moderator/facilitator) to seek input from various stakeholders. In addition, a separate Co-permittee Adhoc meeting was held on December 16, 2001.

[2] The SCVURPPP's watershed assessment priorities are described in the Program's report entitled " Watershed Management and Urban Runoff Management Integration Report – Permit Provision C.10, June 29, 2001."

and San Francisco Bay. A summary matrix of the various ongoing and planned projects relative to how they address the four major components of the RWQCB's long-term monitoring goals (i.e., status and trends monitoring, surveillance monitoring, management effectiveness monitoring, and monitoring to help set realistic standards) is shown in Table 3. The purpose of this table is to give the reader a perspective on the various projects that the SCVURPPP has underway or planned. Additional detail on the expected schedule for conducting a particular project is contained in the comprehensive monitoring plan timeline, Table 1, previously discussed.

In addition to the summary matrix shown in Table 3 of the main report, a detailed set of tables and figures that identifies the SCVURPPP's proposed surface water monitoring program for the next eight years is contained in this appendix (Appendix B). Appendix B is a standalone section that: 1) assists the RWQCB characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program, 2) identifies where and what type of status and trend type monitoring is appropriate, 3) recognizes the need for site-specific water quality investigations to address questions that might arise during the conduct of the routine monitoring efforts, and 4) allows for determining if control measures are having the intended effect.

Included in this appendix (Appendix B) are the following tables and figures:

- Table B-1Existing Monitoring Data for Coyote Creek Watershed: Table B-1 contains a description of parameters, sampling locations and number of sites, along with the agency and specific project where the data have been collected within the Coyote Watershed. The information is based on a summary of the information contained in the *"Santa Clara Basin Stream Studies Inventory, July 24, 2001"* prepared by the Program to assist the WMI, as well as more recent date from ongoing Program efforts (The Program will be producing a quick update of the SSI during the fall of 2002. That project is part of the WAS workplan and the Program's FY02-03 Annual Monitoring Plan).

- Figure B-1 Pilot Assessment and Monitoring Efforts (1997 to Present) Occurring in Watersheds of the Santa Clara Basin: Figure B-1 illustrates the spatial coverage of investigations as well as the type (i.e, benthic , macroinvertebrate, salmonid habitat, biological, sediment, and water quality) of investigations conducted over the past four years throughout the Santa Clara Basin.

- Figure B-2 Existing Chemical, Biological and Physical Data Collection Efforts in Coyote Creek Watershed: Figure B-2 illustrates, in greater detail the spatial coverage of data and type of data available specifically in the Coyote Watershed[3].

[3] The high priority assigned to the Coyote watershed is based on the fact that, relative other watersheds in the Santa Clara Basin (as well as others), the watershed has the least amount of developed land (and thus the least amount of imperviousness), has the least amount of development within riparian corridors, and has one of the highest areas for projected future development. In addition, a significant amount of available work is ongoing or recently completed which allows the Program to build upon. The high priority given to the Coyote Watershed is consistent with the WMI's assessment priorities described in Work Group D products entitled *"Combined Technical Memoranda #29, #30, #13 – Management Issues to be Considered in*

- Table B-2 Preliminary SCVURPPP 8-Year Monitoring Plan for the Santa Clara Basin (excluding the Coyote Watershed): Table B-2 contains the following information: watershed location (prioritized based on WMI and SCVURPPP assessment priorities), data type (chemical, biological, physical, and trash), FYs (8 years starting with FY02-03 through FY09-10), rationale, and lead agency. The information on data type utilizes a tiered monitoring approach discussed by the RWQCB staff in its RMAS memo (February 8, 2001 Draft Monitoring Design in Regional Board-lead Pilot Watersheds, Spring 2001) that includes the following monitoring categories: screening level, detailed investigation, and status and trends[4].

- Table B-3 provides a description of data parameters and analytical methods used in the SCVURPPP FY 02-03 and Multi-Year Receiving Waters Monitoring Plan.

The investigation of beneficial uses and causes of impairment will be greatly facilitated by implementation of the Regional Board's Regional Monitoring and Assessment Strategy (RMAS). The Program is committed to continuing its efforts to facilitate technical and stakeholder workgroups that will assist Regional Board staff to implement the RMAS.

With appropriate policy and guidance from the Regional Board, it should be possible to develop practical, implementable indicators (including physical and biological indicators) and protocols to assess beneficial uses in creeks, wetlands, and the Bay. These indicators and protocols are a necessary step toward establishing a sound regulatory basis for locally based watershed management.

Watershed Selection; Process and Objective Criteria for Incorporating Management Issues into the Selection of Watersheds, and Watershed Suite Selection and Reevaluation , dated April 18, 2000." In addition, the high priority assigned to the Coyote Watershed is further described in the SCVURPPP" report entitled *" Watershed Management and Urban Runoff Management Integration Report, C.10, June 29, 2001."*

[4] Comments and guidance contained in the RWQCB's letter regarding Pesticide-Related components of the 2002/01 Annual Report indicate that water quality monitoring must include: 1) routine screening of representative creeks for aquatic toxicity (wet and dry periods), 2) monitoring for diazinon levels (wet and dry), and 3) monitoring for other pesticides with a substantial market share. MY-RWMP includes screening level toxicity testing in various locations based on the results of past work. MY-RWMP also allows for monitoring other pesticides consistent with permit Provision C.9i. Annual monitoring programs are developed based on previous years results. It is the SCVURPPP's intent to incorporate, as appropriate, monitoring based on the results of the Pesticide Plan use surveys.

Table B-1. Existing monitoring parameters, location, number of sites, sampling dates, associated projects and agencies for Coyote Creek Watershed.

Tier One - screening level monitoring

Data type	Parameters	# Sites/Subwatershed			Sampling Date	Project	Lead Agency
		Below Anderson Dam	Upper Penitencia Creek	Above Anderson Dam			
Chemical							
Field probe	Water temp, pH, conductivity, DO, turbidity	15		3	May - Sept 1999	SEIDP	SCVURPPP
Continuous monitoring	Water temp, pH, conductivity, DO	4		1	June - Sept 1999	SEIDP	SCVURPPP
Field probe	Water temp, pH, conductivity, DO, turbidity, alkalinity	9	1		May - Nov 2000	Streamflow Augmentation	San Jose
Continuous monitoring	Water temp, pH, conductivity, DO	3			May - Nov 2000	Streamflow Augmentation	San Jose
Continuous monitoring	Water temperature	6	1		May - Sept 2000	Streamflow Augmentation	San Jose
Continuous monitoring	Water temperature	42	5	1	1996-2001	FAHCE, others	SCVWD
Biological							
Rapid bioassessment	Benthic Macroinvertebrates	7		2	May - June 1999	SEIDP	SCVURPPP
Rapid bioassessment	Fish	15		3	May - Sept 1999	SEIDP	SCVURPPP
Bioassessment	Benthic Macroinvertebrates	9	7	2	May-97	Distribution and Abundance of Lotic Macroinvertebrates	USGS/ SCVURPPP
Bioassessment	Benthic Macroinvertebrates	15			Sep-98	Streamflow Augmentation	San Jose
Bioassessment	Fish	15			Oct-98	Streamflow Augmentation	San Jose

Data type	Parameters	# Sites/Subwatershed			Sampling Date	Project	Lead Agency
		Below Anderson Dam	Upper Penitencia Creek	Above Anderson Dam			
Bioassessment	Fish				1858 - 1999	Characterization Western Hamilton Stream Fisheries	The Nature Conservancy
Bioassessment	Microsatellite DNA		x	x	1997	Steelhead Genetic Study	SJSU
Physical							
Physical habitat	Salmonid Habitat Survey	15		3	Jul-99	SEIDP	SCVURPPP
Physical habitat	Salmonid Habitat Survey	4			Nov-98	Streamflow Augmentation	San Jose
Physical habitat	Salmonid Habitat Survey	x	x		1999	FAHCE	SCVWD
Physical habitat	Fish barriers	x	x		1999	FAHCE	SCVWD
Stream morphology	Rosgen classification	x	x		1999	FAHCE	SCVWD
Stream morphology	Stream classification	x	x	x	2002	Coyote Pilot Assessment	SCVURPPP
Stream morphology	Channel modification	x	x	x	1999	Waterways Management Model	SCVWD
Land use	Watershed Imperviousness	x	x	x	2000	SEIDP	SCVURPPP
Riparian Vegetation	Map of vegetation communities	x	x		1998	CCRS	SCVURPPP
Sediment	Volume of sediment removal	x	x		2001	Stream Maintenance Project	SCVURPPP
Other							
Photos - Physical Habitat	Channel location of fish sampling sites	15		3	May - Sept 1999	SEIDP	SCVURPPP
Trash	Illicit Discharge Inspection Records	x	x		Ongoing	Illicit Discharge Control Program	SCVURPPP
Flow	Stream gage measurement	x	x	x	Ongoing	Flow monitoring	SCVWD
Tier 2 - Detailed-level monitoring							
Chemical							
Field probe	Metals	9	1		May - Nov 2000	Streamflow Augmentation	San Jose

Data type	Parameters	# Sites/Subwatershed			Sampling Date	Project	Lead Agency
		Below Anderson Dam	Upper Penitencia Creek	Above Anderson Dam			
Field probe	Organophosphate Pesticides	2			Jul-00	Streamflow Augmentation	San Jose
Sediment sampling	Arsenic, cadmium, chromium, copper, lead, mercury	7		2	Jun-99	SEIDP	SCVURPPP
Sediment sampling	PCB, mercury	13		1	2000-2001	PCB/mercury study	SCVURPPP
Sediment sampling	Metals, Organics	9			Ongoing	Sediment Characterization - Stream Maintenance Program	SCVWD
Biological							
Field probe	Nutrients, pathogens	9	1		May - Nov 2000	Streamflow Augmentation	San Jose
Chronic toxicity bioassays	*Ceriodaphnia*	3			Jun-00	Streamflow Augmentation	San Jose
Physical							
Stream morphology	Channel cross sections, longitudinal profiles, bank erosion assessment		x		Mar-00	Alum Rock Park Riparian Management Plan	San Jose

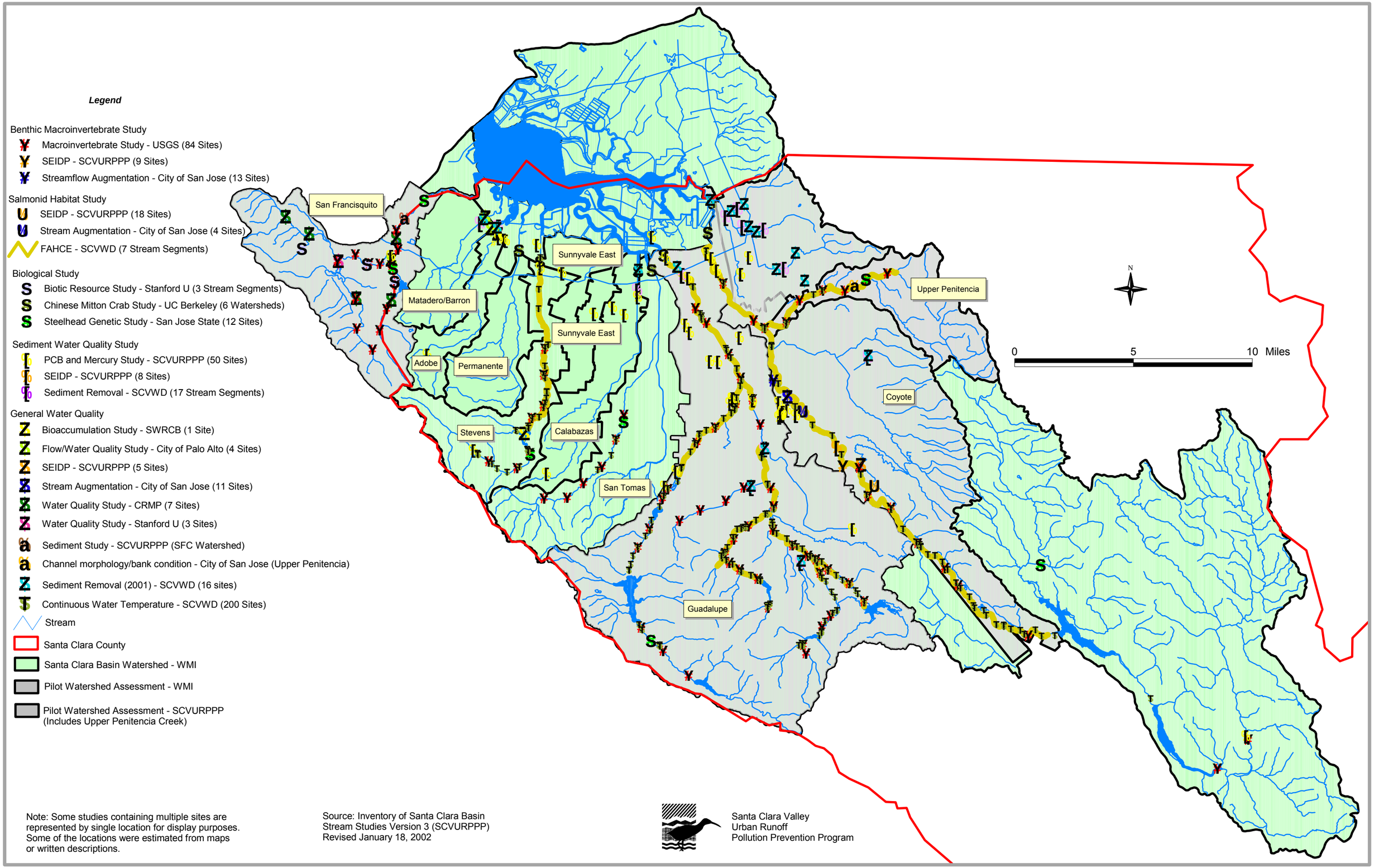

Figure B-1. Pilot Assessments and Monitoring Efforts (1997 to Present) Occurring in Watersheds of the Santa Clara Basin

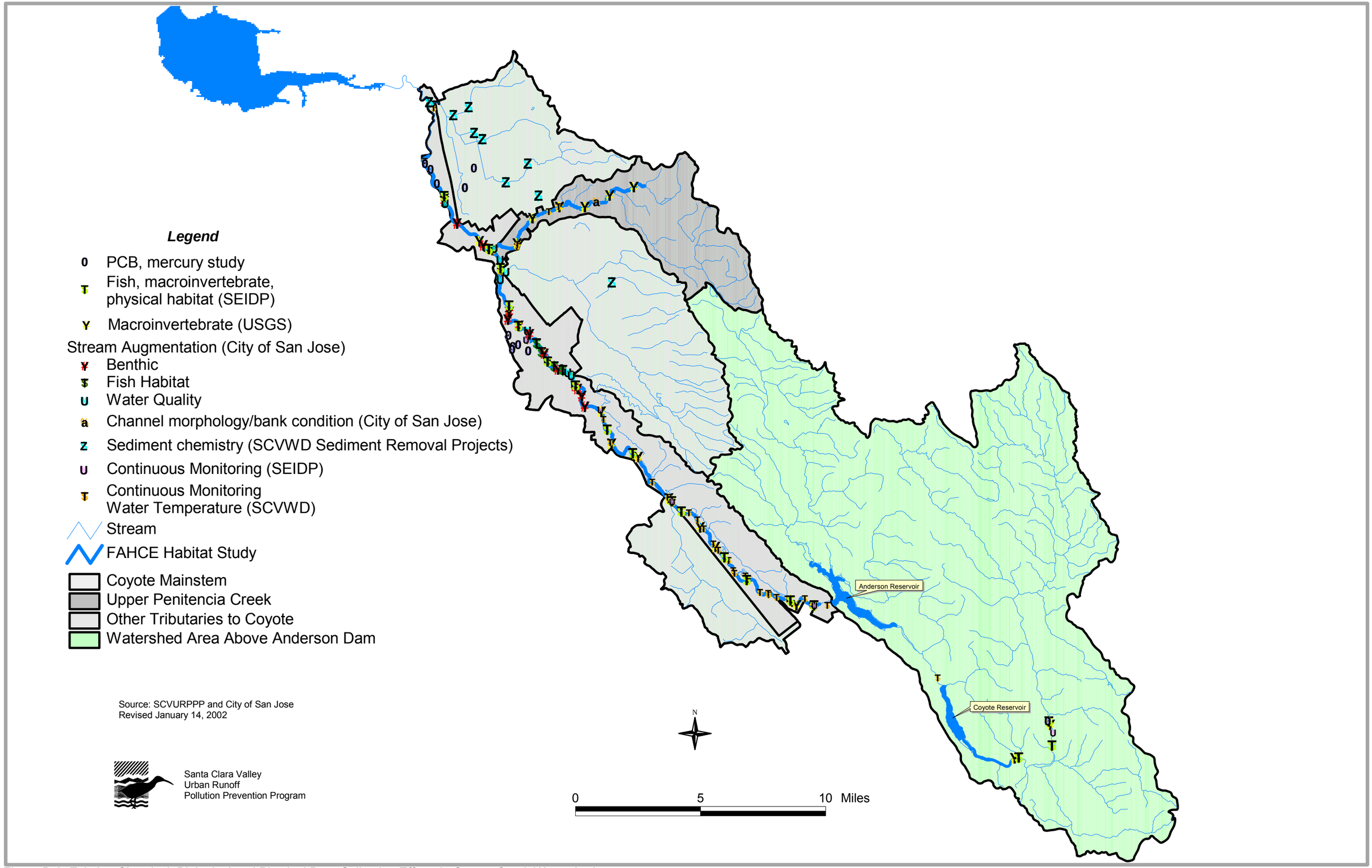

Figure B-2. Existing Chemical, Biological and Physical Data Collection Efforts in Coyote Creek Watershed.

Table B-2 (Revised 8/5/02). SCVURPPP 8-year monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Coyote Creek (Only tribs sampled in FY 02-03)	***Chemical***										
	Contaminants - Water [3]	S(3)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
	Contaminants - Sediment[4]	S(1)				T(1)				See FY 02-03 Monitoring Plan	SCVURPPP
	General Water Quality[5]	S(5)				T(8)				See FY 02-03 Monitoring Plan	SCVURPPP
	Biological										
	Toxicity - Water Quality[6]	S(1)				T(4)				See FY 02-03 Monitoring Plan	SCVURPPP
	Conventional Water Chemistry[7]	S(4)				T(8)				See FY 02-03 Monitoring Plan	SCVURPPP
	Pathogens (Indicator Organisms) [8]	S(4)				T(8)				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment – Macroinvertebrates[9]	S(4)				T(12)				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment – Fish[10]					T(6)				See FY 02-03 Monitoring Plan	SCVURPPP
	Physical										
	Physical Habitat[11]	S(4)				T(12)				See FY 02-03 Monitoring Plan	SCVURPPP
	Sediment Characterization[12]	S(4)		I	I	T(12)				See FY 02-03 Monitoring Plan	SCVURPPP
	Channel Dynamics and Hydrology									See FY 02-03 Monitoring Plan	SCVURPPP
	Riparian Vegetation									See FY 02-03 Monitoring Plan	SCVURPPP
	Trash[13]	S(4)				T(4)				See FY 02-03 Monitoring Plan	SCVURPPP
Lower Penitencia Creek	***Chemical***										
	Contaminants - Water Quality	S(2)				T(2)				See FY 02-03 Monitoring Plan	SCVURPPP
	Contaminants - Sediment	S(1)				T(1)				See FY 02-03 Monitoring Plan	SCVURPPP
	General Water Quality	S(5)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
	Biological										
	Toxicity - Water Quality	S(2)				T(2)				See FY 02-03 Monitoring Plan	SCVURPPP
	Conventional Water Chemistry	S(5)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
	Pathogens (Indicator Organisms)	S(5)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment - Macroinvertebrates	S(5)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment - Fish									See FY 02-03 Monitoring Plan	SCVURPPP
	Physical										

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Physical Habitat	S(5)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
	Sediment Characterization	S(5)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
	Channel Dynamics and Hydrology									See FY 02-03 Monitoring Plan	SCVURPPP
	Riparian Vegetation									See FY 02-03 Monitoring Plan	SCVURPPP
	Trash	S(5)				T(5)				See FY 02-03 Monitoring Plan	SCVURPPP
Stevens Creek	***Chemical***										
	Contaminants - Water Quality				T(2)				T(2)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Contaminants - Sediment				T(1)				T(1)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	General Water Quality				T(3)				T(3)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Biological										
	Toxicity - Water Quality				T(2)				T(2)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Conventional Water Chemistry				T(3)				T(3)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Pathogens (Indicator Organisms)				T(3)				T(3)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				T(8)				T(8)	Baseline data collected by USGS in 1997 and RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Bioassessment - Fish				T(4)				T(4)	Coordinate with SCVWD to obtain permits and/or develop approach to monitor status and trends of steelhead populations.	SCVWD/ SCVURPPP
	Physical										
	Physical Habitat				T(8)				T(8)	Salmonid habitat survey in 1999 by FAHCE; Visual habitat assessment by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Sediment Characterization		I		T(8)				T(8)	Identified as high priority for potential impairment from sediment in SCVURPPP sediment report. Conduct studies using methods developed in work associated with sediment workplan.	SCVURPPP
	Channel Dynamics and Hydrology									Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
										Hydrogeomorphic Management Plan, as required in the C.3 Provision. The specific creeks in which to compile baseline data have not been selected at this time.	
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
	Trash				T(3)				T(3)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
Permanente Creek	***Chemical***										
	Contaminants - Water Quality				T(2)				T(2)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Contaminants - Sediment				T(1)				T(1)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	General Water Quality				T(3)				T(3)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Biological										
	Toxicity - Water Quality				T(2)				T(2)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Conventional Water Chemistry				T(2)				T(2)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Pathogens (Indicator Organisms)				T(3)				T(3)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Bioassessment - Macroinvertebrates				T(7)				T(7)	Baseline data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
	Bioassessment - Fish				T(4)				T(4)	Coordinate with SCVWD to monitor status and trends of resident rainbow trout populations.	SCVWD/ SCVURPPP
	Physical										
	Physical Habitat				T(7)				T(7)	Baseline screening level data collected by RWQCB in 2002; repeat monitoring in future to determine status and trends. Conduct salmonid habitat survey in reaches that support trout.	SCVURPPP
	Sediment Characterization				T(7)				T(7)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	RWQCB/ SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Channel Dynamics and Hydrology									Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3 Provision. The specific creeks in which to compile baseline data have not been selected at this time.	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
	Trash				T(3)				T(3)	Baseline screening level data collected by RWQCB in 2002; SCVURPPP will repeat monitoring in future to determine status and trends.	SCVURPPP
San Thomas Aquino	***Chemical***										
	Contaminants - Water Quality		S(3)				T(3)			Conduct screening level monitoring	SCVURPPP
	Contaminants - Sediment		S(1)				T(1)			Conduct screening level monitoring	SCVURPPP
	General Water Quality		S(7)				T(7)			Conduct screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality		S(3)				T(3)			Conduct screening level monitoring	SCVURPPP
	Conventional Water Chemistry		S(7)				T(7)			Conduct screening level monitoring	SCVURPPP
	Pathogens (Indicator Organisms)		S(7)				T(7)			Conduct screening level monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Bioassessment - Macroinvertebrates		S(7)				T(7)			Baseline data from 1997 USGS study in Saratoga; conduct rapid bioassessment synoptically with chemical and physical parameters.	SCVURPPP
	Bioassessment - Fish		S(4)				T(4)			Coordinate with SCVWD to monitor status and trends of resident rainbow trout populations.	SCVURPPP
	Physical										
	Physical Habitat		S(7)				T(7)			Salmonid habitat survey data was identified as a data gap for Saratoga Cr in SCVURPPP sediment report; conduct salmonid habitat survey.	SCVURPPP
	Sediment Characterization		S(7)			I	T(7)			Conduct evaluation of sediment related impacts in Saratoga Cr in conjunction with SCVURPPP sediment assessment workplan.	SCVURPPP
	Channel Dynamics and Hydrology									Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3 Provision. The specific creeks in which to compile baseline data have not been selected at this time.	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
	Trash		S(4)				T(4)			Conduct screening level monitoring	SCVURPPP
Matadero/ Barron	***Chemical***										
	Contaminants - Water Quality			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Creeks	Contaminants - Sediment			S(2)				T(2)		Conduct screening level monitoring	SCVURPPP
	General Water Quality			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Pathogens (Indicator Organisms)			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates			S(6)				T(6)		Conduct screening level monitoring	SCVURPPP
	Bioassessment - Fish									No data collection is currently planned	SCVURPPP
	Physical										
	Physical Habitat			S(6)				T(6)		Conduct screening level monitoring	SCVURPPP
	Sediment Characterization			S(6)				T(6)		Conduct screening level monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3 Provision. The specific creeks in which to compile baseline data have not been selected at this time.	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
	Trash			S(6)				T(6)		Conduct screening level monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Adobe Creek	***Chemical***										
	Contaminants - Water Quality		S(2)				T(2)			Conduct screening level monitoring	SCVURPPP
	Contaminants - Sediment		S(1)				T(1)			Conduct screening level monitoring	SCVURPPP
	General Water Quality		S(3)				T(3)			Conduct screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality		S(2)				T(2)			Conduct screening level monitoring	SCVURPPP
	Conventional Water Chemistry		S(3)				T(3)			Conduct screening level monitoring	SCVURPPP
	Pathogens (Indicator Organisms)		S(3)				T(3)			Conduct screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates		S(4)				T(4)			Conduct screening level monitoring	SCVURPPP
	Bioassessment - Fish									No data collection is currently planned	SCVURPPP
	Physical										
	Physical Habitat		S(4)				T(4)			Conduct screening level monitoring	SCVURPPP
	Sediment Characterization		S(4)				T(4)			Conduct screening level monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3 Provision. The specific creeks in which to compile baseline data have not been selected at this time.	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
	Trash		S(4)				T(4)			Conduct screening level monitoring	SCVURPPP
Calabazas Creek	***Chemical***										
	Contaminants – Water Quality			S(2)				T(2)		Conduct screening level monitoring	SCVURPPP
	Contaminants - Sediment			S(1)				T(1)		Conduct screening level monitoring	SCVURPPP
	General Water Quality			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality			S(2)				T(2)		Conduct screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Pathogens (Indicator Organisms)			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Bioassessment - Fish									No data collection is currently planned	SCVURPPP
	Physical										
	Physical Habitat			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Sediment Characterization			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
										Provision. The specific creeks in which to compile baseline data have not been selected at this time.	
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
	Trash			S(4)				T(4)		Conduct screening level monitoring	SCVURPPP
Sunnyvale Channel (East/West)	***Chemical***										
	Contaminants - Water Quality			S(2)				T(2)		Conduct screening level monitoring	SCVURPPP
	Contaminants - Sediment			S(2)				T(2)		Conduct screening level monitoring	SCVURPPP
	General Water Quality			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality			S(2)				T(2)		Conduct screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP
	Pathogens (Indicator Organisms)			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP
	Bioassessment - Fish									No data collection is currently planned	SCVURPPP
	Physical										
	Physical Habitat			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP
	Sediment Characterization			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Channel Dynamics and Hydrology									Baseline information describing geomorphic and hydrologic characteristics of stream channels in the Santa Clara Basin will be compiled to assist in the development of the Hydrogeomorphic Management Plan, as required in the C.3 Provision. The specific creeks in which to compile baseline data have not been selected at this time.	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
	Trash			S(3)				T(3)		Conduct screening level monitoring	SCVURPPP

Monitoring Activities in watersheds not currently considered in plan.

San Francisquito Creek										Detailed watershed assessment being conducted by stakeholder workgroup administered by the San Francisquito Creek Joint Powers Authority (JPA)	
Guadalupe River	***Chemical***										
	Contaminants - Water Quality	S 16	S 16	S 16	S 16	S 16	S 16	S 16	S 16	Four reaches. Monitoring is shown as quarterly; actual frequency will be in accordance with RWQCB requirements. Total Hg, Methylmercury, TSS.	SCVWD
	Contaminants - Sediment	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	Methylmercury concentrations in riverbed and suspended sediments.	SCVWD
	General Water Quality	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	Monitoring used to calibrate model to simulate stream temperature. Key variable for fish survival.	SCVWD

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Biological										
	Toxicity - Water Quality										
	Conventional Water Chemistry										
	Pathogens (Indicator Organisms)										
	Bioassessment - Macroinvertebrates										
	Bioassessment - Fish	S 17	S 17	S 17	S 17	S 17	S 17	S 17	S 17	Adult migration & spawning; juvenile rearing and/or migration in 17 or more locations.	SCVWD
	Physical										
	Physical Habitat										
	Sediment Characterization										
	Channel Dynamics and Hydrology	S 14	S 14	S 14	S 14	S 14	S 14	S 14	S 14	Channel bottom stability in 14 transects	SCVWD
	Riparian Vegetation	S 23	S 23	S 23	S 23	S 23	S 23	S 23	S 23	Survival, health & vigor, non-native species cover, and/or tree basal area (18 plots)	SCVWD
	Trash										

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) detailed investigation, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. Sampling locations are described in separate table and figure attached to Plan.

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology. Adjustments will be made, if necessary, when SWAMP QAPP becomes available in September 2002.

3 Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se) and organophosphate pesticides; sampling conducted for three seasonal time periods.

4 Sediment chemistry: Metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As), PCB, mercury, PAHs and organochlorine pesticides; sampling conducted in the dry season only. Sediment samples taken only at integrator sites.

5 General water quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted for three seasonal time periods.

6 Toxicity testing of water on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted at wet and dry season. Frequency of toxicity was reduced (RMAS/SWAMP conducts 3 samples/year at each site) to cut costs and to increase the number of sites.

7 Conventional water chemistry: Major anions: ortho-phosphate, nitrate, nitrite, chloride, sulfate; total phosphate, boron, TKN, TDS, SSC, ammonia, chlorophyll-a, alkalinity, hardness, TOC and DOC; sampling conducted for three seasonal time periods.

8 Indicator organisims: total and fecal coliform and *enterococcus*; sampling conducted for three seasonal time periods.

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency

9 Bioassessment: following CSBP methodology and conducted in the spring season.

10 Rapid bioassessment of fish communities will be done using methods established in the SEIDP or by other standardized methods utilized by the SCVWD or other Co-permittee agencies.

11 Habitat survey physical habitat assessment using CSBP methodology.

12 Sediment characterization includes collecting sediment grain size (full analysis) at sites sediment samples are collected. Suspended sediment concentrations (SSC) are collected with conventional water chemistry samples. Bedload sediment is estimated using pebble counts during bioassessment and habitat survey.

13 Trash assessment will be conducted at selected locations identified as hot spots in SCVURPPP report SCVURPPP will test and implement RWQCB assessment survey form and methods. Trash assessments will also occur at sites concurrent with bioassessment and visual habitat surveys to identify levels of trash at non-hot spot locations.

Table B-3. Analytical methods used in SCVURPPP FY 02-03 and Multiyear Monitoring Plan.

Description of data parameters	Analytical Methods
Pesticides (water) - Organophosphate suite	EPA 8141A
Pesticides (sediment) - Organochlorine suite	EPA 8081A
PCB congeners	EPA 8082
PAH congeners	EPA 8270
ICPMS metals suite (sediment) (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As--all costs)	EPA 6020
ICPMS metals suite (water)--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	EPA 200.8
ICPMS metals suite (water)--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--al costs)	EPA 200.8
Mercury (sediment)	EPA 245.7/1631M
Major anions nutrient scan: ortho-phosphate, nitrate, nitrite, chloride, sulfate	EPA 365.2, EPA 300
Total Phosphate	EPA 365.2
Boron	EPA 200.8
TKN	EPA 351.3
TDS	EPA 160.1
Suspended Sediment Concentration (SSC)	ASTM D3977-97
Ammonia	EPA 350.3
Chlorophyll-a	SM 10200H/EPA 445.0
Alkalinity	EPA 310.1
Hardness	EPA 130.2
TOC	EPA 415.1
DOC	EPA 415.1
Sediment grain size - full analysis (phi scale)	Plumb/PSEP
Total coliform	SM 9221B
Fecal coliform	SM 9221B
enterococcus	SM 9230B
Ceriodaphnia 7-day Survival & Reproduction	EPA 1002.0 (WET)
Pimephales (fathead minnow) 7 - day	EPA 1000.0 (WET)
Selenastrum (algae) test	EPA 1003.0 (WET)

(WET) Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants (October 16, 1995)

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A Program Monitoring Priorities	B Permit Provision	C Task	D In progress 00-01 (New FY01-02)	3/1/01	7/1/01	9/1/01	3/1/02	7/1/02	9/1/02	3/1/03	7/1/03	9/1/03	3/1/04	9/1/04	3/1/05	9/1/05
Category #2 - Continuous Improvement																
	C(6)a.i.	Continuous Improvement of ICID	Completed	→	d	Description of Procedures for Enhanced ICID Reporting										
		Continuous Improvement of ICID	SC34.02			Development and Testing of Program-wide ICID Reporting System	→	→	→	→		Implementation of Program-wide ICID Reporting System	→	→	→	→
	C(5)a.1.	Continuous Improvement of IND	Completed	→		Description of Procedures for Enhanced IND Reporting										
		Continuous Improvement of IND	SC34.01			Development and Testing of Program-wide Inspection Reporting &Tracking System	→	→	→	→	→	Implementation of Program-wide Inspection Reporting &Tracking System	→	→	→	→

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	C2	Pilot Liter "HotSpots"	Project SC27.01	→	→	→	→		Draft June Final Sept.Technical Report							
	C2	Storm Drain Inlet Retrofit Design Development	Project SC27.02	→	→	→	→		Technical Report							
	C2	Trash Work Plan	FY02-03							WorkPlan	→	→	→	→	→	→
Category #3- Support SCBWMI																
3a - Investigate BUs and Causes of Impairment																
	C10	Support for SCBWMI Watershed Assessment Subgroup Workplan	FY02-03 (WAS task 7.7, Task 7.6, Task 11.2, and Task 11.3)	→	→	→	→	→	→	→	→	→	→	→	→	→
	C9/10	Policy and Guidance for 305(b) Assessments and 303(d) Listings	Project SC22.59	→	→	→	Contributions to 305(b) Report		→	→	→	→	→	→	→	→
	C9/10	Integrated Assessment of Coyote Creek	SC27.11 -	→	→	→	Interim Status Report		Final Report							

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	C(9)fi.	San Francisquito Creek Watershed Analysis	To be prepared by SCVWD	→		Plan and Schedule										
	C(9)fii.	San Francisquito Creek Management Practices	To be prepared by SCVWD	→	→	→	Plan and Schedule									
	C7/9	San Francisquito Creek Baseline Streamflow	Completed													
	C(9)fiii	Identify other creeks potentially impaired by sediment	FY01-02		→	→	Report									
	C(9)fiii.	Other Creeks - Watershed Analysis and Management Practice Assessment	FY02-03			→	→	→	Plan and Schedule							
	C(9)fiii.	Analysis of Other Creeks								Analysis of Other Creeks		→ Tentative	→	→	→	→

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	C(10)I,ii,iii	Integration of Watershed Management into URMP	Completed	→	Report with priority listing & schedule for assess-ments											
	C(10)iii	Summary Assessments of Each Watershed			→	Not Defined	→	→	→	→	→	→	→	→	→	→
	C7/10	Targeted Assessment and Monitoring of Water-Quality and Biological Indicators in Coyote Creek							→ Findings from Assessment	→	→	→	→	→	→	→
	C7/10	Support for Baylands Assessment	Completed	→	→	→ Draft	Final (Feb. 02)									
	C10	Review Assessments Strategies/Approaches								Define Project Scope and Funding						
3b - Review and Compile Environmental Data and Make it Accessible	**C2-10**	Compile, Maintain and Share Watershed Data	SC34.13	→	→	→	→	→	→	→	→	→	→	→	→	→

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3c - Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses	**C7/10**	Support SCBWMI Land Use Subgroup	Project SC34.14													
	C7/10	Opportunities for Land Use Policies to Protect Beneficial Uses	Project SC20.06													
	C7/10	Economic and Tax Incentives in Watershed Management	Project SC22.65													

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Category # 4- Regional Collaborative Efforts																
	C(7)b	Participation in Regional Monitoring Program	Projects SC27.10 - Assist RMP Redesign	→	→	→	→	→	→	→	→	→	→	→	→	→
	C(7)	Annual Contribution to RMP	Program Budget Line Item	→	→	→	→	→	→	→	→	→	→	→	→	→
Pollutant-Specific Provisions																
	C(9)a	Control Program for Copper	Metals Control (SC34.04)	→	→	Annual Report on Baseline Activities	→	→	Annual Report on Baseline Activities	→	→	→	→	→	→	→
	C(9)b	Control Program for Nickel	(SC34.05)	→	→	Annual Report on Baseline Activities	→	→	~~Annual Report on~~ Baseline Activities	→	→	→	→	→	→	→
	C(9)c	Mercury Control Program	Completed	→	→	→	Mercury Plan									
	C(9)diii	Regional Pesticide Strategy Coordination & Implementation	SC34.07	→	Updated Plan		Updated Plan									

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	C(9)ei&ii	Characterize PCBs	SC34.08(participation in Joint SW Agencies Project)First Year Completed	Submit draft Year One Report	Submit Final First Year Report		Submit draft Year One Report	Submit Final First Year Report								
	C(9)eiii	Identify PCB Control Measures; Schedule Implementation	Completed		Plan (Due June 1, 2001)											
	C(9)eiii	Begin PCB Control Impl.	SC34.09				Plan									
	C(9)eiv	Implement PCB Actions					Plan		(Begin Impl. July 1, 2002)							
	C(9)eiii	Identify Dioxin Control Measures; Schedule Implementation	SC34.09				Plan									
	C(9)eiii	Begin Dioxin-like PCBs Control Impl.							Begin (Oct. 1, 2002)							
	C(9)eiv	Implement Dioxin-like PCBs Actions								Plan	(Begin Implementation)					

Table 2
Summary of Ongoing and Planned SCVURPPP Programmatic Monitoring Activities

SCVURPPP Monitoring Categories	Status and Trends[1]	Surveillance (targeted – source ID)	Evaluate Management Effectiveness	Realistic Standards	Status (Expected FY)
Assessment					
Assess the Assessments	No	No	Planned	No	Planned 02-03
Implementation					
Copper/Nickel Baseline Actions[2]	Yes	Yes	Yes	Yes	Ongoing[3]
Pesticide Strategy	Yes	Yes	Yes	Yes	Ongoing
LUS – subgroup support	No	No	Yes	Yes	Ongoing
LUS • Economic and Tax Incentives • Compare and Contrast develop. policies	No	No	Yes	Yes	Ongoing Draft FY01-02 Final FY01-02 Draft FY01-02 Fianl 02-03

[1] Notes: Status and Trend monitoring involves 1) collection and analysis of existing and/or new data (chemical, physical, biological) to characterize baseline conditions, and 2) periodic collection of new data for comparison against baseline conditions and analysis of trends.
Surveillance monitoring involves targeted monitoring of known or suspected sources of pollutants of concern.
Management Effectiveness monitoring involves designing specific receiving water and/or programmatic monitoring programs to evaluate BMPs and/or the implementation and effectiveness of overall stormwater program activities.
Realistic Standards monitoring involves specifically designing monitoring and data analysis programs to establish reasonable standards (narrative and/or numeric).
[2] Multi-year implementation program for Copper and Nickel Action Plan.
[3] Review of the results of the Baseline Actions is conducted via the BMM subgroup twice per year. The results of the first review were completed and submitted to the RWQCB on November 9, 2001 (see separate submittal).

SCVURPPP Monitoring Categories	Status and Trends[1]	Surveillance (targeted – source ID)	Evaluate Management Effectiveness	Realistic Standards	Status (Expected FY)
• Stormwaters role in congestion management					Draft FY01-02 Final FY01-02
Effectiveness					
Storm drain inlet retrofit assessment	No	No	Planned	Planned	Planned 01-02
Industrial Outreach (FWP to IND 2)	Planned	Planned	Planned	Planned	Planned 02-03

SCVURPPP Monitoring Categories	Status and Trends[1]	Surveillance (targeted – source ID)	Evaluate Management Effectiveness	Realistic Standards	Status (Expected FY)
Pilot Investigation re. Trash "hot spots"	Planned	Planned	Planned	Planned	Ongoing FY 01-02 Workplan 02-03
Project					
Stream Inventory	No	No	Yes	No	Two updates Completed Quick Update Planned FY02-03 Complete Update Planned F03-04
Baylands Inventory	No	No	Yes	No	Draft Completed Final to be completed FY001-02
Program Data Management & ICID/IND enhanced reporting	No	Yes	Yes	Yes	Ongoing
Draft Multi-Year Plan	Planned	Planned	Planned	Planned	Various Drafts Completed FY00-01 and Interim Draft Completed July1, 2001 Final Completed March 1, 2002

Table 3
Summary of Ongoing and Planned SCVURPPP Receiving Water Monitoring & Watershed Assessment Activities

SCVURPPP Monitoring Categories	Description	Status and Trends Monitoring[1]	Surveillance Monitoring (targeted – source ID)	Management Effectiveness Monitoring	Realistic Standards Monitoring	Activity Status
Baseline						
PCB[2]	Three year project. Characterization of deposited sediments in urban storm drains for industrial, residential, commercial , open and mixed land uses. First year sampling included 21 sites for SCVURPPP. Year two includes 20 sampling sites and a "hot spot" case study for four different drainages (i.e., Leo Ave., Burke St., Auzerais and Sunol St., and West Holm St., this includes 9 separate stations).	Yes	Yes	Yes	Yes	Ongoing
Hg[3]	First year study included sampling at 21 sites for total and mythel mercury. Second year includes sampling at the sites noted above for Total only.	Yes	Yes	Yes	Yes	Ongoing
Copper/Nickel[4]	Monthly monitoring of ten receiving water stations located in the Lower South San Francisco Bay.	Yes	No	Yes	Yes	Ongoing
Chlorinated Pesticides[5]	Preliminary sampling at 20 sites as part of year two of the PCB/Hg investigation.	Yes	Yes	Yes	Yes	Ongoing

[1] Notes: Status and Trend monitoring involves 1) collection and analysis of existing and/or new data (chemical, physical, biological) to characterize baseline conditions, and 2) periodic collection of new data for comparison against baseline conditions and analysis of trends (the tier 1 and 2 concepts contained in the RMAS are considered as part of this type of monitoring). Surveillance monitoring involves targeted monitoring of known or suspected sources of pollutants of concern (includes the collection of information to allow the RWEQCB to develop preliminary loading estimates within the technical constraints of conducting such estimates). Management Effectiveness monitoring involves designing specific receiving water and/or programmatic monitoring programs to evaluate BMPs and/or the implementation and effectiveness of overall stormwater program activities. Realistic Standards monitoring involves specifically designing monitoring and data analysis programs to establish reasonable standards (narrative and/or numeric).

[2] Joint Bay area stormwater program managed by the SCVURPPP to assist RWQCB with TMDL effort. Third year effort to consider sediment as a drainage basin monitoring tool.

[3] Joint Bay area stormwater program managed by the SCVURPPP to assist RWQCB with TMDL effort.

[4] Multi-year Joint POTW and stormwater monitoring effort in Lower South San Francisco Bay managed by the City of San Jose

[5] Initiated some preliminary chlorinated pesticide monitoring as part of the Joint Bay Area stormwater PCB and Hg program. Results will be use to define second year of effort.

Table 3, continued
Summary of Ongoing and Planned SCVURPPP Receiving Water Monitoring & Watershed Assessment Activities

SCVURPPP Monitoring Categories	Description	Status and Trends Monitoring[1]	Surveillance Monitoring (targeted – source ID)	Management Effectiveness Monitoring	Realistic Standards Monitoring	Activity Status
Sediment – San Francisquito	Work plan developed by the SCVWD in conjunction with the San Mateo STOPPP to conduct a watershed analysis that provides for: 1) quantitative characterization of sediment and water inputs to the creek, 2) relative roles of sediment associated with natural and anthropogenic land use discharges, 3) sediment conveyance from headwaters to the Bay, and development of a rapid sediment budget.	Planned	Planned	Planned	Planned	Planned 02-03
Sediment - other	Project aimed at 1) identifying urban streams that may be impaired by excessive sediment production from erosion due to anthropogenic activities, and 2) developing a plan and time schedule to conduct watershed analysis and management practices.	Planned	Planned	Planned	Planned	Planned 02-03
Regional Monitoring Program	The RMP is a regional collaborative monitoring effort. The Regional Monitoring Program for Trace Substances (RMP) monitors contaminant concentrations in water, sediments, and fish and shellfish tissue in San Francisco Bay and Delta, together known as the San Francisco Estuary. The RMP is designed to obtain data describing the concentration of toxic trace elements and organic contaminants. Ultimately, the goal of the RMP is to provide information on how contaminant concentrations in the Estuary are responding to pollution prevention and reduction measures and thus if the financial resources devoted to these efforts are improving water quality. Funding is provided by the three South Bay POTWs (who are Co-permittees to urban runoff program) and the SCVURPPP on behalf of all 15 Co-permittees.	Yes	No	Yes	Yes	Ongoing

Table 3, continued
Summary of Ongoing and Planned SCVURPPP Receiving Water Monitoring & Watershed Assessment Activities

SCVURPPP Monitoring Categories	Description	Status and Trends Monitoring[1]	Surveillance Monitoring (targeted – source ID)	Management Effectiveness Monitoring	Realistic Standards Monitoring	Activity Status
Water Quality Attainment Strategies Program (WQASP)[6]	The San Francisco Bay Area Water Quality Attainment Strategies Program is a joint Bay Area Clean Water Agencies (BACWA), Bay Area Stormwater Management Agencies Association (BASMAA), and SFRWQCB program established under an MOU to guide and assist the development of TMDLs and other water quality attainment strategies for the SF BAY-Delta and its tributaries. The three South Bay POTWs, as members of BACWA) and the SCVURPPP as a member of BASMAA will be providing resources to this effort over the next five plus years.	Planned	Planned	Planned	Planned	Planned 02-03 (Year 0 funded requested in FY01-02 not originally in budget-will address with contingency)
Follow-up monitoring to fill high priority assessment data gaps (Screening-Level Receiving Water Monitoring)	Annually develop and conduct a screening level assessment of the physical, chemical (water and/or sediment), and biological parameters at stations for a selected reach of an urban stream. For each of the next five Fiscal years, starting in FY 02-03, a screening level assessment will be conducted. Urban stream reaches will be selected to 1) assist fill high priority data gaps identified as part of the WMI watershed assessments and SCVURPPP Coyote Assessment, and 2) collect preliminary water quality data on prioritized list of watersheds listed in the Integration Report.	Planned	Planned	Planned	Planned	Planned 02-03

[6] While the SCVURPPP supports the overall goals of the WQASP efforts it has requested that BASMAA forward to the Executive Management Board the following questions: The SCVURPPP understands that an overall plan is under preparation as part of FY year zero (FY 01-02) and that it is the intent to address the above questions as part of the plan. The SCVURPPP has separately requested that the EMB give careful consideration to these questions. The SCVURPPP's review of the plan and the responses to these questions will be a key consideration for future funding requests.

Table 3, continued
Summary of Ongoing and Planned SCVURPPP Receiving Water Monitoring & Watershed Assessment Activities

SCVURPPP Monitoring Categories	Description	Status and Trends Monitoring[1]	Surveillance Monitoring (targeted – source ID)	Management Effectiveness Monitoring	Realistic Standards Monitoring	Activity Status
Long-term Monitoring in Coyote Watershed	Implement the long-term monitoring plan developed as part of the Pilot Coyote Integrated Assessment. Integrate the monitoring plan with the City of San Jose monitoring program.	Planned	Planned	No	Planned	Planned 03-4
Coyote Creek Water Quality Monitoring[7]	The City of San Jose has, for the past two years, collected baseline water quality data in Coyote Creek. On a monthly basis between May and November, water quality monitoring is conducted at 8 stations in Coyote Creek and two stations in tributaries (i.e, Upper Penitencia and San Miguelita Creeks). Fifty-five water quality parameters (includes temperature, nutrients, pathogens, metals, anions, and general water quality parameters) are measured from garb samples during each sampling event, but not at each station. (The sampling stations are located between the Montague Expressway to just south of the Capitol Expressway.) The CSJ has included additional investigations for low DO as shown in Appendix B and have committed to annual monitoring for screening and/or investigation type studies in the future based on the results of each years monitoring.	Yes	No	Yes	No	Ongoing
Assessment						
WMI – Assessments (San Francisquito Creek, Guadalupe River, Upper Penitencia)	Three ongoing watershed assessments by the WMI following the WMI's "Framework for Conducting Watershed Assessments." The assessments are based on available data.	Planned	No	Planned	Planned	Ongoing

[7] Coyote creek water quality monitoring is part of stream flow augmentation project funded by the City of San Jose and managed by the City's Stormwater Program.

Table 3, continued
Summary of Ongoing and Planned SCVURPPP Receiving Water Monitoring & Watershed Assessment Activities

SCVURPPP Monitoring Categories	Description	Status and Trends Monitoring[1]	Surveillance Monitoring (targeted – source ID)	Management Effectiveness Monitoring	Realistic Standards Monitoring	Activity Status
Coyote Creek Pilot Assessment	Develop and test, on a pilot scale, an integrated watershed assessment approach. The assessment is based on the linkage of stream hydrogeomorphic functions (movement of water and sediment) to habitat functions and how the functions support aquatic life beneficial uses. The project includes conducting: a stream classification , assessment of physical conditions affecting biological resources, evaluating potential near-term management actions, prioritizing critical reaches, and developing a long-term monitoring program (see above for implementation of receiving water monitoring).	Planned	No	Planned	Planned	Ongoing

REVISED
MULTI-YEAR RECEIVING WATERS MONITORING PLAN

Original Plan Submitted on March 1, 2002 in Compliance with Permit Provisions C7a & b

Draft- March 1, 2004
Final- July 1, 2004

PREFACE

On March 1, 2002, the SCVURPPP submitted a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) that was prepared in compliance with monitoring requirements of the permit. The previously submitted Multi-Year Plan covered the entire spectrum of the SCVURPPP monitoring activities, both programmatic and environmental, and outlined the SCVURPPP's approach to monitoring, presented monitoring priorities and described accomplishments to-date. Furthermore, the Multi-Year Plan described the SCVURPPP's linkage to, and support for the Santa Clara Basin Watershed Management Initiative (WMI).

Since its approval, the SCVURPPP has fully implemented the Multi-Year Plan and conducted a variety of special studies. In particular, screening level/baseline water quality monitoring was conducted in receiving water bodies in FY 02-03 and 03-04, and the *Assessment of Watershed Assessment Methods Technical Memorandum* (Technical Memo), dated July 31, 2003, recommended improvements to the SCVURPPP's monitoring and assessment program. Lessons learned from data collected during the first two years of implementing the Multi-Year Plan and recommendations presented in the Technical Memo provide the impetus for the revisions to the Multi-Year Plan.

The revisions presented in this Revised Multi-Year Receiving Waters Plan (Revised Multi-Year Plan) are minor and intended to: 1) more fully integrate the monitoring activities identified in the Multi-Year Plan with watershed assessments, and 2) allow for additional follow-up monitoring activities in order to better identify sources of pollutants or causes of impairment to Beneficial Uses. Additionally, the Revised Multi-Year Plan attempts to provide the SCVURPPP a framework for conducting watershed characterization, screening-level monitoring, watershed assessment, investigative monitoring and management action implementation.

Summary of Revisions

It is important to point out that a large majority of the information contained within this Revised Multi-Year Plan was originally presented in the Program's previously submitted Multi-Year Plan (dated March 1, 2002). Therefore, for the sake of the reader, we would like point out the sections of this Revised Multi-Year Plan that contain a majority of the revisions. These include:

- **Sections 2.3 & 2.4**: SCVURPPP's Monitoring and Assessment Approach and Process Flow Chart – Describes the tiered monitoring approach, the proposed framework for conducting monitoring and assessment activities, and how watershed assessments are integrated with this approach and activities.
- **Section 6.0:** Reporting and Quality Control – Describes the deliverables the Program will develop and quality control procedures which will continue to be incorporated into the SCVURPPP's Monitoring and Assessment Program.
- **Section 7.0:** Environmental Monitoring Measures Summary Matrix – Illustrates the revised environmental monitoring and assessment Program's sampling design.

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SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

MULTI-YEAR RECEIVING WATERS MONITORING PLAN
(REVISED MARCH 1, 2004)

1.0 INTRODUCTION

The Santa Clara Valley Urban Runoff Pollution Prevention (SCVURPPP) was reissued a National Pollutant Discharge Elimination System (NPDES) permit to discharge storm water on February 21, 2001 by the San Francisco Bay Regional Water Quality Control Board (Regional Board). On March 1, 2002, the SCVURPPP submitted a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) that was prepared in compliance with monitoring requirements of the permit. In particular Provision C.7b, which reads:

> **Multi-Year Receiving Waters Monitoring Plan.** In conjunction with the submissions required by Provision 9 the Dischargers shall submit by July 1, 2001, an interim draft of a Five-Year Receiving Waters Monitoring Plan, and, by March 1, 2002, a final Five-Year Receiving Waters Monitoring Plan acceptable to the Executive Officer, designed to comply with these Monitoring Program requirements. The Receiving Waters Monitoring Plan shall include provisions for monitoring South San Francisco Bay by participating in the San Francisco Estuary Regional Monitoring Program for Trace Substances or an acceptable alternative monitoring program. The Receiving Waters Monitoring Plan activities shall be coordinated with SCBWMI assessment activities.

The previously submitted Multi-Year Plan covered the entire spectrum of the SCVURPPP monitoring activities, both programmatic and environmental, and outlined the SCVURPPP's approach to monitoring, presented monitoring priorities and described accomplishments to-date. Furthermore, the Multi-Year Plan described the SCVURPPP's linkage to, and support for the Santa Clara Basin Watershed Management Initiative (WMI), a collaborative, stakeholder driven effort aimed at protecting and enhancing the watersheds in the Santa Clara Basin.

Since its approval, the SCVURPPP has fully implemented the Multi-Year Plan and conducted a variety of special studies. In particular, screening level/baseline water quality monitoring was conducted in receiving water bodies in FY 02-03 and 03-04, and the *Assessment of Watershed Assessment Methods Technical Memorandum* (Technical Memo), which provides information necessary to improve SCVURPPP's monitoring and assessment program, was completed on July 31, 2003. Lessons learned from data collected during the first two years of implementing the Multi-Year Plan and recommendations presented in the Technical Memo provided the impetus for revising the Multi-Year Plan. The revisions contained within this Revised Multi-Year Receiving Waters Monitoring Plan (Revised Multi-Year Plan) are further described in this section.

1.1 Purpose of the Multi-Year Monitoring Plan and Revisions (2004)

Monitoring activities originally described in the Multi-Year Plan are generally aimed at developing and implementing programs/projects designed to assess programmatic and environmental effectiveness and practical, implementable indicators and protocols for assessing the beneficial uses of receiving water bodies, including local creeks and the San Francisco Bay estuary. The implementation of these indicators and protocols are a

necessary step toward establishing a sound regulatory basis for locally based watershed management.

The Revised Multi-Year Plan continues to embrace this strategy and offers revisions that are intended to: 1) more fully integrate the monitoring activities identified in the Plan with the Program's need to conduct watershed assessments, and 2) allow for additional follow-up monitoring activities that will help better identify sources of pollutants or causes of impacts to Beneficial Uses (Uses). Additionally, the Revised Multi-Year Plan attempts to provide the SCVURPPP a formalized process for conducting future monitoring and assessment activities.

The Revised Multi-Year Plan is intended to provide a broad roadmap for the Program's monitoring activities. The full scopes of many of the activities presented in this Revised Multi-Year Plan have not yet been developed. More detailed descriptions of these planned activities will be provided in the Program's Annual Workplans over the next six years. In addition, it is foreseeable that due to unknown water quality issues in the future, the Program will be directed to focus resources on higher priority monitoring and assessment efforts not presented in this Revised Multi-Year Plan. In this case, new and/or revised monitoring and assessment activities will also be presented in the Program's Annual Monitoring Program Plan, which is submitted with its Annual Report.

1.2 Goals and Objectives

The Revised Multi-Year Plan is intended to be a "living" document, evolving along side other regional and State monitoring and assessment plans and strategies, including: the Regional Monitoring and Assessment Strategy (RMAS), Regional Monitoring Program (RMP) and Surface Water Ambient Monitoring Program (SWAMP). The Revised Multi-Year-Plan helps reach the goals and objectives that were set by the Program's Management Committee in 1996. These goals and objectives were incorporated into the SCVURPPP's 1997 Urban Runoff Management Plan (URMP). In particular, the monitoring program aids in reaching Goals 2 and 3 (see highlighted text in Table 1.0).
To aid the SCVURPPP in reaching its primary goals, the following goals specific to the SCVURPPP's monitoring program were developed:

- Develop a better understanding of the chemical, biological, and physical characteristics of water bodies and watersheds relevant to the Program, which will help inform decisions about future management actions and help clarify and resolve storm water related issues within watersheds;

- Assess baseline water quality conditions in representative watersheds within Program boundaries to evaluate storm water impacts and help solve creek drainage basin-specific water quality problems;

- Assess whether specific pollutants of concern are found in storm water discharges and impact water quality in local water bodies and the San Francisco Bay;

- Evaluate the effectiveness of existing storm water pollution prevention and control Best Management Practices (BMPs) and recommend improvements; and,

- Evaluate overall Program effectiveness over time.

Table 1.0. 1997 Urban Runoff Management Plan
Goals and Objectives

GOAL 1: Comply with Permit

- Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)
- Reduce, to the maximum extent practicable, pollutants in stormwater runoff
- Comply with permit submittal requirements

GOAL 2: Determine Success

- Periodically evaluate the attainment of beneficial uses in selected waterways
- Evaluate changes in public awareness and behavior
- Evaluate effectiveness of specific control measures at pollution reduction.

GOAL 3: Adjust Activities to Meet Changes

- Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP
- Utilize what we learn to plan the next steps

GOAL 4: Achieve Acceptance of Urban Runoff Management Activities

- Effectively facilitate public input into Program planning process
- Integrate urban runoff goals at various intra-agency levels
- Develop and maintain a proactive relationship with regulatory authorities
- Publicize the efforts of the Co-permittees (Program)

GOAL 5: Integrate Urban Runoff Program Elements into other Programs

- Promulgate an understanding of the role of the urban runoff program
- Encourage other agencies to become involved in urban runoff issues
- Encourage action by the appropriate agencies

These goals were designed to achieve each of the following objectives, contained in the Program's NPDES Permit:

1. Characterization of representative drainage areas and storm water discharges, including land-use characteristics, pollutant concentrations, and mass loadings;

2. Assessment of existing or potential adverse impacts on beneficial uses caused by pollutants of concern in storm water discharges, including an evaluation of representative receiving waters;
3. Identification of potential sources of pollutants of concern found in storm water discharges; and,

4. Evaluation of effectiveness of representative storm water pollution prevention or control measures

It is important to point out that although the Revised Multi-Year Plan has been developed to meet the objectives of the NPDES permit, it also addresses the guidance contained in several RWQCB letters written to both the Program and members of the BASMAA monitoring committee.[1]

This Revised Multi-Year Plan is intended to help the SCVURPPP: 1) plan and prioritize its watershed assessment and monitoring activities over the next six years, and 2) coordinate with other watershed assessment programs in the Bay area, including the WMI. The SCVURPPP's watershed assessment and monitoring approach emphasizes characterizing watersheds and collecting data when and where appropriate, which will enable watershed assessments and focused studies to be conducted that will yield information necessary to implement effective and feasible management actions designed to reduce the impacts of urban runoff on Uses.

1.3 Revised Multi-Year Plan Organization and Structure

The Revised Multi-Year Plan is organized into eight (8) sections and describes both environmental and programmatic monitoring designed to meet previously stated goals and objectives. The Revised Multi-Year Plan includes sections:

1.0 Introduction – provides a brief introduction to the Revised Multi-Year Plan, including goals and objectives.

2.0 Monitoring and Assessment Approach – presents the SCVURPPP's approach to monitoring and assessment, including: a description of monitoring categories, monitoring and assessment process, annual project funding process, priorities for assisting the WMI, SCVURPPP monitoring priorities, and regional and SCVURPPP monitoring activities accomplished to-date.

3.0 Watershed Monitoring and Assessment Activities - description of planned watershed monitoring and assessment activities, including: screening-level monitoring and watershed assessments.

4.0 Pollutant of Concern Monitoring and Characterization Activities – provides a description of planned pollutant of concern monitoring and characterization, including local and regionally-based activities.

5.0 BMP and Performance Standard Monitoring – describes monitoring activities associated with measuring the effectiveness of implementing performance standards and control programs for POCs.

6.0 Reporting and Quality Control Procedures - provides a description of the quality control and assurance (QA/QC) procedures and the reporting process the Program will develop and implement.

7.0 Environmental Monitoring and Assessment Measures Summary Matrix- illustrates Environmental Monitoring and Assessment Measures (EMMs) that are currently being

[1] RWQCB letter from Tom Mumley to BASMAA monitoring committee entitled *"Urban Runoff Monitoring Needs/Recommendations"* dated February 2, 2001.
RWQCB letter from Loretta Barsamian to Adam Oliveiri entitled *"FY2002-2003 Stormwater Municipal NPDES Program Priorities"* dated December 7, 2001.
The water quality monitoring comments in the RWQCB from Bruce Wolfe to Beau Goldie entitled *"Pesticide-Related Components of 2000/01 Annual Report"* postmarked December 28, 2001.
RWQCB letter from Loretta Barsamian to Beau Goldie entitled *"Request for revision of the Program's long-term receiving waters monitoring plan"* dated June 5, 2002.

implemented or are planned. EMMs are used to gauge the effects of urban runoff on the environment.

8.0 Programmatic Monitoring Indicators Summary Matrix – illustrates Programmatic Monitoring Indicators (PMIs) that are currently being implemented or are planned. PMIs are used to gauge how well Performance Standards are being met and control measures are being implemented.

2.0 MONITORING AND ASSESSMENT APPROACH

The information contained in Section 2.0 is intended to provide context to the SCVURPPP's Monitoring Program, by briefly describing SCVURPPP's approach to monitoring and assessment. Background information is provided, including: a summary of SCVURPPP's monitoring priorities; descriptions of environmental and programmatic monitoring, and SCVURPPP's monitoring and assessment process; the annual project funding process; priorities for assisting the WMI; the integration of SCVURPPP-led monitoring activities with regional monitoring strategies; and a description of a portion of the SCVURPPP monitoring-related accomplishments to-date

2.1 Background

From its inception in 1990 through 1995, the Program's monitoring activities focused on establishing baseline information through sampling and analysis of runoff from various land uses and ambient waters. A summary of the products produced as part of the SCVURPPP's previous monitoring efforts is contained in the 1997 URMP. In addition to gathering baseline information, the Program's annual monitoring plans have also included assessments intended to enhance understanding of the sources and extent of urban runoff pollution, its effects, and methods for its control.

In August 1996[2] the Regional Water Quality Control Board (RWQCB) requested that the SCVURPPP redirect its monitoring resources and develop a new approach:

> *Specific monitoring activities that should be considered within the strategy include characterization of drainage areas (watershed monitoring) including land use characteristics (general, such as open, residential, commercial, or industrial areas, or specific sources) and consideration of physical and biological, as well as chemical indicators to assess the drainage areas. We strongly encourage you to use community-based (volunteer) monitoring as an inexpensive and effective means to conduct this type of monitoring. The strategy should also establish a mechanism or process for effective use of special or pilot studies by your program or those conducted by other programs.*

Since 1997, the Program's emphasis has been on integrating urban runoff and watershed management. This emphasis continues to be a major condition of the urban runoff permit. The results of this integration effort include the Program's and individual Co-permittee assistance on: managing various subgroups of the WMI, preparing the abridged and unabridged Watershed Characteristics Report, conducting various projects related to the review of development policies, and the completion of the national Stormwater Environmental Indicators Demonstration Project. A more detailed discussion of these efforts is contained the Program's Annual Reports (i.e., see FY 97-98, 98-99, 99-00, 00-01, 01-02 and 02-03).

2.2 Summary of Program Monitoring Priorities

The SCVURPPP's Monitoring AHTG uses the following monitoring priorities to determine which projects are funded for a given year:

[2] Loretta K. Barsamian, Executive Officer. August 30, 1996 letter to Frank Maitski.

1) New projects needed to implement the results, and achieve the goals, of current projects;
2) New projects that implement continuous improvement items identified through the annual review process;
3) Projects that support the Santa Clara Basin Watershed Management Initiative in one of the following ways:
    a) Investigate Beneficial Uses and Causes of Impairment (including field work)
    b) Review and Compile Environmental Data and Make it Accessible
    c) Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
    d) Facilitate and Support WMI Subgroups (including coordination with other agencies)
4. Projects identified through participation in regional monitoring collaborative efforts, including the Regional Monitoring Program and BASMAA.

Each of these priorities is intended to fulfill specific provisions of the Program's NPDES permit and the 1997 URMP, and to provide a strong basis for both program improvement and the next round of permit requirements.

2.3 SCVURPPP's Monitoring and Assessment Approach

The SCVURPPP continues to embrace the watershed approach to direct its monitoring and assessment activities, and meet its goals and objectives. The watershed approach is a coordinating framework for environmental management that focuses efforts to address the highest priority problems within hydrologically-defined geographic areas. The SCVURPPP will continue to define and address high priority issues through the implementation of activities that fall into two monitoring categories: programmatic monitoring and environmental monitoring and assessment. Each monitoring category and specific subcategories are defined below. Specific activities being conducted under each category are further described in Sections 3.0, 4.0 and 5.0; and implementation timelines are presented in Section 7.0.

2.31 Monitoring Categories

The word monitoring can be applied to a wide range of activities; therefore, it is important that a monitoring program begins by defining the types of monitoring that will be employed to achieve its objectives. Nonpoint source programs, including urban runoff management programs, generally employ several types of monitoring depending on the type of observation that is desired. The types of monitoring employed by the SCVURPPP fall into two general categories: *Environmental Monitoring and Assessment Measures (EMMs)* and *Programmatic Monitoring Indicators (PMIs).* Although inherently interconnected, each strategy has its own objectives. The objectives, elements, differences and utility of the environmental monitoring and assessment; and programmatic monitoring strategies are further discussed in the following paragraphs.

Programmatic Monitoring – Programmatic Monitoring Indicators (PMIs) are used to gauge how well performance standards are being met. Programmatic monitoring efforts typically include tracking and evaluating continuous improvements and evaluating the effectiveness of implementing control programs for pollutants of concern. Programmatic monitoring provides the best basis for measuring compliance with Permit requirements

and the success of implementing Program components. Programmatic Monitoring Indicators are presented in described in Section 5.0 *BMP and Performance Standard Monitoring Activities*, and in Section 8.0 *Programmatic Monitoring Indicators Summary Matrix*.

Environmental Monitoring and Assessment - Environmental monitoring and assessment measures (EMMs) are activities that entail the collection of environmental data through field studies and analysis of information through assessments. EMMS are coordinated at the local or regional level and typically fall into one of two general areas:

- Watershed Assessment Activities; and,
- Pollutants of Concern (POC) Monitoring.

EMMs are intended to: 1) assist the RWQCB characterize receiving water quality in urban watersheds consistent with the priorities of the Watershed Management Initiative and the Program; 2) identify where and what type of screening-level monitoring is appropriate; and, 3) recognize the need for site-specific water quality investigations to address questions that might arise while conducting screening-level monitoring efforts. Based on the Program's experience, we believe EMMs provide the best context for considering the effects of stormwater runoff on the environment.[3,4] EMMs are further described in Sections 3.0 *Watershed Monitoring and Assessment* and 4.0 *Pollutants of Concern Monitoring*. Implementation timelines for EMMs are presented in Section 7.0.

Tiered Monitoring and Assessment Approach

Because there are a variety of types of environmental monitoring that are available, it is useful to classify parameters that may be measured into two tiers; screening-level monitoring and assessments (i.e. Tier I) and investigative monitoring (i.e., Tier II). Screening level monitoring and assessments include more general measurements made at various sampling locations, providing an initial characterization of the physical, chemical, and biological integrity of a particular watershed/waterbody.

Investigative monitoring or studies include more detailed measurements typically taken in a more defined area (e.g., stream reach). Investigative monitoring is intended to address specific questions of impairment, such as: 1) what is the cause of the potential impairment, and 2) what is the potential source of the pollutant identified? Table 2.0 provides a few examples of screening-level indicators and investigative monitoring parameters.

[3] *Stormwater Environmental Indicators Demonstration Project – Final Report*, prepared for the Water Environment Research Foundation, 2001.
[4] *Watersheds 2000 – A Vision of the SCVURPPP's Role in Watershed Management and the SCBWMI*, December 9, 1999.

Table 2.0. Examples of screening-level indicators and investigative monitoring parameters, with associated beneficial uses.

Indicator/Parameter	Beneficial Uses
Screening-level Indicators	
General Water Quality	Aquatic Life Uses
Rapid Bioassessment	
Fisheries Assemblage Characterization	
Qualitative Physical Habitat Assessments	
Bacterial Indicators	Recreation Uses
Investigative Parameters	
Nutrients (NO3, NO2, NH4, PO4)	Aquatic Life Uses
Sediment (TSS, SSC, Geomorphic Analyses)	
Toxicity (3 species bioassays, TIEs)	
Metals (Cu, Ni, Cd, Hg, Cr, Pb, Se)	Aquatic Life and Recreation Uses
Pesticides (Organophosphates)	Aquatic Life Uses
Quantitative Physical Habitat Assessments	
Organics (PCBs, PAHs, Dioxins)	Aquatic Life and Recreation Uses

2.32 Integrating Monitoring into Watershed Assessment

In the absence of a robust data set that can be used to characterize water quality and the physical, chemical and biological integrity of most water bodies in the Santa Clara Valley basin, initial characterization (i.e., screening-level monitoring/assessments) is needed. To provide this necessary information, the SCUVRPPP intends to conduct screening level monitoring in watersheds within the Santa Clara Valley basin using screening-level indicators. Data collected from these efforts is intended to provide information that will aid the Program in conducting watershed assessments. To the extent possible, these assessments will be conducted in coordination and collaboration with other efforts current underway in the basin (e.g., SCVWD Stream Stewardship Plans).

As an outcome of conducting watershed assessments, data gaps, testable hypotheses and preliminary management actions will be presented. Where feasible, investigative studies will be conducted to help test hypotheses and fill data gaps identified during watershed assessments. These investigative studies will aid the Program in determining the extent of impairment, and the causes and sources of impairment (if necessary), leading to potential recommendations for management actions in these watersheds. This approach is similar to regional (i.e., RMAS) and other Bay area urban runoff management program monitoring and assessment approaches. The approach is illustrated in Figure 1.0 *SCVURPPP's Monitoring and Assessment Process Flow Chart* and further described in Section 2.4. Additionally, a generalized timetable for conducting screening-level monitoring and assessments, watershed assessments, investigative monitoring, and status and trends monitoring is presented in Section 7.0.

2.4 SCVURPPP's Monitoring and Assessment Process Flow Chart

A *Monitoring and Assessment Process Flow Chart* (Figure 1.0) was developed to illustrate the Program's "tiered" monitoring approach to environmental monitoring and the nexus between environmental monitoring and watershed assessment. This process is intended to provide the Program with a formalized structure for conducting monitoring and assessments under the Revised Multi-Year Receiving Waters Monitoring Plan. This process utilizes the best available water quality and watershed-related information throughout each step, with the goal of collecting additional data needed to characterize, assess and protect/restore beneficial uses in receiving water bodies. The following sections describe each step in the process.

Step #1: Watershed Characterization

Watershed characterization is an import foundation-setting activity needed to develop a better understanding of the location and extent of impacts to watersheds, water quality and beneficial uses. Building on recent watershed assessment activities conducted by the WMI and the SCVURPPP, the Program plans to conduct activities entailing the collection and analysis of information needed to further characterize watersheds. To facilitate this process, the SCVURPPP will annually develop a *Watershed Characterization and Sampling Design Technical Memorandum* (Characterization Memo).

The purpose of the Characterization Memo is to describe existing readily available information (e.g. watershed attributes, beneficial use information, water quality data) that will aid in the development of a sampling design for a specific watershed(s) that are scheduled for screening-level monitoring to begin during the next fiscal year. Beginning with the Program's FY 05-06 Annual Workplan, a Characterization Memo that will, (1) describe relevant watershed attributes and (2) provide justification for the selection of sampling parameters and sites within a watershed(s) scheduled for screening-level sampling in that fiscal year ,will be submitted to the Regional Board.

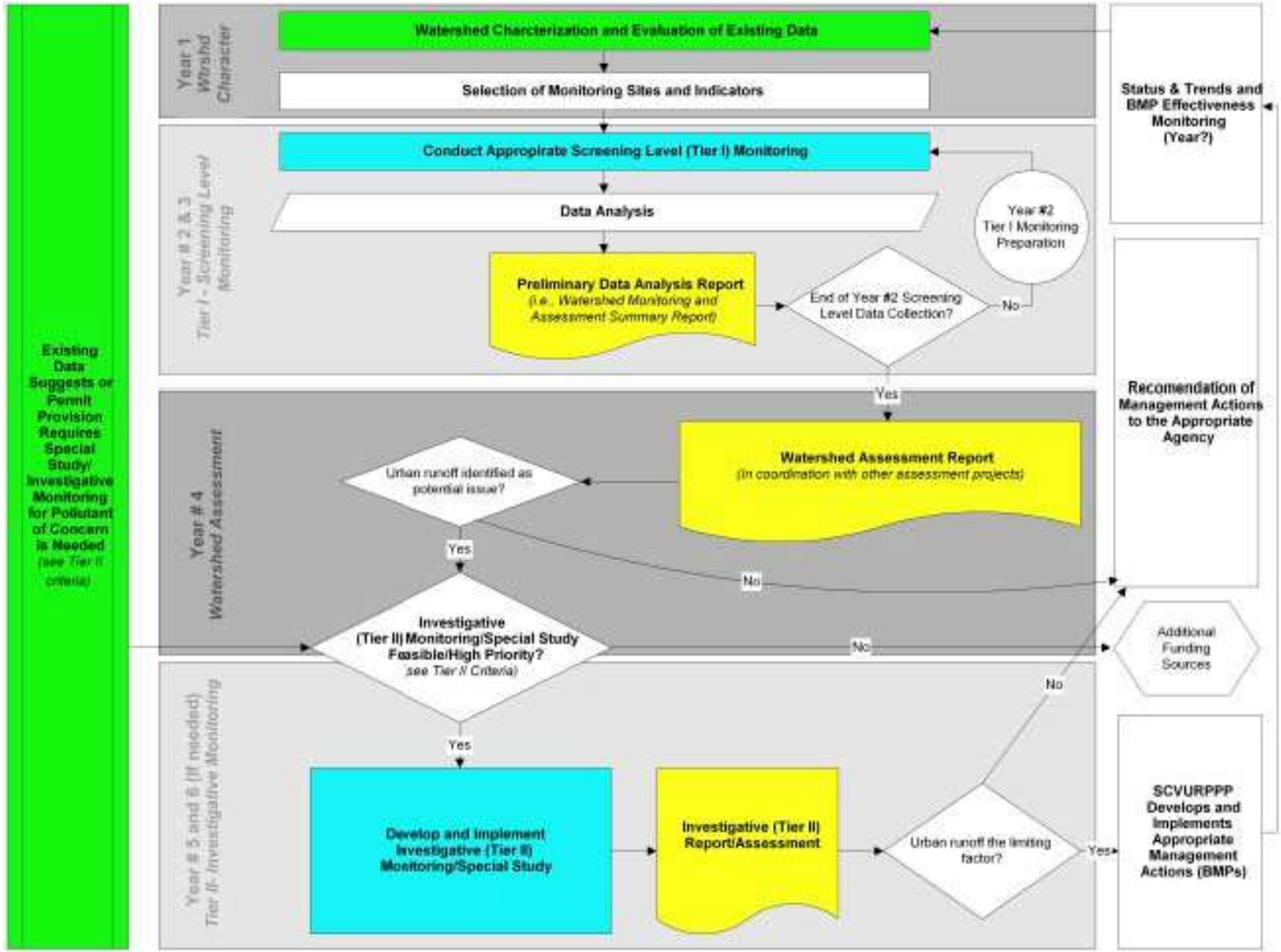
It is important to point out that this task is very similar to activities previously conducted by Program staff when developing the Program's Annual Monitoring Program Plan. The only difference being the deliverable (i.e., Characterization Memo), which will aid the Program in, documenting the extent of readily available information for the given watershed, and developing the rationale behind selection of monitoring indicators and sampling site locations.

Step #2: Screening Level Monitoring

An ecological indicator is a measure, an index of measures, or a model that characterizes an ecosystem or one of its critical components. An indicator may reflect biological, chemical and/or physical attributes of ecological condition, and may also be used to identify major ecosystem stress. The Program intends to collect two types of screening level indicators during the implementation of the Revised Multi-Year Plan: (1) aquatic life use indicators (e.g., benthic macroinvertebrates and fish assemblages) and (2) water recreation use indicators (e.g., fecal and total coliforms, enterococcus and E. coli). Each type of indicator is further described below.

Aquatic Life Use Indicators - As a first step in conducting environmental monitoring, the Program intends to use screening level indicators that will aid in determining ecological

Figure 1.0 SCVURPPP *Monitoring and Assessment Process Flow Chart,* illustrates the Program's "tiered" monitoring approach to environmental monitoring and the nexus between environmental monitoring and watershed assessment.



condition and status of aquatic life uses in Santa Clara basin water bodies. In particular, the Program has selected Benthic macroinvertebrates (BMIs) and fish community assemblages as screening level indicators of aquatic life uses. Extensive guidance on development and use of BMIs and fish as indicators has been supported at the national and state levels, and a number of agencies and volunteer groups have begun to sample BMIs in Bay Area creeks using the California Stream Bioassessment Procedure developed by the California Department of Fish and Game. Additionally, screening level assessments of physical habitat will be conducted to aid in determining the physical/habitat condition or quality of a watershed and water body. Qualitative screening-level physical habitat assessments will be conducted synoptically with BMI and fish data collection efforts. Qualitative physical habitat assessments also include, general water quality measurements and substrate composition estimates taken during biological sampling.

Recreation Use Indicators - Microbiological water analysis is typically carried out to safeguard the health of a community by testing for possible fecal pollution, the source of microorganisms causing waterborne disease. Indicators of recreational use are microbiological organisms that coexist with pathogens in the fecal environment and are easier and less expensive to test for than pathogens. For these reasons, indicator organisms are often the focus of water analyses rather than pathogens. The most commonly employed indicator organisms are total coliform, fecal coliform, enterococcus, and E. coli. The Program intends to use these organisms as screening level indicators of beneficial uses related to recreation (i.e., REC-1 and REC-2). To ensure locations that have a high potential for recreational uses are sampled, Program staff will identify sampling sites within a given watershed during the watershed characterization stage of the watershed monitoring and assessment process (see Step #1). The selection of sampling site locations will be based upon where the highest potential for exposure and access to the creek appears to exist (e.g., parks adjacent to creeks and local swimming sites).

Step #3: Watershed Assessment

Watershed assessment is the systematic review of specific resources such as benthic macroinvertebrates or fish and their habitat and riparian areas in a watershed-scale context. The results of watershed assessment can be used to establish the context for subsequent evaluations and analysis of cumulative watershed effects. It is the Program's intent to conduct watershed assessments in specific watersheds within the Santa Clara basin. Assessments will integrate information collected during watershed characterizations and screening-level assessments to support Program objectives of continuously improving Program components and developing additional ones to support attainment of beneficial uses in selected water bodies. As an outcome of the assessment, the Program will develop a *Watershed Assessment Report* that will describe the assessment process, identify data gaps and potential follow-up studies, and recommend management actions, where feasible. Watershed assessments will be coordinated with other assessment-related activities occurring in the basin, to the extent possible, and will only occur in watersheds identified as high priority by the Program.

Step #4: Investigative Monitoring/Studies

Investigative monitoring/studies include more detailed measurements typically taken in a more defined area (e.g., stream reach). Investigative monitoring is intended to address

specific questions related to potential impairment, such as: 1) what is the cause of the potential impairment, and 2) what is the potential source of the pollutant identified? Table 2.0 provides a few examples of investigative monitoring parameters.

As illustrated in the Monitoring and Assessment Process Flow Chart (Figure 1.0), investigative monitoring/studies can arise through multiple pathways. First, additional data collection (e.g., investigative monitoring or special studies) may be recommended in a *Watershed Assessment Report* to aid in determining beneficial uses impacts. Alternatively, existing data may suggest that additional data collection is needed to determine impacts, or a NPDES Permit Provision may require that investigative monitoring or a special study be conducted. Regardless of which pathway is taken, prior to conducting investigative monitoring or a special study the Program will determine if additional monitoring or a study is feasible and/or a high priority by reflecting on monitoring priorities established in 1997 to determine which projects should occur in a given year (see Section 2.2).

Step #5: Development/Implementation/Recommendation of Management Actions

Once investigative monitoring or a special study has adequately determined the cause(s) and source(s) of adverse impacts in a watershed or sub-watershed, a logical next step is to implement feasible management actions designed to reduce/eliminate the impacts on beneficial uses (e.g., best management practices). Depending on the location of the source, jurisdiction of the agency and feasibility of implementation, management actions could be implemented by a variety of agencies. For example, if a source of a water quality impact is determined to be outside of the jurisdiction of the SCVURPPP, recommendations may be provided to the appropriate agency or individual. Alternatively, a particular municipality within the SCVURPPP may be the most appropriate agency to implement a best management practice (BMP) designed to help protect or restore a beneficial use.

Step #6: Status & Trends Monitoring and BMP Effectiveness Monitoring

Best Management Practices (BMPs) are measures, activities, or other practices that prevent or minimize pollutant discharges to water bodies. Some are routine activities such as recycling materials that contain pollutants, good housekeeping practices and spill prevention procedures. Others are structural treatment measures that are integrated into the storm water conveyance system to remove pollutants from runoff before it enters water bodies. During its second NPDES permit cycle the Program established initial Performance Standards incorporating a variety of BMPs into several components including, Public Information and Participation; New Development and Redevelopment Activities; Illicit Discharge Controls; Industrial and Commercial Business Controls, and; Municipal Government Maintenance Activities. Performance standards under each component are updated on an as needed basis through the Program's continuous improvement process.

To monitor the effectiveness of an implemented BMP or performance standard, the Program will conduct programmatic monitoring by developing and implementing Programmatic Monitoring Indicators (PMIs). As described in Section 2.31, PMIs typically include tracking and evaluating continuous improvements and the effectiveness of implementing BMPs. Programmatic monitoring provides the best basis for measuring compliance with Permit requirements and the success of implementing Program

components. Additionally, once a BMP has been implemented, status and trends monitoring will occur (in parallel with PMIs) over time to determine if a net environmental benefit is apparent. Although particular situations may require the use of more specific monitoring parameters, screening level indicators will likely be used to determine the status and trends of water bodies.

2.5 Priorities for Assisting the Watershed Management Initiative

The Program's Monitoring Ad-hoc Task Group (AHTG), composed of Co-permittee representatives, works with Program staff to review proposed projects and allocate available funds. Regional Board staff and interested parties attend the AHTG meetings. As presented in the Program's monitoring priorities (see section 2.2), there are four general areas in which the SCVURPPP provides support to the SCBWMI. These include:

1. Investigate Beneficial Uses and Causes of Impairment (including field work)
2. Review and Compile Environmental Data and Make it Accessible
3. Develop Strategies for Controlling Impacts of Land Use on Beneficial Uses
4. Facilitate and Support WMI Subgroups (including coordination with other agencies).

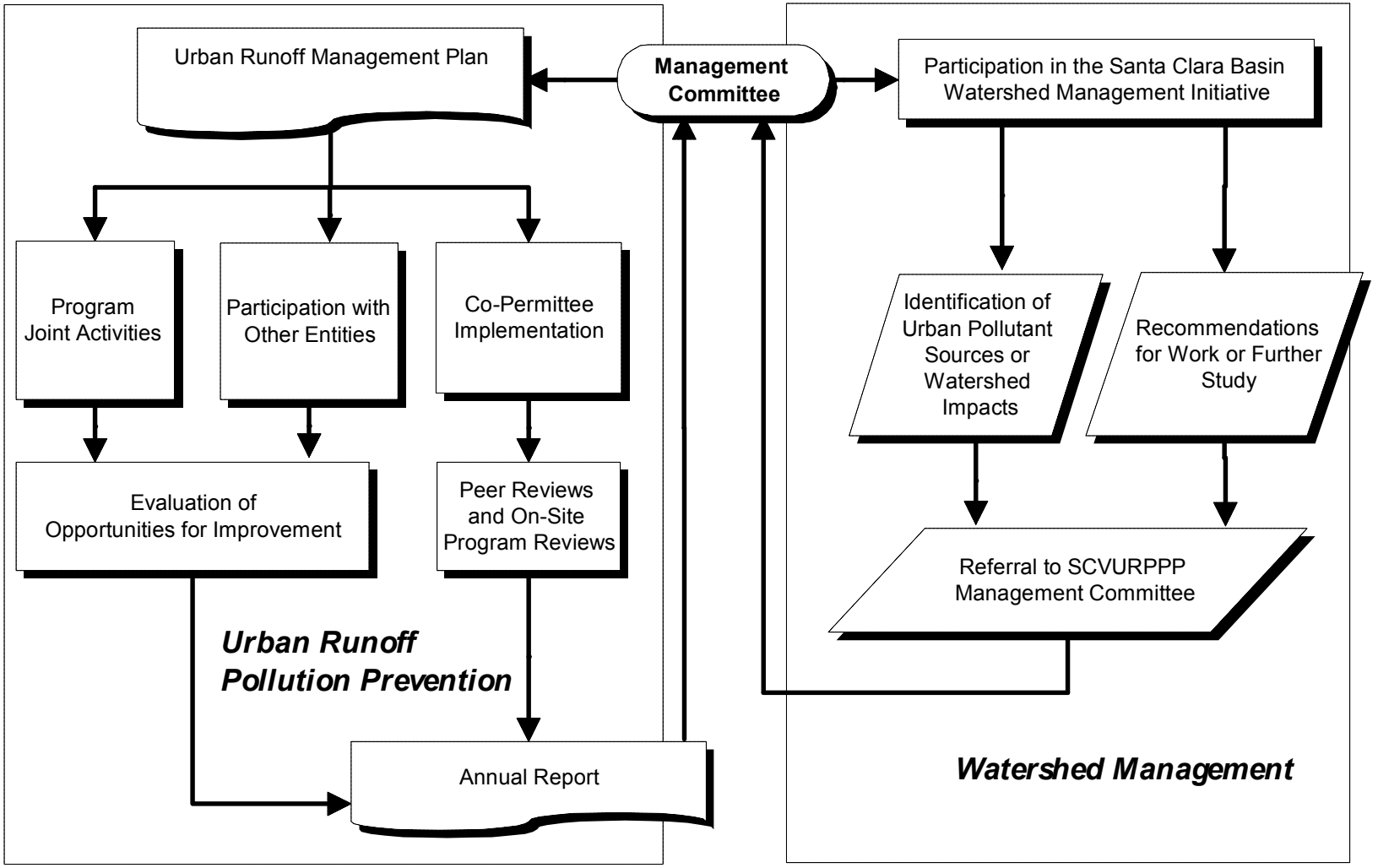
2.6 Continuous Improvement Process

An important feature of a mature Phase I municipal stormwater management program like the Santa Clara Valley Program is a process for continuous improvement. As shown in the Program's 1997 URMP and illustrated in Figure 2.0, continuous improvement is implemented through two feedback "loops." The loop on the left emphasizes programmatic measures to gage the performance of the Co-permittees and the overall Program (and includes participation in regional efforts such as the San Francisco Bay Regional Monitoring Program for Trace Substances). The loop on the right emphasizes watershed assessment and management conducted jointly with other stakeholders in the SCBWMI[5].

This two-pronged approach facilitates the Regional Board's responsibility for fairly measuring regulatory compliance while encouraging a watershed management approach. The continuous improvement process has been utilized by the Program over the past seven years to successfully integrate programmatic monitoring indicators, which provide the best basis for measuring permit compliance, with watershed management measures (including environmental monitoring), which provides the best context for considering the effects of urban runoff on the environment and measures to improve the health of the watershed.

[5] The continuous improvement process concept was developed as part of the Program's 1997 Urban Runoff Management Plan to more effectively integrate urban runoff and watershed management.

Figure 2.0. SCVURPPP's continuous improvement process illustrating two feedback "loops" which emphasize the nexus between the Program and the Santa Clara Basin Watershed Management Initiative (SCBWMI). The continuous improvement process was originally presented in the Program's 1997 Urban Runoff Management Plan (URMP).



2.7 Stakeholder Involvement & Input

A significant factor in the success of the continuous improvement program is the active involvement and input from the various watershed stakeholders. Over the past seven years, this involvement and input has principally come through the Program's and Co-permittees significant involvement in the Santa Clara Basin Watershed Management Initiative (WMI). For example, the Program's involvement involved a major role preparing both the abridged and unabridged versions of the Watershed Characteristics Report, the lead role in conducting the assessment of Coyote Watershed, a continuing leadership role in the Landuse Subgroup as well as the Bay Monitoring and Modeling and Regulatory Subgroups, and it's continued support of the Core Group efforts.

As the SCVURPPP and WMI move forward towards completing ongoing assessments, initiating new assessments, identifying impediments to maintaining and improving water quality and identifying actions to improve water quality, the "continuous improvement" process and input from stakeholders will become even more important to shape the actions and priorities for the future. As illustrated in Figure 2.0 the most advantageous time to provide effective input to the Program and Co-permittees is through the review of the Annual Report. The Annual Report is submitted to the RWQCB on September 15 each year. To be useful, the review and comment needs to occur during the latter half of September and October of each year with comments available by the first of November.

While review of the Annual Report is the most effective means to influence future efforts, the Program and Co-permittees continued involvement in the WMI will also generate new ideas and avenues to improve the management of urban runoff and the effective and efficient integration[6] of urban runoff management into the overall management of the Santa Clara basin watersheds.

2.8 Effectively Integrating Urban Runoff and Watershed Management

The requirement to investigate, consider, and implement watershed management measures first appeared in the Program's 1995 NPDES permit and is also a requirement of the Program's current NPDES permit. As part of its application for the current permit, the Program developed a "Watersheds 2000 Vision" (December 1999) that outlines the principles and approaches that the Program and its Co-permittees will use to support better management of the Santa Clara Basin through the implementation of urban runoff control measures. The vision statement also defines the relationship between and the roles of the Program and the SCBWMI in this context.

The Program's approach for supporting watershed management and the SCBWMI is based on the following principles:

- The goal of the Program and its Co-permittees is to maintain water quality and protect the beneficial uses of the waterbodies in the Santa Clara Basin through the implementation of control measures to the maximum extent practicable.

- Successful watershed management must be a community-wide, stakeholder-driven effort that includes regulatory agencies, the business community, environmental advocates, and local government.

[6] See the Program's report entitled "Watershed Management and Urban Runoff Management Integration Report-Permit Provision C.10, June 29, 2001" for a further discussion.

- The Co-permittees recognize it can be difficult to separate many urban runoff "issues" from the general impacts of urbanization resulting from the cumulative effects of land development.

- The Co-permittees understand that municipal agency activities have the potential to impact water quality and beneficial uses; conversely such activities can create opportunities to improve water quality and enhance aquatic resources.

Given those principles, the Co-permittees envision the roles of the Program and that of the SCBWMI as follows:

- The Program's activities pursuant to the NPDES permit assist Co-permittees and other local agencies to incorporate appropriate watershed management recommendations into their decision-making and specific watershed protection approaches into their day-to-day operations.

- The SCBWMI, as a stakeholder process, provides the tools to identify community goals and issues, and facilitates the development of common ground between stakeholders to recommend to policy-makers the actions needed to better manage watershed resources.

The Program seeks to create an avenue by which the SCBWMI's broad stakeholder goals and objectives can be incorporated into the daily operations of the Co-permittees. The Co-permittees will strive to apply their resources and powers to preserve and enhance the watershed. To do this most effectively, the Program and Co-permittees need to translate SCBWMI stakeholder recommendations into specific actions that are reasonable, practical, and that can be incorporated into their missions and services (see Figure 2.0). In addition, the Program will work with Regional Board staff to apply a regulatory strategy that allows Co-permittees to find ways to coordinate with other agencies within a specific watershed to protect and enhance beneficial uses.

2.9 Integration with Regional Monitoring Activities

The Program has contributed to the Regional Monitoring Program for Trace Substances (RMP) since 1993 and has contributed approximately $150,000 a year to the RMP over the past four years. In addition, the three South Bay municipal wastewater treatment plants (i.e., City of Palo Alto, City of Sunnyvale, and the San Jose-Santa Clara facility) annually contribute between $200,000 and $250,000 a year to the RMP. Thus, local communities (which are urban runoff Co-permittees) contribute approximately $350,000 to $400,0000 a year to a regional monitoring program (consistent with Permit Provision C.7b). The results of the RMP's research and investigations have been published by the San Francisco Estuary Institute (SFEI).

The Regional Board has requested that the Program and other members of the Bay Area Storm water Management Agencies Association (BASMAA) conduct "monitoring" in a broad sense that includes watershed assessment, and pollutants of concern (POCs) and BMP monitoring. The scope and objectives of monitoring and assessment activities have been refined through a number of initiatives including the BASMAA Regional Monitoring Strategy (BRMS) and the Regional Monitoring and Assessment Strategy (RMAS). The Regional Board's most recent conceptual strategy is based on the design

of its Surface Water Ambient Monitoring Program (SWAMP) efforts and uses several categories of monitoring depending on the spatial extent, type of pollutant or stressor and level of detail and data quality required. These activities are described in more detail in Sections 3.0, 4.0 and 5.0.

2.10 Accomplishments to-date

Complying with the Regional Board directive to redirect monitoring resources from a baseline monitoring approach, the Program has, since 1997, moved toward assessment of specific pollutants and conditions of designated beneficial uses. To improve the effectiveness of our special studies and those conducted by other programs, in 1996 and 1997, the SCVURPPP co-sponsored, and participated in, the Bay Area Stormwater Management Agencies Association's (BASMAA's) development of a BASMAA Regional Monitoring Strategy (BRMS). The SCVURPPP continues to coordinate its monitoring activities with other BASMAA member agencies.

In recent years, the Program has conducted substantial original research and investigations into the sources, fate, transport, and effects of urban runoff pollutants, the characteristics of Santa Clara Basin watersheds, the effects of urbanization on watersheds, and the effectiveness of various control measures. Beginning in 1993-1994, the SCVURPPP has funded efforts to assess the condition of beneficial uses of creeks within the Santa Clara Basin. The Program, as part of the Annual Reports, updates a summary of memoranda and reports published as a result of their research and investigative efforts. The most recent update is contained in Table 4-2 of the 2002-2003 Program Annual Report. The following subsections briefly describe a portion of the projects the Program has conducted.

Stormwater Environmental Indicators Demonstration Project (SEIDP)

The SCVURPPP recently completed a two year research project entitled "The Stormwater Environmental Indicators Demonstration Project (SEIDP). The SEIDP is part of USEPA's Environmental Indicators/Measures of Success Project (third phase), which focuses on local demonstration projects and testing of the indicators. The Water Environment Research Foundation sponsored the SEIDP jointly with the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP).

The project objectives were to:

- Evaluate the usefulness of the Center for Watershed Protection's (CWP) Stormwater Indicator Methodology under semi-arid conditions;
- Evaluate the applicability of environmental indicators under semi-arid conditions in two different situations: at a watershed level that includes a variety of chemical, physical and biological indicators and in an industrial watershed that emphasizes programmatic indicators;
- Select, test, and refine protocols for monitoring environmental indicators in semi-arid conditions; and,
- Develop guidance on selection and use of environmental indicators, and disseminate guidance to other stormwater programs in California, Oregon and the west to assist in validation of environmental indicators throughout the west.

Consistent with these objectives, the CWP's stormwater indicator methodology was applied at two distinct geographic scales: the 310-square-mile watershed of Coyote Creek (which includes the eastern portion of the City of San Jose) and a 28-acre industrial catchment along Walsh Avenue in the City of Santa Clara. The semi-arid climate is typical of California's coast from the San Francisco Bay area southward.

In Coyote Creek, the baseline was a 1979-1981 EPA-sponsored study that sought to identify the effects of urban runoff on water quality, sediment, fish, macroinvertebrates, attached algae, and rooted aquatic vegetation. In addition, the SCVURPPP monitored stormwater constituents and toxicity in the creek 1987-1996. In 1999, the SEIDP sampled fish and the physical habitat at 18 locations in Coyote Creek, sampled surficial sediment at six locations, and sampled benthic macroinvertebrates at nine locations. The SEIPD analyzed flooding, changes to stream morphology, and sources of imperviousness in the surrounding watershed. Georeferenced reports of illegal dumping and known industrial and construction sites were also generated.

Regional Board staff has been thoroughly involved in these projects through participation in the Program's Monitoring Ad-hoc Task Group, through WMI subgroups, and through special review groups such as the Stormwater Environmental Indicators Demonstration Project Review Committee and other technical advisory groups facilitated by Program staff.

Joint Stormwater Agency Project

The recent emphasis on developing Total Maximum Daily Loads (TMDLs) for water quality impairing pollutants has led the Regional Board to require new assistance from Bay area municipal storm water programs. Requirements include characterizing pollutant distributions in representative watersheds, identifying pollutant sources, estimating pollutant loads and identifying and implementing additional pollutant control measures. To meet these requirements, the Program coordinated a recently completed two-year regional study to characterize distributions of these pollutants found in storm drain and creek embedded sediment. The study found statistically higher concentrations of mercury, PCBs, chlordanes and DDTs in urbanized areas compared to undeveloped, open land uses. Median concentrations of total PCBs, chlordanes and DDTs measured in urban storm drain sediments were roughly two orders of magnitude greater than median concentrations measured in Bay sediments by the Regional Monitoring Program. The median concentration of mercury in urban storm drains was generally comparable to Bay sediments. Several sites with elevated levels of one or more of the study pollutants were identified. The study also developed planning-level estimates of urban runoff pollutant loads to San Francisco Bay from its surrounding watersheds.

Regional Monitoring and Assessment Strategy

Regional Board staff has developed a Regional Monitoring and Assessment Strategy (RMAS) for watershed monitoring and assessment in the Bay area. The purpose of the RMAS is to improve the technical content of the Regional Board's policies and regulatory actions. The specific regulatory focus of the RMAS is to help the Regional Board complete biennial water quality assessments under the Clean Water Act's 305(b) and 303(d) requirements. The RMAS endorses a multi-faceted monitoring approach, including incorporation of bioassessment data and physical measurements into Regional Board decision making, as supported by the 1997 USEPA 305(b) guidelines. The RMAS is being carried out in a phased approach, beginning with "pilot-scale implementation in

selected watersheds," and establishing a rotating basin approach that will eventually result in "comprehensive assessment of surface and ground waters in the San Francisco Bay Region."

The Regional Board has begun implementing the RMAS by assessing selected pilot watersheds in the Bay area. These assessments of "Board-lead" watersheds are currently funded by the NPDES permittees, including SCVRUPPP, through permit surcharges for the State Surface Waters Ambient Monitoring Program (SWAMP). The Regional Board is also relying on partnerships with local agencies to implement the RMAS in "Partner-lead" pilot watersheds.

To-date, the Program has participated in the RMAS through its pilot watershed assessment work in the Coyote Creek, Adobe and San Tomas Aquino watersheds. It is the Program's intent to continue to conduct bioassessments in Program relevant watersheds during the implementation of the Revised Multi-Year Plan. A timetable for completion of bioassessments is presented in Section 6.0.

Coyote Creek Watershed Integrated Pilot Assessment

Past Program efforts (reported in the Program's FY 99-00 and FY 01-02 Annual Reports) have been to assist Regional Board staff with the development of a functional and pragmatic assessment approach. To test this functional assessment approach and to contribute to the SCBWMI's assessment of Santa Clara Basin watersheds, the Program conducted an Integrated Pilot Assessment in the Coyote Creek Watershed. The intent of the pilot assessment was to: (1) help facilitate continuous improvement of the SCBWMI's watershed assessment framework; (2) integrate that methodology with that being used by the Regional Board's Regional Monitoring and Assessment Strategy (RMAS) and other Regional Board initiatives; (3) develop a list of appropriate initial management actions to preserve and enhance the Coyote watershed; and (4) identify appropriate monitoring locations and provide baseline information as part of the Multi-year Monitoring Program to assist with continued watershed assessment.

The method used in the Coyote Creek Watershed Integrated Pilot Assessment to assess physical stream ecosystem is based on the Hydrogeomorphic Approach (HGM) that was developed to assess riverine (water and wetland) functions. It has been applied locally and in Central and Northern California. Biological stream ecosystem functions were assessed using a multimetric approach to calculate an Index of Biological Integrity. A multimetric approach is useful to assess biotic integrity in streams in which a broad range of human impacts occur.

The study area for this project was limited to data-rich portions of the two largest creeks in the watershed: Upper Penitencia Creek below Cherry Flat Dam and Coyote Creek below Anderson Dam. Stream reaches were classified using factors related to geomorphology and urbanization. The existing capacities of study area reaches to support the following four physical ecosystem functions were assessed using hydrogeomorphic models: hydrologic processes and channel dynamics, aquatic habitat, riparian habitat and landscape-level connectivity. The existing capacities of study area reaches to support aquatic fauna (macroinvertebrates and fishes) were assessed using indices of biological integrity. Selected water quality parameters were examined to assist interpreting model results. Future capacities of stream ecosystem functions were assessed by estimating the relative positive and negative impacts of existing and near-

term factors that may continue or soon influence the distribution and viability of fish and macroinvertebrate assemblages, their habitats and the functional capacities of supporting stream processes. Potential capacities of stream ecosystem functions were assessed by identifying where existing and future stream ecosystem functional capacities could be maintained or improved by practical, strategic management actions that have not been planned. Potential management actions were prioritized based on which would have the greatest positive impact on cold and warmwater fish and macroinvertebrate communities. Monitoring activities to address data gaps identified through the assessment are also described and prioritized.

Assessment of Watershed Assessment Methods

In keeping with the Program's commitment to continuous improvement of program elements, selected regional and national watershed assessment methods were evaluated to identify and recommend future direction for SCVURPPP's environmental monitoring and assessment program. As part of this evaluation, a memorandum was prepared which identifies the Program's monitoring and assessment needs in the context of prior efforts and pilot studies. In addition, the memorandum provides a framework for linking different types of assessment methodologies to address such needs using an adaptive management approach; summarizes types of and trends in watershed assessments; and focuses on methods using bioassessment and analysis of stream ecosystem functions.

The framework integrates the tiered assessment and rotating basin approaches currently implemented by the Regional Board, Program and many other agencies involved in water quality and watershed monitoring and assessment. Watershed assessment methods were characterized as either Tier I (screening level methods intended to detect beneficial use impairment) or Tier II (more detailed investigations of causes of degradation and use impairment). The framework also embraced the practice of integrating biological, chemical and physical indicators using a regional reference framework to establish water body condition relative to benchmarks. The ultimate goal of implementing this framework is to develop a monitoring and assessment program that provides an information base to support Program objectives of continuously improving program components and to develop additional ones to support attainment of beneficial uses in selected water bodies.

The Tier I assessment methods evaluated included Rapid Bioassessment Protocols, Rapid Stream Assessment Technique, Proper Functioning Condition, Stream Ecosystem Function Assessment, Oregon Watershed Assessment Manual and the Framework for Conducting Watershed Assessments. The Tier II assessment methods evaluated included the North Coast Watershed Assessment Program Limiting Factors Analysis, the Napa River Basin Limiting Factors Analysis, the San Francisquito Creek Sediment Reduction Plan and Aquatic Habitat Assessment and Limiting Factors Analysis, the Program's *Workplan for Watershed Analysis and Management Practice Assessment in Other Creeks Potentially Impaired by Sediment from Anthropogenic Activities*, the Hydromodification Plan, and the Biological Water Quality Target Approach.

Recommendations for the Program's monitoring and assessment program resulting from this evaluation of watershed assessment methods include the following:

Tier I (Screening-level) Assessment Methods

- Use the Stream Ecosystem Function Assessment (SEFA) approach (as recommended by the Program in 2003), augmented by certain aspects of the Rapid Stream Assessment Technique (RSAT), to analyze data generated from an ambient monitoring program based largely on Rapid Bioassessment Protocols (RBPs);

- Coordinate regionally to develop reference conditions and bioassessment tools to support analysis of macroinvertebrate data;

- Work towards developing robust numeric biocriteria; and

- Consider pursuing bioassessment of fish assemblages in larger order streams and in streams supporting steelhead trout.

Tier II (Investigative-level) Assessment Methods

- Continue to implement Limiting Factors Analysis (LFA) as primary approach to investigating factors potentially limiting attainment of aquatic life uses. Incorporate lessons from other projects implementing LFA;

- Consider using the HMP as tool to address potential use impairment caused by hydromodification associated with future development;

- Consider incorporating aspects of the HMP method of geomorphic assessment into a method for classifying Santa Clara Basin streams. Identify and prioritize where restoration efforts could occur; and

- Incorporate biocriteria into assessments as feasible.

The Program's document entitled *Assessment of Watershed Assessment Methods* was provided as Appendix D-2 to the Program's FY 02-03 Annual Report. The results and recommendations included in the report were presented to the SCBWMI Watershed Assessment Subgroup (WAS) and the Ad Hoc Monitoring Workgroup in July 2003, and were generally well received by the participants.

3.0 WATERSHED MONITORING AND ASSESSMENT ACTIVITIES

A watershed is hydrologically-defined geographic area that includes all land and water areas within its boundaries. Creeks, lakes and wetlands are the receiving water bodies that make up the complex system that ultimately receives runoff and drainage from the surrounding upland area within the watershed boundaries. The entire municipal storm drainage system that feeds into the receiving water bodies consists of storm drain inlets, culverts, road-side ditches, and outfalls. Changes to either upland areas or storm drainage systems may cause changes in the physical, chemical or biological characteristics of receiving water bodies. These effects may be most visible in a part of the stream far removed from the area where changes occurred. The response of the system may also take many years after the change has occurred.

3.1 APPROACH AND OBJECTIVES

The goal of the watershed assessment activities element of the SCVURPPP's Revised Multi-Year Plan is to develop a better understanding of the physical, biological, and physical characteristics of watersheds relevant to the Program. The collection and analysis of watershed information will help make informed decisions about future management actions and help clarify and resolve potential issues within the watersheds.

The Program's watershed assessment activities are designed to meet the following three main objectives:

- Collect, analyze and present appropriate watershed data, using a Geographical Information System (GIS) and other mapping tools;

- Develop and refine indicators for evaluating the physical, chemical and biological functioning of watersheds, and identify effective ways to apply them in urban creeks; and,

- Provide guidance and support to better understand watershed processes with the goal of protecting and restoring beneficial uses to the maximum extent practicable.

3.2 WATERSHED MONITORING AND ASSESSMENT ELEMENTS

The SCVRUPPP watershed monitoring and assessment activities are described within this section. By implementing these activities, the SCVURPPP seeks to extend and continue implementation of the Program's monitoring priorities.

To reach the Program's watershed assessment objectives presented above, the Program anticipates that activities will be conducted within two (2) watershed assessment elements during implementation of the Revised Multi-Year Plan.

Watershed Characterization Activities – element entails watershed characterization of watershed attributes, leading to the development of watershed scale features for all watersheds within the co-permittees' jurisdictions.

Screening-level Monitoring and Assessment Activities – element entails the development and implementation of screening-level indicators of creek health,

and aids determining the ability of the water body to support beneficial uses (e.g., aquatic life and recreational uses).

Watershed Assessment Activities – entails a process that characterizes current watershed conditions at a coarse scale. The main goal in conducting watershed assessments is to characterize current watershed conditions by using existing data. Although course in resolution, watershed assessments can provide the basis for watershed-level planning, management and policy decisions and can lead to more detailed hypothesis testing through the implementation of monitoring studies at the finer scale.

Brief descriptions of each watershed assessment element and relevant activities are provided. A timeline for implementing these activities is presented in Section 6.0 *Comprehensive Monitoring Plan Timeline*.

3.21 Watershed Characterization Activities

Watershed characterization is an import foundation-setting activity needed to develop a better understanding of the location and extent of impacts to watersheds, water quality and beneficial uses. The analysis of similarities and differences in watersheds or sub-watersheds can help interpret indicator data and make useful distinctions among these watersheds. Additionally, watershed characterization can aid in the identification of priority areas where management actions may be taken, with the goal of protecting or restoring watershed functions.

Building on recent watershed monitoring and assessment activities conducted by the WMI and the SCVURPPP, the Program plans to conduct activities entailing the collection and analysis of information needed to further characterize watersheds. To facilitate this process, the SCVURPPP will annually develop a *Watershed Characterization and Sampling Design Technical Memorandum* (Characterization Memo). The purpose of the Characterization Memo is to describe existing readily available information (e.g. watershed attributes, beneficial use information, water quality data) that will aid in the development of a sampling design for a specific watershed(s) that are scheduled for screening-level monitoring to begin during the next fiscal year. Beginning in FY 05-06, the Program will submit within its Annual Work Plan. The memo will describe and provide the rationale for the selection of sampling parameters and sites within the watershed scheduled for screening-level sampling in that fiscal year.

3.22 Screening-level Monitoring and Assessment Activities

An ecological indicator is a measure, an index of measures, or a model that characterizes an ecosystem or one of its critical components. An indicator may reflect biological, chemical and/or physical attributes of ecological condition. The primary uses of an indicator are to characterize current status and to track or predict significant change. With a foundation of analytical research, an ecological indicator may also be used to identify major ecosystem stress. The Program intends to collect two types of screening level indicators during the implementation of the Revised Multi-Year Plan: (1) aquatic life use indicators (e.g., benthic macroinvertebrates and fish assemblages) and (2) water recreation use indicators (e.g., microbiological indicators). The following paragraphs briefly describe these indicators and related activities the Program will conduct during the implementation of the Revised Multi-Year Plan.

Biological and Physical Habitat Assessments

Benthic macroinvertebrates (BMIs) are organisms that inhabit the bottom of freshwater habitats for at least part of their life cycles and are at least a half a millimeter in size. BMIs are important indicators of biological and ecological condition of fresh water bodies because they are ubiquitous, affected by a variety of environmental perturbations (e.g. hydromodification, sedimentation, and chemical pollutants), can be easily identified and enumerated, and contain a diversity of taxonomic groups that are well known. Extensive guidance on development and use of BMI indicators has been supported at the national and state levels, and a number of agencies and volunteer groups have begun to sample BMIs in Bay Area creeks using the California Stream Bioassessment Procedure developed by the California Department of Fish and Game.

Fish assemblages have also been used as indicators of biological integrity for many years throughout the world. In fact, many water quality management program consider fish assemblage monitoring an integral component, and its importance is reflected in the aquatic life use-support designations of many states. Assessments of the fish assemblage must measure the overall structure and function of the community to adequately evaluate biological integrity and protect surface water resource quality. Fish bioassessment data quality and comparability are assured through the utilization of qualified fisheries professionals and consistent methods, such as the USEPA's Rapid Bioassessment Procedures for Fish.

Together with biological indicators, assessments of physical habitat can aid in determining the physical/habitat condition or quality of a watershed and water body. Physical habitat assessments can be conducted at multiple spatial and temporal scales and can be quantitative or qualitative in nature. Depending on the methodology used to collect physical habitat data, one may use the information to help interpret results from biological indicator studies, or for separate analyses of ecological condition. Strategies may involve the collection of instream, riparian, and/or landscape scale measurements.

To-date, the Program has conducted biological and physical habitat assessments in the Coyote Creek, Adobe Creek and San Tomas Aquino Creek watersheds. Additionally, a number physical habitat assessment-related activities have been, and will likely continue to be conducted by Co-permittees. It is the Program's intent to continue conducting screening level monitoring by utilizing aquatic life use indicators in Program relevant watersheds during the implementation of the Revised Multi-Year Plan. Additional measurements which will be collected synoptically with aquatic life use indicators include qualitative substrate characterizations and general water quality parameters. A timetable for the completion of screening level monitoring is presented in Section 7.0.

Regional Biological Assessment Network

In February 2002, the SCVURPPP participated in a workshop for information sharing and discussion of recent and ongoing bioassessment (benthic macroinvertebrates) studies in the Bay Area. The network of individuals participating in the workshop was named the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI). BAMBI's purpose is to coordinate and share bioassessment information throughout the Bay Area.

Building on the success of the BAMBI workshop in 2002, the Program participated in the second annual BAMBI workshop on January 29, 2003. In preparation for the workshop,

the Program supported the development of issue papers intended to stimulate discussion on issues related to the following five topic areas: (1) the standardization of rapid bioassessment protocols in the Bay Area; (2) the establishment of reference conditions for Bay Area creeks; (3) quality assurance and control in field sampling and laboratory analyses; (4) data management and sharing; and (5) physical habitat assessments and protocols. As a follow up, the third annual BAMBI workshop was held on January 29, 2004.

In fiscal year 2004/05 and beyond, the Program anticipates providing support and actively participating in BAMBI activities with the goal of developing regional bioassessment tools necessary to provide context to bioassessment data collected in creeks relevant to the Program.

Pathogen Indicator Organisms

Microbiological water analysis is typically carried out to safeguard the health of a community by testing for possible fecal pollution, the source of microorganisms causing waterborne disease. Indicators of recreational use are microbiological organisms that coexist with pathogens in the fecal environment and are easier and less expensive to test for than pathogens. For these reasons, indicator organisms are often the focus of water analyses rather than pathogens. The most commonly employed indicator organisms are total coliform, fecal coliform, enterococcus, and E. coli.

To provide data necessary to determine impacts to recreational uses in Santa Clara basin water bodies, the Program intends to conduct screening level monitoring using microbiological indicators. Sampling will likely occur at areas where recreational uses are the most prevalent and during times when recreational uses may occur. A timetable for the completion of screening level monitoring is presented in Section 7.0.

3.23 Watershed Assessment Activities

Watershed assessment is the systematic review of specific resources such as benthic macroinvertebrates or fish and their habitat and riparian areas in a watershed-scale context. Watershed assessment is a stage-setting process intended to be based primarily on existing information. The results of watershed assessment can be used to establish the context for subsequent evaluations and analysis of cumulative watershed effects. Watershed assessments typically: 1) address cumulative effects within a watershed; 2) provide for more ecologically sound resource planning; and, 3) identify and help protect environmentally sensitive areas.

From its inception in 1990 through 1995, the Program's monitoring activities focused on establishing baseline information through sampling and analysis of runoff from various land uses and ambient waters. Most recently, SCVURPPP implemented the monitoring approach endorsed by the State Water Resources Control Board (SWRCB) (Surface Waters Ambient Monitoring Program (SWAMP)) and by the RWQCB (Regional Monitoring and Assessment Strategy (RMAS). However, the SWAMP/RMAS approach focuses on strategies for monitoring but does not describe methods to assess monitoring data. To address this need, SCVURPPP recently developed and tested a method to assess stream ecosystem functions in the Coyote Creek watershed that integrated hydrogeomorphic models and indices of biotic integrity. This method was found useful for evaluating stream ecosystem functions and associated aquatic life Beneficial Uses and for identifying and prioritizing additional management actions that could improve

conditions and beneficial use attainment as well as monitoring activities that could fill existing data gaps.

Following the testing of the stream ecosystem function (SEF) method in Coyote Creek, the Program conducted an *Assessment of the Watershed Assessment Methods* project, which was undertaken to build upon recent pilot studies and evaluate findings in the context of the Program's current monitoring and assessment program as well as those implemented by other selected local, regional, and state agencies. Recommendations from the project included, using the SEF assessment approach to analyze data generated from an ambient monitoring program based largely on rapid bioassessments. The Program has embraced this recommendation by integrating watershed assessments into this Multi-Year Plan.

It is the Program's intent to conduct watershed assessments in specific watersheds within the Santa Clara Valley basin beginning in FY 05-06. Assessments will integrate information collected during watershed characterizations and screening-level assessments to support Program objectives of continuously improving Program components and developing additional ones to support attainment of beneficial uses in selected water bodies. Watershed assessment will be coordinated with other assessment-related activities occurring in the basin, to the extent possible, and will only occur in watersheds identified as high priority by the Program.

4.0 POLLUTANTS OF CONCERN (POC) MONITORING ACTIVITIES

4.1 Approach and Objectives

Several Multi-Year Plan elements address local and regional needs for technical information to address POCs in water bodies in or adjacent to the Santa Clara Valley basin. The goal of POCs monitoring to collect scientifically valid information on the sources, status, trends, fate, and transport of POCs and their effects, so that feasible, cost effective management actions can occur to the maximum extent practicable to reduce the impacts on the beneficial uses. POCs monitoring typically include studies that involve field sampling or environmental monitoring, which should not be confused with monitoring the effectiveness of BMPs implemented to control POCs in urban runoff. BMP monitoring is described in Section 5.0 of this Revised Multi-Year Plan.

To assist in reaching the goal of POCs monitoring, the Program has developed the following two POCs monitoring objectives:

- Continue to participate in regional efforts to gain a better understanding of the impacts of POCs on beneficial uses and to work to mitigate these impacts through implementation of water quality attainment strategies (e.g., TMDLs); and,

- Continue to characterize the concentrations and extent of POCs in Program-relevant water bodies, and investigate and identify potential sources and information to support strategies for controlling POCs.

4.2 Pollutants of Concern Monitoring Elements

To reach the Program's monitoring objectives for POCs, the Program will conduct and participate in monitoring-related activities under the following three POC monitoring elements during implementation of the Multi-Year Plan:

Impacts of POCs on the San Francisco Bay Estuary – element entails participation in, and support regional efforts such as the Regional Monitoring Program for Trace Substances (RMP);

Impacts of POCs on Local Water Bodies and Source Characterization– element entails investigating the impacts to, and sources of POCs present in Program-relevant local creeks and water bodies; and,

Additional Regional POC Activities – element entails participation in, and support for regional programs (e.g., Clean Estuary Partnership) designed to develop studies supporting the development of scientifically based total maximum daily loads (TMDLs) and/or site specific water quality objectives for specific POCs;

Brief descriptions of each POCs monitoring element and relevant activities that either, were recently completed; are currently being implemented; or are planned, are provided below. To the extent possible, results from POCs monitoring activities presented in this Revised Multi-Year Plan have been integrated into the Program's POCs Control Programs as they are revised or developed.

4.21 Impacts of POCs on the San Francisco Bay Estuary

In recent years, the Regional Board has determined that the San Francisco Estuary and associated water bodies are impaired by a variety of POCs, under Section 303(d) of the federal Clean Water Act. There are several regional efforts that are currently helping to address the sources, pathways, loadings of POCs and their impacts on the Bay. The Program is an active participant in these efforts and continues to provide funding to regional programs designed to monitor the Bay for POCs. The following paragraphs provide brief descriptions of these programs and the Program's involvement.

Regional Monitoring Program for Trace Substances (RMP)

The RMP was developed in 1993 to provide information to State and local agencies on the status, trends, sources and pathways of pollutants, and the potential effects on organisms that live in or use the Estuary. The RMP's goal is to collect scientifically valid information that allows movement towards understanding contaminant impacts on beneficial uses of the Bay. The RMP focuses on determining spatial patterns and long term trends through sampling of water, sediment, bivalves, and fish; effects on sensitive organisms; and chemical loading to the Bay. To provide the most complete assessment possible of chemical contamination in the Bay, the RMP seeks to synthesize RMP data with data from other sources. Ultimately, the RMP will provide information on how contaminant concentrations in the Estuary are responding to pollution prevention and reduction measures, and if the financial resources devoted to these efforts are improving water quality.

All Bay Area dischargers with NPDES permits (including the Program) contribute funding to the RMP annually. Currently, Program staff represents BASMAA on the RMP Technical Review Committee (TRC). The Program will continue to contribute and actively participate in the RMP (or its equivalent) during the implementation of the Revised Multi-Year Plan. Additionally, the Program will seek to utilize information collected through the RMP to assess potential impacts from discharges under the Program's jurisdiction and develop appropriate management actions through the implementation of POCs Control Programs.

Brake Pad Partnership

After studies in the South Bay indicated that automobile brake pads may be the most significant source of copper in urban runoff, the Brake Pad Partnership (BPP) was initiated in 1996 as a collaboration among regulators, storm water programs, brake material manufacturers, scientists and environmentalists to address environmental problems from brake wear debris. The BPP's work includes research and monitoring, and is an integral part of the Program's Copper Action Plan. Contingent upon available funding, the Program plans to continue participating in the BPP during the implementation of the Revised Multi-Year Plan.

4.22 Impacts of POCs on Local Water Bodies and Source Characterization

Very few local water bodies (i.e., creeks and lakes) throughout the Bay area are currently listed as impaired by specific POCs under Section 303(d) of the federal Clean Water Act. Rather, local water bodies have been thought of as potential transport pathways of POCs that the Regional Board has determined impair segments of the Bay. This section discusses specific investigative monitoring that will be conducted in local water bodies during the implementation of the Revised Multi-Year Plan. As watershed

characterization, screening level monitoring and watershed assessments progress additional investigative monitoring may be needed.

Urban Creeks Toxicity Testing and Chemical Analyses

The SCVURPPP is currently conducting investigative monitoring to determine if diazinon-related toxicity exists in urban creeks. Sampling is conducted twice a year (wet and dry seasons) and water samples are analyzed for the organophosphate pesticide concentrations and three species bioassays are conducted. The goal of the diazinon monitoring program is to detect changes in diazinon concentrations and related toxicity in urban creeks, as management actions are further implemented. Monitoring will occur in a representative number of creeks that provide adequate information for detecting changes in water quality and associated toxicity. Additionally, the Program will continue to conduct water chemistry analyses in sampling locations where toxicity testing has occurred and/or where elevated levels of POCs are evident. These efforts will be coordinated with other stormwater management programs and regional collaborative efforts (e.g, CEP) to the extent possible.

Guadalupe River Monitoring

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is serving as the stakeholder forum for the development of the Guadalupe River TMDL Report for Mercury. The Guadalupe River Watershed encompasses parts of San Jose, Los Gatos, Campbell, Monte Sereno and Santa Clara. The Program is a stakeholder in the Guadalupe River TMDL. The Santa Clara Valley Water District (SCVWD) and is playing a lead role in the TMDL development process. Program staff is also participating in the TMDL process. Through the Guadalupe River TMDL efforts, a substantial amount of water quality monitoring and bioaccumulation studies are planned to occur during the implementation of the Multi-Year Plan.

San Francsiquito Creek Sediment Analysis

In response to a listing of impairment by sediment under section 303(d) of the Clean Water Act and a need to provide information for a TMDL assessment, two separate (but coordinated) projects have been developed. These projects are the San Francisquito Creek Sediment Reduction Plan, administered by the San Francisquito Creek Joint Powers Authority (JPA); and the Aquatic Habitat Assessment and Limiting Factors Analysis, managed by the Santa Clara Valley Water District (SCVWD).

The primary issues driving the TMDL are flooding and degradation of steelhead trout, other threatened aquatic species and their habitats. The approach adopted by the JPA and SCVWD in these projects is to assess factors limiting the threatened aquatic species, including but not confined to those related to excessive sedimentation caused by human land use activities. Project products are intended to produce information that will assist the Regional Board to confirm or reject the validity of the sediment impairment listing and help identify other causes of impairment to aquatic species and their habitats in San Francisquito Creek.

Additional Watershed Analyses and Sediment Practice Assessments

In accordance with permit provision C.9.f.iii, the Program submitted the Sediment Impairment Report (Other Creeks) to the Regional Board on March 1, 2002. The Program received a request from Regional Board staff on July 8, 2002 to revise the

report to include certain issues regarding the development of a work plan and schedule relating to Stevens, Coyote and Saratoga creeks. On August 30, 2002, the Program developed a work plan entitled *Workplan for Conducting Watershed Analysis and Management Practice Assessment in Other Creeks Potentially Impaired by Sediment from Anthropogenic Activities* (Watershed Analysis Work Plan) to fulfill the request. The Watershed Analysis Work Plan tasks and timeline was designed to evaluate and potential implement new watershed assessment approaches in the future using lessons learned from the San Francisquito Creek TMDL project.

Additional Investigative Monitoring

As watershed characterization, screening level monitoring and watershed assessments progress, areas where beneficial uses appear to be impacted by urban runoff may become apparent. In these cases, additional investigative monitoring may be needed. The goal of investigative monitoring is to collect scientifically valid information on the sources, status, trends, fate, and transport of pollutants and their effects, so that feasible, cost effective management actions can occur to the maximum extent practicable to reduce the impacts on the beneficial uses. As previously described,

4.23 Additional Regional POC Activities

Total Maximum Daily Loads (TMDLs) are actions to restore water bodies that have been determined to be impaired under section 303(d) of the federal Clean Water Act. Through the TMDL process, these water quality problems are examined, sources of pollutants are identified, and specify actions that may create solutions are developed. The Regional Board is currently developing more than 30 TMDL projects to address more than 160 listings of Bay area water bodies impaired by specific pollutants.

Clean Estuary Partnership (CEP)

On August 6, 2001, a Memorandum of Understanding (MOU) regarding development of: 1) a Water Quality Attainment Strategy for San Francisco Bay-Delta and Tributaries; and 2) TMDLs for 303(d) pollutants (including mercury) was entered into by the Regional Board, Bay Area Clean Water Agencies (BACWA) and Bay Area Stormwater Management Agencies Association (BASMAA). This group is referred to as the Clean Estuary Partnership (CEP).

The mission of the Clean Estuary Partnership (CEP) is to use sound science, adaptive management, and public collaboration to develop and implement technically valid and cost-effective strategies (including TMDLs) that result in identifiable, sustainable water quality improvements for San Francisco Bay. As a member agency of BASMAA, the Program has contributed funding annually to the CEP. In addition, Program staff currently participates on the CEP Technical Committee (TC) and pollutant-specific workgroups.

In recent years, CEP accomplishments included the development of technical draft reports and projects, including: *Draft Conceptual Model for Mercury in the Bay; Mercury Source Assessment Report*; implementation alternatives for reducing mercury from various sources (seven reports); and the *Guadalupe River Contaminant/Sediment Loading Study*. Contingent upon available funding, the Program will to continue to actively participate in the CEP during the implementation of the Revised Multi-Year Plan.

5.0 BMP AND PERFORMANCE STANDARD MONITORING ACTIVITIES

5.1 Approach and Objectives

Best Management Practices (BMPs) are measures, activities, or other practices that prevent or minimize pollutant discharges to water bodies. Some are routine activities such as recycling materials that contain pollutants, good housekeeping practices and spill prevention procedures. Others are structural treatment measures that are integrated into the storm water conveyance system to remove pollutants from runoff before it enters water bodies. During its second NPDES permit cycle the Program established initial Performance Standards incorporating a variety of BMPs into several components including, Public Information and Participation; New Development and Redevelopment Activities; Illicit Discharge Controls; Industrial and Commercial Business Controls, and; Municipal Government Maintenance Activities. Performance standards in under each component are updated annually on an as needed basis.

The SCVURPPP has developed the following two BMP effectiveness monitoring objectives to aid the Program in determining the most effective and feasible measures that can be implemented to control potential impacts of urban runoff:

- Evaluate the effectiveness of activities and measures implemented by the Program through POCs control programs designed to alleviate potential adverse effects of POCs on water bodies; and,

- Evaluate the effectiveness of activities implemented by the Program that may effectively reduce pollutants from entering water bodies and causing or contributing to exceedances in water quality objectives and/or adverse impacts to beneficial uses.

5.2 BMP and Performance Standard Monitoring Elements

To reach the Program's objectives for BMP implementation monitoring, the Program will conduct and participate in BMP monitoring related activities under following two elements during implementation of the Revised Multi-Year Plan:

Control Programs for POCs – entails monitoring the effectiveness of measures developed and implemented by co-permittees to control POCs;

Performance Standard Monitoring Activities– entails tracking, evaluating and reporting on the effectiveness of urban runoff BMPs, performance standards through the implementation of continuous improvement activities.

Brief descriptions of ongoing or planned activities related to the BMP and performance standard monitoring elements are provided below.

5.21 Control Programs for POCs

The recent emphasis on the enforcement of long-standing Federal requirements relating to TMDL development and implementation has led the Regional Board to request (and require) assistance with identifying control measures for pollutants of concern. The Program's current Performance Standards provide for the control of urban runoff

pollutants to the maximum extent practicable. In addition, the Program's continuous improvement process provides for timely and orderly updates of the Performance Standards as new technology and information becomes available.

The Program's current NPDES permit has greatly expanded the requirements for developing and implementing copper, mercury, pesticides, PCBs, dioxins and sediment control tasks/measures/plans/programs. Since the permit was reissued, the Program has focused on the creation, revision and implementation of numerous activities associated with developing control programs for POCs. The following paragraphs provide brief summaries of these activities. A detailed timeline for implementation of these activities is provided in Section 7.0, *Programmatic Monitoring Indicators (PMIs) Summary Matrix.*

Copper and Nickel Action Plans

The Metals Control Measures Plan, was first created in FY00-01 to assist implementation of baseline activities contained in the Lower South San Francisco Bay Copper and Nickel Action Plans, to track and report activities, and to continue to work with the SCBWMI Bay Monitoring and Modeling (BMM) and Regulatory Subgroups regarding BMM Work Plan Updates. Descriptions of copper control program activities and nickel control program activities are included in the Copper and Nickel Action Plans approved by the SCBWMI and transmitted to the RWQCB as part of the Copper and Nickel TMDL Project for the South Bay. In addition, those baseline activities that are specifically related to the stormwater program are listed in Appendix B of the recently adopted NPDES permit.

To date, most of the CAP/NAP baseline activities have been implemented at the Program level (except for those assigned to specific Co-permittees). During FY 02-03 SCVURPPP, in response to Regional Board staff comments, formalized the process in which Co-permittees clearly identify specific baseline actions within their individual work plans in addition to Program-wide actions. The SCVURPPP, working with Regional Board staff, met in FY 02-03 and FY 03-04 to discuss proposed changes to the CAP/NAP reporting approach and format and agreed upon a revised approach. Relative to developing the annual Work Plan, the revised reporting format includes the following basic information for each baseline action: description of baseline action, regional applicability, linkage to copper reduction, and identification of the performance measure. For each baseline activity the following information is included in the reporting table: an identification of the lead party (if the lead party is the Co-permittee then the Co-permittee includes the action within their individual work plans), a description of the proposed Work Plan actions, a description of how effectiveness will be evaluated, and a summary of the possible future actions.

In addition, the Work Plans tables also provide a summary of actions accomplished in the prior (i.e., FY 02-03) for each CAP/NAP activity assigned to the Program and certain Co-permittees (San Jose, Sunnyvale and Palo Alto). The CAP/NAP contains 21 copper baseline actions and 7 nickel actions. Overall, Regional Board staff has indicated that they are satisfied with the improvements made in the Program's revised Cu/Ni Work Plan and the strategy implemented regarding the tracking/completion of tasks. Some minor remaining issues were acknowledged to be difficult to resolve since they are in large part due to the vagueness of the language (in certain places) found in the original CAP baseline activity tables.

These tasks will be tracked and reported by the Program in Annual Reports. To the extent possible, the Program will evaluate the effectiveness of implementing the tasks during its annual reporting process.

Mercury Pollution Prevention Activities

The Program's reissued NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in South San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires the Program to address the impairment by developing and implementing a mercury pollution prevention plan. The Program developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with this Provision. The Mercury Plan was submitted to the Regional Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan. To the extent possible, mercury pollution prevention measures described in the workplan will be consistent with the required implementation actions for urban runoff described in the approved and adopted Basin Plan Amendment associated with the Mercury TMDL for the San Francisco Bay. Through its annual reporting process, the Program will provide an assessment of the effectiveness of mercury reduction measures following their implementation.

Pesticide Control Program

Diazinon has been identified in recent studies as causing toxicity in local creeks. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by diazinon under Section 303(d) of the Clean Water Act (CWA). The 303(d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired waterbodies.

The SCVURPPP's NPDES Permit Provision C.9.d. includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticide by others within municipal jurisdictions. The permit provision also requests that the Program continue to work with the Urban Pesticide Committee, BASMAA, and the California Stormwater Quality Association Pesticide Committee to assess impacts of pesticide use and encourage actions by other state and federal agencies. Through its annual reporting process, the Program will provide an assessment of the effectiveness of mercury reduction measures following their implementation.

Polychlorinated Biphenyls (PCBs) and Dioxin Compounds Control Program

PCBs - To develop data needed for the Bay PCBs TMDL, the Program has provided leadership to Bay Area storm water agencies in their efforts during the past three years. This has included coordinating a regional study that characterized the distribution of PCBs concentrations in storm water conveyance sediments in Bay Area watersheds. The Program has also performed PCBs case studies in selected areas where elevated concentrations of PCBs were found during the regional study and coordinated similar case studies by other Bay Area storm water agencies. The case studies were aimed at identifying PCBs sources and assist in developing controls. To facilitate regional coordination, the Program has led a work group of representatives from BASMAA and Regional Board staff. The Program has also prepared PCBs work plans for the above regional and local field studies. The work plans included a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County and preliminary tables summarizing PCBs control options. Through its annual reporting process, the Program will provide an assessment of the effectiveness of PCDD/Fs control measures following their implementation.

Dioxin-like Compounds – All segments of San Francisco Bay were initially listed as impaired by certain PCDD/F compounds in the 1998 303(d) list and repeated in the 2002 303(d) list. The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment. The advisory was issued after PCDD/F compounds (i.e., Dioxin-like compounds) and other pollutants (e.g., mercury and PCBs) were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay.

There is considerable controversy regarding the Bay 303(d) listing and the associated potential threats to human health by PCDD/Fs. The SWRCB and the Regional Board opposed the 1998 listing of PCDD/Fs in the Bay for three reasons: 1) water column concentrations did not exceed PCDD/F water quality criteria; 2) fish tissue concentrations of PCDD/F were consistent with national background levels; and, 3) the fish consumption advisory was an interim action that only included PCDD/Fs because of exceedances of informal screening levels. The State of California was overruled by the USEPA, which cited two primary reasons for the Bay listing: 1) failure to attain a designated beneficial use of the Bay, Commercial and Sport fishing (COMM), based on the interim fish consumption advisory; and, 2) violation of a narrative objective found in the San Francisco Bay Water Quality Control Plan (Basin Plan) pertaining to bioaccumulation of pollutants.

SCVURPPP has conducted a variety of characterization activities for PCDD/Fs in the recent past. These efforts are summarized in the *Control Program for Dioxin Compounds,* which was submitted in the Program's FY 04-05 Annual Work Plan, per NPDES Permit Provision C.9.e. Additionally, in the SCVURPPP has continued to work with other Bay area dischargers and Regional Board staff through the Bay Area Stormwater Management Agencies Association (BASMAA), the CEP and the San Francisco Estuary Regional Monitoring Program (RMP) to coordinate PCDD/F-related activities. Through its annual reporting process, the Program will provide an assessment of the effectiveness of PCDD/Fs control measures following their implementation.

Trash Management Activities

On November 14, 2001, the Regional Board released the document entitled *Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region* Report. This report states that "between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction …", Regional Board staff will review information concerning trash in the next listing cycle to determine whether specific water bodies warrant 303(d) listing. In addition, the report proposed that all urban creeks of the San Francisco Bay region be placed on the 2002 303(d) "monitoring list" due to the threat of trash impairment to water quality.

On February 4, 2003, the State Water Resources Control Board adopted the 2002 303(d) list of water quality limited segments (which included this recommendation) at its Board meeting. According to the SWRCB's *Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments* (dated February 4, 2003), water bodies placed on the "monitoring list" have:

> *" data or information that are not of adequate quality and/or quantity to support a listing and subsequent TMDL regulatory process. In these cases, a finding is warranted that more information must be collected to resolve whether objectives and beneficial uses are attained. The waters on the Monitoring List are high priority for monitoring before the next section 303(d) list is completed."*

In order to effectively address trash issues, the Management Committee formed a Trash AHTG on February 21, 2002. The Trash AHTG prepared a Trash Work Plan that identifies a strategy for addressing trash problem areas that occur in urban streams and waterways. The Trash Work Plan was submitted within the Program's *FY 03-04 Draft Work Plan* on March 1, 2003. During the implementation of the Revised Multi-Year Plan, the Program will provide an assessment of the effectiveness of trash management measures through its annual reporting process.

5.22 Performance Standard Monitoring Activities

In recent years, the Program has implemented, developed and revised performance standards through its continuous improvement process. These efforts are generally focused towards tracking, reporting and evaluating data collected through Program activities and the implementation of BMPs. The following are activities the Program intends to conduct during the implementation of the Revised Multi-Year Plan.

Enhanced Reporting for Industrial-Commercial Discharger (IND) Control Program Illicit Connection and Illegal Dumping (ICID) Elimination Activities

Since October 2001, Program staff has assisted each Co-permittee (on an individual basis) with the implementation of enhanced reporting requirements for IND and IC/ID. To demonstrate consistency and compliance (on a Program-wide basis) with the strategy provided in the Program's technical memoranda regarding IND and IC/ID reporting (dated September 7, 2001) and the approved MC approach, Co-permittees have been submitting raw IND and IC/ID inspection data to Program staff. This data is used to construct IND and IC/ID summary tables. The summary tables are double checked (with the Co-permittees) to ensure that the results are reasonably consistent with their internal data and their interpretation of the data; provided to the Co-permittees for inclusion in their annual reports; and included in the Program's Annual Report. The

overall goal of the effort has been to capture the full extent and the results of the Co-pemittees efforts in a consistent format and on a Program-wide basis. This effort has been very successful in demonstrating compliance with Permit Provisions C.6.a.i and ii. To ensure effective reporting of IND and IC/ID data, Co-permittees intend to continue this process during the implementation of the Revised Multi-Year Plan.

Development of Strategies for Controlling Impacts of Land Use on Beneficial Uses

To implement this priority, the Program supports the SCBWMI Land Use Subgroup (LUS). The Program's participation in the LUS is intended to fulfill a commitment in the 1997 URMP to "translate SCBWMI goals and objectives into model local-jurisdiction policies and procedures." The LUS includes stakeholders representing business interests, developers, environmental advocates, and Regional Board staff, as well as SCVURPPP Co-permittees. As documented in the LUS "Consensus Points" and in Chapter 4 of the SCBWMI Watershed Characteristics Report ("Land Use in the Basin"), the LUS has reviewed and discussed at length the potential effectiveness of various approaches to controlling urban runoff pollutants and other effects of urbanization on streams. A specific approach to integrating municipal land use planning and watershed management is described in Section 4.1 of the Watershed Characteristics Report (unabridged).

In addition to administrative support and leadership for the LUS, the Program has also created additional projects to support the LUS' development of policies and watershed management measures. These projects include: *Economic and Tax Incentives in Watershed Management* and C*ompare and Contrast Development Policies*. The Program encourages the RWQCB staff, as part of developing the revised permit language for new development, to integrate the results of the LUS' work to date, to continue RWQCB staff participation in the LUS, and to work with the Program and LUS to implement consensus recommendations reached within the LUS. The Program intends to monitor the successes of the LUS during the implementation of the Revised Multi-Year Plan. The Program intends to report these efforts through its annual reporting process.

Compile, Maintain and Share Program Watershed Data

The Watershed Assessment Subgroup (WAS) of Santa Clara Basin Watershed Management Initiative (SCBWMI), has a mission to provide the SCBWMI with a solid scientific foundation for watershed planning. One of WAS's tasks is to coordinate the SCBWMI's data collection and data management efforts with stream monitoring studies within the Basin. The Stream Studies Inventory (SSI) is a result of this task and was initially prepared by the Program in November 1998. The purpose of the SSI is to promote inter-agency awareness of environmental investigations within riparian corridors and to facilitate coordination of related data collection and management. It also describes stream-related multi-stakeholder studies and projects that were in-progress in the Santa Clara Basin. The SSI was updated, revised and reissued in February 2000 (version 2.0), July 2001 (version 3.0), August 2002 (version 4.0) and November 2003 (version 5.0). The Program funded the initial development of the SSI and each of the annual updates.

Additionally, to comply with its NPDES permit, the Program compiles, develops and analyzes a variety of data sets and reports. Most of this data is collected and generated as part of the Program's environmental monitoring and assessment activities. A majority

of the information collected and used by the Program originates from different municipalities and agencies that conduct studies within Program jurisdictional boundaries.

The Program developed a relational database as an initial task to systematically describe and document data used for its activities. The intent of the database is to demonstrate its usefulness of how to systematically and efficiently collect and document all of the relevant data used in the Program's activities. In addition, the database was designed to explore the feasibility of eventually expanding and coordinating its maintenance and use with other agencies and organizations in the Program. The database is a metadata database which focuses on the description, documentation, and indexing of the data sets, sources, reports, etc. It does not focus on data. The current metadata database incorporated information on data sources that were documented in the existing SCBWMI's watershed assessment metadata database (MDDB) and the WMI's Stream Studies Inventory Report data (SSI). The Program developed draft written user documentation for the database in FY 02-03.

In an effort to compile, maintain and share watershed data, the Program intends to continue to update the SSI and the Program's relational database, to the extent possible during the implementation of the Revised Multi-Year Plan. Additionally, the Program will report on these efforts during its annual reporting process.

6.0 REPORTING AND QUALITY CONTORL PROCEDURES

Consistent reporting of monitoring activities not only allows the Program to comply with NPDES Permit requirements, but also provides a format to discuss the results of data collection efforts and evaluation of the effectiveness of control measures. Additionally, in any environmental monitoring program effective quality control procedures are necessary to assess the accuracy and completeness of data, and to ensure it's scientifically validity. Lastly, data management is an integral part of environmental monitoring, providing a means to access, query and retrieve data in a relatively easy manner. This section briefly discusses the reporting, quality control and data management activities the Program will undertake during the implementation of the Revised Multi-Year Plan.

6.1 Reporting Procedures and Deliverables

There are a variety of reporting mechanisms the Program utilizes to: 1) demonstrate compliance with monitoring requirements in the Permit; 2) describe monitoring activities conducted; 3) provide an evaluation of information collected; and, 4) suggest next steps, including changes in methodologies, potential management actions and additional data collection efforts. Each reporting mechanism has its purpose and scope, as described below. The following is a list of documents the Program intends to submit to the Regional Board during the implementation of the Revised Multi-Year Plan.

Watershed Characterization and Sampling Design Technical Memorandum

Building on recent watershed monitoring and assessment activities conducted by the WMI and the SCVURPPP, the Program plans to conduct activities entailing the collection and analysis of information needed to further characterize watersheds. To facilitate this process, the SCVURPPP will annually develop a *Watershed Characterization and Sampling Design Technical Memorandum* (Characterization Memo). The purpose of the Characterization Memo is to describe existing readily available information (e.g. watershed attributes, beneficial use information, water quality data) that will aid in the development of a sampling design for a specific watershed(s) that are scheduled for screening-level monitoring to begin during the next fiscal year. Beginning in FY 05-06, the Program will submit the Characterization Memo within its Annual Work Plan. The memo will describe and provide the rationale for the selection of sampling parameters and sites within the watershed scheduled for screening-level sampling in that fiscal year. This task is very similar to activities previously conducted by Program staff when developing the Program's Annual Monitoring Program Plan.

Watershed Monitoring and Assessment Summary Report

Following the first and second year of screening-level monitoring in a given watershed, the Program will develop and submit a *Watershed Monitoring and Assessment Summary Report* (Summary Report). The Summary Report is intended to provide a preliminary analysis of data collected during the previous fiscal year. The Summary Report will discuss the results of implementing the Annual Monitoring Plan, pursuant to Provisions C.8 and C.10(b) of the Program's NPDES Permit, by illustrating the SCVURPPP's support for the WMI by: (1) investigating beneficial uses and causes of impairment; (2) reviewing, compiling, and disseminating environmental data; (3) developing and implementing strategies for controlling adverse impacts of land use on beneficial uses; and, (4) facilitating, implementing, and supporting relevant SCBWMI subgroups.

Furthermore, this Summary Report may also provide information on current or planned watershed management activities and suggest (to the extent possible) next steps needed for continuous improvement in addressing high priorities in each of the subject watersheds. The report will be submitted annually with the Program Annual Report.

Watershed Assessment Report

As described in Section 3.23 and illustrated in Figure 1.0, it is the Program's intent to conduct watershed assessments in specific watersheds within the Santa Clara basin beginning in FY 05-06. Assessments will integrate information collected during watershed characterizations and screening-level assessments to support Program objectives of continuously improving Program components and developing additional ones to support attainment of beneficial uses in selected water bodies. Watershed assessment will be coordinated with other assessment-related activities occurring in the basin, to the extent possible, and will only occur in watersheds identified as high priority by the Program. The *Watershed Assessment Report* (Assessment Report) will document the assessment process implemented in a given watershed and present data gaps that the Program may chose to fill through additional monitoring activities. Additionally, similar to the Coyote Creek Watershed Integrated Pilot Study, potential management actions that will likely enhance beneficial uses may be recommended in the Assessment Report.

Investigative Monitoring Reports

Investigative monitoring/studies include more detailed measurements typically taken in a more defined area (e.g., stream reach). As described in Section 2.4, investigative monitoring activities will be conducted on an as needed basis, where previous monitoring suggests that more detailed studies are warranted and feasible. To document these activities, *Investigative Monitoring Reports* (Investigative Reports) will be developed by the Program as investigative studies are completed. Investigative Reports will likely include a detailed analysis of the methods utilized, a discussion of results and recommended next steps.

Program Annual Reports

The Program annually submits a comprehensive report (Annual Report) to the Regional Board that describes activities conducted during the previous fiscal year that are intended to demonstrate compliance with Permit requirements. Within the report, monitoring and watershed management activities implemented during the previous year are described and an evaluation of the effectiveness of implementing these activities is presented.

6.2 Quality Control Procedures

A thorough and effective quality control program is an essential aspect of any monitoring program. While the specific quality control methods applied may vary with the type of monitoring (e.g., sediment quality, water quality, habitat evaluation) and data quality objectives, a few key activities should be included in the development of the quality control program. These activities include:

- An evaluation and documentation of data quality objectives, data acceptance criteria, and field and laboratory quality control methods;

- A review and documentation of field and laboratory methods, along with appropriate information regarding equipment, personnel, logistics and safety considerations;
- Coordination of each project with other projects in the watershed, to ensure consistency and compatibility of approach and to foster interdisciplinary transfer of data and resources; and,
- Review of the project data (including QA/QC data) to determine where project-specific objectives are or are not being met and to identify any notable QA/QC problems, and modification or revision of study methods as appropriate to provide corrective action where needed.

Since the implementation of the Program's original Multi-Year Plan (FY 02-03), quality control procedures have been followed to the extent possible with available resources. To further document quality control procedures that will be followed, the Program will develop, adopt and implement a Quality Assurance Project Plan (QAPP) related to its watershed monitoring and assessment and POC monitoring activities during the implementation of Multi-Year Plan. The QAPP is intended to help the Program ensure that data collected under the Revised Multi-Year Plan are of adequate quality given the monitoring objectives. Once complete, the QAPP will be included as an Appendix to the Revised Multi-Year Plan.

7.0 ENVIRONMENTAL MONITORING MEASURES - SUMMARY MATRIX

While continuing the programmatic approach to measuring compliance, the SCVURPPP is committed to monitoring and assessing their creeks and the San Francisco Bay. Table 3.0 is provided to illustrate the SCVURPPP's proposed surface water monitoring program for the next six years. Table 3.0 contains the following information: watershed location (prioritized based on WMI and SCVURPPP assessment priorities), data type (chemical, biological and physical), FYs (8 years starting with FY02-03 through FY09-10), rationale, and lead agency. The information on data type utilizes a tiered monitoring approach discussed in Section 2.0 of this document, and includes the following monitoring categories: screening level, investigative, and status and trends. Table 4.0 provides a description of data parameters and analytical methods SCVURPPP intends to use during implementation of its Revised Multi-Year Waters Monitoring Plan.

Table 3.0 (Revised 3/1/04). SCVURPPP 8-year monitoring plan for Santa Clara Basin Watersheds[1].

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Coyote Creek (Only tributaries sampled in FY 02-03)	***Chemical***										
	Contaminants - Water [3]	I (3)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Contaminants - Sediment[4]	I (1)								See FY 02-03 Monitoring Plan	SCVURPPP
	General Water Quality[5]	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Biological										
	Toxicity - Water Quality[6]	I (1)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Conventional Water Chemistry[7]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Pathogens (Indicator Organisms) [8]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment – Macroinvertebrates[9]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment – Fish[10]									See FY 02-03 Monitoring Plan	SCVURPPP
	Physical										
	Physical Habitat[11]	S(4)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Sediment Characterization[12]	S(4)		I	I	I				Identified as high priority for potential impairment from sediment in SCVURPPP sediment report. Conduct studies using methods developed in work associated with sediment workplan.	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									See FY 02-03 Monitoring Plan	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Lower Penitencia Creek	***Chemical***										
	Contaminants - Water Quality	I (2)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Contaminants - Sediment	I (1)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	General Water Quality	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Biological										
	Toxicity - Water Quality	I (2)			I	I				See FY 02-03 Monitoring Plan	SCVURPPP
	Conventional Water Chemistry	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Pathogens (Indicator Organisms)	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment - Macroinvertebrates	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Bioassessment - Fish									See FY 02-03 Monitoring Plan	SCVURPPP
	Physical										
	Physical Habitat	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Sediment Characterization	S(5)			S	S				See FY 02-03 Monitoring Plan	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
San Thomas Aquino	***Chemical***										
	Contaminants - Water Quality		I (6)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP
	Contaminants - Sediment		I (1)							Investigative Monitoring	SCVURPPP
	General Water Quality		S(7)	S(11)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Conventional Water Chemistry		S(7)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality		I (3)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Pathogen Indicator Organisms		S(7)	S(3)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates		S(7)	S(7)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Fish			S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Physical										
	Physical Habitat		S(7)	S(7)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Sediment Characterization		S(7)	S(7)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection currently planned	SCVURPPP
Adobe Creek	***Chemical***										
	Contaminants - Water Quality		I (2)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP
	Contaminants - Sediment		I (1)							Investigative Monitoring	SCVURPPP
	General Water Quality		S(3)	S(5)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Conventional Water Chemistry		S(3)	S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality		I (1)	I (1)		I	I	T	T	Investigative Monitoring	SCVURPPP
	Pathogen Indicator Organisms		S(3)	S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates		S(4)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Bioassessment - Fish			S(2)		I	I	T	T	Screening Level Monitoring	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Physical										
	Physical Habitat		S(4)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Sediment Characterization		S(4)	S(4)		I	I	T	T	Screening Level Monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Matadero/ Barron Creeks	***Chemical***										
	Contaminants - Water Quality			I (3)	I		T	T	T	Screening level monitoring	SCVURPPP
	General Water Quality			S(6)	S		I	I	T	Screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(4)	S		I	I		Screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality			I (2)	I		T	T	T	Screening level monitoring	SCVURPPP
	Pathogen Indicator Organisms			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Fish			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Physical										
	Physical Habitat			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Sediment Characterization			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Calabazas Creek	***Chemical***										
	Contaminants – Water Quality			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	General Water Quality			S(6)	S		I	I	T	Screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Pathogen Indicator Organisms			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Macroinvertebrates			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Bioassessment - Fish			S(2)	S		I	I	T	Screening level monitoring	SCVURPPP
	Physical										
	Physical Habitat			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Sediment Characterization			S(4)	S		I	I	T	Screening level monitoring	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Sunnyvale Channel (East/West)	***Chemical***										
	Contaminants - Water Quality			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	General Water Quality			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	Conventional Water Chemistry			S(3)	S		I	I	T	Screening level monitoring	SCVURPPP
	Biological										
	Toxicity - Water Quality									No data collection is currently	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
										planned	
	Pathogen Indicator Organisms									No data collection is currently planned	SCVURPPP
	Bioassessment - Macroinvertebrates									No data collection is currently planned	SCVURPPP
	Bioassessment - Fish									No data collection is currently planned	SCVURPPP
	Physical										
	Physical Habitat									No data collection is currently planned	SCVURPPP
	Sediment Characterization									No data collection is currently planned	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Stevens Creek	***Chemical***										
	Contaminants - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Conventional Water Chemistry				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	General Water Quality				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Biological										
	Toxicity - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Pathogens (Indicator Organisms)				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	Bioassessment - Macroinvertebrates				S	S		I	I	Baseline data collected by USGS in 1997 and RWQCB in 2002	SCVURPPP
	Bioassessment - Fish				S	S		I	I	Coordinate with SCVWD to obtain permits and/or develop approach to monitor status and trends of steelhead populations.	SCVWD/ SCVURPPP
	Physical										
	Physical Habitat				S	S		I	I	Salmonid habitat survey in 1999 by FAHCE; Visual habitat assessment by RWQCB in 2002	SCVURPPP
	Sediment Characterization		I	I	S	S				Identified as high priority for potential impairment from sediment in SCVURPPP sediment report. Conduct studies using methods developed in work associated with sediment workplan.	SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP
Permanente Creek	***Chemical***										
	Contaminants - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Conventional Water Chemistry				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
	General Water Quality				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Biological										
	Toxicity - Water Quality				I	I		T	T	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Pathogens (Indicator Organisms)				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Bioassessment - Macroinvertebrates				S	S		I	I	Baseline data collected by RWQCB in 2002	SCVURPPP
	Bioassessment - Fish				S	S		I	I	Coordinate with SCVWD to monitor status and trends of resident rainbow trout populations.	SCVWD/ SCVURPPP
	Physical										
	Physical Habitat				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	SCVURPPP
	Sediment Characterization				S	S		I	I	Baseline screening level data collected by RWQCB in 2002	RWQCB/ SCVURPPP
	Channel Dynamics and Hydrology									Potential Data Collection through the Hydromodification Management Plan (HMP)	SCVURPPP
	Riparian Vegetation									No data collection is currently planned	SCVURPPP

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency
Monitoring Activities in watersheds not currently considered in plan.											
San Francisquito Creek		I	I	I						Detailed watershed assessment being conducted by stakeholder workgroup administered by the San Francisquito Creek Joint Powers Authority (JPA)	
Guadalupe River	Contaminants - Water Quality	S 16	S 16	S 16	S 16	S 16	S 16	S 16	S 16	Four reaches. Monitoring is shown as quarterly; actual frequency will be in accordance with RWQCB requirements. Total Hg, Methylmercury, TSS.	SCVWD
	Contaminants - Sediment	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	S(4)	Methylmercury concentrations in riverbed and suspended sediments.	SCVWD
	General Water Quality	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	S(9)	Monitoring used to calibrate model to simulate stream temperature. Key variable for fish survival.	SCVWD
	Bioassessment - Fish	S 17	S 17	S 17	S 17	S 17	S 17	S 17	S 17	Adult migration & spawning; juvenile rearing and/or migration in 17 or more locations.	SCVWD
	Physical										
	Channel Dynamics and Hydrology	S 14	S 14	S 14	S 14	S 14	S 14	S 14	S 14	Channel bottom stability in 14 transects	SCVWD
	Riparian Vegetation	S 23	S 23	S 23	S 23	S 23	S 23	S 23	S 23	Survival, health & vigor, non-native species cover, and/or tree basal area (18 plots)	SCVWD

1 Parameter types are listed with category of monitoring design, which include: (S) screening level, (I) investigative, and (T) status and trends. The number in parentheses represents the number of sampling locations for that sampling period. For FY's 05-06 to 09-19, Parameters types (I and T) only serve as place holders. Future annual monitoring plan submittals will indicate the number of sites where screening-level (S) , investigative (I), and status and trends (T) monitoring will occur in a given watershed.

Watershed Area	Data Type[2]	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	Rationale	Lead Agency

2 Description of analyses conducted for each data type is described in the footnotes below. In some cases, partial analyses may be implemented for data types when existing data satisfies screening level target. Standard analytical methods are indicated in separate table attached to Plan; methods are intended to be congruent with SWAMP/RMAS methodology. Adjustments will be made, if necessary, when SWAMP QAPP becomes available in September 2002.

3 Water Chemistry: Total and dissolved metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se) and organophosphate pesticides; sampling conducted for two times per year.

4 Sediment chemistry: Metals (Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As), PCB, mercury, PAHs and organochlorine pesticides; sampling conducted in the dry season only.

5 General water quality: Temperature, dissolved oxygen, pH and specific conductance (multiparameter probe readings and/or continuous measurements); sampling conducted two times per year.

6 Toxicity testing of water on three species: (1) Ceriodaphnia: 7 day survival and reproduction; (2) pimephales 7-day; and (3) selenastrum test; toxicity conducted at wet and dry season.

7 Conventional water chemistry: Major anions: ortho-phosphate, nitrate, nitrite, chloride, sulfate; total phosphate, boron, TKN, TDS, SSC, ammonia, chlorophyll-a, alkalinity, hardness, TOC and DOC; sampling conducted two times per year.

8 Indicator organisims: total and fecal coliform and *enterococcus*; sampling conducted two times per year.

9 Bioassessment: following CSBP methodology and conducted in the spring season.

10 Rapid bioassessment of fish communities will be done using methods established in the SEIDP or by other standardized methods utilized by the SCVWD or other Co-permittee agencies.

11 Habitat survey physical habitat assessment using CSBP methodology.

12 Sediment characterization includes collecting sediment grain size (full analysis) at sites where sediment samples are collected. Suspended sediment concentrations (SSC) are collected with conventional water chemistry samples. Stream substrate composition is estimated qualitatively during Macroinvertebrate bioassessments and physical habitat surveys.

Table 4.0 Analytical methods used in SCVURPPP Multi-Year Monitoring Plan.

Description of data parameters	Analytical Methods
Pesticides (water) - Organophosphate suite	EPA 8141A
Pesticides (sediment) - Organochlorine suite	EPA 8081A
PCB congeners	EPA 8082
PAH congeners	EPA 8270
ICPMS metals suite (sediment) (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As--all costs)	EPA 6020
ICPMS metals suite (water)--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	EPA 200.8
ICPMS metals suite (water)--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--al costs)	EPA 200.8
Total mercury (sediment)	EPA 245.7/1631M
Major anions nutrient scan: ortho-phosphate, nitrate, nitrite, chloride, sulfate	EPA 365.2, EPA 300
Total Phosphate	EPA 365.2
Boron	EPA 200.8
TKN	EPA 351.3
TDS	EPA 160.1
Suspended Sediment Concentration (SSC)	ASTM D3977-97
Ammonia	EPA 350.3
Chlorophyll-a	SM 10200H/EPA 445.0
Alkalinity	EPA 310.1
Hardness	EPA 130.2
TOC	EPA 415.1
DOC	EPA 415.1
Sediment grain size - full analysis (phi scale)	Plumb/PSEP
Total coliform	SM 9221B
Fecal coliform	SM 9221B
enterococcus	SM 9230B
Ceriodaphnia 7-day Survival & Reproduction	EPA 1002.0 (WET)
Pimephales (fathead minnow) 7 - day	EPA 1000.0 (WET)
Selenastrum (algae) test	EPA 1003.0 (WET)

(WET) Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants (October 16, 1995)

8.0 PROGRAMMATIC MONITORING INDICATORS - SUMMARY MATRIX

Based on the SCVURPPP's experience in implementing Performance Standards, monitoring projects and the continuous improvement process, the Program believes that a key element of its strategy should focus on developing better programmatic indicators and on collecting and analyzing programmatic data. A summary matrix of the various ongoing and planned projects relative to how they address the four major components of the RWQCB's long-term monitoring goals is shown in Table 5.0. The purpose of this table is to give the reader a perspective on the various projects that the SCVURPPP has underway or planned.

In general, specific details on the project scope, expected or completed products and overall due dates can be found in several other reports produced by the Program and are not reproduced in this report. Please refer to the Program's website (www.scvurppp.org) or see the following areas noted below for additional information:

- Project Scopes & Schedules: see the annual monitoring plan contained in the Annual Program Workplans.
- Completed Products: see Table 4-2 contained in the monitoring section of the Program's Annual Reports.
- Status Reports: distributed to AdHoc Monitoring Group and Management Committee at least on a quarterly basis. In addition, the Program discusses the status of various projects on an as needed basis at the BASMAA monitoring subcommittee meetings, special workshops, and various WMI subgroup meetings, in particular the Land Use Subgroup. The results of those presentations and discussions are contained in meeting notes that are distributed to the Management Committee and members of the specific workgroup.

TABLE 5.0
SUMMARY OF ONGOING AND PLANNED SCVURPPP PROGRAMMATIC MONITORING ACTIVITIES

SCVURPPP Programmatic Monitoring Elements	Screening Level[1]	Investigative (targeted – source ID) [2]	Status and Trends Monitoring[3]	Evaluate Management Effectiveness[4]	Status (Expected FY)
Control Programs for POCs					
Copper/Nickel Baseline Actions	Yes	Yes	Yes	Yes	Ongoing
Mercury Pollution Prevention	Yes	Yes	Yes	Yes	Ongoing
Pesticide Control Program	Yes	Yes	Yes	Yes	Ongoing
PCBs Control Program	Yes	Yes	Yes	Yes	Ongoing
Dioxin-like Compounds Control Program	Yes	Yes	Yes	Yes	Ongoing
Trash Management Activities	Yes	Yes	Yes	Yes	Ongoing

SCVURPPP Programmatic Monitoring Elements	Screening Level[1]	Investigative (targeted – source ID) [2]	Status and Trends Monitoring[3]	Evaluate Management Effectiveness[4]	Status (Expected FY)
Performance Standard Monitoring Activities					
Program Data Management & ICID/IND enhanced reporting	No	Yes	Yes	Yes	Ongoing
<u>Land Use Subgroup</u> • Economic and Tax Incentives • Compare and Contrast develop. policies • Stormwater's role in congestion management	No	No	No	Yes	Ongoing

[1] Screening-level monitoring involves the collection and analysis of existing and/or new data (chemical, physical, biological) to characterize baseline conditions.

[2] Investigative monitoring typically includes the collection of more detailed measurements in a defined area (e.g., stream reach), to answer specific questions of impairment our source/causes of adverse impacts to beneficial uses and water quality.

[3] Status and trends monitoring typically involves the periodic collection of new data for comparison against baseline conditions and analysis of trends.

[4] Management Effectiveness monitoring involves designing specific receiving water and/or programmatic monitoring programs to evaluate BMPs and/or the implementation and effectiveness of overall stormwater program activities.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Pilot Trash Structural Treatment Control Study

Implementation Plan

March 2008

EOA inc.

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SCVURPPP Pilot Trash Structural Treatment Control Study Implementation Plan

March 2008

1.0 INTRODUCTION

Consumer items and waste materials including food and beverage containers (e.g., plastic bags and bottles), cigarette butts, food waste, construction and landscaping materials, furniture, electronics, tires and hazardous materials (e.g., paint, batteries) are discarded everyday in the Santa Clara Valley (California). While many of these items are properly disposed of, a portion are inappropriately discarded, 1) onto the urban landscape that drains into a stormwater conveyance systems (i.e., stormwater systems), or 2) directly into local creeks and channels. This portion is collectively called "trash" and once in local water bodies it can adversely impact Santa Clara Valley residents, visitors, fish and wildlife.

Responding to water quality concerns regarding trash, the San Francisco Bay Regional Water Quality Control Board (Water Board) identified trash as a potential pollutant in urban creeks in 2001 and directed municipalities to assess the potential impairment of water quality produced by the presence of trash in creeks within their jurisdiction. The Water Board suggested that Bay Area municipalities define trash problems in water bodies, identify the sources of trash through monitoring or existing information, and develop a program of action to address the principle sources of trash.

In response to the call to action from the Water Board, the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program) began taking additional steps toward improving trash conditions in Santa Clara Valley urban water bodies. Specifically, the Program's Management Committee formed a Trash Ad Hoc Task Group and subsequently developed a multi-year Work Plan that outlined a strategy to address trash in urban creeks and channels in the Santa Clara Valley. Through Work Plan implementation, creek trash assessments were conducted by SCVURPPP Co-Permittees at approximately fifty sites between 2004 and 2007. The goal of the assessments was to better understand the level of trash and potential impacts at creek sites identified as "problem areas". Results suggest that during the wet season, large amounts of trash are conveyed through stormwater from poorly kept commercial facilities, schools, bus stops and roads. During the dry season, wind blown trash from adjacent land uses and illegal dumping on creek banks appear to be the most important trash source-transport combinations. In addition, homeless encampments are sources of trash at some creek sites.

Building on the completion of the Work Plan, Program staff developed a *Draft Trash Management and Effectiveness Assessment Strategy* (Strategy) in October 2006. The Strategy currently serves as a roadmap to guide future trash-related activities conducted by the Program. It includes three main tasks:

1. Identifying trash problem areas and sources;
2. Selecting and implementing appropriate control measures at high priority problem areas; and,
3. Assessing the effectiveness of control measure implementation.

Recent, current and future activities conducted under the Work Plan and the Strategy are illustrated in Figure 1. The *SCVURPPP Pilot Trash Structural Treatment Control Study* (Trash Control Study) described in this implementation plan is designed to assist Co-permittees in completing Task 2.2 of the Strategy.

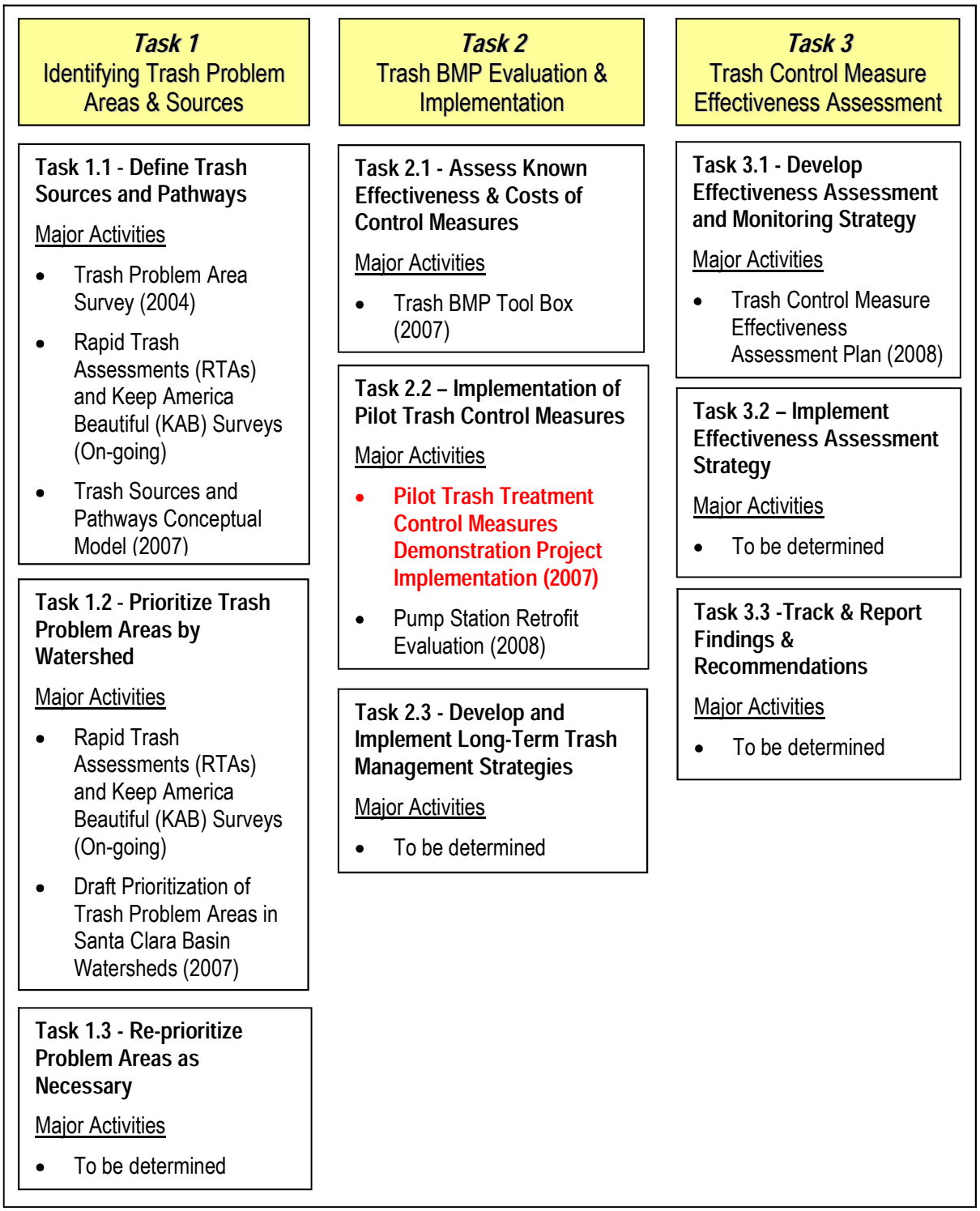


Figure 1. Illustration of the SCVURPPP Pilot Trash Structural Treatment Control Study (Pilot Study) in the context of all major Trash Management and Assessment Strategy tasks.

2.0 BACKGROUND

2.1 Trash Sources and Pathways to Urban Creeks

People are the fundamental source of all trash found in Santa Clara Basin urban creeks and San Francisco Bay. However, similar to other pollutants, more specific sources and associated transport processes must be identified to allow effective management actions to be implemented. Based on creek trash assessments and local agency staff knowledge of how trash is deposited and transported to local water bodies, there are four distinct source categories for trash to urban creeks:

1. **Pedestrians** who lack the willingness to properly dispose of waste or do not have access to waste containers are likely the greatest source of trash in local water bodies. Land areas where pedestrians litter typically include high foot traffic locations (e.g., shopping plazas, convenience stores, parks), transition points (e.g., bus stops, train stations, entrance to public buildings), and special event venues (e.g., concerts, sporting events and fairs).
2. Drivers and passengers who litter from **Vehicles** or do not adequately cover their vehicles when transporting trash and debris are also sources. Land areas that may generate trash from vehicles include roads, highways (on/off ramps, shoulders or median strips) and parking lots.
3. **Waste Containers** (e.g., trash receptacles, recycling bins and dumpsters) that are overflowing and/or uncovered, and improper handling of trash and recycling materials during curbside collection (e.g., residential and commercial areas).
4. **Illegal Dumping** of large volumes of trash within a watershed or directly into a waterway is a source – typically in out of sight locations. This source includes trash illegally dumped or discarded by illegal encampments near or within riparian areas.

Pedestrians, vehicles and inadequate waste container management are generally considered a chronic source of trash in urbanized areas and usually occur where there are high populations of people consuming products and generating waste. In contrast, illegal dumping typically occurs sporadically and in general consists of large items (e.g., furniture and tires) compared to other source categories.

There are also four major trash transport pathways to urban creeks:

A. **Stormwater Conveyance Systems** can transport trash to waterways from any combination of the four source categories described above during storm events and dry weather flows. Small and floatable trash items are particularly susceptible to transport through this pathway.

B. **Wind** can also transport trash to creeks and stormwater conveyance systems, especially when sources are located adjacent to creeks with minimal riparian vegetation and obstructions (e.g., fences).

C. **Direct Disposal** of trash into creeks or along creek banks also serves as a transport mechanism. Illegal dumping and pedestrian litter are the two most prevalent trash source categories applicable to this pathway.

D. **Downstream Transport** of trash can occur once it enters a creek from any of the pathways described above. Depending on the physical characteristics of trash and the creek, trash may accumulate a creek sites or be transported to larger downstream water bodies (e.g., wetlands, bays and estuaries), where additional influence of tide, currents and wind can affect the distribution of trash.

Although the magnitude of trash in urban creeks from each source and transport pathway combination is currently unclear, SCVURPPP and Water Board creek trash assessments suggest that stormwater conveyance systems are an important transport pathway. Therefore, additional information is needed to better quantify the sources of trash entering the stormwater system and the magnitude of trash entering local creeks via this transport pathway.

2.2 Estimated Trash Loading Rates

The composition of the trash, and rate at which it finds its way into the stormwater conveyance system, are highly variable. Contributing factors may include:

- Type and density of land uses (e.g., commercial, industrial and residential);
- Income level and environmental awareness of the community; and,
- Rainfall intensity and antecedent rainfall period.

Several studies have attempted to quantify the amount of trash reaching the stormwater conveyance system from discreet land areas. However, most studies have been conducted in relatively small areas, or for relatively short periods of time, or both. The findings of a portion of these studies are discussed below.

2.2.1 City of Calabazas, CA

The City of Calabasas owns and operates a Continuous Deflective Separation (CDS) unit that receives runoff from a land area of approximately 12.8 mi^2. The urbanized portion of this area is estimated to be about 0.10 mi^2. The volume of trash removed from the CDS unit in 1999 was 2,000 gallons of sludgy water and a 64-gallon bag about two-thirds full of plastic food wrappers. This volume represents approximately nine months of runoff. Based on these data, the Los Angeles Regional Water Quality Control Board (LA Water Board) estimates that the annual loading of trash from this 0.10 mi^2 urbanized area is approximately 64 gallons (640 gallons/ mi^2). These data were used as the current loading rate for the *Trash Total Maximum Daily Load (TMDL) for the Los Angeles River Watershed* (LA Water Board 2007).

2.2.2 City of Los Angeles, CA

The City of Los Angeles conducted an *Enhanced Catch Basin Cleaning Pilot Project* in compliance with a consent decree between the United States Environmental Protection Agency, the State of California, and the City of Los Angeles. The project goals were to determine debris loading rates, characterize the debris, and find an optimal cleaning schedule through enhanced catch basin cleaning. The project evaluated trash loading at two drainage basins: 1) Hollywood Basin (1,366 acres and 793 catch basins), mostly residential with some commercial and open space, and no industrial land; and, 2) Sawtelle Basin (2,267 acres and 502 catch basins) includes residential areas with some commercial, industrial and transportation-related uses, and some open space. The catch basins are inlet structures without a sump below the level of the outlet pipe to capture solids and trash washed down by stormwater. Catch basins were cleaned three to four times from March 1992 to December 1994 and yielded approximately 0.79 yd^3 (160 gallons) of debris per cleaning characterized as paper (26%), plastic wastes (10%), soil (33%), and yard trimmings (31%). The study also observed that the amount of plastic waste was less in residential areas and greater in non-residential areas, that paper waste was greater in commercial areas, and that soil and yard waste was greater in residential areas and open spaces.

In another study by the City of Los Angeles, the amounts of trash generated based on land use were addressed in a report required by the MS4 permit and submitted by Public Works to the LA Water Board on May 3, 2004. The report described the accumulation and cleanout of man-made trash, sediment, and natural vegetation in 500 catch basin inserts and five hydrodynamic separators in the Ballona Creek and Los Angeles River watersheds between November 11, 2002

and March 20, 2004. This period included 15 storm and one dry weather cleanouts. Land use types with highest litter generation per acre were commercial and industrial.

2.3 Trash Best Management Practices (BMPs)

In 2006, SCVURPPP Co-permittees expressed an interest in better understanding the known effectiveness, costs, challenges and applicability of various Best Management Practices (BMPs) designed to reduce trash in municipal stormwater conveyance systems and water bodies receiving urban runoff. In response, the Program staff conducted an extensive literature review on trash BMPs and created the *Trash BMP Tool Box* (Tool Box). The Tool Box examines both institutional (non-treatment) BMPs and stormwater treatment BMPs. Examples of institutional BMPs include, street sweeping, public education campaigns and creek cleanup events. Treatment controls are physical devices that are installed at stormwater catch basins, within the stormwater conveyance system, at an outfall to a creek, or within a water body. Treatment BMPs for trash typically block, separate or catch items transported through this pathway. Common types include catch basin inserts, hydrodynamic separators and outfall netting devices.

Historically, SCVURPPP Co-permittees have attempted to manage trash in watersheds and creeks using a variety of institutional BMPs. Although the effectiveness of institutional BMPs is difficult to assess, some attempts have been made to determine the success of trash removal via street sweeping and receptacle management. In addition, Co-permittees know the costs of their storm drain maintenance and street sweeping programs, and operation and maintenance requirements.

Treatment controls for trash have been implemented by Co-permittees to a lesser extent than institutional controls. Therefore, it is not unreasonable to assume that Co-permittee staff has less understanding of capital and maintenance costs, maintenance requirements and proper application of treatment controls. In addition, many of the treatment controls reviewed in the Tool Box are relatively new and little is known about effectiveness and maintenance requirements/costs.

2.3.1 Full Capture Certification for Treatment BMPs

Many types of stormwater treatment BMPs have been recently piloted Southern California as part of the Total Maximum Daily Load (TMDL) for trash within the Los Angeles River watershed. Based on design and effectiveness considerations, the LA Water Board can designate a trash treatment control as “full-capture” (~100% removal). By definition, full capture treatment devices must:

> *Trap all particles retained by a 5-mm screen, and have a demonstrated treatment capacity that exceeds the peak flow rate resulting from a one-year, one-hour storm in the subdrainage area (LARWQCB 2007).*

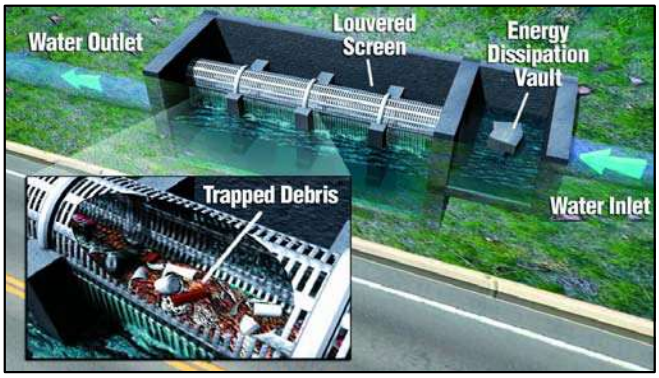
As of October 2007, six full-capture designations have been approved by the LA Water Board. Treatment devices certified as full capture are listed below and examples are presented in Figure 2.

1. Catch basin inserts developed by the City of Glendale, a combination of brush and aluminum mesh;
2. Vertical trash capture screen inserts developed by Advanced Solutions, installed within catch basins;
3. Horizontal trash capture screen inserts developed by Advanced Solutions, installed within catch basins;
4. End-of-pipe trash nets developed by Fresh Creek Technologies, Inc;

5. Linear radial gross solids removal device configuration 1 (LR1 I-10) developed by Caltrans; and,
6. Inclined screen gross solids removal device configuration 1 (IS1 SR-170) developed by Caltrans.

Fresh Creek Technologies End-of-Pipe Netting

Advanced Solutions Vertical Screen Inserts



CalTrans Linear radial gross solids removal device configuration

Figure 2. Examples of treatment devices certified by the Los Angeles Regional Water Quality Control Board as a "full capture" for trash.

3.0 PILOT STUDY OBJECTIVES AND DESIGN

3.1 Study Objectives

Based on (a) the continued focus and challenges associated with reducing trash discharged to Santa Clara Basin creeks and channels through the stormwater conveyance system; (b) the need to better understand the costs, effectiveness, and maintenance requirements related to stormwater treatment BMPs; and, (c) the need to better define major land-based sources of trash and associated land use characteristics, the SCVURPPP Co-permittees have launched a *Pilot Trash Structural Treatment Control Study* (Pilot Study). The Pilot Study is designed to answer the following management questions:

1. What are the trash loading rates from specific land uses to the stormwater conveyance systems?
2. What is percentage of different types of materials (e.g., trash, sediment, leaves, grass) removed by selected treatment devices?

3. What is the maintenance frequency needed for proper operation of selected BMPs?
4. What are the overall costs of treatment per amount (volume or weight) of trash removed?

Specific objectives of the Pilot Study are to:

1. Increase the removal of trash (and to a lesser degree sediment associated pollutants) in stormwater conveyance systems via the implementation of treatment BMPs;
2. Estimate trash loading rates to stormwater conveyance systems in the Santa Clara Basin for various sources and/or land use types;
3. Characterize the types of trash removed by selected treatment BMPs;
4. Determine operation and maintenance requirements and associated costs for treatment BMPs implemented by SCVURPPP Co-permitees; and,
5. Identify opportunities and challenges for future implementation.

In addition, through the implementation of this Pilot Study, Co-permittees will gain valuable information that will assist them in addressing trash control requirements through the Municipal Regional Permit (MRP), which is currently being developed by the SF Bay Water Board.

3.2 Participating Agencies

The two largest cities in Santa Clara County, the City of San Jose and the City of Sunnyvale, agreed to participate in the Pilot Study. Information collected through their participation will allow other SCVURPPP Co-pemittees to gain insight into the most dominant trash sources and the most effect ways to reduce trash from entering urban creeks through stormwater conveyance systems.

3.2.1 City of San Jose

With roughly 950,000 residents, the City of San Jose is the third-largest city in California, and the largest in Santa Clara County. The City is roughly 178 mi^2 in size, has over 30,000 stormwater inlets that receive drainage from land uses presented in Table 1. These inlets convey stormwater to approximately 760 outfalls, which discharge to local creeks.

3.2.2 City of Sunnyvale

The City of Sunnyvale is the second largest city in Santa Clara County with approximately 133,000 residents. Sunnyvale is roughly 23 mi^2 in size, and has roughly 4,183 municipal stormwater inlets, 25 outfalls to local creeks, and 48 outfalls to two storm drainage channels that connect to South San Francisco Bay.

Table 1. Size (mi^2) and percentages of land use types in the cities of San Jose and Sunnyvale (Santa Clara Valley Urban Runoff Management Plan 2000-2005).

Land Use Type	San Jose	Sunnyvale
Commercial	7.1 (4%)	1.75 (7%)
Light and Heavy Industrial	16.2 (9%)	4.5 (18%)
Public/Institutional/Schools	8.9 (5%)	2.25 (9%)
Parks/Open Space	8.9 (5%)	1.25 (5%)
Agriculture/Vacant	7.1 (4%)	1.0 (4%)
Roads	28.5 (16%)	0.5 (2%)
Single Family Residential	105.0 (59%)	7.25 (29%)
Multi-Family Residential		3.75 (15%)
Total	**178**	**25**

3.3 Selection of Trash Treatment Device

To determine the type(s) of treatment devices that could be implemented during the Pilot Study to meet the objectives of the Pilot Study, the Program reviewed existing information presented in the Trash Tool Box. The following criteria were used to select the device(s) appropriate for the Pilot Study:

1. Must be certified as "full-capture" by the LA Water Board to have confidence in the data for developing trash loading rates;
2. Should be relatively easy to install and remove if flooding becomes an issue;
3. Should have been successfully installed and maintained by municipalities in Southern California and applicable to the types of drainage infrastructure in the cities; and
4. Should be relatively easy to maintain by Public Works crews at minimal costs.

Based on these criteria and extensive field reconnaissance, the City of San Jose and the City of Sunnyvale selected a catch basin insert device designed and produced by Advanced Solutions as the primary trash treatment BMP that will be used during the Pilot Study. The StormTek™ catch basin insert is designated as a full capture treatment device and consists of a perforated metal screen placed horizontally or vertically in front of the storm drain pipe outlet within a catch basin (Figure 3). The StormTek™ device is capable of catching smaller and larger debris and uses the volume of the catch basin to retain trash before it is conveyed through the stormwater conveyance system. The debris captured remains until it is removed by a maintenance crew. In addition, the StormTek™ device is scalable to fit many catch basin sizes and dimensions. This makes them uniquely appropriate in cities with older stormwater infrastructure like the Cities of San Jose and Sunnyvale.

Figure 3. Example of the StormTek™ catch basin inserts which was selected for the SCVURPPP Pilot Study.

3.4 Study Area Selection and Characterization

Approximately 80 StormTek devices will be installed in the Cities of San Jose and Sunnyvale. The devices will be located to help meet two objectives of the Pilot Study. First, the participating cities are interested in maximizing the volume of trash removed through the Pilot Study (i.e., Objective #1). Therefore, the most direct way to achieve this objective is to install StormTek™

devices in catch basins that receive drainage from land use types previously identified as generating relatively large volumes of trash. These include commercial and multi-family residential land uses, schools, and bus stops. Approximately 35 catch basin inserts will be installed in these types of areas within the two cities. The second objective is to develop trash loading rates for areas believed to be generating relatively moderate volumes of trash (e.g., industrial and single-family residential). The remaining catch basin inserts (~45) will be installed in locations with these land use characteristics.

To better characterize the area draining to each catch basin where a StormTek™ device will be installed, the following information is being documented:

- Size of area draining into catch basin;
- Percentage of each land use within the drainage area, including roads;
- Presence of bus or train stops;
- Presence of improper container management (e.g., overflowing dumpsters or trash receptacles); and
- Presence of other sources.

3.5 Data Collection Methods

After installation, the basins will be visually inspected after each of the first 3 storm events (>0.25”). Most of the catch basins within the two participating cities are small (approximately 24”w X 24”d X 26”h) and may rapidly fill with debris. Therefore, frequent inspections at the onset will be necessary to determine the required maintenance frequency and volume/type of trash captured. Following these initial inspections, the frequency of inspection may be re-evaluated. At each visual inspection, the information on the *Standard Catch Basin Inspection/Cleaning Data Collection Form* (Data Collection Form) in Appendix A will be recorded. Public works crews will maintain the devices by vactoring the basins and cleaning screens as needed. At each maintenance event, information will also be recorded on the Data Collection Form. All data will be tabulated in Excel and managed by Program staff.

3.6 Data Analysis Techniques

Following the completion of the Pilot Study, all data will be compiled into a single database. Data will be used to answer the management questions described in Section 3.1. Specifically, trash volumes captured will be used to assess temporal and spatial patterns and develop preliminary trash loading rates for land uses. In addition, maintenance frequency and cost estimates will be developed to assist future trash implementation activities. Data will be presented graphically and in tabular formats.

4.0 PILOT STUDY SCHEDULE

All StormTek™ devices are expected to be installed no later than spring 2008. Data will be collected throughout two wet weather seasons (FY 2007- 2008 and FY 2008- 2009) and one dry weather season (2008) to characterize wet and dry weather loading rates. An update will be reported within the Program’s FY 2007-2008 Annual Report. A final report will be developed following the completion of the Pilot Study.

5.0 REFERENCES

Los Angeles Water Board (2007). Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the TMDL for Trash in the Los Angeles River Watershed. August 9, 2007.

Appendix A

Standard Catch Basin Inspection/Cleaning Data Collection Form

Santa Clara Valley Urban Runoff Pollution Prevention Program

Standard Catch Basin Inspection/Cleaning Data Collection Form

Date: _____ Time: _____ City: _____

I. CATCH BASIN INFORMATION	
Inlet #:	Street:
Block Map #:	Cross Street:

II. ACTIVITY

☐ Inspection ☐ Cleaning ☐ Both Time Spent Inspecting/Cleaning: _____ minutes

III. WEATHER CONDITIONS (Check all that apply)

☐ Rain ☐ Clear ☐ Other: _____
☐ Heavy Rain ☐ Cloudy
☐ Drizzle ☐ Windy

III. REASON FOR INSPECTION/CLEANING

☐ Initial ☐ Follow-up ☐ Other: _____
☐ Routine ☐ Response to Complaint

IV. INSPECTION OBSERVATIONS

1. Material Observed (**Provide Percentage Observed**):
☐ Leaves _____ ☐ Grass _____ ☐ Sediment _____ ☐ Paper _____
☐ Plastic _____ ☐ Metal _____ ☐ Other: _____

2. Approximate Depth to Debris/Material: _____ inches 3. Percentage of Catch Basin Full: _____

4. Needs Maintenance? ☐ Yes ☐ No If Yes, What? _____

5. Functioning Correctly? ☐ Yes ☐ No If No, Why? _____

6. Needs Cleaning? ☐ Yes ☐ No 7. Evidence of Bypass? ☐ Yes ☐ No

8. Is Catch Basin Accessible? ☐ Yes ☐ No If No, Why? ☐ Can't Open ☐ Vehicle ☐ Other: _____

9. Additional Comments/Notes: _____

V. CLEANING/MAINTENANCE ACTIVITIES

1. Describe Cleaning Activities: _____

2. Return Inspection Needed? ☐Yes ☐No ☐Comments _____
3. Priority for Reinspection: ☐High ☐Medium ☐Low
4. Additional Comments/Notes: _____

EOA, Inc.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

MEMORANDUM

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TO: **Trash Ad Hoc Task Group (TAHG)**

FROM: **Paul Randall and John Fusco, Program Staff**

DATE: **August 24, 2006 (Final)**

SUBJECT: **Trash Problem Area Evaluation Results- FY 05-06**

The purpose of this memorandum is to provide summary results of the Co-permittee trash evaluations conducted during FY 05-06 (September 2005 through July 2006). Program staff will conduct a more detailed analysis of trash evaluation data collected during FY 04-05 and FY 05-06. A technical memorandum detailing the analysis will be completed by the end of CY 2006.

Background

On May 10, 2004, SCVURPPP completed a technical memorandum entitled *Trash Problem Area Survey Results* which documented the location, reported ownership, trash source, information resource and relevant comments for 195 potential trash problem areas within the Program's jurisdiction. Sixty-four sites were located in creeks or in close proximity to a creek (i.e., banks); and 131 sites were located in areas that were not in the creek (e.g., areas near dumpsters, freeway exit ramps, road sides, etc.). This list of potential trash problem areas is expected to change over time as additional information becomes available through future implementation of trash evaluations and management practices.

In FY 04-05, Co-permittees conducted evaluations at a subset of the trash problem areas using two existing protocols (i.e., Regional Water Quality Control Board (RWQCB) Rapid Trash Assessment (RTA) Protocol (Version 7.0) and the Keep America Beautiful (KAB) Litter Index). The RWQCB Rapid Trash Assessment Protocol (Version 7.0) was used to qualitatively assess trash conditions in wadeable creeks and the KAB Litter Index was used to evaluate trash problem areas not located near creeks. During FY 04-05, Co-permittee staff and volunteers from watershed stakeholder groups conducted a total of 189 trash evaluations, including 146 trash evaluations using the KAB Litter Index (i.e., non-creek sites) and 43 trash evaluations using the RWQCB Rapid Trash Assessment Protocol (Version 7.0) (i.e., creek sites). A summary of the trash evaluation results was provided in the Program's *FY04-05 Annual Report*.

To improve the effectiveness of the Water Board RTA Protocol (Version 7.0), the Program's Trash Ad Hoc Task Group (Trash AHTG) agreed that refinements were necessary to better address trash problem areas located in urban creeks. The Water Board RTA Protocol (Version 7.0) was developed to assess a range of trash conditions in urban and rural creeks. As a result, the protocol was not designed to evaluate conditions of trash-impacted sites in urban streams, especially downstream reaches of a watershed. To evaluate trash problem areas in urban

creeks, the Trash AHTG requested that a separate "Urban RTA" be developed to identify, prioritize and evaluate trash management activities over time. The Urban RTA is intended to be used by Co-permittee staff to evaluate and monitor trash problem areas in urban creeks within the Santa Clara Basin. However, this protocol may also be used by other agencies and/or stormwater Programs within the San Francisco Bay area.

During FY 05-06, Co-permittees implemented the Urban RTA (Version 1.0) for trash evaluations of creek sites. In addition, the Program revised the format for reporting trash evaluation results to improve consistency of Co-permittee responses and to enhance the analysis of trash assessment data on a Program-wide basis. The information collected during the trash evaluations conducted in FY 05-06 is presented below.

Summary Results

Co-permittees conducted a total of 233 trash evaluations, including 206 trash evaluations using the KAB Litter Index (i.e., non-creek sites) and 27 trash evaluations using the Urban RTA Protocol (Version 1.0) (i.e., creek sites). *Table 1: Summary Results of FY 05-06 Trash Evaluations* provides scores (for both KAB and RTA trash evaluations) by watershed. A total of 149 unique sites were assessed. The KAB Litter Index was used at 128 sites and the Urban RTA Protocol at 19 sites. A combination of the KAB and Urban RTA Protocol was used at two sites. Nine of the sites evaluated were new sites (i.e., not previously listed in the memorandum entitled *Trash Problem Area Survey Results* dated May 10, 2004).

Seventy-two sites were evaluated more than once (i.e., two to five times), typically during different seasonal time periods (i.e., late fall/winter and spring/ early summer). The re-assessed sites included 66 non-creek sites and six creek sites. Subsequent evaluations at non-creek sites indicated that there was no change in score for fifty percent of the sites, higher scores occurred at twenty-five percent of the sites (i.e., conditions degraded) and lower scores occurred at twenty-five percent of the sites (i.e., conditions improved). Subsequent evaluations at creek sites indicated that over 80 percent of the sites (n=5) exhibited higher scores (i.e., conditions improved) and about 20 percent of the sites (n=1) exhibited no change in score. Improved trash conditions during subsequent evaluations may be related to trash being removed by Co-permittee staff during the first trash evaluation.

Seventy percent of the trash evaluations were conducted in the Guadalupe River (n=64), San Tomas Aquino Creek (n=45), Calabazas Creek (n=29) and Sunnyvale East Channel (n=26) watersheds. Detailed Co-permittee trash evaluation results are provided within the attached table entitled *Trash Evaluation Area Results by Watershed*. Information within this table includes the following: (ID #, date, location of trash problem area, assessment tool, score, existing management actions, recommended management actions and/or future evaluations). The approximate physical location, score rating (for both KAB and RTA trash evaluations) and major watershed boundaries within the Santa Clara Basin are provided within Figures 1 through 6. The following results were observed during FY 05-06.

KAB Litter Index – Non-Creek Sites

The KAB Litter Index uses a four-point scoring system to estimate the presence of litter within a specific area. To ensure consistent KAB Litter Index scoring between Co-permittees, Co-permittee staff reviewed materials developed by Keep America Beautiful. These materials included written descriptions (on how to score), photographs (which show conditions) and a training video (which detail how to conduct an evaluation). Several Co-permittees increased the resolution of the original KAB litter scale by assigning scores as fractions. The following describes the modified scoring system of the KAB Litter Index: 0 – 1.0 ("no litter"); 1.1 – 2.0 ("slightly littered"); 2.1 – 3.0 ("littered"); and 3.1 – 4.0 ("extremely littered").

- Seventy-eight percent of the sites were scored as "no litter" or "slightly littered";
- Eighteen percent of the sites were scored as "littered". Only four percent were scored as "extremely littered";
- Guadalupe River and San Tomas Aquino Creek watersheds had the greatest number of sites, twenty-four and eighteen respectively, that were scored as "no litter" or "slightly littered";
- Guadalupe River, Calabazas Creek and Sunnyvale East watersheds had the greatest number of sites, seven, five and three, respectively, that were scored as "littered"; and
- Guadalupe River and San Tomas Aquino Creek watershed had five and two "extremely littered" sites, respectively. (**Note**: Guadalupe River is the second largest watershed in the Santa Clara Basin and contained the greatest number of sites (n=34) and evaluations (n=64) compared to all other watersheds. As a result, Guadalupe watershed exhibited a wide range of trash conditions).

The majority of trash problem areas in non-creek areas occurred adjacent to roadways (28%), commercial areas (22%) and residential homes (16%) and apartments (12%). Seventy-five percent of the most prevalent trash items reported by Co-permittees during KAB evaluations (n=259) were biodegradeable/paper (41%) and plastic/Styrofoam (35%). Approximately twenty percent of the reported trash items observed during these evaluations were a combination of miscellaneous items (includes cigarette butts), glass and metal (**Note**: the actual number of trash items was not recorded). Sixty-three percent of the suspected trash sources reported by Co-permittees during KAB evaluations (n=242) included litter from both pedestrians (32%) and vehicular traffic (31%). Approximately thirty percent of the remaining trash sources reported was from a combination of litter at commercial areas, illegal dumping, homeless encampments, litter at schools and dumpsters.

The most common recommended management actions reported by Co-permittees (n=130) include the following : referral to agency staff (e.g., public works, solid waste and police); coordinate with Cal Trans; inclusion into existing clean up programs; and conduct public education outreach to businesses and schools. Fifty percent of the responses recommended future assessments. However, sixteen percent of the responses (n=21) indicated no trash problem and recommended removal of the trash problem area from the list. Over twenty-five percent of the responses indicated that existing management actions were adequate at the site.

During FY 05-06, a higher number of trash evaluations were conducted in non-creek areas (n=206) compared to FY 04-05 (n=146). Trash scores were very similar for both years with seventy-five (FY 04-05) and seventy-eight percent (FY 05-06) of all sites scored as "no litter" or "slightly littered". Similar to FY 04-05, there was no consistent pattern in changes of trash condition over time at non-creek sites. In addition, KAB assessment results did not indicate any spatial relationships between littered non-creek sites and creek sites with poor/marginal trash

condition. The KAB assessment results were not conclusive for identifying and prioritizing trash problem areas that are sources of litter in the creeks.

SCVURPPP Urban Rapid Trash Assessment (RTA) – Creek Sites

The Urban Rapid Trash Assessment consists of six assessment parameters (with narrative descriptions) that qualitatively rate the trash condition of each parameter on a scale of 0 – 120. The range of scores for each parameter is divided into four categories: "poor", "marginal", "suboptimal" and "optimal". The total site score represents the summation of the six individual parameter scores. For the purposes of this analysis, the total site score was divided into the same four categories: 0 – 30 ("poor"); 31 – 60 ("marginal"); 61-90 ("suboptimal"); and (91 – 120: "optimal").

- Ninety-five percent of the sites were scored as "optimal" or "suboptimal";
- Five percent of the sites were scored as "marginal"; no sites were scored as "poor";
- Nine sites identified as optimal (scores of 91 to 120) were located in lower reaches of San Francisquito Creek (n=3); middle reaches of Stevens Creek (n=3), and middle or lower areas of Calabazas Creek, Adobe Creek and Sunnyvale West Channel watersheds (one site within each watershed);
- Eleven sites identified as suboptimal (scores of 61 to 90) were located in the middle and lower reaches of six different watersheds or within the Baylands (n=2);
- One site scored as marginal (scores of 31 to 60) occurred in Coyote Creek; and
- Volume of trash removed during an Urban RTA evaluation typically ranged from a partially filled garbage bag (less than one cubic foot) to two filled garbage bags (32 gallon size or about three cubic feet).

The majority of trash problem areas in creek areas occurred adjacent to roadways (28%), residential (23%) and park/trail land uses (20%). Fifty-four percent of the most prevalent trash items reported by Co-permittees (n=56) during Urban RTA evaluations were plastic/Styrofoam (34%) and biodegradeable/paper (20%) (**Note:** trash items are classified and enumerated for a 100 foot section of stream). Over forty percent of the remaining trash items reported, in order of most frequent, were a combination of glass, miscellaneous, construction materials and metal. Over seventy percent of the suspected trash sources reported by Co-permittees (n=51) during Urban RTA evaluations included litter from pedestrians (31%); upstream/stormdrain catchment (18%); and litter from vehicular traffic (12%) and recreational areas (10%). Approximately thirty percent of the remaining trash sources reported was from a combination of litter at commercial areas, illegal dumping, homeless encampments, litter at schools and dumpsters.

A majority of the sites were reported to have ongoing clean up efforts related to channel maintenance activities. The most common recommended management actions reported (n=21) by Co-permittees include the following: increase enforcement or police patrols; support volunteer clean up programs; conduct public education outreach to homeowners associations and schools; and install new BMPs (i.e., fences along roadway). Over fifty percent of the responses recommended future assessments, in some cases to evaluate effectiveness of upstream management actions. A small number of responses (n=3) indicated that existing management actions were adequate.

During FY 05-06, a fewer number of trash evaluations were conducted in creeks (n=27) compared to FY 04-05 (n=43). This was partly due to unseasonably high flows during spring and early summer 2006. The SCVWD is planning to conduct trash assessments at creek sites during fall 2006. Overall trash scores for creek sites evaluated in FY 05-06 were generally

much higher (i.e., better condition) than creek sites evaluated in FY 04-05. Ninety-five percent of the creek sites evaluated in FY 05-06 were scored "optimal" or suboptimal", while twenty-three percent of the creek sites evaluated in FY 04-05 were scored "optimal" or suboptimal". The higher overall scores in FY 05-06 may have been the result of the following conditions: 1) fewer creek assessments, with many new sites that were not previously identified as trash problem areas; 2) revisions to the Water Board RTA Protocol (Version 7.0) that were incorporated into the Urban RTA Protocol implemented in FY 05-06; and 3) large storms resulting in high stream flows during winter and spring season of FY 05-06. This may have resulted in more flushing of litter and debris out of previously identified trash problem areas and redistributing the material in other locations downstream.

Conclusions

KAB trash evaluation results for non-creek sites indicate that a majority of the trash problem areas have no or limited amounts of litter (i.e., seventy-eight percent). A majority of these sites occurred in roadways, commercial and residential land uses. The prevalent trash items observed during evaluations was biodegradable/paper and plastic/Styrofoam. Sources of trash were reported to be primarily from littering by pedestrian and vehicular traffic. Preliminary analysis of sites evaluated more than once indicated that there was no consistent pattern in changes of trash condition over time. In addition, KAB site locations and assessment scores did not appear to have any spatial correlation with location and severity of trash problem areas in creeks. As a result, current implementation of the KAB assessment tool does not appear to be useful approach for identifying potential sources of litter in creeks.

Urban Rapid Trash Assessment evaluation results for creek sites indicate that the majority of the trash problem areas were scored as "optimal" or "suboptimal" (i.e., ninety-five percent). A majority of these sites occurred in roadways, residential and park/trail land uses. These sites contained primarily plastic/Styrofoam and biodegradeable/paper items, which are highly mobile litter easily transported by wind and water. Sources of trash were reported to be primarily from littering by pedestrians and vehicle traffic, upstream/stormdrain catchments and recreational areas. There were no apparent spatial patterns for trash conditions in creeks (i.e., optimal and suboptimal sites were located in upper, middle and lower reaches of watersheds). Preliminary analysis of sites evaluated more than once indicated that there was improvement in trash condition over time. Improved trash conditions during subsequent evaluations may be related to trash being removed by Co-permittee staff during the first trash evaluation. Overall trash scores for creek sites evaluated in FY 05-06 were generally much higher (i.e., less impacted) than creek sites evaluated during FY 04-05. These results may be due to the limited number of creek assessments conducted at trash problem areas during FY 05-06 and revisions made to the RTA protocol between the two assessment years.

Next Steps

Co-permittees have identified the following tasks in the FY 06-07 Work Plan: 1) identify high priority areas to continue conducting trash evaluations; 2) identify and begin to implement or refine existing trash control measures, as appropriate, to address these areas; and 3) implement pilot demonstration project using structural best management practices. The Trash AHTG will continue to meet on a quarterly basis to continue discussing the results of trash evaluations and potential implementation strategies.

To support Co-permittee staff in completing the tasks listed above, Program staff will complete a technical memorandum to meet the following objectives:

1. Provide "lessons learned" regarding the utility of the assessment tools currently being used. Determine if the KAB Litter Index is useful for identifying potential sources of trash observed in creek sites and in what cases, if any, it should continue to be used for assessing condition of trash in non-creek areas. In addition, determine the most effective approach for using the Urban RTA Protocol (i.e., timing and frequency);
2. Conduct analyses of trash evaluation information on a watershed basis. Data to be analyzed will include information from trash evaluations of creek sites conducted by the Santa Clara Valley Water District during fall 2006. Information will be assessed to help determine high priority watershed areas (i.e., most severe trash problems); and other urban areas of interest (e.g., parks and recreational areas) to focus future assessments and management actions;
3. Identify location and type of structural BMPs to install and monitor effectiveness and potential downstream reductions in storm drain conveyed trash as part of pilot demonstration project.

Program staff will present a draft technical memorandum to the Trash AHTG by the end of 2006.

Table 1: Summary Results of FY 05-06 Trash Evaluations

		KAB Litter Index					Urban RTA Protocol (Version 1.0)				
Watershed	Total Scored	No Litter	Slightly Littered	Littered	Extremely Littered	Total	Poor	Marginal	Suboptimal	Optimal	Total
Adobe	8	1	5	1	0	7	0	0	0	1	1
Baylands	5	1	0	1	0	2	0	0	3	0	3
Calabazas	29	10	11	7	0	28	0	0	0	1	1
Coyote	9	1	5	1	0	7	0	1	1	0	2
Guadalupe	64	19	28	9	7	63	0	0	1	0	1
Lower Penetencia	11	4	5	2	0	11	0	0	0	0	0
Matadero/Barron	10	6	3	1	0	10	0	0	0	0	0
Permanente	0	0	0	0	0	0	0	0	0	0	0
San Francisquito	11	3	2	0	0	5	0	0	2	4	6
San Tomas	45	22	14	2	4	42	0	0	3	0	3
Stevens	11	4	1	0	0	5	0	0	2	4	6
Sunnyvale East	26	7	13	4	0	24	0	0	2	0	2
Sunnyvale West	4	0	2	0	0	2	0	0	0	2	2
Trash Problem Areas	**233**	**78**	**89**	**28**	**11**	**206**	**0**	**1**	**14**	**12**	**27**

Key		
Trash Evaluation Method	Condition Category	Range of Scores
KAB Litter Index	No Litter	0-1.0
	Slightly Littered	1.1-2.0
	Littered	2.1-3.0
	Extremely Littered	3.1-4.0
RWQCB RTA Protocol (Version 7.0)	Optimal	91-120
	Suboptimal	61-90
	Marginal	31-60
	Poor	0-30

Trash Problem Area Evaluation Results by Watershed

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
			Adobe Creek			
LA12	6/28/2006	Central Plaza behind Home Consignment	KAB	2.5	Routine cleanup	Routine cleanup
LA02	6/28/2006	North Plaza btwn 1st & 2nd Streets	KAB	2	Routine cleanup	Routine cleanup
LA08	6/28/2006	Bus Stop on San Antonio Road north of Almond Ave	KAB	2	Routine cleanup	Routine cleanup
LA09	6/28/2006	Intersection of Main Street and Second Street	KAB	2	Routine cleanup	Routine cleanup
LA10	6/28/2006	Bus Stop on San Antonio Road btwn El Camino Real and Loucks	KAB	1.5	Routine cleanup	Routine cleanup
LA03	6/28/2006	Bus Stop btwn El Camino Real & Acadia	KAB	1.5	Routine cleanup	Routine cleanup
LA01	6/28/2006	Hetch Hetchy pathway	KAB	1	Routine cleanup	Routine cleanup
WD17	5/24/2006	Adobe Creek @ El Camino Real	RTA	93	Clean four times a year	None are required.
			Baylands			
PA07	6/16/2006	Highway 101 at University Avenue	KAB	3		Continue to monitor with proposed Summer 2005 Action Plans.
PA05	6/13/2006	Flooding Basin Tide Gate Trash Rack	KAB	1		Recommend removal from list.
CL01	5/10/2006	Stevens Creek - La Avenida site	RTA	67	Site is cleaned up at least twice each year by volunteers and park patrol cleans up daily along the trail area.	The majority of litter/debris observed comes from upstream sources. May be a good point to continue monitoring to determine if upstream measures to control litter are effective.
PA06	5/24/2006	Matadero Crk 200' d/s E. Bayshore Rd	RTA	76	Clean four times a year.	Install fences along highway.
PA06	6/15/2006	Matadero Creek at East Bayshore Rd	RTA	86		Continue to monitor with proposed Summer 2005 Action Plans.
			Calabazas Creek			
SU13	5/24/2006	Willow and Aster intersection	KAB	3	City monitors area periodically and cleans it when requested. Public works staff were notified of debris accumulation in ROW. Debris from Lawrence Expy is under County jurisdiction.	PW was notified to pick up illegally dumped debris along roadway ROW. Continue to monitor for illegal dumping activities. Not adjacent to a waterway. Side slope of Lawrence Expy with less litter observed - may have been cleaned by County.
SC11	5/3/2006	3700 El Camino Real	KAB	3	Police Dept. controls homeless encampments. Violation notices are given to commercial stores if trash can be linked to their operations.	Increase enforcement and continue to evaluate for trash.
SU12	12/8/2005	Lawrence Expy and Highway 237 on-ramps and exits	KAB	3	CalTrans cleans the area periodically. (It was cleaned up about a week after the observations were made.	Continue to monitor the site. Work with SCVURPPP to identify mechanism for notifying CalTrans when there is a significant accumulation.
SU12	5/24/2006	Lawrence Expy and Highway 237 on-ramps and exits	KAB	2.5	CalTrans had cleaned portions of the west-bound on and off-ramp areas about 2-3 weeks before the assessment was completed.	Continue to monitor the site. Work with SCVURPPP to identify mechanism for notifying CalTrans when there is a significant accumulation.
SU09	5/24/2006	1131 Lawrence Expy	KAB	2.5	Site in need of housekeeping - overflowing dumpsters and litter around back alleyway.	Notified Public Works- Solid Waste division regarding dumpster and alley-way litter problems.

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
SU13	12/12/2005	Willow and Aster intersection	KAB	2.5	City monitors area periodically. Cleans up ROW debris on City street. Debris from Lawrence Expy is under County jurisdiction.	PW was notified to pick up debris at site. Continue to monitor for illegal dumping activities. Not near a waterway. Illegal dumping debris was picked up by City crews. Need to identify County contact for Lawrence Expy clean up.
SC01	5/3/2006	French Street and Agate Drive	KAB	2.25	Routine inspections are conducted on a regular basis.	Continue evaluating for trash.
SA04	6/30/2006	This address has been corrected because Brookglen does not cross Lawrence Expwy. The actual site is near W. Wallbrook Dr. at the end of Brookglen. This site was thought to be in Saratoga but after further review it appears to be located about 3 blocks fr	KAB	2	This site is located at a walkthrough between a residential neighborhood and Lynbrook High. Litter was trapped in the cyclone fence at the field entrance. Will assess twice a year.	Consider removing from Saratoga's list since it is in San Jose.
SU20	12/8/2005	Wildwood Drive and Lawrence Expressway	KAB	2	City monitors the area in their ROW and picks up debris as needed.	Notified PW about the shopping carts for pick up and the cardboard boxes/debris. City crews picked up the site. Continue to monitor, but not significant threat to storm drains in the area.
SC11	1/19/2006	3700 El Camino Real	KAB	1.75	Police Dept. controls homeless encampments. Violation notices are given to commercial stores if trash can be linked to their operations.	Increase enforcement and continue to evaluate for trash.
SU20	5/24/2006	Wildwood Drive and Lawrence Expressway	KAB	1.5	City monitors the area in their ROW and picks up debris as needed.	Very little trash visible at this time. Continue to monitor, but not significant threat to storm drains in the area.
SU10	5/24/2006	911 Duane Ave	KAB	1.5	Dumpster and alleyway are gated to prevent illegal dumping. Some litter from materials being placed in dumpster. In need of litter pick up.	Continue to monitor the site and if sufficient amount continues to be there, notify PW - solid waste to request enforcement. Litter amount visible was relatively small and not an immediate threat to waterways.
SU10	12/8/2005	911 Duane Ave	KAB	1.5	Dumpster and alleyway are gated to prevent illegal dumping. Some litter from materials being placed in dumpster. In need of litter pick up.	Continue to monitor the site and if sufficient amount continues to be there, notify PW - solid waste to request enforcement. Litter amount visible was relatively small and not an immediate threat to waterways.
SU06	5/25/2006	1053 E. El Camino	KAB	1.5	Some litter in the parking lot, a few pieces observed near dumpster, but dumpster was not full.	Continue to periodically monitor the site for problems. However, this should not be a priority site since it is not near any water bodies and the quantity of litter observed is small.
SU06	12/12/2005	1053 E. El Camino	KAB	1.5	Site was assessed before the dumpster was picked up that day.	Continue to periodically monitor the site for problems.
SU03	5/24/2006	Tamarack Lane, Helen Ave,and Miramar Way * note SU 02 and SU 03 were combined as they were adjacent to each other and with similar litter problems.*	KAB	1.5	No current city actions other than periodic monitoring.	Contacted Public Works staff an notified them of the shopping carts and the businesses they belong to. PW policy is to contact the business owners and require their removal. Litter was only a very minor issue at this site.
SU03	12/12/2005	Tamarack Lane, Helen Ave,and Miramar Way * note SU 02 and SU 03 were combined as they were adjacent to each other and with similar litter problems.*	KAB	1.5	No current city actions other than periodic monitoring.	Contacted Public Works staff an notified them of the shopping carts and the businesses they belong to. PW policy is to contact the business owners and require their removal. Litter was only a very minor issue at this site.
SC01	1/19/2006	French Street and Agate Drive	KAB	1.5	Routine inspections are conducted on a regular basis.	Continue evaluating for trash.

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
CU01	10/17/2005	Tantau and Finch Avenues, vacant lot: private property	KAB	1	Very little to no trash observed at this location. Removed existing litter. This location is not near a waterway. Code Enforcement notified property owner in FY 04-05 and trash management activities were implemented.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
CU03	10/18/2005	Disney Lane near Miller adjacent to Hyde Jr. High; private property	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
SA01	6/30/2006	Calabazas Creek at intersection of Southern Pacific Railroad and Arroyo De Arguello (between Norada Court and Grenada Court)	KAB	1	Assess once or twice a year.	Land owned by Santa Clara Valley Water District and Pacific Gas and Electric. Consider removing from list. Area is very clean.
CU01	6/6/2006	Tantau and Finch Avenues, vacant lot: private property	KAB	1	Very little to no trash observed in this location. Removed existing litter. This location is not in a waterway. Code Enforcement notified property owner in FY 04-05 and trash management activities were implemented.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
CU03	6/8/2006	Disney Lane near Miller adjacent to Hyde Jr. High; private property	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
SU04	12/12/2005	1034 E. El Camino	KAB	1	New trash compacter and enclosure fencing. Suggest removal from Hot Spot list	Remove from future inspections. Due to changes in trash containment, litter is no longer an issue at this site.
SU09	12/8/2005	1131 Lawrence Expy	KAB	1	It appears that the property owner is keeping the site clean. The few pieces of litter observed could have come from parked cars.	Continue to monitor, but should consider removing from list since trash problems are minimal.
SU04	5/24/2006	1034 E. El Camino	KAB	1	New trash compacter and enclosure fencing. Suggest removal from Hot Spot list	Remove from future inspections. Due to changes in trash containment, litter is no longer an issue at this site.
SC10	1/19/2006	Pomeroy between Calabazas & Benton.	KAB	1	Clean up by City, as needed.	Has not been a source of trash for two evaluations.
SC10	5/3/2006	Pomeroy between Calabazas & Benton.	KAB	1	Cleanup by City, as needed.	Has not been a source of trash for three evaluations.
WD05	5/24/2006	El Camino storm Drain d/s Miramar	RTA	91	Clean four times a year	Police patrol end of court.
			Coyote Creek			
SJ30	6/29/2006	Coyote Creek at Upper Penitencia (confluence adjacent to Flea Market)	KAB	2.5	Flea Market staff cleans the parking lot and creek banks regularly. Area seemed cleaner than it was at the last assessment.	No additional management actions recommended. A periodic communication with the Flea Market Management may help. Future assessment is recommended.
SJ03	10/23/2005	Santa Clara between 17th and 20th St.	KAB	2	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Continue support of community cleanup efforts in this area.
SJ27	6/29/2006	Coyote Creek between Berryessa Rd and Mabury Road	KAB	2	Site was in very clean condition. The Santa Clara Valley Water District has the area fenced off which prevents access and windborne trash.	No additional management actions recommended. Future assessment is recommended.

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
SJ28	6/23/2006	Coyote Creek at Julian Street Bridge	KAB	2	The San Jose Academy has been cleaning the banks adjacent to the academy on National River cleanup Day and Coastal Cleanup Day. A community group also helps maintain the area.	No additional management actions recommended. Future assessment is recommended.
MI08a	6/12/2006	Coyote Creek @ Dixon Landing Rd.	KAB	1.75	The litter is cleaned up during the annual creek clean-up programs. The last creek clean-up was on September 20, 2003.	Existing management practices suffice. The next cleanup-up of Coyote Creek is due on September 16, 2006.
MI08b	6/8/2006	Coyote Creek North of 237	KAB	1.5	The litter is cleaned up during the annual creek clean-up programs. The last creek clean-up was on September 20, 2003.	Existing management practices suffice. The next cleanup-up of Coyote Creek is due on September 16, 2006.
MI06	6/8/2006	Near Main Lift Station	KAB	1	There is illegal dumping of household garbage at South Gate of Pump Station and at the nearby dumpster. There is also illegal dumping of construction material at the North Gate. The trash is removed when noticed.	Existing management practices suffice.
SJ23	6/22/2006	Coyote Creek at Evergreen Park	RTA	56	Park Maintenance staff maintains the park on a regular basis. However, the trash left in creekbed following the heavy winter rains remained.	Determine whether volunteer resources are available to do annual cleanup. Future assessment is recommended.
SJ07	6/23/2006	Penitencia Creek at Creekland Cir	RTA	71	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	This location could benefit from involvement of adjacent property association participation. Future assessment is recommended.
				Guadalupe River		
LG09	6/18/2008	Town of Los Gatos Parking Lot; at University and Andrews	KAB	4	Assess site weekly. Town tries to clean and sweep parking lots at least once a month. Last clean up and sweeping was on June 19 and 20, 2006.	Town will continue to clean, sweep and assess the parking lots.
SJ06	10/5/2005	Home St from Sunol to the dead end	KAB	4	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	This may be a potential site for partnered City and District cleanup. Future assessment is recommended.
CA09	6/27/2006	Hwy 17 @ Hamilton	KAB	4	Due to the high use of the new light rail station at this site, trash appears to have increased. Plan to notify Caltrans	Will continue to monitor and talk to Caltrans about the possibility of a regular cleaning schedule for this off-ramp area.
SJ14	4/28/2006	Old Almaden Rd from Capitol Expwy to Almaden Expwy	KAB	4	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Make contact with Goodwill regarding potential solutions to the problem. Future assessment is recommended.
SJ14	10/5/2005	Old Almaden Rd from Capitol Expwy to Almaden Expwy	KAB	4	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Determine property ownership and identify resources to cleanup of the area. Future assessment is recommended.
LG09	6/27/2006	Town of Los Gatos Parking Lot; at University and Andrews	KAB	4	Assess site weekly. Town tries to clean and sweep parking lots at least once a month. Last clean up and sweeping was on June 28 and 29, 2006.	Town will continue to clean, sweep and assess the parking lots.
CA08	6/27/2006	Hwy 17 @ White Oaks	KAB	4	Motorist and pedestrian trash was observed. This site is in Caltrans' jurisdiction.	This site was very dirty. Lots of food containers and beverage bottles. Continue to assess. Need to work with Caltrans regarding a solution for this off ramp.

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CA08	4/27/2006	Hwy 17 @ White Oaks	KAB	3	Some beverage containers were observed. This site is in Caltrans' jurisdiction. Will continue to assess.	Will continue to assess and notify Caltrans about litter in this off ramp area.
SJ19	10/5/2005	Camden Av between Coleman and Camden Village Cir	KAB	3	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	This site is located in front of a multifamily dwelling, and adjacent to a VTA bus stop. Installation of a trash receptacle may help reduce litter on ground. Lots of trash accumulated behind bench. Future assessment is recommended.
CA08	5/27/2006	Hwy 17 @ White Oaks	KAB	3	Motorist trash appears to have increased. Plan to notify Caltrans.	This site was very dirty. Lots of food containers and beverage bottles. Will talk with Caltrans about the possibility of establishing a regular cleaning schedule for this off-ramp area
CA02	2/6/2006	Winchester Ave from Camden to Knowls along tracks	KAB	3	City has regular maintenance schedule. This site was littered with beverage containers and food wrappers.	City will continue maintenance and assessments.
SJ15	4/28/2006	E side of Camden Av between Guadalupe Mines Rd and Vista Loop	KAB	3	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Future assessment is recommended.
LG05	6/30/2006	Blossom Hill Rd. from Short Rd. to Harwood	KAB	3	Drive by assessments. Town picks up trash twice a month.	A lot of plastic pieces and beverage containers. Main source is motorists Continue to assess.
SC15	5/3/2006	Martin Avenue by train tracks.	KAB	2.75	Inspect paper recycler and issue violations to recycler for paper products along their fence.	Continue evaluating for trash.
SC13	1/19/2006	4767 Lafayette Street.	KAB	2.5	Pass out BMPs to local stores when trash problem is present.	Continue evaluating for trash.
SC12	5/3/2006	Clyde, Haig, Lafayette area.	KAB	2.25	Cleanup by City, as needed.	Continue evaluating for trash.
SJ18	10/5/2005	Northside of Coleman Rd between Almaden Expwy and Meridian Av	KAB	2	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. Future assessment is not recommended.
SJ17	4/28/2006	Almaden Expwy at Crown and Camden	KAB	2	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. Future assessment is not recommended.
SJ16	10/5/2005	Blossom River Dr between Blossom Hill Rd and Blossom River Wy	KAB	2	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. Future assessment is not recommended.
SJ19	4/30/2006	Camden Av between Coleman and Camden Village Cir	KAB	2	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	No recommended management action. One future assessment is recommended. Area may have been clean due to construction project occurring at the time of assessment.
CA09	4/27/2006	Hwy 17 @ Hamilton	KAB	2	Due to the high use of the new light rail station at this site, motorist and pedestrian trash appears to have increased. The site is in Caltrans' jurisdiction. Plan to notify Caltrans.	Will continue to assess and work with Caltrans about the possibility of establishing a regular cleaning schedule for this off-ramp area.
CA08	4/27/2006	White Oaks at 17 South	KAB	2	Some beverage containers were observed. The site is in Caltrans' Jurisdiction. Continue to assess.	Will continue to assess and notify Caltrans about litter within this off ramp area.
CA07	5/24/2006	Cristch Ln @ McGlincy	KAB	2	City has regular maintenance schedule	Found very little trash. Consider removing from list.
SJ20	10/5/2005	Almaden at Ironwood	KAB	2	Area is fenced off to prevent access which serves to keep litter out of the channel.	This site should be assessed at least once more. This location is a potential site for a future cleanup.

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CA09	4/17/2006	Hwy 17 @ Hamilton	KAB	2	Due to the high use of the new light rail station at this site, motorist and pedestrian trash appears to have increased. The site is in Caltrans' jurisdiction. Plan to notify Caltrans.	Will continue to monitor and talk with Caltrans about the possibility of establishing a regular cleaning schedule for this off-ramp area.
CA13	2/6/2006	Winchester and Camden/ San Tomas Expwy	KAB	2	A trash assessment is recommended after seeing litter along the roadsides.	Will continue to assess this site.
CA04	2/6/2006	Whit Oaks from Hwy 17 S. to Redding ,West side of street	KAB	2	City has regular maintenance schedule. Some debris is from roadside construction	City will continue maintenance and WVCWP will continue to assess this site.
CA12	6/29/2006	E. Campbell Ave. between Winchester and Hwy17	KAB	2	Motorist and pedestrian trash. The site is in Caltrans' jurisdiction.	WVCWP staff will continue to assess and notify Caltrans regarding the condition of this site.
MS05	6/27/2006	Hwy 9 (Ridgecrest to Rose)	KAB	2	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Litter has increased since May 2006. Plastics and food/beverage containers/wrappers are strewn regularly throughout the median and on the sides of the road. Continue to monitor. Consider arranging a trash cleanup.
CA08	6/27/2006	White Oaks at 17 South	KAB	2	Still a lot of debris and beverage containers. The site is in Caltrans' jurisdiction. Continue to assess.	Will continue to assess and notify Caltrans about litter within this off ramp area.
SJ21	10/5/2005	Julian St near Guadalupe Pkwy (under bridge near creek)	KAB	2	According to signage, the Rotary Club adopted this area under the Water District's Adopt-a-Creek Program.	Existing management actions appear to be effective. Future assessment is recommended to compare seasonal differences.
SJ21	4/28/2006	Julian St near Guadalupe Pkwy (under bridge near creek)	KAB	2	This area is maintained by the Park maintenance staff, and is a targeted cleanup site for creek cleanup days. According to signage, the Rotary Club adopted this area under the Water District's Adopt-a-Creek Program.	Existing trash management practices appear to be sufficient. No future assessment is recommended.
SJ20	4/28/2006	Almaden at Ironwood	KAB	2	Area is fenced off to prevent access which serves to keep litter out of the channel.	No recommended management action. Future assessment is not recommended.
CA02	4/27/2006	Winchester Ave from Camden to Knowls along tracks	KAB	2	City has a regular maintenance schedule	City will continue maintenance and assessments.
MS01	6/27/2006	Hwy 9 (Rose to Grandview Ave.)	KAB	2	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Litter has increased since May 2006. Plastics and food/beverage containers/wrappers are strewn regularly throughout the median and on the sides of the road. Continue to monitor. Consider arranging a trash cleanup.
LG02	5/24/2006	Hicks Rd. between Camden & Shannon	KAB	2	Site noted as a problem due to a single report of 30 motorcycle tires on December 9, 2006.	Will continue to assess and collect information from Town staff.
LG06	5/24/2006	Town of Los Gatos Parking Lot ; on Main St. near Monte-Bello	KAB	2	Drive by assessments. Town picks up trash twice a month. Town tries to clean and sweep once a month.	Town will continue to clean, sweep and assess the parking lots.
SJ06	4/28/2006	Home St from Sunol to the dead end	KAB	2	A fence was installed that blocks access to creek area from Sunol. Based on what could be seen through fence, the site is cleaner than it was six months ago.	Future assessment is not recommended due to blocked access.
SC15	1/19/2006	Martin Avenue by train tracks.	KAB	1.75	Inspect paper recycler and issue violations to recycler for paper products along their fence.	Continue evaluating for trash.
SC13	5/3/2006	4767 Lafayette Street.	KAB	1.5	Pass out BMPs to local stores when trash problem is present.	Continue evaluating for trash.
SC14	1/19/2006	Lafayette & Yurba Buena Way.	KAB	1.5	This site is subject to large illegal dumping. Routine inspections are conducted on a regular basis.	Continue evaluating for trash.

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SJ18	4/28/2006	Northside of Coleman Rd between Almaden Expwy and Meridian Av	KAB	1.5	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. Future assessment is not recommended.
SJ17	10/5/2005	Almaden Expwy at Crown and Camden	KAB	1.5	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. Future assessment is not recommended.
SC12	1/19/2006	Clyde, Haig, Lafayette area.	KAB	1.25	Clean up by City, as needed.	Continue evaluating for trash.
SC04	5/3/2006	Bellomy Street and Alviso	KAB	1	Cleanup by City, as needed.	Has not been a source of trash for three evaluations.
MS01	4/16/2006	Hwy 9 (Rose to Grandview)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Continue to monitor. Consider arranging a trash cleanup with WVCWP staff. This area is along Hwy 9 and within the median of Hwy 9. Trash collection is not entirely safe in this area. Any cleanup will be conducted with extreme caution.
CA03	4/17/2006	Downing Ave east of Bascom	KAB	1	This site is located by a catwalk and traps litter from pedestrian use. City has a regular maintenance schedule.	City will continue maintenance and WVCWP will continue to assess this site.
CA10	2/6/2006	Los Gatos Creek east of Camden	KAB	1	The site is in Caltrans' jurisdiction.	Will continue to assess this site at least twice a year.
SC14	5/3/2006	Lafayette & Yurba Buena Way.	KAB	1	This site is subject to large illegal dumping. Routine inspections are conducted on a regular basis.	Has not been a source of trash for two evaluations.
SC08	5/3/2006	Lafayette Street at Memorex & DiGiulio	KAB	1	Cleanup by City, as needed.	Continue evaluating for trash.
MS05	5/24/2006	Hwy 9 (Ridgecrest to Rose)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Plastic bags and beverage bottles. Continue to monitor and arrange trash cleanup.
SJ15	10/5/2005	E side of Camden Av between Guadalupe Mines Rd and Vista Loop	KAB	1	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	This site was extremely clean. No litter visible. Does not warrant future assessment.
MS01	5/24/2006	Hwy 9 (Rose to Grandview Ave.)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Very little litter. Continue to monitor. Consider arranging a trash cleanup.
MS05	4/16/2006	Hwy 9 (Ridgecrest to Rose)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Continue to monitor. Consider arranging a trash cleanup.
LG10	6/27/2006	St. Mary's School at 30 Lyndon Ave, Los Gatos 95030. Kindergarteners and teacher monitored the school site and collected trash after a WVCWP classroom presentation.	KAB	1	WVCWP gave a demonstration of the Enviroscape model to 30 kindergarten students at St. Mary's school. After our demonstration, the students went and collected trash at the school site and visited the storm drain inlets.	Continue outreach and presentations to ensure that young students are aware of pollution problems.
LG03	5/24/2006	Kennedy to Shannon	KAB	1	Town picks up twice a month.	No visual trash. Site looks clean. Continue to assess.
LG01	5/24/2006	Los Gatos Creek Trail	KAB	1	Volunteers clean trail monthly.	Continue to assess site.
SJ16	4/28/2006	Blossom River Dr between Blossom Hill Rd and Blossom River Wy	KAB	1	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. Future assessment is not recommended.
SC04	1/19/2006	Bellomy Street and Alviso	KAB	1	Clean up by City, as needed.	Has not been a source of trash for two evaluations.
SC08	1/19/2006	Lafayette Street at Memorex & DiGiulio	KAB	1	Clean up by City, as needed.	Continue evaluating for trash.

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SJ02	10/5/2005	Blackford High School (Boyton Av)	KAB	1	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Site was clean. There were signs indicating that sweepers recently passed through. One additional assessment is recommended to ensure that the site was not just clean because of recent street sweeping.
SJ02	6/29/2006	Blackford High School (Boyton Av)	KAB	1	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. No future assessment recommended.
LG04	5/24/2006	Shannon Rd to Hicks	KAB	1	Drive by assessments. Town picks up trash twice a month.	Continue to assess site.
CA01	4/8/2006	Area between 1220 Dell Avenue and 638 E. Campbell Avenue in Campbell - Site includes Fwy off ramps and area next to railway track.	RTA	68	City of Campbell has been holding a volunteer cleanup event in April to celebrate Earth Day. This site was appropriate for many volunteers to address a littered area.	This event was very successful. Will continue to conduct KAB assessments at least twice per year and hold annual cleanup if possible. Some of this area is in Caltrans' jurisdiction.
				Lower Penitencia Creek		
MI12	5/17/2006	Apartments in between Calaveras Blvd. and Adams	KAB	2.75	This area has an ongoing problem of extra garbage overflowing from trash bins. Allied Waste Services picks up all the trash in this area.	The problem resurfaces every now and then. Sometimes it does not appear to be a problem. The place gets cleaned. Allied Waste Services will continue its efforts.
MI11	5/17/2006	House at Corner of Adams and Temple	KAB	2.25	This is an ongoing problem and is an eyesore. Trash consists of domestic litter, lot of garbage in seven or more trash cans, some garbage overflowing the bins. Allied Waste Services picks up all the trash in this area.	The problem persists. Allied Waste Services will continue its efforts.
MI07a	6/8/2006	Berryessa Creek @ Calaveras Blvd.	KAB	2	The litter is cleaned up during the annual creek clean-up programs. The last creek clean-up was in September 2005. 2.5 tons of garbage was removed from this creek, Tularcitos and Calera Creek.	Existing management practices suffice. The Berryessa Creek is cleaned every year in the third week of September, while other creeks are cleaned in alternate years.
MI07b	6/8/2006	Berryessa Creek @ Able Bridge	KAB	2	The litter is cleaned up during the annual creek clean-up programs. The last creek clean-up was in September 2005. 2.5 tons of garbage was removed from this creek, Tularcitos and Calera Creek.	Existing management practices suffice. The Berryessa Creek is cleaned every year in the third week of September, while other creeks are cleaned in alternate years.
MI05	5/17/2006	Dempsey Rod Between yosemite and Edsel	KAB	2	This is a persistent problem. The trash is mainly windborne. This area is inspected twice a week, Monday and Friday and trash is removed.	Existing management practices suffice.
MI09	6/12/2006	Penitencia Creek off of Marilyn Dr Between Abbott and Abel	KAB	2	Allied Waste Services does not clean in the creek. City does not have access to this area as it is fenced.	It is difficult to take action as most of the trash is windblown and water borne. Neither Allied Waste Services nor City is responsible for the clean-up of this area of the creek.
MI04	5/17/2006	Piedmont Rd. between Yosemite and Uridias Ranch	KAB	1.25	This is a persistent problem. There used to be illegal dumping of appliances, old furniture, tires, indoor and outdoor construction waste, engines, motors etc. This area is inspected twice a week, Monday and Friday and trash is removed.	This area has been referred to Police Department due to a recent increase in activity.

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MI10	6/12/2006	Minnis Circle	KAB	1	The trash is accumulated by commercial customers and is often cleaned up by them. But the problems resurface every now and then. Typical trash includes paper, cardboard, containers, parts from body repair shops and other commercial stores.	This is not a problem site any more. Persistent clean-up action and follow-up with customers have resulted in major improvement in this area. These management practices will be continued.
MI02	5/17/2006	Downing Road Near Old Calaveras	KAB	1	This is a persistent problem. There used to be illegal dumping of appliances, old furniture, tires, indoor and outdoor construction waste, engines, motors etc. This area is inspected twice a week, Monday and Friday and trash is removed.	Existing management practices suffice.
MI01	5/17/2006	Old Calaveras Near intersection of Downing	KAB	1	This is a persistent problem. There used to be illegal dumping of appliances, old furniture, tires, indoor and outdoor construction waste, engines, motors etc. This area is inspected twice a week, Monday and Friday and trash is removed.	Existing management practices suffice.
MI03	5/17/2006	Calaveras Road near Spring Creek Ln.	KAB	1	This is a persistent problem. There used to be illegal dumping of appliances, old furniture, tires, indoor and outdoor construction waste, engines, motors etc. This area is inspected twice a week, Monday and Friday and trash is removed.	Existing management practices suffice.
				Matadero/Barron Creeks		
PA15	6/19/2006	Wet Well at Matadero Creek Station	KAB	3		Continue to monitor and evaluate.
PA08	6/16/2006	Highway 101 at Embarcadero Road	KAB	2		Continue to monitor with proposed Summer 2005 Action Plans.
PA11c	6/19/2006	Alma Street at Adobe Creek	KAB	2		Continue to monitor with proposed Summer 2005 Action Plans.
PA11	6/19/2006	Alma Street at Barron Creek	KAB	2		Continue to monitor with proposed Summer 2005 Action Plans.
PA10	6/16/2006	Albertson's at Embarcadero Road	KAB	1		Continue to monitor with proposed Summer 2005 Action Plans.
PA11a	6/19/2006	Alma Street at Matadero Creek	KAB	1		Continue to monitor with proposed Summer 2005 Action Plans.
PA12	6/19/2006	Oregon Expressway between Waverley & Middlefield	KAB	1		No trash. Recommend removal from list.
PA11	6/19/2006	Alam Street at San Francisquito Creek	KAB	1		Continue to monitor with proposed Summer 2005 Action Plans.
PA09	6/15/2006	Molley Stones on Cal Avenue	KAB	1		No trash. Recommend removal from list.
PA16	6/19/2006	Arastradero Road between Gates A and B	KAB	1		Continue to monitor and evaluate.
				San Francisquito Creek		
PA18	6/19/2006	Mitchell Lane and the Red Cross	KAB	2		Continue to monitor and evaluate.
PA19	6/15/2006	Lane 21	KAB	2		Continue to monitor and evaluate. The building at 529 Bryant Street is currently under interior construction. This alley is being used as a staging area for construction workers and port-a-potties.
PA14	6/15/2006	Lane 12 West	KAB	1		No trash. Recommend removal from list.

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PA17	6/15/2006	Lane 20	KAB	1		Continue to monitor and evaluate. Small amount of cardboard on ground next to adjacent PASCO Bin.
PA13	6/15/2006	Paulsen Lane	KAB	1		No trash. Recommend removal from list.
PA20	5/18/2006	San Francisquito Creek at Manhattan	RTA	63		The area that requires attention is located in East Palo Alto. The debris generally does not make it down to the creek.
WD19	5/18/2006	San Francisquito Creek at Newell	RTA	76		Continue to monitor with proposed Summer 2005 Action Plans.
PA01	5/18/2006	San Francisquito Creek at El Camino	RTA	91		Continue to monitor with proposed Summer 2005 Action Plans.
PA03	5/18/2006	San Francisquito Creek at Middlefield	RTA	107		Continue to monitor with proposed Summer 2005 Action Plans.
PA20	5/24/2006	San Francisquito Creek at Manhattan	RTA	119		Area was cleaned by SF Water Council on recent creek clean up day.
PA02	5/18/2006	San Francisquito Creek at Webster St	RTA	119		Continue to monitor with proposed Summer 2005 Action Plans.
				San Tomas Aquino Creek		
SA03	2/14/2006	Dumpster area at Big Basin Way behind restaurants	KAB	4	Frequent inspections by WVCWP IC/ID inspector. On February 14, 2006, Inspector and Program Manager met with Saratoga City Stormwater Rep and Water District staff (Ray Bramer) to discuss options for cleaning. The plan is to sponsor a cleanup event for th	Clean up scheduled for April 1, 2006. Contact nearby restaurants about litter problem and contact local police about illegal dumping activities. Will continue to assess and inspect. City and Water District staff will look into partnering to address illeg
SA03	1/31/2006	Dumpster area at Big Basin Way behind restaurants	KAB	4	WVCWP staff will continue to monitor trash and work with Saratoga staff to enhance management plan.	Coordinate a clean up event. Provide additional outreach to restaurants. Continue to assess.
SC03	1/19/2006	Bowers Alley behind Russell's Furniture.	KAB	3.5	Issue BMPs to local merchants when trash is present. Routine inspections are conducted on a regular basis.	Continue evaluating for trash issue citations to known violators.
SC03	5/3/2006	Bowers Alley behind Russell's Furniture.	KAB	3.25	Issue BMPs to local merchants when trash is present. Routine inspections are conducted on a regular basis.	Continue evaluating for trash.
SA03	3/20/2006	Dumpster area at Big Basin Way behind restaurants	KAB	3	WVCWP staff will continue to monitor trash and work with Saratoga staff to enhance management plan.	Coordinate a clean up event. Provide additional outreach to restaurants. Continue to assess.
SC05	5/3/2006	Behind Parking lot at Ellena & Williams Streets	KAB	2.25	Cleanup by City, as needed.	Continue evaluating for trash.
CA11	4/27/2006	4805 Westmont Avenue Campbell, CA 95008 behind Westmont High School along San Tomas Aquino Creek	KAB	2	This site is located behind a local high school. It has been a creek clean-up site for the past two years.	Will continue to hold volunteer participation clean ups and monitoring. Next clean up for this site is scheduled for May 20,2006
SC09	1/19/2006	Lafayette Street & Basset Street, Cal Trans	KAB	2	Notify Caltrans of major litter accumulation.	Continue evaluating for trash.
SJ01	10/5/2005	San Tomas Aquino Pkwy between Payne and Mona	KAB	2	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Abandoned carts reported for pick up. Future assessment is recommended.
CA05	5/30/2006	Mona Way east of Lisa Way	KAB	2	Motorist and pedestrian trash. The site is in Caltrans' jurisdiction.	WVCWP staff will continue to assess and notify Caltrans regarding the condition of this site.
MS02	6/27/2006	Hwy 9 (Grandview to Daves)	KAB	2	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Litter has increased since May 2006. Plastics and food/beverage containers/wrappers are strewn regularly throughout the median and on the sides of the road. Continue to monitor. Consider arranging a trash cleanup.

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MS04	6/27/2006	Hwy 9 (Blythswood to Ridgecrest Ave.)	KAB	2	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Litter has increased since May 2006. Plastics and food/beverage containers/wrappers are strewn regularly throughout the median and on the sides of the road. Continue to monitor. Consider arranging a trash cleanup.
SA03	6/30/2006	Dumpster area at Big Basin Way behind restaurants	KAB	2	WVCWP staff will continue to monitor trash and work with Saratoga staff to enhance management plan.	Coordinate a clean up event. Provide additional outreach to restaurants. Continue to assess.
MS03	6/27/2006	Hwy 9 (Daves to Quito Rd)	KAB	2	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Litter has increased since May 2006. Plastics and food/beverage containers/wrappers are strewn regularly throughout the median and on the sides of the road. Continue to monitor. Consider arranging a trash cleanup.
SC16	5/3/2006	Bowe Avenue alleyway next to creek	KAB	1.5	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for three evaluations.
SC05	1/19/2006	Behind Parking lot at Ellena & Williams Streets	KAB	1.5	Clean up by City, as needed.	Continue evaluating for trash.
SC16	1/19/2006	Bowe Avenue alleyway next to creek	KAB	1.25	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for two evaluations.
SC06	1/19/2006	519 Saratoga Alley behind apartments	KAB	1.25	Continue to respond to overflowing dumpster complaints and illegal dumping calls.	Continue evaluating for trash.
SC06	5/3/2006	519 Saratoga Alley behind apartments	KAB	1.25	Continue to respond to overflowing dumpster complaints and illegal dumping calls.	Continue evaluating for trash.
SC09	5/3/2006	Lafayette Street & Basset Street, Cal Trans	KAB	1.25	Notify Caltrans of major litter accumulation	Continue evaluating for trash.
MS03	5/24/2006	Hwy 9 (Daves Ave to Quito Rd)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Lots of small pieces of plastic and empty soda bottles. Continue to monitor and arrange trash cleanup.
MS02	5/24/2006	Hwy 9 (Grandview to Daves)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Very little litter. Continue to monitor. Consider arranging a trash cleanup.
MS04	4/16/2006	Hwy 9 (Blythswood to Ridgecrest Ave.)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Continue to monitor. Consider arranging a trash cleanup.
SC17	1/19/2006	1995 Bellomy	KAB	1	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for two evaluations.
SJ01	6/23/2006	San Tomas Aquino Pkwy between Payne and Mona	KAB	1	This location is on the Anti Litter Program list and is periodically cleaned by volunteers or City staff.	Existing trash management practices appear to be sufficient. Future assessment is not recommended.
SC02	5/3/2006	Alpine Alley between Kiely & Pomeroy	KAB	1	Issue BMPs to local merchants when trash is present. Routine inspections are conducted on a regular basis.	Continue evaluating for trash.
LG08	5/24/2006	Quito & Mt.Claire	KAB	1	Assess twice a year.	One beverage bottle and a couple of wrappers. Continue to assess.
LG07	5/24/2006	Quito & Pollard	KAB	1	Assess twice a year.	Very clean, no visual trash. Continue to assess.
SC02	1/19/2006	Alpine Alley between Kiely & Pomeroy	KAB	1	Issue BMPs to local merchants when trash is present. Routine inspections are conducted on a regular basis.	Continue evaluating for trash.
SJ25	6/23/2006	Starbird Park (Boynton at Williams)	KAB	1	Park Maintenance staff maintains the park on a regular basis. Neighboring apartment manager collects stray carts in the area and places in a fenced corral.	Existing trash management practices appear to be sufficient. No future assessment is recommended.
SJ25	10/5/2005	Starbird Park (Boynton at Williams)	KAB	1	Parks Maintenance cleans the park area.	Abandoned carts reported for pick up. One future assessment is recommended.

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
CA11	6/27/2006	4805 Westmont Avenue Campbell, CA 95008 behind Westmont High School along San Tomas Aquino Creek	KAB	1	This site has been a creek clean up site for the past two years.	Continue to hold volunteer participation clean ups and monitoring. Next clean up for this site is scheduled for September 16, 2006.
SA02	6/30/2006	Fruitvale Ave. by City Hall to Sacred Heart School	KAB	1	Assess twice a year.	Consider coordinating annual cleanup event in partnership with Sacred Heart School. Educate local residents to make them aware of littering and dumping problems. The School has adopted this stretch of Wildcat Creek. Continue to assess. Participate in scho
MS03	4/16/2006	Hwy 9 (Daves Ave to Quito Rd)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Continue to monitor. Consider arranging a trash cleanup.
MS04	5/24/2006	Hwy 9 (Blythswood to Ridgecrest Ave.)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Plastic bags and beverage bottles. Continue to monitor and arrange trash cleanup.
CA06	5/25/2006	Gale Dr. and San Tomas Expy.	KAB	1	City has regular maintenance schedule.	One soda bottle was observed, otherwise very clean. Will continue to assess.
MS02	4/16/2006	Hwy 9 (Grandview to Daves)	KAB	1	Caltrans Jurisdiction - Notify Caltrans - Conduct Assessments	Small pieces of plastic and empty soda bottles. Continue to monitor.
SC18	1/19/2006	583 Saratoga	KAB	1	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for two evaluations.
SC19	5/3/2006	Martin & Richard	KAB	1	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for three evaluations.
SC19	1/19/2006	Martin & Richard	KAB	1	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for two evaluations.
SC18	5/3/2006	583 Saratoga	KAB	1	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for three evaluations.
SC17	5/3/2006	1995 Bellomy	KAB	1	Pass out BMPs to local stores when trash problem is present.	Has not been a source of trash for three evaluations.
SA03	4/1/2006	Expanded this site to include Dumpster area and parking lot (600 ft. stretch) between Big Basin Way and Saratoga Creek, behind several restaurants.	RTA	68	WVCWP staff, Saratoga City staff and Saratoga Elementary School parents and students conducted a three-hour cleanup at a 600-foot stretch of parking lot adjacent to Saratoga Creek. Cleanup volunteers collected incidental litter and debris within the dumps	Continue frequent inspections by WVCWP IC/ID inspector. The City's police have discovered that it is a place for students to convene for alcohol or drug use. The City Code enforcement officer visited each restaurant adjacent to the parking lot to discus
CA11	9/17/2005	4805 Westmont Avenue Campbell, CA 95008 behind Westmont High School along San Tomas Aquino Creek	RTA	85	This site is located behind a local high school. It has been a creek clean-up site for the past two years.	Will continue to hold volunteer participation cleanups and monitoring. Next clean up for this site is scheduled for September 16, 2006
CA11	5/20/2006	4805 Westmont Avenue Campbell, CA 95008 behind Westmont High School along San Tomas Aquino Creek	RTA	87	This site is located behind a local high school. It has been a creek clean-up site for the past two years.	Will continue to hold volunteer participation cleanups and monitoring. Next clean up for this site is scheduled for September 16, 2006
				Stevens Creek		
LA05	6/28/2006	Grant Road frontage from Arboretum	KAB	2	Routine cleanup	Routine cleanup
CU05	6/10/2006	Somerset Park owned and maintained by City	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash. This is a City park maintained by City staff.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
CU05	10/19/2005	Somerset Park owned and maintained by City	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash. This is a City park maintained by City staff.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
CU02	10/17/2005	Homestead and Mary Ave. adjacent to high school; private property	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash. This lot is monitored by the school janitor.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
CU02	6/7/2006	Homestead and Mary Ave. adjacent to high school; private property	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash. This lot is monitored by the school janitor.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
CL04	5/3/2006	Stevens Creek - Moss Rock	RTA	68	Site occasionally cleaned up by volunteers. No current management actions in place - property owner is believed to be the County. Area appears to have increased "party" activity, along with new illegal dumping of yard waste observed.	Contacted County staff and confirmed that area was on County Parks property. County Parks staff will increase patrols to the area and try to prevent future problems. Continued monitoring of the site is recommended.
CL05	12/16/2005	Stevens Creek - West Valley Elementary School Bridge crossing	RTA	82	Site is monitored by Stevens Permanente Watershed Council Streamkeeper program. Accumulated trash is picked up monthly, when accessible.	Continue monitoring to see if upstream efforts or BMPs reduce amounts of trash observed. Consider working with school on litter control project.
CL02	5/10/2006	Stevens Creek - El Camino Bridge crossing	RTA	91	Site occasionally cleaned up by volunteers. No current management actions in place. Large accumulation of floating debris on side of bank downstream of assessment area.	Site is located below the El Camino bridge and several upstream storm drain outfalls. Water was higher and faster than last year at the time sampled. Will work with volunteers to get the downstream area trash accumulation picked up.
CL05	5/3/2006	Stevens Creek - West Valley Elementary School Bridge crossing	RTA	95	Site is monitored by Stevens and Permanente Watershed Council Streamkeeper volunteer. Litter is collected on a monthly basis from one side of the creek, depending on accessibility and creek water levels.	Site is located just below an outfall for West Valley Elementary and the residential areas nearby. Monitoring will continue at this site. May consider getting school involved with trash/clean up activities on their grounds.
CL06	12/16/2005	Stevens Creek, foot bridge crossing behind West Valley Elementary School -directly below storm drain outfall	RTA	99	Site is monitored by Stevens Permanente Watershed Council Streamkeeper program. Accumulated trash is picked up monthly, when accessible.	Continue monitoring to see if upstream efforts or BMPs reduce quantities of trash observed. Consider working with school on litter control project.
CL03	5/3/2006	Stevens Creek - McClellan Ranch	RTA	101	Site often cleaned by Park staff and students. Most recent cleaning occurred on 3/18/06	Very little debris was found. Park area is well maintained. Does not appear to collect debris from upstream areas. May be a good reference point.
					Sunnyvale East	
SU08	12/12/2005	727 Sunnyvale-Saratoga Rd	KAB	3	Site monitored occasionally by staff. Contact property/business owners when litter problem is noted.	Contacted Public Works/Solid Waste Division to determine if they could notify property/business owners about the problem and follow up with enforcement as needed. Also finding some "homeless" debris/collections in the area. Received Complaint Response ba
SU07	5/24/2006	1675 Hollenbeck Ave	KAB	2.5	Site infrequently monitored by City staff. Property owners have cleaned up when requested in the past. Last time when it was inspected there was less debris.	Contacted PW/ Solid Waste Division regarding dumpster issues. They will follow up and provide a report on the outcome.
SU08	5/24/2006	727 Sunnyvale-Saratoga Rd	KAB	2.5	Site monitored occasionally by staff. Contact property/business owners when litter problem is noted.	Contacted Public Works/Solid Waste Division to determine if they could take action with the property/business owners about the problem and follow up with enforcement as needed.
SU11	12/16/2005	Mathilda Ave and Highway 101 on-ramps and exits	KAB	2.5	CalTrans cleans the area periodically and appears to have been picked up a few weeks after the assessment.	Continue to monitor the site. Identify mechanism for notifying CalTrans when there is a significant accumulation.

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
SU19	5/24/2006	Wolf Road Overpass- Access from Evelyn Ave	KAB	2	City monitors the area under the overpass and picks up debris as needed. Staff notified of need for cleanup.	Mostly large debris from homeless usage of the area under the overpass. PW staff was notified of fence and debris problem, and it was taken care of within two weeks of their notification. Debris in area is little threat to the storm drains due to the larg
CU06	10/19/2005	Park Circle East & West, area behind apartments, private property	KAB	2	Not in a waterway. A lot of illegal dumping from neighboring apartment complexes. Removed smaller pieces and notified property managers to remove larger pieces.	Continue to work with landlords and property managers on illegal dumping issues.
SU11	5/25/2006	Mathilda Ave and Highway 101 on-ramps and exits	KAB	2	CalTrans had cleaned portions of the west-bound off-ramp and east-bound on-ramp areas approximately two weeks before the assessment was completed.	Continue to monitor the site. Work with SCVURPPP to identify mechanism for notifying CalTrans when there is a significant accumulation.
CU06	6/11/2006	Park Circle East & West, area behind apartments, private property	KAB	2	Not in a waterway. Illegal dumping from neighboring apartment complexes still exists, but less than last assessment. Removed smaller pieces and notified property managers to remove larger pieces.	Continue to work with landlords and property managers on illegal dumping issues.
SU07	12/16/2005	1675 Hollenbeck Ave	KAB	2	Site infrequently monitored by City staff. Property owners have cleaned up when requested in the past. Last time when it was inspected there was less debris.	Continue to monitor and determine if further actions need to be taken to get the property owners/businesses to control litter and clean up the areas around their dumpsters.
SU01	5/25/2006	600 Block Grand Fir and Bellflower	KAB	1.5	Site has not had any illegal dumping of furniture in two years. Checked back on 6/2/06 and furniture had been removed.	Site should remain on the list, but not be a priority as amounts of debris are small and illegal dumping/accumulation does not seem to be a significant problem.
SU21	12/8/2005	E. Persian Drive between Sunnyvale East and Lawrence Expy. - blocks 190-400	KAB	1.5	Sunnyvale PW cleans the ROW and monitors the site for illegal dumping from nearby residences and others.	Continue to monitor the site. Notified PW to pick up debris. Site is behind the Highway sound wall and along the back fence of the mobile home park. There are not any nearby storm drains and mostly larger debris seems to appear here.
SU14	5/24/2006	Angel Ct Parking lot and Hendy Rd, near CalTrain ROW	KAB	1.5	City monitors the area monthly and crews pick up debris as needed.	Only small amounts of litter visible at this time. Will continue to monitor and initiate clean up actions when needed.
SU14	12/12/2005	Angel Ct Parking lot and Hendy Rd, near CalTrain ROW	KAB	1.5	City monitors the area monthly and crews pick up debris as needed.	Contacted Public Works Staff regarding shopping cart. Also let PW Boulevards staff that litter was accumulating along the railroad track fence to the west of Hendy Rd.
SU19	12/8/2005	Wolf Road Overpass- Access from Evelyn Ave	KAB	1.5	City monitors the area under the overpass and picks up debris as needed.	Mostly large debris from homeless usage of the area under the overpass. Little threat to the storm drains due to the large size of material and it is not near any water bodies. City will continue to monitor and remove debris as needed.
SU17	5/24/2006	California Ave on-ramp to Central Expressway	KAB	1.5	Site may have been cleaned up recently since only a small amount of debris was visible.	Continue to monitor the site and notify PW if accumulation is significant. However, site is not a threat to waterways and quantity of debris present is small, so it should be a low priority for future efforts.
SU15	5/24/2006	Victory Village Park under Fair Oaks Overpass	KAB	1.5	City monitors and PW crews clean underpass area on a regular basis.	Business had placed garbage can where day laborers congregate. Some litter may be blowing in from railroad track. Very small amount of litter was present.
SU17	12/12/2005	California Ave on-ramp to Central Expressway	KAB	1.5	Site monitored occasionally by City staff. Site is periodically cleaned by County and/or City PW staff.	Continue to monitor the site and notify PW if accumulation is significant.
SU15	12/12/2005	Victory Village Park under Fair Oaks Overpass	KAB	1	City monitors and PW crews clean underpass area on a regular basis.	In the past, most of the litter seen a this site appeared to come from the day-labor force that frequent the sidewalk outside the Home Depot store. This appears to have been cleaned up either by business staff or city crews in the area. Very little litt

ID #	Date	Location	Assessment Tool	Score	Existing Management Actions	Recommended Management Actions and/or Future Evaluations
SU21	5/24/2006	E. Persian Drive between Sunnyvale East and Lawrence Expy. - blocks 190-400	KAB	1	Sunnyvale PW cleans the ROW and monitors the site for illegal dumping from nearby residences and others.	Continue to monitor the site and have PW pick up debris as needed. Site is behind the Highway 237 sound wall and along the back fence of the mobile home park. There are not any nearby storm drains and mostly larger debris seems to appear here.
CU04	10/18/2005	Ann Arbor and Ann Arbor Ct., close to City park; private property	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash. It appears that most of the trash is from neighboring homes.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
SU05	12/16/2005	594 El Camino Real, Alleyway behind business	KAB	1	Site monitored occasionally by City staff.	Consider removal from trash hot-spot list
SU05	5/24/2006	594 El Camino Real, Alleyway behind business	KAB	1	Site monitored occasionally by City staff.	Suggest removal from trash hot spot list as there has not been a litter problem here in the past year. No nearby waterways are present and the amount of debris/litter that could get into storm drains is small.
CU04	6/9/2006	Ann Arbor and Ann Arbor Ct., close to City park; private property	KAB	1	Not in a waterway. Little to no trash observed at this location. Removed existing trash. It appears that most of the trash is from neighboring homes.	Site has been monitored for 2 years and is no longer a trash problem area. Recommend that the site be removed from list.
SU01	12/16/2005	600 Block Grand Fir and Bellflower	KAB	1	Streets swept by City. Periodic monitoring by city staff or receipt of complaints by Neighborhood Preservation.	A number of shopping carts were observed in the back alleyway. City PW staff were notified. Should probably remain on list for potential illegal dumping, but not a priority site due to distance from storm drains and waterways.
SU16	1/20/2006	Sunnyvale East Channel, below Caribbean Bridge crossing, 100 ft north of access gate/fence	RTA	67	City crews clean up along road right of way. Most of the debris observed this time either washed down from upstream or came in with high tides during storms.	Continue monitoring to see if upstream efforts or BMPs that might be installed as part of a pilot project can help reduce quantities observed.
SU16	6/2/2006	Sunnyvale East Channel, below Caribbean Bridge crossing, 100 ft north of access gate/fence	RTA	83	City crews clean up along road right of way. Most of the debris observed this time appeared to be washed down from upstream, with some blowing in from the roadway.	Continue monitoring to see if upstream efforts or BMPs that might be installed as part of a pilot project can help reduce quantities observed. Amount of litter debris observed this time was significantly less than what was observed in January after winter
			Sunnyvale West			
SU16c	12/8/2005	Caribbean Drive between Lawrence Expressway and Matilda Ave.	KAB	1.5	Sunnyvale PW cleans right of way and center divider periodically. Street is swept bi-weekly by SMART Station Contractor.	Most of the litter present on the roadway and median comes from trucks entering and leaving the SMART station materials recovery facility off of Borregas Ave. City crews clean the ROW area and the contractor who operates the SMART Station sweeps the stre
SU16c	5/24/2006	Caribbean Drive between Lawrence Expressway and Matilda Ave.	KAB	1.5	Sunnyvale PW cleans right of way and center divider periodically. Street is swept bi-weekly by SMART Station Contractor.	Most of the litter present on the roadway and median comes from trucks entering and leaving the SMART station materials recovery facility off of Borregas Ave. City crews clean the ROW area and the contractor who operates the SMART Station sweeps the stre
SU16a	12/6/2005	Sunnyvale West Channel, 100 ft below Caribbean Bridge crossing	RTA	100	City crews clean up along road right of way. Most of the debris observed seemed to have washed down from upstream sources, very little littering along access road/trail bank.	Channel was adopted under District's Adopt-a- Creek program. Further investigations upstream to the point where the channel goes into an underground box culvert by Matilda Ave did not show any upstream business sources. (e.g., open dumpsters or outdoor
SU16a	5/26/2006	Sunnyvale West Channel, 100 ft below Caribbean Bridge crossing	RTA	100	City crews clean up along road right of way. Most of the debris observed seemed to have washed down from upstream sources, very little littering along access road/trail bank.	About the same amount of litter debris was removed during this assessment. No potential new actions have been identified to help reduce litter in the area.

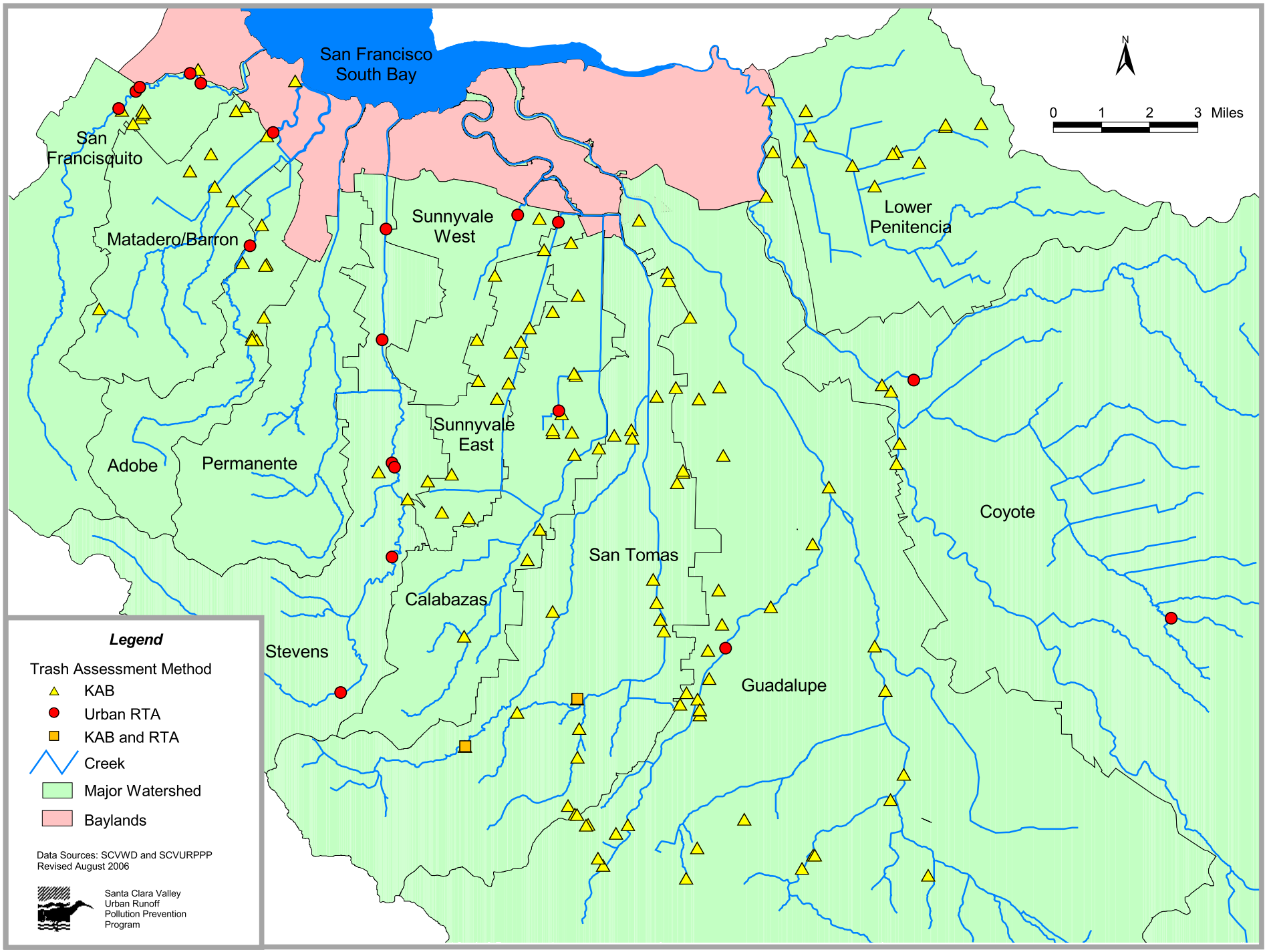


Figure 1. Total Trash Evaluations Conducted During FY 05-06.

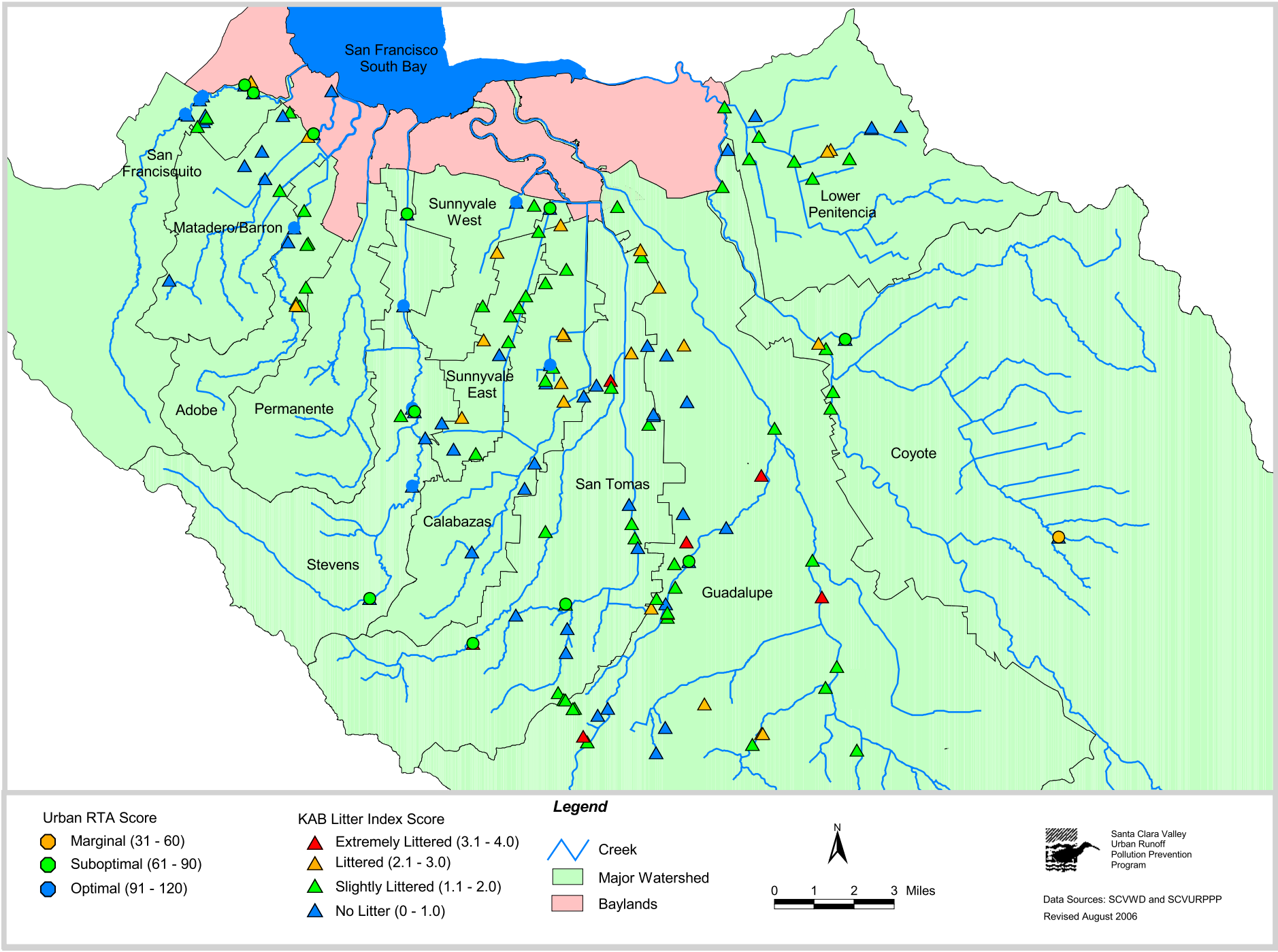


Figure 2. Trash Evaluation Scores During FY 05-06.

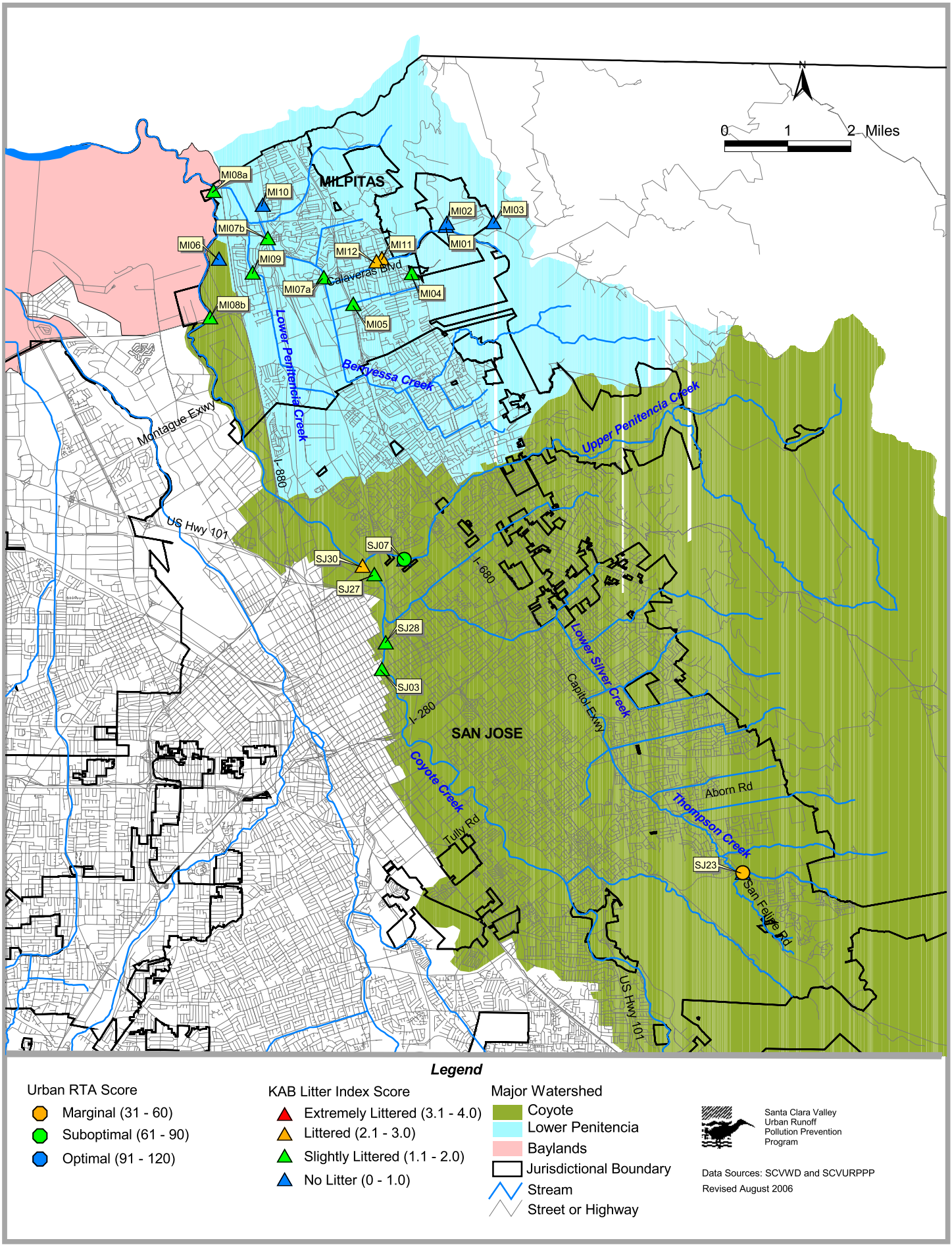


Figure 3. Location of Trash Evaluations in Coyote and Lower Penitencia Creek Watersheds.

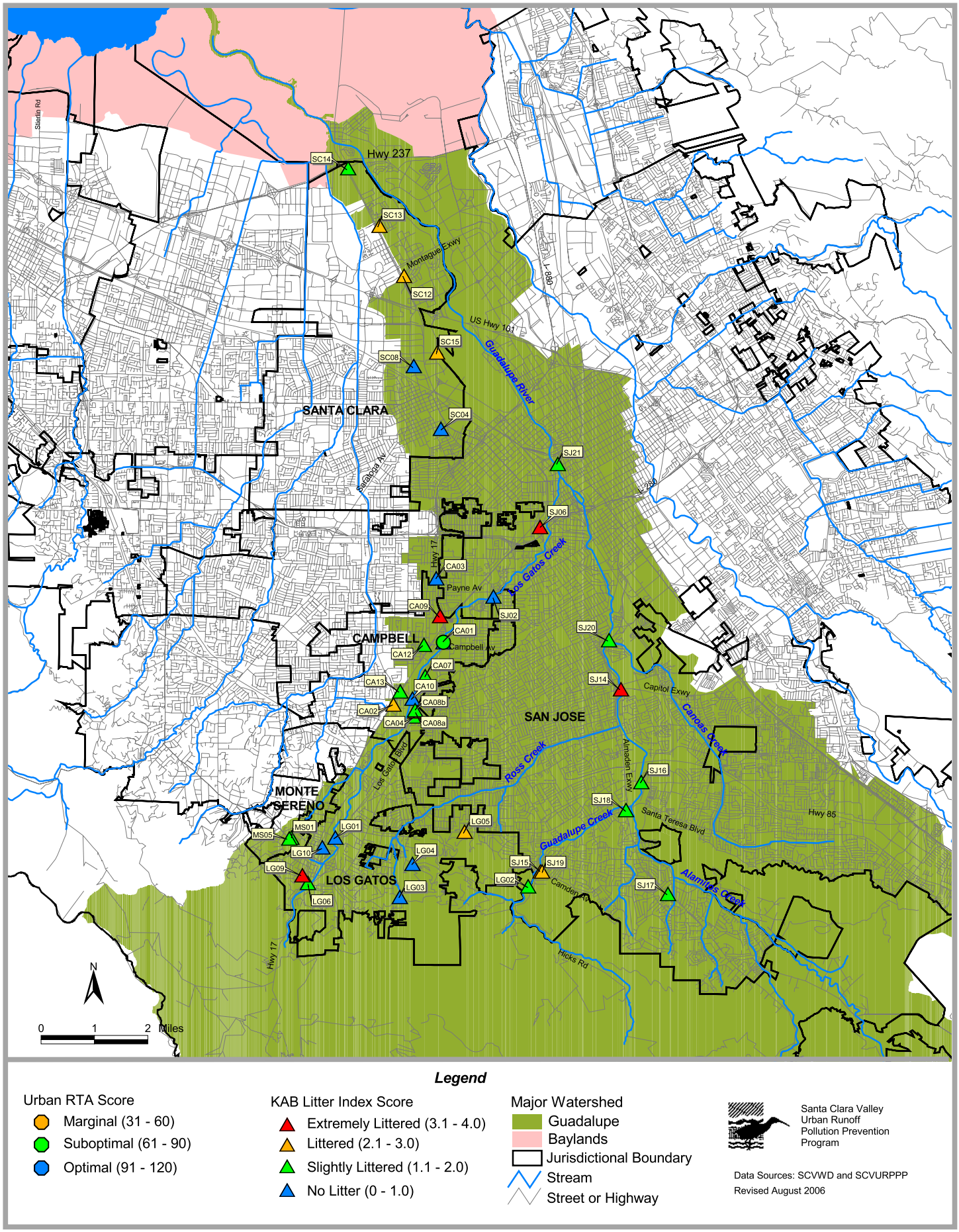


Figure 4. Location of Trash Evaluations in Guadalupe River Watershed.

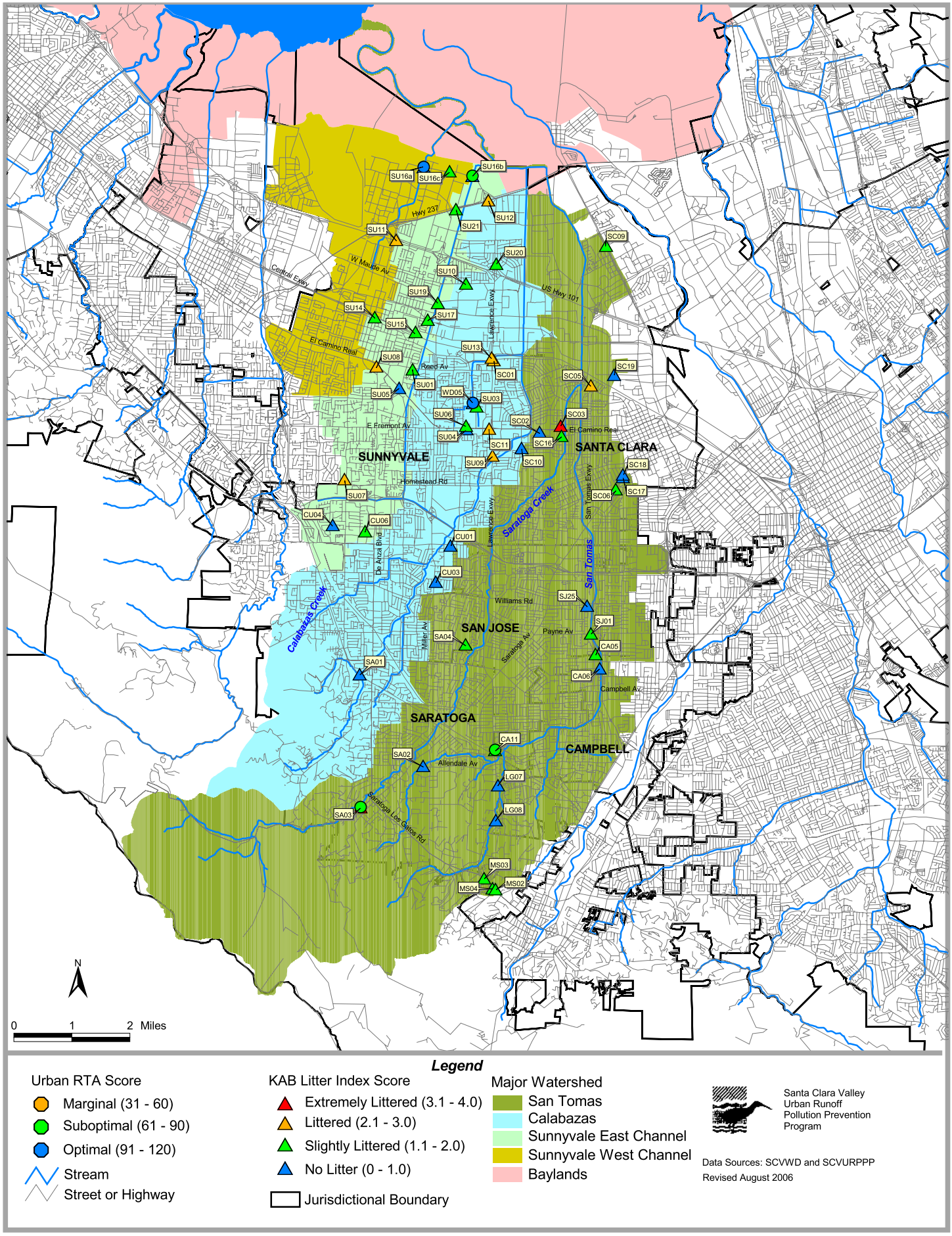
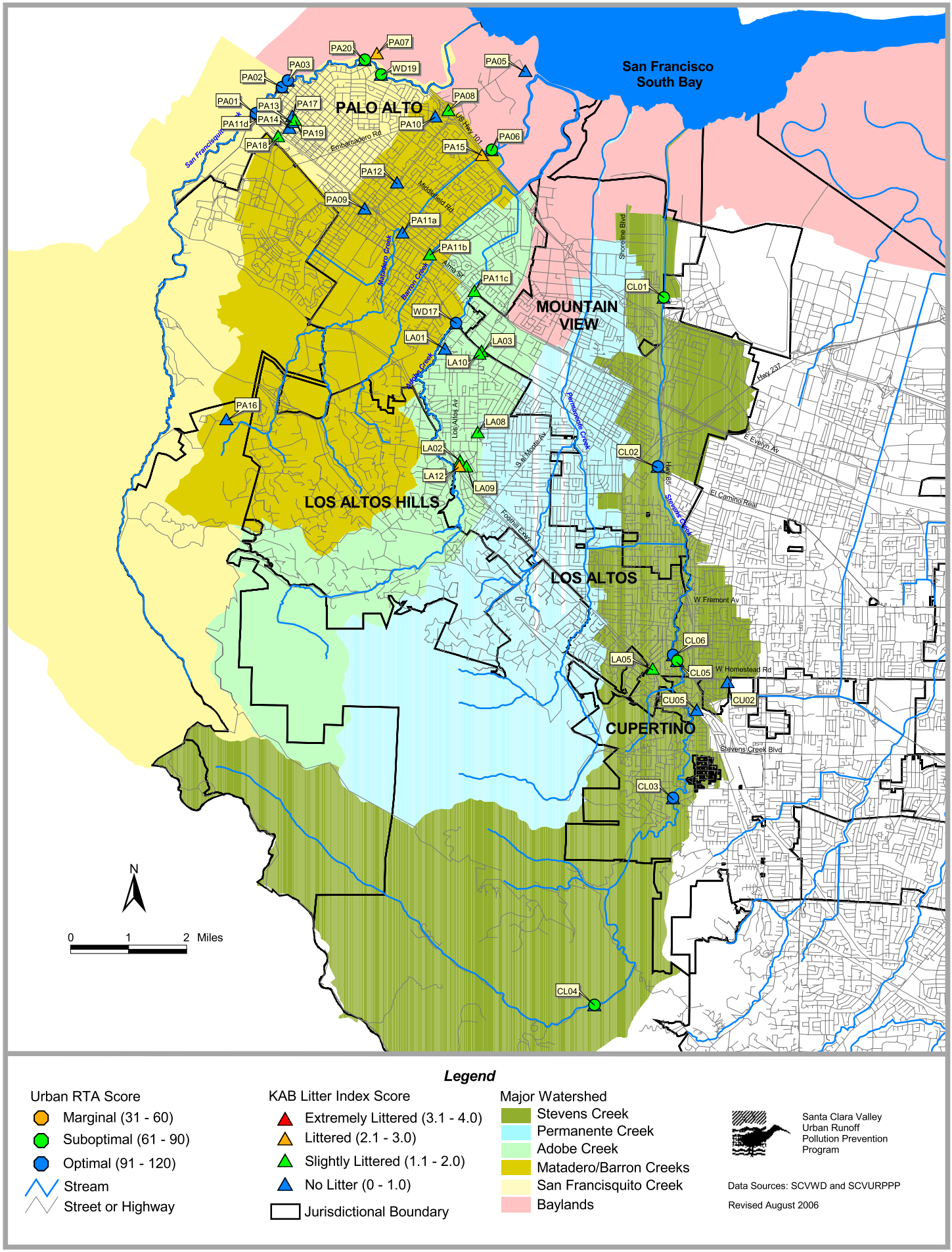


Figure 5. Location of Trash Evaluations in Sunnyvale East and West Channel, San Tomas and Calabazas Creek Watersheds.



Legend

Urban RTA Score
- Marginal (31 - 60)
- Suboptimal (61 - 90)
- Optimal (91 - 120)
- Stream
- Street or Highway

KAB Litter Index Score
- Extremely Littered (3.1 - 4.0)
- Littered (2.1 - 3.0)
- Slightly Littered (1.1 - 2.0)
- No Litter (0 - 1.0)
- Jurisdictional Boundary

Major Watershed
- Stevens Creek
- Permanente Creek
- Adobe Creek
- Matadero/Barron Creeks
- San Francisquito Creek
- Baylands

Santa Clara Valley Urban Runoff Pollution Prevention Program

Data Sources: SCVWD and SCVURPPP

Revised August 2006

Figure 6. Location of Trash Evaluations in the Baylands and Stevens, Permanente, Adobe, Matadero/Barron, and San Francisquito Creek Watersheds.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Trash Work Plan

March 1, 2003

INTRODUCTION

This Work Plan is submitted to fulfill a Program FY01-02 Continuous Improvement item and actions identified within the Program's Multi-Year Receiving Waters Monitoring Plan. The Work Plan was developed in response to the November 14, 2001 San Francisco Bay Regional Water Quality Control Board (RWQCB) 303(d) Staff Report that proposed all urban creeks, lakes and shorelines be placed on the 2002 303(d) "monitoring" list due to the threat of trash impairment to water quality. The State Water Resources Control Board (SWRCB) adopted the 2002 Clean Water Act section 303(d) list of water quality limited segments (which included this recommendation) at its February 4, 2003 Board Meeting.

The goal of the Work Plan is to identify a strategy for Co-permittee municipalities and agencies to address trash problem areas that occur in urban streams and waterways. The Work Plan includes the following objectives:

- Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction;
- Develop a strategy to conduct trash evaluations in creeks;
- Assist municipalities to identify high priority trash problem areas and sources of trash;
- Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas;
- Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

The results and implementation efforts over the next two years will be documented and provided within the Program's and Co-permittee's Annual Reports. The information is intended to assist Regional Board staff in their assessment of creeks and more specifically, stream reaches (for potential trash impairment) by the next 303 (d) listing cycle; which is expected to begin in the Spring of 2005.

BACKGROUND

The November 14, 2001 Regional Board 303(d) Staff Report proposes changes to the 1998 303(d) list of impaired water bodies within the San Francisco Bay area. The Staff Report states there "are excessive levels of trash in virtually all urbanized waterways of

the San Francisco Bay Region." However, listing these waterways was not proposed due to a lack of consistent assessment methodology for trash "impairment".

Instead, the Staff Report proposes placing all Bay area urban creeks, lakes and shorelines on the 2002 303(d) "monitoring" list due to the threat of trash to impair water quality. It states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by stormwater agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information and developing a program of action to address the principle sources. Regional Board staff has indicated that it will review this specific information in the next listing cycle; determine whether specific water bodies warrant a 303(d) listing for trash and note the existence of relatively clean urban streams.

In a proactive response to the 303(d) Staff Report, the Program developed a Work Plan to identify a strategy for addressing trash problem areas that occur in urban streams and waterways. In addition, the Program has completed several tasks to determine procedures that will efficiently and effectively define trash problem areas and identify trash sources through monitoring or existing information. A more detailed description of the methods and results of each task are provided in Attachment A. These tasks include: 1) forming a Trash Ad Hoc Task Group (see Attachment B for a list of attendees); 2) completing a technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (June 24, 2002); 3) completing a technical memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of RWQCB Rapid Trash Assessment (*March 1, 2003) (Attachment C); 4) developing and distributing an *Existing Trash Management Practices Survey Form* (November 2002) to individual Co-permittee staff (Attachment D); 5) completing a preliminary report that documents Co-permittee existing trash management practices (Attachment E); and 6) completing a technical memorandum entitled *Update of the 1999 Catch Basin Retrofit Feasibility Study* (June 26, 2002).

The preliminary report documenting Co-permittees existing trash management practices and policies identified a wide range of municipal and agency departments and programs that are responsible for trash management and code enforcement. These agencies perform the following activities to reduce trash:

- Household hazardous waste collection;
- Solid waste and curb-side recycling programs;
- Response to trash complaints/incidents;
- Litter pick-up and trash removal;
- Street sweeping;
- Storm drain operations and maintenance;
- Incentive programs (free trash pick-up/drop-off days; reduced fees for low income residents);
- Removal of homeless encampments;
- Anti-litter campaigns; and
- Volunteer creek clean-up programs and events.

Several agencies responsible for trash management reported that they currently document trash management activities and/or enforcement actions; and evaluate effectiveness of these activities. Mechanisms used to determine effectiveness include the number of routine inspections and tracking the number of complaints or work orders. Some agencies have developed specific performance measures to evaluate their programs. Several Co-permittees have indicated that the strict enforcement of anti-litter laws and increased level of outreach would most likely improve their agency's ability to manage litter and illegal dumping. The Program will continue to work with Co-permittees to fill in data gaps; and obtain additional information useful in evaluating the effectiveness of existing trash management practices and policies.

In effort to promote a regional approach in addressing trash problems, the Program coordinated and collaborated with BASMAA during the development and review of products associated with the tasks described above.

TRASH WORK PLAN

The goal of the Trash Work Plan is to identify a strategy for municipalities and agencies to address trash problems in urban streams within the Program's jurisdiction. Five major objectives have been identified for the Work Plan. They include the following:

- Document and evaluate existing trash management practices implemented by municipalities and agencies within the Program's jurisdiction;
- Develop a strategy to conduct trash evaluations in creeks;
- Assist municipalities in identifying the high priority trash problem areas and sources of trash;
- Provide guidance on the implementation of potential control measures and evaluation criteria needed to address problem areas;
- Develop a standardized reporting format for documenting and evaluating trash management and monitoring activities.

The Program places a higher priority on specific urban areas of special concern (identified trash problem areas and creek segments that are visible and/or accessible to the general public). Thus, the Program will focus on implementing trash control measures within these areas and documenting the effectiveness of management activities. The FY 03-04 tasks focus on further documentation and evaluation of existing management practices; the identification of potential management actions; the further development of trash evaluation tools and the development of standardized format for reporting and evaluating trash management practices. The FY 04-05 tasks focus on the development of a monitoring strategy; implementation of trash evaluations and the identification and implementation of trash management practices.

Evaluation results and implementation efforts will be documented and provided within the Program and Co-permittee's Annual Reports. The information is intended to assist Regional Board staff in their assessment of creeks or more specifically, creek reaches (for potential trash impairment) by the next 303 (d) listing cycle; which is expected to begin in the spring of 2005.

APPROACH

The Work Plan uses a three-prong approach to address trash problems in urban creeks. This approach involves conducting trash evaluations; identifying trash problem areas; and developing and implementing a strategy to address trash problem areas.

Conduct Trash Evaluations

Trash evaluations will primarily be used to assist municipalities and agencies in identifying trash problem areas and potential sources of trash; selecting and implementing appropriate control measures; and measuring the effectiveness of trash-related management actions over time.

The Program will use a modified version of the Regional Board's *Rapid Trash Assessment Methodology*, which was designed to assess wadeable streams. The Work Plan includes a task to modify the RWQCB assessment methodology in accordance with the recommendations provided in the document entitled *SCVURPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (Attachment A). To maintain consistency and enhance data analysis of trash evaluations being conducted within the Bay area, modifications will be coordinated with other stormwater agencies.

The Program will also investigate the utility of Keep America Beautiful's litter index (as an evaluation tool) to measure the effectiveness of management actions over time. Municipal and agency staff and/or volunteers will conduct trash evaluations within their respective jurisdictions. Program staff will provide the necessary training and guidance to implement evaluations. Trash evaluation results will be compiled and documented in the Program's annual reports.

Identify Trash Problem Areas and Trash Sources

The Work Plan includes a task to compile information (from municipalities and agencies), which identifies known trash problem areas and suspected sources of trash (e.g., litter or illegal dumping). These locations will be geo-referenced and mapped. To determine the range of trash conditions at identified trash problem areas, Co-permittee staff and/or volunteers will conduct trash evaluations at these locations. In addition, stream segments suspected of having trash problems (e.g., drainage areas with observed trash or land uses suspected of creating trash problems) will be assessed. Trash evaluation results from creeks will assist stormwater managers in prioritizing their efforts in addressing trash problem areas, identifying potential upstream sources of trash and providing baseline data for evaluating the effectiveness of potential implementation of trash controls.

The Program will also focus trash evaluation efforts in stream segments that are visible and/or accessible to the general public. These evaluation results may be used to assist stormwater managers in evaluating the effectiveness of existing trash controls implemented in areas where trash is considered a nuisance or aesthetically unpleasing to the general public.

Implement Trash Control Measures

The Program will focus its implementation of trash management practices and policies in three primary areas: eradication of trash; public outreach and participation; and enforcement of litter laws. The Work Plan identifies tasks to document and evaluate existing trash management practices and policies for municipalities and agencies within the Program's jurisdiction. It also contains a task to identify potential trash management actions and monitoring strategies conducted by other programs and agencies not part of the SCVURPPP NPDES permit. Co-permittee staff will identify and implement reasonable management actions to remedy high priority trash problem areas. To address the source and cause of trash in creeks, the Program will establish long-term management actions and policy changes as information becomes available.

The Work Plan identifies tasks to develop standardized procedures and reporting formats used to document control measures and management practices. Program staff will assist Co-permittee staff in developing a standardized reporting format for detailing trash eradication efforts, public involvement and enforcement actions. Trash evaluations will also be implemented to identify changes in trash conditions at problem areas over time. This information will be used to evaluate the effectiveness of the Program's trash control efforts.

Roles of Program and Co-permittee Agency Staff

The Work Plan identifies tasks for both Program staff and Co-permittee staff to develop and implement a strategy that addresses trash problems in urban creeks and waterways.

Program Tasks

- Further inventory, document and evaluate existing trash management practices into a summary report.
- Document and map Co-permittees' known trash problem areas.
- Conduct literature review of existing trash management practices and monitoring efforts used worldwide and incorporate into technical memorandum.
- Further develop RWQCB Rapid Trash Assessment Methodology and evaluate utility of KAB litter index.
- Conduct trash evaluation training workshop.
- Develop standardized reporting and documentation format and procedures that detail and evaluate trash management practices.
- Provide guidance to Co-permittee staff for developing a strategy to monitor trash in urban creeks.
- Compile and document trash evaluation results.
- Compile and document Co-permittee implementation of trash management practices.
- Organize and manage Trash AHTG meetings.
- Collaborate and coordinate Program activities related to trash with the City of San Jose anti-litter campaign ("Pick-Up San Jose") and the BASMAA Monitoring Committee.

Municipal/Agency Tasks

- Support Program staff to further identify municipality's existing trash management practices.
- Provide Program staff with documentation regarding trash complaints/incidents and eradication efforts and a list of trash "hot spots" or trash problem areas within their jurisdiction.
- Participate in trash evaluation methodology field training.
- Use Program's monitoring strategy guidance to develop a monitoring strategy for conducting trash evaluations
- Conduct trash evaluations at known and suspected trash problem areas.
- Identify and implement trash control measures at high priority trash problem areas.
- Evaluate effectiveness of implementing trash control measures and management practices.
- Provide Program staff with trash evaluation results and information on the implementation and evaluation of trash management activities.

The Co-permittees will include designated tasks in their Annual Work Plans submitted to the Regional Board each March. The Work Plan schedule identifies Program and Co-permittee roles and responsibilities, along with expected completion dates.

SCOPE OF WORK

Task 1: Inventory, Document and Evaluate Existing Trash Management Practices

To supplement information gathered from the *Existing Trash Management Practices Survey Form* (November 2002) of municipalities and agencies (Attachment E), the Program and Co-permittees will further identify and document existing trash management practices and policies. Tasks include the following:

- Identify and fill information gaps from the November 2002 Trash Survey;
- Develop additional survey instruments that ask Co-permittees for additional information which is useful in evaluating the effectiveness of existing trash management practices and policies;
- Program staff will conduct interviews and/or survey Co-permittee staff to update and further document existing trash management practices;
- Compile, summarize and evaluate existing trash management practices and policies information.

Work Products: Report that further documents and evaluates existing trash management practices and policies within the Program's jurisdiction.

Task 2: Identify and Document Known Trash Problem Areas

To supplement information gathered from the SCVURPPP technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (June 24, 2002), the Program and Co-permittees will further identify and document known trash problem areas. Tasks include:

- Compiling information and data sources (from municipality and agency staff) to identify known trash problem areas that occur in creeks, streets, parks and other land uses within urban areas. Data sources may include, but not be limited to, trash complaints databases, maintenance and operations records, existing list of trash hot spots (e.g., "Pick-Up San Jose's" 100 trash hot spots) and creek clean-up locations;
- Converting and mapping location information of trash problem areas into coordinates using Geographic Information System (GIS).

Work Products: Maps and electronic files identifying the location of known trash problem areas.

Task 3: Identify and Document Trash Management Practices and Monitoring Efforts Implemented Worldwide.

The Program will conduct a literature review of trash management practices and monitoring approaches used throughout the United States and internationally. Tasks include:

- Reviewing trash management efforts implemented by other programs outside the Program's jurisdiction, including, but not limited to municipalities involved with the Los Angeles River Watershed trash TMDL and those cities in partnership with Keep America Beautiful.
- Documenting criteria used by other programs to evaluate the effectiveness of trash control measures and management practices.

Work Product: Technical memorandum summarizing potential management actions and monitoring activities associated with the control and reduction of trash.

Task 4: Develop Protocols for Trash Evaluations; Conduct Training Workshop

Program staff will further develop and test methodologies to conduct trash evaluations and train municipal staff to implement these methods. Tasks include:

- Modifying the Regional Board's Rapid Trash Assessment Methodology to assess trash in wadeable streams, in accordance with the recommendations provided in the document entitled *SCVURPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (Attachment C).
- Evaluating and testing Keep America Beautiful's (KAB) litter index. The use of the KAB index will maintain consistency with "Pick-Up San Jose's" efforts in evaluating trash control measures.
- Training and providing guidance (to Co-permittee staff and volunteer groups) on how to implement the RWQCB methodology and KAB litter index.

Work Products: Develop modified version of the Regional Board's Rapid Trash Assessment Methodology and conduct trash evaluation training workshop.

Task 5: Develop Standardized Documentation and Reporting Format

To ensure a consistent trash assessment approach among Co-permittees, the Program will assist Co-permittees in developing standardized procedures for documenting, reporting and evaluating control measures and monitoring activities used for trash management. Standardized procedures may include:

- Consistent documentation of the location, quantity, type and potential source of trash removed;
- The level of effort exerted (by Co-permittee or volunteer staff) while conducting trash monitoring and removal;
- The number of brochures and materials distributed;
- The number of presentations given which contain an anti-litter message;
- Tracking municipal staff responses to trash complaints and enforcement actions.

The standardized procedures will be used by Program staff to evaluate the effectiveness of trash management practices and policies.

> **Work Products**: Develop reporting format and relational database to document trash management activities in Annual Reports.

Task 6: Develop Monitoring Strategy

The Program will assist Co-permittee staff in developing a monitoring strategy to conduct trash evaluations (including criteria for selecting appropriate sites and using evaluation tools). Program staff will coordinate and collaborate with existing municipal and agency programs and volunteer efforts to develop a monitoring program. Objectives for conducting trash evaluations in creeks include:

- Collecting baseline condition of trash;
- Identifying trash problem areas;
- Investigating trash sources;
- Measuring trends of trash conditions over time;
- Evaluating the effectiveness of trash control measures.

Trash evaluations will initially be conducted at high priority problem areas (creeks identified in Task 1) and stream segments suspected of having trash problems. Suspected trash problem areas within creeks will be identified using mapped locations of municipalities' trash problem areas (e.g., streets, storm drain inlets and parks) and by evaluating creeks in land uses where trash is likely to accumulate.

Trash evaluations can also be used to determine potential causes of trash (e.g., litter, illegal dumping, accumulation, etc.) and trash sources within a drainage area (i.e.,

linkage to upstream land uses). Identifying trash sources is an important step in developing strategies used in the implementation of control measures and management actions. In addition, trash evaluations can be used after implementation of control measures to evaluate the effectiveness of management actions.

Program staff will also coordinate with Regional stormwater programs and Regional Board trash assessment activities to determine patterns between trash accumulation and trash sources (e.g., problematic land use types).

Work Products: Develop guidance document that assists Co-permittees in identifying and prioritizing creek segments for conducting trash evaluations.

Task 7: Implement Trash Evaluations

- Municipalities, agencies, and/or other Co-permittee programs (and their designated volunteers) will implement trash evaluations in accordance with the monitoring strategy identified in Task 6. The entities responsible for conducting evaluations will submit copies of completed evaluation forms to Program staff.

Work Product: Completed trash evaluation forms.

Task 8: Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas

Program staff will assist municipalities identify high priority areas by conducting the following tasks:

- Evaluating survey results from Co-permittee staff and entering relevant data into database;
- Mapping locations of trash evaluations into a GIS;
- Developing criteria to prioritize and rank trash problem areas. Factors used in prioritization include the total score of trash evaluations, public access to a creek, presence of aquatic life and/or recreational uses, constraints associated with land ownership, and existing or planned trash management practices;
- Distinguishing type of trash sources associated with problem areas (e.g., litter, illegal dumping, accumulation from upstream sources, or a combination of all three);
- Identifying suspected land uses or behaviors associated with trash problem areas.

Work Products: Develop maps showing location and ranking of trash problem areas; Prepare technical memorandum that summarizes evaluation results, prioritizes problem areas and provides recommendations for identifying and implementing potential management actions.

Task 9: Identify and Implement Trash Management Practices

The Program will assist Co-permittees with identifying and implementing potential management practices to address trash problem areas in the Program's jurisdiction. The first step will be to identify reasonable control measures and trash management

practices which address high priority trash problem areas identified in Tasks 6, 7 and 8. Potential management measures will be identified in three major areas: 1) eradication of trash; 2) public outreach and participation; and 3) enforcement of litter laws. Measures may include, but not be limited to, the following:

- Anti-litter campaigns (local and nationwide);
- Incentive-based programs (e.g., expanding redemption values for trash items);
- Expanding trash control ordinances and enforcement actions;
- Improving documentation and reporting;
- Enhancing interagency coordination of tracking and enforcing trash violations;
- Implementing structural controls in trash areas of concern.

The second part of this task will be for municipal and agency staff to implement control measures and best management practices to address trash problem at high priority areas. Municipal and agency staff will report their implementation of trash management practices and enforcement actions to Program staff.

Work Product: Report detailing trash problem areas, management practices implemented and the monitoring strategy used to determine effectiveness.

Task 10: Organize and Manage Trash Ad Hoc Task Group Meetings

Program staff will plan and organize Trash AHTG meetings to facilitate review and approval of Program products identified in this Work Plan. Program staff will attend "Pick-Up San Jose" Technical Advisory Committee meetings to coordinate trash-related activities identified in the Work Plan. Program staff will also attend BASMAA Monitoring Committee meetings to coordinate Program's efforts in addressing trash with other stormwater agencies.

Work Product: Trash AHTG meeting minutes

Task 11: Review and Update Performance Standards Relevant to Trash Management

Program staff will assist Co-permittees in the review of existing performance standards (which address BMPs or control measures relevant to trash management); and identify potential revisions to existing performance standards. The Trash AHTG will develop recommendations for potential revisions to existing performance standards. Recommendations will be reviewed and approved by the Management Committee. Program staff will make recommendations regarding the development of a performance standard for trash management. If necessary, Program staff will initiate the development of this performance standard.

Work Product: Revise or develop performance standards, as appropriate.

Trash Work Plan Schedule			
Task Description	**SCVURPPP**	**Municipality**	**Completion Date**
Task 1: Inventory, Document and Evaluate Existing Trash Management Practices (Work started in November 2002)			
1.a: Determine data gaps from initial survey; Develop additional trash survey questions; Coordinate with Co-permittees to facilitate documentation and evaluation of existing trash management practices.	X	A	October 2003
1.b: Compile Co-permittee data/information; Develop report summarizing and evaluating existing trash management practices.	X	A	December 2003
Task 2: Document and Map Known Trash Problem Areas (Work started in June 2002)			
2.a: Identify data sources and information showing the location of known trash problem areas (e.g., trash complaints/incidents and eradication efforts).	A	X	October 2003
2.b: Compile data/information; Convert location information of trash problem areas into coordinates; Develop maps in GIS.	X	A	December 2003
Task 3: Identify and Document Trash Management Practices and Monitoring Efforts Implemented Worldwide.			
3.a: Conduct literature search to identify and document trash management practices used in trash control programs outside SCVURPPP; Develop technical memorandum summarizing information.	X	N	February 2004
Task 4: Develop Protocols for Trash Evaluations and Implement Training Workshop (Work started in September 2002)			
4.a: Modify RWQCB Rapid Trash Assessment Methodology.	X	N	March 2004
4.b: Evaluate utility of KAB litter index.	X	N	March 2004
4.c: Plan, organize and conduct training workshops for municipal staff.	X	A	May 2004
Task 5: Develop Standardized Documentation and Reporting Format			
5.a: Based on results from Tasks 1-3, identify standardized procedures to document and evaluate the effectiveness of trash management practices and policies.	X	N	April 2004
5.b: Develop reporting format and relational database to document trash management activities in Annual Reports.	X	A	June 2004

Legend:
"X" = Will implement at this level
"N" = Not being implemented at this level
"A" = Assist with or develop guidance for implementation

Trash Work Plan Schedule			
Task Description	**SCVURPPP**	**Municipality**	**Completion Date**
Task 6: Develop Monitoring Strategy			
6.a: Evaluate results from tasks 1-3; Develop guidance for Co-permittees to identify and prioritize creek segments to conduct trash evaluations.	X	N	July 2004
6.b: Select monitoring locations and trash evaluation methodology to implement (e.g., collect baseline data at trash problem areas in creeks)	N	X	August 2004
Task 7: Implement Trash Evaluations			
7.a: Identify which entities will conduct trash evaluations (e.g., Municipal staff, volunteer groups, etc.)	A	X	July 2004
7.b: Conduct trash evaluations and submit results to Program staff.	N	X	October 2004
Task 8: Document and Analyze Evaluation Results; Identify and Prioritize Trash Problem Areas			
8.a: Document and analyze trash evaluation results	X	A	December 2004
8.b: Identify high priority trash problem areas using trash evaluation results	A	X	December 2004
Task 9: Identify and Implement Trash Management Practices			
9.a: Identify reasonable trash management practices to address high priority areas, initially focusing on known trash problem areas.	N	X	Ongoing (Start July 2004)
9.b. Implement trash management practices at high priority areas to the maximum extent practicable.	N	X	Ongoing (Start July 2004)
9.b: Document and report implementation of trash management actions	A	X	June 2005
Task 10: Manage Trash Ad Hoc Task Group Meetings and Coordinate with other Programs			
10.a: Plan and Organize Trash AHTG meetings	X	A	Ongoing
10.b: Attend quarterly meetings of the Pick-Up San Jose TAC	X	N	Ongoing
10.c: Attend BASMAA Monitoring Committee meetings to coordinate Program's efforts to address trash with other stormwater agencies.	X	N	Ongoing

Legend:
"X" = Will implement at this level
"N" = Not being implemented at this level
"A" = Assist with or develop guidance for implementation

Trash Work Plan Schedule			
Task Description	**SCVURPPP**	**Municipality**	**Completion Date**
Task 11: Review and Update Performance Standards Relevant to Trash Management			
11.a: Review existing standards that address BMPs or control measures relevant to trash management			April 2005
11.b. Develop recommendations for the Management Committee regarding potential revisions to existing standards or development of new standards.			June 2005

Legend:

"X" = Will implement at this level
"N" = Not being implemented at this level
"A" = Assist with or develop guidance for implementation

ATTACHMENT A

PROGRAM TASKS COMPLETED IN 2002 TO ADDRESS TRASH

The following is a detailed summary of tasks completed by the Program to determine procedures that will efficiently and effectively define trash problem areas and identify trash sources through monitoring or existing information. These include: 1) forming a Trash Ad Hoc Task Group; 2) completing a technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (June 24, 2002); 3) completing a technical memorandum entitled *SCVURPPP and SMSTOPPP Pilot Implementation and Testing of RWQCB Rapid Trash Assessment*-March 1, 2003; 4) developing and distributing an *Existing Trash Management Practices Survey Form* (November 2002) to individual Co-permittee staff; 5) completing a preliminary report that documents Co-permittee existing trash management practices; and 6) completing a technical memorandum entitled *Update of the 1999 Catch Basin Retrofit Feasibility Study* (June 26, 2002).

Trash Ad Hoc Task Group (Trash AHTG) Meetings

To effectively address trash issues, a Trash AHTG was formed by the Program's Management Committee. Since May 2002, seven AHTG meetings have been conducted (see Attachment B for a list of attendees). AHTG members include persons extremely knowledgeable about integrated waste management and the enforcement of litter laws. The initial meeting provided background of existing trash management practices implemented by the City of San Jose and Santa Clara Valley Water District (SCVWD). In addition, Regional Board staff (Steve Moore) discussed the Regional Board's position on trash for the 303(d) list and described their Rapid Trash Assessment Methodology. Later meetings contained presentations by SCVWD staff describing their Creek Clean-up activities and Santa Clara County staff providing a background on their trash enforcement activities. Since May 2002, the Trash AHTG has identified the major issues pertaining to trash assessment and trash management practices; developed technical memoranda on the preliminary identification of trash problem areas and pilot testing and implementation of the Regional Board's Rapid Trash Assessment Methodology; developed and completed the existing trash management practices survey form and commented on the preliminary results of the survey. This information was critical in the development of the Trash Work Plan. Documentation of all meetings has been distributed and is available upon request.

Pilot Investigation of Trash Hot Spots

Program staff identified potential trash "hot spots" areas using existing data from the City of San Jose, SCVWD and Santa Clara County. The term "hot spot" was not used to denote impairment but to indicate "potential areas of concern" for possible improvement or documentation of trash management practices. Data sources used for preliminary identification of trash areas of concern included data collected by the Creek Connections Action Group (CCAG), the SCVWD's Good Neighbor Program and the Santa Clara County Department of Environmental Health database that documents complaints of litter and illegal dumping on County lands. The results of this study were presented in a technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (SCVURPPP, June 24, 2002).

The memorandum concluded that the available data or information from the programs was inadequate to draw definitive conclusions due to either

inconsistencies with data collection or scarcity of data. Interpretation and data collection are important not only to identify trash "hot spots" but also to identify the effectiveness of current management practices and the potential need for improvement of management practices. The memorandum also recommended identifying trash types and possible trash sources (for data collection) as a method of characterizing potential trash problem areas.

Implementation and Development of Trash Assessment Methodology

Program staff implemented and tested the Regional Board staff's Rapid Trash Assessment Methodology at nine stream locations in Santa Clara and San Mateo Counties. The results of the study were incorporated in a technical memorandum entitled *SCVURPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* (Attachment C). The study was a collaborative effort between SCVURPPP and San Mateo Countywide Pollution Prevention Program (STOPPP) to determine the utility of the approach for performing the following functions: 1) Document baseline levels of trash in creeks; 2) Identify sources of trash and appropriate control measures to reduce trash; 3) Evaluate effectiveness of trash management practices; 4) Assess all creeks in the SCVURPPP jurisdiction for trash; and 5) Assess impairment of beneficial uses from trash.

The Trash AHTG reviewed the results of pilot assessments and identified the following recommendations for future implementation of the assessment methodology:

- The RWQCB assessment methodology may be useful for measuring baseline levels of trash, identifying and prioritizing trash problem areas and evaluating the effectiveness of targeted BMPs in future assessments. In addition, the assessment may be useful for identifying potential sources of trash and appropriate BMPs. It is important to note that the RWQCB methodology can rapidly estimate trash quantity and quality in a creek for a particular index period (e.g., dry season). However, the methodology does not provide an estimate for the total amount of trash entering and being transported through receiving waters.
- The RWQCB methodology is limited in its ability to link assessment results with potential impairment to aquatic life uses. More studies are needed to link trash with degraded water quality conditions and impacts to aquatic life. The methodology does provide a direct measure of aesthetic quality of trash, which can potentially be used to evaluate impairment of recreational beneficial uses.
- It is not feasible to implement the methodology to assess all urban creeks. Trash levels in creeks will be highly variable due to changes in land use and public access. As a result, the extrapolation of trash assessments (to the entire waterbody) is difficult which may lead to the potential misinterpretation of results.
- To improve the interpretation of results in urban streams and the identification of trash sources and potential management actions, it is recommended that the methodology be revised. Recommended revisions include the development of additional categories and parameters (within the "trash tally sheet") that enhance the distinction of trash sources (e.g., recyclables versus Non-recyclables, illegal dumping versus litter, etc.) and modifying numeric ranges used in condition categories for certain trash parameters (to better represent urban stream conditions).

Program staff presented pilot trash assessment results at the October 2 and November 6, 2002 BASMAA Monitoring Committee meetings. Comments from BASMAA Monitoring Member members were compiled and considered for final revision of the technical memorandum. The final draft *entitled SCVURPPP and SMSTOPPP Pilot Implementation and Testing of the RWQCB Rapid Trash Assessment* was approved by at the February 4, 2003 Trash AHTG meeting.

Documentation of Existing and Planned Trash Management Practices

Working collaboratively with the Trash AHTG and Co-permittee staff, Program staff developed and distributed an existing trash management practices survey form to individual Co-permittee staff (Attachment D). The main purpose of the survey was to document existing trash management practices and policies for each Co-permittee. The survey responses were compiled and entered into a Microsoft Access® database. Preliminary reports were generated from the database to document existing trash management practices and policies implemented by the Co-permittees (Attachment E). The Trash AHTG reviewed the reports and commented on the utility of this information.

The preliminary report documenting Co-permittees existing trash management practices and policies identified a wide range of municipal and agency departments and programs that are responsible for trash management and code enforcement. These agencies perform a wide range of activities to reduce trash, including:

- Household hazardous waste collection;
- Solid waste and curb-side recycling programs;
- Response to trash complaints/incidents;
- Litter pick-up and trash removal;
- Street sweeping;
- Stormdrain operations and maintenance;
- Incentive programs (free trash pick-up/drop-off days; reduced fees for low income residents);
- Removal of homeless encampments;
- Anti-litter campaigns;
- Volunteer creek clean-up programs and events.

Several of the agencies responsible for trash management reported that they currently document both trash management activities and/or enforcement actions and evaluate effectiveness of these activities, either by routine inspections or tracking the number of complaints or work orders. Some of the agencies have developed specific performance measures to evaluate their programs. Several Co-permittee municipal staff identified stricter enforcement of anti-litter laws and increased level of outreach as additional management activities that would most likely improve their agency's ability to manage litter and illegal dumping.

A concerted effort to address trash is being implemented as part of the City of San Jose's Anti-Litter Campaign entitled "Pick-Up San Jose". This campaign was started in April 2002 and is modeled after the City's successful anti-graffiti campaign. It is a collaborative effort between several city and county agencies. The Anti-litter

ATTACHMENT A

Campaign's goal is to make San Jose one of the cleanest, trash-free cities in the country.

The Anti-Litter Campaign has the following three key components: 1) eradication of litter, 2) community involvement and 3) enforcement of litter laws. The eradication efforts have included identifying 100 trash "hot spots", which were based on complaints from residents and city staff observations, and implementing the Keep America Beautiful's (KAB) Litter Index to evaluate effectiveness of targeted management practices. Volunteers have adopted many identified hot spots for periodic trash removal and plan on re-assessing problem areas (using KAB's litter index) on an annual basis. The California Department of Transportation (Caltrans) and Weekend Offender Program are also involved in the clean up of identified hot spots.

Community involvement efforts have included the development of anti-litter brochure and video entitled *Climb the Litter Ladder*. The Anti-Litter Campaign has organized volunteers and obtained necessary supplies to conduct trash clean-up events (including a major event planned for Earth Day 2003). Enforcement agencies are involved in conducting school outreach to promote anti-litter behavior in kids. In addition, enforcement agencies have reviewed existing ordinances and increased their issuance of citations relating to trash violations. Additional activities conducted by local police and the Santa Clara County District Attorney's Office include the outreach and enforcement of tarpaulin ordinances (for solid waste haulers) and the development of form letters (sent to fast food restaurants) to promote proper litter clean-up.

The Anti-litter Campaign has formed a Technical Advisory Committee (TAC), which meets on a quarterly basis to discuss accomplishments and milestones. Each agency or program involved in the Anti-Litter Campaign has identified performance measures (e.g., number of volunteers or creek cleanup events). The SCVURPPP will continue to coordinate its activities with programs associated with Anti-litter Campaign. Several members of the TAC have regularly attended Trash AHTG meetings. Program staff (Paul Randall) attended the January 6, 2003 TAC meeting.

The Trash AHTG agreed that it was difficult to evaluate effectiveness of existing trash management practices due to the lack of detailed information. Several agencies reported a high variability of frequencies for certain existing management practices (e.g., street sweeping frequency depends on land use and/or district). The surveys were not designed to gather the range of efforts for each practice due to the difficulty of evaluating the effectiveness of management practices between Co-permittees. In addition, the severity of trash varies among municipalities, requiring different levels of management efforts. As a result, a comparison of existing trash management practices between municipalities is less informative. Additional information from Caltrans or the Santa Clara Valley Transportation Authority (VTA) is needed to provide the "complete picture" of existing trash management practices implemented within the Program's jurisdiction.

Another difficulty in evaluating the survey results was the lack of available information to identify existing trash problem areas in creeks. Knowledge of trash problem areas is useful in identifying where existing trash control measures appear to be ineffective. The Program's technical memorandum entitled *Pilot Investigation of Trash Hot Spots* (dated June 24, 2002) concluded that available data were either

too inconsistent or sparse to identify trash problem areas in creeks. SCVWD Operation and Maintenance Departments and creek cleanup organizations have recently started documenting trash removal efforts in a more consistent manner. Municipalities primarily focus trash management efforts within streets and parks, which is the jurisdiction for the majority of departments responsible for trash control. The City of San Jose has identified 100 trash "hot spots" as part of its "Pick-Up San Jose" anti-litter campaign. In addition, the City of Palo Alto has developed a trash hot spots program, which entails routine patrol of roadside areas identified as trash problem areas. This information can be useful in determining potential sources of trash. However, it will not necessarily identify or describe trash condition within creeks.

Update of the 1999 Catch Basin Retrofit Feasibility Study

To address specific recommendations raised in July 12, 1999 Catch Basin Retrofit Feasibility Study Technical Memorandum, the Program updated specific recommendations regarding inlet screen inserts; investigated the status of model designs for pit traps and modified catch basins; and tracked the availability and municipal experience with litter control devices, especially in-line deflection separator units (continuous deflection separator units). Based on review and analysis of the information listed, specific recommendations regarding storm drain litter control devices were made. In addition to a data review, promising designs and devices were analyzed for their effectiveness, technical feasibility, ease of operation and maintenance and potential costs. The results of the review are described in the technical memorandum entitled *An Update of the 1999 Catch Basin Retrofit Feasibility Study* (dated June 26, 2002). This review will assist Co-permittees in selecting the potential BMPs necessary to control trash discharges.

ATTACHMENT B – SCVURPPP TRASH AHTG MEETING ATTENDANCE LIST

Name	Affiliation	Meeting Date						
		May	June[1]	July	Sept	Nov	Dec	Feb
Alan Jones	Santa Clara County Roads and Airports	x						
Arleen Feng	Alameda County Cleanwater Program				x	x		
Bill Grimes	Sr. Env. Compliance Spec. @ Parks & Rec	x						
Brett Calhoun	Santa Clara Valley Water District	x		x	x		x	
Carrie Wright	San Jose - Transportation						x	
Cheri Donnelly	West Valley Communities							x
Chris Rummel	DEH. Solid Waste and LEA Section	x	x	x		x		x
Dave Staub	Santa Clara				x	x	x	x
Ed Morales	Santa Clara Valley Water District	x	x	x				
Elizabeth Neves	Creek Connections Action Group	x						
Irene Salazar	Anti-Graffitti and Litter Program	x		x				
Jack Judkins	San Jose – ESD	x		x	x	x	x	x
James Downing	San Jose – ESD			x	x	x		
Jan O'Hara	RWQCB	x	x					
Jeff Daniels	San Jose	x						
Jim Ervin	San Jose	x	x					
Jim Letiner	San Jose – Transportation	x						
Josephine Byer	Santa Clara County Roads and Airports				x		x	x
Kathy Wells	Santa Clara County DA's Office	x				x	x	
Kay Moss	Santa Clara Valley Water District	x		x			x	
Kristin Kerr	SCVURPPP Program Staff	x	x	x				
Kristy McCumby-Hyland	Sunnyvale	x	x	x	x	x	x	x
Lisa Fleming	Santa Clara Valley Water District				x			x
Lisa Rose	San Jose Graffitti Abatement & Anti-Trash Campaign	x		x	x		x	
Margaret Rands	County Integrated Waste Mgmt. Program Mgr	x						
Mondy Lariz	RPMC - FFF	x	x				x	x
Mary Morse	San Jose - ESD						x	
Paul Randall	SCVURPPP Program Staff			x	x	x	x	x
Phil Bobel	Palo Alto	x	x	x		x	x	x
Randy Turner	Creek Connections Action Group	x						
Rene Eyerly	West Valley Communities	x						
Rob Boyles	AGLP						x	

Name	Affiliation	Meeting Date						
		May	June[1]	July	Sept	Nov	Dec	Feb
Roberto Medina	Palo Alto				x			
Roger Lee	Santa Clara	x						
Roger Narsim	Santa Clara Valley Water District						x	
Sandra Dutra	San Jose	x		x				
Skip Lacaze	San Jose, ESD/IWM	x	x	x	x	x	x	x
Steve Homan	Santa Clara County	x	x	x	x			
Steve Moore	RWQCB	x						
Tom Mumley	RWQCB	x						
John Fusco	SCVURPPP Program Staff	x		x	x	x	x	x
Trish Mulvey	CLEAN South Bay	x	x	x	x	x	x	

[1] Not all attendees were reported in meeting minutes

ATTACHMENT C

SCVURPPP AND SMSTOPPP PILOT IMPLEMENTATION AND TESTING OF RWQCB RAPID TRASH ASSESSMENT

March 1, 2003

INTRODUCTION

Program staff implemented and tested the Regional Water Quality Control Board's (RWQCB) *Rapid Trash Assessment Worksheet* at nine stream locations in Santa Clara and San Mateo Counties. Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and San Mateo Countywide Pollution Prevention Program (SMSTOPPP) are collaborating to determine the utility of the approach for performing the following functions:

- Document baseline levels of trash in creeks
- Identify sources of trash and appropriate control measures to reduce trash
- Evaluate effectiveness of trash management practices
- Assess all creeks in the SCVURPPP and SMSTOPPP jurisdiction for trash
- Assess impairment of beneficial uses by trash

Results of the pilot assessment were presented by Program staff at the September 25th SCVURPPP Trash Ad Hoc Task Group (AHTG) and at the October 2, 2002 BASMAA Monitoring Committee meeting. Comments from the Trash AHTG were compiled and incorporated into the discussion section of this memorandum. The current draft of the trash assessment technical memorandum was approved by the AHTG at the November 4, 2002 Trash AHTG meeting.

Development and implementation of trash assessment protocols is one component of the SCVURPPP and SMSTOPPP Trash Work Plans. SCVURPPP and SMSTOPPP will consider the recommendations included in this memorandum and comments from Regional Board staff and members of the BASMAA Monitoring Committee for future implementation of trash assessments.

BACKGROUND

A November 2001 Regional Board staff report proposes changes to the 1998 303(d) list of impaired water bodies in the Bay area. The staff report states there "are excessive levels of trash in virtually all urbanized waterways of the San Francisco Bay Region." However, listing these waterways as impaired by trash is not proposed due to a lack of consistent assessment methodology.

Instead, the staff report proposes placing all Bay area urban creeks, lakes, and shorelines on a preliminary or "monitoring" list due to the threat of trash to impair water quality. It states that between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdictions, as documented by storm water agencies in annual reports to the Regional Board. The report recommends that the approach mirror the standard TMDL approach of defining the problem, identifying the sources through monitoring or existing information, and developing a program of action to address the principle sources. Regional Board staff will review this specific information in the next listing cycle and determine whether specific water bodies warrant 303(d) listing for trash, and note the existence of relatively clean urban streams.

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METHODS

The RWQCB Rapid Trash Assessment Version 6.0 was released to the public on September 25, 2002. The assessment was designed for several purposes, including ambient monitoring, evaluation of management actions, and evaluation of the effects of public access to trash condition of creeks. The RWQCB began implementing the trash assessment in summer of 2002 as part of their Surface Water Ambient Monitoring Program (SWAMP).

The assessment protocol includes identification and enumeration of all trash items that occur below high water line and along stream banks within a 100-foot section of stream. The second part of the RWQCB protocol includes determination of condition for six assessment parameters (scores 0-20, higher score = less trash) using the narrative parameter descriptions provided in the assessment worksheet. Program staff attended a training session on these protocols given by RWQCB staff. In addition to implementing the assessment approach, Program staff took digital photographs at each site to determine if photo documentation could accurately depict level of trash and potential impairment.

The pilot testing of the RWQCB's approach did not include implementing the assessment during different seasons to determine temporal variation of trash condition at individual sites. The pilot assessment was conducted in the fall to capture levels of trash in the creeks prior to winter rains, and before the national trash cleanup event that occurred on September 21st 2002.

Assessments were completed over a two-day period in September 2002 at five stream locations within San Pedro Creek (Figure 1), a coastal watershed in San Mateo County, and four stream locations in Coyote Creek watershed (Figure 2), which is located in the eastern portion of the Santa Clara Valley and drains into the South Bay. The assessment locations were selected based on several factors including known problem areas, land use type (residential, commercial, open space) and stream size. Creek segments in Upper Penitencia (total =3) and San Pedro Creek (total = 5) were selected at different points in each respective watershed to represent varying degrees of urbanization, i.e., sites at the lower, middle and upper sections of the urbanized portion were surveyed within each watershed. One site on Coyote Creek was sampled to identify the feasibility of this assessment approach in larger streams.

RESULTS

Individual parameters scores, total scores and the number of major trash item types for each assessment site are provided in Tables 1 and 2. Major findings include:

1) Known problem areas had the worst scores within each watershed. The flea market site, although not previously identified as a problem area, had low trash scores (more trash) with an apparent chronic trash problem and should be considered a problem area. The two highest scores (less trash) were at the upper sites of each watershed, toward the edge of the urban boundary.

2) Total scores (parameter scores combined) decreased and total trash items increased in the downstream direction. Most of the individual assessment parameter scores also decreased in the downstream direction, with the exception of the human health parameter, which was consistently rated as sub-optimal at all but two sites.

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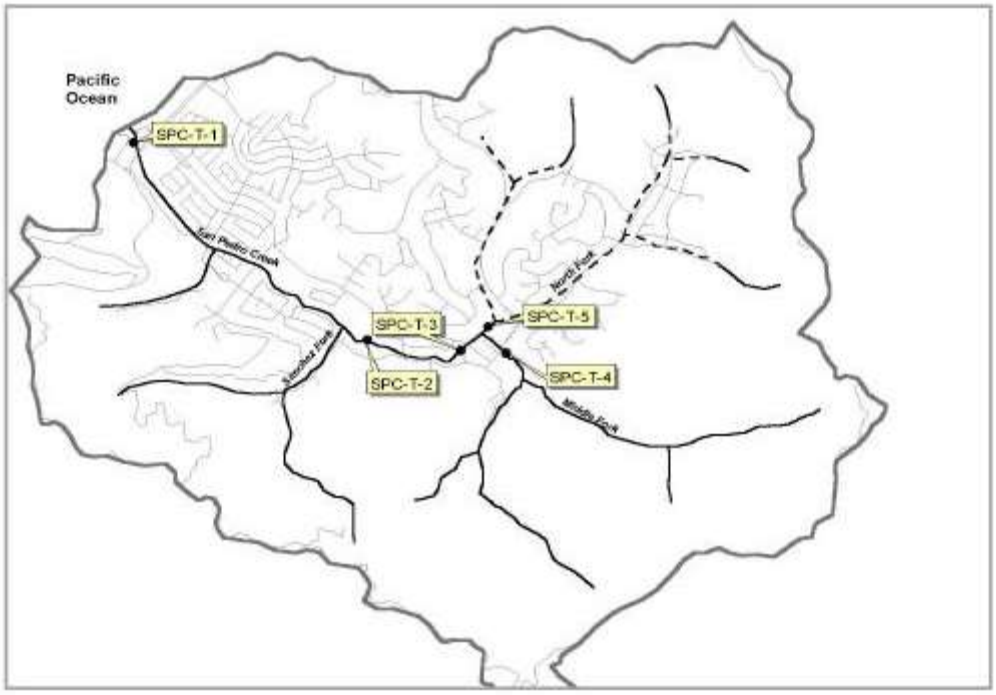

Figure 1. Location of pilot trash assessments conducted in San Pedro Creek.

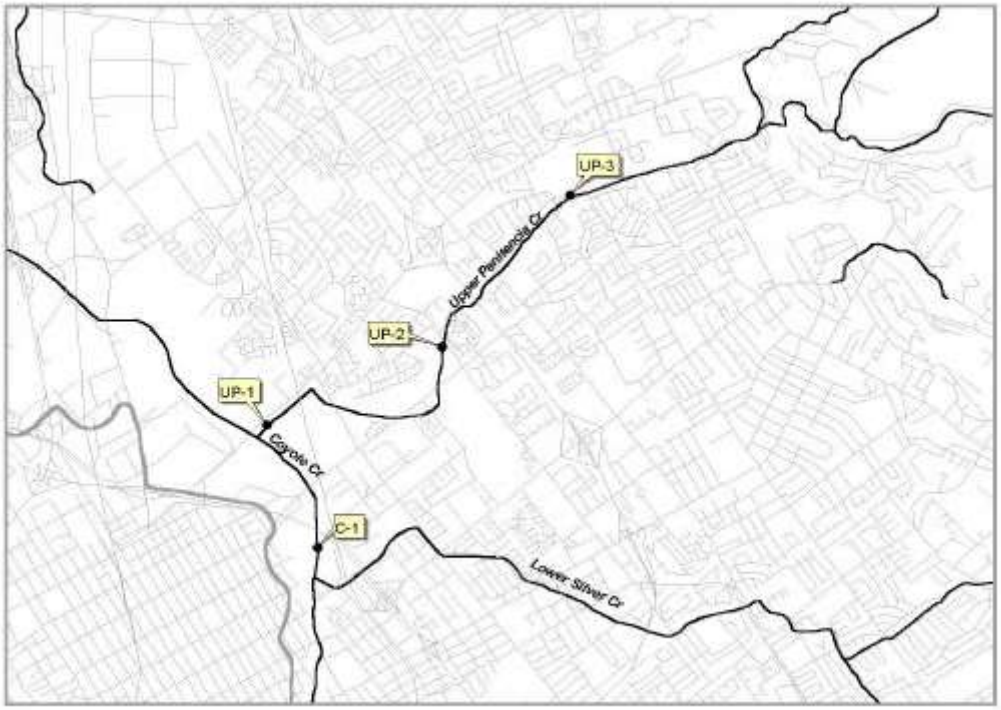

Figure 2. Location of pilot trash assessments conducted in Upper Penitencia and Coyote Creek.

3) The survey worked best in Upper Penitencia and San Pedro Creeks because all areas of the stream habitat were accessible and generally visible. The assessment at the site on Coyote Creek was less effective because the creek was too deep in some areas and the visibility too poor to accurately identify all trash items. There were generally no problems identifying trash along the stream banks, although there was difficulty in some instances of identifying the upper boundary (see # 5).

4) Digital photographs provided insufficient details to identify level of trash, estimate threats to water quality, or potential sources of trash. The relative number of trash items and types of trash are not clearly distinguishable. These results were consistent with earlier RWQCB evaluation. The photos may be useful for identifying benchmarks that define site boundaries and for documenting the general conditions of the site.

5) Using slightly different definitions for the stream bank boundary can have significant impact on the results. Incorporating trash items along the edge of upper right bank adjacent to a parking lot (at lowest site in San Pedro Creek) resulted in decreasing the total score from 74 to 30. Integrating trash for the upper section of streambank was questionable in this case because dense riparian vegetation appeared to prevent trash from entering the creek. There was minimal evidence of trash in the creek.

6) The lower site of San Pedro Creek and Upper Penitencia Creek (flea market) were cleaned up for trash shortly after the assessment. If the assessment had been repeated after the cleanup, the trash scores would have been much improved.

7) Eight of nine sites were rated poor for quantity of trash. In contrast, half of these eight sites were qualitatively rated sub-optimal (visual estimation of trash problem). As a result, conditions for qualitative and quantitative parameters were not very well correlated.

8) The most common trash items for all sites were plastic (primarily bags, bottles and wrappers), biodegradable (mostly paper), and metal (aluminum foil wrappers and cans). Trash items were more prevalent below the water line, with the exception of paper, cigarette butts and glass bottles, which were more common on the stream banks.

9) The trash items found that were considered potential threats to aquatic organism health were typically plastic (bags, bottles, wrappers) and other buoyant items (styrofoam and cigarette butts). The condition rating for aquatic health parameter was largely based on the relative number of these items found (e.g., low, medium prevalence, large amount), regardless if the plastic items were in the creek or on the bank. The scores typically decreased in the downstream direction.

10) There were few trash items found considered to be threats to human health. The most common were sharp objects, such as glass and jagged metal. There were animal feces and diapers found on the banks of two sites. The condition for this parameter was never optimal because there was always glass found on-site; five of the nine sites were rated sub-optimal due to presence of glass. There were no spatial trends observed for this parameter.

11) Dumping and littering appear to be a major problem for some sites we assessed. All four sites that were rated poor for this parameter had the lowest total scores and the highest number of trash items. Three of these sites were commercial and one was

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Table 1. Rapid trash assessment results from watersheds in Santa Clara and San Mateo County. Individual trash assessment parameter scores range from 0-20, with low numbers representing poor conditions. Similarly, low total score represents poor conditions. The sites marked with (*) refer to previously known trash problem areas.

Location Description	Site Id	Land use	Date	Trash Assessment Parameter Scores						
				Qual.	Quant.	Aquatic Life	Human health	Dump/ Litter	Accum	Total Score
Santa Clara County (Upper Penitencia Creek)										
Fleamarket	UP-1	Commercial	9/12/02	6	0	5	16	5	7	**39**
Penitencia Park (lower)	UP-2	Residential/park	9/12/02	13	4	11	3	12	10	**53**
Penitencia Park (upper)	UP-3	Residential/park	9/12/02	15	5	15	15	14	13	**77**
Watson Park (Coyote)*	C-1	Undeveloped Park	9/12/02	8	2	4	12	1	6	**33**
San Mateo County (San Pedro Creek)										
Above Pacifica Beach*	SPC-T-1	Commercial	9/20/02	6	1	4	5	5	9	**30**
Behind Sanchez Art Center	SPC-T-2	Residential	9/20/02	12	3	6	15	15	4	**55**
Below Linda Mar Bridge	SPC-T-3	Residential	9/20/02	12	3	8	15	14	5	**57**
Above Oddstad Bridge	SPC-T-4	Residential/park	9/20/02	15	6	14	15	13	19	**82**
Behind Shopping Center (North Fork)*	SPC-T-5	Commercial	9/20/02	1	0	1	11	5	1	**19**

Table 2. Total number of items from each major category of trash tallied in trash assessments for nine locations in Santa Clara and San Mateo County. Stream location "A" and "B" represents above and below, respectively, high water line.

Site Id	Plastic		Biohazard		Const Debris		Misc.		Metal		Large Items		Toxic		Bio-degradable		Glass		Fabric		Total #
Location	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	
UP-1	77	85	0	0	3	0	2	13	10	4	0	0	0	0	35	36	0	0	1	4	**270**
UP-2	22	7	2	0	5	0	2	0	14	0	0	0	1	0	6	6	6	0	2	1	**74**
UP-3	17	13	0	0	0	1	2	0	1	4	0	0	0	0	7	12	2	1	1	0	**61**
C-1	35	17	0	0	4	0	1	0	10	2	20	0	0	0	18	26	3	3	2	2	**143**
SPC-T-1	32	46	0	1	2	0	1	61	4	6	0	0	0	0	4	64	0	1	0	1	**223**
SPC-T-2	66	29	0	0	11	0	4	0	14	3	1	0	0	0	3	6	1	1	14	3	**156**
SPC-T-3	80	10	0	0	8	0	14	1	11	0	0	0	0	0	4	0	2	0	1	1	**132**
SPC-T-4	5	9	0	0	4	1	1	0	9	2	0	1	0	0	0	2	2	9	1	1	**47**
SPC-T-5	205	31	0	0	11	17	14	3	29	11	4	1	0	0	19	4	0	11	2	4	**366**
Total	539	247	2	1	48	19	41	78	102	32	25	2	1	0	96	156	16	26	24	17	**1472**

undeveloped parkland, which had low scores due to dumping. A majority of the trash observed was from littering, not dumping.

12) Accumulation of trash generally increases in the downstream direction as expected, with the exception of the lower site on San Pedro Creek, which had very little accumulated trash. This may be due to yearly trash clean up events. Only two of nine sites had less than five accumulated trash items; the rest of the sites were marginal or poor.

DISCUSSION

The SCVURPPP Trash AHTG evaluated the results of the pilot assessment and the overall approach used in the RWQCB protocols. The AHTG addressed the following questions to evaluate the utility of the RWQCB's assessment protocols for assessing trash in urban streams:

- What role should the RWQCB's protocol play in assessing trash? (e.g., identify baseline levels of trash in urban creeks; document status and trends; identify trash sources; evaluate effectiveness of BMPs).
- How feasible is the approach to assess all urban creeks in SCVURPPP and SMSTOPPP jurisdictions?
- Can the results be used to assess potential impairment to beneficial uses?
- What refinements would enhance utility of the assessment approach?

Role of Trash Assessment for SCVURPPP

The Trash AHTG agreed that the RWQCB trash assessment could be used at specific reaches to establish baseline levels of trash during selected index periods. The dry season is optimal time period to use RWQCB protocols since low water levels provides maximum access to streambed and banks to measure trash condition. It is important to note the amount of trash documented in the assessment does not measure total amount of trash that enters and is transported in receiving waters, but rather more of a rapid estimate of trash condition for a snapshot in time in a limited number of locations. The trash assessments are useful to identify and prioritize trash problem areas. Future assessments could be conducted at these sites and index period using the same protocols to document status and trends or to help evaluate the effectiveness of targeted BMPs. In addition, the assessment results may assist in the identification of potential sources of trash and appropriate BMPs to implement. Overall, the protocols would be useful in prioritizing and implementing management activities and measuring the effectiveness of these actions.

One limitation identified by the AHTG is related to implementing the RWQCB protocols to characterize trash conditions for entire water bodies or subwatersheds. The level of trash within a single waterbody is assumed to be highly variable due to changes in land use, accessibility, size of the watershed, and channel characteristics (e.g., gradient, stream vegetation). Typically, many 100-foot sections would need to be assessed to measure the range of trash conditions found within an entire creek. Assessing some sections of creek and extrapolating the information to larger areas, however, could lead to misinterpretation of the results and potential listing for an entire waterbody based on data collected at a few reaches. Further discussion on the feasibility of using the RWQCB protocols to assess trash for all creeks within SCVURPPP or SMSTOPPP jurisdiction is provided below.

Another limitation of the RWQCB protocols is that it was not designed to assess lakes, shorelines or sloughs, which are types of waterbodies that are identified on the Regional Board's "monitoring" list due to the threat of trash to impair water quality.

The Trash AHTG agreed that the RWQCB protocols provide a standardized approach to assess trash, which could be used on a regional basis. Collaboration with other storm water programs and SWAMP using the same protocols would provide a larger data set for more detailed data analyses, which may include identifying relationships between trash condition and land use types. These relationships would assist managers in identifying potential trash problem areas and aid in selecting appropriate assessment locations. In addition, compilation of assessment data taken in urban streams would be useful for statistically identifying thresholds used in the condition categories for each of the assessment parameter (see recommendation section below). Program staff has started compiling trash assessment data gathered from Alameda County Cleanwater Program and Regional Board efforts.

Feasibility of Assessing all SCVURPPP and SMSTOPPP Creeks

The Trash AHTG believed it was not feasible or cost-effective to use the RWQCB protocols to assess all creeks within the SCVURPPP and SMSTOPPP jurisdiction. High variability of trash conditions would be expected within sections of urban creeks. In addition, an estimation of trash levels for a single creek would require numerous assessments. It is more cost effective to assess already known trash problem areas or in land uses that are associated with litter or illegal dumping and then monitor these sites over time to determine trends or evaluate the effectiveness of BMPs. The Trash AHTG agreed that a decision to spend resources on conducting trash assessments for all creeks in their jurisdiction needs to be weighed with efforts to resolve problems that have already been identified. For example, schools and commercial areas are land uses that are often associated with trash-impacted areas. The Trash AHTG will identify a process for prioritizing creek segments (potentially on land use) and implementing trash assessments as a task in the SCVURPPP Trash Work Plan. The proper entity (e.g., municipality/agency staff or volunteer citizen group) to conduct trash assessments will also be determined as a task in the Work Plan.

Utility of Assessment to Measure Potential Impairment

The trash AHTG identified several limitations of the protocol in linking trash assessment results with potential impairment to beneficial uses. First, there is no clear linkage between type of trash items or number of trash items in a reach to beneficial use impairment. There are no established criteria or threshold values of specific trash items that can be used to estimate the relative impairment to most beneficial uses. An exception may be using both quantitative and qualitative assessment parameters to evaluate the aesthetic quality of streams for recreational beneficial uses. Two parameters (aquatic and human health) identify specific trash items that may affect beneficial use attainment, but more than the presence of these items is needed to determine the level of impairment. For example, there is no method to determine how many small persistent trash items (e.g., styrofoam pellets) are necessary to impact aquatic biota. In addition, the link between human health and the presence of human diapers or animal feces within a 100-foot section of stream has not been clearly established. These trash items may not have direct contact with the water and in some cases, may not even contain human pathogens. Furthermore, the threat to human health ranking does not take into account the potential level of public exposure. Exposure to contaminated water or sharp objects (e.g., glass and metal) is dependent on the level of accessibility to a creek (e.g., fences limit access to creeks) and creek conditions (e.g., depth of water).

Recommendations for Modifying Protocols

The RWQCB protocols were designed to assess both rural and urban stream conditions. The threshold values used to identify conditions for some of the assessment parameters may be too conservative and not adequately represent the range of conditions typically found in urban streams. As a result, most urban creek segments are likely to fall into the poor or marginal categories. Ubiquitous low scores for all urban creeks would not provide adequate resolution to distinguish spatial or temporal variation in trash conditions.

The RWQCB protocols are intended to assist in management decisions, such as source identification. The utility for the protocols to identify trash sources could be enhanced if litter and illegal dumping were distinguished to better assist managers in the identification of appropriate BMPs to reduce the trash. In addition, new trash item categories should be added to enhance evaluation of BMP effectiveness, such as recycling programs. For example, tallying aluminum cans and plastic bottles that are labeled with California Redemption Value (CRV) symbol, along with non-CRV cans and bottles can help determine if recycling programs are effective at reducing trash in creeks.

Additional information should also be included in the assessment procedures. The assessment datasheet should include a place to indicate if an enforcement action or cleanup event is needed. Previous history of trash management activities (e.g., previous or planned cleanup events; known trash problem area) should be documented. Photo documentation should be used when at sites with large amounts of trash.

Based on the pilot evaluation, Table 3 lists some limitations of the RWQCB protocols for conducting trash assessments of urban creeks and provides recommended modifications. These modifications could be incorporated as an "urban management version" of the RWQCB protocols and not result in changes to the original protocols being used for the SWAMP program. The Trash AHTG will coordinate all recommended modification of the protocols with other stormwater programs, BASMAA Monitoring Committee and the RWQCB staff in order to develop a standardized approach for conducting trash assessments on a regional basis. The SCVURPPP and SMSTOPPP have identified tasks in their respective Work Plans to consider the recommendations to modify RWQCB assessment methodology for the purpose of developing a tool to evaluate trash problem areas. The assessment approach should also be evaluated in the future for continuous improvement as additional assessment results become available.

ATTACHMENT C

Table 3. Recommended Modifications to RWQCB Assessment Parameters

Trash Assessment Parameter	Limitation	Recommendation
Actual Number of Trash Items	Numerical thresholds used to rate categories too conservative and not representative for range of conditions in urban streams	Compile additional assessment results from urban streams and statistically compute ranges.
	Difficult to evaluate BMP effectiveness for existing trash item categories	Include additional categories useful for evaluating BMP effectiveness (e.g., distinction between recyclable and non-recyclable cans and bottles)
Threat to Aquatic Life	Subjective rating (little, medium, large) for number of persistent trash items may not provide consistent results.	Compile additional assessment results for specific trash items found in urban streams and statistically compute ranges.
	Equal weighing for trash above and below water line.	Place greater weight on trash below water line. Define water line mark as the bankfull channel.
Threat to Human Health	Human health threats are determined only by presence of specified trash items, not on potential for exposure.	Include additional rating for potential risk of exposure (e.g., public access: good/poor; wadable habitat: yes/no).
Illegal dumping and Littering	Doesn't provide a mechanism to distinguish two different trash sources.	Separate into two separate categories to enhance distinction of trash sources.
Illegal dumping and Littering	Litter categories do not address accumulation from adjacent land uses that result from wind.	Include narrative description to rate wind accumulated litter from adjacent land uses; expand its definition of "shoreline littering" to include "litter within creek and banks that appear to originate from adjacent land uses."
Accumulation of trash	Numerical thresholds used to rate categories not representative for range of conditions in urban streams.	Compile additional assessment results from urban streams and statistically compute ranges.

Santa Clara Valley Urban Runoff Pollution Prevention Program

ATTACHMENT D

EXISTING TRASH MANAGEMENT PRACTICES SURVEY

Co- Permittee: _____ Contact Person: _____ Position: _____

Phone: _____ E-mail: _____ Date: _____

1. Does your municipality/agency conduct or participate in the following trash management activities:

			Frequency of Activity
Household Hazardous Waste Collection	☐ Yes	☐ No	_____
Solid waste recycling program	☐ Yes	☐ No	_____
Curb-side recycling program	☐ Yes	☐ No	_____
Respond to trash complaints	☐ Yes	☐ No	_____
Litter pick-up and control	☐ Yes	☐ No	_____
Trash removal from receptacles	☐ Yes	☐ No	_____
Street sweeping	☐ Yes	☐ No	_____
Storm drain operations and maintenance	☐ Yes	☐ No	_____
Inspection and maintenance of storm drain outfalls in creeks	☐ Yes	☐ No	_____
Free trash pick-up and /or drop-off days	☐ Yes	☐ No	_____
Reduced trash collection fees for low-income residents	☐ Yes	☐ No	_____
Removal of homeless encampments along waterways	☐ Yes	☐ No	_____
Anti-litter campaigns	☐ Yes	☐ No	_____
Volunteer creek clean-up programs	☐ Yes	☐ No	_____

2. Which departments of your municipality/agency are responsible for trash management activities/programs and/or the enforcement of litter laws?

3. Provide the role of each department in trash management and/or litter/solid waste enforcement (e.g., Grounds Dept- litter control in parks and medians).

4. How does your agency determine the effectiveness of existing trash management activities or programs? How do you document effective trash management practices? What, if any, future plans do you have to improve documentation?

5. What incentive programs are in place to reduce litter and illegal dumping? Do disincentives (e.g., expensive landfill tipping fees, few trash receptacles, etc.) exist which prevent proper trash management?

6. What mechanisms does your municipality/agency use to document trash complaints and/or incidents? (e.g., report forms; database)

7. What, if any, ordinances are in place to enforce litter or illegal solid waste dumping laws? What, if any, enforcement actions are available to remedy illegal dumping or trash-related violations? Do you have mechanisms to collect penalties? If so, what are they?

8. What additional activities and/or programs do you feel would improve your agency's ability to manage litter and illegal dumping?

9. Provide interesting anecdotes relating to trash management and/or litter/solid waste enforcement. Provide any additional information you wish to share.

ATTACHMENT E

Preliminary Reports Documenting Existing Trash Management Practices and Policies of the SCVURPPP Co-permittee Municipalities and Agencies

Program staff developed and distributed an existing trash management practices survey form to individual Co-permittee staff (Attachment D). The main purpose of the survey was to document existing trash management practices and policies for each Co-permittee. The survey responses were compiled and entered into a Microsoft Access® database. Preliminary reports were generated from the database to document existing trash management practices and policies implemented by the Co-permittees. The first report contains Co-permittee responses to survey question number one; the second report contains responses from survey questions 2 - 9. The Trash AHTG reviewed these reports and commented on the utility of this information at the December 18 Trash AHTG to help in the development of the Trash Work Plan.

The AHTG determined that additional information to the survey data reports would enhance the report and assist the Program to better evaluate the effectiveness of existing management practices and to identify where potential management actions are needed. As part of the Trash Work Plan, Program staff will continue to collect information (and data sources) related to existing trash management practices and policies of agencies within the SCVURPPP jurisdiction. Additional surveys and interviews with individual Co-permittees will assist in filling in the gaps and provide a more detailed and comprehensive documentation of existing trash management and monitoring activities. In addition, the location of known trash problem areas will be collected from the Co-permittee agencies to assist in the evaluation of current management practices.

Co-permittee Existing Trash Management Practices Survey
Detail Report

1. Does your municipality/agency conduct or participate in the following trash management activities:

Cupertino

Activity	Frequency	Notes
Household hazardous waste collection	On-going	
Solid waste recycling program	On-going	
Curb-side recycling program	Variable	Biweekly at homes. Weekly (minimum) at apartments and businesses.
Respond to trash complaints	As Required	Not a frequent problem
Litter pick-up and control	On-going	Regularly picked up by City staff on Stevens Creek and De Anza Blvds.
Trash removal from receptacles	On-going	Picked up at parks and main streets.
Street sweeping	Variable	City contractor sweeps commercial areas once a week. Residential areas are swept twice a week. Approximately 50 % of streets have sweeping and no parking signs.
Stormdrain operations and maintenance	Annually	Storm drain inlets are vacuumed out annually.
Inspection and maintenance of stormdrain outfalls	N/A	Maintained by SCVWD.
Free trash pick-up and/or drop-off days	Biannual	Two on-call disposal days a year.
Reduced trash fees for low-income residents	On-going	Senior, low-income rates available.
Removal of homeless encampments	As Required	Not common in Cupertino.
Anti-litter campaigns	N/A	Never been an important problem in Cupertino.
Volunteer creek clean-up programs	Biennial	Every other year or so- if warranted by litter in creeks.

Los Altos

Activity	Frequency	Notes
Household hazardous waste collection	Variable	Administered by the County. Available by appointment with Sunnyvale being the closest location. Los Altos does host a collection event one week/year by appointment.
Solid waste recycling program	N/A	
Curb-side recycling program	Bimonthly	
Respond to trash complaints	Complaint Dri	Responses are made when complaint is received. Action will depend on the complaint.
Litter pick-up and control	Variable	City parks are cleaned-up daily. City boulevards are cleaned-up monthly. Various events are cleaned-up after completion.
Trash removal from receptacles	Daily	Commercial areas and City Parks are picked-up daily.
Street sweeping	Variable	Residential streets are swept monthly and streets within commercial areas are swept weekly.
Stormdrain operations and maintenance	Annually	Cleaned annually and additionally as needed.
Inspection and maintenance of stormdrain outfalls	Annually	
Free trash pick-up and/or drop-off days	Biannual	By appointment
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	As Required	
Anti-litter campaigns	N/A	
Volunteer creek clean-up programs	N/A	

Los Altos Hills

Activity	Frequency	Notes
Household hazardous waste collection	N/A	
Solid waste recycling program	Weekly	
Curb-side recycling program	Weekly	
Respond to trash complaints	Upon Request	
Litter pick-up and control	Upon Request	
Trash removal from receptacles	Routine	By contract
Street sweeping	Biannual	
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls	Annually	
Free trash pick-up and/or drop-off days	Occasionally	By events
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	N/A	
Anti-litter campaigns	N/A	
Volunteer creek clean-up programs	Biannual	Volunteering events

Milpitas

Activity	Frequency	Notes
Household hazardous waste collection	By Appointme	
Solid waste recycling program	Weekly	
Curb-side recycling program	Weekly	
Respond to trash complaints	Complaint Dri	
Litter pick-up and control	As Required	
Trash removal from receptacles	Daily	
Street sweeping	Variable	Commercial (weekly), Residential (bimonthly). Milpitas sweeps approximately 10,000 curb miles/year.
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls	Biannual	
Free trash pick-up and/or drop-off days	Bimonthly	Landfill drop-off- Second and fourth Saturday of each month.
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	As Required	Requested by the Police
Anti-litter campaigns	On-going	Informational letters
Volunteer creek clean-up programs	Biannual	In May and September

Mountain View

Activity	Frequency	Notes
Household hazardous waste collection	Weekly	County HHW
Solid waste recycling program	On-going	
Curb-side recycling program	On-going	
Respond to trash complaints	Complaint Dri	
Litter pick-up and control	On-going	
Trash removal from receptacles	On-going	
Street sweeping	Variable	Routine, varies by district
Stormdrain operations and maintenance	Variable	Routine, varies by area
Inspection and maintenance of stormdrain outfalls	N/A	
Free trash pick-up and/or drop-off days	Biannual	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	Complaint Dri	On a complaint basis
Anti-litter campaigns	On-going	Regular articles and education regarding proper trash management (schools)
Volunteer creek clean-up programs	Biannual	Two city events per year.

Palo Alto

Activity	Frequency	Notes
Household hazardous waste collection	Variable	Palo Alto provides a drop-off location rather than a collection event(s). Drop-off is available five days/week for mercury, silver and organophosphate pesticides; daily for oil antifreeze and batteries and monthly for all other hazardous waste streams..
Solid waste recycling program	Daily	Backyard pick-up of recyclables and green waste available for the handicapped. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.
Curb-side recycling program	Weekly	Weekly, backyard pick-up. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard). Weekly curbside green waste pick-up.
Respond to trash complaints	Variable	Messy dumpster areas are brought to the attention of the property owner, verbally first, then via letter. If compliance does not result, the sanitation company (City contractor) can clean the area and bill the property owner. In addition, trash on private property is a Palo Alto Municipal Code (PAMC) violation (esp. visible trash – front yard). Incoming complaints result in: a) Logging and tracking; b) Inspection within 5 days; c) Notice of Violation (NCR form delivered or posted.); d) Can be followed by letter; e) Can be followed by administrative penalty and criminal action.
Litter pick-up and control	Variable	a) University Avenue Patrol (Green Machine)- Daily- July 1 through December 31; Five days/week- January 1 through June 30. Hot spots program- Patrol of identified roadside areas known to accumulate trash. Persons who litter are subject to action by the Police Department. The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney. The California Penal Code or the PAMC is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney. Complaints and observations of trash result in clean-up by City Staff (or SCVWD staff for most creek-bed areas). If the responsible party is known, the facts are referred to Code Enforcement (Planning and Community Environment Department) for enforcement. Land fill Litter Control- Litter migration from the working face of the Landfill is controlled primarily through the use of the alternate daily cover tarps, weekly cover and the use of permanent and portable fencing. Litter is routinely picked up by landfill personnel on an as-needed basis. Materials dropped off from vehicles that may pose a hazard are picked up immediately. In the event of high winds, temporary staff is brought on to augment permanent staff, if needed, to pick up windblown litter. Daily from July 1 through December 31. Five days/week January 1 through June 30. b) Hot spots program: Patrol of identified roadside areas known to accumulate trash.
Trash removal from receptacles	Variable	Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers; Sanitation Company is required to clean up trash if it spills. Fines are possible. Trash receptacles are emptied by Sanitation Company (City contractor) at various frequencies depending on location. Trash pick-up of grounds is performed at various frequencies by either City staff or maintenance contractor depending on location.
Street sweeping	Variable	a) Three times per week in Major Commercial Areas (University and California Avenues); b) Weekly in other areas; c) Highway 101 - State responsibility; d) Oregon & Foothill Expressways – County responsibility.
Stormdrain operations and maintenance	Variable	a) Each catch basin cleaned each fall (annually); b) If debris is observed in a line next to a catch basin, the line is flushed; c) Special areas are addressed as needed (e.g. construction site areas after the project is over.); d) Enforcement actions for discharges to the storm drain are taken when intentional discharges are observed; e) Residents and Businesses who sweep excess leaves or debris into the street are notified (via door hanger) of the code violation; f) If the practice continues, it is referred to Code Enforcement (Planning and Community Environment Department).
Inspection and maintenance of stormdrain outfalls	As Required	Typically, there are no locations where trash collects.
Free trash pick-up and/or drop-off days	Annually	a) Residential (less than 5 units); b) By appointment (by phone); c) Four Bulky (furniture) items; d) Other items unlimited; e) Free; f) One visit allowed per year.
Reduced trash fees for low-income residents	On-going	Weekly trash collection is avaliable.
Removal of homeless encampments	As Required	
Anti-litter campaigns	As Required	
Volunteer creek clean-up programs	Variable	Note: The cleaning of most creek reaches within Palo Alto are the responsibility of the Santa Clara Valley Water District (SCVWD). Certain reaches of San Francisquito Creek are the responsibility of Palo Alto. Each Fall (annually) a San Francisquito Creek walk is conducted with other agencies to identify clean-up of debris which is needed. Debris and trash is then removed. Creek Cleaning by Citizen Groups (Community Services and Public Works)- The City and organized citizen groups participate in Coastal Clean-up Day to clean creeks and the Baylands. Citizen groups bag trash and City crews pick it up.

San Jose

Activity	Frequency	Notes
Household hazardous waste collection	Variable	Drop-off: By appointment for 3% of HH/yr. Curbside: Weekly collection of used oil and filters for all single-family HH and by arrangement for multi-family complexes.
Solid waste recycling program	Variable	Varies—most materials can be recycled at multiple locations Monday-Saturday.
Curb-side recycling program	Weekly	Weekly collection (Monday-Friday)
Respond to trash complaints	On-going	Continuous (mostly during business hours)
Litter pick-up and control	On-going	
Trash removal from receptacles	Variable	ESD/IWM (contract with Stevens Creek Disposal & Recycling)- one to six times per week, as needed. General Services/Parks Maintenance and PRNS/Regional Parks staff- one to seven times per week or more, as needed. DOT (contract with Universal Maintenance)- twice daily
Street sweeping	Variable	Residential: semi-monthly. Business and arterials: varies.
Stormdrain operations and maintenance	Annually	27,000 + storm drain inlets serviced annually (after leaf drop)
Inspection and maintenance of stormdrain outfalls	Annually	700+ outfalls inspected annually and maintained as needed and as budget allows.
Free trash pick-up and/or drop-off days	On-going	78(?) neighborhood cleanups per year. One in each Strong Neighborhood Initiative area, plus several related to Code activities).
Reduced trash fees for low-income residents	On-going	$450,000 per year in General Fund subsidy
Removal of homeless encampments	Monthly	Usually the third Saturday
Anti-litter campaigns	On-going	Started in 2002
Volunteer creek clean-up programs	Biannual	Coordinated through Creek Connection Action Group

Santa Clara

Activity	Frequency	Notes
Household hazardous waste collection		
Solid waste recycling program	On-going	On-going at landfill sites.
Curb-side recycling program	Weekly	
Respond to trash complaints	As Required	
Litter pick-up and control	As Required	
Trash removal from receptacles	Weekly	Weekly?
Street sweeping	Variable	Weekly/Biweekly
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls		
Free trash pick-up and/or drop-off days	Seasonal	one clean-up campaign and two free droff-offs
Reduced trash fees for low-income residents	As Required	
Removal of homeless encampments	As Required	
Anti-litter campaigns		
Volunteer creek clean-up programs		

Sunnyvale

Activity	Frequency	Notes
Household hazardous waste collection	Variable	City participates in Countywide HHW program and augments funding to provide service to as many households as wish to participate. County HHW collection event at Carl Road facility occurs the third Saturday of each month from 8 AM - 1 PM and is open to all Sunnyvale residents (no appointment necessary and at no charge). County residents can also make an appointment to drop off material at this location. Motor oil and oil filters are picked up with curbside recyclables for Sunnyvale residents, when placed in special one-gallon oil jugs and plastic oil filter bags. Sunnyvale, Mountain View, and Palo Alto residents can bring motor oil, oil filters, antifreeze, batteries (both household and vehicle), and fluorescent tubes to the SMaRT station from 8 AM - 5 PM, 7 days a week for recycling.
Solid waste recycling program	Daily	Businesses and residents from any community may bring their recyclables to the SMaRT Station Recycling Center from 8 AM - 5 PM, 7 days a week.
Curb-side recycling program	Weekly	Sunnyvale provides weekly (single family and multi-family) residential curb-side recycling program for tin/aluminum beverage containers, plastics (#1-7), glass food and beverage containers, newspaper, used oil and oil filters, and corrugated cardboard. White or other colored paper, junk mail, envelopes, magazines, or waxed food boxes are recovered at the SMaRT station.
Respond to trash complaints	On-going	Public Works, Solid Waste Division - Solid Waste Contractor responds to complaints related to trash collection activities (e.g., blowing debris, litter from collection process, and missed collections). They also respond to open dumpster, litter complaints at businesses. Response times to complaints received must be within 8 hours (1 working day-contract requirement). Public Works, Field Services Division - Field Services staff respond to complaints of trash in roadways, medians, rights-of-way, sidewalks, and City easements. Emergency responses to roadway hazards must occur within 3 hours of receipt of the call. Non-hazardous, non-emergency complaints are responded to within two working days. Community Development -Neighborhood Preservation responds to trash/nuisance calls on private property. Staff have three working days to respond to a complaint. Their goal is to resolve it within 30 days. Resolution usually occurs within 20 days. However, it may sometimes take longer if legal procedures are needed to resolve a complaint. Public Safety responds to dumping of hazardous materials, illegal dumping, and homeless encampments/trespass complaints. Staff respond immediately to hazardous or dangerous complaints. They have up to three days to respond to non-threatening or nuisance complaints.
Litter pick-up and control	On-going	Public Works/Solid Waste Division requires SMaRT Station contractor to pick up litter from areas with high truck traffic/potential for litter on the way to the SMaRT Station (e.g. Borregas Ave, Carl Rd, Mathilda Ave north of Highway 237, Caribbean Drive). Clean ups of these areas are scheduled for twice each week. Refuse collection contractor is required to clean up materials spilled during collection. Public Works -Field Services Division schedules street sweeping to occur every two weeks in residential areas for the day after garbage collection day. They pick up debris from streets on an emergency basis (within 3 hours of a notice). They also pick up litter from public rights-of-way, city easements, and pedestrian walkways when notified of a problem. Public Works - Field Services and Boulevard Landscape field crews sweep or vacuum sidewalks and plazas every other week. Murphy Avenue is cleaned twice each week, due to the high traffic in the area. Parks and Recreation Dept. staff pick up litter from parks on a daily basis in summer months (April - October) and Monday - Friday in winter months (November - March).
Trash removal from receptacles	Variable	Public Works/ Solid Waste Division contracts with waste hauling company to empty litter receptacles weekly or as needed in commercial areas. Valley Transit Authority is responsible for emptying litter receptacles at major bus/transit stops. Parks and Rec. Dept. staff empty waste and recycling receptacles in parks daily (or more frequent basis if there is an event) into the park dumpster and recycling bins in summer months. They remove trash and recyclables from receptacles Monday - Friday in winter months. Waste hauling contractor empties dumpsters/recycle bins daily in summer months and every 2-3 days in winter months.
Street sweeping	Variable	City streets are swept twice each month, usually the day after garbage collection in residential areas. The Downtown District and City parking lots are swept three times a week. Extra sweeping requests can be made in conjunction with a trash complaint.
Stormdrain operations and maintenance	As Required	All municipal catch basins are inspected annually, and cleaned out, if needed. They are also cleaned out on an “as needed” basis if there is a complaint.
Inspection and maintenance of stormdrain outfalls	Annually	Storm Drain outfalls are inspected annually. Storm drain pump stations are inspected weekly. They are also inspected just prior to and almost hourly after major storm events.
Free trash pick-up and/or drop-off days	Seasonal	•Spring and fall clean ups have “extended” curbside collection for city residents. These events last for four weeks and residents can dispose of bulky goods or household debris on their regular garbage day at no extra charge. Loose items must be bagged or boxed or otherwise containerized for collection. •During each spring and fall clean up, the City offers two “extra dump weekends” where residents can dispose of garbage, refuse (especially large bulky items) free of charge at the SMaRT Station.

		•In conjunction with recognized neighborhood associations, there may be a specific neighborhood clean up event where roll-off debris boxes are placed throughout a neighborhood for a specific weekend, then picked up Monday morning. Neighborhood residents who are unable to participate in other no-cost disposal options can use them.
Reduced trash fees for low-income residents	N/A	Fee reductions are not available. However, there are different choices for level of service (limited quantity - 32 gallon can vs. unlimited). Residents can chose to pay for limited service for a lesser fee, then take advantage of spring/fall clean up free "extra dump" day activities.
Removal of homeless encampments	As Required	Community Development - Neighborhood Preservation can, with assistance of Public Safety staff, remove homeless encampments within city limits. Public works department staff will provide equipment to remove trash and debris. This is done on an as-needed basis, based on complaints received.
Anti-litter campaigns	On-going	•Anti-littering messages were developed and sent out as a part of Environmental Outreach program efforts (e.g., transit advertising, movie theatre slide shows) during a two-month period in 2002. •Litter source reduction messages (e.g., keep storm drains cleared of yard debris, options for disposing of various wastes) are sent out through semi-annual Solid Waste Recycling newsletter as well as in utility bill stuffers several times each year. •The Solid Waste Service Guide is mailed to all residents and businesses. It contains information about the proper procedures for preparing solid waste for recycling or disposal.
Volunteer creek clean-up programs	N/A	Sunnyvale does not have its own creek clean up program. However, it does support and promote the creek clean up activities and Adopt-A-Creek programs promoted by the Santa Clara Valley Water District.

West Valley Communities (Campbell)

Activity	Frequency	Notes
Household hazardous waste collection	N/A	Santa Clara County provides service for Campbell
Solid waste recycling program	Weekly	Residential only. Conducted by Green Valley Disposal Company.
Curb-side recycling program	Weekly	Residential only. Separate bins for recyclables and yard waste.
Respond to trash complaints	Daily	
Litter pick-up and control	Daily	
Trash removal from receptacles	Variable	One to three times/month
Street sweeping	Variable	Commercial (once/week), Residential (twice/month)
Stormdrain operations and maintenance	Seasonal	Once/year
Inspection and maintenance of stormdrain outfalls	Seasonal	Once/year
Free trash pick-up and/or drop-off days	Annually	Fall cleanup
Reduced trash fees for low-income residents	On-going	Reduced rates for senior citizens
Removal of homeless encampments	As Required	On occasion
Anti-litter campaigns	On-going	Anti-litter messages are distributed through publications, newspapaer and radio announcements.
Volunteer creek clean-up programs	Variable	Two creek cleanups (May and October) are conducted per year. Other litter clean-up activiites are conducted through Adopt-a-Creek. Litter is also removed from road off-ramps.

West Valley Communities (Los Gatos)

Activity	Frequency	Notes
Household hazardous waste collection	On-going	Santa Clara County HHW provides for Town of Los Gatos.
Solid waste recycling program	On-going	No 1/2 time position to administer AB939 activities.
Curb-side recycling program	Variable	Residential one day/week; Commercial one to three times/week.
Respond to trash complaints	Daily	
Litter pick-up and control	Daily	
Trash removal from receptacles	Frequent	three to four times/week
Street sweeping	Variable	Commercial: once/week; Residential: twice/month
Stormdrain operations and maintenance	Seasonal	once/year
Inspection and maintenance of stormdrain outfalls	Seasonal	once/year
Free trash pick-up and/or drop-off days	Biannual	Spring and Fall Clean Up; twice/year
Reduced trash fees for low-income residents	On-going	
Removal of homeless encampments	As Required	
Anti-litter campaigns	On-going	Education and Outreach
Volunteer creek clean-up programs	On-going	Throughout the year.

West Valley Communities (Monte Sereno)

Activity	Frequency	Notes
Household hazardous waste collection	Monthly	
Solid waste recycling program	Weekly	
Curb-side recycling program	Weekly	
Respond to trash complaints	As Required	
Litter pick-up and control	N/A	
Trash removal from receptacles	N/A	
Street sweeping	Monthly	
Stormdrain operations and maintenance	Biannual	Biannually and before/after any major storm event
Inspection and maintenance of stormdrain outfalls	Biannual	Biannually and before/after any major storm event
Free trash pick-up and/or drop-off days	Biannual	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	N/A	
Anti-litter campaigns	Variable	Conducted by WVCWP
Volunteer creek clean-up programs	Biannual	Events in May and September

West Valley Communities (Saratoga)

Activity	Frequency	Notes
Household hazardous waste collection	Annually	One HHW collection event is conducted once/year within Saratoga. Residents may contact County HHW to schedule an appointment at any time.
Solid waste recycling program	Annually	
Curb-side recycling program	Weekly	
Respond to trash complaints	As Required	
Litter pick-up and control	As Required	
Trash removal from receptacles	Weekly	
Street sweeping	Weekly	
Stormdrain operations and maintenance	As Required	
Inspection and maintenance of stormdrain outfalls	As Required	
Free trash pick-up and/or drop-off days	Annually	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	N/A	
Anti-litter campaigns	On-going	Handled by the WVCWP.
Volunteer creek clean-up programs	Biannual	

Santa Clara County

Activity	Frequency	Notes
Household hazardous waste collection	On-going	Services provided through County HHW Disposal Program: Residents make appointment for dropoff of waste at permanent or mobile collection location. Franchised service providers provide for weekly or bi-weekly collection of used oil and used oil filters for residential customers; latex paint is collected at curbside/streetside in Lexington Hills residenial service area.
Solid waste recycling program	On-going	Varies—most materials can be recycled at multiple locations Monday-Saturday. Ongoing waste reduction and recycling outreach through participation in countywide and regional outreach campaigns, outreach by franchise service providers, information provided on countywide recycling website ReduceWaste.org.
Curb-side recycling program	On-going	Franchises provide for collection of a wide range of recyclable materials, green waste recycling, used oil and oil filters, and seasonal collection of holiday trees. Residential recycling collection is weekly or biweekly. Drop off of green waste is included in services for residential customers in the South County unincorporated area through a voucher program. All other areas have weekly or biweekly collection of residential yard waste. Weekly recycling and green waste collection services are provided at the option of the business customer.
Respond to trash complaints	As Required	Few complaints are received. County staff and franchised service providers respond to complaints. Action requirements vary, according to the nature of the complaint. Roads and Airports Department removes large items from unincorporated roadways.
Litter pick-up and control	On-going	County Roads Department has an ongoing program for litter collection on County maintained roads and highways. County franchise agreements require service providers to clean up any spills and to report observed illegal dump sites to County Environmental Health. The Graffiti and Litter Abatement Program partners with the Probation Department's Juvenile Court Work Program to provide litter collection on a weekly basis in unincorporated pocket areas of the County.
Trash removal from receptacles	On-going	Generally not applicable, because there are few unincorporated civic center areas. San Martin downtown area has litter and recycling receptacles; waste is collected by franchised service provider. Litter cleanup around collection containers is the responsibility of the adjacent businesses.
Street sweeping	Variable	County Roads Department sweeps expressways on a monthly basis; and does limited street sweeping of unincorporated residential streets in response to complaints.
Stormdrain operations and maintenance	Seasonal	Seasonal and as needed
Inspection and maintenance of stormdrain outfalls	Seasonal	Seasonal and as needed
Free trash pick-up and/or drop-off days	Variable	Note that cost of services is included in service rates -- no services are "free." Provisions vary by service area. Franchise agreements provide for drop off days, community cleanup events, and/or on-call disposal days.
Reduced trash fees for low-income residents	On-going	Low-income service rates are provided for in all service areas. Also on-premises collection services are available to customers with physical disabilities that make curbside setout difficult.
Removal of homeless encampments	As Required	Yes, as needed. (usually under expressways)
Anti-litter campaigns	On-going	The Graffiti and Litter Abatement Program, District Attorney's Office and Roads and Airports Department partner with the City of San Jose on the Pick Up San Jose Task Force, which will expand Countywide in 2003. The countywide task force will participate in The Great American Clean Up on May 10, 2003. The litter task force includes 3 subcommittees: eradication, education, and enforcement.
Volunteer creek clean-up programs	On-going	SCVWD is responsible for creek cleanup.

SCVWD

Activity	Frequency	Notes
Household hazardous waste collection	N/A	
Solid waste recycling program	Daily	District actvities
Curb-side recycling program	N/A	
Respond to trash complaints	Daily	
Litter pick-up and control	Weekly	
Trash removal from receptacles	N/A	
Street sweeping	As Required	During district construction projects.
Stormdrain operations and maintenance	Annually	
Inspection and maintenance of stormdrain outfalls	As Required	Following complaints.
Free trash pick-up and/or drop-off days	N/A	
Reduced trash fees for low-income residents	N/A	
Removal of homeless encampments	Bimonthly	
Anti-litter campaigns	Occasionally	
Volunteer creek clean-up programs	Biannual	Each group must conduct two cleanups a year.

Co-Permittee Answer Comparison
Existing Trash Management Practices Survey

2. Which departments of your municipality/agency are responsible for trash management activities/programs and/or the enforcement of litter laws?

3. Provide the role of each department in trash management and/or litter/solid waste enforcement (e.g., Grounds Dept-litter control in parks and medians).

Cupertino	2. -Trash management: Environmental Division (Public Works Department) -Enforcement of litter laws: City Code Enforcement (but this is not a big problem in Cupertino—city staff routinely monitor and clean up the few areas known to have some littering) -Large dumping incidents would involve the County Sheriff's Department 3. Parks trash: Public Works Dept. empties trash and recycling bins Street trash: Bus stop trash bins/litter: Public Works Dept. and the County Valley Transportation Agency share the responsibility of emptying trash containers and cleaning up any litter at bus stops. Illegal dumping on streets: Public Works responds and cleans up dumping if violator can't be identified
Los Altos	2. Public Works and Police Departments 3. The Public Works Department conducts maintenance and cleanup. The Police Department conducts enforcement and reporting.
Los Altos Hills	2. Public Works 3. Public Works is responsible for trash management and/or litter/solid waste enforcement.
Milpitas	2. Utility Engineering and Planning, Recreation & Neighborhood Preservation Department 3. Management of Solid Waste, Recycling and Yard Waste Recycling Program by Utility Engineering including annual promotional campaigns and school projects. Litter control in parks, streets and right-of-way landscaped areas is handled by Public Works.
Mountain View	2. The City has many departments involved in the above activities depending on where the litter is found or responsibilities for maintenance: Police, Public Works, Community Services, Fire Department, and the City Attorney's Office (code enforcement). Most of the trash management is in the form of the City's franchised hauler collection of trash and recycling from all sectors overseen by the Solid Waste Section in Public Works. Litter collection is handled by Public Works (Streets), and volunteer activities (creek clean up) through the Fire Department; and Community Services (Parks & Roadways). Enforcement of litter problems on private non-apartment properties is handled by the City Attorney's office through Code Enforcement. 3. -The Community Services Department maintains City parks, roadway medians, and landscape outside City facilities, which includes litter removal. The Community Services Department also contracts Park Ranger services for patrolling and maintaining Shoreline Park and the Stevens Creek Trail. Rangers also conduct litter control activities. -Police Department coordinates homeless camp removal along with Community Services Department. -Public Works, Solid Waste and Recycling Section oversees garbage franchise with Foothill Disposal, including garbage and recycling collection programs. This Section also enforces the solid waste ordinance. -City Attorney's Office, Code Enforcement Division, enforces nuisance (junk, etc.) violations found on private properties (not apartments) (including illegal dumping); and the Fire Department enforces nuisances and housing codes on apartment properties. -Public Services Dept, Streets Section, responds to illegal dumping on public properties for clean-up. -Fire Department, Fire and Environmental Compliance Section coordinate 2-3 creek clean-up events per year with a local volunteer organization, Friends of Stevens Creek Trail.

2. Police, Public Works, Community Services and the Planning and Community Environmental Departments.

3. 1. Street Sweeping Program (Public Works Department)
A. Three times per week in Major Commercial Areas (University and California Avenues)
B. Weekly in other areas.
C. Highway 101 - State responsibility.
D. Oregon & Foothill Expressways – County responsibility.

2. Sidewalk and Roadside Litter Patrol (Public Works Dept)
A. University Avenue Patrol (Green Machine)
Daily from July 1 through December 31
Five days/week January 1 through June 30
B. Hot spots program
Patrol of identified roadside areas known to accumulate trash.

3. Collection Program (Public Works Department)
A. Weekly, backyard pick-up.
B. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard).
C. Weekly curbside green waste pick-up.
D. Backyard pick-up of recyclables and green waste available for the handicapped.
E. Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers.
F. Sanitation Company is required to clean up trash it spills. Fines are possible.

4. Annual "Clean-up Day" (Public Works Department)
A. Residential (less than 5 units)
B. By appointment (by phone)
C. Four Bulky (furniture) items
D. Other items unlimited
E. Free
F. One visit allowed per year.

5. Storm Drain System Cleaning (Public Works Department)
A. Each catch basin cleaned each fall (annually)
B. If debris is observed in a line next to a catch basin, the line is flushed.
C. Special areas are addressed as needed (e.g. construction site areas after the project is over.)
D. Enforcement actions for discharges to the storm drain are taken when intentional discharges are observed.
E. Residents and Businesses who sweep excess leaves or debris into the street are notified (via door hanger) of the code violation. If the practice continues, it is referred to Code Enforcement (Planning and Community Environment Department).

6. Creek Cleaning by Staff (Public Works Department)
Note: The cleaning of most creek reaches within Palo Alto are the responsibility of the Santa Clara Valley Water District (SCVWD). Certain reaches of San Francisquito Creek are the responsibility of Palo Alto, and those reaches are addressed below:

A. Each Fall (annually) a San Francisquito Creek walk is conducted with other agencies to identify clean-up of debris which is needed. Debris and trash is then removed.

7. Creek Cleaning by Citizen Groups (Community Services and Public Works)
A. The City helps with Coastal Clean-up Day and other organized citizen affords to clean creeks and the Baylands. Citizen groups bag trash and City crews pick it up.

8. Dumpster Area Clean-up (Public Works Department)
Messy dumpster areas are brought to the attention of the property owner, verbally first, then via letter. If compliance does not result, the sanitation company (City contractor) can clean the area and bill the property owner.

9. Trash on Private Property Enforcement Program (Planning and Community Environmental Department)
Trash on private property is a P.A.M.C. violation (esp. visible trash – front yard).
Incoming complaints result in:
A. Logging and tracking.
B. Inspection within 5 days.

C. Notice of Violation (NCR form delivered or posted.)
D.Can be followed by letter.
E.Can be followed by:
-Administrative Penalty
-Criminal Action.

10. Litter Enforcement (Police Department)
-Persons who litter are subject to action by the Police Department.
-The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney.
-The California Penal Code or the Palo Alto Municipal Code (PAMC) is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney.

11. Trash on Public Right-of-Way/Lands (Public Works Department)
A. Complaints and observations of trash result in clean-up by City Staff (or SCVWD staff for most creek-bed areas as noted in #6 above).
B. If the responsible party is known, the facts are referred to Code Enforcement (Planning and Community Environment Department) for the enforcement actions in #9 above.)

12. Palo Alto Parks Litter Patrol (Community Services Department)
A. Trash receptacles are emptied by sanitation company (City contractor) at various frequencies depending on location.
B. Trash pick-up of grounds is performed at various frequencies by either City staff or maintenance contractor depending on location.

13. Landfill Services (Public Works Department)
A. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.

14. Palo Alto Landfill Litter Control (Public Works Department)
A. Litter migration from the working face of the Landfill is controlled primarily through the use of the alternate daily cover tarps, weekly cover and the use of permanent and portable fencing.
B. Litter is routinely picked up by landfill personnel on an as-needed basis. Materials dropped off vehicles that may pose a hazard are picked up immediately.
C. In the event of high winds, temporary staff is brought on to augment permanent staff, if needed, to pick up windblown litter.

San Jose

2. -Environmental Services Department/Integrated Waste Management (ESD/IWM)
   -Code Enforcement
   -Department of Transportation
   -General Services/Parks
   -Parks, Recreation and Neighborhood Services/Anti-Graffiti Program
   -Parks Maintenance
   -San Jose Police Department Metro Unit
   -Creek Connection Action Group
   -Enforcement is conducted by various departments.

3. Household Hazardous Waste Collection:
   -Drop-off- ESD/IWM contracts w/ SCCHHWP
   -Curbside- ESD/IWM contracts with Norcal & GreenTeam for single-family and with GreenTeam for multi-family.

   Solid Waste Recycling Program:
   -ESD/IWM administers 20+ Commercial Solid Waste and Recycling Franchises; more drop-off and buyback sites are operated by private recyclers.

   Curb-side recycling program:
   ESD/IWM contracts for collection of garbage and recyclables in carts and dumpsters with Norcal & GreenTeam for single-family and with GreenTeam for multi-family; garbage is metered, recycling is unlimited.
   ESD/IWM contracts with GreenWaste Recovery and Norcal for unlimited collection of residential yard trimmings, either loose in the street or in carts.

   Respond to trash complaints:
   Code Enforcement: accumulations of waste; front yard blight; shopping carts (through Call Center); early yard trimmings setouts, etc.;
   Dept of Transportation: illegal dumping;
   Police: pedestrian and vehicular littering; untarped loads

   Litter pick-up and control:
   DOT contracts with Universal Maintenance for litter pick-up in the Transit Mall and coordinates the Alternate Work Program, Adopt-A-Park, etc.;
   General Services/Parks Maintenance, PRNS/Regional Parks, and other staff pick up litter on City property;
   PRNS/Anti-Graffiti Program is coordinating the new Pick-Up San Jose program with additional volunteer participation.

   Trash removal from receptacles:
   ESD/IWM contracts with Stevens Creek Disposal & Recycling for 2000 weekly collections from more than 700 sidewalk litter containers and with the SJ Conservation Corps for weekly collection from several hundred recycling receptacles in parks;
   General Services/Parks Maintenance and PRNS/Regional Parks staff collect from additional litter containers at parks and other outdoor City facilities;
   DOT contracts with Universal Maintenance for collection from litter modules in the Transit Mall.

   Street Sweeping:
   ESD/IWM contracts with Norcal and GreenWaste Recovery for residential street sweeping; DOT inspects;
   DOT provides more frequent sweeping of arterials and business districts directly.

   Storm drain operations and maintenance:
   Department of Transportation- 27,000 + storm drain inlets serviced annually (after leaf drop).

   Inspection and maintenance of storm drain outfalls in creeks:
   Department of Transportation- 700+ outfalls inspected annually and maintained as needed and as budget allows.

   Free trash pick-up days:
   ESD/IWM contracts with Norcal and GreenTeam to provide neighborhood cleanups and Code Enforcement oversees.

   Reduced trash collection fees for low-income residents:
   ESD/IWM administers Low-Income Rate Assistance for single-family service provided by Norcal, GreenTeam, and GreenWaste.

Removal of homeless encampments along waterways:
San José Police Department Metro Unit, with SCVWD staff.

Anti-litter campaigns:
Parks, Recreation and Neighborhood Services Anti-Graffiti Program and others.

Volunteer creek clean-up programs:
Coordinated through Creek Connection Action Group

Enforcement:
PRNS/Anti-Graffiti Program is coordinating the new Pick-Up San Jose enforcement program with the participation of the SJPD, Santa Clara County District Attorney, County Sheriff, City Attorney, Code Enforcement, and PRNS rangers; the Local Enforcement Agency in Code Enforcement enforces litter regulations at the solid waste facilities in the City.

Santa Clara

2. Trash Management Programs: Street, Parks Department
   Enforcement of Litter Laws: Police, Planning and Street Departments.
3. Street Department manages residential ground garbage and recycling programs and litter collection in public right-of-ways and the storm drain system. Parks Department collects litter in city parks. Streets, Planning and Police Departments may issue administrative citations for littering or accumulation of refuse.

Sunnyvale

2. Public Works -Solid Waste Division
   Public Works - Trees and Landscape Division
   Public Works - Field Services Division
   Parks and Recreation - Parks Division
   Parks and Recreation - Baylands Park
   Community Development - Neighborhood Preservation
   Public Safety - Patrol Services, Bureau of Field Operations
3. Public Works Solid Waste Division: Collection of household and commercial solid waste and operation of the SMaRT Station (via contractors), promotion of local recycling programs and waste diversion programs, litter clean up on major access roads leading to the SMaRT station, ensure that solid waste collection contractor responds to litter complaints resulting from waste pick up activities. Responsible for public education on waste reduction, recycling, and disposal options.
   Public Works - Environmental Division: Public education and outreach - anti-litter messages and stormwater pollution prevention messages.
   Public Works - Trees and Landscape Division: Boulevard medians, City parking lots, Murphy Avenue business district, landscape maintenance,
   Public Works - Field Services Division: Clean and maintain storm sewers, outfalls, pump stations, street maintenance and cleaning, trash/litter pick up on City easements, public right-of-way, pedestrian walkways and City streets.
   Parks and Recreation - Parks Division and Baylands Park: Park maintenance, litter pick up and trash collection in city parks and picnic areas.
   Community Development - Neighborhood Preservation: Respond to Municipal code violations, illegal dumping, and homeless encampment trespass using municipal code enforcement through administrative citations, notices to abate, and compliance orders.
   Public Safety - Bureau of Field Operations: Homeless encampment removal, criminal citations for littering on public or private property.

Los Gatos

2. Community Services Department, Parks and Public Works.
3. Community Services Department oversees hauler's trash and recycling contract, works with County on SWM activity and administers AB939 Projects and Programs.
   Parks and Public Works administers park, trail and creek cleanups, storm drain activities and street sweeping.

Monte Sereno

2. Public Works Department
3. The Public Works Department oversees storm drain activities, erosion control enforcement, street sweeping and the trash/recycling contract.

Saratoga

2. Public Works and Community Development
3. Public Works- All efforts; Community Development- Code Enforcement

Santa Clara County	2. The Santa Clara County District Attorney's Office is responsible for prosecuting litter citations issued pursuant to the California Penal Code and the California Vehicle Code. Illegal dumping, toxic waste and other environmental crimes are reviewed for prosecution by the DA's Environmental Crimes Unit. 3. The District Attorney's Office coordinates with the primary law enforcement agencies in the county (CHP, San Jose PD, Sheriff's Office) and the courts in which litter matters are heard to oversee that litter citations are appropriately prosecuted.
SCVWD	2. Trash Management-Purchasing Department, Enforcement- Countywide Watershed Programs Unit, Clean up activities-Maintenance Department, Adopt A Creek- public Information. 3. The Field Maintenance Units collect trash along creek right of ways. If illegal dumping takes place it is reported to Countywide Watershed Programs Unit, if the material is hazardous waste the Countywide Watershed Programs Unit disposes of it via a contractor. If it is trash and debris, Maintenance will dispose of it and then Community Projects Review Unit will file an 83-2 violation with the owner of the trash or Responsible Party.

4. How does your agency determine the effectiveness of existing trash management activities or programs? How do you document effective trash management practices? What, if any, future plans do you have to improve

Cupertino	Parks and streets are routinely monitored by Public Works Dept. supervisors on their normal rounds. Monitoring is not documented. No chronic problems have been discovered. There are no plans to document such a routine supervisory activity.
Los Altos	Los Altos conducts inspections of facilities, streets and other city properties to determine if trash is being picked up on a regular basis. Pulbilc Works Maintenance document their efforts on work requests. The Police Department documents their responses on incident reports.
Los Altos Hills	Due to Town of Los Altos Hills' zoning, the Town only has residential area for the trash management activities which are under control.
Milpitas	Monthly review and coordination meetings with contractor. Periodic awareness surveys. "Pre and Post" surveys for classroom projects/lesson plans. Public Works - Monthly scheduling and tracking of litter activities.
Mountain View	The Solid Waste and Recycling section tracks customer complaints about garbage subscription problems (i.e. not enough service causing other problems of odor or litter) or hauler performance. Performance measures are based on tons recycled, number of complaints, and diversion rate. No plans to revise current documentation and tracking. Other departments also track data. The creek clean ups are coordinated by the Fire Department with other agencies using volunteers. The volunteers track how much of which materials they find in the creeks. The majority of litter found in creek clean ups (non-bulky items) are polystyrene foam "peanuts" from nearby businesses or residents. As a result, we are concentrating on more articles about properly bagging polystyrene.
Palo Alto	Effectiveness: By observation Documentation: No separate trash documentation program. Future Plans: No plans for a separate documentation program.
San Jose	Effectiveness has traditionally been measured on a complaint basis for general littering and dumping and on an inspection basis for some specific programs such as Residential Street Sweeping. The Mayor's anti-litter initiative included the establishment of a list of 100 litter hot spots (ten for each of the ten Council Districts) and initiation of a documentation system using Keep America Beautiful's litter index, which has already been used on the 100 hot spots.
Santa Clara	The City of Santa Clara has not performed a study to determine the effectiveness of existing trash management practices. The City maintains regular clean-up schedules for medians, streets and catch basins. The City performs additional work as needed. No plans are in place to improve documentation.

Sunnyvale	Public Works - Solid Waste Division has established program outcomes that are measured annually. These include meeting solid waste diversion requirements, cost effectiveness of service to residents, and number of complaints. Records are kept on waste diversion and cost of service issues and reported annually. Records are kept on number of complaints and responses/resolutions to them. Liquidated damages can be assessed on the waste-hauling contractor for service failures. Complaints are logged in a complaint database by Solid Waste Division staff. An index of the number of solid waste complaints per 10,000 collections is determined. This index is not to exceed an average of the three previous years' complaints. This documents the customer satisfaction with the Solid Waste Program. A Citywide customer service survey also measures resident satisfaction. Public Works - Field Services Division also has established outcomes for their goals of responding to and resolving complaints received. For example for hazardous debris in roadway complaints, they must respond within 3 hours, 95% of the time and for non-hazardous complaints, they must respond within two workdays, 95% of the time. Parks and Recreation, Neighborhood Preservation, and Public Safety - All have measurable outcomes established for their responses to complaints and their resolution. This is tracked and reported on annually. Each Division has its own specific, measurable outcomes to demonstrate effectiveness of programs/activities. Each division in the City tracks its complaints and their resolution in their own database. There are no future plans to change the current documentation program, as it seems to work reasonably well.
Los Gatos	The Town meets all jurisdictional federal and state requirements. The Town submits reports on activities and has been informed that it is meeting and exceeding trash activities. The Town also has a close relationship with the community and documents all complaints relating to this field. Complaints and/or suggestions to improve the service are taken into consideration.
Monte Sereno	The City meets all jurisdictional federal and state requirements and reports on activities which meet or exceed existing trash management requirements. The City also has a close relationship with the community and documents any trash complaints. Complaints and/or suggestions are taken into consideration. Public health and safety is a priority.
Saratoga	Belong to a JPA. The JPA Executive and Board Monitoring Activities.
Santa Clara County	N/A
SCVWD	Recycling and District Solid Waste Practices as well as disposal options have been evaluated. Effectivness Evaluations for trash and clean-up related to creeks have not been developed. The Emergency Response Program and violation of 83-2 program has had effectiveness evaluations of the overall programs but these evaluations were not specifically broken down to the trash level. The extent of evaluations is to have a approximately 60 creek clean events per year and a measurement of the trash removed.

5. What incentive programs are in place to reduce litter and illegal dumping? Do disincentives (e.g., expensive landfill tipping fees, few trash receptacles, etc.) exist which prevent proper trash management?

Cupertino	The City's waste hauler provides two, no cost trash pickups per household, annually. The City provides trash and recycling receptacles at City parks, as well as bus stops. Both types of locations are maintained regularly. City staff distributes many public information pieces targeting how to dispose of electronics, construction materials, etc. City staff is unaware of any chronic trash problems in the city.
Los Altos	Los Altos has no incentive programs at this time.
Los Altos Hills	No disincentives (e.g., expensive landfill tipping fees, few trash receptacles, etc.) exist which prevent proper trash management in the Town.

Milpitas

Household disposal at landfill six times a year for residential customers. Free recycling services for commercial customers. Annual Neighborhood Beautification Awards Program, a Lend-A-Tool Program and Volunteer Program (MVP).

Mountain View

-City has a free on-call clean-up program 3x/yr. allowing residents to dispose of unwanted materials, which could end up being dumped. City also offers bulky goods collection for a fee, but in 2003 non-hazardous bulky goods are being collected at no charge. City participates in County HHW program and has a curbside recycling program.
-The City does not have public cans except in the downtown area. Some bus cans provided by the VTA were pulled because residents would illegally dump trash despite the fact that the rates are among the lowest in the County and there has been no rate increase for more than two years. Community Services Department and the Solid Waste Section of the Public Works Department work together to identify illegal dumping and have the Finance Department charge customers for illegal dumping if enough evidence exists and a current billing account exists.
-The City also has free drop-off centers for recycled materials in the downtown and at local recycling centers (Foothill @ Terra Bella, downtown district, and 20-20 centers, thrift stores). The City provides a variety of free programs, has very low rates, and has a variety of curbside and drop-off services so that littering and illegal dumping are discouraged.
-The City has a good code enforcement program enforcing codes proactively and through complaints. The Solid Waste section requires Foothill Disposal to conduct subscription audits annually and Solid Waste regularly increases services to businesses and residents found insufficiently served. The City has an ordinance requiring trash lids be closed at all times, and the Solid Waste Section has fined businesses in the downtown for every day that a lid is found open. In some cases, Solid Waste required Foothill to weld steel bars at the back of dumpsters to prevent apartments or businesses from keeping the lids open. All recycling dumpsters have locks to prevent scavenging, and scavengers of garbage are actually pretty neat using grocery carts and poles to go through trash and picking up spilled items. Police have talked to scavengers to discourage scavenging, so scavengers tend to be neater to avoid complaints.
-Solid Waste staff regularly follows Foothill Disposal collection vehicles and debris boxes en route for litter and leaks, and has only reported two trucks since 1999 that littered or leaked. Debris boxes are covered loads. Foothill is required to pick up any spilled garbage and does so (observed). Solid waste considered a requirement for Foothill to cover collection vehicle hoppers on routes but found it really unnecessary, and found it would be very costly because it would slow down the route collection.
-Most of the litter on streets is from private vehicles. Solid Waste reports to Police any passenger and commercial vehicles observed littering, some of it deliberate (a driver threw 3 bags of fast-food garbage onto the street). Finally, Solid Waste runs articles about proper trash management for residents, businesses and the downtown, and regularly refers local schools to the CIWMB website on litter curriculum for students.
-The City has many incentive programs to reduce litter and dumping and there really is no reason for litter and illegal dumping except for people who don't read the articles or are deliberate in their actions despite low rates and ample opportunities for trash management. We believe the state should resurrect it's anti-litter radio and television campaign in all languages targeted to adult and child pedestrians, and drivers of passenger vehicles, pick up trucks, and small commercial contractor trucks. Additional ordinances are really unnecessary because these laws are already on the books at city, county and state levels, and it would be more helpful to have a statewide litter campaign and maybe some warnings from the CHP/Police for observed roadway litterbugs.

Palo Alto	Collection Program (Public Works Department) A. Weekly, backyard pick-up. B. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard). Weekly curbside green waste pick-up. C. Backyard pick-up of recyclables and green waste available for the handicapped. D. Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers. E. Sanitation Company is required to clean up trash it spills. Fines are possible. Annual "Clean-up Day" (Public Works Department) A. Residential (less than 5 units) B. By appointment (by phone) C. Four Bulky (furniture) items D. Other items unlimited E. Free F. One visit allowed per year. Landfill Services (Public Works Department) A. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.
San Jose	For the price of basic garbage service, residents are provided with unlimited weekly curbside collection of a wide range of recyclable or compostable materials, including all beverage containers, all paper, many plastic and metal products, used motor oil and filters, and yard trimmings. Storage and collection of recyclables at single-family homes was changed from open tubs to fully-enclosed carts in July 2002. The City participates in the Countywide Household Hazardous Waste Program, providing appointments for three per cent of all household annually to discard any toxic household materials at no charge. Free cleanup events are provided to City neighborhoods, especially blighted or low-income neighborhoods and areas with greater accumulations of rubbish. Since 1985, the number of Civic Litter Modules on or near public sidewalks has been increased from less than 100 to over 800. The City of San José does not believe that local tipping fees affect littering generally or that they are so high that illegal dumping is significantly increased beyond the level that would be expected when there is any fee at all.
Santa Clara	Punitive violators will be issued citations. Departments have citation authority.
Sunnyvale	Incentive programs include all of the free " Extra Dump" days and spring and fall clean ups. The Solid Waste Program also provides an answer point phone number so people can call to find out about disposal options and activity dates. This information is also kept on the City's Solid Waste website: http://www.ci.sunnyvale.ca.us/recycle/index.htm. The Solid Waste Division strives to keep its rates as low as possible and still meet the charges for cost of service. Currently, Sunnyvale's rates are 98% of what charges are for similar cities in the South Bay area. Disincentives: High landfill disposal fees in the County tend to promote illegal dumping, especially by small businesses. The high fees are caused primarily by the $13 per ton City of San Jose Landfill Excise Tax. This accounts for over 25% of typical charges at the four landfills in San Jose, which are the only North County sites available to the general public.
Los Gatos	There does not appear to be much happening in the Town of Los Gatos. Overall, there are enough trash receptacles in the parks, trails and throughout the Town. Expensive landfill tipping fees do not deter the Town from providing quality trash management.
Monte Sereno	Dumping within the City does not appear to be a problem.
Saratoga	Curbside Recycling and HHW Pickups.
Santa Clara County	N/A
SCVWD	The effect of the City of San Jose's increase in land fill tax has not been quantified in the illegal dumping program to date.

6. What mechanisms does your municipality/agency use to document trash complaints and/or incidents? (e.g., report forms; database)	
Cupertino	The City's Code Enforcement Department maintains a database of all complaints received. The database can be sorted by category for trash related complaints.
Los Altos	Public Works Maintenance Division has a service request system that can provide reports on litter/trash complaints. Police Department code enforcement keeps reports of each incident they respond to.
Los Altos Hills	We use both report forms and database.
Milpitas	Complaints are documented on in-take inquiry forms by staff and follow up for resolution with contractor, resident or property owner. Service requests are generated and response tracked.
Mountain View	Complaint forms. Work orders are used if called to clean up a dumping incident. Inspection notices for downtown restaurant dumpsters. Complaints and inspections are tracked on database.
Palo Alto	No separate forms or data base. Complaints are logged in by each Department – not specific to trash.
San Jose	Log of complaints only.
Santa Clara	Service requests to document complaints. Notice of violations, pre citation notices and citations to document incidents to violators.
Sunnyvale	Several different databases are kept for dealing with trash/litter complaints or incidents, depending on the type of incident and where it comes from. Public Works Answer Point staff take in complaints for litter/trash related to collection of wastes or on public property and log them in a database. These may be referred to different Public Works divisions, Parks and Recreation, Neighborhood Preservation, or Public Safety to follow up on and resolve. If it is related to trash transport activities, the trash-hauling contractor is called and they respond to any complaints on the same day (within 8 hours) of receipt of the complaint. They also respond to overflowing or uncovered waste receptacle calls. Solid Waste Division Staff work with Neighborhood preservation to issue citations, if needed. Neighborhood Preservation receives complaints at their Answer Point related to litter, trash, other problems both in public right of ways and on private property, and logs them into a database. They respond immediately (along with Public Safety Haz-mat staff) to any immediate threats to public health or safety. They have up to three days to respond to other complaints and their goal is to resolve the complaint within 30 days. Usually they are resolved within 19-20 days. However, if legal procedures are needed to resolve the complaint, then the time required to resolve the problem may be significantly longer. Mechanisms for resolution of complaints can include a Courtesy Notice, Administrative Citation, or other administrative actions such as Abatement Hearings. The City Finance Department collects administrative penalties, which are deposited in the City's General Fund. Public Safety - Receives complaints from the public or requests for assistance from other City departments to assist with enforcement of penal codes and municipal codes for certain incidents. These are logged into their Record Management System (RMS) database. They respond to complaints received from City dispatch immediately. If they observe someone in the act of littering, they can write a criminal citation. They also respond to illegal dumping complaints and try to determine the responsible party for enforcement actions. They also deal with homeless encampment removal by citing participants with trespass and violations of the penal code. They work with Public Works staff to remove debris left behind from the encampments and make the place less desirable as a continued encampment.
Los Gatos	Trash complaints are documented in the Town's database and in Green Valley Disposal's data base. The Town of Los Gatos has the right to review it's haulers database complaint records at any time. Trash complaints are recorded and reviewed on an annual basis. The Town has a good and open relationship with it's trash and recycling hauler.

Monte Sereno	Complaints are taken down on our "Complaint Tracking Form". Working closely with Green Valley Disposal has proven to be efficient.
Saratoga	E-mail and hard copy files.
Santa Clara County	Referrals from partnering law enforcement agencies by way of infraction citation process or criminal complaint.
SCVWD	A database of 83-2 violations is maintained as well as a spreadsheet of ICID incident responses

7. What, if any, ordiances are in place to enforce litter or illegal solid waste dumping laws? What, if any, enforcement actions are available to remedy illegal dumping or trash-related violations? Do you have mechaisms to collect penalties? If so, what are they?

Cupertino	According to the City's Code Enforcement Department, the California State Penal Code Section 374.3A regarding litter, is used to enforce litter violations. Violations can be a misdemeanor, which carries a fine and/ or imprisonment. If a case is determined to be a nuisance, the nuisance abatement ordinance is followed, which is approved by City Council and then a fee is collected from the violator to pay for the cleanup.
Los Altos	Title 6- Health and Safety of the City's Municipal Code regulates littering, nuisance abatement and gargage collection. Title 11 regulates blight conditions. Police Department code enforcement can cite these regulations.
Los Altos Hills	There are no specific ordinances to enforce litter or illegal solid waste dumping laws.
Milpitas	Neighborhood Preservation Ordinance was enacted in February 2000 and the Solid Waste Management Ordinance. Penalties include administrative citations.
Mountain View	Chapter 16, Mountain View City Code includes litter and illegal solid waste dumping laws. Typical enforcement actions are corrective actions. The City Attorney's Office, Code Enforcement Division may seek penalties to illegal dumping incidents but the problem is identifying who dumped it and finding out where they are now. Ordinance is being revised to include $250 penalty for dumping citation. See answer to question #5 for more details about enforcement.
Palo Alto	Discarding trash on public or private property is illegal (P.A. Municipal Code) Administrative penalties are specified in the Code and utilized. Trash on Private Property Enforcement Program (Planning and Community Environmental Department) Trash on private property is a P.A.M.C. violation (esp. visible trash – front yard). Incoming complaints result in: A. Logging and tracking. B. Inspection within 5 days. C. Notice of Violation (NCR form delivered or posted.) D. Can be followed by letter. E. Can be followed by: - Administrative Penalty - Criminal Action. Litter Enforcement (Police Department) - Persons who litter are subject to action by the Police Department. - The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney. - The California Penal Code or the Palo Alto Municipal Code (PAMC) is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney.

San Jose	The City has dozens of provisions in the Municipal Code relating to litter, however, as part of the Pick Up San José initiative, it has been determined that the Penal Code and Vehicle Code provisions regarding littering and illegal dumping are the best tools for enforcement. The one general exception relates to property-related public nuisance code language related to litter and accumulation of waste, which are enforced by Code Enforcement. A specific exception will be use of the vehicle code provision requiring that truck loads of waste be covered, which will be enforced by both the Police Department and the Highway Patrol.
Santa Clara	Yes, the City of Santa Clara does have Municipal Code Sections making it illegal to litter, accumualte refuse and illegally dump. Citations are the primary enforcement action to remedy these problems. Liens can be placed on properties if citations are not paid.
Sunnyvale	Sunnyvale Administrative Codes: Title 8.16.030 (a) © Solid waste container requirements Title 8.16.060 Solid Waste Management and Recycling - Solid Waste Deposit -where prohibited Title 9.26.030 Abatement of nuisances Title 9.52.010 Prohibition of unauthorized presence in posted parking lots of a closed commercial business Title 9.62.020 Injury or misuse of park property prohibited Title 9.62.030 Polluting waters and dumping of refuse prohibited Title 9.62.060 Picnic areas use Title 13.08.380 Sidewalk maintenance Title 19.54.050 Wireless telecommunications - operation and maintenance standards Title 19.78.020 Mobile vendor permits - standard requirements Title 19.82.020 Miscellaneous plan permit - when required Criminal Code: 373.a Public Nuisance 374.4 Littering Prohibited 5410 Illegal Dumping Administrative Citations, Notices to Abate, and Compliance Orders can be issued by Neighborhood Preservation. Criminal Citations (misdemeanors) can be issued by the Public Safety Department. Public Safety will work with the City Attorney's office to prosecute criminal citations, as needed. Administrative penalties can be collected and can vary from $50 per incident to $500. These penalties are turned over by Neighborhood Preservation to the Finance Department to collect and place in the City's General Fund. Criminal fines can be assessed, and may be up to $1000 per incident.
Los Gatos	Sec. 11.10.055. Dumping of garbage and rubbish restricted to authorized disposal site. No person shall dump any trash or garbage upon any lot, piece or parcel of land not owned by such person or upon any public street, way, alley or place within the Town. Sec. 11.10.025. Disposal by Town, compliance with solid waste management plan required. (a) Except as otherwise expressly provided in this chapter, it shall be unlawful for any person to dispose of garbage and rubbish, except through the service provided by the Town, its agents, servants, or employees, or by persons who shall contract with the Town to gather and collect and to dispose of such garbage and rubbish. (b) Any person who collects and disposes of garbage and rubbish in the Town shall do so in compliance with the solid waste management plan approved by resolution of the Town Council.
Monte Sereno	6.09.040-It shall be unlawful for any person in the City of Monte Sereno to throw or deposit garbage, rubbish or waste matter, or to cause same to throw or deposit the same upon any vacant lot, or back yard, or to store or keep the same otherwise than in cans or receptacles, as required by Sections 6.09.020 or 6.09.050; and it shall be unlawful to have, store, deposit or keep garbage where rats can have access thereto, or feed thereon. Each day in violation of this Section shall be treated and considered, and the same shall be separate and distinct offense. Criminal prosecution and/or public nuisance abatement procedures are used at the discretion of the City.
Saratoga	Ordinances are in place. Information may be found on City of Saratoga website.

Santa Clara County	San Jose Municipal Code section 9.10.550 California Vehicle Code section 23113 California Penal Code section 374(a) Santa Clara County Ordinance B14-22.1(a) Above violations are subject to fine and are collected through the court system.
SCVWD	83-2 soon to be the Water Resources Protection Ordinance, Enforcement Actions include utilization of Fish and Game codes and Clean Water Act laws via the local District Attorneys Office and the RWQCB. We have never used our mechanism to collect penalties.

8. What additional activities and/or programs do you feel would improve your agency's ability to manage litter and illegal dumping?

Cupertino	Cupertino doesn't have much of a problem with illegal dumping. On occasion, an apartment manager reports that a tenant has left furniture or a mattress adjacent to the apartment dumpster, after moving out. The city offers to post "No dumping" signs. The owner still has the responsibility to dispose of waste and pay for the costs. Fortunately, we don't often find this material in the creeks.
Los Altos	None. Trash seems to be a managable problem in Los Altos.
Los Altos Hills	By public participation and public out-reach.
Milpitas	Grant funding to promote messages at the grass root level locally and in the schools ($5K + needed).
Mountain View	-Littering is a regional problem and needs to be addressed through anti-litter messages. See answer at the bottom of question #5 regarding our experience observing passenger and commercial pick up trucks. -The City has many incentive programs to reduce litter and dumping and there really is no reason for litter and illegal dumping except for people who don't read the articles or are deliberate in their actions despite low rates and ample opportunities for trash management. We believe the state should resurrect its anti-litter radio and television campaign to reach them in all languages. Additional ordinances or laws are already on the books and further laws are unnecessary and probably unenforceable due to available resources and other priorities.
Palo Alto	N/A
San Jose	A law prohibiting trash in any open vehicle on public streets, whether moving or not, so parked pickup trucks could be ticketed without having to see the fast food garbage blow out of the bed an hour later on the freeway. Expansion of the State's Beverage Container Redemption Act (AB 2020) to include all single-serve and take-out food and beverage packaging, such as drink cups and burger clamshells (or local fees instead). Advance disposal fees on littered items such as disposable diapers that have durable alternatives.
Santa Clara	Additional neighborhood clean-ups encourage the community to keep their neighborhoods clean and litter free.
Sunnyvale	Parks and Recreation - Would like to see more education on social responsibility for use of public spaces- including litter prevention along with other potentially destructive behaviors that have to be dealt with on public property.
Los Gatos	N/A
Monte Sereno	N/A
Saratoga	Public Outreach and Education and enhanced HHW pick-ups.
Santa Clara County	Education program – DA has begun education program at elementary and middle schools.

SCVWD	Source control of both manufactures and retailers, public outreach and education. Strict enforcement of existing Anti litter laws.

9. Provide interesting anecdotes relating to trash management adn/or litter/solid waste enforcement. Provide any additional information you wish to share.

Saratoga	E-waste is a concern to our city council. Legislation needs to be passed to address this growing waste stream.
Los Altos	None.
Milpitas	Ask a classroom, "Where does your garbage go?" and you get these answers: "Into the garbage truck", "down the street", and "Around the corner." Same with, "What happens to litter?" "It disappears", It goes to litter heaven". This is why we need environmental lessons, and projects that fit the State of California Education Department's curriculum for ALL grades and as many subject areas as possible (Art, Social Studies, Mathematics as well as Sciences).
Santa Clara County	
San Jose	None to report.

Palo Alto

1. Street Sweeping Program (Public Works Department)
A. Three times per week in Major Commercial Areas (University and California Avenues)
B. Weekly in other areas.
C. Highway 101 - State responsibility.
D. Oregon & Foothill Expressways – County responsibility.

2. Sidewalk and Roadside Litter Patrol (Public Works Dept)
A. University Avenue Patrol (Green Machine)
Daily from July 1 through December 31
Five days/week January 1 through June 30
B. Hot spots program
Patrol of identified roadside areas known to accumulate trash.

3. Collection Program (Public Works Department)
A. Weekly, backyard pick-up.
B. Weekly curbside recycling (bottle, cans, paper, dry-cell batteries, certain plastics, cardboard).
C. Weekly curbside green waste pick-up.
D. Backyard pick-up of recyclables and green waste available for the handicapped.
E. Sanitation Company (contractor) removes spilled or overflowing containers as well as trash in the containers.
F. Sanitation Company is required to clean up trash it spills. Fines are possible.

4. Annual "Clean-up Day" (Public Works Department)
A. Residential (less than 5 units)
B. By appointment (by phone)
C. Four Bulky (furniture) items
D. Other items unlimited
E. Free
F. One visit allowed per year.

5. Storm Drain System Cleaning (Public Works Department)
A. Each catch basin cleaned each fall (annually)
B. If debris is observed in a line next to a catch basin, the line is flushed.
C. Special areas are addressed as needed (e.g. construction site areas after the project is over.)
D. Enforcement actions for discharges to the storm drain are taken when intentional discharges are observed.
E. Residents and Businesses who sweep excess leaves or debris into the street are notified (via door hanger) of the code violation. If the practice continues, it is referred to Code Enforcement (Planning and Community Environment Department).

6. Creek Cleaning by Staff (Public Works Department)
Note: The cleaning of most creek reaches within Palo Alto are the responsibility of the Santa Clara Valley Water District (SCVWD). Certain reaches of San Francisquito Creek are the responsibility of Palo Alto, and those reaches are addressed below:

A. Each Fall (annually) a San Francisquito Creek walk is conducted with other agencies to identify clean-up of debris which is needed. Debris and trash is then removed.

7. Creek Cleaning by Citizen Groups (Community Services and Public Works)
A. The City and citizen groups help out on Coastal Clean-Up Day to clean creeks and the Baylands. Citizen groups bag trash and City crews pick it up.

8. Dumpster Area Clean-up (Public Works Department)
Messy dumpster areas are brought to the attention of the property owner, verbally first, then via letter. If compliance does not result, the sanitation company (City contractor) can clean the area and bill the property owner.

9. Trash on Private Property Enforcement Program (Planning and Community Environmental Department)
Trash on private property is a P.A.M.C. violation (esp. visible trash – front yard).
Incoming complaints result in:
A. Logging and tracking.
B. Inspection within 5 days.
C. Notice of Violation (NCR form delivered or posted.)
D.Can be followed by letter.

E.Can be followed by:
-Administrative Penalty
-Criminal Action.

10. Litter Enforcement (Police Department)
-Persons who litter are subject to action by the Police Department.
-The California Vehicle Code is used to prosecute cases of littering from a moving vehicle. Cases are investigated and appropriate ones are referred to the District Attorney.
-The California Penal Code or the Palo Alto Municipal Code (PAMC) is used to prosecute other cases of littering. Penal Code cases are referred to the District Attorney and PAMC cases are referred to the City Attorney.

11. Trash on Public Right-of-Way/Lands (Public Works Department)
A. Complaints and observations of trash result in clean-up by City Staff (or SCVWD staff for most creek-bed areas as noted in #6 above).
B. If the responsible party is known, the facts are referred to Code Enforcement (Planning and Community Environment Department) for the enforcement actions in #9 above.)

12. Palo Alto Parks Litter Patrol (Community Services Department)
A. Trash receptacles are emptied by sanitation company (City contractor) at various frequencies depending on location.
B. Trash pick-up of grounds is performed at various frequencies by either City staff or maintenance contractor depending on location.

13. Landfill Services (Public Works Department)
A. The Palo Alto Landfill, Recycling Center, and green waste composting area are open to residents 7 days/week at extremely reasonable rates. Recycling and green waste areas are free.

14. Palo Alto Landfill Litter Control (Public Works Department)
A. Litter migration from the working face of the Landfill is controlled primarily through the use of the alternate daily cover tarps, weekly cover and the use of permanent and portable fencing.
B. Litter is routinely picked up by landfill personnel on an as-needed basis. Materials dropped off by vehicles that may pose a hazard are picked up immediately.
C. In the event of high winds, temporary staff is brought on to augment permanent staff, if needed, to pick up windblown litter.

Los Gatos No additional comments.

Cupertino
Los Altos Hills
SCVWD

Mountain View

A. In the City's downtown area, space for garbage and recycling dumpsters is limited. The City built community recycling enclosures on public property to preserve space for private trash dumpsters on private properties and encourage recycling. A thorough door-to-door downtown business education campaign about proper management of trash, recycling and tallow was conducted, and is repeated through weekly downtown inspections.

B. In response to a complaint about litter coming from a local convenience store, the City found the problem was not with the store but with children and visitors to the local elementary school and a "joint use" park. The litter found was primarily ice cream wrappers and some sport drinks discarded directly in front of the school and along a concrete path to the basketball courts on school property adjoining the park. So the litter was coming from neighborhood children and families visiting the school usually after hours. Only one or two identifiable fast-food containers were found from restaurants along El Camino (not from the convenience store). We found litter near the street corner (on the residential side across from the convenience store) was schoolwork and artwork.

-The litter was also coming from travelers from one bus stop to another. The complainant's property and school property are located between two major arterials with bus routes, El Camino Real and California Avenue. Based on various field inspections lasting a few hours on different days and at different hours revealed a well-traveled path from one bus stop to another with many pedestrians towing roller suitcases. Solid Waste contacted the VTA and they exchanged a 10-gallon public can near the bus stop for a 32-gallon can.

-The school crossing guard was a great source of information. He confirmed our observations about the after hours basketball activity, ice cream street vendors, and bus travelers; and he noted that some of the snack bags found in the bushes across from the school were well-positioned at eye level and checked by passersby and concluded there may be drug activity. Solid Waste notified the Police Department about the guard's observation, and met with the school principal.

-The principal and solid waste staff checked public cans near the basketball area and found litter in one part of the park where a trash can was only 10 feet away. There are about 4 trash cans along the border between the school basketball courts and the park. Solid Waste staff asked Community Services (Park) to add another public can in the park about 5 feet away next to the basketball courts where litter was found. Solid Waste suggested to the principal that the school increase litter removal on its property more frequently, and add another public can near the entrance from the street to the basketball courts. Solid Waste provided reference to the litter sections of the CIWMB curriculum for the school to use in teaching students about litter. Depending on the success of the school, a joint litter education campaign in Spanish may be implemented consisting of store and school posters and banners.

Sunnyvale

Neighborhood Preservation and Public Safety respond to situations at abandoned houses (and sometimes ones that are occupied). In some of these cases "super-cleanups" of the yards were needed. Public Safety staff assisted with site security during these clean up efforts.

A general comment that was received from several staff interviewed for this report was that warning signs and anti-litter signs, (even those with penalties listed e.g., $500 - $1000) do not have any effect on the public and their behaviors.

Monte Sereno

No additional comments.

Santa Clara

Litter and illegal dumping are virtually impossible to stop at the source. Very rarely will you successfully be able to catch the responsible party in the act of littering and/or dumping. A $500 penalty per violation is a significant penalty but it does not seem to prevent littering. It is important to keep neighborhood streets, creeks and medians as clean as possible all of the time. If you remove litter quickly and keep areas clean, people are less likely to litter in clean areas. Once an illegal pile gets started, it grows exponentially until it is removed. People are more likely to add to a pile rather than to start one.

ACKNOWLEDGEMENTS

The Santa Clara Valley Urban Runoff Program's (Program) Urban Runoff Management Plan (URMP) was developed by the Program Manager under the direction of the Management Committee.

MANAGEMENT COMMITTEE

Dave Chesterman (Chair)	Randolph Shipes (Vice Chair)
Santa Clara Valley Water District	San Jose
Lavenia Millar, Cupertino	Lorrie Gervin, Budget & Executive Committee Chair, Sunnyvale
Larry Lind, Los Altos	Cheri Donnelly, West Valley Cities
Richard Chen, Los Altos Hills	Lynn Penoyer, Campbell
Darryl Wong, Milpitas	John Curtis, Los Gatos
Eric Anderson, Mountain View	Brian Loventhal, Monte Sereno
Joe Teresi, Palo Alto	John Cherbone, Saratoga
Rick Mauck, Santa Clara	Steve Homan, Santa Clara County

Note: The 2004 Urban Runoff Management Plan was revised on February 24, 2005 to only reflect changes to the Industrial/Commercial Discharger Control Program and Illicit Connection/Illegal Dumping Elimination Activities Performance Standards provided within Appendix A: Model Performance Standards.

ACRONYMS

ABAG	Association of Bay Area Governments
AHTG	Ad Hoc Task Group
BAAQMD	Bay Area Air Quality Management District
BACWA	Bay Area Clean Water Agencies
BASMAA	Bay Area Storm Water Management Agencies Association
BMM	Bay Monitoring and Modeling
BMP	Best Management Practice
BPP	Brake Pad Partnership
CAP	Copper Action Plan
CEP	Clean Estuary Partnership
CCMP	Comprehensive Conservation and Management Plan
CEQA	California Environmental Quality Act
CMA	Congestion Management Agency
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CZARA	Coastal Zone Act Reauthorization Amendments
EOA	Eisenberg, Olivieri, & Associates
EPA	Environmental Protection Agency
HMP	Hydromodification Management Plan
ICID	Illicit Connection/Illegal Dumping

IND	Industrial and Commercial Discharge
IPM	Integrated Pest Management
KLI	Kinetic Laboratories Incorporated
MCMP	Metals Control Measures Plan
MEP	Maximum Extent Practicable
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MTC	Metropolitan Transportation Commission
NAP	Nickel Action Plan
NDC	New Development and Construction
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	Operation & Maintenance
PAA	Public Agency Activities
PCB	Polychlorinated Biphenyls
PCDF	Polychlorinated dibenzofurans
PCDD	Polychlorinated dibenzo-p-dioxins
PIP	Public Information and Participation
POC	Pollutant of Concern
POTW	Publicly Owned Treatment Works

QA/QC	Quality Assurance/Quality Control
RMAS	Regional Monitoring and Assessment Strategy
RMP	Regional Monitoring Program
RWQCB	Regional Water Quality Control Board
SCBWMI	Santa Clara Basin Watershed Management Initiative
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SCVWD	Santa Clara Valley Water District
SFEI	San Francisco Estuary Institute
SIC	Standard Industrial Classification
SOP	Standard Operating Procedure
SWAMP	Surface Water Ambient Monitoring Program
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TATG	Trash Ad Hoc Task Group
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
USEPA	United States Environmental Protection Agency
WEO	Watershed Education and Outreach
WLA	Waste Load Allocation
WMI	Watershed Management Initiative (same as SCBWMI, above)

WUPPP Water Utility Pollution Prevention Plan

WWC Watershed Watch Campaign

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Overview Chapter One

This Urban Runoff Management Plan (URMP)[1] details what the Santa Clara Valley Urban Runoff Pollution Prevention Program[2] (SCVURPPP or Program) is doing to reduce urban runoff pollution in the Santa Clara Valley watershed.

Fifteen agencies — *Co-permittees* under a stormwater discharge permit issued by the Regional Water Quality Control Board — comprise the Program. Each agency implements urban runoff pollution controls within its own jurisdiction. A *Management Committee* coordinates joint efforts among the Co-permittees. By pursuing agency-specific activities, and contributing to joint activities, each Co-permittee endeavors to protect water quality in local creeks and South San Francisco Bay, and complies with a myriad of regulatory requirements that govern urban runoff pollution control programs.

Chapter 2 provides the geographical and regulatory context for Program activities. It begins with a description of the characteristics of the Santa Clara Valley drainage basin, followed by a brief history of the Program. Chapter 2 continues with a discussion of the Program's overall approach to controlling pollutant sources and the Program's relationship to other pollution-prevention efforts. The Program's participation in Santa Clara Basin Watershed Management Initiative (SCBWMI) is described in some detail, followed by more brief notes on the Program's work with other public agencies and with private entities.

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[1] The URMP complies with NPDES Permit CAS029718 (Order No. 01-024 as amended by Order 01-119).

[2] As stated in the Bylaws, the co-permittees — when collectively implementing area-wide activities that benefit all co-permittees — are referred to as the "Program".

Chapter 3 describes the fundamental ideas around which the Program is organized, and which drive the relationship between the Program and its participating agencies. These ideas are embodied in the Program's Mission Statement, Goals and Objectives. This is followed by a summary of the roles played by the Co-permittees, Management Committee and Program staff in implementing the Program. Chapter 3 also describes how the Program applies Performance Standards to achieve consistency, accountability and continuous improvement in the Program and every jurisdiction within the Santa Clara Valley Basin.

Chapter 4 summarizes the common features of each Co-permittees' local urban runoff pollution prevention program, as represented in the Program-wide model Performance Standards. The Performance Standards apply to each element of the Program: Illicit Discharge and Illegal Dumping Elimination (ICID), Industrial and Commercial Discharge Controls (IND), Public Information and Participation (PIP), Public Agency Activities (PAA), and New & Redevelopment and Construction (NDC).

Chapter 4 also describes activities, coordinated through the Management Committee that the Co-permittees pursue jointly. These include specific things the Program and Co-permittees are doing to support other entities' efforts to reduce, to the maximum extent practicable (MEP), urban runoff pollution — and protect and enhance beneficial uses.

Chapters 5 through 16 consist of individual Urban Runoff Management Plans for Cupertino, Los Altos, Los Altos Hills, Milpitas, Mountain View, Palo Alto, San Jose, Santa Clara, and Sunnyvale; the West Valley communities of Campbell, Los Gatos, Monte Sereno and Saratoga (combined in Chapter 14); Santa Clara County, and the Santa Clara Valley Water District.

Each of these Co-permittees may choose to adopt any or all of the model Performance Standards, or adapt them to suit local conditions. The adaptations accommodate differing local conditions and are documented in Chapters 5-16. The local plans also describe how each Co-permittee organizes and carries out its local program.

About the Santa Clara Valley Urban Runoff Pollution Prevention Program

Chapter Two

2A THE SANTA CLARA BASIN AND ITS COMMUNITIES

Physical Setting. Santa Clara County encompasses more than 1,300 square miles in the southern portion of the San Francisco Bay Area, making it the second largest of the nine Bay Area counties. The County is geomorphologically diverse and includes the Santa Clara Valley, the Santa Cruz Mountains, the mountains of the Diablo Range, and the Baylands.

The northern portion of the county is occupied by a broad, northward draining valley located between the Santa Cruz Mountains, to the west, and the Diablo Range to the east. This basin, the Santa Clara Valley, is highly urbanized and contains 13 of the county's 15 cities and towns (Figure 1). This portion of the County constitutes the area covered by the Santa Clara Valley Urban Runoff Pollution Prevention Program. The Santa Clara Basin has warm, dry summers and receives 15 to 20 inches average rainfall between October and April each year.

Creeks and streams that originate in the Santa Cruz Mountains and the Diablo Range drain through the Santa Clara Basin into South San Francisco Bay. Thirteen major watersheds are within the Program's jurisdictional areas (Figure 1). They include the Coyote Creek watershed on the east side of the

valley, the Guadalupe River watershed, which drains the south-central portion of the valley, and a series of small, relatively urbanized watersheds that drain the west side of the valley. Surface runoff generated from various land uses in all the hydrologic subbasins discharges into watercourses, which in turn flow into South San Francisco Bay (below the Dumbarton Bridge).

Population and Job Growth. In 2000, Santa Clara County ranked fourth in the state in terms of population and employment. According to the California Department of Finance 2000 Census Report, the population of the county is about 1.68 million. Of this total, about 1.51 million or 90 percent are residents of the thirteen communities in the Program Area. Most of the population in the unincorporated county is concentrated in areas around these urban communities. Therefore an estimated 95 to 96 percent of the county's total population is within the Program Area. According to the Association of Bay Area Governments' (ABAG's) *Projections 2002*, the population in the county will grow to about 2.06 million by 2025.

San Jose, with approximately 894,950 residents, is by far the most populous city. San Jose has 53 percent of the total county population, followed by Sunnyvale, with about 8 percent of the total county population, and Santa Clara, with 6 percent of total county population. San Jose is expected to retain a similar share of the county population in 2015. The smallest communities in the valley are the City of Monte Sereno and the Town of Los Altos Hills.

The Santa Clara County economy is dynamic. Up until the mid 1950s, the county was predominantly rural with an agricultural-based economy. Since then, the valley has been transformed into a vast metropolitan area with an economy dominated by high technology firms. Through these decades, the valley has continued to attract fast-growth industries, which have led to both job and population growth within the county and in adjacent counties. The end of the 1990s saw tremendous growth in Santa Clara County as the Silicon Valley became the embodiment of a "New Economy" driven by efficiencies from computers, communications and the use of the internet. During the 1990s, the county added 201,400 jobs. Job growth continues in some sectors throughout 2000, even as the news media reported the demise of dot-com

companies. In many ways, companies that provided the services and materials for internet companies eventually accounted for most of the job losses. Currently, companies that make equipment and provide business services, not the pure internet companies, are causing a shift in the county's economic fortunes.

Santa Clara County will see limited job growth in the first ten years of the forecast period (2000-2025). Service jobs will account for approximately 38 percent of new jobs in the county during the next ten years. Between 2000 and 2025, the county is expected to add 303,500 new jobs.

Land Use. The Santa Clara Valley is characterized by flat fertile lands and was once an important agricultural area. Since the mid 1950s however, housing developments, businesses, industrial parks, shopping centers, and freeways have replaced agricultural lands. This development was triggered by the emergence of the electronics industry. Stanford University in Palo Alto spawned the earliest firms engaged in electronics and further supported the growth by building the Stanford Industrial Park. As available land in Palo Alto became scarce, the electronics and semiconductor industry moved south into Mountain View and Sunnyvale, then into Santa Clara and Cupertino. By the 1970s, industries were concentrated in the northern portion of the valley, with housing extending into the southern part of the county. Very-low-density, affluent residential areas developed in the western foothill communities.

Table 1 presents estimated percentages of land within the Program communities devoted to different land uses. As this table shows, some communities, such as Los Altos, Los Gatos, Saratoga, and Monte Sereno, are almost entirely residential with little or no industrial areas and very limited commercial areas. Other communities are more diverse. The cities of Mountain View, Santa Clara, and Milpitas have 15 to 20 percent of their land in industrial use.

Most communities are built out, and the availability of land for development is limited. With the exception of San Jose, Milpitas, and unincorporated County, valley communities generally have less than 8 percent of their land vacant or under agricultural use that could be converted to urban uses. Land

prices and scarcity of vacant land will likely spur intensification of existing land uses, such as increased residential density through infill and redevelopment. ABAG notes that Santa Clara County has a large inventory of commercial and industrial sites that will not be fully absorbed over the next 20 years and could be made available for housing.

Industrial Base. High technology firms, engaged in the electronics, aerospace, and semi-conductor industries, dominate the industrial economy of the valley. Other major industries include printing and publishing, industrial machinery and equipment, auto repair, trucking, and warehousing. Most of the electronics industry is concentrated in the cities of Santa Clara, Sunnyvale, Mountain View, Palo Alto, and Milpitas. The City of San Jose has a more diverse industrial base.

Jurisdiction over Drainage Systems. Within the valley, drainage systems are of diverse physical types, and have diverse ownership and maintenance responsibility. Drainage facilities consist of gutters, swales, ditches, culverts, storm drain inlets, catch basins, storm drain lines, pump stations, and detention basins. In most cases, these facilities are owned and maintained by the municipality in which the facility is located. The natural drainages and flood control channels, some detention basins, and groundwater recharge basins are maintained and operated by the Santa Clara Valley Water District. Multiple agencies have jurisdiction and responsibility for management and maintenance of drainage facilities within the Program's thirteen major watershed areas. In addition, upland portions of some of these subwatersheds have non-urban land uses (agricultural, ranching, and open space) and are outside the Program Area. Runoff from these non-urban areas drains through the urban portion of the valley on its way to South San Francisco Bay.

2B HISTORY OF THE SCVURPPP

1986 Basin Plan and Initial Memorandum of Understanding. The Program was originally organized in response to the 1986 Regional Water Quality Control Plan for the San Francisco Bay Region (Basin Plan).[3] The 15 agencies prepared a plan[4] to characterize urban non-point sources and to identify and evaluate existing and additional controls. The 15 agencies then signed a Memorandum of Understanding to jointly contribute to a series of monitoring and BMP studies leading to a control plan.[5]

1990 Stormwater Permit and Storm Water Management Plan (SWMP). These materials became the basis for an NPDES permit application. In June 1990 the Program received an early NPDES municipal stormwater permit.[6] Permit provisions recognized that the Program had already accomplished significant work, which the California Regional Water Quality Control Board for the San Francisco Bay Region (Regional Board or RWQCB) considered equivalent to specific municipal stormwater permitting requirements promulgated by EPA in October of that year.

1990 Memorandum of Agreement. The Program is organized, coordinated, and implemented based upon a mutual Memorandum of Agreement (MOA) signed by the 15 participating public agencies in 1990. The MOA defines roles and responsibilities of all Co-permittees, a cost-sharing formula for joint expenditures and the role of the SCVWD as managing agency of the Program. The Management Committee, which includes representatives from the 15 Co-permittees, provides overall direction to the Program. The SCVWD chairs the Management Committee and employs a Program Manager and staff to implement, manage, and coordinate joint activities. The Program's Management Committee established subcommittees, composed of

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[3] California Regional Water Quality Control Board for the San Francisco Bay Region (1986). *Water Quality Control Plan for the San Francisco Bay Region*. (Basin Plan). The reference in this section is to the 1986 version of the Basin Plan. The Regional Board approved the most recent Basin Plan on June 21, 1995.

[4] CH2MHill and EOA, Inc. (1987). *Nonpoint Source Evaluation Action Plan.*

[5] Woodward-Clyde Consultants (1990). *Loads Assessment Results and Implementation Program,* (3 volumes).

[6] Permit No. CA 0029718, Order No. 90-094

Program and Co-permittee staff, to assist in coordination of Co-permittee implementation efforts, including annual reporting and evaluation.

1993 Copper Waste Load Allocation[7] (WLA) and Copper Reduction Dialogue. In June 1993 the Regional Board adopted a WLA, which included an annual reduction of 950 pounds of copper to be accomplished jointly by the three South Bay wastewater dischargers (Publicly Owned Treatment Works, or POTWs) and the Program. In response, the Program and POTWs included regulatory, environmental, and commercial interest groups in a Copper Reduction Dialogue. In March 1994, the four entities signed a Memorandum of Agreement specifying actions to be completed. The actions are reviewed in the Program's 1997 Metals Control Measures Plan, and appropriate items incorporated into the URMP. The State Water Resources Control Board (SWRCB) has since remanded the WLA back to the Regional Board for review.

1995 Permit Reissuance. As part of the 5-year NPDES permit cycle, the Program developed and submitted a second SWMP to the Regional Board on June 30, 1995. The Regional Board approved the SWMP and issued the second NPDES storm water permit[8] on August 23, 1995. The SWMP included metals control measures. The permit called for the Program to develop watershed-based measures.

1997 Storm Water Management Plan Revision. The 1995 Permit called for the Program to develop a set of Performance Standards during 1995-1996. The permit defined Performance Standards as "the level of implementation necessary to demonstrate the control of pollutants in storm water to the maximum extent practicable." The Performance Standards were incorporated in the revised plan and submitted to the Regional Board on September 1, 1997. The Regional Board approved the URMP and performance standards in two separate letters (July 10, 1998 and December 14, 1998). In addition, an updated URMP, including updates to several Performance Standards only,

[7] A Waste Load Allocation is the portion of a receiving waters' assimilative capacity that is allocated to one of its existing or future point sources of pollution (40 CFR 130.2(g)).

[8] NPDES Permit No. CAS029718, Order 95-180.

was submitted to the Regional Board as part of the permit renewal application in December 1999. The Permit also calls for the submittal of an Annual Work Plan and Annual Monitoring Plan[9] on March 1 of each year and an Annual Fiscal Year Report, which may include recommendations for improvements or revisions to the plan, to be submitted on September 15 of each year.

In September 1997, the Management Committee (consistent with the SCVURPPP MOA/Bylaws) retained EOA, Inc. to provide Program management services. The SCVWD is the Program's fiscal agent and contracts with the Program Manager.

Memorandum of Understanding (MOA) and SCVURPPP Bylaws. The Co-permittees submitted an updated Memorandum of Agreement (MOA) and SCVURPPP Bylaws as part of the December 21, 1999 permit re-application package. Co-permittees are individually responsible for implementing the permit within their respective jurisdictions. The Co-permittees make use of the Program to pool resources and complete joint activities.

The Management Committee renamed the Santa Clara Valley Nonpoint Source Pollution Control Program to the Santa Clara Valley Urban Runoff Pollution Prevention Program. The new name is more descriptive of the Program's purpose, and better defines the Program's focus. Consistent with this renaming, this plan is titled an Urban Runoff Management Plan (URMP) instead of a Storm Water Management Plan.

2001 Permit Reissuance.

On February 21, 2001, the Regional Board adopted the Program's third NPDES permit (NPDES Permit No. CAS029718, Order No. 01-024 as amended by Order No. 01-119). The permit required the Co-permittees to

[9] Consistent with Provision C.7.b and C.9 of its Permit, the Program developed and submitted to the RWQCB (on March 1, 2002), a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) that identifies Program monitoring activities in Santa Clara Basin Watersheds over an eight-year period. The Program received a request from Regional Board staff on June 5, 2002 to revise the March 1, 2002 Multi-Year Plan. On August 5, 2002, the Program submitted an updated Multi-Year Plan. Each year (March 1), the Program submits an Annual Monitoring Plan that is consistent with the Multi-year Plan.

continue to implement existing performance standards and contained a number of new requirements including: addressing the post-construction and some construction phase impacts of new and redevelopment; hydromodification management plan; enhanced reporting requirements for industrial/commercial discharger control and illicit connection and illegal dumping elimination activities; a Multi-Year monitoring program; and control programs for pollutants of concern that have the reasonable potential to cause or contribute to exceedances of water quality standards/receiving water limitations. Specific control programs cover the following pollutants of concern: copper, nickel, mercury, legacy pesticides, PCBs, dioxin-like compounds and sediments. The Program was also required to continue to implement the 2000 Copper and Nickel Action Plans.

2C THE PROGRAM'S APPROACH TO POLLUTION PREVENTION AND REGULATORY COMPLIANCE

Santa Clara Valley municipalities were among the first in California, and nationally, to begin implementing control measures for urban runoff pollution prevention. The technical knowledge, regulatory mechanisms, and institutional division of responsibility needed to control urban runoff pollution are still maturing.

The Co-permittees' pollution control strategies have been developed in the context of Federal regulations, state regulations, regional management plans, regulatory staff guidance, and the requirements of the Program's NPDES permit.[10]

Ultimately, each "non-point" pollutant source is related to some specific natural condition or human activity. The general solution to "nonpoint" pollution is to find each of a multitude of small "point" sources — and then to reduce them to the maximum extent practicable.

[10] A brief summary of these regulatory and management programs is contained in Appendix B.

The Program encourages reduction of all sources of pollutants that may enter storm drains. These sources may be divided into three categories:

1. Urban sources that are within the authority and ability of municipal government to address

2. Urban sources that are beyond the regulatory authority of municipal government or that municipal government does not have the ability to address

3. Non-urban sources, which are beyond the regulatory authority of municipal government

Each Co-permittee has developed a comprehensive URMP to reduce sources in the first category to the maximum extent practicable. The Co-permittee Urban Runoff Management Plans incorporate Performance Standards that, where necessary, refine the model Performance Standard to suit local conditions. The Co-permittee URMPs contain local strategies for urban runoff control; including tailored Performance Standards, work plans to implement Performance Standards, and Best Management Practices and Standard Operating Procedures that detail how control measures will be carried out day-to-day. The Co-permittee URMPs comprise Chapters 5-16. The common features of the Co-permittee URMPs are detailed in Chapter 4.

For sources in the second category, the Program participates in, and contributes to, joint efforts with other entities, including regulatory agencies, public benefit corporations, universities, and citizens' groups. These entities take the lead on addressing particular sources because they are regional, statewide or national in scope, because they have different skills or expertise, or because they have appropriate regulatory authority.

For the third category, non-urban sources, the Program continues to build, and actively participate in, the Santa Clara Basin Watershed Management Initiative (SCBWMI).

2D POLLUTION PREVENTION AND WATERSHED MANAGEMENT

Watershed Management — managing activities and natural processes of a watershed in a practical manner that maximizes the benefits and minimizes the adverse impacts on the environment for the benefit of the community and recognizes the quality of life and diversity — defines a new approach to the Regional Board's watershed and Bay protection efforts. The Regional Board has specified the Santa Clara Basin as one of two watersheds initially targeted for this approach.

The first Storm Water Management Plan (June 1995) contained five Watershed Management Measures, beginning with institutional arrangements and leading, after some years of planned effort, to area-wide watershed management. Since that time the Program has helped forge a new approach that brings in stakeholders at the beginning of the planning process.

The Santa Clara Basin Watershed Management Initiative (SCBWMI) is organized into three distinct phases: (1) Initiating Phase, (2) Planning Phase, and (3) Operating or Implementing Phase. In April 1996, Regional Board staff commenced the Initiating Phase. The Board staff, with the assistance of several Co-permittees, gathered together various interested parties (stakeholders) in the watershed to determine their interest in watershed management and their vision of how to begin planning watershed use and protection. In June 1996, an ad hoc committee composed of representatives from various stakeholder groups met to discuss these issues. This group later came to be called the Core Group and now meets monthly. The Core Group developed a mission statement, and a Process subgroup formalized the planning structure, planning process, and a timeline. In November 1996, the SCBWMI moved into an 18- to 24-month planning phase.

Coincident with this planning phase, the Program committed specific resources, in addition to resources committed by individual Co-permittees, to assist the SCBWMI with:

- Modeling loading, fate and transport of pollutants, to support development of a copper and nickel Total Maximum Daily Load (TMDL) in the Lower South Bay.

- Assessments of impairment of beneficial uses in the sloughs and tributary creeks of the Lower South Bay.

SCVURPPP's Program Manager participates in the SCBWMI's Core Group. Co-permittee staff, and Program staff and consultants, will continue to participate in various SCBWMI workgroups. By helping to create the SCBWMI, the Co-permittees have effectively implemented the watershed tasks in the 1995 SWMP, the 1997 URMP, and the 2001 Watershed and Urban Runoff Integration report.[11] The Program believes that a viable watershed management plan for the Santa Clara basin will require stakeholder involvement and area-wide planning. Accordingly, the Program's ongoing watershed planning is coordinated through participation in the SCBWMI. As the SCBWMI has developed, it has begun to lay the groundwork for adaptive management within the Santa Clara Basin watersheds. The SCVURPPP will continue to focus on preventing pollution from urban sources by pursuing activities within the purview of the Co-permittees. (See Figure 2)

The Management Committee, as part of the annual evaluation and continuous improvement cycle, reviews the resources that the Program and Co-permittees contribute to the SCBWMI and recommends actions (including budget) to assist the SCBWMI in the coming year.

2E DESCRIPTION OF RELATED PROGRAMS

In addition to participating in the SCBWMI, the Program works with other entities — including regulatory agencies, trade associations and nonprofit groups — to pursue urban runoff pollution prevention. Some examples follow.

[11] Consistent with Provision C.10 of the NPDES permit, SCVURPPP developed a report entitled "Watershed Management and Urban Runoff Management Integration Report, June 29, 2001." The report contains an analysis of how watershed management and urban runoff are currently integrated along with recommendations on the prioritization of watersheds for future investigations/assessments. .

SF Bay Regional Monitoring Program (RMP). Point and urban runoff dischargers including the SCVURPPP fund this monitoring program. The program is administered by the San Francisco Estuary Institute and includes water column, sediment, and biological monitoring at stations throughout the San Francisco Bay, including the lower South Bay. The program conducts special studies such as a pilot watershed-monitoring element in Coyote Creek. The SCVURPPP may supplement RMP funds, from time to time, to encourage special studies that are of interest to the Program.

Bay Area Stormwater Management Agencies Association (BASMAA). BASMAA is a consortium of San Francisco Bay region municipal stormwater programs. Representatives of the seven contributing programs comprise the association's Board, which oversees the work of three committees:

- Monitoring
- New Development
- Operational Permits

BASMAA's New Development Committee has focused on providing tools municipalities can use to incorporate measures to mitigate the urban runoff impacts of new development and construction. The New Development Committee has also overseen preparation of *Start at the Source*[12][13], a site planning/design guidance manual and other products, and provided coordination with Regional Board staff. Regional public outreach and advertising is also conducted through BASMAA. In addition, BASMAA continues to successfully develop a single voice for Bay Area urban runoff programs. The SCVURPPP Program Manager has (for the past five years) and continues to serve as Vice Chair of BASMAA.

POTW Pretreatment Programs. The three POTWs in the Santa Clara Basin inspect many facilities that discharge to sanitary sewers. The

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[12] Tom Richman & Associates (1997). *Start at the Source: Residential Site Planning and Design Guidance Manual for Stormwater Quality Protection.* Bay Area Stormwater Management Agencies Association.

[13] Tom Richman & Associates (1999). *Start at the Source: Design Guidance Manual for Stormwater Quality Protection.* Bay Area Stormwater Management Agencies Association.

inspections insure compliance with the industry's discharge permit and Federal pretreatment regulations. These inspection programs are closely coordinated with the control of industrial sources of urban runoff pollutants. All facilities that are inspected for compliance with sanitary sewer discharge regulations are also inspected for compliance with requirements to implement urban runoff pollution prevention Best Management Practices (BMPs).

Vehicle Emissions and Congestion Management Programs. The Santa Clara Transportation Authority is responsible for developing and implementing a Congestion Management Program that is intended to reduce traffic congestion through various measures, including public education, provision of high-occupancy-vehicle lanes, employer carpooling incentives, and encouraging use of public transit. Similarly, the Bay Area Clean Air Plan, jointly developed by the Bay Area Air Quality Management District (BAAQMD), the Metropolitan Transportation Commission (MTC), and ABAG, aims to improve air quality through controls on emissions from stationary sources and motor vehicles, and through transportation system improvement measures. The emission reduction programs benefit urban runoff quality because particulate metals and other pollutants emitted by automobiles settle on urban surfaces and are later washed into urban runoff.

Hazardous Waste Recycling and Disposal Programs. Most cities in Santa Clara County participate in the Countywide Household Hazardous Waste Collection Program, which is administered by the County Health Department. A guidebook describing these activities was developed jointly by the County Hazardous Waste Program and the SCVURPPP in 1991. The elements of the program differ from jurisdiction to jurisdiction, but typically include household hazardous waste drop-off locations, curbside pickup, and community recycling centers. These programs recycle batteries, fluorescent lamps, automotive fluids, household cleaners, paints, and garden chemicals generated by households and some small businesses.

Certified Unified Program Agency (CUPA) Program. Senate Bill 1082 of 1993 (Health and Safety Code Chapter 6.11) requires California EPA to establish a "unified hazardous waste and hazardous materials management" regulatory program (Unified Program) by January 1, 1996. The Unified

Program is intended to consolidate, coordinate and make consistent the administrative requirements, permits, inspection, enforcement and fees for state-mandated regulation of:

- Hazardous waste generators and onsite treatment of hazardous wastes
- Spill prevention control and countermeasure plans for above-ground storage tanks
- Underground storage tanks
- Hazardous material release response plans and inventory
- Risk management and prevention

Clean Estuary Partnership. The Clean Estuary Partnership (CEP) is a cooperative partnership (voluntary) that facilitates efforts to improve water quality in San Francisco Bay by providing financial and staff support for technical analysis and stakeholder outreach activities. The official CEP partners are:

1. San Francisco Bay Regional Water Quality Control Board (RWQCB);
2. Bay Area Stormwater Management Agencies Association (BASMAA); and
3. Bay Area Clean Water Agencies (BACWA).

The recent trend toward lengthy and costly legal challenges of regulatory decisions convinced stakeholders to pursue a more collaborative approach. In September 2001, the Regional Board, BACWA and BASMAA signed a memorandum of understanding (MOU) to establish the CEP. The intention was to provide a forum and process for industry, the environmental community and various research and planning initiatives to work together to:

4. Summarize the existing scientific evidence for pollutant impacts;
5. Develop conceptual models that explain the source of the problems and are consistent with available scientific data and theory;

6. Coordinate peer review of key scientific/technical documents; and

7. Identify feasible long-term strategies for addressing pollution problems.

The effort is designed to result in greater consensus regarding the technical foundation for regulatory action, and reduce the likelihood of controversy and litigation when the regulations are adopted in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). SCVURPPP has been actively involved from the inception of the CEP and annually contributes resources (both funding and staff in-kind support) to the effort. While SCVURPPP supports the overall goals and mission of the CEP, there is a need to been refine the operational relationship between the RMP and the CEP to more efficiently and cost-effectively utilize the limited public agency resources that support these two programs.

Water Resources Protection Collaborative. The Water Resources Protection Collaborative (Collaborative) includes representatives from the SCVWD, the County of Santa Clara, each municipality within the County, the Regional Water Quality Control Board, and representatives of property owners, the environmental community and business/development interests. It was initiated in December, 2002 in order to address land use issues near streams in response to SCVWD's proposal to modify Ordinance 83-2. The Collaborative's Mission is to review and assess the current state of water resources protection measures in Santa Clara County; and to propose appropriate management strategies and institutional arrangements to implement these strategies.

The Co-permittees, typically higher level staff from Planning and Public Works Departments, have participated in the Collaborative meetings since December 2002. The Program itself is not a member, but participates as needed in technical work groups and reviews products for consistency with Program goals and objectives and permit requirements. The Collaborative's goal to better implement watershed management strategies within the County supports the mission of the Program to assist in protecting beneficial uses of

streams by reducing pollutants of concern from adjacent land uses to the maximum extent practicable.

Santa Clara Valley Urban Runoff Pollution Prevention Program's Goals and Organization

Chapter Three

3A DURATION OF THE URBAN RUNOFF MANAGEMENT PLAN

More than just a list of control measures, this Urban Runoff Management Plan is intended to guide continuous improvement and ongoing development of the Program. The original Plan period began in September 1997. The Management Committee, consistent with Provision C.2.b of the 2001 NPDES permit, developed the revised Plan that became effective starting on September 1, 2004.

The Co-permittee URMPs (Chapters 5-16) contain the local strategy for urban runoff control, including tailored Performance Standards, Best Management Practices (BMPs) and Standard Operating Procedures (SOPs). The Co-permittee URMPs represent the local work plans for implementing control measures. As shown within Figure 2, the Program's annual reports will document continuous improvements to the Co-permittees' URMPs, BMPs and SOPs.

3B MISSION STATEMENT

During four study sessions in mid-1996, the Program's Management Committee developed a Program Mission Statement and Program Goals and Objectives. This process brought about a general consensus among the Co-permittees on the Program's approach to compliance with water-quality regulations.

Mission Statement

"To assist in the protection of beneficial uses of receiving waters by preventing pollutants generated from activities in urban service areas from entering runoff to the maximum extent practicable."

The Mission Statement:

- Targets pollutant reduction measures that are needed to help protect beneficial uses
- Focuses on urban pollutant sources (as opposed to nonpoint sources generally)
- Sets a specific benchmark for implementation (as opposed to doing "anything and everything" related to pollutant sources)

This focused approach is consistent with the Program's idea of working with other parties or institutions that are better equipped to carry out specific pollution control strategies. The Program concentrates its own efforts on identifying pollution sources, and implementing pollution prevention measures, that are clearly within the authority and ability of the Co-permittees.

Goals and Objectives

GOAL 1: Comply with Permit

- Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)
- Reduce, to the maximum extent practicable, pollutants in stormwater runoff
- Comply with permit submittal requirements

GOAL 2: Determine Success

- Periodically evaluate the attainment of beneficial uses in selected waterways
- Evaluate changes in public awareness and behavior
- Evaluate effectiveness of specific control measures at pollution reduction.

GOAL 3: Adjust Activities to Meet Changes

- Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP
- Utilize what we learn to plan the next steps

GOAL 4: Achieve Acceptance of Urban Runoff Management Activities

- Effectively facilitate public input into Program planning process
- Integrate urban runoff goals at various intra-agency levels
- Develop and maintain a proactive interrelationship with regulatory authorities
- Publicize the efforts of the Co-permittees (Program)

GOAL 5: Integrate Urban Runoff Program Elements into other Programs

- Promulgate an understanding of the role of the urban runoff program
- Encourage other agencies to become involved in urban runoff issues
- Encourage action by the appropriate agencies

3C GOALS AND OBJECTIVES

The Program's goals and objectives also stress this practical, focused approach.

Goal 1 is to achieve regulatory compliance by implementing all permit requirements. That overall purpose can be summed in two key objectives: (1) effectively preventing non-stormwater discharges and (2) implementing best management practices that can reduce the concentration of pollutants in urban runoff. A third objective is to insure that the Co-permittees comply with the letter, as well as the spirit, of the regulations, by fulfilling each formal requirement of the permit.

Goal 2 is to measure Program successes. Many Program activities are essentially mandated by Federal and state regulations or are strongly encouraged by Regional Board staff. The effectiveness of many of these mandated activities has not been established—or may be near impossible to measure. However, in its strategy for complying with regulatory mandates, the Program continually seeks to measure the results of its efforts to make the

Performance Standards

Performance Standards establish a level of effort for best management practices or control measures that can be implemented throughout the urban watershed according to the characteristics of individual Co-permittee jurisdictions.

Program more efficient, and seeks new opportunities to control urban runoff pollutants. In particular, the Program is committed to a periodic evaluation of beneficial uses in some of the Santa Clara watershed's waterways. At present, the Program is pursuing this by participating in the Santa Clara Basin Watershed Management Initiative and implementation of the Program's Multi-Year Receiving Water Monitoring Plan. Some other Program activities are amenable to measurement of intermediate objectives. For example, changes in the general public's knowledge, attitudes, and pollution-causing behavior can be measured through surveys.

Goal 3 spurs SCVURPPP to continuously re-evaluate the meaning of "Maximum Extent Practicable." As the knowledge and philosophy within this new and fast-changing field evolve, the Program seeks new opportunities to prevent urban runoff pollution and to protect beneficial uses of the region's water bodies. Urban Runoff Management Plans and Performance Standards are designed to be flexible.

Goal 4 embodies the perspective that to be effective, the Co-permittees must integrate the work of each department of their own agency and work to influence the work of other agencies. For example, municipal urban runoff pollution prevention programs typically coordinate with their local fire marshal or fire prevention bureau, planning and building department, attorney's office, and public information officer, as well as public works.

Goal 5 reflects the Program's commitment to involving agencies, (e.g. BAAQMD and CMA), in solutions which reduce urban runoff pollutants at their source. Where no suitable agency exists — as for controlling copper-laden dust from brake pads, or for implementing a watershed perspective the Program works with others to foster development of appropriate entities, such as the Brake Pad Partnership and the SCBWMI.

3D HOW THE PROGRAM IS ORGANIZED

During 1996 and early 1997, the Program's Management Committee worked on a new Agreement for Implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program, and new Bylaws governing the operation of the committee. The new Agreement and Bylaws clarified the Program's decision-making process and enhanced the ability of the Program to assist each Co-permittee to comply with the provisions of the NPDES permit.

The Agreement formally renamed the Program (from the Santa Clara Valley Nonpoint Source Pollution Control Program to the Santa Clara Valley Urban Runoff Pollution Prevention Program) and reconstituted a Management Committee to be the official decision-making body for the Program.[14] The Management Committee consists of one designated voting representative from each of the listed Co-permittees. Voting is not weighted by community size or by the Co-permittees financial contribution to the Program. However, the Bylaws provide that "the affirmative vote of at least eight voting members which collectively contribute at least fifty percent of the Program costs is necessary to approve any measure…." This scheme provides that action by the Management Committee requires the support of a majority of the Co-permittees, including the support of either the City of San Jose or the Santa Clara Valley Water District.

[14] Management Committee meetings are publicly noticed and provide opportunity for public input as part of the decision-making process.

Co-permittees are those entities named in the NPDES permit issued by the Regional Board. As stated in the Bylaws, the Co-permittees, when collectively implementing area-wide activities that benefit all Co-permittees, are referred to as the "Program."

The Co-permittees share the costs of implementing the Program. The Management Committee designates a public entity to act as its fiscal agent. Through the fiscal agent, the Management Committee retains a Program Manager.

The Program Manager:

- Administers the Program.
- Supports the Management Committee and its ad-hoc Task Groups.
- Prepares budgets and tracks and reports expenditures.
- Coordinates with the Program's legal consultant.
- Prepares and submits annual reports and other documentation to the Regional Board.
- Provides liaison between the Program and Co-permittees.
- Represents the Program to, and facilitates cooperation with, the SCBWMI, Regional Board, BAAQMD, BASMAA, environmental groups, other organizations and interested parties.

The Program Manager also directs consultants to implement area-wide activities that require specialized expertise. These activities include public information, public opinion polling, development of new BMPs and control measures, and monitoring of sources, fate and effects of urban runoff pollutants.

The individual Co-permittees implement most BMPs and control measures. As is documented in Chapters 5-16, each Co-permittee has organized its own

urban runoff pollution prevention program, including assignments for implementing control measures and a structure for coordinating local efforts.

3E PERFORMANCE STANDARDS

Consistent with its emphasis on effectiveness, accountability, and continuous improvement, the Management Committee has developed mechanisms for facilitating consistent countywide implementation of Program elements, while preserving flexibility and allowing Co-permittees to tailor elements to fit their local conditions. (One size does not fit all) These mechanisms also provide for systematic documentation of local efforts.

Model Performance Standards. Most Co-permittee activities — and the level of implementation for those activities — are defined in Performance Standards. Performance Standards describe a specific result, or level of effort, that constitutes the "maximum extent practicable" based on current technical knowledge, available resources and local conditions. First developed in 1996, the Program adopted model Performance Standards for:

- Illicit Connection and Illegal Dumping Elimination Activities
- Industrial/Commercial Discharger Control Programs
- Public Streets, Roads and Highways Operation and Maintenance
- Storm Drain System Operation and Maintenance
- Water Utility Operation and Maintenance
- Planning Procedures
- Construction Inspection

Since 1997, the Management Committee has updated the following performance standards:

- Illicit Connection and Illegal Dumping Elimination Activities (March 1999)
- Industrial/Commercial Discharger Control Programs (March 1999)
- Storm Drain System Operation and Maintenance (March 1999)
- Construction Inspection (January 2002)
- Planning Procedures for New Development and Redevelopment (January 2004)

Since 2001, the Management Committee has developed and finalized the following new performance standards:

- Pest Management (February 2002). Accepted by the Regional Board on June 19, 2002.
- Rural Public Works Maintenance and Support (December 2002). Accepted by the Regional Board on February 18, 2003.

In addition, the Program prepared Public Information and Participation (PIP) framework that the Co-permittees have used to develop their individual PIP programs and the Management Committee has used to develop a joint PIP program.

The model Performance Standards were developed by Ad-Hoc Task Groups (AHTGs), composed of Co-permittee staff, Program staff and consultants. They are included in Appendix A.

Model Performance Standards assist Co-permittees to develop their local programs. Co-permittees have the option of adopting the model Performance Standards without changes. Each Co-permittee can, if it so chooses, begin implementation of a thorough, well-thought-out plan that has had the benefit of extensive peer review. Alternatively, Co-permittees may develop their own Performance Standard by adapting the model Performance Standard to suit their local conditions. In developing their own Performance Standards,

Co-permittees cite their specific characteristics to justify a different degree of implementation.

3F REPORTING

The principal purpose of the Program's Annual Reports is to facilitate and document the Program's activities and process of evaluation and continuous improvement (see following Section 3G). Accordingly, the reports focus on the Co-permittees' progress in developing their local programs and in implementing the individual Co-permittees' URMPs. The reports document routine implementation of control measures, but in brief, summary form.

The Program's annual report also summarizes Program joint activities (e.g. Public Information/Participation, Monitoring, assisting Co-permittees to implement Performance Standards, and participation with other entities, including the Santa Clara Basin Watershed Management Initiative). (The Management Committee, Regional Board staff and interested parties receive monthly reports on these activities at monthly Management Committee meetings.)[15]

Performance Standards are a key component of each Co-permittee's URMP. Each Performance Standard consists of a series of explicit or implicit questions: Was the specific action accomplished, at or above the level specified? What documentation is available? Answering these questions, along with a discussion of overall implementation status of the Performance Standards, provides for systematic documentation of activities and point-by-point evaluation of whether the Performance Standards are being met. Activities that are identified in the individual Co-permittee URMPs, but are

[15] To ensure public access to all reports, work products, guidance documents and environmental data, the Program has placed the vast majority of the 258 major reports and work products produced by SCVURPPP since September 1997 on its website (www.scvurppp.org). When viewing the website, the majority of reports and work products are linked to downloadable documents. Reports and work products not available through the website may be obtained by submitting a request form. The website is continually updated to include the latest reports and work products, data inventory sets and other pertinent Program information.

not covered by Performance Standards (e.g. participation in school-based watershed education) are also documented in the annual reports. Annual reports also describe and synthesize the Co-permittees' local experience and joint efforts to produce a comprehensive view of the past year's progress in pollution prevention and urban watershed protection.

3G WORK PLANS

By March 1 of each year, the Program submits to the Regional Board a draft Work Plan (both Program and Co-permittee specific) for implementation of the Program's URMP for the coming fiscal year, in accordance with NPDES Permit Provision C.6.b. The Work Plan includes clearly defined tasks, responsibilities and schedules to be implemented by the Program and Co-permittees. It also includes development of new, or modification of existing performance standards (Provision C.2.b), provides the Work Plan for implementing Provision C.3., describes planned monitoring activities (Provision C.7), describes pollutant-specific requirements (Provision C.9) and defines the Program's role relative to Watershed Management efforts (Provision C.10).

The Work Plan builds on the baseline efforts conducted by the Program and Co-permittees through a "continuous improvement" process, in which the Program seeks new opportunities to control storm water pollution. The Program's concept for continuous improvement is illustrated within Figure 2. The Work Plan includes a discussion of continuous improvement tasks that were identified, in part, during individual Co-permittee performance reviews, effectiveness evaluations in previous annual reports, and cooperative efforts between the Program and groups which include the Bay Area Stormwater Management Agencies Association (BASMAA), SCBWMI, Regional Monitoring Program (RMP) and Clean Estuary Partnership (CEP).

3H EVALUATION AND CONTINUOUS IMPROVEMENT

SCVURPPP's approach to implementing Performance Standards explicitly acknowledges that "Maximum Extent Practicable" (MEP) is an evolving and flexible concept. Knowledge about controlling urban runoff pollution continues to advance, and available resources vary with changes to each municipality's staffing and budget.

What's more, defining MEP is subjective. It requires judgment to balance resources applied against results gained.

Given that MEP is subjective, evolving, and flexible, it makes sense to ask, "What opportunities are available for improving Program effectiveness?" rather than "Has the Co-permittee done everything possible to control urban runoff pollution?"

Therefore, the SCVURPPP is dedicated to a process of continuous review and improvement, which includes seeking new opportunities to control stormwater pollution and to protect beneficial uses. When such opportunities arise, the Program will revise, update and add to its activities, control measures, BMPs and Performance Standards.[16] Chapter 4 details how the Program will pursue continuous improvement in each Program area. These changes will be documented in the Annual Report. A typical schedule for the annual continuous improvement cycle is shown in Table 2.

Under direction of the Management Committee, the Program implements joint activities. Joint activities include the area-wide Public Information/ Participation and Monitoring program elements, assistance to Co-permittees to implement other program elements (as detailed in Sections 4) and participation with other entities to reduce sources of pollutants that are beyond municipalities' authority or ability to address (as described in Sections 2C, 2D, 2E, and 4H).

[16] Among other things this applies to pollutants of concern that have been identified as causing or contributing to exceedances of water quality standards/receiving water limitations (See Appendix D, Attachment D-1)

Co-permittees will perform an annual review of the Program's work and set priorities for the coming year. This review is also an opportunity to check progress on activities required under the Program's permit.

The Program's annual report reviews and evaluates joint activities in the context of Program goals and objectives. However, since many Program objectives are long-term, it is difficult to assess incremental progress toward these objectives.

As discussed in Section 2D, the Program is evolving toward a watershed approach. Future Program initiatives may originate in discussions among stakeholders in the SCBWMI. Figure 3 shows two categories of these Program initiatives:

1. SCBWMI monitoring and investigations may identify sources of pollutants or watershed impacts that are clearly within the jurisdiction of the Co-permittees to abate.

2. The SCBWMI may identify special studies, or institutional needs, that the Program (among SCBWMI stakeholders) is best suited to implement.

SCBWMI recommendations will be forwarded to the Management Committee for action. Actions will be documented in the Program's annual reports.

Table 2 Typical Annual Cycle for Continuous Improvement	
July/August	• **Document previous year Program activities (Prepare Annual Report).**
Sept. 15	• **Submit Annual Report, including Program and Co-permittee objectives for current fiscal year.**
October	• **Initiate review of one existing Performance Standard or Program element, or create one new Performance Standard.** • **Review commitments to the SCBWMI, BASMAA, CEP, Projects of Regionwide Benefit, RMP, Brake Pad Partnership, BAAQMD, and other entities for next fiscal year.** • **Prepare draft Program budget and final Annual Budget Compilation Report for previous fiscal year.**
December	• **Review permit administration and Program administration. Prepare final Program budget.**
January	• **Summarize contemplated Program improvements and potential effects on Co-permittee programs and budgets.**
February	• **Review Program activities and commitments for the current fiscal year, revise schedule to insure commitments are met and approve draft Work Plan.**
March	• **Submit draft Work Plan, including Program and Co-permittee objectives for upcoming fiscal year.**
May	• **Prepare draft *Review of Program Management Services* memorandum for current fiscal year.** • **Review of draft *Review of Program Management Services* memorandum by Management Committee.**
June/July	• **Review Program objectives and priorities, schedule and budget for the next fiscal year.**

3I EXEMPTED AND CONDITIONALLY EXEMPTED DISCHARGES

The Program's NPDES permit (Permit Provision C.8) identifies the approach for addressing exempted and conditionally exempted discharges[17], as well as reporting procedures. Co-permittees will continue to follow the NPDES permit approach and may, from time to time, request modification to the categories as allowed for within the Permit Provision.

[17] The Program's report entitled *Conditionally Exempted Discharges – Classification and Control Measures, June 15, 2000* (see Appendix D, Attachment D-2) contains control measures for the twelve (12) non-storm water discharges. Although they are rarely, if ever, pollution sources; each of the discharges may warrant some type of control measure. The report includes a discussion of control measures to reduce pollutants in these discharges to appropriate levels, procedures and Performance Standards for the implementation of these control measures, procedures for notifying the Regional Board of these discharges, and procedures for monitoring and record management. The report was developed by a specially formed AHTG consisting of qualified Co-permittee staff members. The evaluations and recommendations for these Conditionally Exempted Discharges are based on the AHTG's thirty (30) years of combined water quality inspection experience. This report also includes responses to Regional Board staff comments.

Santa Clara Valley Urban Runoff Pollution Prevention Program Summary of Activities

Chapter Four

4A PROGRAM FEATURES

The SCVURPPP has been designed to help the Co-permittees secure regulatory compliance and maximize their effectiveness in preventing urban runoff pollution. The Program's main features are:

- Model Performance Standards (included in Appendix A) which define the result, or level of effort, for each major pollution-prevention task
- Cooperation between Co-permittees to jointly implement some required tasks — such as watershed monitoring — that can be done most effectively on a watershed or regional scale
- Participation in related programs and efforts that take the lead to address specific pollutant sources (e.g. BAAQMD's regulation of vehicle exhaust) or to pursue preservation of beneficial uses (e.g. the SCBWMI)
- Co-permittee URMPs that incorporate Performance Standards that (where necessary) refine the model Performance Standard to suit local conditions. Each Co-permittee URMP contains a local strategy for urban runoff

control, including tailored Performance Standards, specific description of steps needed to implement Performance Standards, and Best Management Practices and Standard Operating Procedures that detail how control measures will be carried out day-to-day. The Co-permittee URMPs are contained in Chapter 5-16.

The following sections 4B through 4H summarize how the Co-permittees (acting individually and collectively as the Program) are implementing each Program element. The Program elements are:

- Illicit Connection and Illegal Dumping Elimination
- Industrial/Commercial Discharger Control
- Public Information and Participation
- Public Agency Activities
- New & Redevelopment and Construction
- Monitoring

Table 3 shows how these Program elements are designed to fulfill the Program's goals and objectives.

Sections 4B through 4H describe, for each Program element:

- Contents of model Performance Standards
- Joint activities, to be carried out under the direction of the Management Committee
- Strategies for continuous evaluation and improvement
- Provisions for annual reporting

Section 4H summarizes how the Program cooperates with other programs to reduce pollutants from non-urban sources and other sources that are beyond

the regulatory authority of municipal government, or that municipal government does not have the ability to address.

Table 3: Program Goals, Objectives and Elements

Program Goals and Objectives Stated in Section 3C	Sections of This Document That Discuss Specific, Corresponding Actions
GOAL 1: Comply with Permit	
• Effectively prohibit non-stormwater discharges (unless exempt or managed according to approved conditions)	Section 4B (Illicit Discharge and Illegal Dumping Elimination) and Section 4C (Industrial/Commercial Discharger Control)
• Reduce, to the maximum extent practicable, pollutants in stormwater runoff	Section 4C (Industrial/Commercial Discharger Control) Section 4D (Public Information/Participation) Section 4E (Public Agency Activities) Section 4F (New &Redevelopment and Construction).
• Comply with permit submittal requirements	Section 3F (Reporting), Section #G (Work Plan)
GOAL 2: Determine Success	
• Periodically evaluate the attainment of beneficial uses in selected waterways	Section 2D (Pollution Prevention and Watershed Management) and Section 4G (Monitoring)
• Evaluate changes in public awareness and behavior	Section 4D (Public Information and Participation)
• Evaluate effectiveness of specific control measures at pollution reduction	Section 2D (Pollution Prevention and Watershed Management) and Section 4G (Monitoring)
GOAL 3: Adjust Activities to Meet Changes	
• Define what constitutes success (how much is enough?) as it relates to programmatic and technical MEP	Section 3H (Continuous Improvement)
• Utilize what we learn to plan the next steps	Section 3H (Continuous Improvement)
GOAL 4: Achieve Acceptance of Urban Runoff Management Activities	
• Effectively facilitate public input into Program planning process	This has been accomplished through public discussions on key elements of the Program. As the Program develops its watershed orientation, public input is also solicited through the SCBWMI stakeholder process.
• Integrate urban runoff goals at various intra-agency levels	Each Co-permittee URMP discusses organization within their agency.
• Develop and maintain a proactive interrelationship with regulatory authorities	Section 3H (Continuous Improvement), particularly the discussion of on-site program reviews.
• Publicize the efforts of the Co-permittees (Program)	Section 4D (Public Information and Participation)
GOAL 5: Integrate Urban Runoff Program Elements into other Programs	
• Promulgate an understanding of the role of the urban runoff program	Section 2C (The Program's Approach to Pollution Prevention and Regulatory Compliance)

• Encourage other agencies to become involved in urban runoff issues	Section 2D (Pollution Prevention and Watershed Management, Section 2E (Description of Related Programs) and Section 4H (Cooperation with Related Programs)
• Encourage action by the appropriate agencies	Section 4H (Cooperation with Related Programs)

Chapters 5-16 contain individual URMPs for each Co-permittee. In Chapter 14, the four West Valley communities have combined their strategies into a single URMP. Appendix C contains additional tables, prepared by each Co-permittee, describing the status of Co-permittee work plans, BMPs and SOPs associated with each Performance Standard.

4B ILLICIT CONNECTION AND ILLEGAL DUMPING ELIMINATION

The Program's Metals Control Measures Plan[18] found that illegal dumping contributes an insignificant amount of the total load of metal pollutants that reaches South San Francisco Bay. However, illicit connections and illegal dumping can cause transient toxicity and localized problems that significantly affect beneficial uses in Santa Clara Valley creeks and wetlands.

EPA regulations and the Basin Plan require that operators of municipal storm drainage systems actively seek to eliminate non-stormwater discharges that can contain significant amounts of pollutants.

The Program has Developed a Model Performance Standard Designed to Effectively Eliminate Illicit Connections and Illegal Dumping (ICID). The Program's December 19, 1996 model Performance Standard for Illicit Connection and Illegal Dumping Elimination Activities contains actions that each Co-permittee has tailored to suit local conditions to effectively eliminate ICID to their storm drainage systems.

The Model Performance Standard and supporting documents call for:

[18] SCVURPPP, *Metals Control Measures Plan (Vol1) and Evaluation of None metals of Concern (vol2)*, 1997, prepared by Woodward Clyde Consultants and EOA, Inc., February 1997.

- Assignment of personnel and resources for enforcing prohibitions on ICID
- A training program for ICID inspectors
- A list of materials that will be used to educate and inform individuals who are engaged in activities associated with prioritized discharges, including door hangers or other literature distributed in areas where illegal discharges have been found
- Plans to inspect the storm drainage system for evidence of non-storm-water flows, with an emphasis on finding and preventing prioritized types or locations of discharges
- A plan for responding to illicit discharge incidents
- A system for responding to referrals from other agencies or departments
- A protocol for contacting, educating, and assisting individuals or businesses responsible for ICID and taking enforcement action, where appropriate
- A tracking system to document and report field inspections and incidents
- Criteria for an annual evaluation of the effectiveness of this element
- A schedule for implementing field investigations

The Co-permittee URMPs Contain Agency-Specific Strategies for Effectively Eliminating ICID. Each Co-permittee has developed a URMP that describes its agency-specific local strategy and includes tailored Performance Standards, BMPs and SOPs. The individual Co-permittee URMPs are contained in Chapters 5-16 and are summarized in Appendix C. Where Co-permittees are not currently implementing all aspects of this element of their URMP, they have provided a schedule for doing so in their work plans.

The Program Pursues Joint Activities that Assist the Co-permittees to Effectively Eliminate ICID. The Management Committee will continue to sponsor periodic meetings where the Co-permittees' field inspectors can share information, experiences and ideas for improving local ICID programs. These meetings also provide a forum for coordinating ICID elimination with other pollution prevention activities, including public outreach and education.

As directed by the Management Committee, Program staff will also continue to:

- Supply storm-drain stencils, with a "no dumping" message, to Co-permittees
- Distribute literature and other materials describing BMPs to avoid non-stormwater discharges and eliminate ICID
- Answer questions, over a toll-free telephone hotline, about proper disposal methods and ways to control non-stormwater discharges
- Provide professional advice and guidance to Co-permittee staff, consultants and interested parties
- Coordinate ad-hoc task groups on ICID issues as needed
- In correspondence with Regional Board staff, periodically identify and describe categories of discharges to storm drains that need not be prohibited if properly managed.

The Program Pursues Continuous Evaluation and Improvement of ICID Elimination. The Co-permittees' incident tracking systems will be designed to help their staff identify and prioritize specific areas for additional investigation. As part of their annual reporting process, Co-permittees will review documentation of ICID to their storm drainage systems during the previous year. In particular, Co-permittees will consider how the number and type of incidents reported may have been affected by changes in field investigations, increased public awareness, or other factors. Co-permittees will identify any changes to their URMPs that result from this review.

Meetings of ICID inspectors and others involved in ICID elimination will facilitate discussion of inspection techniques and of the Program's strategy for outreach and education to prevent ICID. Where there is consensus that new outreach materials or strategies could be effective in reducing specific categories of discharge, the Management Committee will coordinate ad-hoc task groups to create and implement them.

ICID Elimination Activities Are Documented in Annual Reports. The Program's annual report will document the Co-permittees' implementation of each specific item in the Performance Standards. Since October 2001[19], the Program Manager has assisted each Co-Permittee (on an individual basis) with implementation of an enhanced reporting strategy. The effort has been very successful in demonstrating the full extent of the Co-permittees efforts in a consistent Program-wide manner. This allows for clear prioritization of related future work including enforcement, where necessary.

The Co-permittees will annually review their Performance Standards, update their URMPs as needed, and report their progress and accomplishments. This will include summaries of training programs and distribution of educational materials. The annual report will, as appropriate, highlight changes in inspection schedules or in priorities for controlling potential discharges.

4C INDUSTRIAL/COMMERCIAL DISCHARGER CONTROL

The Program's Metals Control Measures Plan concluded that runoff from industrial sites in the Santa Clara Valley may contribute a small load of copper and other metals to South San Francisco Bay. The estimates were based on concentration data reported by industries to the SWRCB. The data indicate that runoff from electroplating, metal finishing and semiconductor manufacturing may have higher-than-average metals concentrations. Actual

[19]The SCVURPPP permit Provision C.6i and ii required enhanced reporting. Consistent with the permit requirements, SCVURPPP developed a Program-wide strategy to comply with the enhanced reporting requirements (September 7, 2001). The overall goal of the strategy has been to demonstrate consistency on a Program-wide basis and compliance with the permit. SCVURPPP intends to incorporate the strategy into updated performance standards.

loading is uncertain because most sampling and analysis was not subjected to quality assurance/quality control procedures. In many cases, analytical limits were too high to detect actual concentrations. Subsequent investigations[20] indicated that there were not significant differences between the concentrations of copper and nickel at either semiconductor manufacturing or metal finishing facilities compared to control sites (commercial/industrial parking lots), and that printed circuit board manufacturers showed elevated levels compared to control sites. Based on these investigations, SCVURPPP and the City of San Jose initiated a pilot outreach campaign designed to increase the level of knowledge among targeted industrial dischargers. The results of the City of San Jose's pilot efforts (e.g., production and distribution of roof vent BMP information for Circuit board and metal finishing facilities) have been distributed to other Co-permittees and have been reported in Annual reports.[21]

Some of the smaller Santa Clara Valley communities have no industry. Some have few or no commercial sites either. Other Santa Clara Valley cities, such as San Jose, Sunnyvale, Palo Alto and Santa Clara, have extensive commercial areas and a diverse mix of industry. EPA regulations and the Basin Plan require these cities to pursue a program to reduce, to the maximum extent practicable, pollutant discharges from businesses and industries.

The Program's Model Performance Standard is Designed to Reduce Industrial/Commercial Discharges to MEP. The Program's December 19, 1996 Performance Standard for Industrial/Commercial Discharger Control (IND) Programs is a detailed, comprehensive description of where and how Co-permittees will conduct inspections of local businesses and industry. The local inspection programs include outreach, assistance and enforcement,

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[20] *City of Sunnyvale Industrial Stormwater Monitoring Pilot Project, Volume I (IND-1*), prepared by Sunnyvale and EOA, Inc., May 1998.

City of San Jose Industrial Stormwater Monitoring Pilot Program (IND-1), prepared by ESD, June 1998

SCVURPPP *Industrial Stormwater Monitoring Pilot project – PhaseII (IND-II), prepared by Sunnyvale and EOA, Inc, September 2000.*

[21] All work was done consistent with the direction contained in the 1997 URMP and fulfilled the goals of the SCVURPPP. All future work on this item is being conducted consistent with the SCVURPPP permit conditions associated with fulfilling the Copper and Nickel Action Plans (CAP and NAP). The status of the CAP and NAP actions is reported in SCVURPPP Annual Work Plans and Annual Fiscal Year Reports.

where necessary. The local programs have been developed consistent with the model to insure that Santa Clara Valley industries are minimizing the potential for pollutants to enter site runoff.

The model Performance Standard and supporting documents provide for:

- Inspections of industries which have filed a Notice of Intent (NOI) to be covered under the SWRCB statewide NPDES permit for stormwater discharges associated with industrial activities
- Investigation of other facilities that are identified within selected Standard Industrial Classification (SIC) codes
- Inspections of selected commercial facilities
- Distribution of information on industrial/commercial Best Management Practices
- Action, under local authority, on all violations of local municipal ordinances
- Referral to the Regional Board of any significant problems which cannot be addressed promptly and fully under local authority

Co-permittees with commercial or industrial facilities have prepared URMPs that include a local strategy to implement the model Performance Standard, or their own equivalent Performance Standard that includes the same elements.

The Co-permittees have conducted initial inspections of automobile dismantlers (SIC 5015), other recycling industries (SIC 5093), stone, clay and concrete product manufacturers (SIC 3200 series) and trucking facilities that repair, maintain or wash vehicles (SIC 4100 and 4200 series). The Co-permittees conduct follow-up inspections as necessary and as defined in their URMPs and work plans.

The Co-permittees have also inspected all commercial facilities that could potentially discharge significant quantities of pollutants to runoff. This includes vehicle service and food service facilities, other commercial

facilities that are permitted to discharge to municipal sewers, and those with "zero-discharge" sewer permits. Any complaints or referrals regarding potential discharges from commercial facilities receive a prompt response and follow-up inspection.

All industrial and commercial inspections include a thorough review of indoor activities (e.g. disposal of wash water, control of residues, spills and leaks), outdoor activities (e.g. maintenance, repair and cleaning of vehicles and equipment; storage, handling and disposal of wastes; power washing of buildings and pavements) and management of equipment and processes (e.g. sumps, air scrubbers, filter backwash, dumpsters, and cooling towers). The Co-permittees use the Program's facility inspection checklist or their own checklist that contains the same information.

Industries that have filed an NOI will be inspected at least once every three years. Those industries that municipal inspectors determine to be potentially significant contributors to urban runoff pollution will be inspected annually.

The Co-permittee URMPs Contain Agency-Specific Strategies for Controlling Industrial/Commercial Discharges. Each Co-permittee has developed a URMP that describes its agency-specific local strategy and includes tailored Performance Standards, BMPs and SOPs. The individual Co-permittee URMPs are contained in Chapters 5-16 and are summarized in Appendix C.

The Program Pursues Joint Activities that Assist the Co-permittees to Reduce Pollutants from Industrial and Commercial Sources to MEP. The Management Committee will continue to sponsor periodic meetings where the Co-permittees' industrial inspectors can exchange information and ideas about inspections, outreach to dischargers, and enforcement. Staff responsible for public information and participation also attends these meetings, which allow opportunity to share perspectives and ideas that can lead to better integration and coordination of the Program.

The Program will also continue to:

- Obtain data on NOI filers from the SWRCB and distribute it to the Co-permittees
- Supply storm drain stencils to Co-permittees, who then provide them to businesses to stencil storm drain inlets on their premises
- Answer industry's questions about BMPs and other stormwater issues through the Program's toll-free telephone hotline
- Distribute materials and make presentations to educate industries and other interested parties
- Facilitate Co-permittee ad-hoc task groups to work on projects related to this Program element
- Coordinate dissemination of information and technical advice from regional, statewide and national sources

The Program Pursues Continuous Improvement of Efforts to Reduce Stormwater Pollutants from Industrial/Commercial Sources. One measure of the success of the Co-permittees' IND efforts is the high level of compliance found during routine inspections. Many, if not most, Santa Clara Valley industries and businesses are aware of the need to minimize the potential for pollutants to enter runoff from their facilities, and have implemented best management practices accordingly.

Continuous improvement of Co-permittee programs will be pursued through:

- Annual local program evaluation by each Co-permittee;
- Regular participation, by Program and Co-permittee staff, in regional and statewide pollution-prevention forums, conferences and other information-sharing events; and
- Ongoing Program-wide information-sharing meetings where local industrial/commercial inspection programs are discussed.

IND Activities are Documented in Annual Reports. The Program's annual report will document the Co-permittees' implementation of each specific item in the Performance Standards. Since October 2001[22], the Program Manager has assisted each Co-Permittee (on an individual basis) with implementation of an enhanced reporting strategy. The effort has been very successful in demonstrating the full extent of the Co-permittees' efforts in a consistent Program-wide manner. This allows for clear prioritization of related future work including enforcement, where necessary.

The Co-permittees will annually review and update their URMP, as needed. This will include changes to methods, protocols, and policies that apply to inspection and enforcement at commercial/industrial facilities.

4D PUBLIC INFORMATION AND PARTICIPATION

The goals of the Program's Public Information and Participation (PIP) element are to:

- Change specific behaviors which adversely affect water quality
- Increase the understanding and appreciation of streams and the Bay, leading to a change in values

In FY 1999-2000, the Program developed a Watershed Education and Outreach (WEO) Strategy for directing future outreach. In FY 2000-2001, using the goals and objectives described in the 1999 WEO Strategy, the Program began implementing the Watershed Watch Campaign. An evaluation of the Watershed Watch Campaign (WWC) was conducted in September 2003[23]. The Program's WEO/PIP AHTG used the

[22]The SCVURPPP permit Provision C.6i and ii required enhanced reporting. Consistent with the permit requirements, SCVURPPP developed a Program-wide strategy to comply with the enhanced reporting requirements (September 7, 2001). The overall goal of the strategy has been to demonstrate consistency on a Program-wide basis and compliance with the permit. SCVURPPP intends to incorporate the strategy into updated performance standards.

[23] Watershed Watch Campaign Evaluation, Evans/McDonough Company, November 2003

recommendations of this evaluation to revise the 1999 WEO Strategy and developed the *SCVURPPP Watershed Education and Outreach Strategy, June 2004*. The WEO Strategy, June 2004 contains a series of outreach goals and measurable objectives that will be used to direct future outreach conducted through the WWC. Meeting Strategy objectives will depend on available outreach resources each year. Depending on available outreach resources, the goals and objectives of the Strategy may be modified.

The outreach goals described in the June 2004 Strategy are:

Short-term Goals

- Change behaviors that negatively impact the watershed
- Encourage behaviors that protect, preserve, and restore the watershed
- Inform audiences that indoor and outdoor daily activities impact our watershed
- Deliver messages to students designed to encourage personal responsibility and actions that benefit the watershed.

Long-term Goals

- Build resident awareness of watershed issues and support for sound watershed decision-making.
- Build business support of sound watershed management, principals and approaches and encourage behaviors that protect, preserve and restore the watershed.
- In ten years, high school students will graduate with the understanding that personal choices affect the watershed.
- In ten years, high school students will make educated choices about behaviors that benefit the watershed.
- Build community leader and decision-makers awareness of watershed issues.

In addition, the Program will continue its involvement in the BASMAA PIP Subcommittee. At the direction of the Program's Management Committee, BASMAA PIP ideas and projects will be integrated into the Program's outreach.

The Program's PIP activities are generally divided into four general categories:

- General Outreach
- Targeted Outreach
- Education
- Citizen Participation

The Program conducts outreach efforts on behalf of the Co-Permittees that are considered to be more cost-effective to conduct at the countywide level. In addition to activities performed through the Program, each Co-permittee implements PIP activities in their own jurisdiction. In their local PIP activities, the Co-permittees make use of information, strategies and materials developed by the Program. Implementation of Co-permittee PIP activities is discussed in Chapters 5-16. The Program's outreach activities do not duplicate Co-permittee activities, but aim to complement and enhance their outreach efforts.

Public Information and Participation Surveys. The Program conducts public opinion surveys to track the effectiveness of its PIP Program. In April 1996, the Program conducted a telephone survey of Santa Clara County residents regarding their awareness of various issues related to urban runoff.[24] The recommendations from this survey were used to identify key messages and direct the Program's PIP efforts. In 1999, the Program conducted a follow-up telephone survey to track the effectiveness of outreach. As

[24] Fairbank, Maslin, Maullin and Associates (1996). *Santa Clara Valley Nonpoint Pollution Control Program Public Opinion Survey*.

described earlier, the recommendations of this survey[25] were used to develop the 1999 Watershed Education and Outreach Strategy and the Watershed Watch Campaign.

To evaluate the effectiveness of the Watershed Watch Campaign, the Program conducted an evaluation in September 2003. This evaluation included a telephone survey of Santa Clara Valley residents, two focus groups and feedback interviews with Watershed Watch partners.

The key findings of the three surveys are:

- Compared to 1999, awareness of the term "watershed" has increased significantly, with 46 percent of respondents having ever seen or heard about watersheds. This is an increase of 19 points from the 1999 results. Of those who have heard something about watersheds, 74 percent (34 percent of total) can mention something specific.

- 73 percent of Basin residents attempt to define a watershed, although few are able to accurately describe it in their own words

- Nearly half (44 percent) mention oil/grease put into the storm drain as the main pollutants affecting Bay water quality, and nearly everyone can name some type of pollutant.

- Awareness of the storm drain issue has not increased. On testing storm drain knowledge more people fall in the "knowledgeable" category in 2003 (54 percent) as compared to 1999 (35 percent) or 1996 (44 percent). However, the percentage of people who "definitely" or "probably" think that substances flowing through the storm drain system are treated has increased (56 percent in 2003 compared to 41 percent in 1999).

- The awareness that it is private residents and not businesses that contribute to storm water pollution has increased.

[25] SCVURPPP 1999 Public Opinion Survey, September 1999

- There has been a decrease in the percentage of residents taking selected water pollution prevention actions.

The main recommendations from the evaluation are:

- The Campaign should continue with its current media advertising with a greater focus on specific pollution prevention actions that residents can take.

- More efforts should be made to build awareness of existing water quality problems of our creeks and the Bay

- Target groups should be divided into short-term and long-term audiences. The key difference between these audiences is their level of awareness of watershed and pollution prevention issues. Short-term audiences have a higher awareness of the watershed concept and take some preventive actions to preserve the watershed. Long-term audiences have very low awareness and messages for them should include building awareness of water quality problems, education about watersheds and specific actions they can take to prevent pollution.

General Outreach. This is a joint activity, carried out through the Watershed Watch Campaign. Changes to Campaign messages and strategies will be made based on the WEO Strategy, June 2004. Each year, messages will be evaluated and may be added to or modified as necessary. Efforts will be made to ensure that these messages are consistent with regional messages on the same subjects and cover TMDL pollutant outreach requirements where possible.

The audience, key messages and communication tools will be determined each year and discussed in the annual work plan. Criteria for determining the campaign message and audience may include:

- Results of area-wide opinion and awareness surveys

- Co-permittee feedback and rankings

- Specific pollutant or behavior problems
- Related campaigns taking place regionally or area-wide
- Results of previous year's campaign
- Input from SCBWMI stakeholders

Outreach mechanisms can include:

- Television, radio, print or outdoor advertising
- Media relations
- Direct mail
- Community events
- Brochures or other printed materials
- In-store or point-of-sale materials
- Joint campaigns with related organizations
- Partnerships with community and business organizations

The effectiveness of the general outreach campaign will be evaluated in each annual report. Following are some criteria for judging effectiveness

- Comparison to goals established in WEO strategy
- Feedback from co-permitttees and other audiences
- Number or nature of calls generated to the Program's "800" number and the Watershed Watch hotline.
- Visits on the Watershed Watch web site
- Responses from focus groups

- Media coverage and media inquiries
- Area-wide public opinion surveys

The Program will continue to participate in cost-effective regional General Outreach efforts, such as the BASMAA Regional Advertising Campaign, when these efforts support the Program's goals and objectives.

Targeted Outreach. This includes activities carried out by the Program at the request of the WEO/PIP Ad Hoc Task Group, as well as agency-specific efforts. The approach taken by each Co-permittee is described in Chapters 5-16.

Targeted outreach delivers specific pollution-prevention messages to those who may be in a position to control specific sources of pollution and those who might not be reached by general outreach efforts. Specific needs are usually identified through work on the Program's IND, ICID, NDC and PAA elements, and aim to change specific behaviors that can adversely affect water quality. Typical methods include:

- BMP and guidance manuals, brochures, posters and other print materials
- Support for employee training
- Informational videos or slide shows
- Joint campaigns or projects with related organizations

Some targeted outreach methods described within other sections of this URMP are cross-referenced in Table 4.

Table 4
Targeted Outreach Incorporated in Other Program Elements

Section		Co-permittee commitments	Program commitments
4B	Illicit Connection and Illegal Dumping Elimination	A list of materials that will be used to educate and inform individuals who are engaged in activities… A protocol for contacting, educating and assisting individuals and businesses …	Supply storm drain stencils …distribute literature … answer questions over a toll-free telephone hotline …
4C	Industrial/ Commercial Discharger Control	Distribution of information on industrial/commercial Best Management Practices…	Develop and provide materials to Co-Permittees and make presentations to educate industries … Coordinate dissemination of information and technical advice …
4E	Public Agency Activities	Annual staff training	Organize training workshops focused on BMP implementation
4F	New Development and Construction	Provide construction BMP information to contractors … developers receive information and guidance on site design, source control, and treatment BMPs early in the application process	Provide information on BMPs (e.g., the Program's C.3. Stormwater Handbook), provide fact sheets for Co-permittee use, and sponsor information-sharing workshops.

The Program also conducts outreach on control of specific pollutants, such as pesticides, mercury, copper, and sediments to comply with certain permit provisions and TMDL requirements. Past and continuing activities and products are described in Table 5.

Table 5 – Outreach activities related to control of specific pollutants

Pollutant of Concern[1]	Past and Continuing Activities	Existing Program PI/P Materials and Programs
Diazinon and pesticides in general	Watershed Education & Outreach Campaign (one of four focus topics), IPM Store Partnership Program (regional and local), Pesticide User Outreach Activities, Annual Workshop potential topic, Distribution of restaurant brochure "Don't Set a Table for Pests" through County Health Inspectors.	"Backyard Bugs", "Pests Bugging You", "Grow It Guide", "When Ants Invade" Self-Mailer, "Landscaping, Gardening and Pool Maintenance" tri-fold, "Don't Set a Table for Pests", IPM Store Partnership Program Fact Sheets, "Control It", HHW programs, BASMAA Media Relations Campaign topic
Sediment	BASMAA Media Relations Campaign (potential topic), Outreach to developers via RWQCB Construction Site Management Workshops.	Construction BMP Tri-folds in English, Spanish and Vietnamese, "Blueprint for a Clean Bay" (revised 1-04), Construction Site Management workshops, Dewatering Brochure
Mercury	Watershed Education and Outreach Campaign (one of four focus topics), BASMAA Media Relations Campaign topic, Mercury P2 Outreach (Residential and business fluorescent light recycling)	"Spare the Air and Water Too" campaign press release and public service announcements, bill stuffers, Program and local co-permittee fact sheets (e.g., Palo Alto and Sunnyvale)
Nickel	See sediment and mercury projects	See sediment and mercury projects
Trash	BASMAA media relations campaign topic, BASMAA regional Ad Campaign topic, Watershed Education and Outreach Campaign (one of four focus topics)	"The Bay Begins at Your Front Door" brochure, Watershed Watch magnets, Watershed Watch Kit brochure, Watershed Watch web site.

Annual evaluation of targeted outreach may be based on:

- Comparison to communication goals in the WEO Strategy and pollutant-specific outreach plans
- Focus groups
- Feedback from the target audience
- Feedback from Co-permittees, inspectors, and other staff involved in delivering the message
- Observed changes in behavior
- Trends in observed pollution problems
- Feedback from related organizations

Education. The Program works to increase understanding and awareness (with the long-term goal of increasing watershed awareness) by delivering watershed stewardship messages through educational institutions.

The Program will focus on providing support and materials directly to teachers or existing education programs. Tasks may involve:

- Creating or purchasing materials such as curriculum, in-class models, activities, field trip programs or others
- Distributing materials directly to educational institutions or through Co-permittees and other institutions with in-school programs
- Participating in education fairs
- Partnering with related organizations
- Funding educational assemblies at schools
- Contract or grants programs for area teachers

Education programs will be evaluated and selected annually, based on:

- Analysis of previous year's results
- Input from Co-permittees and teachers
- Priorities set by the Management Committee
- Educators' assessments
- Estimates of the number of teachers or students reached
- Student or teacher feedback
- Feedback from related programs

Citizen Participation. Citizen participation programs are intended to encourage the active involvement of the public in preventing urban runoff pollution, and increase appreciation of streams and the Bay.

Area-wide citizen participation programs may include:

- Volunteer creek/shoreline clean-up events such as Coastal Clean-up Day
- Funding community groups and other organizations for citizen participation projects
- Partnering with related organizations

Citizen participation activities may be evaluated and refined based on:

- Number of participants
- Feedback from participants
- Amount of trash removed, miles of creek cleaned, etc.
- Media coverage generated
- Feedback from co-sponsoring organizations

The Program will sponsor meetings (at least annually) to coordinate local PIP activities and to help those Co-permittees with less-active PIP programs adopt materials and techniques used by other Co-permittees. Regional Board staff and interested parties often participate in these meetings and assist in setting priorities for the next fiscal year.

4E PUBLIC AGENCY ACTIVITIES

As is described in the Metals Control Measures Plan[26], a large portion of the copper load in runoff originates from brake pads containing copper. Significant amounts of nickel and mercury are discharged with vehicle exhaust and from stationary air pollution sources. Once these pollutants are discharged to the urban environment, there is little that can be done to prevent them from being dissolved in runoff from roadways and roofs, or attached to minute suspended particles transported into creeks, wetlands and the Bay.

However, results from street sweeping studies[27] suggest that removal of copper-laden dust from roadways and other paved surfaces is intermittent. Prevailing winds and vehicle wakes move dust from place to place; dust settles in quiescent areas only to get blown about again. Dirt accumulates rapidly on the street surface immediately following a rain or sweeping, but the rate of accumulation decreases over time. If this concept is correct, the proportion of total fine particulates removed by street sweeping is highly

[25] In response to the earlier SCVURPPP MCMP study, outreach efforts to manufacturers of brake pad friction materials led to a unique partnership effort among industry representatives, regulators, storm water management agencies and environmental groups called the Brake Pad Partnership (BPP). Since 1996, the BPP has developed a consensus process through annual stakeholder meetings and a working Steering Committee, supported in part by BASMAA contributions. To understand the potential water quality impacts that may arise from brake pad wear debris, the BPP has developed a controlled method of producing wear debris and sponsored studies to characterize the copper released during the wear process. The BPP is also tracking trends in the copper content of brakes used on domestically produced passenger cars. In 2001, the BPP developed an Action Plan to link these initial projects with environmental monitoring and fate and transport modeling to assess the effects of copper (from brake pads) on San Francisco Bay. Through its own efforts and BASMAA has supported a stormwater representative on the BPP Steering Committee and provides comment on stormwater-related issues raised during BPP meetings and conference calls.

[27] Alameda County Clean Water Program (1994). *Street Sweeping and Storm Inlet Modification Literature Review*. Woodward-Clyde Consultants.

variable and difficult to control. Therefore, the Program will emphasize efforts to control sources of metals (as described in the MCMP), and will continue to review and evaluate street sweeping activities.

Street sweeping and storm drain cleaning intercept an unquantified proportion of brake pad dust and other metal-laden particles before they reach the storm drain system. Other Public Agency Activities, including litter control, erosion control, leaf collection, waste recycling, and cleaning of storm water detention basins, also intercept some urban pollutants.

The Public Agency Activities Model Performance Standards Are Designed to Achieve MEP.

Maintenance of Streets, Roads and Highways. The Co-permittees, together, own and operate a large proportion of the total public right-of-way within the watershed. However, most highways are maintained by Caltrans. The Santa Clara Valley Transportation Authority maintains bus stops, light rail stations and park-and-ride lots. Co-permittees will coordinate with these agencies to implement appropriate controls, to the maximum extent practicable, for all facilities.

The Management Committee has prepared a model Performance Standard for Public Streets, Roads and Highways that call for each municipal agency (and its contractors, if any) to implement appropriate BMPs for these activities.

The model Performance Standard for Public Streets, Roads and Highways, and its supporting documents, cover the following operation and maintenance activities:

- Street/Road/Highway Sweeping and Cleaning (timing, frequency, equipment, disposal of debris)
- Street/Road/Highway Operation and Maintenance (asphalt/concrete removal; patching, resurfacing and surface sealing; signing and striping, concrete work, equipment cleaning, maintenance and storage)
- Sidewalk/Plaza Maintenance

- Bridge and Structure Maintenance (painting and paint removal; graffiti removal)
- Median and Road Embankment Maintenance (erosion controls, slide and embankment repair; irrigation practices and vegetation controls)
- Litter Control
- Spill Control

The model Performance Standard includes provisions for Co-permittee:

- Preparation of a Work Plan describing implementation of street/road/ highway operation and maintenance BMPs
- Ensuring that contractors also implement the municipality's BMPs as appropriate
- Training staff on the use of BMPs, as needed
- Informing other parties involved in similar activities that they are expected to implement BMPs, as well as eliminate illicit discharges
- Review and evaluation of BMP effectiveness

The Program has prepared an extensive set of model BMPs for Co-permittees to use in implementing their Performance Standards. Co-permittees may modify these BMPs to suit local conditions. The Co-permittee URMPs describe the applicability of each model BMP to local conditions. Where model BMPs have been tailored to local conditions, the Co-permittee has justified why the modifications are necessary and effective.

Storm Drain System Operation and Maintenance. Supporting documents for the Program's model Storm Drain System Operation and Maintenance Performance Standard contain a 2-tiered standard for cleaning frequency. Co-permittees may select one or the other tier, based on local conditions. Storm Drain System O&M Tier 1 requires that Co-permittees inspect, and clean as needed:

- All inlets/catch basins at least every other year
- All inlets/catch basins in known problem areas at least once a year
- All storm drain lines in known problem areas at least once a year
- Sumps, pump station debris racks, detention basins, drainage ditches and debris basins throughout the year

In addition, Co-permittees target known problem areas prior to the rainy season and clean areas affected by emergency response (i.e. dumping or spills) as needed.

Storm Drain System O&M Tier 2 requires slightly higher cleaning frequencies.

The model Performance Standard states general best management practices for dewatering and storing accumulated debris from cleaning activities. The Performance Standard also provides for:

- Devising a referral process for when illegal discharges are found
- Annual staff training
- Inclusion of storm water pollution prevention in contracts for storm drain operation and maintenance

Water Utilities. Co-permittees that operate and maintain municipal water systems have completed development of the Performance Standard for Water Utility Operation and Maintenance. The Performance Standard components include an inventory of discharges, development and implementation of Water Utility Pollution Prevention Plans (WUPPPs), evaluation process for activities, and staff training.

Each Co-permittee that operates a water utility has prepared a strategy contained in their respective URMPs for implementing the model Performance Standard.

Public Facilities. As described in the Program's model Performance Standard for Public Streets, Roads and Highways Operation and Maintenance, each Co-permittee implements BMPs for maintenance of sidewalks, plazas, bridges and structures, in addition to streets, roads and highways. The Co-permittees also require their contractors, and encourage other public agencies, to implement the same BMPs.

Each Co-permittee that operates a municipal corporation yard has prepared a Storm Water Pollution Prevention Plan (SWPPP) for that facility. The Co-permittees will continue to implement the SWPPPs and update them with additional control measures to improve effectiveness.

As suits local conditions, the Co-permittees have also developed BMPs and standard operating procedures for managing stormwater runoff from golf courses, hospitals and other public facilities. The Co-permittees will continue to implement current BMPs and operating procedures. As new information is available, or as additional potential sources within public facilities are identified, the Program and Co-permittees will respond by creating new operating procedures to reduce pollutant discharges to the maximum extent practicable. For example, Co-permittees have changed their operating procedures for managing algae in ponds and fountains to eliminate the use of copper algicides.

Rural Public Works Maintenance and Support. During FY 01-02, the Program formed an AHTG and worked with Regional Board staff to develop a new performance standard for rural public works activities. The goal of the Rural Public Works Maintenance and Support Performance Standard is to minimize the water quality impacts resulting from public works maintenance and support activities in rural areas. This performance standard helps Co-permittees whose jurisdictions include rural areas to ensure that required control measures are implemented while performing maintenance activities adjacent to streams to prevent the degradation of stream functions. The Performance Standard was approved by the Management Committee on December 20, 2002 and accepted by the Regional Board on February 18, 2003.

The Co-permittee URMPs Contain Agency-Specific Strategies for Pursuing Public Agency Activities to Control Pollutants to MEP. Each Co-permittee has developed a URMP that describes its agency-specific local strategy and includes tailored Performance Standards, BMPs and SOPs. The individual Co-permittee URMPs are contained in Chapters 5-16 and are summarized in Appendix C.

The Program Pursues Continuous Improvement in Techniques and Procedures for Public Agency Activities. As noted at the beginning of this section, treatment controls (e.g. street sweeping and storm drain cleaning) can remove only a limited portion of copper-laden brake-pad dust and other fine materials that are discharged to streets and drains.

However, the Co-permittees seek to maximize the proportion removed by optimizing, within the constraints of budget and personnel, the frequency, techniques and equipment used. This optimization will continue through periodic review of results and updating of BMPs and SOPs. Improvements will be documented in the annual report.

Public Agency Activities are Documented in Annual Reports. The Co-permittees' annual reports will document their implementation of each specific item in the Performance Standards. In addition, each Co-permittee will update their associated Performance Standard, as needed, within their URMP.

Mobile Surface Cleaner Certification Program.

In 1998, BASMAA initiated a certification program for mobile surface cleaning businesses. This program included training mobile cleaners on appropriate BMPs to protect water quality when conducting outdoor cleaning activities. BASMAA developed an educational brochure containing descriptions of the BMPs and began to maintain a list of certified mobile cleaners (those who had completed the training). The certifications are good for two years.

In spring of 2000, BASMAA developed additional training materials (including a training video). Six training workshops were conducted in June

and July 2000, with one hosted by the Program. A total of 86 Bay Area surface cleaners were trained. Around this same time, the BASMAA Board determined that providing mobile surface cleaning training should be shifted to the individual stormwater programs or municipalities. In addition, BASMAA conducted "train the trainer" workshops and provided training materials for trainers designated by the stormwater programs. Within the Program's jurisdiction, the three POTW cities—San Jose, Sunnyvale and Palo Alto—assumed the task of providing surface cleaner training on an as needed basis.

Prior to shifting the training to the stormwater programs, BASMAA certified and/or recertified 117 Bay Area surface cleaners in the Spring of 2002. As the 2002 training certificates were coming due, the Program sponsored three standardized Mobile Surface Cleaner Training and Certification workshops on December 17, 2003, February 11, 2004 and March 24, 2004. The workshops were hosted by one of the three POTW cities (San Jose, Sunnyvale and Palo Alto). The three workshops attracted a total of 137 participants, of which 84 were mobile surface cleaners. The list of 84 mobile surface cleaners was distributed to the Management Committee and BASMAA Executive Director (by electronic mail) on March 31, 2004

Currently, BASMAA is considering the development of a web-based training certification Program for Mobile Surface Cleaners. BASMAA's approach will be coordinated with the Program's approach and may eliminate the need for the Program's standardized training approach. In addition, training will be provided by designated staff from each of the three POTW cities on an as-needed basis. Any modifications to the overall training approach, as well as the number of cleaners trained per year will be provided within the Program's Annual Report submitted each September 15.

4F NEW & RE-DEVELOPMENT AND CONSTRUCTION

On October 17, 2001, the Regional Board adopted Order No. 01-119 which amended SCVURPPP's Permit Provision C.3 (New and Redevelopment Requirements) to contain significant new requirements. These requirements include:

- Numeric design standards for sizing stormwater treatment controls;
- Limits on increases in peak stormwater discharge rates and/or durations from new or redevelopment sites that may result in increased potential for erosion or other adverse impacts in creeks;
- Requirements for operation and maintenance of stormwater controls;
- Requirements for site design and source control measures;
- Definition of a minimum project size, based on amount of impervious surface created, for which the design standards, control measures, peak flow limitations, and maintenance requirements apply;
- Requirements for changes to General Plans and environmental review processes to provide authority to implement the requirements;
- Reporting requirements; and
- Schedule for implementation.

On October 15, 2003, Co-permittees were required to begin implementing the C.3 requirements for Group 1 projects, i.e., those projects that included creation or replacement of one acre or more of impervious surface.

Permit Provision C.3 also required the Program and Co-permittees to submit specific work plans for: 1) modifications to the development project review process (C.3.b.); 2) implementation of Group 1 requirements (C.3.c.); and 3) site design standards review and revision (C.3.j.). In response, the Program and Co-permittees submitted work plans for implementing all C.3

requirements to the Regional Board on March 1, 2002 (as part of the Program's FY 02-03 Work Plan, Volume II).

Since the October 17, 2001 adoption by the Regional Board of Order 01-119, there have been several changes to the requirements of Provision C.3. The first change, authorized by the Regional Board Executive Officer, was an extension of three of the permit deadlines, as shown below, in order to be somewhat more consistent with other Bay Area storm water permits adopted subsequent to SCVURPPP Order 01-119[28]. This decision extended the completion dates for corresponding tasks in the C3 Work Plan Guidance.

Provision	Activity	Original Deadline	New Deadline
C.3.c.i.	Require stormwater treatment BMPs at Group 1 Projects	July 15, 2003	October 15, 2003
C.3.c.ii.	Require stormwater treatment BMPs at Group 2 Projects in addition to Group 1 Projects	October 15, 2004	April 15, 2005
C.3.f.	Submit HMP for Regional Board approval	October 15, 2003	January 15, 2004

The second change relates to the definition of Group 2 projects. The Program requested Regional Board approval of an Alternative Group 2 Project Definition, as allowed under Provision C.3.c.iii. of the Program's NPDES Permit (Order No. 01-119). In a letter dated September 22, 2003 (Attachment 7-1), the Program proposed an Alternative Group 2 Project Definition that would make its Provision C.3 project size requirements more consistent with the other Bay Area stormwater permit requirements. At the Regional Board's October 15, 2003, meeting, the Board authorized the Executive Officer to approve the Program's proposal. Approval of the proposal did not change the implementation dates for Provision C.3 beyond the changes described in the table above.

The Program's Planning Procedures and Construction Inspection Model Performance Standards Are Designed to Reduce, to MEP, Construction

[28] Letter to Beau Goldie, SCVURPPP Management Committee Chair, from Loretta Barsamian, Executive Officer, San Francisco Bay Regional Water Quality Control Board, re: Extension of Specified Deadlines in Order 01-119, May 12, 2003.

and Post-Construction Impacts on Urban Runoff. The Program's 1995 NPDES permit (Order No. 95-180) required the Program to develop and implement performance standards for Construction Inspection and for Planning Procedures. The model performance standards are provided in Appendix A. The Construction Inspection Performance Standard was updated in February 2001 and January 2002 to respond to Regional Board staff comments as part of a continuous improvement process. The Planning Procedures Performance Standard was revised in June 2003 and December 2003 to reflect the 2001 NPDES permit requirements.

Construction-Phase Controls. The model Performance Standard for Construction Inspection, and its supporting documents, provide that construction-site inspection programs should ensure that:

- Contractors properly store, use and dispose of construction materials, chemicals and wastes and prevent illicit discharges to storm drains and watercourses;
- Erosion and sediment control measures, where needed, are implemented and maintained;
- The frequency of inspections is appropriate to the size of the project and its potential impacts on water quality;
- All sites requiring erosion and sediment control plans are inspected prior to the beginning of the annual wet season;
- Construction sites with inadequate erosion and sediment control measures are given verbal or written notice, followed by agency enforcement procedures if necessary;
- Construction inspection staff receives training at least annually;
- The local agency provides construction BMP and General Permit information to contractors.

Each Co-permittee has been implementing this model Performance Standard since 1997. The individual Co-permittee URMPs document the Co-

permittee's legal authority to implement the Performance Standard and include specific BMPs and control measures, and a description of the local inspection and enforcement program.

Post-Construction Controls. The Program's model Performance Standard for Planning Procedures provides that:

- Co-permittees have adequate legal authority to implement new development control measures as part of development plan review and approval;
- Developers receive information and guidance on site design and pollution-prevention BMPs early in the application process;
- CEQA documentation addresses urban runoff impacts over the life of the project, including cumulative impacts;
- Developers of all discretionary projects are encouraged to incorporate source control and site design measures that minimize stormwater pollutant discharges;
- Developers of projects above a certain size are required to mitigate storm water quality impacts through site design, source control, and stormwater treatment measures, and in some cases, flow duration and volume controls;
- Where applicable, developers demonstrate coverage under the statewide construction storm water permit;
- Municipalities require effective erosion/sediment control plans where project conditions warrant;
- Developers provide for operation and maintenance of structural controls, where such controls are required, and municipalities have a program to verify that this is done;
- Municipalities insure that their own capital improvement projects include measures to minimize pollutant discharges during and after construction;

- Municipalities provide staff training, at least annually.

Each municipality has prepared a plan in its URMP, including appropriate BMPs and standard operating procedures, for meeting this Performance Standard, and has been implementing the procedures since 1997.

The Program's Role is to Provide Up-to-Date Guidance on Implementation of the C.3. (New and Redevelopment) Requirements. Over the last three years, the Program has developed numerous guidance documents on various aspects of the C.3. requirements, including changes to development project review processes; CEQA guidelines; model conditions of approval; approach for selecting site design, source controls and treatment controls; treatment control sizing criteria and procedures; operation and maintenance of storm water controls; and data management and reporting. This guidance was recently compiled into a concise but comprehensive manual called the *C.3. Stormwater Handbook*. To date, three comprehensive workshops have been held on C.3 implementation and more are planned. In addition, the Program recently completed a manual called *Developments Protecting Water Quality – A Guidebook of Site Design Examples* (2004) providing numerous examples of developments located throughout Santa Clara Valley that have incorporated water-quality friendly designs.

The URMP Incorporates the Erosion Control Measures Described in the Copper/Nickel Action Plans. The Program's Copper and Nickel Action Plans (CAP/NAP) include tasks for erosion and sediment control[29] as a way to control sources of these metals to South San Francisco Bay.

The Co-permittees' plans to implement the Construction Inspection Performance Standards are described in their respective URMPs. The

[29] The actions contained in the CAP/NAP were derived from the following two activities contained in the SCVURPPP Metals Control Measures Plan regarding the reducing construction site erosion to the maximum extent practicable.

EROSION-1	Implement Performance Standards for Construction Inspection.
EROSION-2	Participate in development of a region-wide training and certification program for construction site inspectors.

Program will continue to work with the Regional Board, through the San Francisco Estuary Program, to implement use of a field handbook for erosion control, to conduct training workshops for construction site inspectors, and to assist municipalities in documenting inspection efforts.

The Co-permittee URMPs Contain Agency-Specific Strategies to Reduce, to MEP, Construction and Post-Construction Impacts on Urban Runoff. Each Co-permittee has developed a URMP that describes its agency-specific local strategy and includes tailored Performance Standards, BMPs and SOPs. The individual Co-permittee URMPs are contained in Chapters 5-16 and are summarized in Appendix C.

The Program Pursues Joint Activities That Assist the Co-permittees to Implement Construction and New Development Controls. Program staff will continue to contribute to regional policy development through the BASMAA New Development Committee, as well as with other regional programs and groups. Additional land use planning related tasks have been undertaken through participation in the Santa Clara Basin Watershed Management Initiative (SCBWMI) Land Use Subgroup. The Management Committee, where appropriate, will assist Co-permittees to review any future developments and to incorporate changes in annual Program work plans.

Site planning and design have advanced with BASMAA's publication of the design handbook, *Start at the Source (1999),* and the companion document *Using Site Design Techniques to Meet Development Standards for Stormwater Quality (2003)*. Through its participation in BASMAA, the Program helped fund these publications and the production of training videos on these topics.

The Program, in conjunction with the SCBWMI Land Use Subgroup, has completed two projects related to land use and development policy. During FY 02-03, Program staff completed the *Santa Clara Basin Municipal Development Policies Comparison Project* (April 2003), an effort to assist Co-permittees to review and improve their development policies (as they relate to Program goals and objectives and desirable watershed protection policies). Program staff developed a methodology, with assistance of the SCBWMI Land Use Subgroup, and completed assessments of municipal

policy, code, ordinance, and guidance documents for each Co-permittee. Through these reviews, Program staff has helped Co-permittees begin the process of identifying additional steps or development policies, ordinances, or other tools that could be improved to meet the C.3. provisions.

Also with the Land Use Subgroup, the Program hosted four dialogues during October through December 2003 to better understand the underlying issues that may lead to potential conflicts when incorporating better site designs. The objective was to assist Co-permittees in addressing these issues and conflicts as they work to meet the requirements of their stormwater NPDES permit provision C.3.j. The dialogues addressed street, building, parking, and landscape designs. In addition to providing a panel of experts, the dialogues stimulated avid participation from an audience consisting of municipal staff, developers, regulatory personnel and other stakeholders.

The site design dialogue series culminated in a workshop on January 29, 2004 titled "Overcoming Hurdles to Using Better Site Designs - Real World Experience Towards Resolving Conflicts", which focused on example development projects where better site designs have been successfully implemented and hurdles have been overcome.

The Program Pursues Continuous Improvement of Methods for Controlling Runoff Pollution Associated with Construction and New Development. The Program and Co-permittees intend that implementation of the Performance Standard for Construction Inspection, together with a regional training program, will substantially improve municipalities' ability to enforce implementation of temporary erosion control measures, and insure timely completion of permanent erosion control measures. As experience is gained with the implementation of the C.3 requirements, the Program will continuously improve its guidance to municipalities and provide opportunities for sharing of experience and issues through its C.3. Provision Oversight Ad Hoc Task Group.

The Program's Annual Reports Document Efforts to Reduce Storm Water Pollution from Construction and New Development. The Program's annual reports document the Co-permittees' implementation of each specific item in the Performance Standards. Co-permittees will report

this information annually in the format described in the Performance Standards.

4G HYDROMODIFICATION MANAGEMENT PLAN

As the total area of impervious surfaces increases in previously undeveloped areas, infiltration of rainfall decreases, causing more water to run off the surface as overland flow at a faster rate. The increase in the volume of runoff, the magnitude of peak flows, and the length of time that erosive flows occur ultimately intensify sediment transport, causing changes in sediment transport characteristics and the hydraulic geometry (width, depth, slope) of channels. The larger peak flows and volumes and the intensified erosion of streams impair the beneficial uses of the stream channels.

The Regional Water Quality Control Board, San Francisco Bay Region, as part of the Bay Area National Pollutant Discharge Elimination System (NPDES) storm water permits, is requiring water programs to develop and implement hydromodification management plans (HMPs) and to implement associated management measures.

Provision C.3.f of the NPDES permit, *Limitation on Increase of Peak Stormwater Runoff Discharge Rates* describes the HMP requirements. Under Provision C.3.f, the Co-permittees are required to develop an HMP to describe how they plan to manage increases in peak runoff flow and increased runoff volume in urban runoff from certain new development and significant redevelopment projects in order to protect streams from increased potential for erosion or other adverse impacts.

When required and where feasible, runoff controls[30] must be designed so that "post-project runoff shall not exceed estimated pre-project rates and/or durations" from the development site (Provision C.3.f.i). Runoff controls are

[30] The term runoff controls or flow controls refers to Best Management Practices (BMPs) that reduce impacts of runoff volume, rate, and duration. Runoff controls that remove pollutants from storm water will be referred to as treatment controls.

not required for projects that discharge storm water runoff where the potential for erosion, or other impacts to beneficial uses, is minimal. Such situations may include: discharges into creeks that are concrete-lined or significantly hardened (e.g., with rip-rap, sack concrete, etc.) downstream to their outfall in San Francisco Bay; underground storm drains discharging to the Bay; and construction of infill projects in highly developed watersheds, where the potential for single-project and/or cumulative impacts is minimal (Provision C.3.f.ii).

Provisions C.3.f.vi.5 and C.3.f.vii of the permit allow hydromodification impacts to be addressed by using strategies other than on-site runoff controls, or in combination with on-site controls. These strategies may allow increases in peak flow and/or durations from a development site, subject to the implementation of specified best management practices (BMPs) and land use planning practices that will accommodate expected stream changes without harming beneficial uses (e.g., increases in the cross-sectional area of a stream channel). BMPs may also be regional projects that mitigate the impacts of more than one new development or redevelopment project.

Goals and Objectives. The goal of the SCVURPPP Hydromodification Management Plan is to protect the physical, chemical, and biological functions of stream systems in urbanizing areas. In order to meet this goal and the NPDES Permit requirements, the following project objectives have been defined:

1. Develop a watershed-based approach to address the impacts of hydromodification on the beneficial uses of streams.

2. Develop, test, and apply an assessment method to evaluate potential hydrograph changes and impacts to stream channels from proposed projects, and identify where such changes can cause increased erosion of creek beds and banks, silt pollutant generation, or other impacts to beneficial uses.

3. Develop design criteria, control measures, and guidance on management strategies to address hydromodification and identified impacts.

4. Develop guidance for Co-permittees to manage the impacts of hydromodification on streams through the implementation of an HMP.

5. Develop an approach for measuring the effectiveness of the runoff controls and management strategies, and continuously improving the HMP as needed.

Proposed Hydromodification Control Standard, Performance Criteria and Implementation Guidance. Hydromodification control standards will be used by local agencies to manage hydromodification impacts of development projects. The proposed hydromodification control standard, management objective, and performance criteria for new development and redevelopment projects covered by the HMP requirements of Permit Provision C.3.f are contained in SCVURPPP's public review draft entitled *Hydromodification Management Plan Report*, June 2004. Guidelines are provided that Co-permittees can use to identify project types and/or areas within the Santa Clara Basin that may be exempt from hydromodification controls under Permit Provision C.3.f.ii.

In addition, the HMP report includes guidelines to Co-permittees and the development community for implementing the SCVURPPP Hydromodification Management Plan in compliance with Permit Provision C.3.f. The guidelines cover:

- Implementation Options
- Land Use Planning Measures
- Incorporating HMP Requirements into Local Approval Processes
- Process for Evaluating Hydromodification Impacts and Requirements for Development Projects
- Opportunities for Watershed Master Planning for Hydromodification, Water Quality, and Flood Management
- Inspection and Maintenance Requirements

- Monitoring and Reporting Requirements
- Program Evaluation and Continuous Improvement

The proposed HMP is currently under review by the Regional Board staff, the public and several independent peer reviewers. It is anticipated that if comments are received in a timely basis, the public review document will be finalized in late October 2004.

4H MONITORING

From its inception in 1990 through 1995, SCVURPPP's monitoring activities focused on establishing baseline information through sampling and analysis of runoff from various land uses and ambient waters. A summary of the products produced as part of SCVURPPP's previous monitoring efforts is contained in the 1997 URMP. In addition to gathering baseline information, the Program's annual monitoring plans have also included assessments intended to enhance understanding of the sources and extent of urban runoff pollution, its effects, and methods for its control.

In August 1996[31] the Regional Water Quality Control Board (RWQCB) requested that the SCVURPPP redirect its monitoring resources and develop a new approach:

> *Specific monitoring activities that should be considered within the strategy include characterization of drainage areas (watershed monitoring) including land use characteristics (general, such as open, residential, commercial, or industrial areas, or specific sources) and consideration of physical and biological, as well as chemical indicators to assess the drainage areas. We strongly encourage you to use community-based (volunteer) monitoring as an inexpensive and effective means to conduct this type of monitoring. The strategy*

[31] Loretta K. Barsamian, Executive Officer. August 30, 1996 letter to Frank Maitski.

should also establish a mechanism or process for effective use of special or pilot studies by your program or those conducted by other programs.

Since 1997, the Program's emphasis has been on integrating urban runoff and watershed management. This emphasis continues to be a major condition of the urban runoff permit. The results of this integration effort include the Program's and individual Co-permittee assistance on: managing various subgroups of the WMI, preparing the abridged and unabridged Watershed Characteristics Report, conducting various projects related to the review of development policies, and the completion of the national Stormwater Environmental Indicators Demonstration Project. A more detailed discussion of these efforts is contained the Program's Annual Reports (i.e., see FY 97-98, 98-99, 99-00, 00-01, 01-02 and 02-03).

Multi-Year Receiving Waters Monitoring Plan. On March 1, 2002, the SCVURPPP submitted a Multi-Year Receiving Waters Monitoring Plan (Multi-Year Plan) that was prepared in compliance with monitoring requirements of the permit. The Multi-Year Plan presented the entire spectrum of SCVURPPP monitoring activities, both programmatic and environmental, outlined the SCVURPPP approach to monitoring, and presented the proposed surface water monitoring program for an eight-year period starting with Fiscal Year 02-03. In addition, the Multi-Year Plan described SCVURPPP's linkage to, and support for the Santa Clara Basin Watershed Management Initiative (WMI).

Since its approval, the SCVURPPP has fully implemented the Multi-Year Plan and conducted a variety of special studies. In particular, screening level/baseline water quality monitoring was conducted in receiving water bodies in FY 02-03 and 03-04, and the *Assessment of Watershed Assessment Methods Technical Memorandum,* dated July 31, 2003*,* recommended improvements to SCVURPPP's monitoring and assessment program. Lessons learned from data collected during the first two years of implementing the Multi-Year Plan along with an external evaluation of SCVURPPP's monitoring program in December 2003 by an EPA contractor

on behalf of the Regional Board led to development of a revised[32] Multi-Year Plan (2004 Multi-Year Plan, Appendix D, Attachment D-3) which was submitted to the Regional Board on March 1, 2004. Table 3.0 of the 2004 Multi-Year Plan illustrates SCVURPPP's proposed surface water monitoring program for eight years starting with FY 02-03 through FY 09-10. Table 3.0 contains the following information: watershed/stream monitoring location (prioritized based on WMI and SCVURPPP assessment priorities), monitoring type (chemical, biological, and physical data type) sampling frequency, monitoring rationale and lead agency. The information on data type utilizes a tiered monitoring approach discussed in Section 2.0 of the 2004 Multi-Year Plan, and includes the following monitoring categories: screening level, investigative, status and trends. The 2004 Multi-Year Plan was finalized on July 1, 2004.

The Multi-Year Plan is intended to be a "living" document, evolving along side other regional and State monitoring and assessment plans and strategies, including: the Regional Monitoring and Assessment Strategy (RMAS), Regional Monitoring Program (RMP) and Surface Water Ambient Monitoring Program (SWAMP). The Revised Multi-Year-Plan helps reach the goals and objectives that were set by the Program's Management Committee in 1996. These goals and objectives were incorporated into SCVURPPP's 1997 Urban Runoff Management Plan (URMP) and remain intact within the 2004 URMP. In particular, the monitoring program aids in reaching Goals 2 and 3.

To aid the SCVURPPP in reaching its primary goals, the following objectives, specific to SCVURPPP's monitoring program were developed:

- Develop a better understanding of the chemical, biological, and physical characteristics of water bodies and watersheds relevant to the Program, which will help

[32] The revisions presented in this Revised Multi-Year Receiving Waters Plan (Revised Multi-Year Plan) are minor and intended to: 1) more fully integrate the monitoring activities identified in the Multi-Year Plan with watershed assessments, and 2) allow for additional follow-up monitoring activities in order to better identify sources of pollutants or causes of impairment to Beneficial Uses. Additionally, the Revised Multi-Year Plan attempts to provide the SCVURPPP a framework for conducting watershed characterization, screening-level monitoring, watershed assessment, and investigative monitoring and management action implementation.

inform decisions about future management actions and help clarify and resolve storm water related issues within watersheds;

- Assess baseline water quality conditions in representative watersheds within Program boundaries to evaluate storm water impacts and help solve creek drainage basin-specific water quality problems;
- Assess whether specific pollutants of concern are found in storm water discharges and impact water quality in local water bodies and the San Francisco Bay;
- Evaluate the effectiveness of existing storm water pollution prevention and control Best Management Practices (BMPs) and recommend improvements; and,
- Evaluate overall Program effectiveness over time.

The above SCVURPPP specific objectives were designed to achieve the objectives contained in the Program's NPDES Permit. Further, the Multi-Year Plan has been developed to address the guidance contained in several RWQCB letters written to both the Program and members of the BASMAA Monitoring Committee.[33]

The Multi-Year Plan is intended to help the SCVURPPP: 1) plan and prioritize its watershed assessment and monitoring activities over the next six years, and 2) coordinate with other watershed assessment programs in the Bay area, including the WMI. SCVURPPP's watershed assessment and monitoring approach emphasizes characterizing watersheds and collecting

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[33] RWQCB letter from Tom Mumley to BASMAA Monitoring Committee entitled *"Urban Runoff Monitoring Needs/Recommendations"* dated February 2, 2001.

RWQCB letter from Loretta Barsamian to Adam Olivieri entitled *"FY2002-2003 Stormwater Municipal NPDES Program Priorities"* dated December 7, 2001.

The water quality monitoring comments in the RWQCB from Bruce Wolfe to Beau Goldie entitled *"Pesticide-Related Components of 2000/01 Annual Report"* postmarked December 28, 2001.

RWQCB letter from Loretta Barsamian to Beau Goldie entitled *"Request for revision of the Program's long-term receiving waters monitoring plan"* dated June 5, 2002.

data when and where appropriate, which will enable watershed assessments and focused studies to be conducted that will yield information necessary to implement effective and feasible management actions designed to reduce the impacts of urban runoff on beneficial uses.

The Multi-Year Plan is organized to describe both environmental and programmatic monitoring designed to meet previously stated goals and objectives as follows:

- Monitoring and Assessment Approach – presents SCVURPPP's approach to monitoring and assessment, including: a description of monitoring categories, monitoring and assessment process, annual project funding process, priorities for assisting the WMI, SCVURPPP monitoring priorities, and regional and SCVURPPP monitoring activities accomplished to-date.

- Watershed Monitoring and Assessment Activities - description of planned watershed monitoring and assessment activities, including: screening-level monitoring and watershed assessments.

- Pollutant of Concern Monitoring and Characterization Activities – provides a description of planned pollutant of concern monitoring and characterization, including local and regionally based activities.

- BMP and Performance Standard Monitoring – describes monitoring activities associated with measuring the effectiveness of implementing performance standards and control programs for POCs.

- Reporting and Quality Control Procedures - provides a description of the quality control and assurance (QA/QC) procedures and the reporting process the Program will develop and implement.

- Environmental Monitoring and Assessment Measures Summary Matrix- illustrates Environmental Monitoring and Assessment Measures (EMMs) that

are currently being implemented or are planned. EMMs are used to gauge the effects of urban runoff on the environment[34].

- Programmatic Monitoring Indicators Summary Matrix – illustrates Programmatic Monitoring Indicators (PMIs) that are currently being implemented or are planned. PMIs are used to gauge how well Performance Standards are being met and control measures are being implemented.

SCVURPPP's Monitoring and Assessment Approach. The SCVURPPP continues to embrace the watershed approach to direct its monitoring and assessment activities, and meet its goals and objectives. The watershed approach is a coordinating framework for environmental management that focuses efforts to address the highest priority problems within hydrologically defined geographic areas. The SCVURPPP will continue to define and address high priority issues through the implementation of activities that fall into two monitoring categories: programmatic monitoring and environmental monitoring and assessment.

The requirement to investigate, consider, and implement watershed management measures first appeared in the Program's 1995 NPDES permit and is also a requirement of the Program's current NPDES permit. As part of its application for the current permit, the Program developed a "Watersheds 2000 Vision" (December 1999) that outlines the principles and approaches that the Program and its Co-permittees will use to support better management of the Santa Clara Basin through the implementation of urban runoff control measures. The vision statement also defines the relationship between and the roles of the Program and the SCBWMI in this context.

The Program's approach for supporting watershed management and the SCBWMI is based on the following principles:

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[34] Because there are a variety of types of environmental monitoring that are available, it is useful to classify parameters that may be measured into two tiers; screening-level monitoring and assessments (i.e. Tier I) and investigative monitoring (i.e., Tier II). Screening level monitoring and assessments include more general measurements made at various sampling locations, providing an initial characterization of the physical, chemical, and biological integrity of a particular watershed/waterbody. Investigative monitoring or studies include more detailed measurements typically taken in a more defined area (e.g., stream reach).

- The goal of the Program and its Co-permittees is to maintain water quality and protect the beneficial uses of the waterbodies in the Santa Clara Basin through the implementation of control measures to the maximum extent practicable.

- Successful watershed management must be a community-wide, stakeholder-driven effort that includes regulatory agencies, the business community, environmental advocates, and local government.

- The Co-permittees recognize it can be difficult to separate many urban runoff "issues" from the general impacts of urbanization resulting from the cumulative effects of land development.

- The Co-permittees understand that municipal agency activities have the potential to impact water quality and beneficial uses; conversely such activities can create opportunities to improve water quality and enhance aquatic resources.

- The Program's activities pursuant to the NPDES permit assist Co-permittees and other local agencies to incorporate appropriate watershed management recommendations into their decision-making and specific watershed protection approaches into their day-to-day operations.

- The SCBWMI, as a stakeholder process, provides the tools to identify community goals and issues, and facilitates the development of common ground between stakeholders to recommend to policy-makers the actions needed to better manage watershed resources.

The Program seeks to create an avenue which the SCBWMI's broad stakeholder can incorporate goals and objectives into the daily operations of the Co-permittees. The Co-permittees apply their resources and powers to preserve and enhance the watershed. To do this most effectively, the Program and Co-permittees need to translate SCBWMI stakeholder recommendations into specific actions that are reasonable, practical, and that can be incorporated into their missions and services. In addition, the Program will work with Regional Board staff to apply a regulatory strategy that allows

Co-permittees to find ways to coordinate with other agencies within a specific watershed to protect and enhance beneficial uses.

Effectively Integrating Monitoring into Watershed Assessment. In the absence of a robust data set that can be used to characterize water quality and the physical, chemical and biological integrity of most water bodies in the Santa Clara Valley basin, initial characterization (i.e., screening-level monitoring/assessments) is needed. To provide this necessary information, the SCUVRPPP will conduct screening level monitoring in watersheds within the Santa Clara Valley basin using screening-level indicators. Data collected from these efforts is intended to provide information that will aid the Program in conducting watershed assessments. To the extent possible, these assessments will be conducted in coordination and collaboration with other efforts current underway in the basin (e.g., SCVWD Stream Stewardship Plans).

A Monitoring and Assessment Process Flow Chart. (see Figure 1.0 of 2004 Multi-Year Plan) was developed to illustrate the Program's "tiered" monitoring approach to environmental monitoring and the nexus between environmental monitoring and watershed assessment. This process is intended to provide the Program with a formalized structure for conducting monitoring and assessments. The decision-making process utilizes the best available water quality and watershed-related information throughout each step, with the goal of collecting additional data needed to characterize, assess and protect/restore beneficial uses in receiving water bodies.

Integrating with Regional Monitoring Activities. The Program has contributed to the Regional Monitoring Program for Trace Substances (RMP) since 1993 has contributed approximately $150,000 per year. In addition, the three South Bay municipal wastewater treatment plants (i.e., City of Palo Alto, City of Sunnyvale, and the San Jose-Santa Clara facility) annually contribute between $200,000 and $250,000 a year to the RMP. Thus, local communities (which are urban runoff Co-permittees) contribute approximately $350,000 to $400,000 a year to a regional monitoring program (consistent with Permit Provision C.7b). The results of the RMP's research and investigations have been published by the San Francisco Estuary Institute

(SFEI). Consistent with the objectives of the RMP, the Program's goal is to coordinate and integrate, where practicable, the various monitoring programs. This statement applies to the relationship between the Program and the CEP as well.

Pollutants of Concern Monitoring Activities. Several Multi-Year Plan elements address local and regional needs for technical imformation to address POCs in water bodies in or adjacent to the Santa Clara Valley basin. The goal of POCs monitoring is to collect scientifically valid information on the sources, status, trends, fate, and transport of POCs and their effects, so that feasible, cost effective management actions can occur to the maximum extent practible to reduce the impacts on the beneficial uses. POCs monitoring typically include studies that involve field sampling or environmental monitoring, which should not be confused with monitoring the effectiveness of BMPs implemented to control POCs in urban runoff.

Pollutants of Concern (POC) Monitoring Elements. To achieve SCVURPPP's monitoring objectives for pollutants of concern (POC), the Program will conduct and participate in monitoring-related activities under the following three POC Monitoring Elements during implementation of the multi-year plan:

- Impacts of POCs on the San Francisco Bay Estuary - element entails participation in, and support of regional efforts such as the Regional Monitoring Program for Trace Substances (RMP);

- Impacts of POCs on Local Water Bodies and Source Characterization - element entails investigating the impacts to, and sources of POCs present in Program-relevant local creeks and water bodies; and,

- Additional Regional POC Activities – element entails participation in, and support for regional programs (e.g., RMP, Clean Estuary Partnership) designed to develop studies supporting the development of scientifically based total maximum daily loads (TMDLs) and/or site specific water quality objectives for specific POCs.

Brief descriptions of each control program associated with the POC monitoring element are presented below:

Pollution Prevention Control Programs for POCs. SCVURPPP's current NPDES permit has greatly expanded the requirements for developing and implementing copper, mercury, pesticides, PCBs, dioxins and sediment control tasks/measures/plans/programs. Since the permit was reissued, SCVURPPP has focused on the creation, revision and implementation of numerous activities associated with developing control programs for POCs. The following paragraphs provide brief summaries of these activities.

Copper and Nickel Action Plans. The Metals Control Measures Plan, was first created in FY 00-01 to assist implementation of baseline activities contained in the Lower South San Francisco Bay Copper and Nickel Action Plans, to track and report activities, and to continue to work with the SCBWMI Bay Monitoring and Modeling (BMM) and Regulatory Subgroups regarding BMM Work Plan Updates. Descriptions of copper control program activities and nickel control program activities are included in the Copper and Nickel Action Plans approved by the SCBWMI and transmitted to the RWQCB as part of the Copper and Nickel TMDL Project for the South Bay. In addition, those baseline activities that are specifically related to the stormwater program are listed in Appendix B of the NPDES permit.

To date, most of the CAP/NAP baseline activities have been implemented at the Program level (except for those assigned to specific Co-permittees). SCVURPPP, working with Regional Board staff, met in FY 02-03 and FY 03-04 to discuss proposed changes to the CAP/NAP reporting approach and format and agreed upon a revised approach. Relative to developing the annual Work Plan, the revised reporting format includes the following basic information for each baseline action: description of baseline action, regional applicability, linkage to copper reduction, and identification of the performance measure. For each baseline activity the following information is included in the reporting table: an identification of the lead party (if the lead party is the Co-permittee then the Co-permittee includes the action within their individual work plans), a description of the proposed Work Plan actions,

a description of how effectiveness will be evaluated, and a summary of the possible future actions.

In addition, the Work Plan tables also provide a summary of actions accomplished in the prior (i.e., FY 02-03) for each CAP/NAP activity assigned to the Program and certain Co-permittees (San Jose, Sunnyvale and Palo Alto). The CAP/NAP contains 21 copper baseline actions and 7 nickel actions. These tasks will be tracked and reported by the Program in Annual Reports. To the extent possible, the Program will evaluate the effectiveness of implementing the tasks during its annual reporting process.

Mercury Pollution Prevention Activities. The Program's NPDES permit states that municipal stormwater discharges may be causing or contributing to exceedances of water quality standards for mercury. Mercury has been found in sediments in San Francisco Bay and the Guadalupe River Watershed. Some types of fish caught in the Bay contain mercury and other pollutants at concentrations that may threaten the health of humans consuming those fish. In response, the California Office of Environmental Health and Hazard Assessment issued an interim fish consumption advisory. The U.S. Environmental Protection Agency (EPA) has listed the Bay and the Guadalupe River Watershed (including the Guadalupe River, Alamitos Creek, Guadalupe Creek, Calero Reservoir, and Guadalupe Reservoir) as impaired by mercury under Section 303(d) of the Clean Water Act. In accordance with Section 303(d), the Regional Board is required to establish a Total Maximum Daily Load (TMDL) for mercury in the South San Francisco Bay and the Guadalupe River Watershed.

Permit Provision C.9.c. requires the Program to address the impairment by developing and implementing a mercury pollution prevention plan. The Program developed a Mercury Pollution Prevention Plan (Mercury Plan) consistent with this Provision. The Mercury Plan was submitted to the Regional Board on March 1, 2002 as part of the Program's FY 02-03 Work Plan.

The Mercury Plan is based on the premise that a Bay area-wide approach (and coordination) in addressing mercury pollution prevention will be most successful. The Plan identifies the goals of each work plan element, actions,

monitoring mechanisms, and schedules. The Plan also identifies whether actions will be implemented at the Program level, municipality level, or both.

The Mercury Pollution Prevention Plan addresses five general goals:

- Municipal Use of Mercury-Containing Products – Eliminate all unnecessary municipal use of mercury-containing products and establish proper disposal methods for products that cannot be eliminated.

- Household Hazardous Waste Collection – Provide mercury-containing product disposal services through household hazardous waste (HHW) collection programs for residents and small businesses, and encourage use of these programs.

- Monitoring and Science – Participate in coordinated monitoring efforts to support mercury TMDL development and implementation, including assessment of air pollution sources of mercury and concentrations of mercury in sediment.

- Regional, State, and Federal Coordination – Actively participate in regional, state and federal coordination efforts to achieve a reduction in the amount of mercury in urban runoff and air emissions.

- Public Education and Outreach –Increase awareness of proper disposal of mercury-containing products and available non-mercury containing alternatives.

Consistent with the above goals, the Management Committee approved the *Guidelines for Mercury-Containing Products Reduction and Management* in April 2003. The goals of the *Guidelines for Mercury-Containing Products Reduction and Management* are to work towards the virtual elimination of mercury from controllable sources that may affect urban runoff due to agency operations; and establish proper recycling and disposal methods for products that cannot be eliminated due to technological, safety or economic factors. To assist with the development of the guidelines Co-permittees completed a mercury-containing product survey to assess the municipal mercury-containing products being used, their locations, and waste disposal and

purchasing routes; and identify the level of awareness of product alternatives and proper disposal methods.

In December 2002, Program staff established the Mercury Pollution Prevention Outreach Work Group. This Work Group implements the Public Education and Outreach elements of the Mercury Plan by organizing a public education, outreach and participation program designed to reach residential and commercial users of mercury-containing products.

In April 2003, the Management Committee approved a model mercury virtual elimination policy, which requires the virtual elimination of mercury from controllable sources in urban runoff. A copy of the model policy was included within the FY 02-03 Annual Report. The model policy serves only as suggested language. Each Co-permittee is to adopt a Mercury Virtual Elimination policy, procedure or ordinance consistent with municipal requirements.

The Program's Annual Reports will provide information on the progress of tasks in the Mercury Pollution Prevention Plan. The Program's annual reports will document the Co-permittees' implementation of each specific task in the Plan.

Pesticide Control Program. Diazinon has been identified in recent studies as causing toxicity in local creeks. In May 1999, the U.S. Environmental Protection Agency (USEPA) listed San Francisco Bay and 35 Bay Area urban creeks as impaired by Diazinon under Section 303(d) of the Clean Water Act (CWA). The 303 (d) listing triggered the need for USEPA and the State to develop Total Maximum Daily Loads (TMDLs) for the impaired water bodies.

NPDES Permit Provision C.9.d. includes specific requirements for a pesticide control program. The Program and Co-permittees must develop and implement a pesticide control plan that addresses municipal uses of pesticides, including diazinon and other lower priority banned pesticides such as chlordane, dieldrin, and DDT, and the use of these pesticides by others within municipal jurisdictions. The permit provision also requests that the Program continue to work with the Urban Pesticide Committee, BASMAA,

and the California Stormwater Quality Association Pesticide Committee to assess impacts of pesticide use and encourage actions by other state and federal agencies.

As required by NPDES Permit Provision C.9.d., the Program developed a Pesticide Management Work Plan (Pesticide Plan) and submitted it to the Regional Board on June 26, 2001. A Pest Management Performance Standard was finalized in February 2002, and Co-Permittees have incorporated it into their URMPs and begun implementation.

The purpose of the Pesticide Plan is to control pesticide-related toxicity in urban runoff, by minimizing pesticide use and reducing the amount of pesticides in storm water and landscape runoff to the maximum extent practicable. The Plan identifies the goals of each work plan element, actions, monitoring mechanisms, and schedules. The Plan also identifies whether actions will be implemented at the Program level, municipality level, or both.

The goals of the Pest Management Performance Standard and control measures are to minimize pesticide use to the MEP, particularly organophosphate pesticides; and reduce the amount of pesticides in storm water and landscape runoff. These control measures apply to pest management on municipally owned property performed by municipal employees and by commercial applicators that contract with the municipality. The control measures also include outreach to other users within the municipality's jurisdiction about less toxic pest control methods and proper disposal of pesticides.

Each year, the Program's Annual Report provides information on the progress of tasks in the Pesticide Plan. Outreach activities that are conducted to meet the requirements in the Pesticide Plan include media advertising, Integrated Pest Management (IPM) outreach at community events and workshops, participation in the Regional IPM Store Partnership program and IPM outreach to local businesses. In addition, through its annual reporting process, SCVURPPP will provide an assessment of the effectiveness of mercury reduction measures following their implementation.

Polychlorinated Biphenyls (PCBs) and Dioxin Compounds Control Program. The 1998 and 2002 Clean Water Act Section 303(d) lists designate all segments of San Francisco Bay as impaired by PCBs and certain dioxin compounds. The listings were in response to an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment (OEHHA). OEHHA issued the advisory after PCBs, dioxins and other pollutants (e.g., mercury) were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay. The Regional Board opposed the 1998 listing of dioxins, but was overruled by the USEPA.

Provision C.9.e. of the SCVURPPP municipal storm water NPDES permit requires development of a control program to eliminate or reduce controllable sources of PCBs and dioxin compounds in urban runoff. The following sections briefly summarize the Program's accomplishments to-date in addressing these pollutants and describe the Program's future strategy.

PCBs - The SCVURPPP has provided leadership to Bay Area storm water agencies in their efforts to develop data needed for the Bay PCBs TMDL. Initially, the Program coordinated a regional study that characterized the distribution of PCBs concentrations in storm water conveyance sediments in Bay Area watersheds (KLI 2001 and 2002). The Program subsequently performed PCBs case studies in selected areas with relatively elevated concentrations of PCBs (City of San Jose and EOA, Inc. 2002 and 2003) and coordinated similar case studies by other Bay Area storm water agencies (SCVURPPP 2002d). The case studies were aimed at beginning to identify PCBs sources and controls. To facilitate regional coordination, the Program led a work group of representatives from BASMAA and Regional Board staff and continues to provide a staff to represent BASMAA on the Clean Estuary Partnership PCBs work group. The Program also prepared work plans for the above regional and local field studies (SCVURPPP 2000, 2001, 2002b, 2002c). The work plans included a preliminary list of known sites where PCBs were used, stored and/or released in Santa Clara County. Most recently, the Program completed a study that summarizes the current status of efforts to address PCBs in Bay Area urban runoff (SCVURPPP 2004b). The study describes 1) past, current and planned efforts to identify PCBs control

options in the Bay Area, 2) management practices currently implemented by Bay Area storm water management agencies that may help control PCBs in urban runoff, and 3) potential additional PCBs storm water control options and some of their advantages, limitations and cost factors. The Program has also collected and analyzed sediment samples from selected Santa Clara County watersheds for PCBs and other pollutants of concern as part of its receiving waters monitoring and assessment program.

Dioxins - The Program's initial work plan to address dioxin compounds[35] (SCVURPPP 2002a) specified reviewing readily available data on methods used to characterize dioxin compounds in storm water runoff and surface waters and concentrations typically found in the Bay Area and other areas. SCVURPPP (2002e) documents the results of the review. The SCVURPPP's second work plan addressing dioxin compounds (SCVURPPP 2003) describes the SCVURPPP's collaboration with other Bay area storm water management agencies to develop a "synthesis" document on dioxin-like compounds. This document was recently completed and summarizes the current state of knowledge regarding dioxin-like compounds in relation to storm water runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, public health impacts, sources, pathways, environmental fate, review of relevant Bay Area, national and international studies, and qualitative review of potential storm water controls (BASMAA 2004). The Program recently completed a new work plan that summarizes past accomplishments and describes activities planned for FY 2004-05 (SCVURPPP 2004a).

The SCVURPPP plans to continue collaborating with the regulatory and discharger community and other stakeholders to develop technically and economically feasible strategies to address controllable sources of PCBs, dioxins and other pollutants of concern[36]. The overarching principle is to

[35] The chemical compounds referred to as dioxin compounds are generally members of three closely related families: the polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and certain polychlorinated biphenyl (PCB) congeners with dioxin-like potency that are often referred to as dioxin-like PCBs. The Program is addressing PCBs, including dioxin-like PCBs, as part of the separate program described above).

[36] Examples of organizations that currently facilitate such collaboration include BASMAA, the Clean Estuary Partnership and the Regional Monitoring Program. The SCVURPPP is currently providing funding to these

develop cost-effective strategies with realistic potential to protect public health. Factors other than strict cost-effectiveness may be important, such as the likelihood of identifying responsible parties or obtaining state or federal funding to identify and cleanup on-land PCBs sites. The SCVURPPP will also consider the potential benefit of implementing strategies that concurrently address multiple sediment-bound pollutants. Furthermore, the SCVURPPP will continue emphasizing the need to prioritize actions in light of the limited public resources available to address pollutants of concern37. As appropriate, the SCVURPPP will incorporate high priority actions into its annual work plans.

Trash Management Activities. On November 14, 2001, the Regional Board released the document entitled Proposed Revisions to Section 303(d) List of Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region Report. This report proposed that all urban creeks, lakes and shorelines be placed on the 2002 303(d) "monitoring list" due to the threat of trash impairment to water quality. On February 4, 2003, the State Water Resources Control Board (SWRCB) adopted the 2002 Clean Water Act section 303(d) list of water quality segments, which included this recommendation.

In a proactive response to the November 14, 2001 Staff Report, the Management Committee formed a Trash AHTG (TATG) on February 21, 2002. Since the formation of the TATG, the Program has completed the following work products:

Trash Management Practices Survey (November 2002) - The survey documents existing trash management practices and policies.

Trash Work Plan - To fulfill a Program FY01-02 Continuous Improvement item and actions identified within the Program's Multi-year Receiving Waters

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organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by these groups.

[37] For example, dioxins appear to be of relatively low priority, since the Regional Board does not plan to perform a TMDL for dioxins in the Bay. The USEPA has stated that, since PCBs are the most significant contributor to dioxin-like toxicity in Bay fish, the Bay PCBs TMDL is high priority (http://www.epa.gov/region09/water/dioxin/sfbay.html).

Monitoring Plan, the TATG prepared a Trash Work Plan that identifies a strategy for addressing trash problem areas that occur in urban streams and waterways. The Trash Work Plan, which was submitted within the Program's *FY 03-04 Draft Work Plan* on March 1, 2003, details tasks to be conducted during FY 03-04 and FY 04-05. The tasks conducted during FY 03-04 focused on: preparing a summary of existing Co-permittee trash management practices survey; identifying and documenting known trash problem areas; identifying and documenting trash management practices implemented by others (e.g., Los Angeles River watershed trash TMDL); refining protocols for trash evaluations and training municipal staff; and developing standardized documentation procedures for data collection and reporting.

The tasks identified for FY 04-05 focus on the implementation of trash evaluations in or/ near watersheds; implementation or refinement of trash control measures, as appropriate to address trash problem areas within high priority areas; and review of existing performance standards relevant to trash management and identify potential revisions to these standards, if necessary. The TATG will continue to meet in support of developing Work Plan products. Recommendations from the TATG will be reviewed and approved by the Management Committee.

Interaction with Santa Clara Valley Water Resources Protection Collaborative- During FY 03-04, the TATG agreed to focus on trash issues which are part of the Trash Work Plan and keep the Water Resources Protection Collaborative informed about trash issues within the Program's jurisdiction.

Trash Goals Statement - In May 2004, at the direction of the Management Committee, the TATG completed the development of a Trash Goals Statement for SCVURPPP. SCVURPPP's goals statement for the next five years is to develop a countywide collaborative trash awareness, monitoring, outreach, removal and abatement program that is specifically directed at enhancing the beneficial uses of urban streams and waterways in Santa Clara County. To achieve this goal, the Program has identified the following objectives:

- Identify and prioritize trash problem areas in urban streams and waterways and other potential sources that may contribute trash to those areas;
- Enhance existing trash management practices or implement new practices to address high priority trash problem areas;
- Evaluate trash condition of urban streams and waterways over time using a field monitoring program;
- Use outreach and community involvement programs to increase public awareness of the impact of urban activities on streams and waterways and to foster a sense of stewardship;
- Evaluate effectiveness of trash management and education practices; and
- Develop and implement a standardized documentation and reporting mechanism for Annual Reports.

During the implementation of the revised Multi-Year Plan, the Program will provide an assessment of the effectiveness of trash management measures through its annual reporting process.

Sediment Analysis. In response to a listing of impairment by sediment under section 303(d) of the Clean Water Act and a need to provide information for a TMDL assessment, two separate (but coordinated) projects have been developed. These projects are the San Francisquito Creek Sediment Reduction Plan, administered by the San Francisquito Creek Joint Powers Authority (JPA); and the Aquatic Habitat Assessment and Limiting Factors Analysis, managed by the Santa Clara Valley Water District (SCVWD).

The primary issues driving the TMDL are flooding and degradation of steelhead trout, other threatened aquatic species and their habitats. The approach adopted by the JPA and SCVWD in these projects is to assess factors limiting the threatened aquatic species, including but not confined to those related to excessive sedimentation caused by human land use activities. Project products are intended to produce information that will assist the Regional Board to confirm or reject the validity of the sediment impairment

listing and help identify other causes of impairment to aquatic species and their habitats in San Francisquito Creek.

Additional Watershed Analyses and Sediment Practice Assessments - In accordance with Permit Provision C.9.f.iii, the Program submitted the Sediment Impairment Report (Other Creeks) to the Regional Board on March 1, 2002. On August 30, 2002, the Program developed a work plan entitled Work Plan for Conducting Watershed Analysis and Management Practice Assessment in Other Creeks Potentially Impaired by Sediment from Anthropogenic Activities (Watershed Analysis Work Plan). The Work Plan describes the phased approach that SCVURPPP intends to follow in addressing the permit condition. As appropriate, lessons learned from the San Francisquito Creek TMDL project will be used to update the Watershed Analysis Work Plan.

4I SUMMARY

Tables C-1 through C-12 within Appendix C, summarize the status of each Co-permittee's URMP, including BMPs and SOPs. In addition, Table C-13 summarizes individual Co-Permittee urban runoff pollution prevention program organization. Further details on Co-permittee programs are in Chapters 5-16 (bound separately).

APPENDIX A
Model Performance Standards

APPENDIX A
Model Performance Standards

Consistent with NPDES Permit Provision C.2.b., the Program worked with Regional Board staff, during 1996, to develop the first seven model Performance Standards. All of these model Performance Standards were submitted with an "early draft" of the 1997 URMP and were accepted by the Regional Board as baseline performance standards upon which to base effectiveness evaluations and consideration of opportunities for improving them." The 1997 URMP, including all performance standards (updated December 1999) was included in the 2001 re-issued SCVURPPP NPDES Permit.

Figure A1

Model Performance Standards

- Illicit Connection and Illegal Dumping Elimination Activities
- Industrial/Commercial Discharger Control Programs
- Public Streets, Roads and Highways Operation and Maintenance
- Storm Drain System Operation and Maintenance
- Water Utility Operation and Maintenance
- Planning Procedures
- Construction Site Inspection
- Pest Management
- Rural Public Works Maintenance & Support

The Program is committed to continuous improvement of the model Performance Standards. As described in the URMP, the Program's Management Committee will review one existing Performance Standard or Program element, or create one new Performance Standard, each year. Since

1997, the Program has revised five of the Performance Standards and created two new ones. The changes are summarized in Table A-1.

Chapters 5 through 16 consist of individual Urban Runoff Management Plans for Cupertino; Los Altos; Los Altos Hills; Milpitas; Mountain View; Palo Alto; San Jose; Santa Clara, and Sunnyvale; the West Valley communities of Campbell, Los Gatos, Monte Sereno and Saratoga (combined in Chapter 14); Santa Clara County, and the Santa Clara Valley Water District. Each of these Co-permittees may adopt any or all of the model Performance Standards, or adapt them to suit local conditions. The adaptations accommodate differing local conditions and are documented in the individual URMPs.

Table A-1
Tracking Matrix: Status of Program URMP and Model Performance Standard Updates
(Updated 9/1/04)

BASELINE PROGRAM (1997)		FY 97-98 – FY 00-01 (URMP Update 2000)		FY 04-05 (URMP Update 2004)	
Program Element	**Performance Standard (PS)**	**Changes Made to Model Performance Standards**	**URMP Update Completed (Date)**	**Changes Made to Model Performance Standards**	**URMP Update Completed (Date)**
ICID	PS for ICID	ICID-2, SWID Inspections; ICID-4, Reporting CEDs and SWIDs	October 2000	None	
IND	PS for IND	IND-4, reporting SWIDs and summary of violations	October 2000	None	
PAA	PS for Streets/Roads O&M	None		None	
	PS for Rural Public Works Maintenance*			New model PS developed to meet Permit Provision C.5., approved by MC 12/20/02, incorporated into URMP	September 1, 2004
	PS for Storm Drain System Maintenance	SDOM #6, notification process between maintenance and ICID inspectors	October 2000	None	
	PS for Water Utilities	None		None	
NDS	PS for Planning Procedures	None		Model PS revised to meet Permit Provision C.3., approved by MC 12/18/03, incorporated into URMP	September 1, 2004
	PS for Construction Inspection	None		Model PS revised per RWQCB comments, approved by MC 1/17/02, incorporated into URMP	September 1, 2004
Pollutant Specific	PS for Pest Management*			New model PS developed to meet Permit Provision C.9.d., approved by MC 2/21/02, incorporated into URMP	September 1, 2004

Notes:
* = New PS not part of original URMP, added per reissued NPDES permit (Order No. 01-024).
PS = Performance Standard; MC = Program Management Committee; RWQCB = Regional Water Quality Control Board

CONSTRUCTION INSPECTION

Santa Clara Valley Urban Runoff Pollution Prevention Program

PUBLIC AGENCY ACTIVITIES

Performance Standard and Supporting Documents for

Construction Inspection

Participating Agencies:

Campbell, Cupertino, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

PART I

Introduction

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM
NEW DEVELOPMENT AND CONSTRUCTION ACTIVITIES CONTROL MEASURES

Performance Standard and Supporting Documents for Construction Inspection

(Revised 1/17/02)[1]

I. Introduction

The goal of construction activities control measures is to minimize the water quality impacts of land development during construction[2]. These control measures apply to both private development projects and municipal public works construction projects. Municipal agencies can ensure that required control measures are implemented at development sites as part of a construction inspection and enforcement program. The Construction Inspection performance standard defines the level of implementation that each municipal agency in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) must attain to demonstrate that its construction inspection program controls storm water quality impacts to the maximum extent practicable. This performance standard will be used as the basis for measuring the effectiveness of each municipal agency's construction inspection and enforcement activities.

The Performance Standard for Construction Inspection is based, primarily, on the San Francisco Bay Regional Water Quality Control Board's April 1994 *Staff Recommendations for New and Redevelopment Controls for Storm Water Programs* (*Recommendations*). The *Recommendations* incorporate the mandates of EPA's storm water regulations as well as the *Coastal Zone Act Reauthorization Amendments.* The performance standard is also consistent with the goals and objectives of the New Development and Construction component of the Program's 1997 *Urban Runoff Management Plan (URMP)*.

[1] Revisions approved by the Program's Management Committee on 1/17/02.

[2] The Program's Planning Procedures Performance Standard addresses the municipal agency's responsibility to ensure that developers include permanent (post-construction) storm water quality control measures in the design of projects with significant storm water pollution potential.

PART II

Performance Standard

Performance Standard and Supporting Documents for
Construction Inspection

PERFORMANCE STANDARD

1) The municipal agency ensures through a construction inspection program that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes at construction sites and prevent illicit discharges[3] to storm drains and watercourses.

2) For development projects with significant erosion potential[2] and planned construction activity during the wet season[2], the municipal agency ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.

3) The municipal agency inspects construction sites for adequacy of storm water quality control measures. The frequency of inspections for active sites is at least once per month, or more frequently based on the size of the project, site conditions, precipitation, and the project's potential impact on storm water quality.

4) Prior to the beginning of the wet season each year, the municipal agency inspects all sites requiring erosion and/or sediment control plans, to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.

5) Construction sites with inadequate erosion/sediment controls are given verbal or written notice of the inadequacies, according to the municipal agency's enforcement procedures, and followed up with action(s) commensurate with the risk of pollutants entering municipal storm drains or waterways. Written notices and follow-up actions are tracked and summarized in the agency's Annual Report to the Regional Board.

6) The municipal agency provides training annually to its construction inspection staff on inspection procedures, documentation, and enforcement related to storm water pollution prevention. All inspectors receive training on the latest construction-related storm water pollution prevention techniques and appropriate follow up actions at least once every two years. The municipal agency keeps documentation that inspectors have received training.

7) The municipal agency provides outreach materials to contractors, developers, and municipal staff on construction BMPs and compliance with the State General Construction Activity Storm Water Permit.

[3] Definitions are provided on page 3 of the Performance Standards.

Performance Standard and Supporting Documents for
Construction Inspection

Definitions

Illicit Discharge – Any non-storm water discharge to a storm drain or watercourse, except for conditionally exempted discharges allowed under the Program's NPDES permit.

Significant Erosion Potential – Conditions created by land disturbance activities that require a grading permit, as defined by local ordinance, or by discharges of storm water runoff over areas with erodable soils.

Wet Season – As defined by local ordinance (typically October 15 to April 15).

NOI Site – A construction site of a size or nature to require coverage under the State's Construction Activity General Permit.

Adequate BMPs -- Best management practices effective for minimizing erosion, controlling sediment onsite, containing materials and wastes, and preventing storm water pollution, such as those described in the Regional Board's *Erosion and Sediment Control Field Manual* (1999), the *California Construction BMP Handbook* (1993 and updates), the ABAG *Manual of Standards for Erosion & Sediment Control Measures* (1995) or other appropriate references.

PART III

Guidance for Support Documents

Attachment 1

Work Plan Implementation

Performance Standard and Supporting Documents for
Construction Inspection

Attachment 1
WORK PLAN IMPLEMENTATION

This section describes the activities to be conducted by the co-permittee , and described in the co-permittee's local URMP to implement the performance standard, along with an implementation schedule.

Example Contents of the Work Plan

- Take steps to obtain adequate legal authority to conduct and enforce construction site inspections if necessary.
- Develop (or review and revise) standard operating procedures for inspection and enforcement.
- Develop or adapt BMPs and control measures identified in Section 3.
- Obtain or develop educational materials for training construction inspectors and for outreach to contractors, developers, and municipal staff.
- Develop a training program for construction inspectors.
- Annually conduct an evaluation of the effectiveness of the construction inspection program, report the results of the evaluation in the Annual Report, and identify items for continuous improvement.

Attachment 2

Legal Authority to Implement

Performance Standard and Supporting Documents for
Construction Inspection

Attachment 2
LEGAL AUTHORITY TO IMPLEMENT

This section contains a demonstration of the co-permittee's legal authority to implement the performance standard, or a time schedule for developing and obtaining additional authority. Adequate legal authority includes the ability to issue a "stop work" order and fines to the construction contractor, owner, or agency for noncompliance with the pertinent ordinances and sections of the municipal code.

Provide references to or excerpts from the following documents, if applicable, to demonstrate adequate legal authority to inspect construction sites and enforce compliance with storm water requirements:

- Storm water discharge ordinance.
- Erosion and sediment control and/or grading ordinance.
- Other ordinance or section of municipal code.

Each municipality should have procedures for applying graduated levels of enforcement, for example:

First level – Verbal warning
Second level — Written field notification of non-compliance;
Third level – Issuance of stop work order or citation;
Fourth level – Referral to the Regional Board.

Attachment 3

Work Plan BMPs and Control Measures

Performance Standard and Supporting Documents for
Construction Inspection

Attachment 3
WORK PLAN BMPS AND CONTROL MEASURES

This section should contain the best management practices and control measures that co-permittees will employ or use as a standard for compliance in the implementation of the performance standard, as well as any design criteria, procedures, or methods that would assist in the use of the BMPs or control measures.

Example BMPs and Control Measures

- Minimum standards for construction BMPs.
- Requirements for erosion and sediment control measures (examples):
  - ⇒ Requiring contractors to have installed and implemented BMPs adequate for the season and site conditions.
  - ⇒ Requiring contractors to keep an adequate (depending on the season) supply of erosion and sediment control materials on-site throughout the year;
  - ⇒ Requiring contractors to have an erosion control emergency response plan, including 24-hour contact numbers.
- Standard contract specifications for municipal projects
- Standard conditions of approval related to construction BMPs and requirements (for example, see Attachment 3a, City of San Jose COA letter).

Attachment 4

Standard Operating Procedures

Performance Standard and Supporting Documents for
Construction Inspection

Attachment 4
STANDARD OPERATING PROCEDURES

This section should contain the co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Description of Inspection and Enforcement Program:

- Which departments or types of inspectors conduct the various components of construction inspections (erosion control measures and materials/waste management, public vs. private projects).
- Timing and frequency of inspections (public and private projects).
- Method of documentation and reporting of violations, follow-up and enforcement actions.
- Who is responsible for taking and tracking follow-up actions.
- Enforcement criteria and procedures.
- Tools used: inspection checklists, outreach materials, use of storm water pollution prevention plans in inspections, etc.
- Coordination of enforcement efforts with other agencies, including the Regional Water Quality Control Board.
- Training program for construction inspectors in erosion control and storm water quality issues, and at least bi-annual training in the latest erosion and sediment control techniques (such as the trainings conducted by Regional Board staff or ABAG).

ILLICIT CONNECTION & ILLEGAL DUMPING ELIMINATION ACTIVITIES

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

ILLICIT CONNECTION & ILLEGAL DUMPING ELIMINATION ACTIVITIES PERFORMANCE STANDARD

Revised February 17, 2005

Participating Agencies:

Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

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PART I

Introduction/Purpose

for

Illicit Connection & Illegal Dumping Elimination Activities

Revised February 17, 2005

Introduction

Performance standards define control measures or levels of achievement for particular tasks carried out by all Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) Co-permittees. Control measures are described in the Program's 2004 Urban Runoff Management Plan (URMP), which details what the Program is doing to reduce urban runoff pollution in the Santa Clara Valley watershed. The development and implementation of performance standards is an integral part of the Program's URMP.

The components contained herein constitute the revised ILLICIT CONNECTION & ILLEGAL DUMPING ELIMINATION ACTIVITIES PERFORMANCE STANDARD.

Purpose

The goal of illicit connection and illegal dumping control measures is to identify and eliminate non-permissible non-storm water discharges associated with illegal dumping or illicit connections to the storm drain system. The Illicit Connection & Illegal Dumping Elimination Activities (ICID) Performance Standard defines the level of implementation that Co-permittees in the Program must attain to demonstrate that their ICID activities reduce pollutants to the maximum extent practicable.

The performance standard for ICID is based on current practices that municipal agencies are and/or will be implementing to eliminate non-storm water discharges and practices that are accepted by the State and Regional Board as being effective in controlling these impacts. The performance standard is also consistent with the goals and objectives of the Program's Urban Runoff Management Plan.

Part II

Performance Standard

Performance Standard and Supporting Documents for

Illicit Connection & Illegal Dumping Elimination Activities

PERFORMANCE STANDARD

A. GENERAL ADMINISTRATION

1) Resource Commitment

- Identify where responsibility for IC/ID enforcement is located within the jurisdiction.

2) Training/Education/Outreach

- Ensure IC/ID Inspectors are trained.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-storm water discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other agencies or industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

3) Complaint Referral/Incident Response System

- Follow existing spill response[1] and cleanup programs used within the jurisdiction.
- Develop and formalize an inter-agency referral process for both internal referrals (within a Co-permittee's jurisdiction) and referrals between Co-permittees.
- Respond to complaints regarding illegal dumping violations into the storm drainage system within the jurisdiction.

4) Field Investigation

- Conduct field investigations[2] that include inspecting portions of the municipal storm drain system for potential sources of non-storm water discharges. Observed discharges will be referred to the appropriate investigating agency.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific areas for pro-active investigations.

5) Effectiveness Evaluation

[1]Activities carried out upon receiving a report of an existing non-storm water discharge.

[2]Pro-actively looking for non-storm water flows.

- Review annually the ICID Performance Standard and internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from complaining parties, other agencies, or citizens, on your agency's response to their concern or complaint.
- Regularly evaluate how the city's interagency ICID referral system works.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- Provide ICID effectiveness evaluation results in Annual Reports.

B. ENFORCEMENT

- If the responsible party is identified, educate the party on the impacts of their actions, explain the storm water requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
  (1) Contact the responsible party to discuss methods of eliminating the non-storm water discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
  (2) Provide Program information to the responsible party, where appropriate.
  (3) Begin enforcement procedures, if appropriate.
  (4) Continue inspection and follow-up activities until the illicit discharge activity has ceased
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

C. RECORD KEEPING/REPORTING

- Document and report ICID incidents annually using one of the descriptive categories provided within Tables 1 through 4 (see below)[3]. The categories provided in each table (total of 4) relate to the origin of report, source of incident, type of incident, and enforcement actions for each ICID incident. A category from each table will be assigned to document the each ICID incident.
- ICID incidents will be documented by, and the documentation maintained in the files of, the local agency or its contractor. The standard Santa Clara Urban Runoff Illicit Connection/Illegal Dumping Reporting Form (see Reporting Form on page 8) or an incident reporting form developed by a Co-permittee that contains all of the elements in the standard incident reporting form, will be used by all local agencies.

[3] Reporting requirements and categories are also described in the *Continuous Improvement of Illicit Connection/Illegal Dumping Reporting* Technical Memorandum dated September 7, 2001

- Submit ICID incident results to the Regional Board within Annual Reports.
- Provide ICID incident results (within an electronic format) to Program staff for inclusion in SCVURPPP Annual Report (see below).
- Develop a tracking system designed to identify and prioritize specific areas for pro-active investigations in order to:
  (1) Determine the appropriate frequency for repeat inspections of high, medium, and low priority areas based on an investigation of the municipality's entire drainage area.
  (2) Determine the number of cross jurisdictional violations (for example, mobile cleaners), seasonal violations, and interagency duplication.
  (3) Review complaint response data.

ICID Inspection Data for SCVURPPP Annual Report

To facilitate the continuous improvement of industrial facility inspection reporting on a Program-wide level, each Co-permittee will provide raw ICID incident data (within an electronic format) to Program staff during each fiscal year. The procedures and schedule for submitting raw ICID incident data will be provided to Co-permittees each November.

Once received within an electronic format, Program staff will analyze all categories to ensure that they are reported in accordance with the categories provided in the ICID technical memorandum. Once all reported data is linked to the appropriate category, Program staff will produce a summary report detailing all ICID incident information for the Program. Individual reports detailing individual Co-permittee ICID inspection information will be developed for each Co-permittee.

Table 1. Categories describing the nature and source of ICID incidents.

Source of Report	Definition
Illicit discharge inspectors	Routine inspection, patrols
Interdepartmental	Referrals within agency, including channel and road maintenance crews, construction inspectors
Other agency	Referrals from other agencies, including other municipalities, SCVWD, State and County Health Departments
Citizen Complaints	Calls from public
Other	None of the above

Table 2. Potential source categories associated with ICID incidents.

Potential Source of Incident	Definition
Residential	Houses or apartments.
Industrial	Industrial facilities or land use area.
Commercial	Commercial facilities or land use area (not including automotive or food facilities).
Automotive Facilities	Includes all automotive facilities, including engine and body repair, gas stations, sales and other vehicle services.
Food Facilities	Includes all food facilities, including restaurants, cafeterias, delis, bakeries, mobile food, and grocery stores.
Construction Sites	Includes all construction related activities.
Public facilities and Utilities	Publicly or utility owned sites and projects (corporation yards, transportation or right of ways).
Other/unknown	All other target audiences associated with ICID incidents, or when specific target audiences can't be identified.

Table 3. Category name and definition of ICID incident types.

Incident Type Category	**Definition (Discharges are defined as releases potentially resulting in pollutants entering stormwater conveyance systems and/or surface waters.).**
Tracking soil	The movement of soil and other materials from vehicle or heavy machinery operation resulting in discharge. Typically occurring at construction sites
Saw cutting slurry discharge	The cutting of Asphalt, Cement, Concrete, etc. that results in a saw cut slurry discharge.
Surface cleaning discharge	The washing of toxic materials such as oil, antifeeze, grease, as well as cleaning chemicals used to clean parking lots, sidewalks, buildings or other surfaces, that results in discharge.
Vehicle & equipment leaking	The leaking of fluids from automobiles, trucks, heavy machinery and other equipment, including but not limited to: brake fluid, radiator fluid, motor oil, transmission fluid, battery acid, etc. resulting in discharge.
Dewatering	Contaminated water from construction areas resulting in discharge.
Water line breaks	Unplanned release of water from break in water pipes and potential soil erosion resulting in discharge.
Landscape material dumping	The illegal dumping of landscape materials resulting in discharge.
SWIDs	Storm Water Infiltration Devices
Vehicle washing	The washing of vehicles that results in discharge.
Vehicle repair	The illicit discharge of automotive fluids or contaminated water from vehicles associated with activities such as oil changing, radiator flushing that result in discharge.
Used oil dumping	The illegal dumping of motor oil resulting in discharge.
Un-hardened cement discharge	The washing of cement and/or the rinsing of cement mixing and laying equipment resulting in discharge.
Equipment cleaning	The washing of equipment using solvents resulting in discharge.
Dumpster discharge	Dumpster that is exposed to rainwater and/or contains leaks resulting in discharge.
Pools/Spas/Fountains discharge	The release of contaminated pool, spa and/or fountain water resulting in discharge.
Cooling water discharge	The release of contaminated water associated with flushing, leaking or blow down of cooling towers.
Accidental spills	Accidental releases of pollutants resulting in discharge.
Abandoned drums discharge	Drums of hazardous or non-hazardous materials dumped and exposed to rainwater or runoff, which results in discharge.
Sanitary spill or leak	Accidental release from sanitary sewer system resulting in discharge.
Dumping -	Improper disposal of hazardous materials, as defined in

hazardous	California Code of Regulations.
Dumping – non-hazardous	Improper disposal of materials not considered hazardous, resulting in discharge. Materials include but are not limited to, construction materials, animal waste, medical waste and pesticide.
Grey water discharge	The release of contaminated water associated with wash water discharge.
Carpet cleaning discharge	The dumping of contaminated water collected during the cleaning of carpets resulting in discharge.
Paint discharge	The dumping or paint and/or the washing of painting equipment resulting in discharge.
Food Facility Oil & grease discharge	Fats, Oils or Grease released from improperly maintained grease traps resulting in discharge.
RV Waste discharge	The dumping of wastes collected in Recreational Vehicles resulting in discharge.
Allowable discharge	Discharges that do not pollute storm drain or do not pollute storm drain when proper control measures are implemented. These include irrigation, car washing (residential), water releases, and pumped water from foundation and footing drains
Misc. incidents	Any type of discharge not listed above. Including, but not limited to sediment laden water and animal waste
Illicit connections	An improperly plumbed facility or parcel plumbed to the storm sewer instead of the sanitary sewer
Complaint not found	Complaint not found

Table 4. Categories describing enforcement actions.

Category	**Description**
Verbal Notice	Verbal warning providing information for corrective actions
Warning Notice	Written letter providing information for corrective actions
Administrative Action	Official letter describing requirements and consequences
Administrative Action with Penalty &/or Fine	Administrative actions, including fines
Criminal Action	Legal actions
Referral for Enforcement	Refer case to agency with enforcement powers

Santa Clara Urban Runoff Illicit Connection/Illegal Dumping Reporting Form

Date: _____ Time: _____

Agency or Department: _____

Inspector(s): _____

I. ORIGIN OF REPORT

1. **Describe reason for conducting the investigation**. (Definitions on Back):
   - ☐ Illicit Discharge Inspection (Routine)
   - ☐ Citizen Complaints
   - ☐ Interdepartmental Referral
   - ☐ Other _____
   - ☐ Other Agency Referral

II. SOURCE OF INCIDENT

1. Describe location of source of discharge (company name, address, cross streets, physical features, etc.)

   _____

   _____

2. **Describe Source of Incident** (Definitions on Back):
   - ☐ Residential
   - ☐ Industrial
   - ☐ Commercial
   - ☐ Automotive Facilities
   - ☐ Food Facilities
   - ☐ Construction Sites
   - ☐ Public Facilities/Utilities
   - ☐ Other/Unknown

3. Responsible Party: _____

   Address and Phone: _____

4. Property Owner: _____

   Address and Phone: _____

III. TYPE OF INCIDENT

1. **Illegal Dumping** Describe Material Discharged**:**

- ☐ Sanitary Spill or Leak
- ☐ Unhardened Cement Discharge
- ☐ Pools/Spas/Fountains Discharge
- ☐ Tracking Soil
- ☐ Surface Cleaning Discharge
- ☐ Saw Cutting Slurry Discharge
- ☐ Vehicle/Equipment Leaking
- ☐ Vehicle Washing
- ☐ Vehicle Repair
- ☐ Equipment Cleaning
- ☐ Used Oil Dumping
- ☐ Landscape Material Dumping
- ☐ Accidental Spills
- ☐ Paint Discharge
- ☐ Carpet Cleaning Discharge
- ☐ Food Facility Oil & Grease Discharge
- ☐ Grey Water Discharge
- ☐ Dewatering
- ☐ RV Waste Discharge
- ☐ Water Line Breaks
- ☐ Dumping (Hazardous)
- ☐ Dumping (Non-hazardous)
- ☐ Abandoned Drums Discharge
- ☐ Dumpster Discharge
- ☐ Cooling Water Discharge
- ☐ Allowable Discharge
- ☐ Miscellaneous Incidents
- ☐ Other (describe): _____

Provide Additional Discharge Information (as appropriate): _____

_____

2. **Other Sources**:
   - ☐ Illicit Connection
   - ☐ Storm Water Infiltration Devices
   - ☐ Other _____

3. **Complaint Not Found** (Circle)

IV. FOLLOW-UP AND ENFORCEMENT ACTIVITIES

1. Describe corrective actions: _____

   _____

   _____

2. Describe materials distributed (brochures, BMPs, etc.): _____

3. **Describe Enforcement Action** (Definitions on Back):
   - ☐ None (Incident Resolved)
   - ☐ Verbal Notice
   - ☐ Warning Notice
   - ☐ Administrative Action
   - ☐ Administrative Action with Penalty/Fine
   - ☐ Criminal Action
   - ☐ Referral for Enforcement

Inspector(s) Signature _____

PART III

Guidance for Support Documents

SECTION 1

Work Plan/Implementation Schedule

Performance Standard and Supporting Documents for

Illicit Connection & Illegal Dumping Elimination Activities

Section 1
WORK PLAN IMPLEMENTATION

This section contains the plan or activities to be conducted to enable the Co-permittee to implement the performance standard along with an implementation schedule. The work plan will be developed by each Co-permittee based on its responsibility to conduct illicit connection and illegal dumping elimination control activities within its jurisdiction.

Example Contents of the Work Plan

- Describe steps needed to incorporate the implementation of the performance standard.
- Obtain adequate legal authority (if necessary).
- Develop a training program for inspectors and field personnel.
- Develop and/or distribute public information.
- Develop and/or implement spill response drills.
- Develop an inter-agency referral process.
- Develop an implementation schedule for priority area field investigation (see Table 5 for a model implementation schedule).
- Develop and/or implement complaint response protocols.
- Develop documentation and record keeping tools.
- Develop priority area field investigation tracking system.
- Develop program evaluations (may include):

  1) Reviewing the Illicit Connection and Illegal Dumping Elimination Activities Performance Standard. Identify any necessary modifications or improvements.

  2) Reviewing internal field investigation results, assessing if the purpose was met and identifying what changes or improvements are necessary.

  3) Obtaining feedback on the Illicit Connection and Illegal Dumping Control Program from involved parties (e.g., complaining parties, other agencies, citizens, etc.).

  4) Formally evaluating the interagency referral system.

  5) Reviewing the Illicit Connection and Illegal Dumping tracking system to identify necessary modifications or improvements in data collection or reporting methods.

Table 5 - Field Investigation Implementation Schedule

The Field Investigation Implementation Schedule below pertains to high, medium and low priority area field investigations. The schedule is a model that may be used by Co-permittees to document priority area field investigations. This model is not intended to be an exclusive template, but rather to provide a simple format Co-permittees may choose to utilize or modify.

The schedule is designed to be based on historical field investigation data and the results of the tracking system for priority area field investigations described in the performance standard. The outfall description and corresponding sector, investigation frequency and total number(s) of outfall investigations for high, medium and low priority areas for a given fiscal year are identified in the Table below. This schedule should be evaluated annually to determine modifications to outfall priorities and to determine appropriate frequencies for repeat investigations.

Priority	Investigation Frequency	Repeat Investigation	Source	Outfall Description	Total (s)
High	AD*	AD*			
				Total Outfalls	
Medium	AD*	AD*			
				Total Outfalls	
Low	AD*	*AD			
				Total Outfalls	

AD* At Agency's Discretion

SECTION 2

Legal Authority to Implement

Performance Standard and Supporting Documents for
Illicit Connection & Illegal Dumping Elimination Activities

Section 2
LEGAL AUTHORITY TO IMPLEMENT

This section contains a demonstration that the Co-permittee has the legal authority to implement the performance standard. Each Co-permittee should provide citations for, or excerpts from, documents that demonstrate adequate legal authority, and/or provide a time schedule for developing and obtaining additional authority. Required areas of authority may include, but are not limited to, the following:

- Authority to prohibit illicit discharges to the municipality's storm drain system.
- Authority to control discharges to the municipality's storm drain system which result from spills, dumping or disposal of substances other than storm water.
- Authority to conduct inspections, surveillance and monitoring of discharges into the municipality's storm drain system.

(Full documents do not need to be included within this performance standard, but should be available upon request by the Regional Board.)

SECTION 3

Work Plan BMPs and Control Measures

Performance Standard and Supporting Documents for
Illicit Connection & Illegal Dumping Elimination Activities

Section 3
WORK PLAN BMPs AND CONTROL MEASURES

This section contains the best management practices and control measures that will be used as a standard for compliance in the implementation of the performance standard. Best management practices, as determined by the Co-permittee, should be available to the responsible personnel.

Example BMP's and Control Measures (outlined in the following documents)

- *Manual for the Investigation and Elimination of Illegal Dumping*, Woodward Clyde Consultants, February 1991.
- *Methods for Conducting Illicit Connection Programs*, Woodward Clyde Consultants, January 1991.
- *NPDES Storm Water Sampling Guidance Document*, Environmental Protection Agency, July 1992.

SECTION 4

Standard Operating Procedures

Performance Standard and Supporting Documents for
Illicit Connection & Illegal Dumping Elimination Activities

Section 4

STANDARD OPERATING PROCEDURES

This section contains the Co-permittee's standard operating procedures for implementation of the performance standard.

Example Contents

- Enforcement Procedures/Response Plan (may include coordination with city/county/district attorney, etc.)
- Documentation and/or Record Keeping Methods
- Staff Training: determine method(s) - internal, conferences, Program generated, etc.
- Public Information and Participation Procedures - determine methods, materials and distribution.
- Complaint Referral Procedures
- Incident Response Procedures

INDUSTRIAL COMMERCIAL DISCHARGER CONTROL PROGRAM

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

INDUSTRIAL/COMMERCIAL DISCHARGER CONTROL PROGRAM PERFORMANCE STANDARD

Revised February 17, 2005

Participating Agencies:

Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

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PART I

Introduction

Performance Standard and Supporting Documents

for the

Industrial/Commercial Discharger Control Program

Revised February 17, 2005

Introduction

Performance standards define control measures or levels of achievement for particular tasks carried out by all Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) Co-permittees. Control measures are described in the Program's 2004 Urban Runoff Management Plan (URMP), which details what the Program is doing to reduce urban runoff pollution in the Santa Clara Valley watershed. The development and implementation of performance standards is an integral part of the Program's URMP.

The components contained herein constitute the revised Industrial/Commercial Discharger Control Program Performance Standard.

The goal of industrial and commercial discharger control measures is to reduce or eliminate adverse water quality impacts from activities conducted at selected industrial and commercial sites. The Industrial/Commercial Discharger Control (IND) Performance Standard defines the level of implementation that Co-permittees must attain to demonstrate their IND activities reduce pollutants to the maximum extent practicable.

The performance standard for IND is based on current and proposed practices that municipal agencies are and/or will be implementing to minimize water quality impacts; and practices that are accepted by the State and Regional Board as being effective in controlling these impacts. The performance standard is also consistent with the goals and objectives of the Program's Urban Runoff Management Plan and is intended to work parallel with the State's General Industrial Permit.

PART II

Performance Standard

Performance Standard and Supporting Documents for the Industrial Commercial Discharger Control Program

MODEL PERFORMANCE STANDARD
(Revised February 17, 2005)

A. INSPECTION CATEGORIES AND FREQUENCIES

Industrial and commercial facilities covered under the Industrial Commercial Discharger Control Program may be described using one or more of the following facility inspection categories: Notice of Intent (NOI) Filers and Program-wide Facilities. The Program-wide Facilities category includes additional facilities not limited to those industrial sites required to obtain coverage under the State's Industrial Stormwater NPDES General Permit. The Program-wide Facilities category was also developed to include facilities typically inspected by Co-permittees and to ensure standardized reporting of facility inspections. Inspection frequencies, which are provided for each category, may vary between Co-permittees, depending on the types of businesses and potential threats of stormwater pollution occurring in each jurisdictional area. In addition, each Co-permittee has assigned an inspection frequency for each industrial and commercial category within their jurisdictional area. Inspection frequencies for certain categories are included in Co-permittee Management Plans, Work Plans, and/or Annual Reports.

1. Notice of Intent (NOI) Filers

NOI filers are those facilities that have filed an NOI with the State and appear on a list provided by the State. The following shall be accomplished for all NOI filers and facilities with individual NPDES permits for storm water discharge:

- A complete initial storm water inspection shall be performed within one (1) year of beginning implementation of this Performance Standard.
- At the beginning of each fiscal year the lists of NOI filers shall be reviewed and revised as needed.
- Any facility that files an NOI after the date that the jurisdictional Co-permittee begins implementation of this performance standard shall undergo its initial inspection within one (1) year of filing report received by Co-permittees.
- During the initial inspection, it will be verified that the facility has submitted an NOI.
- NOI filers who have undergone their initial inspection shall have an inspection frequency of no less than once in five (5) years. However, the inspection frequency can be reduced for sites that demonstrate a history of compliance or exhibit little threat to water quality.
- Inspection frequency should be increased (greater than once in five (5) years) for sites

that demonstrate non-compliance, or exhibit significant threat to water quality.

2. Program–wide Facilities

Program-wide facilities (Table 1) have a potential to be a source of pollutants to storm water. This category includes seventeen descriptive facility types typically inspected by the Co-permittees. To ensure standardized reporting of inspections, facility types described as NOI Filers are also included within this category. The program-wide facility type described as "Other" is provided to include miscellaneous industries that are less significant or less probable sources of stormwater pollution. Each program-wide facility category was developed in accordance with the Program's Enhanced Annual Reporting Requirements for the Industrial/Commercial Discharger Control Program (Permit Provision C.6.a.i). Each category is also described in the *Continuous Improvement of Industrial Reporting* Technical Memorandum dated September 7, 2001. Program-wide facilities that are not NOI Filers are inspected no less than once every five (5) years. Program-wide facilities that are NOI filers shall be inspected within one (1) year of filing report received by Co-permittees. However, the inspection frequency for Program-wide facilities can be reduced for sites that demonstrate a history of compliance or exhibit little threat to water quality. Inspection frequency should be increased (greater than once in five (5) years) for sites that demonstrate non-compliance, or exhibit significant threat to water quality.

TABLE 1 - Program–wide Facilities

Facility Category	Description
• Automotive	Automotive sales, engine and body repair, gas stations, car washes, parking, vehicle services
• Food Service	Eating and drinking establishments, including cafeterias, delis, bakeries, mobile food
• Paint Facilities	Manufacturing and retailing
• Dry Cleaners	Dry cleaners
• Cleaning Services	Mobile washers, building cleaning, carpet cleaning
• Pesticide Facilities	Manufacturing and retailing; pesticide applicators
• Machine Shops	Industrial machinery and equipment
• Metal Manufacturing	Metal fabricating, finishing, plating, metal work (40 CFR 413, 433)
• Electric/Electrical Components	Manufacturing (40 CFR 469)
• Construction/Building	Retail, trade contractors, construction, landscape and garden businesses
• Local Transit; Highway Transport	Electric, Gas and Sanitary Services, Trucking Industries
• Recycling yards	Recycling yards
• Auto Dismantlers	Auto Dismantlers
• Concrete/Stone/Clay Products	Concrete/Stone/Clay Products
• Corporation Yards	Corporation Yards
• Landfills	Landfills
• Other	Other

Other may include:

- Photographic/Printing
- Laboratories
- Medical and Dental Labs
- Chiropractors
- Radiologists
- Veterinarians
- Plastics manufacturing
- Pharmaceuticals manufacturing
- Cabinetry
- Wood furniture
- Commercial Areas
- Winery
- Florist
- Jewelry/Precious Metal manufacturing
- Miscellaneous Manufacturing
- Storage
- Welding/Iron Works
- Amusement Parks
- Laundries
- Hazardous Waste
- Underground Storage Tanks

B. GENERAL ADMINISTRATION

- All facilities addressed by this Performance Standard will be inspected to determine the existence of discharges or threatened discharges that are illegal under local ordinances.
- For any Storm Water Infiltration Devices (SWIDs) discovered, a SWID notification card will be completed. One copy will be submitted to the Santa Clara Valley Water District's Water Quality Unit.
- Facilities will be inspected to determine compliance with local municipal storm water ordinances. The facility operator will be notified of observed areas of concern; official action on violations will take place under local authority.
- Significant problems that cannot be addressed promptly and fully under local authority shall be referred to the Regional Board or other appropriate agency.
- Best Management Practices (BMP) information will be distributed to those facilities that do not already have them at the time of the inspection. These BMP documents include the Santa Clara Valley Urban Runoff Pollution Prevention Program literature for: Industrial Facilities, Construction, Food Service Facilities and Automotive Facilities will be distributed as appropriate depending on the type of facility inspected.
- Internal summaries of the type and number of violations reported, and the type of facilities with reported violations, will be reviewed annually. Recommendations for updates to the standard list of violations on the Inspection Checklist, or possible Program-wide focus for facility type or violation type, will be made as needed.

C. ENFORCEMENT

- When non-compliance is observed, educate facility operators/owners on the impacts of their actions, explain the storm water requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Certain violations may warrant immediate mitigation and/or enforcement actions. Each Co-permittee will follow its enforcement plan to determine the level of enforcement for issues identified during inspections.
- If a specific problem is identified during an inspection, provide information on corrective actions and provide either verbal or written warnings to the facility owner and expected dates to correct the problem.
- If compliance has not been achieved upon re-inspection, initiate formal enforcement procedures (e.g., Compliance Order, Notice to Comply or Compliance Directive). Conduct follow-up inspections to evaluate progress towards compliance.
- If compliance has not been achieved upon a second re-inspection, enforcement actions should be taken. Enforcement actions can include a Compliance Agreement or Administrative Citation, which may include fines and/or court action.

D. RECORD KEEPING/ REPORTING

- Document and report IND inspections annually using one of the descriptive categories provided within Tables 1 and 2[1]. The categories provided in each tables relate to the facility category and enforcement actions for each IND inspection. A category from each table will be assigned to document the each IND inspection.
- IND inspections will be documented by, and the documentation maintained in the files of, the local agency or its contractor. The standard Santa Clara Urban Runoff Industrial/Commercial Inspection Checklist (see Reporting Form on page 8) or an inspection reporting form developed by a Co-permittee that contains all of the elements in the standard incident reporting form, will be used by all local agencies
- If actual non-compliance or threatened non-compliance is noted during an inspection, the nature of the follow-up, through resolution of the noted issues, up to and including the enforcement action will be reported annually.
- Submit IND inspection results to the Regional Board within Annual Reports.
- Provide IND inspection results (within an electronic format) to Program staff for inclusion in SCVURPPP Annual Report (see below).
- Provide IND effectiveness evaluation results in Annual Reports.

IND Inspection Data for SCVURPPP Annual Report

To facilitate the continuous improvement of industrial facility inspection reporting on a Program-wide level, each Co-permittee will routinely submit raw IND inspection data (within an electronic format) to Program staff during each fiscal year. The procedures and schedule for submitting raw IND inspection data will be provided to Co-permittees each November.

Once received within an electronic format, Program staff will analyze all categories to ensure that they are reported in accordance with the categories provided in the IND technical memoranda. Once all reported data is linked to the appropriate category, Program staff will produce a summary report detailing all IND information for the Program. Individual reports detailing individual Co-permittee IND inspection information will be developed for each Co-permittee.

[1] Reporting requirements and categories are also described in the *Continuous Improvement of Industrial Reporting* Technical Memorandum dated September 7, 2001.

The following levels of enforcement shall be reported by municipalities against non-compliant facilities:

Table 2 – IND Enforcement Actions

Level 1 – (Warning)
Verbal and/or written notice to facility owner/operator identifying the problem and providing information on corrective actions. A time frame to correct the problem should be specified based on the severity and/or complexity of the problem.
Level 2 - (Administrative Actions):
Issuance of Compliance Order, Notice to Comply or Compliance Directive, or other similar notification outlined in the municipality's storm water ordinance that identifies a problem, requires correction or abatement but does not assess fines. A time frame to correct the problem should be specified based on the severity and/or complexity of the problem. This category is more descriptive and provides steps conducted prior to assessing fines.
Level 3 - (Enforcement Actions):
Administrative and/or civil actions that may include fines or require the facility to resolve the matter in the court system. Level 3 may include the following categories: administrative citations with monetary fines and referral for legal action. Level 3 is the highest level of enforcement.
No Action:
Facilities observed to be in compliance with storm water ordinances and/or current and proposed practices implemented to minimize water quality impacts.

Santa Clara Valley Urban Runoff Industrial/Commercial Inspection Checklist

Date: _____ Time: _____

Agency or Department: _____

Inspector(s): _____

I. FACILITY INFORMATION

1. Facility Name: _____

2. Address: _____

3. Responsible Party: _____ 4. Phone: _____

5. Notice of Intent (NOI) has been submitted: Yes ☐ No ☐ N/A ☐

6. **Describe the Facility Type:**

- ☐ Automotive
- ☐ Food Service
- ☐ Paint Facilities
- ☐ Dry Cleaners
- ☐ Cleaning Services
- ☐ Pesticide Facilities
- ☐ Machine Shops
- ☐ Metal Manufacturing
- ☐ Electric/Electrical Components
- ☐ Construction/Building
- ☐ Local Transit/Highway Transport
- ☐ Recycling Yards
- ☐ Auto Dismantlers
- ☐ Concrete/Stone/Clay Products
- ☐ Corporation Yards
- ☐ Landfills
- ☐ Other* _____

☐ **No Violations Observed**

II. ENFORCEMENT ACTIONS

1. **Describe Enforcement Action** (Definitions on Back).

- ☐ No Action
- ☐ Level 1 (Warnings)
- ☐ Level 2 (Administrative Actions)
- ☐ Level 3 (Enforcement Actions)

III. COMMENTS/RECOMMENDATIONS/REFERRALS

_____

_____

_____

Inspector(s): _____

Received by: _____

PART III

Guidance for Support Documents

SECTION 1

Work Plan/Implementation Schedule

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 1
WORK PLAN IMPLEMENTATION

This section contains the plan or activities to be conducted to enable the Co-permittee to implement the performance standard along with an implementation schedule. The work plan will be developed by each Co-permittee based on its responsibility to conduct industrial/commercial discharger control activities within its jurisdiction.

Example Contents of the Work Plan

- Steps needed to incorporate the implementation of the performance standard.
- Obtain legal authority for inspection and enforcement (if necessary).
- Facilities to be inspected and inspection frequency
- Develop inspection program for a new category of discharger.
- Develop agreements with other agencies to conduct facility inspections (e.g., Health Department).
- Develop referral and complaint response protocols.
- Develop documentation and record keeping tools.
- Develop a training program for inspectors and field personnel.
- Conduct workshops for inspectors or the regulated community.
- Develop and/or distribute public information.
- Develop an inspection checklist.
- Incorporate BMPs (included in section 3) and other control measures into facility inspections.
- Develop program evaluations (may include):
    1. Reviewing the industrial/commercial facility tracking system to assess the effectiveness of data collection, the inspection reporting format and identification of facilities to be inspected.
    2. Verifying the frequency requirements for facility inspections outlined in the current performance standard.
    3. Identifying other facilities or activities related to industrial/commercial storm water discharge(s) not addressed in the current performance standard that require attention.
    4. Obtaining and reviewing feedback on the Industrial/Commercial Discharger Control Program from: 1) citizen reports 2) inspections 3) workshops for inspectors.
    5. Documenting recommended modifications to the performance standard.
    6. Reviewing data for the purposes of evaluating compliance and opportunities for Program improvement.
- Submit industrial/commercial facility data to Program staff.

SECTION 2

Legal Authority to Implement

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 2
Legal Authority to Implement

This section contains a demonstration that the Co-permittee has the legal authority to implement the performance standard. Each Co-permittee should provide citations for, or excerpts from, documents that demonstrate adequate legal authority, and/or provide a time schedule for developing and obtaining additional authority. Required areas of authority may include, but are not limited to, the following:

- Authority to control quantity and quality of discharges from industrial activities that enter the municipality's storm drain system.
- Authority to prohibit illicit discharges to the municipality's storm drain system.
- Authority to control discharges to the municipality's storm drain system which result from spills, dumping or disposal of substances other than storm water.
- Authority to conduct inspections, surveillance and monitoring of discharges into the municipality's storm drain system.

(Full documents do not need to be included within this performance standard, but should be available upon request by the Regional Board.)

SECTION 3

Best Management Practices and Other Control Measures

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 3
WORK PLAN BMPs AND CONTROL MEASURES

The purpose of best management practices for a commercial and industrial discharger control program is to eliminate or reduce adverse water quality impacts from activities commonly conducted at commercial and industrial sites. This section contains a list of model best management practices to be used as guidance by Co-permittees in conducting commercial and industrial facility inspections.

The model BMPs are grouped into four areas: general facility information, indoor activities, outdoor activities and equipment. These areas correspond to each element in the standard Santa Clara Valley Urban Runoff Facility Inspection Checklist (see part II). Note: BMPs were developed by Co-permittees through the Industrial/Commercial Subcommittee.

I. General Facility Information

A. Notice of Intent (NOI)
   1) Determine whether an NOI for coverage under the State's General Permit has been submitted (if required).
   2) Make visual verification of NOI.
   3) If NOI has not been filed, but is required, advise facility to contact RWQCB.

B. Storm Water Pollution Prevention Plan and Storm Water Monitoring Plan
   1) If NOI has been filed, a visual verification of a Storm Water Pollution Prevention Plan (SWPPP) and a Storm Water Monitoring Plan will be conducted.
   2) If SWPPP and SWMP are required, but not on site, advise facility to contact the RWQCB regarding NPDES requirements.

C. Best Management Practices (BMPs)
   1) Distribute appropriate BMP brochures to all inspected industrial and commercial facilities.

II. Indoor Activities

A. Floor Cleaning
   1) Verify where all floor cleaning water, wax and unused stripper is disposed of. Advise facility staff on proper disposal of unused products.
   2) Make visual inspection of all drains and sinks. Look for signs of improper disposal of waste liquids.
   3) Verify waste liquids from automated floor cleaning equipment holding tanks are discharged to the sanitary sewer.

B. Indoor Equipment Cleaning
   1) Wastewater from cleaning equipment should be discharged to the sanitary sewer (within local POTW discharge limits) or recycled. The facility should consult with the POTW or manage wastewater as a hazardous waste.

C. Indoor Manufacturing, Residues and Spills
   1) Ensure proper cleaning and disposal methods are performed for interior spills and leaks. Proper disposal methods depend on the type of substance. If hazardous material is spilled, the facility should refer the incident to the local hazardous material agency.
   2) Verify appropriate absorbent materials are kept readily accessible and designated employees are trained on proper spill response techniques.
   3) Ensure proper control of process residues and dust near exterior doorways (e.g., recommend relocating machinery and improving housekeeping).
   4) Verify proper connection of interior floor drains (e.g., review plumbing schematics, conduct a dye test). All interior floor drains and sumps should be plumbed to the sanitary sewer or closed loop treatment system.

III. Outdoor Activities

A. Vehicle and Equipment Fuel Dispensing Areas
   (Note: Some items in this section are the responsibility of the local hazardous materials or fire prevention agency. Refer to appropriate enforcement agencies as needed).
   1) Determine whether any fuel dispensing equipment is exposed to storm water and/or whether fueling or the transfer of any chemical from one vessel or another is conducted near a storm drain. If so:
      a) Verify the dewatering procedures for the secondary containment areas that surround fuel tank farms or other fuel storage equipment.
      b) Ensure a method is in effect to protect all adjacent storm drains in the event of a spill.
      c) Ensure absorbent material and booms are readily at hand.

B. Vehicle and Equipment Washing
   1) Verify floor mat and equipment screen/filter cleaning is not conducted in a location that may adversely impact a storm drain.
   2) All vehicle and equipment rinse water should be discharged, with proper approval, into a sanitary sewer drain. All wastewater resulting from power washing of contaminated surfaces may be subject to some type of pretreatment prior to entering the sanitary sewer.
   3) Recommend wash water be recycled in a closed loop system.

C. Vehicle and Equipment Maintenance
   1) If vehicles are maintained on site, ensure there are no associated impacts to any storm drains.
   2) If leaks or drips occur under vehicles, drip pans should be placed under the vehicles.
   3) If applicable, inspect all outdoor drains and suspicious indoor drains in the vehicle maintenance area. Conduct dye tests to verify proper connections.
   4) If specialized equipment (forklifts, fifth wheels, etc.) is maintained on site, ensure wash water used to clean equipment is not disposed to the storm drain directly or indirectly.

D. Material Storage
   1) Determine whether raw materials and their by-products are exposed to rain water. Ensure loose materials are stored under cover or in bermed areas if possible.

2) If raw materials and their by-products are transferred from one place to another in or adjacent to any storm drain, or in such a manner to impact the storm drain, recommend placing protective covers or similar devices over storm drains and improving housekeeping in these areas.

E. Waste Storage

(Note: In cases where hazardous materials or hazardous waste storage pose a threat to the storm drain, the facility should consult with the local hazardous materials/waste enforcement agency).

1) Determine whether the facility stores or disposes of hazardous materials, hazardous wastes, or any other substances on site.
2) Verify if rainwater can enter any double contained areas and how these areas are drained once rainwater comes into contact with these materials. The facility should consult with the local hazardous materials enforcement agency and POTW.
3) Determine whether the transfer of hazardous materials, waste or non-hazardous substances may potentially impact the storm drain. If non-hazardous substances are involved:
   a) Recommend good housekeeping measures.
   b) Recommend the facility protect storm drains by relocating substance to a covered area.
   c) Recommend the facility berm or cover substance(s) or install an approved protective device at storm drain inlets.
4) If there are any storm drains adjacent to any storage areas, request that the facility effect a method to monitor and protect storm drain inlet from accidental discharge.

F. General Construction Activities

1) Facilities are responsible to advise and require contractors to protect storm drains.
2) Advise facility that if 5 acres or more are disturbed, a general construction permit (NPDES) is required.
3) If construction activities are current, determine if there is a potential for soil to erode into the storm drain by rain or irrigation run-off. If so:
   a) Recommend installing filter fabrics in combination with swales or berms to protect storm drain inlets.
   b) Recommend erosion control techniques.
4) Verify construction workers are not washing tools and/or equipment adjacent to any storm drains.
   a) Recommend that the facility incorporate storm control verbage into all contracts.
   b) Recommend that the facility provide an employee training program.
5) Verify construction materials are <u>not</u> being disposed in the storm drain directly or indirectly. Construction debris and materials such as paint, mineral spirits, drywall compounds, adhesives and other solvents should be properly disposed of. If a material is a hazardous waste, the facility should refer to the appropriate agency.

G. Power Washing

1) Recommend dry methods of clean-up.
2) If power washing must be used, the facility should refer to the proper procedures in the Bay Area Storm Water Management Agencies Association's "Pollution From Surface Cleaning."

H. Outdoor Equipment Storage
   1) Inspect all scrap yards, vehicle storage lots or areas where retired/surplus equipment is stored. Determine where storm drains are in relation to these areas.
      a) The facility should cover oily and soiled equipment with a leak proof cover.
      b) The facility should drain all automotive related fluids prior to storage, and dispose of properly.
      c) Drip pans should be placed under leaky equipment.

I. Process Residues
   1) Determine if any manufacturing process that creates any residue is conducted outdoors and whether this residue can impact the storm drain.
      a) The facility should ensure good housekeeping.
      b) Recommend conducting manufacturing processes in a covered location.
      c) Recommend protection of adjacent storm drains.

J. General Housekeeping
   1) Determine the general overall condition of the facility. Is housekeeping conducted on a consistent basis? Are there accumulations of debris, refuse or litter? Make necessary recommendations.
   2) Recommend a training program addressing good housekeeping practices.

K. Irrigation and Landscape
   1) Determine if landscape contractors are properly disposing of lawn clippings and other vegetative wastes.
   2) Inspect storm drains for vegetative wastes.
   3) Ensure temporary protection of all impacted storm drain inlets while conducting landscape activities.
   4) Inspect paving around landscaping to see if sprinklers are over watering and causing undue erosion and runoff of associated chemicals. If, so have facility representative adjust irrigation timers or sprinkler heads.
   5) Determine whether pesticides, herbicides or fertilizers are applied to the landscaping; identify how much and how often. Refer all pesticide/herbicide application problems to the Santa Clara County Agriculture Department.
   6) Verify landscape equipment is washed properly and away from paved areas or storm drain. The facility should filter wash water and discharge to sanitary sewer (if within POTW limits).

IV. Equipment

A. Air Compressors
   1) Inspect air compressor units that are exposed to storm water for residual grease on the tank or motor surface.
   2) Air compressors should be located in a covered area.
   3) Request air compressor leaks be repaired.
   4) Inspect area beneath air compressor bleed line and determine if any oily substance is being released which could impact the storm drain. If so, place a catch pan below he bleed off valve and dispose of water from pan on a regular basis.

B. HVAC, Chillers and Refrigerators
   1) Determine whether air conditioning units (generally found on roof) and chillers have a condensate line that is plumbed to a roof storm drain.
      a) For existing buildings, non-contaminated discharge can go to the storm drain.

b) For new development or building remodels, the discharge should go to the sanitary sewer. Consult with local planning/building department.

2) Determine whether air conditioning and chiller units are treated with descaling or anti-algae agent. Facility representatives are responsible to direct HVAC contractor to properly dispose of all flushing agent residues and by-pass condensate line while flushing unit.
3) Determine whether HVAC condenser tubes are annually flushed with any type of chemical by a servicing contractor and how wastewater is disposed of. The runoff from the tube cleaning must be captured and properly disposed of.
4) Determine whether any of the units are power washed. If so, refer to proper procedures in the Bay Area Storm Water Management Agencies Association's "Pollution From Surface Cleaning".
5) Determine whether defrost water or condensate is discharged. The facility representative is responsible to ensure defrost water does not come into contact with any pollutants directly or indirectly.
6) Determine how waste compressor oil from chillers is disposed of. The facility should contact the local hazardous waste enforcement agency regarding proper disposal.

C. Air Scrubbers
1) Determine whether particulate from air scrubbers is deposited on any surface in a manner that may impact the storm drain.
2) Advise the facility representative to repair air scrubbers and remove any debris. If feasible, a protective catch pan should be placed around the scrubber.
3) Refer any fall out violations to the Bay Area Air Quality Management District.
4) Inspect the discharge point of any wet scrubber. Wet scrubbers must discharge to the sanitary sewer.

D. Basement Sump Pumps
1) If the facility has a basement parking lot, verify rainwater drains to a storm drain.
2) Inspect the bottom of the storm drain sump drain and determine the method of cleaning.
3) Advise the facility representative that only rainwater can be pumped into the storm drain. Any debris surrounding or inside the sump should be removed. A screen mesh or filter fabric may be installed on the sump grate to assist in protecting sump from particulate debris (if it will not cause a flood hazard). The facility should consult the appropriate agency regarding proper disposal of sump debris.
4) Determine whether automotive fluid spills and/or drips are cleaned with appropriate absorbent.
5) Determine whether cars are washed in the basement parking lot. This should include mobile auto detailers.
6) Advise the facility representative that all floor cleaning contractors must protect the storm drain system from accidental discharge.

E. Boilers
1) Determine whether the blow line or tank drain line is located adjacent to any storm drain inlet or channel, directly or indirectly. All treated boiler discharge must be discharged to the sanitary sewer or recycled/reused in an approved closed loop system.

2) Determine whether the boiler is treated with scaler or algicide and if any leakage is present. Discharge from boiler chemical additives may meet hazardous waste criteria. If so, the facility should refer to the local hazardous waste compliance agency for proper storage and disposal.
3) Determine whether the boiler vents to the roof. If so, determine whether vapor will recondense on the roof and make contact with storm water runoff. Advise facility representative to repair condensate pipe and redirect flow to sanitary sewer.

F. Facility Catch Basins
1) Inspect all catch basins and drop inlets for debris or other foreign material and have the facility clean or remove debris regularly.
2) Identify all storm drains with stencil: "Do Not Dump- Flows to Bay"

G. Refuse Dumpster and Compactor
1) Advise the facility to keep dumpster lids closed when not in use and/or exchange bins without lids.
2) The facility should relocate dumpsters and bins away from storm drains.
3) Contaminated rainwater that has accumulated from an open container must be discharged to the sanitary sewer (if within POTW limits).
4) Verify plugs are installed on dumpsters and are not leaking. If so, the facility should install plugs or exchange dumpsters.
5) Verify compactor leachate or associated hydraulic fluid does not leak into or adjacent to any storm drain or onto the pavement. If so, the facility should protect the storm drain, repair the compactor, absorb leaked material, and discharge absorbent in compactor. Liquid can also be discharged to the sanitary sewer, if within POTW limits.

H. Cooling Tower
1) All cooling tower discharges must be directed to the sanitary sewer.
2) Cooling tower chemicals should not be stored adjacent to any storm drain. Refer any chemical storage problems to the local hazardous waste enforcement agency. Also contact POTW.
3) Ensure proper disposal of washing detergents and/or muriatic acid (common cooling tower cleaner). The facility should contact the appropriate agency for proper disposal.

I. Emergency Showers
1) Verify emergency showers do not discharge to the storm drain sewer.

J. Filter Back flush
1) Back flushed or back washed equipment filters, including filters for pools and fountains, should discharge to the sanitary sewer. The facility should collect and dispose of solids into a refuse container.
2) Commercial and institutional swimming pool facilities should refer to the Santa Clara County Health Department, Consumer Protection Division for filter medium disposal issues

K. Grease Interceptor, Tallow Containers
1) Inspect the area around outdoor grease interceptor cover and verify rain water can not carry residual grease to the storm drain.
2) Advise facility representative to clean debris on a regular basis and clean the interceptor area after it is pumped by a septic hauler. Residual grease must be

collected or washed back into the interceptor.

3) Tallow bins must be stored in areas where they do not come into contact with storm water. Recommend a covered area for tallow bin storage.
4) Ensure a mechanism is in effect to protect storm drains if an interceptor overflows.
5) Replace or exchange bins, if necessary.

L. Ground Water Treatment Discharge
1) Determine whether ground water is being treated at the site and where it is discharged. Consult with RWQCB or SCVWD.
2) If ground water is discharged to the storm drain, verify an NPDES permit has been issued. If ground water is discharged to the sanitary sewer, verify POTW permit.

M. Ground Water Dewatering Devices
1) Determine if any groundwater is discharged from the site, and verify which sewer it connects to.
2) Uncontaminated groundwater infiltration need not be prohibited unless the discharge is identified by a public agency or the RWQCB as a source of pollutants to receiving waters.
3) If applicable, review spill control plan.
4) Determine whether pumped water comes into contact with any pollutants before water is discharged. Consult with RWQCB and SCVWD.

N. Loading Docks
1) Inspect all loading dock drains for potential pollutants, including truck fluid leaks.
2) Debris from catch basins should be removed on a regular basis.
3) Catch basin inlets should be protected from accidental spillage by placing absorbent booms or covers over drains or installing valved inlet inserts (if safe and feasible).
4) Advise local hazardous materials agency if materials that could impact the storm drain are loaded or transferred at the dock.
5) Dock wash water should be diverted to the sanitary sewer, (if within POTW limits) or a dry method of clean-up should be used.

O. Parking Lots
1) Inspect facility parking lots for excessive vehicle fluid leaks or spills. The facility should clean-up spills by (1) sweeping up particles and debris, (2) absorbing spills with rags or absorbent, (3) mopping area.

P. Ponds, Fountains and Pools
1) Overflow drains from ponds and decorative fountains must be discharged to the sanitary sewer or re-used for irrigation. This includes all pool filter backwash and associated debris.
2) The facility should consult with the local POTW if ponds or fountains are treated with copper-based algaecides (shock), growth inhibitors or other agents.
3) Ensure pond or fountain filters are not back flushed into a storm drain.

Q. Roof Vents and Equipment
1) Excessively greasy roof vents should be cleaned on a regular basis, especially during the wet season.
2) If feasible, catchment pans or trays should be installed at the base of the vents.
3) Duct work should be properly sealed and maintained.
4) If feasible, protective devices should be installed around storm drains.
5) Inspect roof for residual machinery process residues on roof (paper dust, sawdust,

steam condensate, paint, etc.). The facility should consult with the local hazardous material waste enforcement agency and the Bay Area Air Quality Management District for control measures.

R. Reverse Osmosis and Deionization Units.

1) Ensure reject water from reverse osmosis (R.O.) units, in no way impacts the storm drain. Reject water from R.O. unit should be diverted to the sanitary sewer. The facility should consult the local POTW for requirements.
2) Back flush water from deionization units should be discharged to the sanitary sewer. The facility should consult the local POTW for requirements.

References

California Storm Water BMP Industrial Handbook

Mobile Cleaner BMP, CETA

Machine Shop BMP, City of San Jose

Guidelines for Vehicle Service Facilities, Santa Clara Valley Nonpoint Source Program

Restaurant BMPs, Santa Clara Valley Nonpoint Source Program

Vehicle Service BMP, City of Sunnyvale

California Storm Water BMP Construction Handbook

BMPs for Industrial Storm Water Pollution Control, Santa Clara Valley Nonpoint Source Program

Pollution from Surface Cleaning BMPs, Bay Area Storm Water Management Agency Association

SECTION 4

Standard Operating Procedures

Performance Standard and Supporting Documents for the
Industrial/Commercial Discharger Control Program

Section 4
STANDARD OPERATING PROCEDURES

This section contains the Co-permittee's standard operating procedures for implementation of the performance standard.

Example Contents

- Enforcement Response Plan
- Documentation and/or Record Keeping Methods
- Staff Training
- Enforcement Procedures
- Public Information and Participation Distribution

PEST MANAGEMENT

Santa Clara Valley Urban Runoff Pollution Prevention Program

PUBLIC AGENCY ACTIVITIES

Performance Standard and Supporting Documents for

Pest Management

Participating Agencies:

Campbell, Cupertino, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

PART I

Introduction and Definitions

FINAL
PEST MANAGEMENT PERFORMANCE STANDARD and Guidance Documents[1]

INTRODUCTION

Purpose of Performance Standard

The goals of the Pest Management Performance Standard and the control measures herein are to: 1) minimize pesticide use, particularly organophosphate pesticides; and 2) reduce the amount of pesticides in storm water and landscape runoff. These control measures apply to pest management on municipally owned property performed by municipal employees and by commercial applicators that contract with the municipality. The control measures also include outreach to other users within the municipality's jurisdiction about less toxic pest control methods and proper disposal of pesticides.

The Pest Management Performance Standard defines the level of implementation that each municipal agency in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) will achieve to demonstrate that its pest management program controls the discharge of pesticides in runoff to the maximum extent practicable. This performance standard will be used as the basis for measuring the effectiveness of each municipal agency's pest management activities.

The Pest Management Performance Standard is based, primarily, on the requirements of Provision C.9.d. of the Program's municipal storm water NPDES permit reissued on February 21, 2001 (see Appendix A). The performance standard is also consistent with the goals and objectives of the Program's *Urban Runoff Management Plan (URMP, 1997, revised October 2000)*.

Permit Requirements Addressed by this Performance Standard

Permit Provision C.9.d. contains requirements pertaining to the use of pesticides within the jurisdictions of the Co-permittees. Some of these requirements will be addressed by activities at the Program level, as described in the Program's Pesticide Management Plan (July 1, 2001), and other requirements will be addressed by individual municipalities' activities at the local level, as described in the co-permittees' work plans.

This performance standard provides guidance to co-permittees in preparing individual pest management plans. Each plan will include activities to implement this performance standard, as well as participate in Program-wide activities as appropriate. Each plan will address municipal use of pesticides, and education and outreach on the use of pesticides by other sources within the municipality's jurisdiction. The plans will describe the Integrated Pest Management (IPM) practices that municipal agencies are, and/or

[1]Approved by SCVURPPP Management Committee 2/21/02.

will be, implementing to minimize pesticide use and water quality impacts from pesticides, and include additional elements per the permit provisions. Co-permittees will also participate and/or support Program staff participation in regional efforts to reduce pesticide use, such as those conducted by the Urban Pesticide Committee (UPC), the Bay Area Stormwater Management Agencies Association (BASMAA), and the Stormwater Quality Task Force (SWQTF).

The permit also requires mechanisms to discourage pesticide use at new development sites by encouraging pest-resistant landscaping, minimization of impervious surface and other design strategies, and education of individuals who perform design and environmental reviews. This requirement will be incorporated into the Planning Procedures Performance Standard, which will be revised subsequent to adoption of revised language for permit Provision C.3. (expected July 2001).

Approach for Addressing Other Pesticide Users

Other pesticide users within the Program's geographic area, but not within the jurisdiction of municipal agencies to regulate include: residential users, commercial applicators hired by private or non-municipal entities, landscape gardeners, special districts (such as vector control and open space districts) and school district staff. Because municipalities have limited authority with respect to these users, the municipal agencies' role for control of pesticide use by these groups will be to provide education and outreach about municipal IPM policies, less-toxic pest control methods, and proper pesticide disposal. Commercial applicators contracted by municipalities for application of pesticides on municipal property can be required to follow the municipalities' IPM policies through contractual agreements.

Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Coordination with Pesticide Regulating Agencies

There are three State and County agencies that regulate the application of pesticides: the State Department of Pesticide Regulation, the Structural Pest Control Board, and the County Agricultural Commission. The roles of these agencies in the licensing and training of pesticide applicators and the monitoring of their activities (i.e., reporting requirements) are described in Appendix B. Co-permittee pest management plans will include recognition of and coordination with the responsibilities and activities of these agencies

Definitions

Pesticides: Section 12753 of the California Food and Agricultural Code defines a pesticide as any spray adjuvant, or any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, as defined in Section 12754.5 (of the Food and Agricultural Code), which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environmental whatsoever.

Pesticides That Cause Impairment of Surface Waters: These are defined as either:

1) pesticides identified on the Clean Water Act's 303(d) list of impaired water bodies in Santa Clara Valley (including the lower South San Francisco Bay); or
2) any additional pesticides identified by the Co-permittees or the Regional Board as causes of water quality impairment in Santa Clara Valley (including the lower South San Francisco Bay) based on scientific evidence obtained from local monitoring and toxicity studies.

Integrated Pest Management (IPM): IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.[2]

Production Agriculture
Production agriculture sites, as defined by the DPR, are sites where crops or livestock are grown.

Non-Production Agriculture
Non-production agriculture sites, as defined by the DPR, are sites on which pesticide use is regulated by the DPR and include areas such as, but not limited to, cemeteries, parks, golf courses, and rights-of-way.

LD_{50}
The concentration of a toxic chemical which is a lethal dose to 50 percent of a population of organisms exposed to it.

[2] Definition from the University of California Statewide Integrated Pest Management Project.

PART II

Performance Standard

PERFORMANCE STANDARD

Overall Plan

1. Each municipal agency will develop and implement a Pest Management Plan to minimize pesticide use and reduce the amount of pesticides in storm water and landscape runoff to the maximum extent practicable.

Legal Authority

2. Each municipal agency will adopt an Integrated Pest Management (IPM) policy and/or ordinance requiring:
   a. the use of IPM techniques in the agency's operations;
   b. minimization of pesticide use, particularly organophosphate and copper-based pesticides, by agency staff and contractors;
   c. the use of organophosphate and copper-based pesticides only when their use is justified and adverse water quality impacts are minimized; and
   d. the reduction, phase-out, and ultimate elimination of the use of pesticides that cause impairment of surface waters.

Procedures for Municipal Staff

3. Each municipal agency will develop and implement standard operating procedures (SOPs) and best management practices (BMPs) for implementing the IPM Policy.

4. Each municipal agency will provide outreach to its employees regarding its IPM policy and goals;

5. Each municipal agency will ensure that employees receive appropriate pest management training by implementing the following:
   a. Employees who apply pesticides for the agency will obtain the appropriate training as required by the County Agricultural Commissioner and the State Department of Pesticide Regulation (DPR);
   b. Employees within departments responsible for pesticide application will receive annual training on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques;
   c. Employees who are not authorized and trained to apply pesticides will be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace, consistent with the IPM Policy.

Procedures for Contractors

6. Each municipal agency will develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities will require contractors to:
   a. Follow the agency's IPM policy, SOPs, and BMPs;
   b. Provide evidence to the agency of having received training on current IPM techniques when feasible;
   c. Provide documentation of pesticide use on agency property to the agency in a timely manner.

Outreach to Other Users

7. Each municipal agency will identify in its annual work plan outreach activities it will conduct consistent with the Program's Pesticide Management Plan. Work plan elements will address outreach to the following target audiences:
   a. residential pesticide users;
   b. professional pest control businesses;
   c. customers of professional pest control businesses;
   d. pesticide retailers;
   e. school districts; and
   f. other special districts.

   Information will be provided on less-toxic pest control practices, proper disposal of pesticides, and the agency's own IPM practices, as applicable.

8. Each municipal agency will coordinate with household hazardous waste (HHW) collection agencies to support, enhance, and help publicize programs for proper pesticide disposal.

Evaluation and Reporting

9. Each municipal agency will develop and implement a process for tracking and reporting pesticide use on municipally-owned property to the maximum extent practicable. The highest priority for tracking and reporting will be organophosphate pesticides and other pesticides impairing water quality. Co-permittees will strive, over time, to resolve difficulties associated with reporting use by contractors and lease holders, and other data collection limitations. The results will be reported in the annual report.
10. Each municipal agency will conduct a periodic agency-wide search of its chemical inventory for pesticides no longer legal for application per EPA, State, and/or local requirements. These pesticides, if found, will be properly disposed pursuant to appropriate waste disposal regulations.
11. As part of the annual reporting process, each municipal agency will review and evaluate, with input from municipal staff, the effectiveness of its Pest Management

Plan and IPM Policy in achieving the goals of the Plan to the maximum extent practicable.

PART III

Guidance for Support Documents

Attachment 1

Work Plan Guidance

Attachment 1
PEST MANAGEMENT WORK PLAN GUIDANCE

Contents of Work Plans

Recommended elements of Co-permittee work plans include the following:

Inventory/Program Assessment

- Determine whether your agency has an IPM policy, ordinance, or procedures, and the actions necessary to revise and/or formalize the policy/ordinance/procedures to comply with this performance standard.
- Inventory the pesticide use by your agency:
  - which departments are responsible for pest management;
  - the level of training/certification of department employees (i.e., number of pest control advisors, qualified applicators, and pesticide workers on staff; see Appendix B);
  - where (in general) do the responsible departments conduct pest management and apply pesticides if needed;
  - what pest control services are contracted out;
  - where pesticides are stored;
  - if and when organophosphate pesticides (particularly diazinon and chlorpyrifos) are used;
  - whether other municipal staff using over-the-counter pesticides in the work place
  - what training is currently provided by your agency and whether IPM training included.

Development of Pest Management Plan

- Revise and/or formalize IPM policy/ordinance/procedures as needed
- Develop pest specific and/or site specific SOPs incorporating input from field personnel
- Develop SOPs and BMPs for implementing the IPM policy/ordinance/procedures
- Revise standard conditions for pest control contracts to reflect IPM policy/ordinance/procedures
- Assess training requirements by department and develop in-house training programs
- Determine method of “awareness training” for employees not authorized to apply pesticides

- Develop a process for obtaining reports on pesticide use by authorized employees and providing summary reports to the Regional Board (see pilot reporting process below)
- Develop a process for a periodic chemical inventory review.
- Develop a process for annual review and evaluation of the Pest Management Plan

Development of Outreach Plan

- Review Program's Pesticide Management Plan for activities at the Program level.
- Develop work plan for specific local outreach activities to address residential and other target audiences as appropriate.
- Coordinate with household hazardous waste (HHW) collection agencies to identify ways to support, enhance, and help publicize programs for proper pesticide disposal, and include appropriate activities in work plan.

Work plans should include deliverables and schedule for completion and/or ongoing implementation.

Reporting Process

A pilot reporting process will be tested and evaluated by the Co-permittees during FY 01-02. The process includes collection of pesticide use reports from each department and contractor summarizing information related to organophosphate pesticide use (including diazinon and chlorpyrifos) during calendar year 2001, and reporting that summary to the Regional Board as part of the annual report. The process was tested by the West Valley Communities during spring and summer 2001 and results shared with other co-permittees. In light of the limitations in data availability, reporting will be done to the maximum extent practicable with identification of areas for improvement occurring annually.

For the pesticides used during calendar year 2001, Co-permittees should report commercial name of pesticide, active ingredient, percent of active ingredient, and total volume or weight of active ingredient applied. At a minimum, this information should be reported for pesticides containing chlorpyrifos (dursban) and diazinon. These data will serve as a baseline for comparison in future years.

Attachment 2

Legal Authority to Implement

Attachment 2
LEGAL AUTHORITY

The co-permittees will need to demonstrate authority to regulate pesticide use by municipal staff through an IPM policy, ordinance, and/or procedures, in accordance with Performance Standard #1. The policy/ordinance/procedures should be included in this section of the performance standard when it is added to the Co-permittees' local URMPs.

Several IPM policies and ordinances exist throughout the state which are being implemented and which can be used as models. Examples of policies can obtained from the City of Sebastopol, and the National Park Service. Examples of IPM ordinances can be obtained from the County of Marin, City of Santa Cruz, and the City of San Francisco. The City of Santa Monica has established a city IPM Program as a part of its sustainable city program. Samples IPM policies and contracts can be obtained from City of Santa Monica staff.

In addition, it is recommended that Co-permittees include language in contracts with pest control companies that requires those pest control services to use practices consistent with each Co-permittee's IPM policy/ordinance/procedures. As an alternative approach, Co-permittees may assign a municipal pest control advisor to instruct and supervise contractors in the control of pests on municipal property.

Sample Contract Language Outline for Pest Control Contractors

This contract language is based on examples of contract language taken from the City and County of San Francisco Integrated Pest Management Services Contract and the City of Santa Monica Request for Qualifications from licensed pest control contractors . These documents were obtained by Program staff at the San Francisco-sponsored IPM workshop held in January 2001. A variety of such contracts were reviewed, containing a range of level of detail.

Background

On [date], the [city/county/district] adopted an Integrated Pest Management (IPM) policy/ordinance. Conventional pest control techniques have relied extensively on the use of chemical pesticides, which contribute to ground and surface water contamination and create the potential for exposure to building occupants and visitors. IPM involves the coordinated use of site-specific environmental and pest information with available pest management methods to effectively manage pests over the long-term with the least possible hazard to human health and the environment. IPM programs employ a holistic approach to pest management decision-making , prioritizing low hazard management options that emphasize prevention, monitoring and natural biological controls. IPM allows the appropriate use of the least hazardous, selective pesticides only when non-chemical methods are not feasible.

The definition of IPM used by the city/county/ district, is: IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a

combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.

Requirement
All contractors retained by the city/county/district to provide pest control services will comply with the city/county/district's IPM Plan/Policy (Appendix X).

Examples of Optional Elements of Pest Control Contracts

1. Contract Modifications to Address IPM

2. On-Going, Long Term Service
   This is service provided using regular inspections, maintenance and other methods on an on-going basis for the prevention and minimization of pest problems.

   A. Initial Building/Site Inspections
   B. Periodic Inspection Schedule
   C. Site-Specific IPM Plans
   D. Record-Keeping
   E. Reporting
   F. Recommendations for Site Tenants and Other Contractors
      (These would be recommendations, when feasible, for changes in behavior which are essential for minimizing the need for pesticide spraying.)
      a. Municipal Staff (Tenants)
      b. Maintenance / Janitorial Staff
      c. Construction Contractors
   G. Effectiveness Evaluation of IPM Methods Used
   H. IPM Plan Updates

3. Short Term Service, or Emergency Service
   (This addresses pest problems which can and need to be addressed within a short period of time, such as destruction of a yellow jacket or other nest, and which are performed on an as-needed basis.)

4. Training
5. Excluded Pests
6. Pesticide Restrictions (bans)
7. Pesticide Use Restrictions (Methods)
8. Approved Products
9. Non-Pesticide Treatments Preferred
10. Quality Control Program

Attachment 3

Work Plan BMPs and Control Measures

Attachment 3
BMPS AND CONTROL MEASURES

This section includes BMPs and control measures to protect water quality during the use of pesticides, when it is determined through an IPM process that pesticides must be used.[1]

PESTICIDE USAGE

1) Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of pesticides and training of pest control advisors and applicators.
2) Use the least toxic pesticides that will do the job, provided there is a choice. The agency will take into consideration the LD_{50}, overall risk to the applicator, and impact to the environment.
3) Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging non-degraded pesticides in stormwater runoff. Avoid application of pesticides if rain is expected (this does not apply to the use of pre-emergent herbicide applications when required by the label for optimal results.)
4) Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques. For example, when spraying is necessary, increase drop size, lower application pressure, use surfactants and adjuvants, using wick application, etc.
5) Apply pesticides only when wind speeds are low.
6) Mix and apply only as much material as is necessary for treatment. Calibrate application equipment prior to and during use to ensure desired application rate.
7) Do not mix or load pesticides in application equipment adjacent to a storm drain inlet, culvert or watercourse.
8) Irrigate slowly to prevent runoff and then only as much as is needed.

PESTICIDE STORAGE

1) To minimize quantities of pesticides stored, purchase what is needed for use in the near future.
2) Implement storage requirements for pesticide products with guidance from the local fire department and the Santa Clara County Agricultural

[1] The following BMPs are taken from the Performance Standard for Public Streets, Roads, and Highways Operation and Maintenance, Section V.D.3. (Vegetation Control for Median and Road Embankment Maintenance), the San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) Performance Standards for Integrated Pest Management, and the San Mateo County Department of Agriculture Alternatives and Best Management Practices letter to San Mateo County Pest Control Companies.

Commissioner. Provide secondary containment for pesticides, if required.

3) Provide spill kits, store the kits near pesticides, and train employees to use them.
4) Store pesticides in a locked and posted individual storage unit. Pesticides should not be stored where they could be exposed to rain or irrigation water, causing pesticide runoff to storm drains or creeks.
5) Store pesticides only in labeled containers.

PESTICIDE DISPOSAL

1) Dispose of empty pesticide containers according to the instructions on the container label.
2) Dispose of unused pesticides as hazardous wastes in accordance with applicable regulations.

References and Sources for Pesticide Regulations

- California Code of Regulations, Title 3 (www.calregs.com\default.htm)
- California Food and Agricultural Code Division 6 and Division 7
- Santa Clara County Agricultural Commissioner
- Department of Pesticide Regulation
- Structural Pest Control Board, California Department of Consumer Affairs

References for IPM Materials, Available from the University of California Statewide Integrated Pest Management Project

- Natural Enemies Handbook: The Illustrated Guide to Biological Pest Control
- Pests of Landscape Trees and Shrubs
- The UC Guide to Solving Garden and Landscape Problems: An Interactive CD ROM

Contact Information
www.ipm.ucdavis.edu/IPMPROJECT/pubs.html/#books or 1-800-994-8849

Attachment 4

Standard Operating Procedures

Attachment 4
STANDARD OPERATING PROCEDURES

[To be completed by each agency, consistent with its IPM Policy]

APPENDIX A

PERMIT PROVISION C.9.d., CONTROL PROGRAM FOR PESTICIDES[1]

d. Control Program for Pesticides. To address the impairment of urban streams by diazinon, the Dischargers shall implement a pesticide toxicity control plan (Pesticide Plan) that addresses their own use of pesticides, including diazinon and other lower priority pesticides no longer in use, such as chlordane, dieldrin and DDT, and the use of such pesticides by other sources within their jurisdictions. The Dischargers may address this requirement by building upon their prior submissions to the Regional Board. They may also coordinate with BASMAA, the Urban Pesticide Committee, and other agencies and organizations.

i. **Pesticide Use by Dischargers**

The Pesticide Plan shall include a program to quantitatively identify each Discharger's pesticide use by preparing a periodically updated inventory of pesticides used by all internal departments, divisions, and other operational units as applicable to each Discharger. The Pesticide Plan shall include goals and implementing actions to replace pesticide use (especially diazinon use) with least toxic alternatives. Schools and special district operations shall be included in the Pesticide Plan to the full extent of each Discharger's authority. The Dischargers shall adopt and verifiably implement policies, procedures, and/or ordinances requiring the minimization of pesticide use and the use of integrated pest management (IPM) techniques in the Dischargers' operations. The policies, procedures, and/or ordinances shall include 1) commitments to reduce use, phase-out, and ultimately eliminate use of pesticides that cause impairment of surface waters, and 2) commitments to not increase the Dischargers' use of organophosphate pesticides without justifying the necessity and minimizing adverse water quality impacts. The Dischargers shall implement training programs for all municipal employees who use or could use pesticides, including pesticides available over the counter. These programs shall address pesticide-related surface water toxicity, proper use and disposal of such pesticides, and least toxic methods of pest prevention and control, including IPM. The Pesticide Plan shall be subject to updating via the Dischargers' continuous improvement process.

ii. **Other Pesticide Sources.** To address other pesticide users within the Dischargers' jurisdictions (including schools and special district operations that are not owned or operated by the Dischargers), the Pesticide Plan shall include the following elements:

- Public education and outreach programs. Such programs shall be designed for residential and commercial pesticide users and pest control

[1] From Order No. 01-024 reissuing waste discharge requirements for the Santa Clara Valley Urban Runoff Pollution Prevention Program, NPDES Permit No. CAS029718, adopted February 21, 2001.

operators. These programs shall provide targeted information concerning proper pesticide use and disposal, potential adverse impacts on water quality, and alternative, least toxic methods of pest prevention and control, including IPM. These programs shall also target pesticide retailers to encourage the sale of least toxic alternatives and to facilitate point-of-sale public outreach efforts. These programs may also recognize local least toxic pest management practitioners.

- Mechanisms to discourage pesticide use at new development sites. Such mechanisms shall encourage the consideration of pest-resistant landscaping and design features, minimization of impervious surfaces, and incorporation of stormwater detention and retention techniques in the design, landscaping, and/or environmental reviews of proposed development projects. Education programs shall target individuals responsible for these reviews and focus on factors affecting water quality impairment.
- Coordination with household hazardous waste collection agencies. The Dischargers shall support, enhance, and help publicize programs for proper pesticide disposal.

The Pesticide Plan shall include a schedule for implementation and a mechanism for reviewing and amending the plan, as necessary, in subsequent years. The Pesticide Plan shall be submitted to the Executive Officer by July 1, 2001.

iii. **Other Pesticide Activities**

The Dischargers shall work with the Urban Pesticide Committee and other municipal stormwater management agencies in the Bay Area to assess which diazinon products and uses and previous uses of dieldren, chlordane, and DDT pose the greatest risks to surface water quality. Along with incorporating this information into the programs described above, the Dischargers shall work with the Urban Pesticide Committee and other municipal stormwater management agencies to encourage US EPA, the California Department of Pesticide Regulation (DPR), and pesticide manufacturers to understand the adverse impacts of diazinon, dieldren, chlordane, and DDT on urban creeks, monitor US EPA and DPR activities related to the registration of diazinon products and uses, and actively encourage US EPA, DPR, and pesticide manufacturers to eliminate, reformulate, or otherwise curtail, to the extent possible, the sale and use of diazinon when it poses substantial risks to surface water quality (e.g., when there is a high potential for runoff).

The Dischargers shall also work with the Regional Board and other agencies in developing a TMDL for diazinon in impaired urban creeks. The Dischargers will participate in stakeholder forums and collaborative technical studies necessary to assist the Regional Board in completing the TMDL.

These studies may include, but shall not be limited to, additional diazinon monitoring and toxicity testing.

APPENDIX B

INFORMATION ON PESTICIDE-REGULATING AGENCIES

There are three State and County agencies that regulate the application of pesticides: the State Department of Pesticide Regulation, the Structural Pest Control Board, and the County Agricultural Commission. The following describes the roles of these agencies in the licensing and training of pesticide applicators and the monitoring of their activities (i.e., reporting requirements).

Department of Pesticide Regulation

The Department of Pesticide Regulation (DPR) is a department of the California Environmental Protection Agency (CAL EPA). The DPR "has primary responsibility for regulating all aspects of pesticide sales and use to protect public health and the environment. The Department's mission is to evaluate and mitigate impacts of pesticide use, maintain the safety of the pesticide workplace, ensure product effectiveness, and encourage the development and use of reduced-risk pest control practices while recognizing the need for pest management in a healthy economy." [1] DPR certifies pesticide applicators that apply certain types of pesticides in agricultural and some outdoor urban settings including rights-of-way, cemeteries, and parks.

Structural Pest Control Board

The Structural Pest Control Board is a division of the California Department of Consumer Affairs. Its mission is to "protect and provide redress to the consumer of structural pest control services and is committed to the public's health, safety and welfare."[2] Pesticide applicators that are licensed through the Structural Pest Control Board apply pesticides primarily to structures, rather than to outdoor areas, however, structural pest control operators can apply pesticides in outdoor settings, according to certain limitations. Some examples of outdoor pesticide use by structural pest control operators (PCOs) are applications to the exterior surfaces of buildings, outdoor perimeter spraying, and spraying to cracks in pavement.

County Agricultural Commissioner

The County Agricultural Commissioner oversees the training, certification, and regulation of all those applying pesticides in agricultural and urban settings. The health and safety of pesticide applicators and the general public is of primary concern. Additionally, the County Agricultural Commissioner's office engages in activities to prevent the "introduction, establishment, and spread of destructive insects, plant diseases and weeds into the County's urban and agricultural areas."[3]

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[1] DPR web site [http://www.cdpr.ca.gov/]
[2] SPCB web site [http://www.dca.ca.gov/pestboard/]
[3] County Agricultural Commissioner's web site [http://santaclaracounty.org/agweights/]

Current Pesticide Application Requirements

DPR Certification

- Agricultural Pest Control Advisor License: This license is required by anyone recommending a pesticide be used for a specific pest problem in any agricultural use setting. Although a municipality is not required to have an Advisor on staff it must have a written recommendation for each agricultural application. Often recommendations are obtained from the Licensed Pesticide Dealer (the manufacturer.)

- Qualified Applicator Certificate: This certificate must be held by the supervisor of persons applying pesticides, or the person applying pesticides directly, if the pesticide is restricted a restricted use pesticide. If the pesticide is not a restricted-use pesticide, the applicator need only receive annual training. The supervisor is not required to be present during pesticide application, but must be accessible via radio or telephone to the person applying the pesticide.
- Qualified Applicator License: This license must be held by the supervisor of persons applying pesticides, or the person applying pesticides directly, if the pesticide application is done for hire.
- Pesticide Worker Training: The person directly applying the pesticides does not have to have a qualified Applicator Certificate, but must go through annual "pesticide worker safety" training.

Structural Pest Control Board Certification

The Structural Pest Control Board (SPCB) issues licenses in three categories under three branches. The three licenses are: operators, field representatives, and registered applicators. The three branches are:

- Branch 1: Fumigation, which is the practice relating to the control of household and wood destroying pests or organisms by fumigation with poisonous or lethal gases.
- Branch 2: General pest, which is the practice relating to the control of household pests, excluding fumigation with poisonous or lethal gases.
- Branch 3: Termite, which is the practice relating to the control of wood destroying pests or organisms by the use of insecticides, or structural repairs and corrections, excluding fumigation with poisonous or lethal gases.

Training

The training requirements for the DPR and SPCB are provided below. Neither the DPR nor the SPCB directly provide training to persons wishing to become certified or licensed under the respective departments. The agencies conduct testing and approve training courses and materials offered by private or public educational institutions.

DPR

The levels of knowledge required by the various license and certificate holders varies according to level of certification. Certified Pest Control Advisors are required to have some knowledge of IPM practices and methods, and to consider IPM when writing recommendations for pest control. Beginning in 2003, Advisors will be required to take four hours of continuing education each year in IPM.

Not all applicators have been trained in IPM, or are required to receive IPM training. IPM is not required as an area of knowledge for qualified applicators and pesticide workers. Knowledge in the areas of worker and public safety, pesticide handling, regulations pertaining to pesticides, and methods and equipment used in the application of pesticides is generally required.

SPCB

The levels of knowledge required by the various license and certificate holders varies, depending on the certificate. Generally, the areas of knowledge required for passing the required tests offered by the Structural Pest Control Board fall under the categories of laws and regulations pertaining to pesticides, contracts, and labor; proper business practices; worker and consumer safety; pest identification and biology; methods and equipment used in the application of pesticides; and wood treatment and structural repair. IPM is not specifically listed in Structural Pest Control knowledge requirements.

Reporting

The application of all restricted-use pesticides and agricultural use pesticides must be reported on a monthly basis to the local County Agricultural Commissioner's office using a DPR-approved monthly summary form (three copies one of which is dept by the originator). The pesticide product name and manufacturer, the EPA pesticide registration number, quantity used, number of applications, commodity or site treated, and acres or units treated may be reported depending on the application. The Agricultural Commissioner keeps one copy and sends the second copy to DPR. This requirement applies to all licensed pesticide applicators (including municipal staff and commercial applicators) [4,5] .

Pesticide applications on "Production Agriculture"[4] sites are reported and can be sorted by township/range coordinates. Applications on "Non-production Agriculture"[5] sites and applications by structural pest control operators are reported by County.

[4] Production agriculture sites, as defined by the DPR, are sites where crops or livestock are grown.
[5] Non-production agriculture sites, as defined by the DPR, are sites on which pesticide use is regulated by the DPR and include areas such as, but not limited to, cemeteries, parks, golf courses, and rights-of-way.

PLANNING PROCEDURES

Santa Clara Valley Urban Runoff Pollution Prevention Program

PUBLIC AGENCY ACTIVITIES

Performance Standard and Supporting Documents for

Planning Procedures

Participating Agencies:

Campbell, Cupertino, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

PART I

Introduction

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM
NEW DEVELOPMENT AND CONSTRUCTION ACTIVITIES CONTROL MEASURES

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Introduction

The goal of new development and redevelopment control measures is to minimize the storm water quality impacts of land development after construction. These control measures apply to both private development projects and municipal capital improvement projects. The Planning Procedures Performance Standard defines the level of implementation that municipal agencies in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) must attain in order to demonstrate that their land use planning, development plan review and approval processes control storm water quality impacts to the maximum extent practicable. Control of impacts on storm water quality from construction activities is addressed under a separate Construction Inspection Performance Standard, although some overlap exists because the planning process is the appropriate opportunity to ensure that projects include erosion and sediment control measures during construction and after completion of construction.

The Planning Procedures Performance Standard was based originally on the San Francisco Bay Regional Water Quality Control Board's April 1994 *Staff Recommendations for New and Redevelopment Controls for Storm Water Programs* (*Recommendations*). The *Recommendations* incorporate the mandates of EPA's storm water regulations as well as the *Coastal Zone Act Reauthorization Amendments.* The performance standard is also consistent with the goals and objectives of the New Development and Construction Activities Component of the Program's *Urban Runoff Management Plan (1997, rev. 2000)*. The performance standard has since been updated to meet the requirements in Provision C.3 of the Program's NPDES permit, amended per Regional Board Order No. 01-119, October 17, 2001.

PART II

Performance Standard

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

PERFORMANCE STANDARD

1) The municipal agency (Co-permittee[1]) shall have adequate legal authority to implement new development control measures, including all applicable requirements of Provision C.3, as part of its development plan review and approval procedures and other appropriate new development and redevelopment permitting procedures (Permit Provision C.3.a.i.).

2) The municipal agency shall provide developers with information and guidance materials on site design guidelines, building permit requirements, and BMPs for storm water pollution prevention early in the application process, as appropriate for the type of project and location (C.3.a.ii.).

3) The municipal agency shall ensure that environmental documents required for those projects that fall under CEQA or NEPA review address both significant and cumulative storm water quality impacts during the life of the project, and relevant permit requirements. These documents include EIRs, negative declarations and initial study checklists (C.3.m.).

4) The municipal agency shall encourage developers of all projects subject to design review under its development plan review and approval procedures to consider incorporating appropriate source control and site design measures that minimize stormwater pollutant discharges to the maximum extent practicable.

5) The municipal agency shall require developers of Group 1 projects[2] to design and implement the following measures to reduce stormwater pollution to the maximum extent practicable[3]:

   a. Site design shall include measures to minimize impervious land coverage, maximize infiltration (where appropriate and designed to protect groundwater quality[4]), and provide detention or retention as part of landscaping where feasible (C.3.b.i. and C.3.j.);

   b. Source controls[5] shall be required to limit pollution generation, discharge, and runoff as appropriate (C.3.k.), including measures to discourage pesticide use (C.9.d.ii.);

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[1] Performance Standards #1, 2, and 4 may not apply to agencies that do not have land use authority (i.e., the Santa Clara Valley Water District). The District does have authority over construction and related activities occurring within 50 feet of the top of bank of a watercourse. It is expected that Co-permittees will address relevant sections of each performance standard when incorporating the model performance standard into their local urban runoff management plans.

[2] Definitions are provided at the end of this section (page 4).

[3] Unless an alternative method of compliance is approved by the municipal agency in accordance with its alternative compliance program (C.3.g.).

[4] Refer to SCVURPPP *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects*, Infiltration Guidelines.

[5] Source control measures should also be encouraged for all discretionary projects that include potential sources of pollutants or activities that are likely to generate pollutants.

c. Stormwater treatment measures shall be designed in accordance with the numeric design criteria in Provision C.3.d.;

d. Increases in peak runoff flow and volume shall be managed for appropriate projects by implementing the guidance in the Program's Hydromodification Management Plan (HMP) for the specific stream receiving the discharge, following approval of the HMP by the Regional Board (C.3.f.).

6) The municipal agency shall require developers of projects that disturb a land area of one acre or more to demonstrate coverage under the State General Permit for Storm Water Discharges Associated with Construction Activity (C.3.a.iii.).

7) The municipal agency shall require developers of projects with potential for significant erosion and planned construction activity during the wet season[1] to prepare and implement an effective erosion and/or sediment control plan or similar document prior to the start of the wet season (C.3.a.iv.).

8) The municipal agency shall implement an operation and maintenance (O&M) verification program that includes: (C.3.e.)

a) Compiling a list of private and public properties and responsible operators for all stormwater treatment measures;

b) Inspecting a subset of prioritized treatment measures for appropriate O&M, on an annual basis, with appropriate follow-up and correction;

c) Requiring legally enforceable agreements or other mechanisms assigning responsibility for O&M of treatment measures.

9) The municipal agency shall ensure that municipal capital improvement projects include storm water quality control measures during and after construction, as appropriate for each project, and that contractors comply with storm water quality control requirements during construction and maintenance activities (C.3.a.v.).

10) The municipal agency shall provide training at least annually to its planning, building, and public works staffs on planning procedures, policies, design guidelines, and BMPs for storm water pollution prevention (C.3.a.vi.).

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Definitions

Group 1 Projects – Beginning October 15, 2003, municipal agencies must begin to implement permit Provision C.3. requirements for public and private projects in the following categories:

1. *Commercial, industrial, or residential developments that create one acre (43,560 square feet) or more of impervious surface, including roof area, streets and sidewalks.* This category includes development of any type on public or private land, which falls under the planning and building authority of the Dischargers, where one acre or more of new impervious surface, collectively over the entire project site, will be created. Construction of one single-family home, which is not part of a larger common plan of development, with the incorporation of appropriate pollutant source control and design measures, and using landscaping to appropriately treat runoff from roof and house-associated impervious surfaces (e.g., runoff from roofs, patios, driveways, sidewalks, and similar surfaces), would be in substantial compliance with Provision C.3.
2. *Streets, roads, highways, and freeways that are under the Dischargers' jurisdiction and that create one acre (43,560 square feet) or more of new impervious surface*. This category includes any newly constructed paved surface used primarily for the transportation of automobiles, trucks, motorcycles, and other motorized vehicles. Excluded from this category are sidewalks, bicycle lanes, trails, bridge accessories, guardrails, and landscape features.
3. *Significant Redevelopment projects*. This category is defined as a project on a previously developed site that results in addition or replacement, which combined total 43,560 square feet or more of impervious surface on such an already developed site ("Significant Redevelopment"). Where a Significant Redevelopment project results in an increase of, or replacement of, more than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, the entire project must be included in the treatment measure design. Conversely, where a Significant Redevelopment project results in an increase of, or replacement of, less than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, only that affected portion must be included in treatment measure design. Excluded from this category are interior remodels and routine maintenance or repair. Excluded routine maintenance and repair includes roof or exterior surface replacement, pavement resurfacing, repaving and road pavement structural section rehabilitation within the existing footprint, and any other reconstruction work within a public street or road right-of-way where both sides of that right-of-way are developed.

Wet season -- As defined by local ordinance (typically October 15 to April 15).

Attachment 1
WORK PLAN IMPLEMENTATION

This section should describe the activities to be conducted by the Co-permittee to achieve the performance standard, along with an implementation schedule. Specific tasks for

PART III

Guidance for Support Documents

Attachment 1

Work Plan Implementation

implementation of Provision C.3. are enumerated in Co-permittee work plans dated March 1, 2002 and September 15, 2002, and subsequent annual work plans.

Co-permittees can reference or insert work plans here]

Attachment 2

Legal Authority to Implement

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 2
LEGAL AUTHORITY TO IMPLEMENT

This section should contain a demonstration that the co-permittee has the legal authority to implement the performance standard, and/or provides a time schedule for developing and obtaining additional authority.

Provide citations for or excerpts from the following documents that demonstrate adequate legal authority:

- General Plan policies and implementation measures which help preserve and enhance water quality.
- Local ordinances and supporting guidelines that provide the municipal agency with an adequate expression of legal authority to fully implement General Plan policies, conduct discretionary reviews of development projects, and require storm water pollution control measures per Permit Provision C.3. (e.g., zoning ordinances, administrative orders, development review guidelines, conditions of approval or other documents or procedures).
- Erosion and sediment control ordinance.
- Storm water discharge ordinance.
- Authority under CEQA to require mitigation measures for environmental impacts.

Note: Guidance on General Plan and environmental assessment language, ordinances and standards is provided in the following documents:

- Permit Provision C.3.l.
- BASMAA *Start at the Source* and *Start at the Source Tools*.
- SCVURPPP Development Policies Comparison
- SCVURPPP *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects*

Attachment 3

Work Plan BMPs and Control Measures

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 3
BMPS AND CONTROL MEASURES

This section should contain the best management practices and control measures that co-permittees will employ or use as a standard for compliance in the implementation of the performance standard, as well as any design criteria, procedures, or methods that would assist in the use of the BMPs or control measures.

Example BMPs and Control Measures

- Design guidelines and practices which incorporate storm water quality control measures.
- Contract specifications for municipal capital improvement projects which address storm water quality controls.
- Minimum standards or conditions of approval for construction and post-construction BMPs.
- Mechanisms for requiring operation and maintenance of structural controls, and example language.
- Mechanisms to discourage pesticide use at new development sites, such as proper design of landscaping, as appropriate for the site.
- Source control measures, such as the model conditions of approval provided in Attachment 4.
- Guidelines and standards for design, operation and maintenance of stormwater BMPs to avoid the creation of aquatic sites suitable for development of mosquitoes.

References:

- *Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality* (BASMAA, 1999)
- *Using Site Design Techniques to Meet Development Standards for Stormwater Quality – A Companion Document to Start at the Source* (BASMAA, May 2003)
- SCVURPPP, *C.3. Handbook: Guidance for Implementing Stormwater Requirements for New and Redevelopment Projects*
- SCVURPPP, *Model Conditions of Approval for Pesticide Reduction in Landscaping Plans*, 9-30-02
- California Stormwater Quality Association, Stormwater Best Management Practice Handbooks, January 2003
- Memorandum to SCVURPPP Management Committee and BMP O&M Verification Work Group from Paul Randall and John Fusco, Program Staff, re *Guidance on Prioritization and Frequency of Stormwater Treatment Best Management Practice Inspections*, June 16, 2003.

Attachment 4

Source Control Measures

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 4

SOURCE CONTROL MEASURES

INTRODUCTION

This section contains a model list of source control measures to control sources of pollutants associated with the post-construction phase of new development and redevelopment projects. These measures may be required at various stages of the development plan review process, e.g., as application submittal requirements or checklists, conditions of approval, plan check comments, etc., depending on the particular process used by each Co-permittee. These measures should be imposed as requirements rather than as recommended best management practices, to meet the intent of Permit Provision C.3.k.

The list relates the source control measures to significant sources of potential pollutants that may be present on the developed site, rather than to a general type of development project. Each identified source of pollutants may have one or more appropriate control measures. The model list is intended to be a menu of measures from which Co-permittees may select appropriate measures to apply to specific projects. (Co-permittees do not have to use the exact wording of a source control measure as long as the intent of the measure is preserved.)

STRUCTURAL CONTROL MEASURES

A. Illegal Dumping to Storm Drain Inlets and Waterways

1) On-site storm drain inlets shall be clearly marked with the words “No Dumping! Flows to Bay,” or equivalent, using methods approved by the [Co-permittee].

2) It is unlawful to discharge any wastewater into storm drains, gutters, creeks, or the San Francisco Bay. Unlawful discharges to storm drains include, but are not limited to, discharges from toilets; sinks; industrial processes; cooling systems; boilers; fabric cleaning; equipment cleaning; or vehicle cleaning.

3) It is unlawful to cause hazardous domestic waste materials to be deposited in such a manner or location as to constitute a threatened discharge into storm drains, gutters, creeks or San Francisco Bay.

B. Interior Floor Drains

1) Interior floor drains shall be plumbed to the sanitary sewer system and shall not be connected to storm drains.

C. Parking Lots

1) Interior level parking garage floor drains shall be connected to [a water treatment device approved by the (Co-permittee) prior to discharging to] the sanitary sewer system. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

D. Pesticide/Fertilizer Application

1) Landscaping shall be designed to minimize irrigation and runoff, promote surface infiltration where appropriate, and minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.

2) Structures shall be designed to discourage the occurrence and entry of pests into buildings, thus minimizing the need for pesticides. For example, dumpster areas should be located away from occupied buildings, and building foundation vents shall be covered with screens.

3) Additional requirements are covered in the "Model Conditions of Approval for Pest Resistant Landscaping" (August 19, 2002).

E. Pool, Spa, and Fountain Discharges

1) Pool (including swimming pools, hot tubs, spas and fountains) discharge drains shall not be connected directly to the storm drain or sanitary sewer system. [Exception: Public pool discharge drains must be connected to the sanitary sewer system, per County Department of Environmental Health requirements.]

2) When draining is necessary, a hose or other temporary system shall be directed into a sanitary sewer clean out. The clean out shall be installed in a readily accessible area [example: within 10 feet of the pool]. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

F. Food Service Equipment Cleaning

1) Food service facilities (including restaurants and grocery stores) shall have a sink or other area for cleaning floor mats, containers, and equipment, that is connected to a grease interceptor prior to discharging to the sanitary sewer system. The cleaning area shall be large enough to clean the largest mat or piece of equipment to be cleaned. The cleaning area shall be indoors or in a covered area outdoors; both areas must be plumbed to the sanitary sewer.

G. Refuse Areas

1) New buildings [such as food service facilities and/or multi-family residential complexes or subdivisions] shall provide a covered or enclosed area for dumpsters and recycling containers. The area shall be designed to prevent water run-on to the area and runoff from the area.

2) Areas around trash enclosures, recycling areas, and/or food compactor enclosures shall not discharge to the storm drain system. Any drains installed in or beneath dumpsters, compactors, and tallow bin areas serving food service facilities shall be connected [to a grease removal device prior to discharging] to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

H. Outdoor Process Activities/Equipment[6]

1) Process activities shall be performed either indoors or outdoors under cover. If performed outdoors, the area shall be designed to prevent run-on to and runoff from the site.

2) Process equipment areas shall drain to the sanitary sewer system. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

I. Outdoor Equipment/Materials Storage

1) All outdoor equipment and materials storage areas shall be covered [and bermed], or shall be designed to limit the potential for runoff to contact pollutants [or a storm drain inlet valves shall be provided on exterior drains in the area].

2) Storage areas containing non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners or vaults. . The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

3) All hazardous materials and wastes, as defined [or regulated] by [cite ordinance or regulation], on the site must be used and stored in compliance with the [Co-permittee's] Hazardous Materials Ordinance and Hazardous Materials Management Plan for the site approved by the [Co-permittee department].

[6] Examples of businesses that may have outdoor process activities and equipment include machine shops and auto repair shops, and industries that have pretreatment facilities.

J. Vehicle/Equipment Cleaning

1) Wastewater from vehicle and equipment washing operations shall not be discharged to the storm drain system. [Optional, e.g. for car dealerships: If water only (without soap or other cleaning agent) is used for rinsing of vehicle exterior surfaces for appearance purposes, the runoff may be discharged to the storm drain system.]

2) Commercial/industrial facilities having vehicle/equipment cleaning needs [and new residential complexes of 25 units or greater] shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. Vehicle/equipment washing areas shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

3) Commercial car wash facilities shall be designed and operated such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer [or a wastewater reclamation system shall be installed]. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

K. Vehicle/Equipment Repair and Maintenance

1) Vehicle/equipment repair and maintenance shall be performed in a designated area indoors, or if such services must be performed outdoors, in an area designed to prevent the run-on and runoff of stormwater.

2) Secondary containment shall be provided for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.

3) Vehicle service facilities shall not contain floor drains unless the floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer, for which an industrial waste discharge permit has been obtained. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

4) Tanks, containers or sinks used for parts cleaning or rinsing shall not be connected to the storm drain system. Tanks, containers or sinks used for such purposes may only be connected to the sanitary sewer system if allowed by an industrial waste discharge permit. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

L. Fuel Dispensing Areas

1) Fueling areas[7] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.

2) Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area, as defined below[1].] The canopy [or cover] shall not drain onto the fueling area.

M. Loading Docks

1) Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

2) Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.

3) Door skirts between the trailers and the building shall be installed to prevent exposure of loading activities to rain.

N. Fire Sprinkler Test Water

1) Fire sprinkler test water shall drain to the sanitary sewer system (with approval from the local permitting authority and/or sanitary district with jurisdiction) or drain to landscaped areas where feasible.

O. Miscellaneous Drain or Wash Water

1) Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.

2) [Air compressor or air conditioner] condensate drain lines shall drain to the sanitary sewer system (with approval from the local permitting authority and/or sanitary district with jurisdiction) or drain to landscaped areas where feasible.

[7] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

3) Roof drains shall discharge and drain away from the building foundation to an unpaved area wherever possible.

4) Roof top equipment shall drain to the sanitary sewer. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

OPERATIONAL BMPS

A. Paved Sidewalks and Parking Lots

1). Sidewalks and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris resulting from pressure washing shall be trapped and collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and shall not be discharged to a storm drain. The applicant shall contact the local permitting authority and/or sanitary district with jurisdiction for specific connection and discharge requirements.

B. Private Streets

1) Owner of private streets and storm drains shall prepare and implement a plan for street sweeping of paved private roads and cleaning of all storm drain inlets.

C. Vehicle/Equipment Repair and Maintenance

1) No person shall dispose of, nor permit the disposal, directly or indirectly, of vehicle fluids, hazardous materials, or rinsewater from parts cleaning operations into storm drains.

2) No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.

3) No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

D. Fueling Areas

1) The property owner shall dry sweep the fueling area and spot clean leaks and drips routinely. Fueling areas shall not be washed down with water unless the wash water is collected and disposed of properly (i.e. not in the storm drain).

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

REFERENCES

- BASMAA “Start at the Source Tools Handbook” (June 2000);
- California Stormwater Quality Task Force, “Best Management Practice Guide – Retail Gasoline Outlets”, March 1997.
- Alameda Countywide Clean Water Program (ACCWP) Model Conditions of Approval (1999);
- City of Palo Alto Municipal Code Chapter 16.09, and revisions to Chapter 16.09 approved July 22, 2002;
- City of San Jose standard conditions;
- City of Cupertino, Guidance for Selecting BMPs for Development Projects;
- Example source control measures provided by Regional Board staff in Provision C.3.k. of the SCVURPPP NPDES Permit (October 2001).

Attachment 5

Standard Operating Procedures

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 5
STANDARD OPERATING PROCEDURES

This section should contain the Co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Examples of Types of SOPs Needed

- A general description of the municipal agency's plan review process, including how Group 1 projects[8] are identified as well as how storm water quality control measures are incorporated into the planning and design stages of development..
- Description of which staff positions are responsible for reviewing the project's storm water impacts, the effectiveness with which the control measures mitigate these impacts, and when in the process these reviews are performed.
- Description of process for allowing independent qualified expert review and certification of stormwater treatment measure designs, if applicable.
- Mechanism to include storm water quality controls in plans and contract specifications for municipal capital improvement projects.
- Guidance on who to give pre-application materials to and when.
- Use of a revised CEQA initial study checklist and/or other plan review checklist that specifically addresses storm water quality impacts.
- Mechanism for recording the treatment control, site design and source control measures used, and the sizing criteria used
- Identification of department/persons responsible for implementing the treatment measure O&M verification program.

See SCVURPPP *C.3. Handbook*, "Summary of Major Changes to the Development Project Review Process" for those additional steps in the development review process necessary in implementing Provision C.3 requirements.

[8] Definitions of Group 1 projects are provided on page 3 of the Performance Standard.

Attachment 6

Reporting Requirements

Performance Standard and Supporting Documents for
Planning Procedures for New Development and Redevelopment

Attachment 6
REPORTING REQUIREMENTS

Co-permittee's will demonstrate implementation of this Performance Standard by providing in their annual reports the information described below (C.3.n.).

- The name or other identifier, type of project, site acreage or square footage, and square footage of new impervious surface on all new development and significant redevelopment projects which meet the Group 1 definitions of C.3.c.[9] For significant redevelopment projects, the square footage of land disturbance will be reported.

- The treatment BMPs used and numeric sizing criteria employed, the operation and maintenance responsibility mechanism including the responsible party, site design measures used, and source control measures required for projects that must implement treatment measures.

- A summary of the types of pesticide reduction measures required for those new development and significant redevelopment projects to be addressed under C.3.c and the percentage of such new development and significant redevelopment projects for which pesticide reduction measures were required.

Model reporting forms for this information are provided on the next two pages.

A summary of all annual and one-time reporting requirements is given in Table 1, Provision C3. of the Permit.

[9] Definitions of Group 1 projects are provided on page 3 of the Performance Standard.

PART IV

Co-permittee Standard Reporting Form

ATTACHMENT6

[Co-permittee Name]
Reporting Form for Planning Procedures Performance Standard
and Provision C.3.n.i. Reporting Requirements

Part 1

Group 1 New Development and Significant Redevelopment Projects[10]
Reviewed and/or Approved During _____

Project Name	Project Type[11]	Site Size (ac. or s.f.)	New Impervious Surface (s.f.)[12]	Area of Land Disturbed (Ac.) [13]	Project Status	Storm Water Control Measures Included in Project
Private Projects						
Public Projects						

[10] List all projects with new impervious surface area greater than 1 acre (43,560 s.f.).

[11] Describe project type, as defined in Provision C.3.c.

[12] "New" is defined as impervious surface created, added or replaced.

[13] If the site is a "significant redevelopment", list the area of land disturbance, if information is readily available.

ATTACHMENT6

[Co-permittee Name]
Reporting Form for Planning Procedures Performance Standard and Provision C.3.n.ii. & iii. Reporting Requirements

Part 2

Stormwater Control Measures for Group 1 Projects[14] Reviewed and/or Approved During FY_____

Project Name	Treatment BMPs	Numeric Sizing Criteria Used	O&M Responsibility Mechanism and Responsible Party	Site Design Measures	Source Control Measures	Pesticide Reduction Measures
Private Projects						
Public Projects						

[14] Beginning October 15, 2003, list all* projects with new impervious surface area greater than 43,560 s.f. (1 acre). See SCVURPP "C.3. Handbook: Guidance for Implementation of Stormwater Requirements for New and Redevelopment Projects".

*Projects that do not require stormwater treatment because they fall under the Alternative Compliance Program must be reported as per Provision C.3.g.v. (see Reporting Form Part 3).

ATTACHMENT6

[*Co-permittee Name]*
Reporting Form for Planning Procedures Performance Standard and Provision C.3.g.v. Reporting Requirements

Part 3

Alternative Compliance/Waiver Program Projects Reviewed and/or Approved During FY_____

Project Name and Location	Project Type	Final Percent Impervious Surface	Reasons for Allowing Alternative Compliance	Alternative Compliance Terms	Project Receiving Benefit (Date of Completion)
Private Projects					
Public Projects					

PUBLIC STREETS, ROADS, AND HIGHWAYS OPERATION AND MAINTENANCE

Santa Clara Valley Urban Runoff Pollution Prevention Program

PUBLIC AGENCY ACTIVITIES

Performance Standard and Supporting Documents for

Public Streets, Roads, And Highways Operation & Maintenance

Participating Agencies:

Campbell, Cupertino, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

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PART I

Introduction, Definitions, and Existing O&M Activities

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM
PUBLIC AGENCY ACTIVITIES CONTROL MEASURES

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

I. Introduction

The goal of public agency activities control measures is to reduce or eliminate adverse water quality impacts of construction, operations, and maintenance activities by municipal agencies. The Public Streets, Roads, and Highways Operation and Maintenance (PSRH O&M) performance standard defines the level of implementation that municipal agencies in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) must attain to demonstrate that their local PSRH O&M activities reduce pollutants in storm water to the maximum extent practicable. This performance standard will be used as the basis for measuring the effectiveness of each municipal agency's street, road, and/or highway O&M activities.

The performance standard for PSRH O&M is based on an analysis of the potential water quality impacts of existing O&M practices, the current management practices that municipal agencies are implementing to minimize these impacts, and practices that are accepted by the State and Regional Boards as being effective in controlling these impacts. The performance standard is also consistent with the goals and objectives of the Public Agency Activities Component of the Program's *Storm Water Management Plan*.

Public agency activities related to the maintenance of storm drain systems are covered by the Program's *Storm Drain System Operation and Maintenance Performance Standard* dated March 1, 1996. Activities related to the planning and construction of municipal public works projects, including street, road, and highway improvements, are addressed in the Program's *Planning Procedures Performance Standards* and *Construction Inspection Performance Standards* (dated November 12, 1996).

II. Definitions and Responsibilities

Streets are defined as public thoroughfares in a city or town, including curbs, gutters, and sidewalks on one or both sides. Roads are defined as open, general public ways for the passage of persons and vehicles; many roads in rural or suburban areas do not have curbs and gutters. Highways are main public roads, especially ones connecting towns and cities. In Santa Clara Valley, most highways are maintained by the California Department of Transportation (Caltrans) while local expressways such as Guadalupe, Monterey, San Tomas, Capitol, and Lawrence are maintained by the County of Santa Clara. Other cities and towns operate and maintain most public streets and roads within their jurisdictions. The Santa Clara Valley Transportation Authority (SCVTA) also conducts maintenance of bus stops, light rail stations, and park-and-ride lots. Implementation of performance standards will require coordination between the Program's municipal agencies, Caltrans, and SCVTA.

III. Existing O&M Activities and Potential Water Quality Impacts

Existing O&M activities covered by this performance standard include the following:

- Street/Road/Highway Sweeping and Cleaning - Sweeping timing and frequency; sweeping equipment operation and selection; other measures to improve sweeping efficiency; management of material removed by sweeping; and street cleaning and flushing;

- Street/Road/Highway Repair and Maintenance - Asphalt/concrete removal; concrete installation and replacement; patching, resurfacing, and surface sealing; signing and striping; traffic detector loop installation and repair; and equipment cleaning, maintenance, and storage;

- Sidewalk/Plaza Maintenance - Cleaning; concrete installation and replacement; surface removal and repair; and landscape maintenance;

- Bridge and Structure Maintenance - Painting and paint removal; repair work; and graffiti removal;

- Median and Road Embankment Maintenance - Erosion controls; slide and embankment repair; irrigation practices; and vegetation controls (manual and mechanical removal, pesticide usage and pest management, and fertilizer usage);

- Litter Control; and

- Spill Control.

Program agencies were surveyed in September 1996 about their current O&M activities. The results of this survey are summarized in Table 1. The results show that most of the activities listed above are conducted by each agency or are contracted out. There is substantial use of contractors to conduct these activities; therefore, ensuring that contractors employ best management practices to control pollutants from these activities is important. Caltrans and the County were also listed by several agencies as conducting O&M activities on streets, roads and highways within their jurisdiction.

Streets, roads, and highways are significant sources of pollutants in storm water discharges, and O&M practices, if not conducted properly, can contribute to the problem. Potential pollutants include: sediment from erosion of denuded roadside embankments and shoulders; debris from road, sidewalk, and bridge repairs; oil and grease and heavy metals from equipment leaks, asphalt replacement, painting, and equipment cleaning; and pesticides and fertilizers from vegetation control and landscape maintenance. These pollutants can damage aquatic and riparian habitat and be toxic to aquatic life.

Table 1 - Agency Street/Road/Highway O&M Activities - Survey Results (continued)

Activity, and related questions	*Agency Responses* *A = conducted by Agency, C = conducted by contractor, No = not conducted, NA = not applicable, NR = not reported*						
	Mountain View	Palo Alto	San Jose	Santa Clara	Saratoga	Sunnyvale	Santa Clara Co.
1. Street/Road/Highway Sweeping and Cleaning							
a. Street Sweeping:	A	A,C	A,C	A,C	C	A	A
Type of sweeping equipment?:	regenerative air	reg, air, broom, vacuum	broom	regenerative air, broom	regenerative air, broom	regenerative air, broom	regenerative air, broom
Sweeping material storage/dewatering locations?	corp. yard	corp. yard, temp street, and park	corp. yard, temp. street	corporation yard	corporation yard	corporation yard	corp. yard, remote storage
Sweeping material disposal?	sanitary landfill	landfill/compost	NR	sanitary landfill	sanitary landfill	sanitary landfill	sanitary landfill, or as haz material
b. Street cleaning by flushing with water	No	No	A	A	No	A	A
If cleaning by flushing with water, explain how often and for what purpose:	NA	NA	rarely, only for spills	minimal, for contracts	NA	prior to resurfacing	minimal, for dust or construction cleanup
2. Street/Road/Highway Repair and Maintenance							
a. Asphalt/concrete removal	A,C	A,C	A,C	A,C	A,C, Caltrans	A,C	A,C
b. Patching, resurface, & surface seal	A,C	A,C	A,C	A,C	A,C, Caltrans	A	A,C
c. Signing and striping	A,C	A,C	A,C	A	A,C, Caltrans	A	A,C
d. Traffic detector loop install/repair	C	A,C	A,C	A,C	C	C	A,C
e. Equipment cleaning and flushing	A	A,C	A	A,C	A	A	A,C
Where does cleaning of equipment take place?	corporation yard	corporation yard	corporation yard	corp. yard and field	corporation yard	corporation yard	corp. yard, contractor's yard
3. Sidewalk/Plaza Maintenance							
a. Cleaning	A,C	A	A,C	A,C	A	A	No
b. Surface removal and repair	A	A,C	A,C	C	A,C	C	A,C
c. Landscape maintenance	A	A,C	A,C	A,C	A,C, Caltrans	A	A
4. Bridge and Structure Maintenance							
a. Painting and paint removal	C	C	A,C	A,C	A,C	A	A,C
b. Repair work	C	C	A,C	A,C	C	A	A,C
c. Graffiti removal	A	A	A	A	A, Caltrans	A	A, volunteers
5. Median and Road Embankment Maintenance							
a. Erosion controls	A, Caltrans	C	A,C	A	A	Co., Caltrans	A
b. Slide and embankment repair	No, Caltrans	C	A,C	No	A,C, Caltrans	Co., Caltrans	A,C
c. Irrigation practices	A, Caltrans	A	A,C	A,C	A,C, Caltrans	A	A
d. Vegetation controls	A, Caltrans	A,C	A,C	A	A,C, Caltrans	A	A
i. Manual/mecha veg'n removal	A, Caltrans	A,C	A, other	A,C	A,C, Caltrans	A	A
ii. Pesticide usage	A, Caltrans	A	A,C	A,C	A,C, Caltrans	A	A
iii. Fertilizer usage	A, Caltrans	A	A,C	A,C	A,C, Caltrans	A	A
6. Litter Control	A	A	A,C, other	A	A,C	A	A, volunteers, inmates
7. Spill Control	A	A,C	A	A	A,C, Fire Dept.	C	A,C, Fire Depts.

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Table 1 - Agency Street/Road/Highway O&M Activities - Survey Results

Activity, and related questions	*Agency Responses* *A = conducted by Agency, C = conducted by contractor, No = not conducted, NA = not applicable, NR = not reported*						
	Campbell	Cupertino	Los Altos	Los Altos Hills	Los Gatos	Milpitas	Monte Sereno
1. Street/Road/Highway Sweeping and Cleaning							
a. Street Sweeping:	C	C	C	C	A	C	Los Gatos
Type of sweeping equipment?:	reg. air, broom, hand sweeping	regenerative air, broom	reg. air, broom and vacuum	regenerative air	regenerative air, broom	regenerative air, broom	none
Sweeping material storage/dewatering locations?	corporation yard	corporation yard	contractor's yard	NR	corporation yard	sanitary landfill	NA
Sweeping material disposal?	sanitary landfill	sanitary landfill	NR	sanitary landfill	sanitary landfill	sanitary landfill	NA
b. Street cleaning by flushing with water	No	No	No	No	No	No	No
If cleaning by flushing with water, explain how often and for what purpose:	NA	NA	NA	NA	NR	NA	NA
2. Street/Road/Highway Repair and Maintenance							
a. Asphalt/concrete removal	A,C	C	A,C	A,C	A,C	A,C	C
b. Patching, resurface, & surface seal	A,C	C	A,C	A,C	A,C	A,C	C
c. Signing and striping	A,C	A	A	A,C	A,C	A,C	C
d. Traffic detector loop install/repair	C	C	C	No	C	C	No
e. Equipment cleaning and flushing	A,C	A	A,C	A	A	C	No
Where does cleaning of equipment take place?	corp.yard, and in field	corporation yard	corp.yard, and in field	car wash	corporation yard	contractor's responsibility	NA
3. Sidewalk/Plaza Maintenance							
a. Cleaning	A	No	No	No	A,C	A	No
b. Surface removal and repair	C	C	A,C	No	A,C	C	No
c. Landscape maintenance	A	A	A	No	A,C	A	No
4. Bridge and Structure Maintenance							
a. Painting and paint removal	C	C	A	No	A,C, Caltrans	A,C	No
b. Repair work	C	C	A,C	No	A,C, Caltrans	A,C	No
c. Graffiti removal	A	A	A	No	A,C, Caltrans	A,C	No
5. Median and Road Embankment Maintenance							
a. Erosion controls	NA	A,C	A	C	A,C, Caltrans	A,C	C
b. Slide and embankment repair	NA	C	A	C	A,C, Caltrans	A,C	C
c. Irrigation practices	A	A	A	No	A,C	A	No
d. Vegetation controls	A,C	A	A	A,C	A,C	A	No
i. Manual/mech veg'n removal	A	A,C	A	A	A,C	A	No
ii. Pesticide usage	A,C	A,C	A	No	A,C	A	No
iii. Fertilizer usage	A,C	A	A	No	A,C	A	No
6. Litter Control	A	A	A	C	A,C, Caltrans	A	No
7. Spill Control	A, Fire Dist.	A	A	Fire Dept.	A,C, Caltrans	A,C	A

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III. Existing O&M Activities and Potential Water Quality Impacts *(continued)*

The Program's NPDES storm water discharge permit prohibits non-storm water discharges to storm drains (except for certain permissible discharges). Raw materials, wastes, and most washwater associated with O&M practices must be properly managed and not allowed to enter storm drains or watercourses.

Use of appropriate best management practices (BMPs) while performing O&M activities can significantly reduce potential discharges of pollutants to nearby storm drains and watercourses. Pollutants that may be controlled during each of the identified street/road/highway O&M activities are listed in Table 2.

Table 2 - Pollutant Discharges Reduced by Street/Road/Highway O&M Activity BMPs

Activity	Pollutant Categories			
	Sediment/ Turbidity	Oil and Grease	Heavy Metals	Other BOD=biological oxygen demand
1. Street/Road/Highway Sweeping and Cleaning				
a. Street sweeping (material collected)	X	X	X	***coliforms, floatables, BOD***
b. Street cleaning by flushing with water	X	X	X	***soap, coliforms, floatables, BOD***
2. Street/Road/Highway Repair & Maintenance				
a. Asphalt/concrete removal	X			***debris***
b. Concrete installation and repair	X			***alkalinity***
c. Patching, resurfacing, and sealing	X	X	X	
d. Signing and striping			X	***paint, debris***
e. Traffic detector loop installation and repair	X			***sealant***
f. Equipment cleaning and flushing	X	X	X	***soap, solvents***
3. Sidewalk/Plaza Maintenance				
a. Cleaning	X	X	X	***soap, solvents, BOD***
b. Surface removal and repair	X			***debris***
c. Landscape maintenance	X		X	***pesticides, nutrients, BOD***
4. Bridge and Structure Maintenance				
a. Painting and paint removal	X		X	***paint, solvents***
b. Repair work	X			***debris***
c. Graffiti removal	X		X	***solvents, paint***
5. Median and Road Embankment Maintenance				
a. Erosion controls	X			***debris, BOD***
b. Slide and embankment repair	X			***debris***
c. Irrigation practices	X			
d. Vegetation controls	X		X	***debris, pesticides, nutrients, BOD***
6. Litter Control	X	X	X	***floatables, BOD***
7. Spill Control	X	X	X	***spilled material or wastes***

PART II

Performance Standard

Performance Standard and Supporting Documents for
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PERFORMANCE STANDARD

1. Each municipal agency will implement best management practices (BMPs) for the street, road, and highway operation and maintenance (O&M) activities that it is responsible for conducting, in order to reduce pollutants in storm water to the maximum extent practicable and eliminate illicit discharges. Specific BMPs for each type of O&M activity will be those listed in the agency's Work Plan BMPs and Control Measures (Section 3).

2. Each municipal agency will develop and implement a process for ensuring that any contractor that it employs to conduct street, road, and highway O&M activities uses the appropriate BMPs adopted by the agency.

3. Each municipal agency will provide training on an annual basis to its municipal staff in the use of appropriate BMPs. The agency will also provide a mechanism for obtaining feedback from its municipal staff on the implementation and effectiveness of the BMPs.

4. Each municipal agency will inform other parties conducting street, road, and highway O&M activities within the municipal agency's jurisdiction that they are expected to implement BMPs to reduce pollutants in storm water to the maximum extent practicable and eliminate illicit discharges.

5. As part of the annual reporting process, each co-permittee will review and evaluate the effectiveness of its BMPs in achieving the goals of reducing pollutants in storm water to the maximum extent practicable and eliminating illicit discharges. The review and evaluation will include input from municipal maintenance staff that implement the BMPs.

PART III

Guidance for Support Documents

Section 1

Work Plan Implementation

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

Section 1
WORK PLAN IMPLEMENTATION

The work plan will describe actions to be taken by the co-permittee during the remaining three years of the storm water permit to meet the performance standards, along with an implementation schedule. The work plan will be developed by each co-permittee based on its responsibilities to conduct street, road, and highway O&M activities within its jurisdiction.

Example Contents of the Work Plan

- Steps needed to incorporate the implementation of performance standards and BMPs into standard operating procedures;
- Development of a process to ensure that contractors use appropriate BMPs;
- Development of a training program for municipal maintenance staff, including a mechanism for feedback on implementation and effectiveness of BMPs;
- A process for informing Caltrans and/or Santa Clara Valley Transportation Authority that they are expected to implement BMPs when work is done within the co-permittee's jurisdiction (the Program may assist with this process and provide other ways of fostering cooperation);
- A plan for reviewing and evaluating the effectiveness of the BMPs, with input from municipal maintenance staff. This should include development of a record keeping system to assist evaluation of the street sweeping program and other BMPs as determined necessary.
- A schedule for implementation.

Section 2

Legal Authority to Implement

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

Section 2
LEGAL AUTHORITY TO IMPLEMENT

This section demonstrates that the co-permittee has the legal authority to implement the performance standard, or provides a time schedule for developing and obtaining additional authority.

The co-permittee should provide references to municipal codes or ordinances that demon-strate adequate legal authority to require municipal staff and contractors to conduct O&M activities in a manner that eliminates or reduces water quality impacts. These include:

- Storm water discharge ordinance.
- Other ordinance or section(s) of municipal code that apply to maintenance activities.
- Standard contract language (see model language below).

Model Standard Contract Language[1]

Storm water runoff flows directly to creeks and San Francisco Bay without treatment. Allowing pollutants to directly or indirectly enter the storm drain system is prohibited by federal, state and local regulations. The operation and maintenance of public streets, roads, and highways can cause storm water pollution in numerous ways. For example, storm water pollution can be caused by wastes from street or equipment cleaning, by improper storage of products or wastes, or inadequate clean up of left-over or spilled products or wastes. These pollutants can either enter storm drains directly or be transported by storm water runoff.

The Contractor shall take all measures necessary to prevent pollutants from entering storm drains or watercourses. For the purpose of eliminating storm water pollution, the contractor shall implement effective Best Management Practices (BMPs). BMPs include general good housekeeping practices, appropriate scheduling of activities, operational practices, maintenance procedures and other measures to prevent the discharge of pollutants directly or indirectly to the storm drain system. These BMPs shall be maintained for the duration of the Contractor's work. The Contractor shall also be responsible for proper disposal of all waste materials, including wastes generated by the implementation of BMPs.

The following BMPs shall be implemented to prevent storm water pollution: (add appropriate BMPs from Section 3 here).

[1] Based on language in *Modifications to the Standard Specifications for Public Works Construction*, 1994, City of Oakland, *Pollution Prevention Language for Construction Contractors,* 1995, City of Palo Alto, and *Supplemental General Provisions,* 1994, City of Sunnyvale.

Section 3

Work Plan BMPs and Control Measures

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

Section 3
WORK PLAN BMPS AND CONTROL MEASURES

This section contains the list of Model Best Management Practices to be used as guidance for compliance in the implementation of the performance standard. The Model BMPs are grouped by activity. For consistency, each co-permittee should maintain the entire list of Model BMPs. Table 3, on the following page, gives each co-permittee the opportunity to list which, if any, BMPs will not be implemented because they do not apply to the activities for which it is responsible. If a group of BMPs does apply, the co-permittee may either agree to implement the Model BMPs or propose modifications or alternatives, as long as the co-permittee justifies why modifications are effective in reducing pollutants in storm water to the maximum extent practicable and in eliminating illicit discharges. A box at the end of each group of BMPs labeled "Individual Co-Permittee Modifications to Street/Road/Highway Sweeping and Cleaning BMPs" is provided to make these modifications and justifications.

References for Model BMPs

Alameda Countywide Clean Water Program, 1996. *Stormwater Management Plan: July 1996 to June 2001*. Appendix B, Performance Standards.

Bay Area Stormwater Management Agencies Association, 1996. *Pollution from Surface Cleaning*. Materials from the Pilot Source Control Program for Mobile Cleaners, Surface Cleaners Workshop, August 13, 1996.

Bay Area Stormwater Management Agencies Association, 1995. *Blueprint for a Clean Bay - Best Management Practices to Prevent Stormwater Pollution from Construction-Related Activities*.

California Department of Transportation, 1995. *Maintenance and Operations Plan for Caltrans District 4.* NPDES Permit No. CAS029998, Order No. 94-098.

Camp Dresser & McKee, et. al., 1993. *California Storm Water Best Management Practice Handbook (Municipal).* Prepared for the State Stormwater Quality Task Force.

Santa Clara Valley Nonpoint Source Pollution Control Program, 1994. *Best Management Practices for the Construction Industry* (7 tri-fold brochures).

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

Table 3 - BMP Applicability Summary Table for _____
(Agency Name)

O&M Activities	BMPs do apply	BMPs do *not* apply	If BMPs do not apply, explain
Street/Road/Highway Sweeping and Cleaning			
Sweeping			
Street cleaning by flushing with water			
Street/Road/Highway Repair and Maintenance			
Asphalt/concrete removal			
Concrete installation and replacement			
Patching, resurfacing, and surface sealing			
Signing and striping			
Traffic detector loop installation and repair			
Equipment cleaning, maintenance, and storage			
Sidewalk/Plaza Maintenance			
Cleaning			
Concrete installation and replacement			
Surface removal and repair			
Landscape maintenance			
Bridge and Structure Maintenance			
Painting and paint removal			
Repair work			
Graffiti removal			
Median/Road Embankment Maintenance			
Erosion controls			
Slide and embankment repair			
Irrigation practices			
Vegetation controls			
Litter Control			
Spill Control			

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

MODEL BMPs

I. STREET/ROAD/HIGHWAY SWEEPING AND CLEANING

A. Sweeping Timing and Frequency

1. Define the street sweeping program, and set priorities for sweeping frequency based on factors such as traffic volume, land use, proximity to watercourses, and field observations of material accumulation.
2. Establish and maintain a consistent sweeping schedule (i.e., sweep streets on the same day of the week or month);
3. Sweep streets just prior to the beginning of the wet season (i.e., during September or October).
4. Establish and implement a record-keeping system to evaluate the effectiveness of the sweeping program.

B. Sweeping Equipment Operation and Selection

1. Ensure that equipment operators are operating equipment according to manufacturer's recommendations.
   a) Check that street cleaning equipment is in proper adjustment.
   b) Operate street cleaning equipment at the speed specified by the manufacturer.
   c) When using broom sweepers, check that the proper weights on main and gutter brooms are used.
2. Maintain equipment in good condition and purchase replacement equipment as needed.
3. When purchasing new sweepers, consider replacing old equipment with more advanced equipment (such as replacing some broom sweepers with regenerative air sweepers) or other new technologies that maximize pollutant removal.
4. Where possible, use the most efficient sweepers owned (or contracted) by the agency in areas expected to have the highest pollutant loads, such as industrial areas.

C. Other Measures To Improve Sweeping Efficiency

1. One or more of the following measures will be used, where needed, to encourage voluntary relocation of vehicles parked in streets:
   a) Develop and distribute newsletters and other public education materials notifying residents and businesses of street sweeping schedules;
   b) Post temporary "no stopping, no parking" signs (for example in business districts, near large apartment complexes, etc.); and/or
   c) Post permanent street sweeping signs.

2. In areas where large accumulations of leaves or yard waste occur, use one or more of the following methods as necessary to improve sweeping efficiency:
   a) Utilize a leaf removal machine just prior to street cleaning;
   b) Utilize a front end loader with a dump truck just prior to cleaning; and/or
   c) Operate street cleaning equipment in tandem;
   d) Encourage residents to collect and compost leaves and yard waste or coordinate with a local composting program. If composting is infeasible, agencies should arrange for curbside pickup of collected leaves or yard waste. Coordinate leaf/yard waste pickup program with street sweeping program so that pickup immediately precedes sweeping.

3. Require operators to report trees or other obstructions interfering with street cleaning.

4. Do not sweep roads without curbs and gutters.

D. Management of Material Removed by Sweeping

1. Provide proper containment and placement for the temporary storage of material removed from streets to prevent discharges of pollutants to surface waters or groundwater. Do not store swept material near creeks or sensitive habitats.
2. When materials are saturated with water, dewatering will be done in an area that does not drain to storm drains or creeks.
3. Provide proper disposal of street sweeping materials.[1]
4. Clean sweepers at a wash rack with a sump that discharges to the sanitary sewer[2] or to a recycling system.
5. Keep debris storage to a minimum during the wet season (or make sure debris piles are covered).

E. Street Cleaning and Flushing

1. Evaluate the need for wet cleaning or flushing of streets on a case-by-case basis and where possible, substitute dry methods.
2.

[1] Proper disposal should be defined by each agency in its work plan.
[2] Contact the local wastewater treatment agency for permission to discharge to the sanitary sewer and information on any pretreatment requirements for this discharge.

Where absolutely necessary to use water to clean streets, collect the resulting washwater and dispose of it in the sanitary sewer[1]. Collect the washwater using methods such as:

a) Plug catch basin outlets or cover storm drains before flushing, and pump out all collected washwater, or

b) Allow washwater to flow into the storm drain system and collect it downstream at a storm drain clean out or manhole.

Individual Co-Permittee Modifications to Street/Road/Highway Sweeping and Cleaning BMPs:

[1] Contact the local wastewater treatment agency for permission to discharge to the sanitary sewer and information on any pretreatment requirements for this discharge.

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

II. STREET/ROAD/HIGHWAY REPAIR AND MAINTENANCE

A. Asphalt/Concrete Removal

1. Schedule asphalt and concrete removal activities for dry weather.
2. Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g., place sand bags around inlets or work areas).
3. After breaking up old pavement, sweep up materials thoroughly to avoid contact with rainfall and storm water runoff. Recycle as much material as possible, and properly dispose of nonrecyclable materials,
4. During saw-cutting and grinding operations, use as little water as possible. Block or place berms around nearby storm drain inlets, in drainage channel (if no inlet is nearby), or around work area (when bordering watercourse) using sand bags or an equivalent appropriate barrier, or absorbent materials such as pads, pillows and socks to contain slurry. If slurry enters the storm drain system, remove material immediately.
5. Remove saw-cut slurry (e.g., with a shovel or vacuum, or sweep up when dry) as soon as possible.

B. Concrete Installation and Repair

1. Avoid mixing excess amounts of fresh concrete or cement mortar on-site.
2. Store dry and wet materials under cover, protected from rainfall and runoff.
3. Wash out concrete transit mixers only in designated wash-out areas where the water will flow into drums or settling ponds or onto dirt or stockpiles of aggregate base or sand. Pump water from settling ponds to the sanitary sewer, where allowed. Whenever possible, recycle washout by pumping back into mixers for reuse. Never dispose of washout into the street, storm drains, drainage ditches, or creeks.
4. Whenever possible, return left-over materials in the mixer barrel to the yard for recycling. Dispose of small amounts of excess concrete, grout, and mortar in the trash.

C. Patching, Resurfacing, and Surface Sealing

1. Schedule patching, resurfacing and surface sealing for dry weather.
2. Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, cover stockpiles with plastic tarps or berm around them if necessary to prevent transport of materials in runoff.
3. Pre-heat, transfer or load hot bituminous material away from drainage systems or watercourses.
4. Cover and seal nearby storm drain inlets and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil

sealants has drained or evaporated. Clean any collected materials from these covered manholes and drains for proper disposal.

5. Prevent excess material from exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for clean up and proper disposal of excess materials.
6. Use only as much water as necessary for dust control, to avoid runoff.
7. Sweep up as much material as possible and dispose of properly. Only wash down streets if runoff is controlled or contained.
8. Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.
9. Make sure all shut-off valves on the equipment are working properly.
10. Follow spill control and clean-up measures listed in Section VII for any spills.
11. After the job is complete, remove stockpiles (asphalt materials, sand, etc.) as soon as possible.
12. If it rains unexpectedly, take appropriate action to prevent pollution of storm water runoff (e.g., divert runoff around work areas).

D. Signing (Legends) and Striping

1. Follow spill control and clean up measures in Section VII.
2. Contain and clean up waste materials and dispose of them properly according to the Material Safety Data Sheet.
3. Transfer and load paint and hot thermoplastic away from drainage systems or watercourses.
4. Sweep thermoplastic grindings into plastic bags. Yellow thermoplastic grindings may require special handling as they may contain lead.

E. Traffic Detector Loop Installation and Repair

1. Protect nearby storm drain inlets prior to cutting or flushing slot for traffic detector loops. Block or berm around nearby storm drain inlets using sand bags or an equivalent barrier, or use absorbent materials such as pads, pillows and socks to contain slurry.

2. Clean up residues by sweeping up as much material as possible, and dispose of material properly.

F. Equipment Cleaning, Maintenance and Storage

1. Inspect equipment daily and repair any leaks.

2. Perform major equipment repairs at the corporation yard, when practical.
3. If refueling or repairing vehicles and equipment must be done on-site, use a location away from storm drain inlets and creeks.
4. Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.
5. Clean equipment including sprayers, sprayer paint supply lines, patch and paving equipment, and mudjacking equipment at the end of each day. Conduct cleaning at a corporation or maintenance yard if possible. Use proper collection methods for the cleaning solution and recycle or dispose of waste materials at an approved hazardous waste facility.

Individual Co-Permittee Modifications to Street/Road/Highway Repair and Maintenance BMPs:

III. SIDEWALK/PLAZA MAINTENANCE

A. Cleaning

1. Use dry methods (e.g., sweeping or vacuuming) whenever practical to clean sidewalks and plazas rather than hosing, pressure washing, or steam cleaning.

2. Clean up spills as specified in Section VII.

3. If water must be used to clean sidewalks or plazas, implement the BMPs in the Bay Area Stormwater Management Agencies Association's *Pollution From Surface Cleaning,* to reduce soap, oil and other pollutants in stormwater to the maximum extent practicable and eliminate illicit discharges.

B. Concrete Installation and Repair

Refer to Section II. B.

C. Surface Removal and Repair

1. Schedule surface removal and repair activities for dry weather if possible.

2. Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g., place hay bales or sand bags around inlets). Clean afterwards by sweeping up as much material as possible.

3. After breaking up old pavement, remove and recycle as much as possible to avoid contact with rainfall and storm water runoff.

4. During saw-cutting operations, block or berm around nearby storm drain inlets using sand bags or an equivalent barrier, or absorbent materials such as pads, pillows and socks to contain slurry if necessary. If slurry enters the storm drain system, remove material immediately.

5. Remove saw-cut slurry (e.g., with a shovel or vacuum, or sweep up when dry) as soon as possible.

6. Stockpile materials away from streets, gutter areas, storm drain inlets or creeks.

7. Prevent excess material washed from placement of exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for clean up and proper disposal of excess materials.

8. Clean up all spills and leaks using "dry" methods (absorbent materials and/or rags). Properly dispose of absorbent materials and rags. If spills occur on dirt areas, dig up and remove contaminated soil promptly and properly.

9. After the job is complete, remove temporary stockpiles (asphalt materials, sand, etc.) and other materials as soon as possible.

10. If it rains unexpectedly, take appropriate action to prevent pollution of storm water runoff (e.g., divert runoff around work areas).

D. Landscape Maintenance

Refer to Section V *Median and Road Embankment Maintenance* for BMPs related to landscape maintenance: erosion controls, irrigation practices, vegetation controls, and use of pesticides and fertilizers.

Individual Co-Permittee Modifications to Sidewalk/Plaza Maintenance BMPs:

IV. BRIDGE AND STRUCTURE MAINTENANCE

1. Painting and Paint Removal

   a) Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.

   b) Do not transfer or load paint near storm drain inlets or watercourses.

   c) Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint container.

   d) Where there is significant risk of a spill reaching storm drains, plug nearby storm drain inlets prior to starting painting and remove plugs when job is completed.

   e) Clean up spills immediately, using methods outlined in Section VII.

   f) Capture all clean-up water, and dispose of properly.

   g) If sand blasting is used to remove paint[1], cover nearby storm drain inlets prior to starting work. Use plywood, canvas, nylon netting, or similar material to contain abrasive and foreign materials and dust within work areas. Meter sand to use the least amount to do the job. Sweep and vacuum up sand and blast materials and recycle or dispose of materials properly.

   h) If the bridge crosses a watercourse, perform work on a maintenance traveler or platform, or use suspended netting or traps to capture paint, rust, paint removing agents, or other materials, to prevent discharge of materials to surface waters. Dredging (with proper permits) may be necessary to recover solid materials that do fall into the watercourse.

2. Repair Work

   a) Prevent concrete, steel, wood, metal parts, tools, or other work materials from entering storm drains or watercourses.

   b) Thoroughly clean up the job site when the repair work is completed.

   c) Refer to Section II, *Street/Road/Highway Repair and Maintenance*, for BMPs regarding maintenance and repair of a paved bridge deck.

3.

[1] See the Bay Area Air Quality Management District requirements for sand blasting operations (Appendix B).

Graffiti Removal

a) When graffiti is removed by painting over, implement the BMPs in Section IV.1., Painting and Paint Removal, above.

b) Protect nearby storm drain inlets (using tarps in work areas, sand bags, and/or booms or barriers around inlets) prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.

c) Prevent any discharge of debris, cleaning compound waste, paint waste, or washwater containing cleaning compounds to storm drains or watercourses.

d) Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a landscaped or dirt area. If a landscaped area is not available, filter runoff through an appropriate filtering device (e.g., filter fabric) to keep sand, particles, and debris out of storm drains.

e) If a graffiti abatement method generates washwater containing a cleaning compound (such as high pressure washing with a cleaning compound), plug nearby storm drains and vacuum/pump washwater to the sanitary sewer.

f) Consider using a waterless chemical cleaning method for graffiti removal (e.g., gels or spray compounds).

g) Avoid graffiti abatement activities during a rain storm. If rains occur during graffiti abatement activities unexpectedly, take appropriate action to minimize the impact on storm water quality (e.g., divert runoff around work areas).

Individual Co-Permittee Modifications to Bridge and Structure Maintenance BMPs:

V. MEDIAN AND ROAD EMBANKMENT MAINTENANCE

A. Erosion Controls

1. Maintain vegetative cover on medians and road embankments to prevent soil erosion, trap pollutants, and slow the rate of storm water runoff. Plant and/or retain native vegetation as much as possible. Adjust mowing heights to allow substantial stubble. Leave clippings in place or apply mulch as additional cover.

2. Avoid moving large quantities of earth, except where regrading is necessary to repair or reconfigure an embankment. Do not use disking as a means of vegetation management.

3. Inspect drainage facilities, including cross drains, on a regular basis to ensure that sufficient drainage is provided during storm periods, so that runoff is not diverted onto slopes in a way that causes erosion. Report and remediate any observed erosion problems as soon as possible.

4. Ensure that erosion control is provided for storm drain outfalls.

B. Slide and Embankment Repair

1. Haul slide debris or removed material to an approved dump site as soon as practicable. Do not dump material into or near storm drain inlets, ditches, or watercourses.

2. Notify proper regulatory agencies (e.g., Santa Clara Valley Water District, California Department of Fish and Game, and Regional Water Quality Control Board) about material that has naturally fallen into a watercourse due to a substantial slide.

3. Use temporary erosion control measures, such as sediment basins, silt fences, hay bales, or blankets, if necessary to protect the slope until repairs have been completed. Revegetate denuded slopes as soon as practical to prevent future erosion.

C. Irrigation Practices

1. Inspect irrigation systems regularly for broken water lines, sprinkler heads, and valves, and to ensure that only the necessary amount of water is applied and that runoff is not occurring.

2. Reduce runoff by careful manual control of water volume and spray or adjusting automatic controls to minimize excess watering.

3. Repair any broken or leaking line, sprinkler head, or valve as soon as possible. Shut off the water source until repairs are made.

4. Prevent soil eroded as a result of a line break from entering the drainage system. After digging out a line, return all soil to the hole and compact properly.

5. When bailing out muddy water, do not pour it into the storm drain inlet or curb; pour it onto the landscape planting.

D. Vegetation Controls

1. General Practices

   a) Check equipment for chemical, oil, or fuel leaks, and make necessary repairs before leaving for the job site. Fuel equipment only at corporation yards or service stations.

   b) If a leak or spill does occur, refer to Spill Control BMPs in Section VII.

2. Manual and Mechanical Vegetation Removal

   a) Keep removed vegetation, including clippings, chips, and pruning debris, away from storm drain inlets and watercourses.

   b) When loading or chipping brush into a parked truck, do not leave leaves, twigs, chips, or other debris in the gutter or paved shoulder.

   c) When working on a slope, avoid loosening soil that could erode into drainage systems. Loosen only the amount of soil needed to remove the vegetation.

   d) Avoid loosening soil when rain is expected.

3. Pesticide Usage and Pest Management

   a) Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of pesticides and training of pest control advisors and applicators.

   b) Consider employing integrated pest management methods, including:
      i) No controls;
      ii) Physical/mechanical controls;
      iii) Environmental controls (mulching, pest-resistant vegetation, prescribed burns);
      iv) Biological controls (predators, parasites, etc.);
      v) Less toxic chemical controls (e.g., soaps and oils); and/or
      vi) Hot water.

   c) Use the least toxic pesticides (including herbicides) that will do the job, provided there is a choice. The agency will take into consideration the LD_{50}[1], overall risk to the applicator, and impact to the environment.

[1] The LD_{50} is the lethal dose killing 50 percent of exposed organisms in toxicity tests.

d) Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging non-degraded pesticides in stormwater runoff. Avoid application of pesticides if rain is expected.

e) Mix and apply only as much material as is necessary for treatment. Calibrate application equipment prior to and during use to ensure desired application rate.

f) Do not mix or load pesticides in application equipment adjacent to a storm drain inlet, culvert or watercourse.

g) Avoid use of copper-based pesticides if at all possible.

h) Consider using biological controls or less toxic chemicals before using diazinon to manage a pest problem (known to cause toxicity in aquatic life).

4. Fertilizer Usage

a) Avoid application of fertilizer if rain is expected.

b) Consider applying municipally-generated compost in lieu of chemical fertilizers.

c) Prior to applying fertilizer, check the nitrogen/phosphorus/potassium (N/P/K) concentrations and calibrate the distributor to avoid excessive application.

d) Check irrigation equipment prior to applying fertilizer to make sure it is working properly, and monitor systems to avoid over-watering.

e) Confine fertilizer to the targeted area. If fertilizer is accidentally applied to paved surfaces, remove fertilizer from these areas before irrigating and/or rainfall occurs. If water is used to remove fertilizer, direct flow to landscaped areas. Do not allow wash water from paved areas to flow to storm drains.

Individual Co-Permittee Modifications to Median and Road Embankment Maintenance BMPs:

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

VI. LITTER CONTROL

1. Post “No Littering” signs where needed and enforce anti-littering laws.
2. Provide an adequate number of litter receptacles in commercial areas and other litter source areas.
3. Empty litter receptacles on a frequent enough basis to prevent spillage.
4. Encourage public education efforts to include an anti-littering message.

Individual Co-Permittee Modifications to Litter Control BMPs:

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

VII. SPILL CONTROL

1. Store spill containment, clean-up materials, and the municipal agency's spill response plan on trucks and equipment.
2. Follow the municipal agency's spill response plan.
3. If you are instructed to clean up spilled materials, contain the spill and use "dry" methods to clean it up (e.g., scoops, rags, absorbents, or vacuuming). Do not hose down or bury spilled materials.
4. Collect spilled (non-hazardous) materials for reuse or recycling, where possible, and properly dispose of nonrecyclable wastes and spent absorbents.
5. If spills occur on dirt areas, dig up and remove contaminated soil promptly and properly.

Individual Co-Permittee Modifications to Spill Control BMPs:

Section 4

Standard Operating Procedures

Performance Standard and Supporting Documents for
Public Streets, Roads, And Highways Operation And Maintenance

Section 4
STANDARD OPERATING PROCEDURES

This section presents the co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Example SOPs:

- Staff and contractor awareness training:
  - conduct annual training;
  - review task related specific BMPs at "tail gate" meetings;
  - review applicable BMPs at pre-construction meeting (for contractors);
- Follow the BMPs.
- Establish responsibility for overseeing implementation of BMPs.
- Establish process for feedback on effectiveness and feasibility of BMPs from field crews.

PART IV

Co-permittee Standard Reporting Form

Appendix A

Comments on the Second Draft Performance Standard

Comments on Draft Performance Standard and Supporting Documents for Public Streets, Roads, and Highways Operation and Maintenance

(Draft Submitted to Management Committee September 19, 1996)

Date	Source	Comments	Response
September 24, 1996	Program Workshop	1. Modify performance standard 4. O&M activities conducted by PG&E, SCV Transportation Authority and others that are not co-permittees. Performance standard needs to be more measurable.	1. Performance standard 4, on page 6, changed from "coordinate with other co-permittees" to *"inform other parties...that they are expected to reduce pollutants in storm water to the maximum extent practicable and eliminate illicit discharges".*
		2. Add footnote specifying need to contact local wastewater treatment agency prior to discharging equipment cleaning, or street cleaning wastewater to the sanitary sewer.	2. Footnotes added on page 12, section I.D.4, and page 13, section I.E.2.
		3. After specifying use of pans or absorbent materials to catch drips, include *"Dispose of collected material and absorbents properly."*	3. Change made on page 15, section II.C.8.
		4. Combine last two BMPs in Equipment Cleaning, Maintenance and Storage, and delete word *"flush"*—it may encourage excess water use.	4. Change made on page 16, section II.F.5.
		5. Delete specific BMPs for sidewalk and plaza cleaning with water, and reference regional BASMAA BMPs.	5. Change made on page 17, section III.A.3.
		6. Add footnote referencing the BAAQMD regulations regarding sand blasting operations, and attach regulations.	6. Footnote added on page 19, section IV.1.g.
		7. Delete *"do not use sand blasting if bridge is over water,"* since capture devices are available and referenced in the following BMP.	7. Deletion made on page 19, section IV.1.g.

012450

Date	Source	Comments	Response
September 24, 1996, continued	Program Workshop, continued	8. Reference Painting and Paint Removal section in Graffiti Removal section. 9. Add *"Ensure that erosion control is provided for storm drain outfalls."* 10. Add *"Avoid application of pesticides if rain is expected."* 11. Modify Spill Control section to reference the municipal agency's spill response plan.	8. Reference made on page 20, section IV.3.a. 9. Addition made on page 21, section V.A..4. 10. Addition made on page 23, section V.D.3.d. 11. Changes made on page 25, section VII.
October 2, 1996	Libby Lucas	1. Pesticide and herbicide spraying on and around waterways must be considered an illegal practice (reference to District personnel observed spraying along banks of Guadalupe River). 2. Streambank setback criteria should be reinstated. 3. Reference should be made to the non-permissible use of herbicides and pesticides in South County. 4. Spills of contaminants on highways should be addressed.	1. This applies to flood control activities, not street, road and highway operation and maintenance. 2. This does not apply to street, road and highway operation and maintenance. 3. Use of pesticides is permitted on road embankments and regulated by the Department of Pesticide Regulation. The need to follow federal, state and local laws, and recommendations for alternatives are stated on page 22, section V.D.3. 4. Pesticide spills addressed on page 22, Section V.D.1.b.; general spill control BMPs on page 25, section VII.

012451

October 4, 1996	Ad-Hoc Task Group	1. Change timing of saw cut slurry removal to *"as soon as possible."*	1. Change made on page 14, section II.A.5, and on page 17, section III.C.5.
		2. Omit from "Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses" the phrase *"unless these areas are protected"*.	2. Omitted from page 14, section II.C.2, and page 17, section III.C.6.
		3. Add to "Cover and berm stockpiles," *"During wet weather"* and *"if necessary to prevent transport of materials in runoff."*	3. Added to page 14, section II.C.2.
		4. Where protection of storm drain inlets is specified (covering, berming, etc.,) change to protection of *"any nearby"* storm drain inlets.	4. Change made throughout.
		5. Add guidance on staff and contractor training to SOPs.	5. Guidance added on page 26.
October 11, 1996	Keyvan Moghbel (Regional Board)	1. Street sweeping frequency needs to be defined better; suggest establishing a baseline level of effort.	1. Co-permittees prefer to have more flexibility in establishing schedules. Will discuss with Program and AHTG and consider for future revision.
		2. Encourage use of best sweeper equipment in areas expected to have higher pollutant load (e.g., industrial areas).	2. Added to page 11, Section I.B.4.
		3. Would like to see a more specific process for record keeping.	3. Co-permittees want flexibility in designing own record keeping system. Will discuss with Program and AHTG and consider for future revision.

012452

Comments on Draft Performance Standard and Supporting Documents for Public Streets, Roads, and Highways Operation and Maintenance, *continued*

Date	Source	Comments	Response
October 11, 1996 (continued)	Keyvan Moghbel (continued)	4. Would like to see standard annual reporting form which indicates whether co-permittee has met performance standards, and if not, why not.	4. Draft reporting form has been developed in this format and sent to Keyvan.
October 13, 1996	Trish Mulvey (Clean South Bay)	1. Section I.A.1.: Clarify applicability in areas without curbs and gutters. 2. Section I.A.4.: Describe how effectiveness should be evaluated. Differentiate between sweeping for aesthetics and sweeping for pollution control. 3. Section I.D.1.: Consider adding *"proper placement"* as well as containment. (Creek banks are NOT O.K. for temporary storage locations.) 4. Section V.A.3: Add reporting and follow-up when erosion problems are found. 5. Section VI.1.: Clarify that "anti-dumping" refers to storm drains and creeks.	1. BMP added to page 12, Section I.C.4, advising not to sweep roads without curbs and gutters. 2. Guidance on record keeping and evaluation of effectiveness will be provided in a future revision. 3. Change made on page 12, Section I.D.1. 4. Change made on page 21, Section V.A.3. requiring O&M staff to report and remediate any erosion problems observed. 5. Change made on page 24, Section VI.1. to eliminate "anti-dumping" reference (does not apply to littering).

012453

STORM DRAIN SYSTEM OPERATION AND MAINTENANCE

Santa Clara Valley Urban Runoff Pollution Prevention Program

PUBLIC AGENCY ACTIVITIES

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

December 19, 1996

March 1, 1999

Participating Agencies:
Campbell, Cupertino, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

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PART I

Introduction, Definitions, and Existing O&M Activities

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM
PUBLIC AGENCY ACTIVITIES CONTROL MEASURES

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

Final Draft - December 19, 1996

I. Introduction

Performance Standards define control measures or levels of achievement for particular tasks carried out by all Santa Clara Valley Urban Runoff Pollution Prevention Program (Program) co-permittees. Control measures are described in the Program's Storm Water Management Plan, which is the basis for the 1995-2000 NPDES municipal storm water permit (Permit) period. The development and implementation of Performance Standards is an integral part of the Program during the five-year Permit period.

II. Purpose

The purpose of the performance standard for co-permittee-owned storm drain system operation and maintenance (O&M) is to identify maintenance activity implementation levels to optimize control of pollutants in storm water. Storms drain system O&M activities generally involve routine inspection and cleaning of inlets, catch basins, SD lines, drainage ditches, and pump stations to maintain capacity. This performance standard identifies the level of implementation for O&M activities, which co-permittees will adopt in order to control pollutants in storm water to the maximum extent practicable.

The performance standard is based on current and proposed practices that municipal agencies are and/or will be implementing to minimize water quality impacts, and practices that are accepted by the State and Regional Board as being effective in controlling these impacts. The performance standard is also consistent with the goals and objectives of the Storm Water Management Plan.

III. Existing Storm Drain O&M Activities

Existing Storm Drain O&M activities covered by this performance standard include the following:

- Storm Drain Inlet Inspection and Cleaning - Cleaning timing and frequency and identify known problem areas:
- Storm Drain Line Inspection and Cleaning - Cleaning timing and frequency and identify known problem areas:
- Storm Drain Manhole Inspection and Cleaning - Cleaning timing and frequency:
- Management of Storm Drain System Solid Waste - Management of material removed by storm drain operation and maintenance activities, including debris capture systems, containment storage and disposal:
- Debris Basin Inspection and Cleaning:
- Pump Station Inspection and Cleaning:
- Drainage Ditches Cleaning:
- Emergency Operations:
    1. Sewage Overflow
    2. Plugged Line
    3. Illegal Dumping

PART II

Performance Standard

Performance Standard and Supporting Documents for
Storm Drain System Operation and Maintenance

MODEL PERFORMANCE STANDARD
(Revised March 1, 1999)

1. Each municipal agency will implement best management practices (BMPs) for the storm drain system operation and maintenance (O&M) activities that it is responsible for conducting. in order to reduce pollutants in storm water to the maximum extent practicable. Specific BMPs for each type of O&M activity will be those listed in the agency's Work Plan BMPs and Control Measures (Section 3).

2. Each municipal agency will develop and implement a process for tracking hot spots and ensuring that appropriate BMPs and SOPs will be implemented for storm drain operation and maintenance activities.

3. Each municipal agency will develop and implement a process for ensuring that any contractor that it employs to conduct storm drain system O&M activities uses the appropriate BMPs adopted by the agency.

4. Each municipal agency will provide training on an annual basis to its municipal staff in the use of appropriate BMPs. The agency will also provide a mechanism for obtaining feedback from its municipal staff on the implementation and effectiveness of the BMPs.

5. As part of the annual reporting process. each co-permittee will review and evaluate the effectiveness of its BMPs in achieving the goals of reducing pollutants in storm water to the maximum extent practicable. The review and evaluation will include input from municipal maintenance staff that implement the BMPs. The evaluation process will include consideration for storm drain structural retrofit.

6. Each municipal agency will develop a process to advise the IC/ID inspectors when hot spots or unusual contaminants are encountered during routine storm drain cleaning/maintenance activities to allow IC/ID inspectors to track the illicit connections or illegal dumping incidents on the "Incident Type" annual summary form.

PART III

Guidance for Support Documents

Section 1

Work Plan Implementation

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

Section 1
WORK PLAN IMPLEMENTATION

This section contains the plan or activities to be taken to enable the co-permittee to achieve the performance standard, along with an implementation schedule. The work plan will be developed by each co-permittee based on its responsibility to conduct storm drain operation and maintenance activities within its jurisdiction.

Example Contents of the Work Plan

The work plan will describe actions to be taken by the co-permittee to meet the performance standard and adopt and implement the model (or equivalent) BMPs. The work plan for the first year should include:

- Steps needed to incorporate the implementation of the performance standard and BMPs into standard operating procedures;
- Development of a process to ensure that contractors use appropriate BMPs;
- Development of a referral and follow-up process between storm drain operation and maintenance activities and illicit connection and illegal dumping activities;
- Development of an annual training program for municipal maintenance staff, including a mechanism for feedback on implementation and effectiveness of BMPs;
- Development of a record keeping system in order to track:
  1. cleaning activities
  2. hot spots
  3. spill and illegal dumping incidents;
- A plan for annually reviewing and evaluating the effectiveness of BMPs, with input from municipal maintenance staff;
- A process for evaluating consideration for storm drain structural retrofitting;
- A schedule for implementation.

Storm Drain System Operation and Maintenance Performance Standard
Example Contents of Work Plan
(Revised March 1, 1999)

- Steps needed to incorporate the implementation of the performance standard and BMPs into standard operating procedures.
- Development of a process to ensure that contractors use appropriate BMPs.
- Development of a referral and follow-up process between storm drain operation and maintenance activities and illicit connection and illegal dumping activities.
- Development of an annual training program for municipal maintenance staff, including a mechanism for feedback on implementation and effectiveness of BMPs.
- Develop and describe a record keeping system in order to track:

1. cleaning activities
2. hot spots
3. spill and illegal dumping incidents

- A plan for annually reviewing and evaluating the effectiveness of BMPs, with input from municipal maintenance staff.
- A process for evaluating consideration for storm drain structural retrofitting.
- A schedule for implementation.

Section 2

Legal Authority to Implement

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

Section 2
LEGAL AUTHORITY TO IMPLEMENT

This section demonstrates that the co-permittee has the legal authority to implement the performance standard or provides a time schedule for developing and obtaining additional authority.

The co-permittee should provide references to municipal codes or ordinances that demonstrate adequate legal authority to require municipal staff and contractors to conduct storm drain system operation and maintenance activities in a manner that eliminates or reduces water quality impacts. These include:

- Storm drain discharge ordinance.
- Other ordinance or sections of municipal code that apply to maintenance activities.
- Standard contract language.

Model Standard Contract Language[1]

Storm water runoff flows directly to creeks and San Francisco Bay without treatment. Allowing pollutants to directly or indirectly enter the storm drain system is prohibited by federal, state and local regulations. The operation and maintenance of storm drain systems can cause storm water pollution in numerous ways. For example, trash, leaves, sediments, oil and grease from parking lots, streets and industrial areas are frequently collected in the storm drain system. These pollutants can either enter storm drains directly or be transported by storm water runoff.

The Contractor shall take all measures necessary to prevent pollutants from entering storm drains or water courses. For the purpose of eliminating storm water pollution, the contractor shall implement effective Best Management Practices (BMPs). BMPs include general good housekeeping practices, appropriate scheduling of activities, operational practices, maintenance procedures and other measures to prevent the discharge of pollutants directly or indirectly to the storm drain system. These BMPs shall be maintained for the duration of the Contractor's work. The Contractor shall also be responsible for proper disposal of all waste materials, including

[1]Based on language in *Modifications to the Standard Specifications for Public Works Construction*, 1994, City of Oakland, *Pollution Prevention Language for Construction Contractors*, 1995, City of Palo Alto, and *Supplemental General Provisions*, 1994, City of Sunnyvale.

wastes generated by the implementation of BMPs.

The following BMPs shall be implemented to prevent storm water pollution: (add appropriate BMPs from Section 3 here).

Section 3

Work Plan BMPs and Control Measures

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

Section 3
WORK PLAN BMPs AND CONTROL MEASURES

This section contains the list of Best Management Practices to be used as guidance for compliance in the implementation of the performance standard. The model BMPs are grouped by activity. Component I of the performance standard is broken down into tiers to fit individual agencies. Depending on individual characteristics and resources, some co-permittees will implement Tier 1, while others will implement Tier 2.

In the table below, the co-permittee should indicate whether or not each group of BMPs applies to the activities for which it is responsible. If a group of BMPs does apply, the co-permittee may either agree to implement the model BMPs or propose modifications or alternatives, as long as the co-permittee justifies why modifications are effective in reducing pollutants in storm water to the maximum extent practicable.

BMP Applicability Summary Table for _____
(Agency Name)

Storm Drain O&M Activities	BMPs do apply	BMPs do not apply	If BMPs do not apply, explain:
Routine Inspection and Cleaning (select Tier 1 or Tier 2)			
Tier 1			
Inlets/Catch Basin Cleaning			
Storm Drain Line Cleaning			
Pump Stations, Detention and Debris Basins			
Known Problem Areas			
Tier 2			
Inlets/Catch Basin Cleaning			
Storm Drain Line Cleaning			
Pump Stations, Detention and Debris Basins			
Known Problem Areas			

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

BMP Applicability Summary Table (continued)

Activities	BMPs do apply	BMPs do not apply	If BMPs do not apply, explain:
Solid Waste Best Management Practices			
Debris Removal			
Debris Capture Systems			
Containment and Storage			
Waste Dewatering			
Staff/Contractor Training and Coordination			
Referral and Follow-up Processes			
Staff Training			
Contract Specifications			
Record Keeping and Evaluation			
Record Tracking Maintenance			
Effectiveness Evaluation			
Operational Improvement, Structural Retrofit and Design Changes			
Annual Review			
Capitol Improvement Projects Maintenance Provisions			

References

Alameda Countywide Clean Water Program, 1993/94, *Municipal Government Maintenance Best Management Practices*.

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

Model BMPs

I. Routine Inspection and Cleaning

(Co-permittees should implement Tier 1 or Tier 2)

Tier 1

1. Inspect and clean as needed, all inlets/catch basins at least once every other year (at least 50% of entire system inspected and cleaned each year).
2. Inspect and clean as needed, all inlets/catch basins in known problem areas at least once a year.
3. Inspect and clean as needed, all storm drain lines in known problem areas at least once a year.
4. Inspect and clean as needed, sumps and debris racks at pump stations, detention basins, drainage ditches and debris basins throughout the year.
5. Cleaning activities may occur on a year round basis; however, known problem areas shall be targeted prior to the rainy season.
6. Inspect and clean as needed, all storm drain facilities that have been affected by emergency response activities.

Tier 2

1. Inspect and clean as needed, all inlets/catch basins at least once a year.
2. Inspect and clean as needed, all inlets/catch basins in known problem areas more than once a year.
3. Inspect and clean as needed, all storm drain lines in known problem areas more than once a year.
4. Inspect and clean as needed, sumps and debris racks at pump stations, detention basins, drainage ditches and debris basins throughout the year.
5. Cleaning activities may occur on a year round basis; however, known problem areas shall be targeted prior to the rainy season.
6. Inspect and clean as needed, all storm drain facilities that have been affected by emergency response activities.

II. Solid Waste Best Management Practices

1. As much debris, silt, trash and sediment as possible shall be removed from the storm drain system when cleaning. Debris capture systems shall be used to prevent material from washing into streams or channels.

2. Provide proper containment for the temporary storage of removed debris during cleaning. Surface types of temporary storage sites shall be of concrete, asphalt or other type of impermeable material.
3. Waste collected from storm drain systems shall be dewatered as necessary for proper disposal to the landfill. Dewatering sites should not drain to storm drains or creeks.

III. Staff/Contractor Training and Coordination

1. Provide a referral and follow-up process between storm drain operation and maintenance and illicit connection and illegal dumping investigation staff for problems found.
2. Provide staff training for storm drain operation and maintenance personnel at least once a year with emphasis on controlling storm water pollution through storm drain operation and maintenance.
3. Include provisions for storm water pollution prevention in contract specifications for conducting storm drain operation and maintenance.

IV. Record Keeping and Evaluation

1. Maintain records tracking all cleaning activities. The records shall show when and which facilities have been inspected and cleaned. Spill and illegal dumping incidents and responses to both incidents shall also be documented and tracked.
2. Document any unusual flows observed during inspection (particularly dry weather flows) and the follow-up actions/referrals.
3. Review the records annually to critique the effectiveness of storm drain operation and maintenance activities. Modifications, if necessary, to co-permittees' storm drain operation and maintenance activities shall be identified in the annual individual work plans.

V. Operational Improvement, Structural Retrofit and Design Changes

1. Review the storm drain operation and maintenance program annually and if needed, identify operational improvements, opportunities for structural retrofit and design changes.
2. Operation and maintenance provisions shall be included in planning and design phases of Capitol Improvement Projects to ensure that storm water quality issues are considered in the design of storm drain systems.

Individual Co-permittee Modifications to Storm Drain System Operation and Maintenance BMPs

Performance Standard and Supporting Documents for

Section 4

Standard Operating Procedures

Storm Drain System Operation and Maintenance

Section 4
STANDARD OPERATING PROCEDURES

This sections contains the co-permittee's standard operating procedures (SOPs) for implementation of the performance standard. When generating documents such as these, it may helpful to conduct this test. If a statement tells you how to do something and it is something you are already doing, it is an SOP. If a statement sounds like what you should be doing or are going to do, it is a work plan item.

Example SOPs

- Staff and/or contractor training.
- Documentation and/or record keeping methods and procedures.
- Referral procedures between storm drain maintenance activities and illicit connection and illegal discharge procedures.
- Follow the BMPs.
- Standard procedures for ensuring contractors employ appropriate BMPs adopted by the agency.

PART IV

Co-permittee Standard Reporting Form

Performance Standard and Supporting Documents for

Storm Drain System Operation and Maintenance

Co-permittee Reporting Form

1. Are you implementing best management practices (BMPs) for storm drain system operation and maintenance (O&M) activities that you are responsible for conducting, in order to reduce pollutants in storm water to the maximum extent practicable?

   ☐ yes ☐ no If no, explain:

2. Have you developed and implemented a process for tracking hot spots, and have you implemented appropriate BMPs and SOPs?

   ☐ yes ☐ no If no, explain:

3. Have you developed and implemented a process for ensuring that any contractor that you employ to conduct storm drain system O&M activities uses the appropriate BMPs adopted by the agency?

   ☐ yes ☐ no If no, explain:

4. Have you provided training on an annual basis to your municipal staff in the use of appropriate BMPs?

   ☐ yes ☐ no If no, explain:

   Have you provided a mechanism for obtaining feedback from your municipal staff on the implementation and effectiveness of the BMPs?

   ☐ yes ☐ no If no, explain:

5. Have you reviewed and evaluated the effectiveness of BMPs in achieving the goals of reducing pollutants in storm water to the maximum extent practicable?

   ☐ yes ☐ no If no, explain:

   Did your evaluation include input from municipal maintenance staff that implement the BMPs?

   ☐ yes ☐ no If no, explain:

   Did your evaluation include consideration for storm drain structural retrofit?

   ☐ yes ☐ no If no, explain:

RURAL PUBLIC WORKS MAINTENANCE AND SUPPORT ACTIVITIES

Santa Clara Valley Urban Runoff Pollution Prevention Program

PUBLIC AGENCY ACTIVITIES

Performance Standard and Supporting Documents for

Rural Public Works Maintenance and Support Activities

December 19, 2002

Participating Agencies:

Campbell, Cupertino, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, County of Santa Clara and the Santa Clara Valley Water District.

PART I

Introduction

PART II

Performance Standard

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for

Rural Public Works Maintenance and Support Activities

(December 19, 2002[1])

I. Introduction

The goal of the Rural Public Works Performance Standard is to minimize the water quality impacts resulting from public works maintenance and support activities in rural areas. This performance standard is intended to aid Co-permittees in ensuring that required control measures are implemented while performing maintenance activities adjacent to streams to prevent the degradation of stream functions. Santa Clara County contains habitat for the threatened Central California Coast Steelhead. Maintenance Activities in watersheds that support steelhead habitat are subject to Limit No. 10, Routine Road Maintenance, of the Endangered Species Act (ESA) Section 4(d) Rules to Protect Threatened Salmon and Steelhead, signed on June 20, 2000. This limit finds routine road maintenance activities must "not impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward [a properly functioning condition] (PFC)"[2][3] This Performance Standard is consistent with the goal of Limit No. 10.

The Rural Public Works Performance Standard defines the level of implementation that each Co-permittee in the Santa Clara Valley Urban Runoff Pollution Prevention Program will attain to demonstrate that water quality is protected to the maximum extent practicable.

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[1] Approved by the SCVURPPP Management Committee at its December 19, 2002 meeting.

[2] *A Citizen's Guide to the 4(d) Rule for Threatened Salmon Steelhead on the West Coast*, National Marine Fisheries Service Northwest and Southwest Regions, June 20, 2000.

[3] NMFS is not requiring states, local governments or private parties to change their practices to conform to any of the take limits described in the final rule. The limits provide one way to be sure an activity or program does not risk violating the take prohibitions. Simply because a program is not within a limit does not mean that it automatically violates the ESA or the 4(d) rule. However, it does mean that any program or jurisdiction would risk ESA penalties if the activity in question takes a listed fish. By receiving a limit, governments and individuals receive assurance that their activities do not violate the take prohibitions and will not be subject to enforcement. (NMFS, June 20, 2000).

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

PERFORMANCE STANDARD

1) The Co-permittee will implement and require contractors to implement appropriate best management practices (BMPs) when performing maintenance activities in or adjacent to a stream channel unless required to do otherwise by emergency flood control procedures. During emergency flood control activities, water quality will be protected to the maximum extent practicable

2) The Co-permittee will plan for proper erosion prevention and sediment control measures in designing rural roads.

3) During construction, the Co-permittee will inspect the construction site, and maintain construction erosion prevention and sediment control BMPs to ensure that they are working properly and that problems are corrected as soon as they develop.

4) Maintenance staff will properly store, use, and dispose of materials, chemicals and wastes during and after the performance of activities. Mechanical equipment will be stored and operated properly as well.

5) Co-permittees will provide annual training and technical assistance to maintenance staff in the use of appropriate BMPs.

6) Co-permittees will obtain the correct permits for maintenance activities taking place in or adjacent to stream channels. The "correct permits" are defined on page 14 herein.

7) The Co-permittee will provide outreach materials to contractors, developers, and staff on Rural Public Works Maintenance and Support Activities BMPs and permitting requirements.

8) The Co-permittee will evaluate and report on the implementation of the rural public works performance standards as part of the individual Co-permittee annual reports. Annual reporting and inspections are not required under the following special cases: levees that are inspected frequently under another program (i.e. SCVWD levees inspected for flood protection and control) and levees where captured runoff would be under another NPDES permit (i.e. City of Sunnyvale treatment pond levees).

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
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DEFINITIONS

Berm — An elevated area constructed of asphalt materials, base rock, soils, sandbags or other materials to divert runoff. Typically located along roadway shoulders.

Brush — Vegetative material smaller in length/diameter than large woody debris. May consist of cuttings of native vegetation intended for use in slope stabilization BMPs such as brushlayering, brushpacking, willow wattles, etc.

Cut and Plug — The practice of cutting woody debris in streams that may become lodged in downstream obstructions into small pieces and/or short lengths. (culverts, log jams, etc.)

Emergency — An emergency consists of circumstances creating a substantial risk of loss, damage, interruption of essential services, or threat to public health or safety that could not have been reasonably foreseen. "Emergency" includes any man-made or natural event or circumstances causing or threatening loss of life, injury to person or property, including but not limited to fire, explosion, flood, severe weather, earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, actual or imminent loss of transportation facilities, civil disturbance, riot, sabotage and war.

The distinction must be made as to when the emergency is over and cleanup begins. An emergency ends when threats of loss of life or injury are mitigated and pre-emergency service is restored. Examples of emergency operations include, but are not limited to, modification of large woody debris/log jams in streams, streambank/slope stabilization, flood response and emergency road opening measures.

Habitat — An area used by a species for migration, breeding, spawning, foraging, shelter, etc. May refer to generic types of habitat, such as riparian (near water bodies), upland (above riparian habitat), etc.

Diversion Potential Occurs at a stream crossing having one approach that slopes away from the stream bed so as to potentially divert flow reaching the road surface away from the channel.

Large Woody Debris Large pieces of woody material 6 inches and larger in diameter and at least 10 feet long. Also includes root wads and stumps. Typically refers to woody debris in water bodies.

Revegetation The placement, planting and/or fostering of growth of beneficial plant species.

Rural Road A public paved or unpaved road that is:

a) in an area having average lot sizes of 1 acre net or greater or zoned as open space under Co-permittee jurisdiction; and
b) not served by an integrated municipal storm drain system;
c) not served by curbs and gutters; and
d) intended to be passable to a maintenance vehicle.

This definition does not include hiking and equestrian trails, unless they are intended to be passable to a maintenance vehicle.

Sensitive Area Any area in which plant or animal life or their habitats are rare or especially valuable, including any area in the following categories:

1. habitats containing or supporting "rare and endangered" species as defined by the State Fish and Game Commission as well as "threatened and endangered" species and their associated critical habitat, as defined under the Federal Endangered Species Act;
2. perennial and intermittent streams and their tributaries that support aquatic habitat;
3. lakes, ponds and adjacent shore habitat;
4. wetlands, marshes and coastal tide lands;
5. coastal and offshore areas containing breeding or nesting sites or used by migratory and resident water –associated birds for resting areas and feeding;
6. areas used for scientific study and research concerning fish and wildlife;
7. existing game and wildlife refuges and reserves; and
8. sand dunes and sea cliffs.

Sidecast Material placed on or within the banks of any water body; the practice of placing material on or within the banks of any water body.

Slipout A shallow slope failure, typically involving the shoulder of a road or trail. May be caused by high groundwater, falling trees (windthrow), etc.

Washout A slope or bank failure, typically involving the shoulder of a road or trail. May be caused by high flows in streams, concentrated runoff, etc.

Watercourse Bank The slope of land that adjoins a watercourse, the top of which shall be the topographic line roughly parallel to the watercourse center line where the side slopes intersect the plane of the ground adjacent to that traversed by the watercourse. Where banks do not distinguishably end, the surrounding land being extensions of the banks, the top of such banks shall be determined by the Santa Clara Valley Water District Community Project Review Unit, Unit Manager.

PART III

Guidance for Support Documents

Attachment 1

Work Plan Implementation

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 1
WORK PLAN IMPLEMENTATION

This section describes the activities to be conducted by the co-permittee, and described in the co-permittee's local Urban Runoff Management Plan (URMP) to implement the performance standard, along with an implementation schedule.

Example Contents of the Work Plan

- Develop (or review and revise) standard operating procedures for rural public works activities.
- Develop or adapt BMPs and control measures.
- Ensure adequate legal authority, including chain of command, used to conduct and enforce the use of rural public works maintenance BMPs by others, if necessary, as documented by reference in Attachment 2.
- Obtain or develop educational materials for training maintenance staff and for outreach to contractors.
- Develop an annual training program for maintenance staff.
- Annually conduct an evaluation of the effectiveness of the rural public works program, report the results of the evaluation in the Annual Report, and identify items for continuous improvement.
- Identify the rural public works facilities that are under the agency's jurisdiction.

Attachment 2

Legal Authority to Implement

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 2
LEGAL AUTHORITY TO IMPLEMENT

This section contains a demonstration of the co-permittee's legal authority to implement the performance standard, or a time schedule for developing and obtaining additional authority.

The co-permittee should provide references to municipal codes or ordinances that demonstrate adequate legal authority to require contractors to conduct O&M activities in a manner that eliminates or reduces water quality impacts. These include:

- Storm water discharge ordinance.
- Other ordinance or section(s) of municipal code that apply to maintenance activities.
- Standard Operating Procedures (see Attachment 4)
- Standard contract language (see model language below).

Model Standard Contract Language[4]

Storm water runoff flows directly to creeks and San Francisco Bay without treatment. Allowing pollutants (including sediment) to directly or indirectly enter the storm drain system is prohibited by federal, state and local regulations. The operation and maintenance of public streets, roads, and highways can cause storm water pollution in numerous ways. For example, storm water pollution can be caused by wastes from street or equipment cleaning, by improper storage of products or wastes, or inadequate clean up of left-over or spilled products or wastes. These pollutants can either enter storm drains directly or be transported by storm water runoff.

The Contractor shall take all measures necessary to prevent pollutants (including sediment) from entering storm drains or watercourses. For the purpose of eliminating storm water pollution, the contractor shall implement effective Best Management Practices (BMPs). BMPs include general good housekeeping practices, appropriate scheduling of activities, operational practices, maintenance procedures and other measures to prevent the discharge of pollutants directly or indirectly to the storm drain system. These BMPs shall be maintained for the duration of the Contractor's work. The Contractor shall also be responsible for proper disposal of all waste materials, including wastes generated by the implementation of BMPs.

The following BMPs shall be implemented to prevent storm water pollution: (add appropriate BMPs from Section 3 here).

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

[4] Based on language in *Modifications to the Standard Specifications for Public Works Construction*, 1994, City of Oakland, *Pollution Prevention Language for Construction Contractors,* 1995, City of Palo Alto, and *Supplemental General Provisions,* 1994, City of Sunnyvale.

Attachment 3

Work Plan BMPs and Control Measures

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 3
WORK PLAN BMPS AND CONTROL MEASURES

This section contains the list of Model Best Management Practices to be used as guidance for compliance in the implementation of the performance standard. Each Co-permittee will adopt specific BMPs applicable to their agencies in order to implement the Performance Standards. For consistency, each co-permittee should maintain the entire list of Model BMPs. Co-permittees may agree to implement the Model BMPs or propose modifications or alternatives to those that apply as long as justification of why the modifications are effective in reducing pollutants in storm water to the maximum extent practicable and in eliminating illicit discharges is provided. If a group of BMPs does not apply, Co-permittees should provide an explanation as to why they are not applicable under their jurisdiction. This will be documented in the Co-permittees URMP.

Some of the BMPs in this document can also be found in the previously adopted Santa Clara Valley Urban Runoff Pollution Prevention Program's Model BMPs for Public Streets, Roads and Highway Operation and Maintenance. Those portions of Sections II. Street/Road/Highway Repair and Maintenance and V. Median and Road Embankment Maintenance, of the Public Streets, Roads, and Highways Operation and Maintenance Model BMPs that address the prevention of road-related erosion are restated in this document. In addition, the report entitled "Effects of County Land Use Policies and Management Practices on Anadromous Salmonids and their Habitats" prepared for the FishNet 4C Program was reviewed in development of the BMPs contained within, in order to include BMPs considered effective for protection of fish habitat. For further information and guidance on the implementation of the BMPs recommended, co-permittees should consult the references listed below.

References for Model BMPs

California Regional Water Quality Control Board San Francisco Bay Region, 1999. *Erosion and Sediment Control Field Manual, Third Edition.*

Camp Dresser and McKee, December 2000. *Alameda Countywide Clean Water Program Unpaved Road BMP Guide.*

Camp Dresser & McKee, et. al., 1993. *California Storm Water Best Management Practice Handbook (Municipal).* Prepared for the State Stormwater Quality Task Force.

County of San Mateo Department of Public Works, 2001. *Endangered Species and Watershed Protection Program, Volume 1: Maintenance Standards.*

Fifield, Jerald, 2002, *Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors*, Forester Press, publisher

Keith Guenther, Wildland Solutions, PO Box 710 Brewster, WA 98812. *Low Maintenance Roads for Ranch, Fire and Utilities Access Wildland Solutions Field Guide Series*

Harris, Richard R., Susan D. Kocher, and Kallie Marie Kull, Jaunuary 2001. *Effects of County Land Use Policies and Management Practices on Anadromous Salmonids and their Habitats: Sonoma, Marin, San Mateo, Santa Cruz and Monterey Counties, California.*

Santa Clara Valley Nonpoint Source Pollution Control Program, 1994. *Best Management Practices for the Construction Industry* (7 tri-fold brochures)

Weaver, William E. and Danny K Hagans, Pacific Watershed Associates, *Handbook for Forest and Ranch Roads: A guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads,* June 1994.

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 3, continued
MODEL BMPs

a) Management and/or Removal of Large Woody Debris and Live Vegetation from Stream Channels

1. Do not remove or physically alter any large woody debris in any body of water except under the following emergency conditions:

   A. Material backing up flows at a bridge or culvert during a storm may be modified to halt damage or flooding.

   B. Large woody debris/log jams on public property that are damaging or immediately threatening the integrity or roads, bridges, other public facilities or private developments during high flows may be modified to reduce or halt damage and direct flow toward a more desirable path.

   C. Logs and debris shall only be removed from streams as a "last resort" (i.e. failure to remove them will most likely cause the loss of an essential facility or in order to maintain channel capacity).

   D. Non-emergency debris maintenance will only be undertaken after the appropriate permits have been obtained.

2. Crews should take precautions when modifying log or debris jams in order to prevent damage downstream. "Cut and plug" practices should be avoided, when possible.
3. Emergency modifications and/or removal shall be limited to materials higher than approximately 2' above the streambed (i.e. above knee height) to preserve some instream habitat features unless the log or debris jam is immediately upstream of a culvert or bridge, or if permit conditions require otherwise. Secure root wads should be left in place, when possible.
4. Reusable large woody debris such as root balls and sizeable logs shall be transported, when logistically feasible to a storage facility. These materials can be used at a later date for erosion repair, mitigation projects or ground up to be used as ground cover. Trees, logs and/or stumps shall be left in the longest lengths/diameters practicable for removal and hauling. When uprooted trees must be cut, leave at least 8' of trunk attached to the root ball. All other logs should be left at least 12' long (to stockpile for future use).

b) Streambank Stabilization Projects

1. When areas adjacent to water bodies wash or slip out resulting in a reduction of the width of the traveled way, Co-permittees shall consider responding by:

   A. Temporary one-way traffic controls

   B. Temporary closure of the road if adequate alternate route(s) exist

   C. Rerouting road into cut slope (This is acceptable if the impacts to the slope and road are minimal, if the additional cut is within the existing right of way or if written approval can be obtained from the owner of the property impacted by the cut slope.)

   D. Emergency stabilization using large wood materials (root wads, log cribbing, etc.)

   E. Placement of asphalt concrete or cutback berms to divert runoff away from the damaged area.

2. Potential impacts to upstream and downstream banks, structures and facilities should be identified before performing maintenance.
3. Slide debris shall not be sidecast. Reuse of slide debris shall be allowed for use in berms if the debris are free of organic materials and if the reuse is approved by a licensed engineer.
4. Notify proper regulatory agencies (e.g., Santa Clara Valley Water District, California Department of Fish and Game, and Regional Water Quality Control Board) about material that has naturally fallen into a watercourse due to a substantial slide.
5. In the case of an unexpected slide, use temporary erosion prevention and sediment control measures, such as sediment basins, silt fences, hay bales, erosion control mats, blankets or wattles, if necessary, to protect the slope until repairs have been completed. (Hay bales should not be used as filters alone)
6. Denuded slopes shall be revegetated. Perform hand seeding and/or hydroseeding and watering to allow germination of the seed prior to the first rains. Erosion control mats and mulching are necessary in the first wet season following revegetation.
7. Slide debris shall be removed to the nearest suitable area for temporary storage and shall be enclosed or contained after the emergency to prevent erosion. Slide debris removed by maintenance crews should not be allowed to erode into any water body. Slide debris shall be removed to the nearest permanent, stable storage or recycling location at the earliest opportunity, or may be used as backfill in permanent repair projects, except where such material is prohibited from use, as described in item 3 above.
8. Whenever possible, brush and garbage shall be sorted and stored separately from soils.
9. Rip rap shall only be used on stream banks for emergency stabilization of roads that have no alternate access, where one or more of the following conditions apply:

   A. Rip rap previously existed, and is to be replaced in the same quantity and location and is immediately reported to agencies specified in Section d) Environmental Permitting for Rural Public Works Activities.

B. Rip rap is to be placed only below the ordinary high water line to halt scour at the toe of a slope or bank supporting a public road, and is immediately reported.

C. Large wood materials (root wads, logs, etc.) are not available or are not considered to be effective.

10. Rip rap may be used to protect bridge support structures (abutments, embankments, etc.) that are actively being undermined and are at imminent risk of failure.

11. Wherever possible, key trenches shall be dug prior to placing rip rap.

12. Rip rap may be used for non-emergency stabilization only after applicable permits have been obtained. Proposals for non-emergency rip rap use shall include mitigation and avoidance measures such as incorporating large woody debris, revegetation, etc. into the bank stabilization.

13. Monitor finished streambanks to ensure stability and vegetative growth. Consult original design engineer as necessary for adjustments and modifications.

c) Road Construction, Maintenance, and Repairs in Rural Areas to Prevent and Control Road-Related Erosion

Note: This section is applicable to work performed on all "rural roads", paved and unpaved, as defined in the Definition Section on page 4.

1. From the previously adopted Public Streets, Roads and Highways Operation and Maintenance Performance Standards, the following apply:

A. Road Construction/Maintenance

1. General Road Construction/Maintenance Practices

a. Schedule construction and maintenance activities for dry weather. Minimize the exposed area and the duration of exposure. Stabilize disturbed areas as quickly as possible.

b. Protect downslope drainage courses, streams, and storm drains with wattles, sand bags, earth dikes, or temporary drainage swales to divert or trap and filter runoff.

c. Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, prevent transport of materials in runoff. Possible methods include covering stockpiles and excavated soil with secured tarps or plastic sheeting, or surrounding stockpiles and excavated soils with berms.

d. Prevent excess material from entering streets or storm drain inlets. Designate an area for clean up and properly dispose of excess materials

e. Use only as much water as necessary for dust control, to avoid runoff.

f. If it rains unexpectedly, take appropriate action to prevent pollution of storm water runoff. (e.g., divert runoff around work areas)

g. When designing roads for construction, consider incorporating ditches, berms, dikes and swales in order to intercept runoff from surfaces and convey it to stabilized watercourses, drainage pipes, or channels.

h. During construction, inspect and maintain all BMPs daily to ensure that they are working properly and to ensure that problems are corrected as soon as they develop.

i. Road drainage systems and stream crossings should be maintained by annual and storm period inspections to prevent small problems from growing into large failures.

j. Consider replacement of stream crossing structure, when ongoing maintenance does not mitigate any associated problems. See Section e. Road Planning and Design BMPs for specific design considerations.

2. Asphalt/Concrete Removal

a. After breaking up old pavement, sweep up materials thoroughly to avoid contact with rainfall and storm water runoff. Recycle as much material as possible, and properly dispose of non-recyclable materials.

b. During saw cutting and grinding operations, use as little water as possible. Block or place berms around nearby storm drain inlets, in drainage channel (if no inlet is nearby), or around work area (when bordering watercourse) using sand bags or an equivalent appropriate barrier, or absorbent materials such as Wet Vac, pads, pillows and socks to contain slurry. If slurry enters the storm drain system, remove material immediately.

c. Remove saw-cut slurry (e.g., with a shovel or vacuum, or sweep up when dry) as soon as possible.

3. Concrete Installation and Repair

a. Avoid mixing excess amounts of fresh concrete or cement mortar on-site.

b. Wash out concrete transit mixers only in designated washout areas where the water will flow into drums or settling ponds or onto dirt or stockpiles of aggregate base or sand. Pump water from settling ponds to the sanitary sewer, where allowed. Whenever possible, recycle washout by pumping back into mixers for reuse. Never dispose of washout into the street, storm drains, drainage ditches, or creeks.

c. Whenever possible, return leftover materials in the mixer barrel to the yard for recycling. Dispose of small amounts of excess concrete, grout, and mortar in the trash.

4. Patching, Resurfacing, and Surface Sealing

a. Sweep up as much material as possible and dispose of properly. Only wash down streets if runoff is controlled or contained.

5. Traffic Detector Loop Installation and Repair

a. Protect nearby storm drain inlets prior to cutting or flushing slot for traffic detector loops. Block or berm around nearby storm drain inlets using sand bags or an equivalent barrier, or use absorbent materials such as pads, pillows and socks to contain slurry.

b. Clean up residues by sweeping up as much material as possible, and dispose of material properly.

B. Road Embankment and Median Maintenance

1. Erosion Prevention and Sediment Controls

a. Maintain vegetative cover on medians and road embankments to prevent soil erosion, trap pollutants and slow the rate of storm water runoff. Plant and/or retain native vegetation as much as possible. Adjust mowing heights to allow substantial stubble. Leave clippings in place or apply mulch as additional cover.

b. Use measures that break the slopes to reduce the problems associated with concentrated flow volumes and runoff velocities.

c. Avoid moving large quantities of earth, except where regrading is necessary to repair or reconfigure an embankment. Disking may be used to manage vegetation on slopes less than 20%. It shall be performed parallel to the contour to prevent rills and gullies from forming during rain events. Disking shall not be performed in areas that support endangered species such as ground burrowing owls, harvest mice, beetles, etc.

d. Inspect drainage facilities, including cross drains, on a regular basis to ensure that sufficient drainage is provided during storm periods, so that runoff diverted onto slopes does not cause erosion. Report and remediate any observed erosion problems as soon as possible.

e. Ensure that erosion prevention and sediment control is provided for storm drain outfalls.

2. Vegetation Controls

a. Manual and Mechanical Vegetation Removal

i. Preserve existing vegetation to the maximum extent practicable within the riparian corridor in order to provide erosion prevention and sediment control, watershed protection, habitat protection, landscape beautification, dust control, pollution control and shade cover. Existing vegetation may

be modified if restoring the riparian corridor with native vegetation species.

ii. Keep removed vegetation, including clippings, chips, and pruning debris, away from storm drain inlets and watercourses.

iii. When loading or chipping brush into a parked truck, do not leave leaves, twigs, chips, or other debris in the gutter or shoulder.

iv. When working on a slope, avoid loosening soil that could erode into drainage systems. Loosen only the amount of soil needed to remove the vegetation.

v. Avoid loosening soil or removing vegetation when rain is expected.

vi. Avoid using mechanical machinery on slopes greater than 30% whenever possible.

vii. Minimize the use of heavy equipment on saturated soils.

2. Maintenance Activities Unique to Unpaved Rural Roads

A. Perform regular inspection to determine if grading is needed to maintain smooth drivable surfaces that are adequately sloped to drain water from the surface without creating erosion problems. Choose appropriate grading, crowning, inslope or outslope, and drainage for road sections.
B. Consider using additional road surface drainage such as rolling dips, water bars, water bars/breaks or open-top culverts, to safely remove runoff that consistently builds up on the road surface or inside ditch.
C. Monitor for soft spots or areas of poor subsurface drainage in subgrade. Fill and re-compact holes in subgrade. Provide subsurface drainage if needed.
D. Monitor and re-grade rolling dips if needed.
E. Clean ditch and re-build berm for water bars, as needed.
F. Monitor open-top culverts after storms and clean as needed.
G. Monitor for potholes, washboarding, and areas of poor surface drainage on gravel surface roads. Re-slope, smooth, and compact where necessary.
H. Water, fertilize, re-seed and mow vegetative surface treatments when necessary.
I. Re-apply mulches and fabric surface treatments as needed.
J. Monitor fords after storms. Repair as needed. See Section C.1.A.1.j for replacement options when ongoing maintenance does not mitigate associated problems.

d) Environmental Permitting for Rural Public Works Activities

1. Permits or written exemptions are required for work involving any of the following:

A. Discharge or placement of any structure or within the banks of the stream or channel (including rip rap, concrete or asphalt, and woody material)

B. Dredging, removal or modification of any structure, fill, sediment, large woody debris or vegetation within the banks of the stream or channel

C. Any work that potentially alters the habitat of any endangered species (including streams, tributaries, lakes, ponds, certain ditches, beaches, wetlands, marshes, banks, and riparian areas, and upland areas).

2. The jurisdictions of the various agencies that must be contacted in response to work performed in areas identified in item 1 above are as follows:

A. Regional Water Quality Control Board

1. Certification under Section 401 of the Clean Water Act is required whenever project activities require a Federal permit (such as an Army Corps of Engineers nationwide permit or individual permit issued under Section 404 of the Clean Water Act fora discharge to waters of the U.S. Discharges may included landfill, rip rap slope protection, bridge piers, outfall structures, etc.
2. Waste Discharge Requirements (WDR's) are required for all proposed discharges above and below ordinary high water, that may impact beneficial uses of Waters of the State. For some discharges, it is possible to obtain waiver of WDR. "Fill", and thus structures, are considered discharges.

B. U.S. Army Corps of Engineers

1. Certification under Section 404 of the Clean Water Actis required for discharges of dredge or fill material into waters of the U.S.
2. Certification under Section 10 of the Rivers and Harbors Act is required for structures or work affecting navigable waters of the U.S.

C. California Department of Fish and Game

1. Section 1600 Streambed Alteration Agreements are required for work in any riparian corridor, even if no actual work is performed in the stream channel.

D. Santa Clara Valley Water District

1. Encroachment permits are required for any work within 50 feet of a watercourse in Santa Clara County, or for work that will resulting the discharge of water to a watercourse.[5]

E. Bay Conservation and Development Commission (BCDC)

1. Approval is required for all work in or within 100 feet of the San Francisco Bay.
2. Permits or written exemptions shall be obtained prior to performing planned work such as culvert replacements, slide repairs, bank stabilization, etc. Maintenance

[5] The District's Ordinance 83-2 is being revised and an increase in the width of the corridor within which encroachment permits are required is being considered.

supervisors shall keep in their possession copies of permits for work being performed under their supervision.

3. Emergency conditions may require that work be performed prior to obtaining written permits or exemptions. Maintenance managers and/or supervisors shall complete report forms for emergency work involving any of the elements described in a-c above. Forms shall document that emergency work was performed in response to valid conditions and should be submitted to the proper regulatory agencies. The Co-permittee is subject to enforcement action by one or more of the environmental agencies if work performed is found to be unnecessary. Forms shall be forwarded to the appropriate internal authority at the earliest opportunity and not more than three working days after completion of work.

e) Road Planning and Design BMPs[6]

1. General
   A. Road junctions on steep slopes should be located far upslope from watercourses to protect against erosion.
   B. Where feasible, replace fords that have maintenance problems with an overpass stream crossing.

2. When designing road drainage, the Co-permittee will consider the following:
   A. Outslope roads to minimize flows in the inside ditch and reduce the potential for erosion and sediment delivery to the next culvert.
   B. Insloped roads should be constructed where road surface drainage discharged over the fill slope would cause unacceptable erosion or discharge directly into stream channels, where fill slopes are unstable or where outsloping would create unsafe conditions for use.
   C. Insloped roads should be built with an inside drainage ditch to collect and remove road surface runoff.
   D. Inside ditches should be drained at intervals sufficient to prevent ditch erosion or outlet gullying, and at locations where water and sediment can be filtered before entering a watercourse (filtering accomplished by thick vegetation, gentle slopes, settling basins, or filter windthrows of woody debris and mulches placed and secured on the slope).
   E. Ditch relief culverts should be designed and installed at intervals along the road that are close enough to prevent erosion of the ditch, gullying or sliding of the slope below the culvert outlet of a cross-drain, direct transport of sediment along

[6] Language in Section e) is based on recommendations in Weaver, William E. and Danny K Hagans, Pacific Watershed Associates, *Handbook for Forest and Ranch Roads: A guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads,* June 1994. See reference for more details.

an inside ditch to a watercourse, and loss of capacity of culvert cross-drains due to filling with sediment.

F. Ditches should not discharge directly into the inlet of a watercourse crossing culvert, and ditch relief culverts should not discharge into a watercourse without first directing flow through an adequate filter strip when possible.

G. Where possible, replacement culverts should have a grade at least 2% greater than the ditch, which feeds it to prevent sediment build-up and blockage. Where possible, ditch relief culverts should be installed at the gradient of the original ground slope so that the outlet of the culvert will emerge on the ground surface beyond the base of the fill. (if not, fill below the culvert should be armored by rocks, or the culvert should be fitted with an anchored downspout to carry erosive flow past the base of the fill)[7]

[7] Depending upon site conditions, culvert grades may deviate from this recommendation upon the professional opinion of the project engineer.

Attachment 4

Standard Operating Procedures

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

Performance Standard and Supporting Documents for
Rural Public Works Maintenance and Support Activities

Attachment 4
STANDARD OPERATING PROCEDURES

This section should contain the co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Description of Rural Public Works Maintenance Program

- Which departments will be performing the various components of rural public works maintenance and support activities and what is the chain of command?
- How will contractors be instructed to conduct rural public works maintenance and support activities with regards to water quality?
- Who is responsible for maintaining the BMPs implemented?
- Where will maintenance staff store and dispose of wastes from rural pubic works activities?
- How is mechanical equipment to be stored and operated?
- Annual training on the use of appropriate BMPs will be provided to maintenance staff.
- How will technical assistance needs be met?
- How will permit requirements for work to be performed be coordinated amongst the differing agencies?
- What outreach materials will be provided for contractors, developers and staff on BMPs and permitting requirements?
- How will activities performed under emergency conditions be documented and who will they be submitted to?
- Which specific agencies and/or persons should be notified when emergency stabilization of roads is needed?

012506

WATER UTILITY OPERATION AND MAINTENANCE

Santa Clara Valley Urban Runoff Pollution Program

PUBLIC AGENCY ACTIVITIES

Performance Standard and Supporting Documents for

Water Utility Operation and Maintenance

Revised – January, 1997

(New Format)

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

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PART I

Introduction and Purpose

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for WATER UTILITY OPERATION AND MAINTENANCE

PART I

Introduction

Performance Standards are the standards which define control measures (particular programs or tasks carried out by co-permittees). Control Measures are described Program's Storm Water Management Plan, which is the plan for the 1995-2000 NPDES municipal storm water permit period. Several Performance Standards are required under the provisions of the 1995 NPDES Permit. The development and implementation of Performance Standards is an important part of the Program during the five-year period under the NPDES Permit.

The components contained herein constitute the **Water Utility Operation and Maintenance Performance Standard.**

Purpose

The purpose of this document is to provide information which details the program and criteria for meeting the standard (work plan). Its use is intended for the individual responsible for implementing the standard, the manager that authorizes the activity, the regulator that reviews the standard and any interested party.

The level or intensity has been established based upon co-permittee community characteristics and the appropriateness of a control measure implementation for the agency (MEP).

The Water Utility Operation and Maintenance Performance Standard defines the level of implementation necessary to demonstrate the control of pollutants discharged from the operation and maintenance of municipal water supply utilities to the maximum extent practicable.

Process

The Co-permittees will provide a model or sample performance standard for each performance standard required in the 1995 NPDES Permit. Individual co-permittees will be responsible for providing or completing the performance standard package and the annual reporting on each Performance Standard. A complete set of co-permittee performance standards wilt be kept on file by Program as well as the author agency.

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

Performance Standard

1. Have you conducted an inventory of all key O&M activities every three years?

   yes no If no, explain:

2. Have you identified routine and unplanned non-storm water discharges from the above activities?

   yes no If no, explain:

3. Have you adopted the model or developed your own Water Utility Pollution Prevention Plans (WUPPP)?

   yes no If yes, describe whether you have adopted the area-wide WTJPPP with modifications or developed your own WUPPP. If no, explain:

4. Are you implementing the WUPPPs?

   yes no If no, explain:

5. Have you conducted the annual training to applicable staff on WUPPP implementation?

   yes no If yes, describe training conducted during the past year. If no, explain:

6. Have you coordinated the WUPPP elements with water utility project planning?

   yes no If no, explain:

7. Have you included applicable WUPPP elements in contract and services agreements?

   yes no If no, explain:

8. Have you evaluated the effectiveness of BMPs (listed in WUPPPs) during the past year?

   yes no If yes, describe any changes in your OMPs during the past year.

   If no, explain:

9. Have you maintained accurate documentation of activities related to implementation of WUPPPs?

   yes no If no, explain:

10. Are you revising the WUPPPs based on the BMPs being changed?

    yes no If no, explain:

PART II

Performance Standard

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

PART II

Performance Standard Components

This Performance Standard applies to discharges resulting from the operation and maintenance (O&M) of municipal water supply systems within the Santa Clara Valley Urban Runoff Pollution Prevention Program, which comprises the Santa Clara Valley Water District, the County of Santa Clara, and the thirteen cities in the County. The water supply systems covered by this Performance Standard extend from a utility's source of supply to its customers points of connection, and include treated and untreated potable water supply systems, reclaimed (recycled) water supply systems, raw water systems, and non-potable water.

The following four components are designed to achieve pollutant reduction or pollution prevention benefits to the maximum extent practicable while the safety and continuity of the public water supplies are maintained.

Component I. Inventory of discharges by each affected water utility

Every three years, conduct an inventory of all key O&M activities, and identical routine and unplanned non storm water discharges from these activities.

Component 2. Pollution Control

Implement the pollution control measures identified in the Water Utility Pollution Prevention Plan (WUPPP) to manage chlorine, biocides, and algaecides and prevent erosion and sedimentation.

Component 3. Staff/Contractor Training and Coordination

Conduct annual training for applicable staff; coordinate WUPPP elements with water utility project planning; and include applicable WJJPPP elements (EMPs, conditions, specifications, etc.) in contract and services agreements.

Component 4. Review and Evaluate the WUPPP

Evaluate the effectiveness of the WUPPP annually. Maintain accurate documentation and revise the WUPPP as necessary.

PART III

Guidance for Support Documents

Section 1

Work Plan Implementation

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

PART III

Section 1
WORK PLAN IMPLEMENTATION

This section contains the plan or activities to be taken to enable the applicable co-permittee to achieve the performance standard, along with an implementation schedule. The work plan will be developed by each applicable co-permittee based on its responsibilities to conduct water utilities O&M activities.

I Implementation Plan

Introduction

This Implementation Plan (IP) describes the approach that co-permittees have adopted in their effort to achieve the Water Utility Operation and Maintenance Performance Standard (WUPS). The approach in the IP is described for each of the four components in the WUPS - The actual tasks and the time line for carrying out the elements listed in this I will be determined by each co-permittee and will be included in the Program's revised Storm Water Management Plan. Co-permittees may adopt or modify the schedules attached in this section for their own. The IP elements for each WUPS component are as follows:

Component 1

Inventory of discharges by each affected water utility

- Survey agency organizational units for key O&M activities that results in discharges.
- Compile the information.
- Generate listing of discharges:

  Agency; location; quantity/rate; planned; frequency; type; unplanned; known chemical additives

Component 2

Pollution Control

- Identify discharges of concern.
- Identify and evaluate existing control measures.
- Identify gaps/weaknesses/deficiencies in existing control measures -
- Identify additional BMPs, as necessary.
- Develop additional BMPs, as necessary.
- Prepare the Water Utility Pollution Prevention Plan (WUPPP).
- Implement the WUPPP.

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

Component 3

Staff/Contractor Training and Coordinations

- Annual Staff Training:
  Identify staff which require training; identify and evaluate existing training programs and materials; incorporate the following elements into a training program:
    Permit Requirements; existence of the WUPPP; how to use BMPs; where to go for questions
  Document training.

- Coordinate WUPPP elements with Water Utility project planning:
  Identify water utility planning and design staff; transmit the WUPPP to applicable staff to be incorporated into the planning and design process.
- WUPPP in contracts and service agreements:
  Identify types of contracts/agreements (C/A); develop and include standard language for C/A; notify contracting managers of standard language.

Component 4

Review and evaluate the WUPPP

- Develop mechanism to solicit feedback.
- Solicit feedback from:
  Training; contract administration; field operations; inspection; contractors/personnel; project planning
- Evaluate effectiveness of implementing the WUPPP:
  Common types of problems; feasibility; additional BMPs or discharges of concern; trends
- Maintaining records:.
  Feedback records; WTJPPP updates; results of WUPPP evaluation

II Work Plan Implementation Schedule

This model schedule includes all the major tasks of the implementation plan. Each co permittee will complete this schedule by fl out the time line for each task. Some tasks are one Sue tasks (eg. develop WUPPPs) while others need a starting time before they become routine (eg. implement WUPPPs). Some tasks will occur annually or at a certain frequency (eg. conduct inventory or conduct staff training). Co-permittees may include other tasks in the schedule as they see fit.

WATER UTILITY O & M POLLUTION PREVENTION PLAN

OUTLINE

October 21, 1996
Version 3.0

I. How to Use this Document
   - A. How to use this document
   - B. Reference tool
   - C. Document structure
   - D. Use of BMP sheets
   - E. Contact list

II. Introduction
   - A. Purpose of Document
     1. what the document is
     2. objective
        - a. pollution prevention
        - b. compliance with the NPS Program Requirement
     3. how it is intended to be used
   - B. Scope of Document
     1. Discharges covered
     2. Discharges not covered

III. Background
   - A. Development of this document
     1. Developed by Santa Clara County Water Utilities.
     2. How the inventory of discharges was accomplished
     3. How the BMPs were developed
   - B. General description of impacts from water utility discharges
     1. Pollutants of concern (general discussion)
   - C. Description of the Regulatory requirements
     1. CA Water Code
     2. Basin Plan Requirements
     3. NPS Program Requirements
     4. Fish and Game Code
   - D. Description of Discharges of Concern
     1. Types of discharges that occur
     2. The pollutant constituents expected in each type of discharge
     3. The approximate duration (expressed as a range) of each type of discharge
     4. Existing structural and non-structural control measures (if any) to reduce pollutants in discharge to surface water
   - E. Description of potential impacts to the environment
     1. disinfection residual
     2. contribution of sediments
     3. other water quality
     4. etc.

IV. BMP Selection
- A. How to select the BMP
- B. Table of BMPs & discharges
- C. Unlisted discharges
  1. contact program manager
  2. program manager to apply "discharge criteria"

V. Reporting/Record keeping
- A. NPDES Permit Requirements
- B. Comments and evaluation via work order
  1. why revision may be necessary
  2. how to relay effectiveness evaluation
  3. need for additional BMPs

Appendices
- A. Individual BMPs
  1. A detailed description of the particular BMP
  2. Operating procedures
  3. Sample field calculations to be performed, if pertinent
  4. Monitoring and evaluation
  5. Suitable applications for the BMP
  6. Structural diagrams, if pertinent
  7. Advantages and limitations of the BMP
  8. References
- B. Forms

Section 2

Legal Authority to Implement

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

Section 2
LEGAL AUTHORITY TO IMPLEMENT

This section demonstrates that the co-permittee has the legal authority to imp the performance standard, or provides a time schedule for developing additional authority.

The co-permittees should provide references to municipal codes or ordinances that demonstrate adequate legal authority to require municipal staff and contractors to conduct O&M activities in a manner that eliminates or reduces water quality impacts. These include:

- Ordinance or section(s) of municipal code that applies to water utility O&M.
- Standard contract language (see model language below).

Example Standard Contract Language

The Clean Water Act makes it illegal to discharge pollutants into storm drain systems. The operation and maintenance of water utilities can cause storm water pollution in numerous ways. For example, storm water pollution can be caused by the discharge of sediments, chlorine, or chemical additives into watercourses, or by bank erosion, during line flushing.

The Contractor shall take all measures necessary to prevent pollutants from entering storm drains or watercourses. For the purpose of eliminating storm water pollution, the Contractor shall implement the effective Rest Management Practices (BMPs). BMPs include general housekeeping practices, appropriate scheduling of activities, operational practices, maintenance procedures and other measures to prevent the discharge of pollutants directly or indirectly to the storm drain system. These BMPs shall be maintained for the duration of the Contractor's work. The Contractor shall also be responsible for proper disposal of all waste materials, including wastes generated by the implementation of BMPs.

The following Water Utility Pollution Prevention Plan shall be implemented to prevent storm water pollution: (attached the WUPPP here).

Section 3

Work Plan BMPs and Control Measures

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

Section 3
MODEL WATER UTILITY POLLUTION PREVENTION PLAN
Outline

The model WUPPP will include the following sections:

I How to use the WUPP

II Introduction

A. Purpose
B. Scope

III Background

A. Development process
B. Potential impacts by water utility discharges
C. Regulatory requirements
D. Discharges of concerns
E. Potential impacts to receiving water bodies

IV BMP Selection

A. BMP selection process
B. Table of BMPs and discharges
C. Unlisted discharges

V Reporting/Record keeping

A. NPDES Permit requirements
B. Evaluation

Appendices

A. Individual BMPs
B. Forms

Section 4

Standard Operating Procedures

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

Section 4
STANDARD OPERATING PROCEDURES

This section presents the co-permittee's standard operating procedures (SOPs) for implementation of the performance standard.

Example SOPs:

- Establish process for identifying problems, implementing BMPs, and follow up. An example of this is a decision chart to include:
  - Define the event
  - Assess potential impacts
  - Assess point of discharge
  - Define scope, location, and materials & equipment for implementing BMPs.
  - Notify applicable agencies and public
  - Implement WUPPP
  - Conduct follow-up inspection

- Establish responsibility for overseeing implementation of BMPs. An example of this is the organization chart of those corresponding to the above decision chart, including title and responsibility.

- Establish process for feedback on effectiveness and feasibility of BMPs from field crews.

PART IV

Co-permittee Standard Reporting Form

Santa Clara Valley Urban Runoff Pollution Prevention Program

Performance Standard and Supporting Documents for
WATER UTILITY OPERATION AND MAINTENANCE

PART IV

Co-permittee Reporting Form
(Co-permittee Name)
(Year)

1. Have you conducted an inventory of all key O&M activities every three years?

   yes no If no, explain:

2. Have you identified routine and unplanned non-storm water discharges from the above activities?

   yes no If no, explain:

3. Have you adopted the model or developed your own Water Utility Pollution Prevention Plans (WUPPP)?

   yes no If yes, describe whether you have adopted the area-wide WTJPPP with modifications or developed your own WUPPP. If no, explain:

4. Are you implementing the WUPPPs?

   yes no If no, explain:

5. Have you conducted the annual training to applicable staff on WUPPP implementation?

   yes no If yes, describe training conducted during the past year. If no, explain:

6. Have you coordinated the WUPPP elements with water utility project planning?

   yes no If no, explain:

7. Have you included applicable WUPPP elements in contract and services agreements?

   yes no If no, explain:

8. Have you evaluated the effectiveness of BMPs (listed in WUPPPs) during the past year?

   yes no If yes, describe any changes in your OMPs during the past year.

   If no, explain:

9. Have you maintained accurate documentation of activities related to implementation of WUPPPs?

   yes no If no, explain:

10. Are you revising the WUPPPs based on the BMPs being changed?

    yes no If no, explain:

SWAMP
Surface Water Ambient Monitoring Program

SWAMP Bioassessment Procedures 2007

Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California

February 2007

California Water Boards

www.waterboards.ca.gov/swamp

Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California

Prepared by: Peter R. Ode Peter Ode, SWAMP Bioassessment Coordinator, California Department of Fish and Game, Aquatic Bioassessment Laboratory

Preparation Date: January 23rd 2007

Approved by: Beverly van Buuren, SWAMP QA Officer

Approval Date: 01/17/07

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ACKNOWLEDGEMENTS

The protocols described here represent the contributions of a wide range of researchers and field crews. Most of the physical habitat methods are close modifications of those used in the U.S. Environmental Protection Agency's (EPA's) Environmental Monitoring and Assessment Program (EMAP) and developed by EPA's Office of Research and Development (ORD, Peck et al. 2004). The benthic macroinvertebrate collection methods are based on EMAP methods (EPA's targeted riffle methods were derived in turn from methods developed at Utah State University; Hawkins et al. 2003).

The current version of these protocols was established by Peter Ode (Department of Fish and Game's (DFG's) Aquatic Bioassessment Laboratory (ABL)) and David Herbst (UC Santa Barbara's Sierra Nevada Aquatic Research Laboratory) with significant contributions from staff at the ABL (Jim Harrington, Shawn McBride, Doug Post, Andy Rehn, and Jennifer York), the Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance (QA) Team, Thomas Suk and other members of the SWAMP bioassessment committee (Mary Adams, Lilian Busse, Matt Cover, Robert Holmes, Sean Mundell, and Jay Rowan) and three external reviewers: Chuck Hawkins, Dave Peck, and Phil Kaufmann.

Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001.

SWAMP GUIDANCE SG

SWAMP GUIDANCE FOR MACROINVERTEBRATE FIELD PROTOCOLS FOR WADEABLE STREAMS

Background: The SWAMP Bioassessment Committee met in December, 2004, and agreed that the SWAMP Quality Assurance Management Plan (QAMP) should be amended to provide greater consistency in bioassessment sampling protocols for wadeable streams. The Committee's recommendations were reviewed and accepted by the full SWAMP Roundtable[1] in February, 2005 (some of the key considerations are contained in Appendix A).

The current guidance for macroinvertebrate sampling under the SWAMP program is as follows:

1. For ambient bioassessment monitoring of wadeable streams in California, two methods are to be used at sites with riffle habitats (i.e., one "multihabitat" sample, and one sample that targets the "richest" habitat):
   - **For sites with sufficient riffle habitat,** the two samples shall be: (1) the reachwide benthos (RWB) method (also known as "multihabitat" sampling.); and (2) the targeted-riffle composite (TRC) method.
   - **For low-gradient sites that do not have sufficient riffle habitat**, the RWB method is the standard method, but we also recommend the option of collecting a sample with (2) the "Margin-Center-Margin" (MCM) method until ongoing methods comparisons are completed (see Appendix A).
   - **Notes:** (1) The protocols for each method are provided in this document; (2) Other appropriate method(s) will be allowed if the specific monitoring objectives require use of alternative method(s). (See Item #2, below.); (3) The protocol recommendations specified above will be reevaluated as results become available from ongoing methods comparison studies. (See Appendix A for more information.)

2. The SWAMP QAMP allows flexibility in sampling methods so that the most appropriate method(s) may be used to address hypothesis tests and project-specific objectives that differ from program objectives. Such situations may include, but are not necessarily limited to, special studies (e.g., evaluation of point source discharges, above/below comparisons where statistical replication is needed), stressor identification investigations, and long-term monitoring projects where consistent data comparability is desired and an alternative method is needed to achieve that comparability. In addition, in some rare cases where funding limitations would make it cost-prohibitive to complete a project in compliance with the protocols listed in #1, above, the project proponent may request to complete laboratory analysis of only one sample, and "archive" one of the macroinvertebrate samples (i.e., the RWB sample in streams with riffles) to reduce lab costs. Deviations from the protocols specified in #1 above may be granted by the SWAMP Bioassessment Coordinator or the full SWAMP Roundtable.

1. The SWAMP Roundtable is the coordinating entity for the program. Participants include staff from the State and Regional Water Boards, USEPA, the Department of Fish and Game, the Marine Pollution Studies Laboratory, Moss Landing Marine Laboratories, contractors, and other interested entities.

SECTION 1 INTRODUCTION

This document describes two standard procedures (TRC and RWB) for sampling benthic macroinvertebrate (BMI) assemblages for ambient bioassessments. This document also contains procedures for measuring instream and riparian habitats and ambient water chemistry associated with BMI samples. These sampling methods replace previous bioassessment protocols referred to as the California Stream Bioassessment Procedure (CSBP, Harrington 1995, 1999, 2002).

These procedures can produce quantitative and repeatable measures of a stream's physical/habitat condition and benthic invertebrate assemblages, but they require field training and implementation of QA measures throughout the field season.

The sampling layout described here provides a framework for systematically collecting a variety of physical, chemical, and biological data. The biological sampling methods are designed to nest within the overall framework for assessing the biotic, physical, and chemical condition of a reach. The layout used in these procedures and most of the physical habitat methods are close modifications of those used in EPA's EMAP and developed by EPA's ORD (Peck et al. 2004). Data collected using this methodology are generally directly comparable to equivalent EMAP data, except for the difference in reach length. Other exceptions are noted in the text.

The following steps are presented in an order suggested for efficient data collection. The specific order of collection for the physical parameters may be modified according to preferences of field crews, with the caveat that care must always be taken to not disturb the substrates within the streambed before BMI samples are collected.

PHYSICAL HABITAT METHODS

The physical habitat scoring methods described here can be used as a stand-alone evaluation or used in conjunction with a bioassessment sampling event. However, measurements of instream and riparian habitat and ambient water chemistry are essential to interpretation of bioassessment data and should always accompany bioassessment samples. This information can be used to classify stream reaches, associate physical and chemical condition with biotic condition, and explain patterns in the biological data.

Because bioassessment samples can be collected to answer a variety of questions, this document describes the component measures of instream and riparian habitat as independent modules. Although individual modules can be added or subtracted from the procedure to reflect specific project objectives, a standard set of modules will normally accompany bioassessment samples. This document describes two standard groupings of modules that represent two different levels of intensity for characterizing the chemical and physical habitat data (Table 1). The BASIC physical habitat characterization represents a minimum amount of physical and chemical data that should be taken along with any ambient BMI sample, the FULL physical habitat characterization represents the suite of data that should be collected with most professional level bioassessment samples (e.g., SWAMP regional monitoring programs). In addition to these data, we also briefly introduce additional data modules (e.g., excess sediment, periphyton) that can be collected as supplements to the full set (OPTIONAL). Table 1 lists the physical and chemical variables that should be measured under the different levels.

Note: *SWAMP intends to develop guidance for selecting appropriate physical habitat modules to the intended uses of data. Until this guidance is available, users of these protocols should consult with representatives of the Regional Water Quality Control Boards (Regional Boards) or the SWAMP Bioassessment Coordinator when selecting modules.*

FIELD CREW SIZE AND TIME ESTIMATES

These methods are designed to be completed by either two or three (or more) person field crews. A very experienced field crew can expect to complete the full suite of physical habitat measurements and the two BMI sampling protocols in approximately two hours. Less experienced crews will probably take closer to three or four hours to complete the work depending on the complexity of the reach. Note that this estimate includes only time at the site, not travel time between sites.

Equipment and Supplies

Recommended equipment and supplies are listed in Table 2.

Table 1. Summary of physical habitat and water chemistry and proposal for basic, full, and optional levels of effort.

Survey Task	Parameter(s)	Basic	Full	Option	Comments
REACH DELINEATION and WATER QUALITY [Conducted before entering stream to sample BMIs or conduct any habitat surveys]	Layout reach and mark transects, record GPS coordinates	X	X		Use 150-m reach length if wetted width ≤10 m; Use 250-m reach length if wetted width > 10 m
	Temperature, pH, specific conductance, DO, alkalinity	X	X		Multi-meter (e.g., YSI, Hydrolab, VWR Symphony)
	Turbidity, Silica			X	Use test kit or meter
	Notable field conditions	X	X		Recent rainfall, fire events, dominant local landuse
CROSS-SECTIONAL TRANSECTS BASIC Measurements at main 11 transects only FULL Measurements at 11 main transects (A, B, C, D, E, F, G, H, I, J, K) or 21 transects (11 main plus 10 inter-transects) for substrate size classes only	Wetted width	X	X		Stadia rod is useful here
	Flow habitat delineation	X	X		Record proportion of habitat classes in each inter-transect zone
	Depth and Pebble Count + CPOM		X		5 -point substrate size, depth and CPOM records at all 21 transects
	Cobble embeddedness		X		All cobble-sized particles in pebble count. Supplement with "random walk" if needed for 25
	Slope (%)	See reach scale	X		Average slope calculated from 10 transect to transect slope measurements. Use autolevel for slopes ≤ 1%; clinometer is OK for steeper gradients
	Sinuosity		X		Record compass readings between transect centers
	Canopy cover	X	X		Four densiometer readings at center of channel (facing L bank R bank, Upstream +Downstream)
	Riparian Vegetation		X		Record % or categories
	Instream Habitat		X		
	Human Influence		X		
	Bank Stability	X	X		Eroding / Vulnerable / Stable
	Bankfull Dimensions		X		
	Excess Sediment Transect Measures (optional)				
	Bankfull width and height, bank angles			X	
	Large woody debris counts			X	Tallies of woody debris in several size classes
	Thalweg profile			X	100 equidistant points along thalweg

Survey Task	Parameter(s)	Basic	Full	Option	Comments
DISCHARGE TRANSECT	Discharge measurements		X		Velocity-Area Method or Neutrally Buoyant Object Method
REACH SCALE MEASUREMENTS:	EPA-RBP visual scoring of habitat features	*		X	*Used for citizen monitoring and comparison with legacy data
	Selected RBP visuals:		X		Channel alteration, sediment deposition, epifaunal substrate (redundant if doing EPA-RBP scoring)
	Slope (%, not degrees)	X	See transect scale		Single measurement for entire reach only for BASIC. Use autolevel for slopes ≤ 1%, clinometer is OK for higher gradients
	Photo documentation	X	X		Upstream (A, F, K) Downstream (F)
OTHER OPTIONAL COMPONENTS					
FOOD RESOURCE QUANTIFICATION	Periphyton (3 replicates)			X	Qualitative characterization of diatom growth and filamentous algal growth, quantification of biomass (AFDM, chl-a)
	CPOM & FPOM (3 replicates)			X	CPOM field measure of wet mass >1 mm particles, FPOM as 0.25 – 1 mm fraction (AFDM in lab)

Table 2. Field equipment and supplies

Physical Habitat	BMI Collection	General/ Ambient Chemistry
• GPS receiver • topographic maps • measuring tape (150-m) • small metric ruler or gravelometer for substrate measurements • digital watch, random number table or ten-sided die • stadia rod • clinometer • autolevel (for slopes < 1%) • handlevel (optional) • current velocity meter • stopwatch for velocity measurements • convex spherical densitometer • flags/ flagging tape • rangefinder	• D-frame kick net (fitted with 500-µ mesh bag) • standard # 35 sieve (500-µ mesh) • wide-mouth 500-mL or 1000 mL plastic jars • white sorting pan (enamel or plastic) • 95% EtOH • fine tipped forceps or soft forceps • waterproof paper and tape for attaching labels • 10-20-L plastic bucket for sample elutriation • preprinted waterproof labels (e.g., Rite-in-the-Rain™) • disposable gloves/ elbow length insulated gloves	• sampling SOP (this document) • hip or chest waders, or wading boots/shoes • field forms printed on waterproof paper (e.g., Rite-in-the-Rain™) • clip board and pencils • digital camera • centigrade thermometer • pH meter • DO meter • conductivity meter • field alkalinity meter • water chemistry containers • calibration standards • spare batteries for meters • first aid kit

SECTION 2
REACH DELINEATION AND WATER QUALITY

REACH LAYOUT AND GENERAL DOCUMENTATION

The systematic positioning of transects is essential to collecting representative samples and to the objective quantification of physical habitat measures. The standard sampling layout consists of a 150-m reach (length measured along the bank) divided into 11 equidistant transects that are arranged perpendicular to the direction of flow (Figure 1, Figure 2). Ten additional transects (designated "inter-transects") located between the main transects give a total of 21 transects per reach. Main transects are designated A through K while inter-transects are designated by their nearest upstream and downstream transects (e.g., AB, BC, etc.). In extreme circumstances, reach length can be shorter than 150 m (e.g., if upstream and downstream barriers preclude a 150-m reach), but this should be avoided whenever possible. If the actual reach length is other than 150 m or 250 m this should be noted and explained on the field forms.

Note 1: *The standard reach length differs from that used in the EMAP design, in which reach length was defined as 40x stream width, with a minimum reach length of 150 m. The EMAP reach length approach is used to ensure that enough habitat is sampled to support accurate fish assemblage estimates and relatively precise characterization of channel characteristics (e.g., residual pool volumes and woody debris estimates, which that are critical for relative bed stability estimates). Programs wishing to sample fish assemblages or produce relative bed stability estimates should strongly consider adopting the EMAP guidance for setting reach length.*

Note 2: *Streams > 10 m wetted width should use a reach length of 250 m. Some very large streams (i.e., > 20-m wetted width) may not be adequately represented even by a 250-m reach. In these cases, field crews should define a reach length that is representative of the larger stream segment being studied (i.e., attempt to include two to three meander cycles, or four to six riffle-pool sequences when possible).*

Note 3: *When the exact reach location is not restricted by the sampling design, attempt to position reaches upstream of bridges to avoid this influence.*

Step 1. Upon arrival at the sampling site, fill out the reach documentation section of the field forms (site and project identification, stream and watershed name, crew members, and date/time). If known at the time of sampling, record the Site Code following SWAMP site code formats. Determine the geographic coordinates of the downstream end of the reach (preferably in decimal degrees to at least four decimal places) with a GPS receiver and record the datum setting of the unit (preferably NAD83/ WGS84).

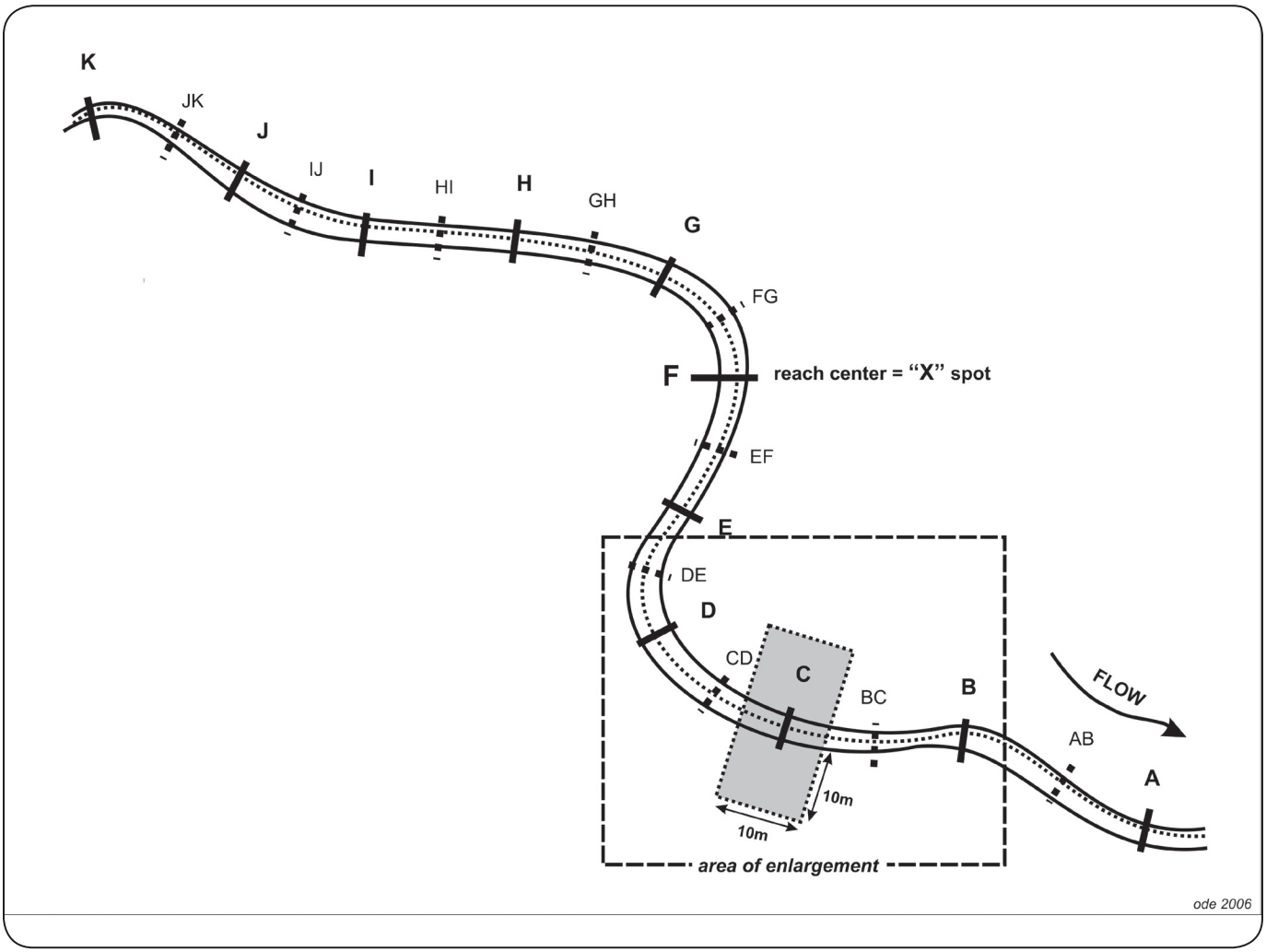

Figure 1. Reach layout geometry for physical habitat and biological sampling showing positions of 11 main transects (A – K) and the 10 supplemental inter-transects (AB- JK). The area highlighted in the figure is expanded in Figure 2. Note: reach length = 150 m for streams ≤ 10-m average wetted width, and reach length = 250 m for streams > 10-m average wetted width.

Step 2. Once a site has been identified, make an initial survey of the reach from the stream banks (being sure to not disturb the instream habitat). If TRC samples will be collected, identify all riffle habitats suitable for sampling (see Section IIIa for suitable habitat types) and note their positions so that a subset can be identified for sampling.

Step 3. Determine if the average wetted width is greater or less than 10 m. If the average wetted width ≤ 10 m, use a 150-m reach length. If the average wetted width > 10 m, use a 250-m reach length.

Step 4. Starting at one end of the reach, establish the position of the 11 main transects (labeled A-K from downstream to upstream) by measuring 15 m (25 m for streams > 10 m wetted width) along the bank from the previous transect. The 10 inter-transects should be established equidistant from the adjacent main transects (i.e., 7.5 m from main transects for 150-m reaches, 12.5 m for 250-m reaches). Since the data collection will start at the downstream end, is often easiest to establish transects starting from the upstream end. For easy setup and breakdown, mark the main transects with easily removable markers (e.g., large washers tied with strips of flagging, surveyor's flags).

Note 1: *While it is usually easiest to establish transect positions from the banks (this also reduces disturbance to the stream channel), this can result in uneven spacing of transects in complex stream reaches. To avoid this, estimate transect positions by projecting from the mid-channel to the banks.*

Note 2: *Flagging of a single bank is recommended to reduce mistakes caused by missed markers.*

Step 5. Measure and record common ambient water chemistry measurements (pH, DO, specific conductance, alkalinity, water temperature) at the downstream end of the reach (near same location as the GPS coordinates were taken). These are typically taken with a handheld water quality meter (e.g., YSI, Hydrolab), but field test kits (e.g., Hach) can provide acceptable information if they are properly calibrated. For appropriate calibration methods and calibration frequency, consult the current SWAMP QAMP (Appendix F), or follow manufacturer's guidelines.

Note 1: *If characteristics of the site prohibit downstream entry, measurements may be taken at other points in the reach. In all cases, ambient chemistry measurements should be taken at the beginning of the reach survey.*

Note 2: *Alkalinity test kits may not perform well in low ionic strength waters. Programs should consider collecting lab samples for these sites (see SWAMP QAMP for guidance on collecting water chemistry samples).*

Step 6. Take a minimum of four (4) photographs of the reach at the following locations: a) Transect A facing upstream, b) Transect F facing upstream, c) Transect F facing downstream, and d) Transect K facing downstream. It may also be desirable to take a photograph at Transect A facing downstream and Transect K facing upstream to document conditions immediately adjacent to the reach. Digital photographs should be used when possible. Record the image numbers on the front page of the field form.

Note 1: *When possible, photograph names should follow SWAMP coding conventions ("StationCode_yyyy_mm_dd_uniquecode"). The unique code should include one of the following codes to indicate direction: RB (right bank), LB (left bank), BB (both banks), US (upstream), DS (downstream). SWAMP suggests using unique codes created by the camera to facilitate file organization. Example: 603WQLB02_2004_03_20_RBDS1253.*

Step 7. Record the dominant land use and land cover in the area surrounding the reach (evaluate land cover within 50 m of either side of the stream reach).

Step 8. At the bottom of the form, record evidence of recent flooding, fire, or other disturbances that might influence bioassessment samples. Especially note if flow conditions have been affected by recent rainfall, which can cause significant under-sampling of BMI diversity (see note in the following section). If you are unaware of recent fire or rainfall events, select the "no" option on the forms.

SECTION 3
COLLECT BENTHIC MACROINVERTEBRATES

MULTIPLE HABITAT AND TARGETED RIFFLE PROTOCOLS

Note 1: *BMI samples intended for ambient bioassessments are generally collected when streams are at or near base flow (i.e., not influenced by surface runoff) as sudden flow increases can dramatically alter local community composition.*

Note 2: *Guidance for choosing among TRC sampling, RWB sampling or both will be provided in a separate document (see Appendix A for current guidance for sampling under SWAMP).*

Once the reach transects have been laid out, the biological samples (BMIs and algae if included) should be collected before any other physical habitat measures so that substrates are not disturbed prior to sampling. Both TRC and RWB methods use 500-µ mesh D-frame nets (see list of BMI sampling equipment in Table 2). The two samples can be collected at the same time by carrying two D-nets and compositing the material from the two samples in their respective nets. If a two person field crew is responsible for both the physical habitat data and benthic invertebrate samples, it is generally best to collect the benthos at each transect, then immediately record the physical habitat data before moving to the next transect. Obviously, this requires especially careful handling of the D-nets during the course of sampling to avoid loss or contamination of the samples. It can be helpful to clearly label the two D nets as RWB and TRC. Larger field crews may choose to split the sampling between biological team and a physical habitat team and have the biological team go through the reach first. The positions of the TRC and RWB subsampling locations are illustrated in Figure 2.

SECTION III A. TARGETED RIFFLE COMPOSITE PROCEDURE

The TRC method is designed for sampling BMIs in wadeable streams that contain fast-water (riffle/run) habitats and is not appropriate for waterbodies without fastwater habitats. The RWB protocol should be used in these situations. Riffles are often used for collecting biological samples (e.g., the old CSBP methods) because they often have the highest BMI diversity in wadeable streams. This method expands the definition to include other fast water habitats, however care should be taken when attempting to apply this method in low gradient streams.

Note: *Since all streams (even low gradient streams) have variation in flow habitats within the channel, this guidance should not be interpreted as including areas within low gradient streams that are only marginally faster than the surrounding habitats. The RWB protocol should be applied in these situations.*

The TRC was developed by the Western Center for Monitoring and Assessment of Freshwater Ecosystems (www.cnr.usu.edu/wmc) in Logan, Utah (Hawkins et al. 2003) and slightly modified by the EPA program (Peck et al. 2004). The TRC has been widely used in California (US Forest Service (USFS), the EMAP Western Pilot, and the California Monitoring and Assessment Program (CMAP)), and in the interest of methodological consistency between state and federal water resource agencies, has been adopted as the standard riffle protocol for bioassessment in California. The version described here is the EMAP modification, which distributes the sampling effort throughout the reach.

Sampling Locations – Acceptable Habitat Types

Riffles are the preferred habitat for TRC sampling, but other fast water habitats are acceptable for sampling if riffles are sparse. Common flow-defined habitat types are listed in Table 3 in decreasing order of energy. Most streams contain some or all of the following fast water habitat types: 1) cascades/falls, 2) rapids, 3) riffles, 4) runs. All of these are acceptable for TRC sampling if riffles are not available.

Note: *Because the common habitat types are arranged on a continuum between high to low energy environments, the categories grade into each other continuously and are not discrete. Thus, determination of habitat types requires somewhat subjective decision-making.*

Table 3. Common habitat types in stream channels, arranged in decreasing order of energy

Flow Habitat Type	Description
Cascades	Short, high gradient drop in stream bed elevation often accompanied by boulders and considerable turbulence
Falls	High gradient drop in elevation of the stream bed associated with an abrupt change in the bedrock
Rapids	Sections of stream with swiftly flowing water and considerable surface turbulence. Rapids tend to have larger substrate sizes than riffles
Riffles	Shallow sections where the water flows over coarse stream bed particles that create mild to moderate surface turbulence; (< 0.5 m deep, > 0.3 m/s)
Step-Runs	A series of runs that are separated by short riffles or flow obstructions that cause discontinuous breaks in slope
Runs	Long, relatively straight, low-gradient sections without flow obstructions. The stream bed is typically even and the water flows faster than it does in a pool; (> 0.5 m deep, > 0.3 m/s)
Glides	A section of stream with little or no turbulence, but faster velocity than pools; (< 0.5 m deep, < 0.3 m/s)
Pools	A reach of stream that is characterized by deep, low-velocity water and a smooth surface ; (> 0.5 m deep, < 0.3 m/s)

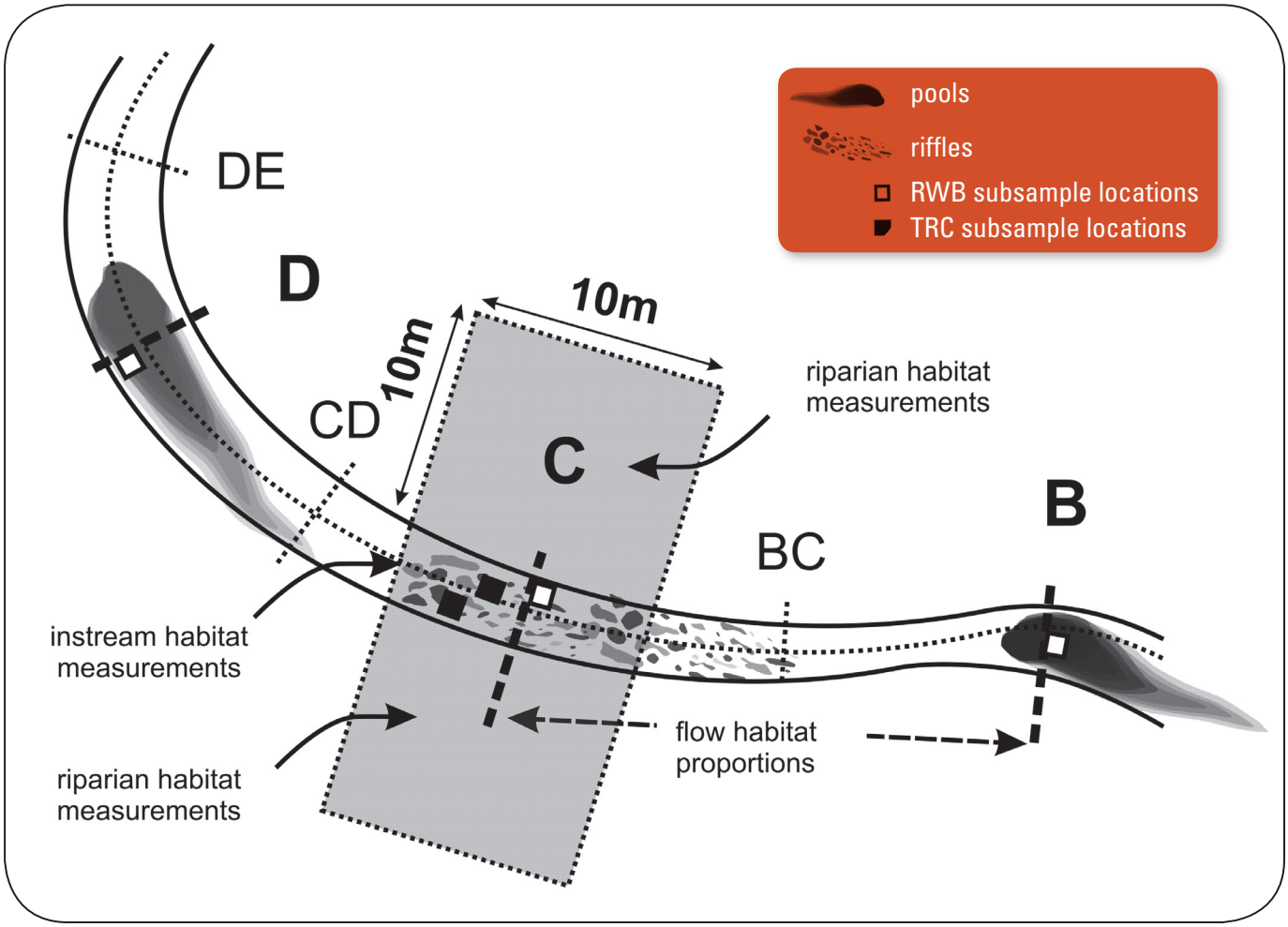

Figure 2. Section of the standard reach expanded from Figure 1 showing the appropriate positions for collecting benthic macroinvertebrate samples, instream and riparian habitat measurements and flow habitat proportion measurements.

Sampling Locations – Selecting Habitat Units

A TRC sample is a composite of eight individual kick samples of 1 ft^2 (0.09 m^2) of substrate each. During your initial layout of the reach, take a mental note of the number and position of the main riffles in a reach (and other fast water habitats if needed). Randomly distribute the eight sub-samples among the fast water habitats in the reach, giving preference to riffles where possible. Unless you are sampling in small streams, try to avoid very small riffle units (i.e., < 5 ft^2). If fewer than eight riffles are present in a reach, more than one sample may be taken from a single riffle, especially if the riffles are large.

Sampling Procedure

Begin sampling at the downstream end of the reach at the first randomly selected riffle and work your way upstream.

TRC-Step 1. Determine net placement within each habitat unit by generating a pair of random numbers between 0 and 9. Examples of convenient random number generators include the hundredths place on the stopwatch feature of a digital watch, a 10 sided die and a random number chart. The first number in each pair (multiplied by 10) represents the percent upstream along the habitat unit's length. The second number in each pair represents the percent of the riffle width from right bank. For example, if the two generated random numbers are 4 and 7, you will walk upstream 40% of the distance of the riffle and then go 70% of the distance across the riffle (see Figure 3). This position is the center of the 1 ft^2 (0.09 m^2) sampling quadrat for that riffle. If you are unable to sample this location because it is too deep or it is occupied by a large boulder, select a new pair of random numbers and pick a new spot.

TRC-Step 2. Position a 500-µ D-net (with the net opening perpendicular to the flow and facing upstream) quickly and securely on the stream bottom to eliminate gaps under the frame. Avoid, and if necessary remove, large rocks that prevent the sampler from seating properly on the stream bottom.

TRC-Step 3. Holding the net in position on the substrate, visually define a square quadrat that is one net width wide and one net width long upstream of the net opening. Since D-nets are 12 inches wide, the area within this quadrat is 1ft^2 (0.09 m^2). Restrict your sampling to within that area. If desired, a wire frame of the correct dimensions can be placed in front of the net to help delineate the quadrat to be sampled, but it is often sufficient to use the net dimensions to keep the sampling area consistent.

TRC-Step 4. Working backward from the upstream edge of the sampling plot, check the quadrat for heavy organisms such as mussels, snails, and stone-cased caddisflies. Remove these organisms from the substrate by hand and place them into the net. Carefully pick up and rub stones directly in front of the net to remove attached animals. Remove and clean all of the rocks larger than a golf ball ($\sim$3 cm) within your sampling quadrat such that all the organisms attached to them are washed downstream into your net. Set these rocks outside your sampling quadrat after you have cleaned them. If the substrate is consolidated or comprised of large, heavy rocks, use your feet to kick and dislodge the substrate to displace BMIs into the net. If you cannot remove a rock from the stream bottom, rub it (concentrating on cracks or indentations) thereby loosening any attached insects. As you are disturbing the plot, let the water current carry all loosened material into the net.

Note 1: *Brushes are sometimes used in other bioassessment protocols to help loosen organisms, but in the interest of standardizing collections, do not use a brush when following this protocol.*

Note 2: *In sandy-bottomed streams, kicking within run habitats can quickly fill the sampling net with sand. In these situations, follow the standard procedures but use care to disturb the substrate gently and avoid kicking.*

TRC-Step 5. Once the coarser substrates have been removed from the quadrat, dig your fingers through the remaining underlying material to a depth of about 10 cm (this material is often comprised of gravels and finer particles). Thoroughly manipulate the substrates in the quadrat.

Note: *The sampler may spend as much time as necessary to inspect and clean larger substrates, but should take a standard time of 30 seconds to perform Step 5.*

TRC-Step 6. Let the water run clear of any insects or organic material before carefully lifting the net. Immerse the net in the stream several times to remove fine sediments and to concentrate organisms at the end of the net, but be careful to avoid having any water or foreign material enter the mouth of the net during this operation.

TRC-Step 7. Move upstream to the next randomly selected habitat unit and repeat steps one through six, taking care to keep the net wet but uncontaminated by foreign material when moving the net from riffle to riffle. Sometimes, the net will become so full of material from the streambed that it is no longer effective at capturing BMIs. In these cases, the net should be emptied into sample jars as frequently as necessary, following guidelines described below in the "Preparation of BMI Sample Jars" section. Continue until you have sampled eight $1ft^2$ ($0.09\ m^2$) of benthos.

TRC-Step 8. PROCEED to Section IIIc. Filling and Labeling BMI Sample Jars.

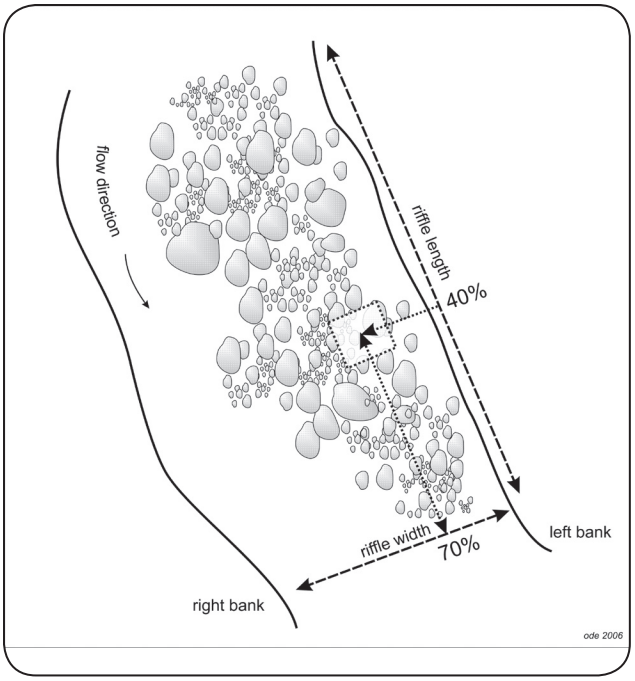

Figure 3. Example showing the method for selecting a subsampling position within a selected riffle under the TRC method. In this example, the random numbers 4 and 7 were selected

SECTION III B. REACHWIDE BENTHOS (MULTIHABITAT) PROCEDURE

The RWB procedure employs an objective method for selecting subsampling locations that is built upon the 11 transects used for physical habitat measurements. The RWB procedure can be used to sample any wadeable stream reach since it does not target specific habitats. Because sampling locations are defined by the transect layout, the position of individual sub-samples may fall in a variety of erosional or depositional habitats.

Note: *Sampling locations should be displaced one meter downstream of the transects to avoid disturbing substrates for subsequent physical habitat assessments.*

RWB -Step 1. The sampling position within each transect is alternated between the left, center and right positions along a transect (25%, 50% and 75% of wetted width, respectively) as you move upstream from transect to transect. Starting with the downstream transect (Transect

A), identify a point that is 25% of the stream width from the right bank (note that the right bank will be on your left as you face upstream). If you cannot collect a sample at the designated point because of deep water obstacles or unsafe conditions, relocate the point as close as possible to the designated position.

Note: *A modification to this procedure is currently being investigated by SWAMP. This "margin-center-margin" (MCM) modification replaces the samples at 25% and 75% of wetted width with samples of the marginal habitats (including emergent and submergent vegetation).*

RWB -Step 2. Place a 500-µ D-net in the water so the mouth of the net is perpendicular to and facing into the flow of the water. If there is sufficient current in the area at the sampling point to fully extend the net, use the normal D-net collection technique to collect the sub-sample (TRC-Step 3 through TRC-Step 6 above). If flow volume and velocity is not sufficient to use the normal collection technique, use the sampling procedure for "slack water" habitats (RWB-Step 3 through RWB-Step 7 below).

RWB -Step 3. Visually define a 1 ft^2 (0.09 m^2) quadrat that is one net-width wide and one net-width long at the sampling point.

RWB -Step 4. Working backward from the upstream edge of the sampling plot, check the quadrat for heavy organisms such as mussels and snails. Remove these organisms from the substrate by hand and place them into the net. Carefully pick up and rub stones directly in front of the net to remove attached animals. Remove and clean all of the rocks larger than a golf ball within your sampling quadrat such that all the organisms attached to them are washed downstream into your net. Set these rocks outside your sampling quadrat after you have cleaned them. Large rocks that are less than halfway into the sampling area should be pushed aside. If the substrate is consolidated or comprised of large, heavy rocks, use your feet to kick and dislodge the substrate to displace BMIs into the net. If you cannot remove a rock from the stream bottom, rub it (concentrating on cracks or indentations) thereby loosening any attached insects.

RWB -Step 5. Vigorously kick the remaining finer substrate within the quadrat with your feet while dragging the net repeatedly through the disturbed area just above the bottom. Keep moving the net all the time so that the organisms trapped in the net will not escape. Continue kicking the substrate and moving the net for 30 seconds. For vegetation-choked sampling points, sweep the net through the vegetation within a 1ft^2 (0.09 m^2) quadrat for 30 seconds.

Note: *If flow volume is insufficient to use a D- net, spend 30 seconds hand picking a sample from 1ft^2 of substrate at the sampling point, then stir up the substrate with your gloved hands and use a sieve with 500-µ mesh size to collect the organisms from the water in the same way the net is used in larger pools.*

RWB -Step 6. After 30 seconds, remove the net from the water with a quick upstream motion to wash the organisms to the bottom of the net.

RWB -Step 7. PROCEED to Section IIIc: Filling and Labeling BMI Sample Jars

SECTION III C. FILLING AND LABELING BENTHIC MACROINVERTEBRATE SAMPLE JARS

Step 1. Once all sub-samples (eight for TRC, 11 for RWB) have been collected, transfer benthos to a 500-mL or 1000-mL wide-mouth plastic sample jar using one of the following methods.

Note: *Field elutriation should only be used by well-trained field crews who are proficient at removing all benthic organisms from the discarded inorganic material. Training in the recognition of aquatic invertebrates is highly recommended.*

Step 1a. Complete Transfer of all Sampled Material – Invert the contents of the kick net into the sample jar. Perform this operation over a white enameled tray to avoid loss of any sampled material and make recovery of spilled organisms easier. If possible, remove the larger twigs and rocks by hand after carefully inspecting for clinging organisms, but be sure not to lose any organisms. Use forceps to remove any organisms clinging to the net and place these in the sample jar.

Step 1b. Field Elutriation of Samples – Empty the contents of the net into a large plastic bucket (10-20 L is sufficient). Use forceps to remove any organisms clinging to the net and place these in the bucket. Add stream water to the bucket and gently swirl the contents of the bucket in order to suspend the organic material (being certain to not introduce entrained organisms from the source water). Pour the organic matter from the bucket through a 500-µ sieve (or use the 500-µ net). Repeat this process until no additional material can be elutriated (i.e., only inorganic material is left in the bucket). If possible, remove the larger twigs and rocks by hand after carefully inspecting for clinging organisms, but be sure not to lose any organisms. Transfer all of the material in the sieve (invertebrates and organic matter) into the sample jar. Carefully inspect the gravel and debris remaining in the bottom of the bucket for any cased caddisflies, clams, snails, or other dense animals that might remain. Remove any remaining animals by hand and place them in the sample jar.

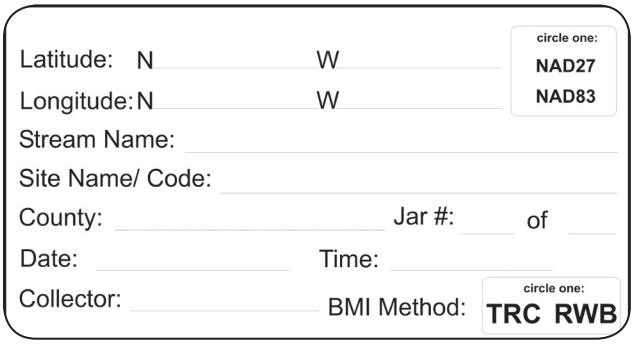

Figure 4. Example date - locality label for all BMI samples.

Step 2. Place a completed date/locality label (see Figure 4) on the inside of the jar (use pencil only as most "permanent" inks dissolve in ethanol) and completely fill with 95% ethanol. Place a second label on the outside of the jar. Note that the target concentration of ethanol is 70%, but 95% ethanol is used in the field to account for dilution from water in the sample. If organic and inorganic material does not accumulate in the net quickly, it may be possible to transfer all the material in the net into one jar. Otherwise, divide the material evenly among several jars

(being careful to clearly label them as part of a set). To ensure proper preservation of benthic macroinvertebrates it is critical that the ethanol is in contact with the BMIs in the sample jar. Never fill a jar more than 2/3 full with sampled material, and gently rotate jars that contain mostly mud or sand to ensure that the ethanol is well distributed. If jars will be stored for longer than a month prior to processing, jars should not contain more than 50% sample material.

SECTION 4 MAIN CROSS-SECTIONAL TRANSECT MEASURES

SECTION IVA. PHYSICAL MEASURES

The majority of physical habitat measurements in this protocol are made relative to the main cross-sectional transects (Figure 5). All the measures taken relative to each transect are recorded on forms specific to that transect. Start with the downstream transect (Transect A) and repeat steps 6-15 for all 11 main transects.

Module A. Transect Dimensions: Wetted Width and Bankfull Dimensions

Wetted Width – The wetted channel is the zone that is inundated with water and the wetted width is the distance between the sides of the channel at the point where substrates are no longer surrounded by surface water. Measure the wetted stream width and record this in the box at the top of the transect form.

Bankfull Width and Depth – The bankfull channel is the zone of maximum water inundation in a normal flow year (one to two year flood events). Since most channel formation processes are believed to act when flows are within this zone (Mount 1995), bankfull dimensions provide a valuable indication of relative size of the waterbody.

Note: *Bankfull dimensions are notoriously difficult to assess, even by experienced field crews (see Heil and Johnson 1995). It is often useful to discuss the interpretation of bankfull locations among the field crew members to reach a consensus. The USFS Stream Team provides a good set of instructional videos for improving consistency in accurate bankfull measurements (http://www.stream.fs.fed.us/publications/videos.html).*

Step 1. Scout along the stream margins to identify the location of the bankfull margins on either bank by looking for evidence of annual or semi-annual flood events. Examples of useful evidence includes topographic, vegetative, or geologic cues (changes in bank slope, changes from annual to perennial vegetation, changes in the size distribution of surface sediments). While the position of drift material caught in vegetation may be a helpful aid, this can lead to very misleading measurements.

Note: *The exact nature of this evidence varies widely across a range of stream types and geomorphic characteristics. It is helpful to investigate the entire reach when attempting to interpret this evidence because the true bankfull margin may be obscured at various points along the reach. Often the bankfull position is easier to interpret from one bank than the other; in these cases, it is easiest to infer the opposite bank position by projecting across the channel. Additionally, height can be verified by measuring the height from both edges of the wetted channel to the bankfull height (these heights should be equal).*

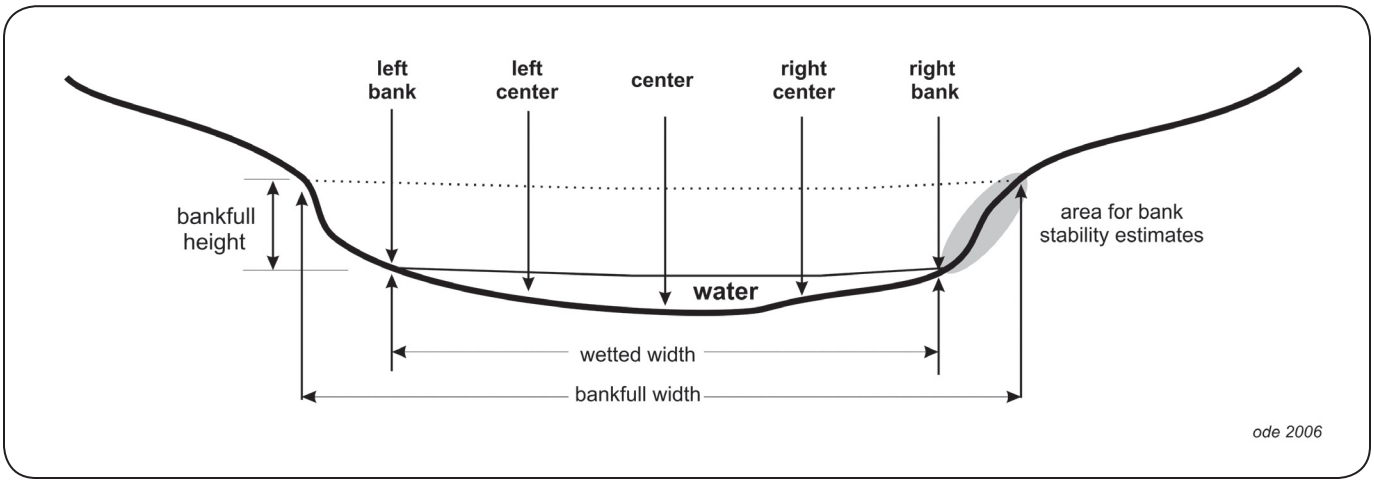

Figure 5. Cross sectional diagram of a typical stream channel showing locations of substrate measurements, wetted and bankfull width measurements, and bank stability visual estimates.

Step 2. Stretch a tape from bank to bank at the bankfull position. Measure the width of the bankfull channel from bank to bank at bankfull height and perpendicular to the direction of stream flow.

Step 3. Measure bankfull height (the vertical distance between the water height of the water and the height of the bank, Figure 5) and record.

Module B. Transect Substrate Measurements

Particle size frequency distributions often provide valuable information about instream habitat conditions that affect BMI distributions. The Wolman pebble count technique (Wolman 1954) is a widely used and cost-effective method for estimating the particle size distribution and produces data that correlates with costly, but more quantitative bulk sediment samples. The method described here follows the EMAP protocol, which records sizes of 105 particles in a reach (five particles from each of 11 main transects and 10 inter-transects).

Note: *The size cutoff for the finest particle sizes in the EMAP protocol (< 0.06 mm) differs from that used by the Sierra Nevada Aquatic Research Laboratory (SNARL) program (0.25 mm), although the narrative description for this cutoff is the same (the point at which fine particles rubbed between one's fingers no longer feel gritty).*

Coarse particulate organic matter (CPOM, particles of decaying organic material such as leaves that are greater than 1.0 mm in diameter) is a general indicator of the amount of allochthonous organic matter available at a site, and its measurement can provide valuable information about the basis of the food web in a stream reach. The presence of CPOM associated with each particle is quantified at the same time that particles are measured for the pebble counts.

Step 1. Transect substrate measurements are taken at five equidistant points along each transect (Figure 5). Divide the wetted stream width by four to get the distance between the five points (Left Bank, Left Center, Center, Right Center and Right Bank) and use a measuring device to locate the positions of these points (a stadia rod is especially helpful here). Once the positions are identified, lower a graduated rod (e.g., a marked ski pole) though the water column perpendicular to both the flow and the transect to objectively select the particle located at the tip of the rod.

Step 2. Measure the depth from the water surface to the top of the particle with the graduated rod and record to the nearest cm.

Step 3. Record the presence or absence of CPOM >1mm within 1 cm of the particle.

Step 4. If the particle is cobble-sized (64-250 mm), record the percent of the cobble that is embedded by fine particles (<2 mm) to the nearest 5% (see cobble embeddedness text below).

Step 5. Remove the particle from the streambed, then measure and record the length of its intermediate axis to the nearest mm (see Figure 6). Alternatively, assign the particle to one of the size classes listed in the bottom of the transect form. Particle sizes classes can be estimated visually or with a quantitative measuring device (e.g., pass/ no-pass template, "gravelometer"). Regardless of the method, all particles less than 0.06 mm should be recorded as fines, all particles between 0.06mm and 2.0 mm recorded as sand. Field crews may want to carry vials containing sediment particles with these size ranges until they are familiar with these particles.

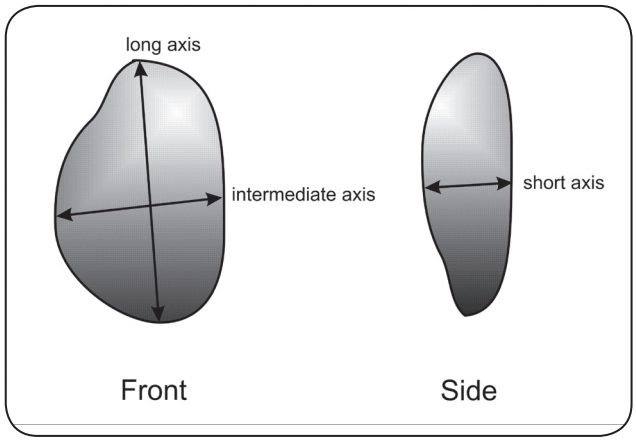

Figure 6. Diagram of three major perpendicular axes of substrate particles. The intermediate axis is recorded for pebble counts.

Module C. Cobble Embeddedness

The quantification of substrate embeddedness has long been a challenge to stream geomorphologists and ecologists (Klamt 1976, Kelley and Dettman 1980). It is generally agreed that the degree to which fine particles fill interstitial spaces has a significant impact on the ecology of benthic organisms and fish, but techniques for measuring this impact vary greatly (this is summarized well by Sylte and Fischenich 2002, http://stream.fs.fed.us/news/streamnt/pdf/StreamOCT4.pdf). Here we define embeddedness as the volume of cobble-sized particles (64-250 mm) that is buried by fine particles (<2.0 mm diameter).

Note: *This method differs from the EMAP method for measuring embeddedness, which measures embeddedness of all particles larger than 2 mm.*

Table 4. Size class codes and definitions for particle size measurements

Size Class Code	Size Class Description	Common Size Reference	Size Class Range
RS	bedrock, smooth	larger than a car	> 4 m
RR	bedrock, rough	larger than a car	> 4 m
XB	boulder, large	meter stick to car	1 - 4 m
SB	boulder, small	basketball to meter stick	25 cm - 1.0 m
CB	cobble	tennis ball to basketball	64 - 250 mm
GC	gravel, coarse	marble to tennis ball	16 - 64 mm
GF	gravel, fine	ladybug to marble	2 – 16 mm
SA	sand	gritty to ladybug	0.06 – 2 mm
FN	fines	not gritty	< 0.06 mm
HP	hardpan (consolidated fines)		< 0.06 mm
WD	wood		
RC	concrete/ asphalt		
OT	other		

Step 1. Every time a cobble-sized particle is encountered during the pebble count, remove the cobble from the stream bed and visually estimate the percentage of the cobble's volume that has been buried by fine particles. Since visual estimates of volume and surface area are subject to large amounts of observer error, field crews should routinely calibrate their estimates with each other and with other field crews.

Step 2. In the spaces to the right of the pebble count data, record the embeddedness of all cobble-sized particles encountered during the pebble count.

Note: *The cobble embeddedness scores do not correspond with the specific particles in the pebble count cells to the left, but are merely a convenient place to record the data.*

Step 3. If 25 cobbles are not encountered during the pebble count, supplement the cobbles by conducting a "random walk" through the reach. Starting at a random point in the reach, follow a transect from one bank to the other at a randomly chosen angle. Once at the other bank reverse the process with a new randomly chosen angle. Record embeddedness of cobble-sized particles in the cobble embeddedness boxes on the transect forms until you reach 25 cobbles. If 25 cobble-sized particles are not present in the entire reach, then record the values for cobbles that are present.

Module D. Canopy Cover

This method uses the Strickler (1959) modification of a convex spherical densiometer to correct for over-estimation of canopy density that occurs with unmodified readings. Read the densiometer by counting the number of line intersections that are obscured by overhanging vegetation (see Figure 7). Taping off the lower left and right portions of the mirror emphasizes overhead vegetation over foreground vegetation (the main source of bias in canopy density measurements). All densiometer readings should be taken with the bubble leveled and 0.3 m (1 ft) above the water surface.

Step 1. Using a modified convex spherical densitometer, take and record four 17-point readings all taken from the center of each transect: a) facing upstream, b) facing downstream, c) facing the left bank, d) facing the right bank.

Note: *This method deviates slightly from that of EMAP (in which two additional readings are taken at the left and right wetted edges to increase representation of bank vegetation).*

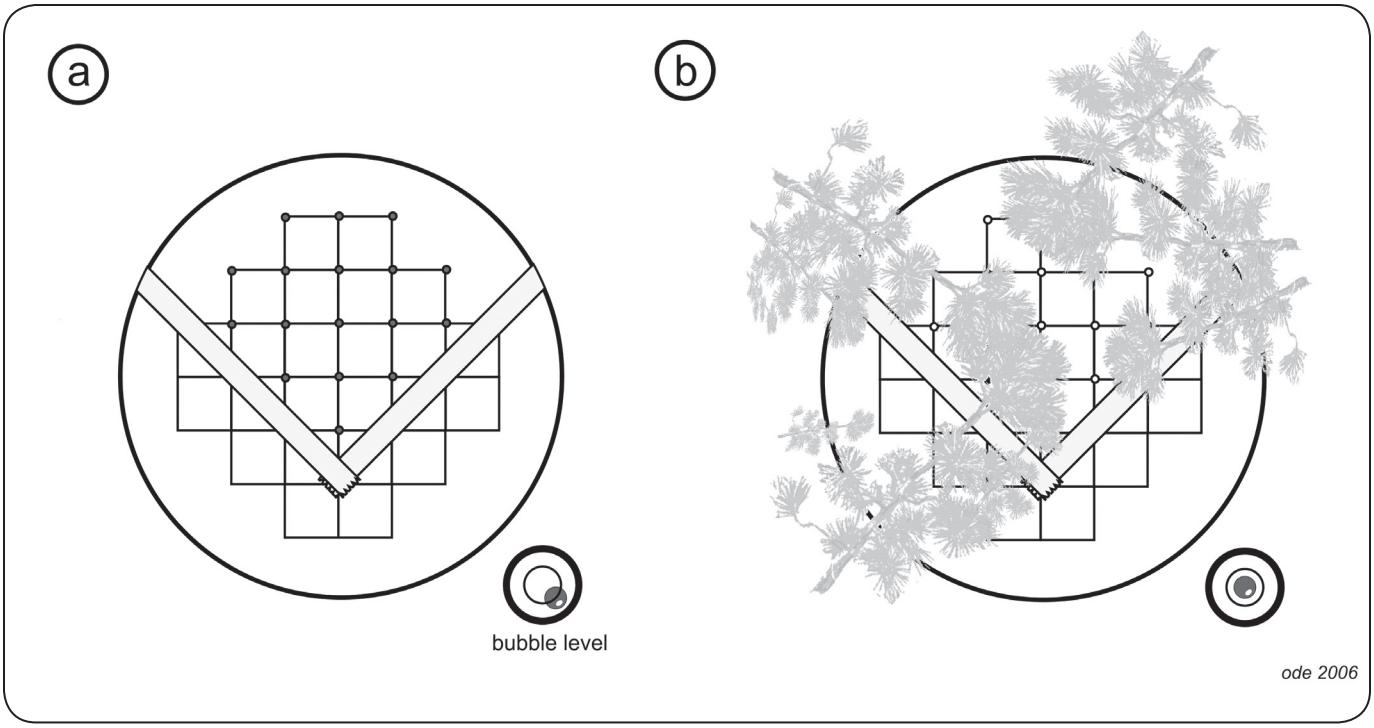

Figure 7. Representation of the mirrored surface of a convex spherical densiometer showing the position for taping the mirror and the intersection points used for the densiometer reading. The score for the hypothetical condition in (b) is 10 covered intersection points out of 17 possible. Note the position of the bubble level in (b) when the densiometer is leveled.

Module E. Gradient and Sinuosity

The gradient of a stream reach is one of the major stream classification variables, giving an indication of potential water velocities and stream power, which are in turn important controls on aquatic habitat and sediment transport within the reach. The gradient (slope) of a stream reach is often strongly correlated with many BMI metrics and other physical habitat measures and is therefore very useful when interpreting BMI data.

The "full" physical habitat method uses 10 transect to transect measurements to calculate the average slope through a reach. Although this is a little more time intensive than the reach-scale transect measures used in the "basic" protocol, it results in more precise slope determination and the ability to quantify slope variability within a reach. Sinuosity (calculated as the ratio of the length of the flow path between the ends of the reach and the straight line distance between the ends of the reach, Kaufmann et al. 1999) is measured at the same time as slope. These two measurements work best with two people, one taking the readings at the upstream transect ("backsighting") and the other holding a stadia rod at the downstream transect. If you cannot see the mid point of the next transect from the starting point, use the supplemental sections (indicating the proportion of the total length represented by each section). Otherwise, leave these blank.

Note 1: *An auto level should be used for reaches with a percent slope of less than or equal to 1%. All methods (clinometer, hand level, or auto level) may be used for reaches with a percent slope of greater than 1%. The following description is for clinometer-based slope measurements, but the same principles apply to use of an auto or hand level.*

Note 2: *In reaches that are close to 1%, you will not know whether you are above or below the 1% slope cutoff before taking readings. In these cases, default to use of an autolevel.*

Step 1. Beginning with the upper transect (Transect K), one person (the measurer) should stand at the water margin with a clinometer held at eye level. A second person should stand at the margin of the next downstream transect (Transect J) with a stadia rod flagged at the eye level of the person taking the clinometer readings. Be sure you mark your eye level while standing on level ground! Adjust for water depth by measuring from the same height above the water surface at both transects. This is most easily accomplished by holding the base of the pole at water level.

Note: *An alternative technique is to use two stadia rods pre-flagged at the eye-height of the person taking the readings.*

Step 2. Use a clinometer to measure the percent slope of the water surface (not the streambed) between the upstream transect and the downstream transect by sighting to the flagged position on the stadia rod. The clinometer reads both percent slope and degree of the slope. Be careful to read and record percent slope rather than degrees slope (these measurements differ by a factor of ~ 2.2). Percent slope is the scale on the right hand side as you look through most clinometers (e.g., Suunto models).

Note: *If an auto level or hand level is used, record the elevation difference (rise) between transects and the segment length (run) instead of the percent slope.*

Step 3. If the stream reach geometry makes it difficult to sight a line between transects, divide the distance into two or three sections and record the slope and the proportion of the total segment length between transects for each of these sections in the appropriate boxes on the slope form (supplemental segments).

Note: *Never measure slope across dry land (e.g., across a meander bend).*

Step 4. Take a compass reading from the center of each main transect to the center of the next main transect downstream and record this bearing to the nearest degree on the slope and bearing section of the form. Bearing measurements should always be taken from the upstream to downstream transect.

Step 5. Proceed downstream to the next transect pair (I-J) and continue to record slope and bearing between each pair of transects until measurements have been recorded for all transects.

SECTION IVB. VISUAL ESTIMATES OF HUMAN INFLUENCE, INSTREAM HABITAT, AND RIPARIAN VEGETATION

The transect-based approach used here permits semi-quantitative calculations from visual estimates even though most are categorical data (i.e., either presence/ absence or size classes) because we can calculate the percentage of transects that fall into different categories. These modules are adapted directly from EMAP protocols with some modifications as noted.

Module F. Human Influence

The influence of human activities on stream biota is of critical concern in bioassessment analyses. Quantification of human activities for these analyses is often performed with GIS techniques, which are very useful but are not capable of accounting for human activities occurring at the reach scale. Reach scale observations are often critical for explaining results that might seem anomalous on the basis of only remote mapping tools.

Step 1. For the left and right banks, estimate a 10 x 10 m riparian area centered on the edges of the transect (see Figure 2). Record the presence of 11 human influence categories in three spatial zones relative to this 10 x 10 m square (between the wetted edge and bankfull margin, between the bankfull margin and 10 m from the stream, and between 10 m and 50 m beyond the stream margins): 1) walls/rip-rap/dams, 2) buildings, 3) pavement/cleared lots, 4) roads/railroads, 5) pipes (inlets or outlets), 6) landfills or trash, 7) parks or lawns (e.g., golf courses), 8) row crops, 9) pasture/ rangelands, 10) logging/ timber harvest activities, 11) mining activities, 12) vegetative management (herbicides, brush removal, mowing), 13) bridges/ abutments, 14) orchards or vineyards. Circle all combinations of impacts and locations that apply, but be careful to not double-count any human influence observations.

Step 2. Record the presence of any of the 11 human influence categories in the stream channel within a zone 5 m upstream and 5 m downstream of the transect.

Module G. Riparian Vegetation

Riparian vegetation (vegetation in the region beyond the bankfull margins) has a strong influence on the composition of stream communities through its direct and indirect roles in controlling the food base, moderating sediment inputs and acting as a buffer between the stream channel and the surrounding environment. These methods provide a cursory survey of the condition of the riparian corridor. Observations are made in the same 10 x 10 m riparian area used for assessing human influence (see Figure 2).

Note: *Riparian vegetation measurements should only include living or recently dead vegetation.*

The riparian vegetation categories used here were condensed from the EMAP version, which further breaks the canopy classes into different components. However, because we have consolidated EMAP categories into fewer categories rather than creating new categories, existing EMAP data can be easily converted to this format simply by combining the appropriate categories.

Step 1. Divide the riparian zone into three elevation zones: 1) ground cover (< 0.5 m), 2) lower canopy (0.5 m - 5 m), and 3) upper canopy (> 5 m). Record the density of the following riparian classes: 1) Upper Canopy–Trees and Saplings, 2) Lower Canopy–Woody Shrubs and Saplings, 3) Woody Ground Cover–Shrubs, Saplings, 4) Herbaceous Ground Cover–Herbs and Grasses, and 5) Ground Cover–Barren, Bare Soil and Duff. Artificial banks (e.g., rip-rap, concrete, asphalt) should be recorded as barren.

Step 2. Indicate the areal cover (i.e., shading) by each riparian vegetative class as either: 1) absent, 2) sparse (< 10%), 3) moderate (10-40%), 4) heavy (40-75%), or 5) very heavy (> 75%).

Module H. Instream Habitat Complexity

Instream habitat complexity was developed by the EMAP program to quantify fish concealment features in the stream channel, but it also provides good information about the general condition and complexity of the stream channel. Estimates should include features within the banks and outside the wetted margins of the stream.

Step 1. Record the amount of nine different channel features within a zone 5m upstream and 5m downstream of the transect (see Figure 2): 1) filamentous algae (long-stranded algal forms that are large enough to see with the naked eye), 2) aquatic macrophytes (include mosses and vascular plants), 3) boulders (> 25 cm), 4 and 5) woody debris (break into two classes- larger and smaller than 30 cm diameter), 6) undercut banks, 7) overhanging vegetation, 8) live tree roots and 9) artificial structures (includes any anthropogenic objects including large trash objects like tires and shopping carts). Indicate the areal cover of each feature as either: 1) absent, 2) sparse (< 10%), 3) moderate (10-40%), 4) heavy (40-75%), or 5) very heavy (> 75%).

SECTION 5
INTER-TRANSECT MEASURES

While most measures are taken at or relative to the main transects, a few measures are recorded at transects located at the midpoint between main transects. These are called "inter-transects".

Module B (Part 2) Pebble Counts (same as for transects, but no cobble embeddedness measures)

Step 1. Divide the wetted stream width by four to get the distance between the five points (Left Bank, Left Center, Center, Right Center and Right Bank) and use a measuring device to locate the positions of these points (a stadia rod is especially helpful here, see Figure 5). Once the positions are identified, lower a graduated rod through the water column perpendicular to both the flow and the transect to objectively select the particle located at its tip.

Step 2. With the graduated rod, measure the depth from the water surface to the top of the particle and record to the nearest cm.

Step 3. Remove the particle from the streambed, then measure and record the length of its intermediate axis to the nearest mm (see Figure 6). Alternatively, assign the particle to one of the size classes listed in the bottom of the transect form (see Table 3 for a list of size classes). Particle size classes may be estimated visually or with a quantitative measuring device (e.g., pass/ no-pass template, gravelometer). Regardless of the method, all particles less than 0.06 mm should be recorded as fines, while all particles between 0.06 mm and 2.0 mm should be recorded as sand. Field crews may want to carry vials containing sediment particles with these size ranges until they are familiar with these particle size classes.

Step 4. Record the presence (P) or absence (A) of any CPOM within 1 cm of each particle.

Module J. Flow Habitats

Because many benthic macroinvertebrates prefer specific flow and substrate microhabitats, the proportional representation of these habitats in a reach is often of interest in bioassessments. There are many different ways to quantify the proportions of different flow habitats (for example, see text on EMAP's "thalweg profile" below). Like the riparian and instream measures listed above, this procedure produces a semi-quantitative measure consisting of 10 transect-based visual estimates.

Note: *The categories used here are based on those used in the EMAP protocol, with pools combined into one class and cascades and falls combined into another class.*

Step 1. At each inter-transect, identify the proportion of six different habitat types in the region between the upstream transect and downstream transect: 1) cascades/falls, 2) rapids, 3) riffles, 4) runs, 5) glides, 6) pools, 7) dry areas. Record percentages to the nearest 5% — the total percentage of surface area for each section must total 100%.

SECTION 6 DISCHARGE

Stream discharge is the volume of water that moves past a point in a given amount of time and is generally reported as either cubic meters per second (cms) or cubic feet per second (cfs). Because discharge is directly related to water volume, discharge affects the concentration of nutrients, fine sediments and pollutants; and discharge measurements are critical for understanding impacts of disturbances such as impoundments, water withdrawals and water augmentation. Discharge is also closely related to many habitat characteristics including temperature regimes, physical habitat diversity, and habitat connectivity. As a direct result of these relationships, stream discharge is often also a strong predictor of biotic community composition. Since stream volume can vary significantly on many different temporal scales (diurnal, seasonal, inter-annually), it can also be very useful for understanding variation in stream condition.

This procedure (modified from the EMAP protocol) provides for two different methods for calculating discharge. It is preferable to take discharge measurements in sections where flow velocities are greater than 0.15 m/s and most depths are greater than 15 cm, but slower velocities and shallower depths can be used. If flow volume is sufficient for a transect-based "velocity-area" discharge calculation, this is by far the preferred method. If flow volume is too low to permit this procedure or if your flow meter fails, use the "neutrally buoyant object/ timed flow" method.

Note: *Programs that sample fixed sites repeatedly may want to consider installing permanent discharge estimation structures (e.g., stage gauges, wiers).*

Module K. Discharge: Velocity Area Method

The layout for discharge measurements under the velocity-area (VA) method is illustrated in Figure 8. Flow velocity should be measured with either a Swoffer Instruments propeller-type flow meter or a Marsh-McBirney inductive probe flow meter. Refer to the manufacturers' instrument manuals for calibration procedures.

VA-Step 1. Select the best location in the reach for measuring discharge. To maximize the repeatability of the discharge measurement, choose a transect with the most uniform flow (select hydraulically smooth flow whenever possible) and simplest cross-sectional geometry. It is acceptable to move substrates or other obstacles to create a more uniform cross-section before beginning the discharge measurements.

VA-Step 2. Measure the wetted width of the discharge transect and divide this into 10 to 20 equal segments. The use of more segments gives a better discharge calculation, but is impractical in small channels. A minimum of 10 intervals should be used when stream width permits, but interval width should not be less than 15 cm.

VA-Step 3. Record the distance from the bank to the end of the first interval. Using the top-setting rod that comes with the flow velocity meter, measure the median depth of the first interval.

VA-Step 4. Standing downstream of the transect to avoid interfering with the flow, use the top-setting rod to set the probe of the flow meter (either the propeller or the electromagnetic probe) at the midpoint of each interval, at 0.6 of the interval depth (this position generally approximates average velocity in the water column), and at right angles to the transect (facing upstream). See Figure 8 for positioning detail.

VA-Step 5. Allow the flow velocity meter to equilibrate for 10-20 seconds then record velocity to the nearest m/s. If the option is available, use the flow averaging setting on the flow meter.

Note: *Under very low flow conditions, flow velocity meters may register readings of zero even when there is noticeable flow. In these situations, record a velocity of 0.5x the minimum flow detection capabilities of the instrument.*

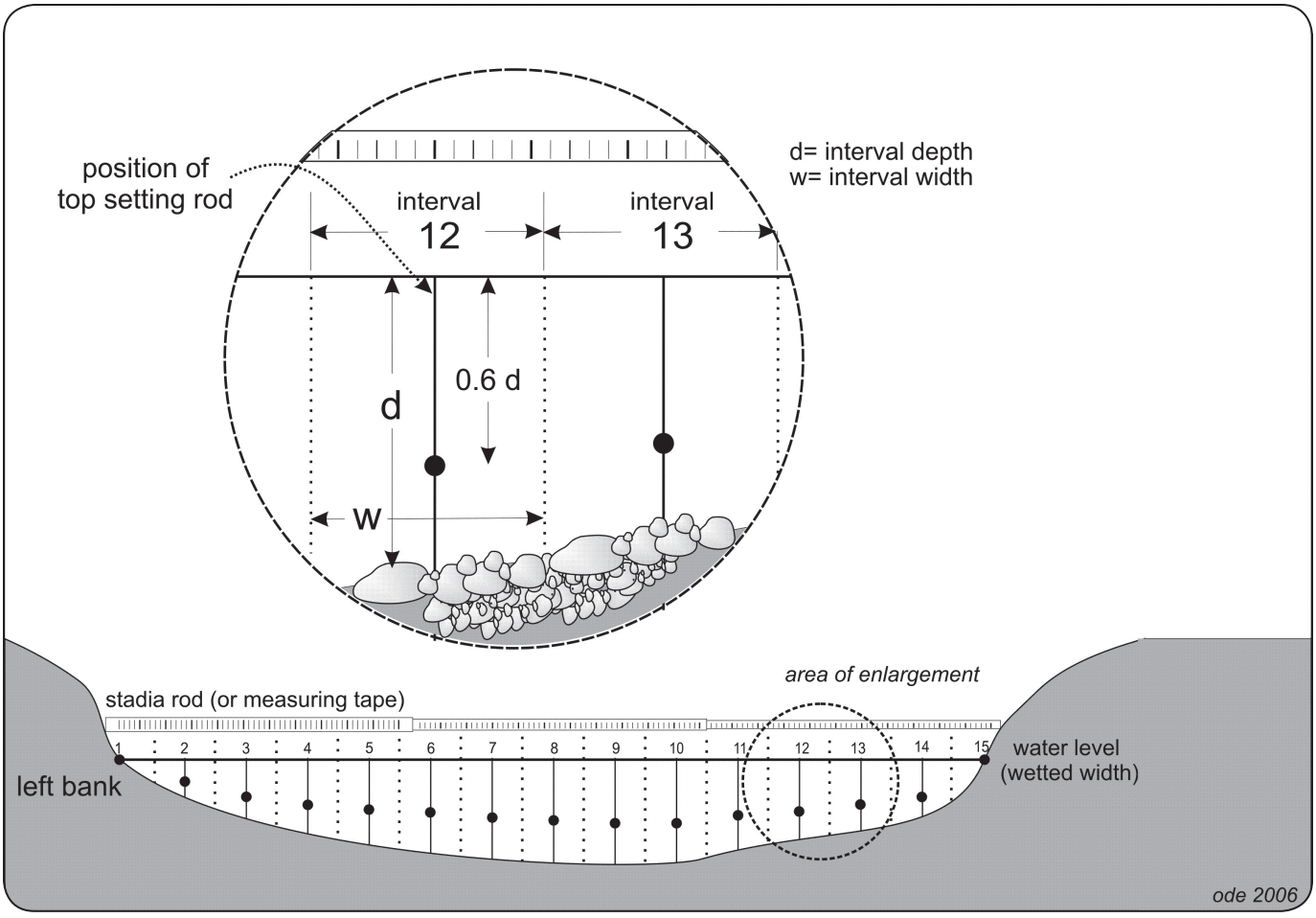

Figure 8. Diagram of layout for discharge measurements under the velocity-area method showing proper positions for velocity probe (black dots).

VA-Step 6. Complete Steps 3 through 5 on the remaining intervals.

Note: *The first and last intervals usually have depths and velocities of zero.*

Module L. Discharge: Neutrally Buoyant Object Method

If streams are too shallow to use a flow velocity meter, the neutrally buoyant object (NBO) method should be used to measure flow velocity. However, since this method is less precise than the flow velocity meter it should only be used if absolutely necessary. A neutrally buoyant object (one whose density allows it to just balance between sinking and floating) will act as if it were nearly weightless, thus it's movement will approximate that of the water it floats in better than a light object. To estimate the flow velocity through a reach, three transects are used to measure the cross-sectional areas within the test section sub-reach and three flow velocity estimates are used to measure average velocity through the test reach. To improve precision in velocity measurements, the reach segment should be long enough for the float time to last at least 10-15 seconds.

NBO-Step 1. The position of the discharge sub-reach is not as critical as it is for the velocity-area method, but the same criteria for selection of a discharge reach apply to the neutrally buoyant object method. Identify a section that has relatively uniform flow and a uniform cross sectional shape.

NBO-Step 2. The cross sectional area is estimated in a manner that is similar but less precise than that used in the velocity area method. Measure the cross sectional area in one to three places in the section designated for the discharge measurement (three evenly-spaced cross sections are preferred, but one may be used if the cross section through the reach is very uniform). Record the width once for each cross section and measure depth at five equally-spaced positions along each transect.

NBO-Step 3. Record the length of the discharge reach.

NBO-Step 4. Place a neutrally buoyant object (e.g., orange, rubber ball, heavy piece of wood, etc.) in the water upstream of the discharge reach and record the length of time in seconds that it takes for the object to pass between the upstream and downstream boundaries of the reach. Repeat this timed float three times.

SECTION 7
POST-SAMPLING OBSERVATIONS

Module M. Rapid Bioassessment Procedures Visual Assessment Scores (for Basic Physical Habitat, or optional supplement)

EPA's Rapid Bioassessment Procedures (RBPs, Barbour et al. 1999) include a set of 10 visual criteria for assessing instream and riparian habitat. The RBP has been used in the CSBP since its first edition (1995) and thus, this information is often valuable for comparison to legacy datasets. The criteria also have a useful didactic role since they help force the user to quantify key features of the physical environment where bioassessment samples are collected.

Module N. Additional Habitat Characterization (Full Physical Habitat only)

The RBP stream habitat visual estimates described in Step 1 are not included in the Full Physical Habitat version because they are generally replaced by more quantitative measurements of similar variables. However, we have found that three of the RBP measures are reasonably repeatable and include them in the reachwide assessment portion of the Full Physical Habitat version.

Note: *This is the only case in which a measurement included in the basic procedure is not included in the full.*

Module O. Reach Slope (for Basic Physical Habitat only)

Reach slope should be recorded as percent slope as opposed to degrees slope to avoid confusion. Slope measurements work best with two people, one taking the readings at the upstream transect and the other holding a stadia rod at the downstream transect. If you cannot see the mid point of the next transect from the starting point, use the supplemental sections (indicating the proportion of the total length represented by each section).

An auto level (with a tripod) should be used for reaches with a percent slope of less than or equal to 1%. All methods (clinometer, hand level, or auto level) may be used for reaches with a percent slope of greater than 1%. In reaches that are close to 1%, you will not know whether you are above or below the 1% slope cutoff. In these cases, default to use of an autolevel.

Step 1. Divide the reach into multiple segments such that stadia rod markings can be easily read with the measuring device to be employed (this is especially a factor for clinometer and hand level readings).

Step 2. Use a clinometer, hand level, or auto level to measure the percent slope of the water surface (not the streambed) between the top and bottom of each segment. Be sure to adjust for water depth by measuring from the same height above the water surface at both transects. Also be sure to record percent slope, not degrees slope. Record the segment length for each of these sections in the appropriate boxes on the BASIC slope form.

SECTION 8
OPTIONAL EXCESS SEDIMENT MEASURES

Future editions of these protocols will include supplemental modules, including a full discussion of the measurements used for calculating the excess sediment index (sometimes referred to as log relative bed stability, LRBS). However, since several of the measurements in EMAP's physical habitat protocols are interwoven into the layout of this protocol, a brief overview of the additional measurements collected for the LRBS calculations is included here for information purposes only. For detailed explanations of these measurements, consult Peck et al. 2004.

Woody Debris Tallies

Large woody debris (logs, snags, branches, etc.) that is capable of obstructing flow when the channel is at bankfull condition (just short of flood stage) contributes to the "roughness" of a channel. The effect of this variable is to reduce water velocity and thereby reduce the stream's competence to move substrate particles. The EMAP protocol tallies all woody debris with a diameter greater than 10 cm (~4") into one of 12 size classes based on the length and width of each object. Tallies are conducted in the zone between the main transects.

Thalweg Measurements

A stream's thalweg is a longitudinal profile that connects the deepest points of successive cross-sections of the stream. The thalweg defines the primary path of water flow through the reach. Thalweg measurements perform many functions in the EMAP protocols, producing measurements for the excess sediment calculations (residual pool volume, stream size, channel complexity) and flow habitat variability.

SECTION 9
OPTIONAL PERIPHYTON QUANTIFICATION

Periphyton Quantification

Characterization of periphyton has a dual role in bioassessments, as periphyton is both a food and habitat resource for benthic macroinvertebrates and fish and an effective bioindicator on its own. Quantification of periphytic resources will be covered under a separate SWAMP bioassessment protocol, but will include procedures for qualitative characterization of diatom assemblages, documentation of filamentous algal growth, and biomass quantification (e.g., ash-free dry mass and chlorophyll a).

SECTION 10
QUALITY ASSURANCE & CONTROL PROCEDURES

The SWAMP bioassessment group is currently developing guidelines for quality assurance and quality control for bioassessment procedures. Future revisions to this document will include guidance covering personnel qualifications, training and field audit procedures, procedures for field calibration, procedures for chain of custody documentation, requirements for measurement precision, health and safety warnings, cautions (actions that would result in instrument damage or compromised samples), and interferences (consequences of not following the standard operating procedure, SOP).

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DEFINITIONS OF TERMS USED IN SOP D

Terms & Definitions	
TERM	**DEFINITION**
ABL	California Department of Fish and Game's Aquatic Bioassessment Laboratory
Allocthonous	Derived from a source external to the stream channel (e.g., riparian vegetation) as opposed to autochthonous, which indicates a source inside the stream channel (e.g., periphyton).
Ambient Bioassessment	Biological monitoring that is intended to describe general biotic condition as opposed to a diagnosis of sources of impairment
Bankfull	The bankfull channel is the zone of maximum water inundation in a normal flow year (one to two year flood events)
BMI	Benthic macroinvertebrates: bottom-dwelling invertebrates large enough to be seen with the unaided eye
Cobble Embeddedness	The volume of cobble-sized particles (64-250 mm) that is buried by fine particles (<2.0 mm diameter)
CPOM	Coarse particulate organic matter (CPOM, particles of decaying organic material such as leaves that are greater than 1.0 mm in diameter)
CSBP	California State Bioassessment Procedures
DFG	California Department of Fish and Game
EMAP	The U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program
EPA	The U.S. Environmental Protection Agency
Fines	Substrate particles less than 0.06 mm diameter (not gritty to touch)
Inter-transects	Transects established at points equidistant between the main transects
MCM	Margin-Center-Margin alternative procedure for sampling low gradient habitats
ORD	EPA's Office of Research and Development
QAMP	Quality assurance management plan
RBP	EPA's Rapid Bioassessment Procedures
Reach	A segment of the stream channel
Riparian	An area of land and vegetation adjacent to a stream that has a direct effect on the stream.
RWB	Reach-wide benthos composite sampling method for benthic macroinvertebrates, also referred to as multi-habitat method
SCCWRP	Southern Coastal California Water Research Project
SNARL	Sierra Nevada Aquatic Research Laboratory
Substrate	The composition of a streambed, including both inorganic and organic particles
SWAMP	The State Water Resources Control Board's Surface Water Ambient Monitoring Program
Thalweg	A longitudinal profile that connects the deepest points at successive cross-sections of the stream. The thalweg defines the primary path of water flow through the reach

TERM	DEFINITION
Transects	Lines drawn perpendicular to the path of flow used for standardizing sampling locations
TRC	Targeted riffle composite sampling method for benthic macroinvertebrates
USFS	The United States Forest Service
Wadeable Streams	Streams that can be sampled by field crews wearing chest waders (generally less that 0.5 m - 1.0 meters deep)

APPENDIX A

FACTORS TO CONSIDER WHEN RECOMMENDING/ CHANGING BIOASSESSMENT METHODS

Beyond the primary considerations of precision and accuracy, there are at least five other key issues that SWAMP has considered and should consider in the future, when recommending or changing its official methods for bioassessment. These issues include:

1. Costs of Collecting Samples via Multiple Protocols – Collecting, processing, and interpreting samples using more than one method for each indicator (e.g., algae, macroinvertebrates, fish) per site adds significant costs to bioassessment monitoring programs. SWAMP should strive to identify the minimum set of protocols necessary for each indicator. However, this should not come at the expense of sound monitoring. If more than one method is needed to interpret the biological response, then this decision should be based on a cost-benefit assessment.

2. Costs of Maintaining Multiple SWAMP Protocols – While multiple methods for monitoring a given indicator may provide additional accuracy in specific habitats, there are significant costs to maintaining multiple protocols:

a. Need to maintain method-specific infrastructure (e.g., separate reference samples, separate indices of biotic integrity (IBIs), separate O/E models, etc.).
b. May lose or impair ability to compare across sites if different methods are used (see Issue 5 below).
c. Guidance on when to use methods becomes more complex. For example, we need to define very specifically which methods to use at each water body type; and thus, which tools can be used to interpret them.

Recommendation: *SWAMP should maintain as few protocols as necessary. If we elect to add new or modified protocols it should be because we have determined that the added value is worth all of the costs listed above.*

3. Separating Physical Impairment from Water Quality Impairment – One of the original reasons for adding a multihabitat component to SWAMP bioassessment programs was the potential for distinguishing physical and water quality impairment sources (see recommendations in Barbour and Hill 2002). In regards to macroinvertebrate indicators, the conventional wisdom has been that reachwide (RW, sometimes referred to as multihabitat or MH) samples should be relatively more responsive to physical habitat alteration (i.e., fine sediment inputs) than targeted-riffle (TR) samples because it is believed that erosional habitats take longer

to respond to sediment stresses, and because pockets of riffle habitat are thought to act as refugia from habitat loss. To the extent that this is true, RW and TR samples may offer complementary information that allows us to separate these sources of impairment.

While very few studies have addressed this conventional wisdom directly, recent studies suggest that this may not be as much a factor as previously believed. In a recent comparison of TR and RW samples at nearly 200 sites statewide, the ABL found at most weak evidence to support this notion (Rehn et al. 2007). Gerth and Herlihy (2006) came to the same conclusion in their analysis of ~500 sites in the eastern and western United States. However, this issue is far from resolved and SWAMP scientists currently are not in agreement regarding this issue. Since the majority of bioassessment programs in California have emphasized targeted riffle sampling, SWAMP will undoubtedly want to evaluate this question further before making any policy decision to discontinue TR sampling.

Recommendation: *Until this issue can be evaluated further and resolved to SWAMP's satisfaction, ambient macroinvertebrate sampling should include collection of both RW samples and richest targeted habitat (TR or MCM) samples at every site. (The TR method should be used where sufficient riffles are present, and the MCM method should be used at low-gradient sites where sufficient riffle habitat is not available.)*

4. Compatibility with Previous Data – To address this issue, at least three sets of macroinvertebrate sampling method comparisons have been conducted in California.

a. **Targeted Riffle Methods –** Comparisons are complete. Samples collected under the current TR protocols are considered interchangeable with both CSBP and SNARL samples (Ode et al. 2005, Herbst and Silldorff 2006).
b. **Low Gradient Sand-Dominated Streams –** Collaborative studies are currently underway between Water Board Regions 3 and 5, the Southern California Coastal Water Research Project (SCCWRP), and ABL to compare the performance of: (1) the "low-gradient" CSBP; (2) RW samples; and (3) a modification of the RW method designed to emphasize habitats along stream margins (MCM). The results of these low-gradient methods comparisons are not yet available.
c. **Targeted Riffle vs. Reachwide Methods –** A recent comparison of RW and TR samples collected from nearly 200 EMAP/ CMAP sites is in peer review press (Rehn et al. 2007). Results demonstrate remarkably similar performance of the methods across a wide range of habitats. Gerth and Herlihy (2006) recently published a similar analysis with the same conclusions. However, the bioassessment committee has yet to carefully review and discuss these analyses and their implications for SWAMP biomonitoring.

5. Comparability Among Sites – The ability to compare biological condition across sites is a common requirement of most ambient bioassessment programs. This type of analysis is confounded if different methods are used at these sites. One of the big advantages of reachwide (i.e., multihabitat) methods is that they can be applied anywhere because they don't require a specific habitat for sampling. Statewide

bioassessments and most regional programs will require the ability to compare their bioassessment results among multiple sites (e.g., within a watershed, within a region, statewide).

INTERIM RECOMMENDATIONS FOR MACROINVERTEBRATE SAMPLING (UPDATED DECEMBER 2006):

1. Until we can reach consensus on the outstanding issues (i.e., whether a single method for macroinvertebrate sampling will meet our needs, and the outcome of RW vs. MCM comparison studies for low-gradient wadeable streams/rivers), SWAMP recommends collecting both a reachwide (i.e., multihabitat) and a targeted habitat sample at each site. In high gradient streams, this means using both the RW and TR methods. In low-gradient streams, we recommend collecting both RW and MCM samples until the results are available from the low-gradient ("non-riffle") comparison. In rare cases where monitoring objectives cannot be met following these recommendations, the SWAMP Bioassessment Coordinator may authorize deviations. For example, where project-specific objectives differ from ambient monitoring, the SWAMP Bioassessment Coordinator may authorize alternate methods. In rare cases where funding is extremely limited and the cost of following the above recommendations would be prohibitive, the SWAMP Bioassessment Coordinator may authorize cost-saving options such as collecting both samples, but archiving one of the samples for later lab analysis.

2. SWAMP should develop guidance specifying when and where different methods should be used. For example, at "low gradient" sites, what is the slope cut-off (or other channel feature criteria to use) when deciding whether to apply TR or MCM? In addition, while SWAMP may eventually choose to adopt a single method (such as RW) at most sites, some regions may determine that the value of targeted habitat sampling merits continued sampling with supplemental protocols. In the latter case, or if SWAMP determines that distinct methods are needed for different habitat types, the guidance should specify the types of waterbodies or classes of waterbodies that require different methods.

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SWAMP
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Surface Water Ambient Monitoring Program
Quality Assurance Program Memorandum

(Approved by the Interim SWAMP Coordinator)

To: SWAMP Round Table

From: Beverly H. van Buuren, SWAMP Quality Assurance Officer and
Peter R. Ode, SWAMP Bioassessment Coordinator

Date: May 21, 2007

Re: SWAMP Standard Operating Procedure (SOP) and Interim Guidance on Quality Assurance for SWAMP Bioassessments

The bioassessment section of the current *SWAMP Quality Assurance Management Plan* (SWAMP QAMP, 2002) is significantly outdated. The SWAMP Quality Assurance Officer and SWAMP Bioassessment Coordinator are currently developing the framework for a comprehensive SWAMP Bioassessment QA Oversight Program that will specify quality assurance requirements for the many components of bioassessment and physical habitat procedures. Until that program is in place, this memo serves as interim guidance defining quality assurance requirements for several key elements of SWAMP's Bioassessment Program. All SWAMP-funded bioassessment projects are subject to the requirements listed in this memo, which are effective May 21, 2007.

If you have any questions regarding this guidance, please contact the SWAMP QA Officer, Beverly H. van Buuren at (206) 297-1378, or via email at bvanbuuren@mlml.calstate.edu or the SWAMP Bioassessment Coordinator, Peter Ode, at (916) 358-0316, or via email at pode@ospr.dfg.ca.gov.

New Field Protocols

All SWAMP-funded bioassessment studies shall follow the new field protocols (February 2007). The new field protocols were developed after completion of two method comparison studies (Ode et al. 2005, Herbst and Silldorff 2006), and received independent peer review by experts in the fields of bioassessment and habitat assessment.

The standard operating procedure (SOP), *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California,* was finalized and released in February 2007. An announcement of the document's availability was distributed by SWAMP's lyris list-serve in April of 2007. The SOP stipulates official procedures for the collection of bioassessment samples and associated physical habitat data. It outlines the process for sampling benthic macroinvertebrate assemblages and describes a suite of measures for sampling associated physical habitat and chemical conditions. The document is available for download on the SWAMP website (www.waterboards.ca.gov/swamp/reports.html).

Macroinvertebrate Sample Collection

All SWAMP-funded bioassessments shall follow the implementation guidance on Page 4 of the February 2007 field protocols to collect two samples (i.e., targeted-riffle composite and

reachwide benthos composite) under most circumstances.[1] SWAMP's bioassessment program was first peer-reviewed from 2001 to 2003. The final peer review report (January 2003) is on the SWAMP website at: http://www.swrcb.ca.gov/swamp/biocalstreams.html. The peer reviewers recommended that targeted riffle samples continue to be collected and that a multihabitat feature also be added to the Water Boards' bioassessment program unless and until sufficient data are available to justify collecting only one sample. This interim guidance to collect two samples was: (1) vetted through the SWAMP Bioassessment Committee in 2003-04; (2) approved via consensus at the full SWAMP Roundtable meeting in January 2005; and (3) included (on Page 4) of the new protocols in February 2007. While much new data is available, there is not yet consensus in the scientific community to support a decision to drop one of these samples. Therefore, this guidance shall remain in effect until the program makes a considered decision to change it.

Site Replication

All SWAMP-funded bioassessments shall include 10% site replication. SWAMP's bioassessment program was first peer-reviewed from 2001 to 2003. The final peer review report (January 2003) is on the SWAMP website at: http://www.swrcb.ca.gov/swamp/biocalstreams.html. The peer reviewers (Section 5.2, Page 47) concluded: *"We recommend that replication be continued in California bioassessments for the purpose of precision estimates…At a minimum, 10% of collections should be replicated."* The SWAMP Bioassessment Committee decided via consensus to incorporate this requirement into all quality assurance project plans (QAPPs) for SWAMP bioassessments (memorialized in a February 3, 2004 memorandum from Tom Suk, Chair, SWAMP Bioassessment Committee, to Dr. Valerie Connor, SWAMP Program Coordinator), and this requirement was discussed and approved at the full SWAMP Roundtable meetings in December 2004 and January 2005. Specifically, at 10% of sites, both the targeted-riffle composite and multihabitat methods shall be replicated to allow ongoing precision estimates over time.

Standard Taxonomic Effort

To ensure standardized reporting and to facilitate data comparability, all SWAMP-funded bioassessments are required to participate in the Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) and utilize the SAFIT Level II taxonomic effort (STE), unless the SWAMP Bioassessment Coordinator concurs in writing that deviation is necessary to meet program and project objectives. SAFIT defines two standard levels of taxonomic effort for benthic macroinvertebrates. Level I generally specifies genus level identification for most insects (with midges to subfamily), whereas Level II specifies more precise taxonomic effort (generally species level ID where possible, with midges to genus). Requirement of Level II taxonomic effort has been discussed at several SWAMP Bioassessment Committee and full SWAMP Roundtable meetings. While there has been general agreement, this agreement has not previously been memorialized. The SWAMP Bioassessment Committee Chair (Tom Suk) and SWAMP Bioassessment Coordinator (Peter Ode) strongly recommend that this be a program requirement. Effective immediately, SAFIT Level II shall be the standard taxonomic effort for SWAMP, with exceptions granted as noted above. The SAFIT STE List can be found at the State Water Board's website: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf

[1] There are two exceptions to this requirement: First, it is acknowledged that riffle habitats do not exist in some low-gradient streams. Where sufficient riffle habitat does not exist to allow collection using the targeted-riffle composite (TRC) method, the TRC sample need not be collected. At such sites, the TRC sample may (but does not have to) be replaced with a Margin-Center-Margin sample, at the discretion of the project. Second, both samples shall be collected in all situations except as noted in the preceding sentence unless the SWAMP Bioassessment Coordinator (currently Peter Ode) documents in writing that deviation is necessary to meet program and project objectives.

External Taxonomic Quality Assurance Analyses

Effective immediately, all SWAMP-funded bioassessments shall include reidentification of a minimum of 10% of samples by an external quality assurance (QA) laboratory.[2],[3] All taxonomic samples subject to QA analysis must be archived with a minimum of one vial per final ID. Final ID vials must contain a taxonomic label and a date/locality label that includes the 9-character SWAMP site code). The originating laboratory shall provide the QA laboratory with a list of all samples collected for SWAMP, with the name of the taxonomist(s) who performed the organism identifications for each sample. The QA laboratory shall then select 10% of samples to be transported for QA analysis, making sure to evaluate samples from each taxonomist at the originating laboratory.[4],[5] Further, the SWAMP QA Officer must approve the QA laboratory to be used for these checks. Deviations from this guidance may be approved with concurrence of the SWAMP Bioassessment Coordinator and the SWAMP QA Officer. This interim guidance is needed to ensure consistent application of QA practices, and to ensure that all laboratories performing taxonomic identifications for SWAMP are doing so to professional standards.

Index Period

All SWAMP-funded bioassessments shall include sampling during the most appropriate index period (i.e., time of year that samples are collected)..This interim guidance is needed to ensure data comparability by requiring that samples are collected during standardized index periods. Since the appropriate index period varies at different latitudes and elevations (southern latitudes are generally sampled in late spring and northern latitude sites are generally sampled in late summer), this guidance will vary with the project boundaries. If any disputes arise, the SWAMP Bioassessment Coordinator shall determine the most applicable index period for a given project.

Other Laboratory Methods

The minimum organism fixed-count per sample shall be 600. Subsampling shall be performed using the grid-tray method described in the California Stream Bioassessment Procedures (Harrington 2003, http://www.dfg.ca.gov/cabw/csbp_2003.pdf) or an alternative method accepted as equivalent by the SWAMP Bioassessment Coordinator after completion of performance-based methods comparison(s). These subsampling standards are necessary to foster data comparability and the minimum sample count ensures large enough sample size to use current biological assessment tools.

Physical Habitat Measurements

SWAMP-funded bioassessments shall include the "Full" suite of physical habitat measurements detailed in the February 2007 protocols cited above, unless the SWAMP Bioassessment Coordinator determines in writing that the "Full" suite of habitat measurements is not needed for a specific project in order to achieve project and program goals. The "Full" suite of habitat measurements is necessary in most cases to characterize habitat conditions and facilitate interpretation of the biological data at a level that will allow SWAMP to build effective tools for bioassessment and biocriteria. The application of consistent methods by all projects is also needed to foster data comparability.

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[2] If an applicable QAPP requires a higher percentage, the higher amount shall be used.
[3] Funding for this requirement is the responsibility of the project, not the analytical laboratory.
[4] "Sample" in this context means all identified taxa from a single method by location (i.e., "site" x "sample event" x "method").
[5] Specific requirements for corrective action will be addressed in the forthcoming Bioassessment QA Oversight Plan

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Surface Water Ambient Monitoring Program
Quality Assurance Program Memorandum

(Approved by the Interim SWAMP Coordinator)

To: SWAMP Round Table

From: Beverly H. van Buuren, SWAMP Quality Assurance Officer and
Peter R. Ode, SWAMP Bioassessment Lead Scientist

Date: September 17, 2008

Re: Ammendment to SWAMP Interim Guidance on Quality Assurance for SWAMP Bioassessments

On May 21, 2007, the SWAMP Quality Assurance (QA) Officer and SWAMP Bioassessment Coordinator issued interim guidance for all SWAMP-funded bioassessment projects defining QA requirements for several key elements of SWAMP's Bioassessment Program. This memorandum, effective September 17, 2008, amends the May 2007 document with updated guidance on macroinvertebrate sample collection.

If you have any questions regarding this guidance, please contact the SWAMP QA Officer, Beverly H. van Buuren at (206) 297-1378, or via email at bvanbuuren@mlml.calstate.edu or the SWAMP Bioassessment Lead Scientist, Peter Ode, at (916) 358-0316, or via email at pode@ospr.dfg.ca.gov.

Macroinvertebrate Sample Collection

The previous SWAMP policy (Ode 2007, http://www.swrcb.ca.gov/swamp/biocalstreams.html) was to collect two field methods under most circumstances: a targeted habitat method ("targeted riffle composite", or TRC) and a systematic representation of multiple habitats in a reach ("reachwide benthos", or RWB). Recent published and unpublished analyses (Gerth and Herlihy 2007, Rehn et al. 2007, Mazor et al. 2008) provide evidence that RWB and TRC methods can produce generally comparable results across a broad range of settings within California. Based on these analyses, SWAMP is now adopting a single field method in MOST streams statewide. However, because the comparability data are equivocal in some settings, SWAMP policy includes two specific exceptions.

SWAMP-funded bioassessments shall adhere to the following guidelines:

1. In most regions of the state (see exceptions listed in 2 and 3 below), SWAMP funded programs shall collect bioassessment samples using the RWB method (sometimes referred to as multi-habitat or MH).

2. SWAMP programs shall continue to collect both TRC and RWB samples in environmental settings where method comparability results are equivocal. While SWAMP will define specific criteria for these settings in a future guidance memo, the current interim policy is to collect both methods at high elevation pool-dominated streams (>2000 m elevation, >80% pool reaches, boulder cascades).

3. SWAMP programs shall employ a modified version of the RWB in large, low-gradient streams dominated by sandy bottoms (e.g., low gradient coastal streams, large Central Valley streams). The modification is to collect subsamples at 0%, 50%, and 100% of stream width instead of 25%, 50%, and 75% of stream width) to ensure collection of marginal habitats.

4. SWAMP programs may choose (at their discretion) to continue to collect a second method at any site where additional sampling data is likely to produce complementary information.

The SWAMP Bioassessment Program will establish a Technical Advisory Committee (TAC) to provide additional guidance on the following topics:

1. *Refined criteria for defining when the exceptions described in 2 and 3 above should be applied*
2. *Analytical considerations for combining RWB and TRC datasets or applying data collected with one method to an indicator (e.g., index of biotic integrity (IBI) or observed/expected (O/E) model) derived from another method*

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SWAMP
Surface Water Ambient Monitoring Program

SCCWRP Established 1969

Technical Report	2008

Incorporating Bioassessment Using Freshwater Algae into California's Surface Water Ambient Monitoring Program (SWAMP)

May 2008

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Water Boards

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Incorporating Bioassessment Using Freshwater Algae into California's Surface Water Ambient Monitoring Program (SWAMP)

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Technical Report 563

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LIST OF ACRONYMS

ABL	Aquatic Bioassessment Laboratory
AFDM	Ash-free Dry Mass
ALU	Aquatic Life Uses
BMI	Benthic Macroinvertebrate
CMAP	California Monitoring and Assessment Program
CRAM	California Rapid Assessment Method
CS	Coastal Southern part of the State (currently developing algae indices)
CWAM	California Watershed Assessment Manual
DO	Dissolved Oxygen
EMAP	Environmental Monitoring and Assessment Program
EU	European Union
HABs	Harmful Algal Blooms
IBI	Index of Biotic Integrity
LR	Lahontan Region (where a preliminary algal index has been developed)
MLOEs	Multiple Lines of Evidence
NAEMP	National Aquatic Ecosystem Monitoring Program (South Africa)
NAWQA	National Water Quality Assessment Program
NNE	Nutrient Numeric Endpoint
NPDES	National Pollutant Discharge Elimination System
O/E	Observed/Expected
PHab	Physical Habitat
PSA	Perennial Stream Assessment
QAPP	Quality Assurance Project Plan
RCMP	Reference Condition Management Program
RIVPACS	River Invertebrate Prediction and Classification System
RWQCB	Regional Water Quality Control Board
SAFIT	Southwest Association of Freshwater Invertebrate Taxonomists
SCCWRP	Southern California Coastal Water Research Project
SEM	Scanning Electron Microscope/Microscopy
SMC	Stormwater Monitoring Coalition
SNARL	Sierra Nevada Aquatic Research Laboratory
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WFD	Water Framework Directive (European Union)

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EXECUTIVE SUMMARY

This document was written to assist California's State Water Resources Control Board (SWRCB) with incorporating algae into the bioassessment toolbox of the Surface Water Ambient Monitoring Program (SWAMP). It represents a consensus among members of a Technical Advisory Committee (TAC) regarding the best next steps toward implementation of algal bioassessment in the State. Recommendations were based on a combination of 1) information gathered from an extensive literature review, 2) a survey of algal bioassessment efforts that have occurred in parts of California and of programs in other states and countries, and 3) the best professional judgment of TAC members.

We recommend that the State include algae as a component of SWAMP monitoring, in terms of both algal biomass and taxonomic composition of algal assemblages, the latter of which can be used in Indices of Biotic Integrity (IBIs). Algae will provide information beyond that which is currently obtainable through bioassessment with benthic macroinvertebrates (BMIs) alone. The following are some of the advantages to including algae in SWAMP monitoring:

- Addition of an algal component to SWAMP bioassessment (in which BMIs are currently the sole bioindicator) will satisfy the United States Environmental Protection Agency (USEPA) recommendation to utilize multiple bioindicators, and will facilitate the "weight-of-evidence" approach to interpretation of biomonitoring results. This approach involves interpreting data from multiple sources to arrive at conclusions about an environmental system or stressor. Multiple lines of evidence (MLOEs) utilizing more than one bioindicator are valuable in corroborating critical levels of stress to stream biota.
- As primary producers, algae are the most directly responsive of the common bioindicators to nutrients, and can be very valuable for assessing nutrient impairment. Furthermore, incorporation of benthic algal biomass data into SWAMP biomonitoring will have the added benefit of supporting ongoing development and implementation of the California Nutrient Numeric Endpoints (NNE) framework, of which algal biomass is a key component.
- Algal assemblages are useful not only for detection of impairment, but can also be valuable for diagnosing the cause(s) of many types of impairment, such as heavy-metal contamination, organic enrichment, or siltation.
- Algae can colonize virtually any stream substratum, thus algal assemblages can be monitored throughout the diverse range of stream types found in California.
- Algal taxa tend to have high dispersal rates, growth rates, and relatively short generation times (on the order of days, for many taxa), thereby allowing rapid response to changes in their environment. Consequently they can provide a temporal window for assessment that is complementary to (shorter than) that for other common bioindicators, and may be valuable for application in streams with short flow durations (*i.e.*, intermittent streams and some ephemeral streams).

The status of the science behind algal bioassessment is mature enough that initial implementation can occur immediately. It is recommended that integration of algae into SWAMP monitoring occur *via* a phased approach, adding layers of complexity to the program over time. Algae have already been incorporated into a number of bioassessment efforts throughout the State,

demonstrating that a user group exists for this bioindicator. However, these efforts have been largely localized and not coordinated. A coordinated statewide program would provide for a more structured and standardized approach to algal bioassessment.

California's program can take advantage of the infrastructure already in place from BMI indicator development and implementation, including: databases, methods standardization and field protocols, taxonomic standardization, and quality assurance procedures and standards. As such, California is poised to leverage these investments and move quickly toward a statewide algal bioassessment program. California can also benefit from the lessons learned and resources created by the many other states and countries that have developed tools and approaches for algal bioassessment.

The TAC has articulated a number of principles to guide California as it proceeds with work toward statewide algal bioassessment, including:

- Develop algae primarily as a bioindicator for aquatic life use assessment, with other beneficial use types (such as those relating to algal nuisance, including recreational use and aesthetics) as secondary, albeit not mutually exclusive, drivers.
- Prioritize wadeable, perennial streams, and progress next to nonperennial systems.
- Coordinate with other SWAMP bioassessment components, as well as with other monitoring and assessment programs around the State, whenever possible.
- Ensure that the algal indicator tools developed are applicable throughout the State.

Algal IBI development has already occurred in the Lahontan region, and is underway in coastal southern California and central California. Sampling of algae has occurred through programs such as the California Monitoring and Assessment Program (CMAP), the USEPA Environmental Monitoring and Assessment Program (EMAP), and the US Geological Survey (USGS) National Water Quality Assessment Program (NAWQA). Because considerable progress has been made in California in terms of foundational work toward algal bioassessment, the next steps for building a statewide program can begin immediately. High-priority, near-term recommendations include the following:

- Develop standard field and laboratory protocols for algae sampling, identification, and quantification
- Establish data-quality assurance measures including:
  - Formation of a workgroup for taxonomic harmonization of stream algae in the southwest (analogous to the Southwest Association of Freshwater Invertebrate Taxonomists; SAFIT)
  - Augmentation of the SWAMP database and bioassessment field forms to accommodate algal data
- Sample algae in conjunction with SWAMP and Perennial Stream Assessment (PSA) monitoring, starting this year (2008), including the following indicators:
  - Diatom and soft-bodied algal assemblages
  - Biomass based on chlorophyll-*a* and ash-free dry mass (AFDM)
  - Algal percent cover

These augments to standard SWAMP bioassessment (*i.e.*, BMI) procedures can be incorporated through a moderate increase in effort in the field, a limited amount of additional training to field crews and the addition of laboratory analyses for algal biomass. If necessary (*i.e.*, due to funding constraints or insufficient taxonomic expertise), diatom assemblage samples can be archived for laboratory work at a later date. Furthermore, initial investments in the applied research needed to develop statewide programmatic infrastructure and tools can be leveraged by testing existing and soon-to-be-developed algal IBIs on the new regional datasets generated through SWAMP and PSA monitoring, and assessing the need for additional work on IBI development thereby.

The TAC has identified a need to resolve some technical issues for incorporation of algal bioassessment into SWAMP. One of the highest-priority decisions to be made by the Roundtable is the determination of which sampling protocol(s) to use throughout the State. As with BMIs, there are two general approaches to collecting quantitative algal samples: 1) **targeted sampling**, in which a specific type of substratum is sampled (*e.g.*, scrapings are taken from cobbles) and 2) **multihabitat/reachwide sampling**, in which substrata are selected objectively, in proportion to their relative abundances within the stream reach. Each approach has its *pros* and *cons*. For the present, the TAC recommends that SWAMP/PSA utilize the multihabitat/reachwide approach for sample collection due to its versatility and anticipated applicability to a variety stream types regardless of dominant substrate. However, SWAMP should fund a methods-calibration study whereby targeted and reachwide methods are compared side-by-side in a set streams in the Lahontan Region, where a preliminary algal IBI was developed using material collected via targeted sampling from cobbles. This will facilitate an assessment of whether, and how, datasets derived from samples collected in different ways can be integrated. This is a high-priority study that should be conducted in the next year.

In addition to sampling approach, there is also some disagreement among practitioners about the degree to which soft-bodied algae provide information beyond that provided by diatom data, and about the value of the various measures of algal biomass. SWAMP should use results from the first cycles of PSA and SWAMP algal monitoring, along with data from the Lahontan Region and from the coastal southern California and central California IBI development projects currently underway, to evaluate the cost/benefit of continuing to monitor all of these indicators.

INTRODUCTION AND PROBLEM STATEMENT

Algae-based stream bioassessment programs involve either an analysis of algal biomass, an assessment of algal taxonomic composition, or both. Biomass assessment of can be relatively inexpensive, and can provide insights into issues such as nuisance algal growth, eutrophication, and effects on beneficial uses. Assessment of algal assemblage is a more involved and costly process, in terms of both tool development and implementation. However, this information can also serve a much broader range of water-quality monitoring needs than can be addressed by biomass measurements alone. Algal taxonomic information, which is necessary for development and utilization of an Index of Biotic Integrity (IBI), can indicate many aspects of water quality, including "general pollution," trophic status, organic enrichment, heavy-metal pollution, salinity, dissolved oxygen (DO), pH, and sedimentation (Stevenson 1996). It can also be used to directly assess aquatic life beneficial uses (ALUs), aid in the development of endpoints for Total Maximum Daily Loads (TMDLs), assist the State in evaluating the adequacy of permit requirements, and provide tools for evaluating the success of restoration efforts.

In the course of generating this study's recommendations for algal bioassessment in California, literature was reviewed and programs of other states and countries, as well as efforts conducted in California, were surveyed. The investigation revealed that many precedents exist for the effective utilization of algal assemblages in stream monitoring (Prygiel and Coste 1993, Pan *et al*. 1996, Hill *et al*. 2003, Berkman and Porter 2004, Ponander and Charles 2004, Wang *et al*. 2005), and in general, algal taxonomic information is widely accepted as a powerful assessment tool, especially when combined with other bioindicators such as benthic macroinvertebrates (BMIs) and/or fish.

Different biological assemblages used in monitoring have been shown to exhibit complementary responses to stress. As such, the use of multiple bioindicators in stream assessment is of great value for understanding the causes of impairment (Sonneman *et al*. 2001, Fore 2003, Griffith *et al*. 2005, Feio *et al*. 2007). Whereas fish tend to be most sensitive to hydrological stress (Bain *et al*. 1988, Moyle and Randall 1998, Moyle and Marchetti 1999), BMIs exhibit sensitivity to, stream physical habitat characteristics, aspects of water-quality, and hydrology. Alternatively, algae tend to be most sensitive to specific water-chemistry parameters (Sonneman *et al*. 2001, Burton *et al*. 2005, Hering *et al*. 2006, Newall *et al*. 2006, Feio *et al*. 2007). From the standpoint of selecting a second bioindicator to complement BMIs in California, there are many challenges to using fish for statewide monitoring (Moyle and Marchetti 1999), such as low native species diversity, high endemism, barriers to (re)colonization, prevalence of non-native/invasive species, and a high occurrence of ephemeral streams in parts of the State. Algae are not subject to these kinds of constraints and would be highly amenable to broad application throughout the State.

A survey of bioassessment programs in other states and countries was conducted in the course of preparing the recommendations in this document. The survey indicated that California is behind several other parts of the world in terms of algal bioindicator development and implementation; however, the State has taken several important steps through a number of monitoring, research, and development projects. The State Water Resources Control Board (SWRCB) has long recognized algae as an important indicator; this assemblage has been sampled for eight years through the California Monitoring and Assessment Program (CMAP; Ode and Rehn 2005) and

the data generated through this effort are ripe for analysis. Herbst and Blinn (2007) recently produced a preliminary IBI for the eastern Sierra Nevada using stream algae, and two projects with the goal of developing draft algal IBIs for use in coastal watersheds in the southern half of California were initiated in 2007. Many other, more localized studies and monitoring efforts in the State have also included algal components, particularly with respect to nutrient and/or algal TMDL studies. In addition to these monitoring efforts, guidance for watershed assessment that includes the use of algae has been prepared for use in California (Shilling 2005), as has a framework for the development of Nutrient Numeric Endpoints (NNEs), with algal biomass as a key indicator (Tetra Tech 2006.)

While the various algae-related projects undertaken to date in California represent a substantial amount of effort and progress, they are mostly regional or *ad hoc* in nature. There is no coordinated statewide program for algal bioassessment nor has there been sufficient investment in developing the full infrastructure needed for adding algae to SWAMP monitoring. This lack of coordination and funding persists despite clear indications of strong regional and statewide interest in adding this bioindicator to the State's toolbox. For example several Regional Water Quality Control Boards (RWQCBs; notably Regions 2, 6, and 9) have expressed a desire to pursue algal-assemblage based bioassessments. The current fragmented approach to algal bioassessment in California precludes statewide assessments, makes data comparability difficult or impossible, and requires repetition and reinvention during data analysis for each project. A coordinated statewide program would ameliorate these problems.

OBJECTIVES AND GUIDING PRINCIPLES

This document was written for the primary purpose of assisting California's SWRCB with incorporation of algae into the bioassessment toolbox being developed by SWAMP. The recommendations presented are the result of three meetings of a Technical Advisory Committee (TAC). The TAC consists of staff members from the SWRCB, various RWQCBs, other agency personnel from within and outside of California, and scientists with expertise in bioindicator development, phycology, and nutrient cycling. We intend for this document to provide SWAMP with information to support implementation of algae-based bioassessment in conjunction with other bioassessment activities, such as benthic macroinvertebrate (BMI) monitoring and collection of physical habitat (PHab) and water-chemistry data. Continued investment in the development of recommendations for the use of algae in statewide bioassessment is anticipated, and as such, there may be additions to what is presented here.

This report begins with a discussion of stream algae and its utility as a bioindicator for water-quality monitoring. It provides an overview of what has been done in some other states and countries, and in parts of California, and provides lessons learned that are of value for the statewide planning process. The document then examines methodology and uses of algae in bioassessment and discusses major decision points that will need to be addressed in the process of implementing algae as a bioindicator in statewide monitoring. Recommendations for specific actions are then provided. As guiding principles, actions recommended by the TAC had to be:

- Feasible and cost-effective
- Relatively straightforward to integrate into existing SWAMP bioassessment practices by leveraging existing infrastructure to the greatest extent possible
- Supported by the literature as something that adds analytical value to monitoring efforts
- Able to serve an immediate regulatory and/or management need, or to provide information that can further aid the development of recommendations

Identifying the primary goal of incorporating algae into monitoring efforts is important. This ensures that the tools developed are most appropriate to the priority tasks at hand. It is recommended that SWAMP prioritize the ongoing support, development, and implementation of algae-based tools geared toward assessing aquatic life uses (ALUs), as this is a primary interest for the State, and algal communities are well suited to this application. However, while it is useful to keep this goal in mind, it should also be noted that focusing on ALUs is not necessarily at odds with the development of algal bioassessment tools that are simultaneously applicable to other beneficial uses. For instance, algae can be a factor impacting recreation (contact and noncontact) uses. The presence of nuisance algae can alter water-chemistry parameters, such as DO and pH (Rankin *et al*. 1999), as well as contribute to production of algal toxins (Codd 2000), and all of these factors can adversely affect aesthetics as well as stream biota, and thus ALUs (Biggs 2000, Lembi 2003).

On a related note, work toward the development of algal bioassessment tools could also yield information and methodology applicable to the implementation of the California NNE framework (Tetra Tech 2006). Sample collection methods can allow for determination of algal assemblage information for the assessment of water quality and stream health, as well as algal

biomass. The latter is a direct indicator of nuisance algal problems and impacts to aesthetic beneficial uses. It is also a key NNE indicator.

ALGAL ASSEMBLAGES AS BIOINDICATORS

Definition of Algae

Bioassessment programs using benthic algae often refer to this community as "periphyton" (Biggs and Kilroy 2000, Moulton *et al*. 2002, Ponander and Charles 2004, Peck *et al*. 2006). For the purposes of TAC recommendations, this term is not used for several reasons. First, there are many definitions of the term "periphyton," which can lead to confusion (Wehr and Sheath 2003). One of the more encompassing is that of a matrix, or biofilm, consisting of all the microscopic algae, bacteria, and fungi on (or associated with) substrata (Stevenson 1996). Despite this, many bioassessment efforts using periphyton examine only the algal (though sometimes also cyanobacterial) component of this biofilm. Furthermore, in some cases, "periphyton" also includes vascular plants (Shilling 2005), as they are also primary producers and can serve as valuable components of monitoring efforts (Tremp and Kohler 1995, WFD 2003, Hering *et al*. 2006, Vis *et al.* 2007).

The lack of a consensus as to the practical meaning of "periphyton" is not the only problem associated with use of this term. Another consideration is that periphyton, as typically defined, is interpreted as strictly benthic. It therefore includes only what is attached to stream substrata at the time of assessment. This distinction is useful to juxtapose it with planktonic forms in the water column, but can become problematic when unattached floating macroalgal mats are present within a reach. Because such mats are generally benthic in origin (Biggs 2000, Lembi 2003, Wehr and Sheath 2003), they may justifiably be considered components of the benthic community. Floating algal mats also have the capacity to influence beneficial uses (Biggs 2000, Lembi 2003, Tetra Tech 2007), and as such, they should be included in monitoring efforts. For all these reasons, this report uses the term "algae" rather than "periphyton" in discussing recommendations for SWAMP bioassessment.

As a matter of convenience, references to "soft-bodied algae" will henceforth include cyanobacteria, even though this is not a phylogenetically supported association. Cyanobacteria, although photosynthetic and historically called "blue-green algae," are prokaryotic, and not actual algae (van den Hoek *et al*. 1995). Despite the fact that this is not a natural grouping, cyanobacteria are often identified and quantified in bioassessment efforts that include soft-bodied algae (Hill *et al.* 2000, Leland and Porter 2000, Leland *et al*., 2001, Burton *et al*. 2005, Parikh *et al*. 2006, Porter *et al.* 2008, Vis *et al*. 2008), as both sample collection and laboratory work can be conducted simultaneously for the two groups. In general, cyanobacteria are of interest as bioindicators because of nitrogen-fixing capability within certain genera (Wehr and Sheath 2003), the availability of autecological[1] information for various taxa (Leland and Porter 2000, Potapova 2005, Porter *et al*. 2008), involvement of cyanobacteria (including benthic forms) in harmful algal blooms (HABs; Baker *et al*. 2001, Izaguirre *et al*. 2007), and contribution of cyanobacteria to water taste and/or odor problems (Watson and Ridal 2004; reviewed by Jüttner and Watson 2007). The New Zealand Stream Periphyton Monitoring Manual espouses this inclusivity based on the unifying attributes of stream algae and cyanobacteria as "chlorophyll-*a* containing organisms occurring in mixed communities in aquatic habitats" (Biggs

[1] Refers to the ecological conditions under which the taxon in question is known to occur. This type of information is useful for bioassessment applications.

and Kilroy 2000). For the purposes of TAC recommendations, the term "algae" will therefore include benthic diatoms and soft-bodied algae, as well as unattached, floating macroalgae and any associated epiphytic[2] diatoms (Kingston 2003).

Benefits of Algae-based Bioassessment

Bioassessment plays an important role in the measurement of stream health and water quality. The appeal of bioassessment comes from its ability to directly measure the effects of anthropogenic disturbances on biota (Karr 2006), an important factor for understanding connections between effects and beneficial uses. Organisms respond to single and multiple stressors; these responses can be interpreted as the result of singular or cumulative effects over some period of time. Thus, biota can be useful integrators of complex interactions over time and/or among stressors (Cairns *et al*. 1993). Finally, biotic assemblages may be sensitive to varying levels of stress, such as concentrations of certain water-chemistry constituents (Sonneman *et al*. 2001) that are too low to be detected by conventional instruments and methods, or to stressors that may not be anticipated and would otherwise go unmeasured.

A number of biotic assemblages, such as fish, BMIs, algae, and macrophytes, have been employed for bioassessment purposes. They can vary widely in terms of the roles they play in the food web, their habitat niches, body sizes, life spans, motility, and home ranges/migratory behavior. Theses factors influence their practicality and utility for different monitoring applications, and the temporal scales at which they provide a signal. As such, consideration of these factors should form the basis of selection of bioindicators to develop and utilize, depending on the regional bioassessment needs.

Planning of monitoring efforts and interpretation of monitoring data should also take into consideration the complex interactions that occur not only between the bioindicators and their physical and chemical environments, but also the way they interact with other biotic assemblages. For instance, excessive algal growth can result in hypoxia (Rankin *et al*. 1999), which can alter community composition of aquatic fauna and even result in phenomena such as "fish kills" (Biggs 2000, Lembi 2003). Alternatively, moderate increases in algal biomass in response to slightly elevated nutrient concentrations in a given reach may actually have a positive effect. For example, an algae study in the San Gabriel River (Tetra Tech 2007) found that in concrete channels, intermediate (as opposed to the lowest) values of algal percent cover were associated with the highest average BMI scores. Thus, although scores overall in concrete channels tend to be lower than in natural habitats, the presence of algae in concrete channels can have a positive effect on BMI scores, to a certain degree. The better complex interactions such as these can be characterized, the easier interpretation of bioassessment results becomes. For these reasons, TAC recommendations address assessment of algal communities within the context of other abiotic and biotic factors, rather than in isolation.

[2] Referring to "plants" that grow on other plants.

There are several arguments for adding algae to California's bioassessment toolkit.

Algae would provide a valuable second bioindicator to corroborate BMI findings

Currently, in California, BMIs are the only bioindicator developed for statewide use (Ode *et al*., 2005). The drawback of using a single bioindicator for water-quality assessment is that no indicator is expected to be responsive to all possible types of stressors (Hering *et al.* 2006) and across all different stream types and temporal scales (Johnson and Hering 2004). Furthermore, even in healthy streams, a given bioindicator may sometimes not perform well for reasons not necessarily resulting from anthropogenic impacts. It is therefore desirable to have additional tools to provide data capable of corroborating critical thresholds of stress on the biota (Fore 2003).

The USEPA recommends the use of multiple assemblages for bioassessment (Barbour and Karr 1996), and an additional bioindicator to complement BMIs for use in California would provide for a weight-of-evidence approach. The weight-of-evidence approach involves utilizing data from multiple sources to arrive at conclusions about an environmental system or stressor (Linthurst *et al*. 2000, Burton *et al*. 2002, Smith *et al*. 2002). Several other states and countries successfully apply weight-of-evidence in their own programs, by conducting bioassessment using algae in conjunction with BMIs, and sometimes also fish and/or macrophytes (Appendices A and B). Numerous studies that have examined responsiveness of various assemblages, such as fish, BMIs and/or algae to anthropogenic stress have shown that different communities can have different sensitivities and therefore can provide complementary information for more powerful assessments (Fore 2003, Griffith *et al*. 2005, Feio *et al*. 2007).

Algae have the potential to colonize any stream substratum

Any surface within the streambed can potentially serve as a substratum supporting the growth of algae; as such, algal communities as bioindicators have applicability within the wide range of stream types with different dominant (or exclusive) habitats (Wehr and Sheath 2003). This is important because of the great diversity in California streams in terms of substrata (*e.g*., sandy-bottomed *vs*. cobble-rich *vs*. concrete channels, *etc*.) As a corollary to this, algae can provide a signal of response to water-chemistry parameters above background variation attributable to streambed physical characteristics (Soininen and Könönen 2004, Feio *et al*. 2007).

Algal communities tend to respond relatively quickly to changes in their environment

Algal taxa tend to have high dispersal and growth rates and relatively short generation times, which can be on the order of days for some taxa (Rott 1991, Lowe and Pan 1996, Hill *et al*. 2000, USEPA 2002). This affords algal assemblages rapid response to changes in their environment (Stevenson and Pan 1999, Rimet *et al*. 2005, Lavoie *et al.* 2008). Because algae tend to develop more rapidly than other aquatic assemblages typically employed for bioassessment (Stevenson and Smol 2003), such as vascular vegetation, BMIs, and fish, algae provide a temporal window for assessment that is complementary to (*i.e*., shorter than) that for the other assemblages (Johnson and Hering 2004). They can provide a particularly rapid means of detecting impacts to water quality, as well as a rapid indicator for stream recovery. However, it should be noted that a potential disadvantage of rapid response is increased sensitivity of algal assemblages to the timing of sampling.

Use of algae may also facilitate the expansion of bioassessment capability to include more ephemeral reaches that might not be appropriate for assessment using other bioindicators, because many algal taxa possess features allowing their survival in dry conditions (Davis 1972, Coleman 1983, Wehr and Sheath 2003). Desiccation-tolerant cells (which can persist in dry sediment or biofilms) as well as cells dispersed by wind may contribute to rapid reestablishment of algal communities upon inundation of seasonally dry reaches (Peterson 1996, Robson 2000, Robson and Matthews 2004).

Algal assemblages could be useful for assessing nutrient impairment and quantifying algal nuisance

Out of 14 pollutant categories, nutrients rank as the fourth most common cause for impairment of California streams, and are therefore a high-priority water-quality concern, both at the State and federal levels. Nutrients can limit algal growth (reviewed by Borchardt 1996), as can degree of sun exposure (Hill 1996). Other ambient factors can also influence stream algal communities, such as herbivory (Steinman 1996), flow velocity (Poff *et al*. 1990) and time of accrual (Jowett and Biggs 1997). While the interplay of all these factors can be complex, and nutrient-algal relationships cannot always be discerned, many studies have detected relationships both in terms of algal biomass (Dodds *et al*. 2002, Berkman and Porter 2004, Busse *et al*. 2006), as well as algal assemblage (Pan and Lowe 1994, Winter and Duthie 2000b, Ponander and Charles 2004, Potapova and Charles 2007, Lavoie *et al*. 2008, Vis *et al*. 2008).

Investigators who have compared biotic assemblages in light of their nutrient relationships have found algae, primary producers, to be the most responsive (Sonneman *et al*. 2001, Hering *et al.* 2006). Various indices have been developed that classify diatom taxa with respect to trophic status of the streams they tend to inhabit (van Dam *et al.* 1994, Kelly and Whitton 1995). Some taxa, such as many cyanobacterial species, and diatoms that harbor cyanobacterial endosymbionts (Lowe 2003), can fix atmospheric nitrogen. This quality is valuable for assessment purposes because abundance of such taxa can provide insight into the level of nitrogen in the system (Berkman and Porter 2004).

While current standard methods in the State examine chemical and/or physical indicators for nutrient impairment (*e.g.*, nutrient concentrations and DO), an approach using bioindicators such as algae would more completely measure the net effect of nutrients on the ecological health of streams. An algae-based bioassessment tool could also be of value in supporting the development of nutrient numeric targets.

APPLICATIONS OF ALGAE FOR BIOASSESSMENT

Use of Algae by Other States and Countries

In preparation for developing recommendations for integration of algal bioassessment into SWAMP monitoring, this study included a survey of programs in other states and countries. The goal of the effort was to determine the utility of algae in monitoring programs, and to benefit from any lessons learned by experienced practitioners. Phone and/or email interviews were conducted with key members of bioassessment program teams and investigators involved in index development and related research. When possible, information provided by program documents and posted on websites was reviewed. This study's outreach effort involved all 50 states; however, it was not possible to obtain information for each state, and therefore the results should not be considered exhaustive. The survey revealed the involvement of nearly 30 states, and a multitude of other countries, in some form of algae-based bioassessment or development thereof (Figure 1). The approaches used are quite variable and continue to evolve as more and more knowledge is generated through each program's experiences.

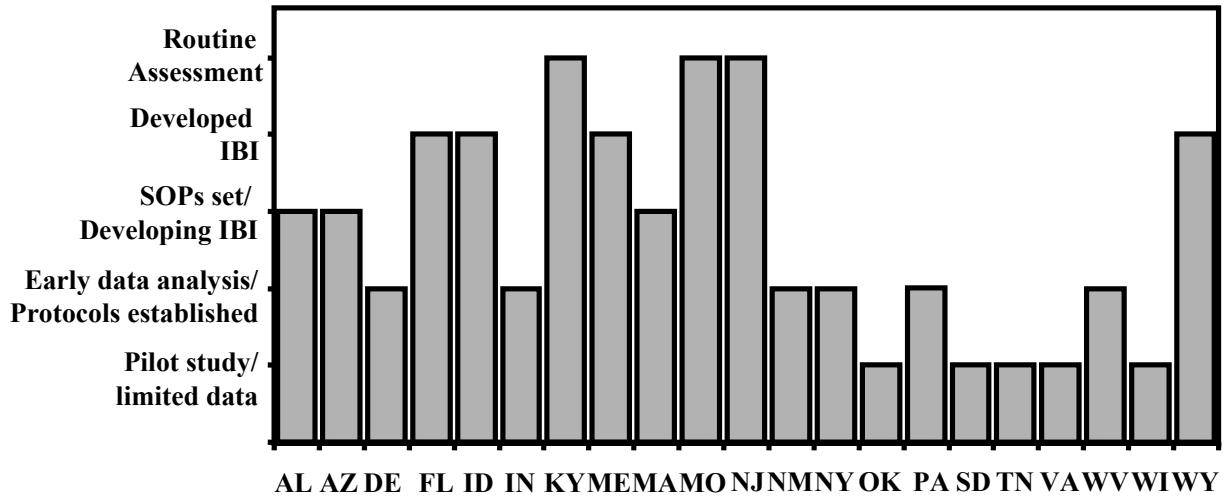

Figure 1. Comparison of progress in development and implementation of algal IBI in stream monitoring by state.

In general, state survey respondents reported that algae provide them with a valuable tool for bioassessment, particularly as an indicator for water-chemistry parameters. All states surveyed use, or plan to use, algae in conjunction with BMI bioassessment (and in some cases, with fish) in order to apply a weight-of-evidence, or multiple lines of evidence (MLOEs), approach in their assessments. All states expressed an interest in using algae not only for general bioassessment efforts, but also for application in development of nutrient criteria and TMDL studies.

With respect to the challenges of bioassessment using algae, some of the more common issues expressed by representatives in the states surveyed include:

- The importance of using a standardized taxonomy for diatoms and soft-bodied algae, and also the need for access to well trained taxonomists for conducting lab work
- Concerns about low repeatability of traditional algal biomass measures and weak relationships between biomass and other variables
- The impression that it is difficult to collect sufficiently quantitative data on percent cover of algae within a reach
- The opinion that soft-bodied algae are not as valuable an indicator as diatoms, and therefore of questionable worth for investment in development and implementation as a bioindicator
- Lack of certainty over whether targeted-substrate or multihabitat/reachwide is a better algae-sampling approach. In some states, targeted is preferred, but cannot be used in all systems due to the nature of available substrates across streams statewide. (A number of states noted that they are shifting from targeted substrates to multihabitat/reachwide sampling, because the latter is less restrictive)
- Difficulty assessing algal communities in shifting sandy- or silty-bottomed streams

A more detailed account of the information gathered from state programs that use algal assemblages as bioindicators is provided in Appendix A, along with a distillation of "lessons learned" that can be taken into consideration in the development of California's program.

A survey was also conducted on biomonitoring programs in other parts of the world. Bioassessment using algae (diatoms) is known to have occurred in Europe as much as a century ago (Kolkwitz and Marsson 1908). Algal communities are a major component of the current Water Framework Directive (WFD) of the European Union (EU), as well as several types of monitoring efforts in New Zealand. Studies are currently being undertaken to inform the integration of diatoms into national monitoring efforts in South Africa, and algae have also been used in regional monitoring efforts and studies in Canada (Vis *et al*. 2007), Israel (Barinova *et al*. 2006), India (Nandan and Aher 2005), Brazil (Lobo *et al*. 2004a,b), Argentina (Lobo *et al*. 2004b, Gomez and Licursi 2001), Australia (Chessman *et al*. 2007), and other nations. Some countries have developed detailed protocols, including supporting materials such as descriptions and pictures of taxa from the local floras (Biggs and Kilroy 2000, Schaumburg *et al*. 2005, Gutowski and Foerster 2007, Pfister and Pipp 2007, Taylor *et al*. 2007), as well as approaches for using multiple assemblages in biomonitoring (Johnson and Hering 2004, Pfister and Pipp 2007). Appendix B provides an overview of some of the programs in other parts of the world, the indicators used, and recommendations that have come forth from some of these efforts.

Development and Implementation of Algae-based Bioassessment in California

For this study, past and current algal monitoring efforts within California were surveyed and carefully considered, in conjunction with findings from other states and countries, to provide the basis for recommending a coordinated strategy for advancing algal bioassessment in the State. Work toward developing algae for use in bioassessment has already begun in several areas in California. David Herbst of the Sierra Nevada Aquatic Research Laboratory (SNARL) and Dean

Blinn of Northern Arizona University recently completed a preliminary IBI using both diatoms and soft-bodied algae, for application in the eastern Sierra Nevada (Herbst and Blinn 2007). Two additional projects were initiated in early 2007 that are led by the Southern California Coastal Water Research Project (SCCWRP) and California State University, Monterey Bay. A common goal of these two projects is to produce one or more draft algal IBIs for use in coastal watersheds in southern California and the State's central coast by 2010.

Various agencies have embarked on algae-based bioassessment efforts in the State. The US Geological Survey (USGS) National Water Quality Assessment (NAWQA) program (Cohen *et al*. 1988, Berkman and Porter 2004) included assessment of benthic algal communities at a number of targeted sites in the San Joaquin River (Leland *et al*. 2001), the Santa Ana River basins (Burton *et al*. 2005), and the Truckee and Carson Rivers, which have headwaters in California (Lawrence and Seiler 2002). In addition, algal communities in California wadeable streams were sampled during the United States Environmental Protection Agency (USEPA) Environmental Monitoring and Assessment Program (EMAP; Stevens 1994) and the collaborative federal-state CMAP (Ode and Rehn 2005).

Other algae-related projects in progress or being planned in the State are primarily localized, pertaining to regions, watersheds, or stream reaches. Many of these projects have focused on algal nuisance and/or nutrient relationships with algae, or the effects of algae on beneficial uses. Indicators assessed have often included at least biomass measured in terms of benthic chlorophyll-*a*, and/or ash-free dry mass (AFDM), and occasionally algal assemblage as well. In certain cases, percent cover of algae has also been assessed, and macroalgal mats and filaments sometimes identified to genus or species. The projects are not coordinated efforts, but rather have been undertaken by various institutions using a variety of methodologies. Several studies have been conducted with the goal of beneficial-use assessment following 303(d) listings and for TMDL studies relating to algae or nutrients. These include projects in Rainbow Creek (Busse 2007), the Pajaro, Santa Clara, Santa Margarita, and San Gabriel Rivers (Tetra Tech 2007), portions of the Newport Bay watershed, the Klamath River, Laguna de Santa Rosa, Chorro Creek, and the Big Bear Lake watershed. Furthermore, guidance documents have recently been prepared that include applications for algae as a bioindicator in watershed-assessment efforts, including the California Watershed Assessment Manual (CWAM; Shilling 2005) and the California NNE framework (Tetra Tech 2006)).

Other programs are scheduled to begin conducting bioassessment using algal-biomass and assemblage data in the next year. These include RWQCB Regions 2, 4, and 9, and the southern California Stormwater Monitoring Coalition (SMC) efforts. In addition, the new National Pollution Discharge Elimination System (NPDES) stormwater permit in San Diego County (Order No. R9-2007-0001) now requires the incorporation of algae as part of their bioassessment monitoring. Sample collection for these efforts, as well as for the Perennial Stream Assessment (PSA), will be carried out using the multihabitat approach employed by current southern and central California IBI projects. As such, it should be possible to combine data from these various efforts in ways that could enhance the development of statewide algal bioassessment tools.

Integration and Leveraging with Existing Bioassessment

The process of developing and implementing statewide algal bioassessment can benefit greatly from previous bioindicator work in California. Much has already been accomplished with regard to BMI and, to a lesser degree, algal bioassessment. As such there is a large body of information to draw upon to make decisions about how best to proceed. Furthermore, the many parallels between BMI- and algal- indicator development and implementation provide numerous opportunities to coordinate efforts and leverage resources.

Table 1 provides a list of the major steps involved in developing and implementing a bioindicator, as well as the current status for both BMIs and algae in the State. TAC recommendations for funding needed to carry out some of the steps are indicated in italics and discussed in more detail later in the document.

Table 1. Steps and timeline for development of BMI and algal indices in California.

Step	Status[3] – Benthic Macroinvertebrates	Status – Algae
Develop preliminary field and laboratory protocols	Posted peer-reviewed SWAMP protocols February 2007	Completed in LR and CS[4]
Identify initial study areas	Boundaries set for statewide PSA[5] survey regions, same for reference sites	Completed in LR and CS
Develop a Quality Assurance Project Plan (QAPP)	SNARL and ABL[6] have QAPPs, no statewide bioassessment QAPP available yet	Completed in LR and CS
Collect samples; conduct laboratory work	Ongoing	Completed in LR; Initiated in CS - completed in 2009
Conduct exploratory analyses; refine field and/or laboratory methods	Ongoing	Completed in LR; Initiated in CS - completed in 2008
Conduct protocol-comparison studies	Two targeted riffle studies and one targeted riffle *vs*. multihabitat study completed and published in peer-review literature; low gradient comparison completed, manuscript in preparation	Pilot completed in CS; *Recommended for funding in 2008 or 2009 to conduct a study in LR*
Develop species lists; archive voucher specimens	SAFIT[7] taxonomic standards group established, publishes regular editions of standard taxonomic effort levels and common taxa lists	Completed in LR; Initiated in CS – completed in 2009
Develop Standard Data Transfer Formats to facilitate sharing of monitoring data	Most components complete and in use; conversion to SWAMP database about 50-75% complete	*Recommended for coordination with BMI efforts and supplemental funding*
Create a forum for taxonomic harmonization and hold periodic meetings	SAFIT incorporated as a non-profit in 2006, 2-3 meetings held per year	Initiated in CS in 2008; *Recommended for funding ongoing meetings of SAFIT-like group*

[3] As of March 2008
[4] LR = Region 6 (Lahontan Region, where a preliminary algae IBI has been developed); CS = Regions 3, 4, 9, and coastal Region 8 (where current algae IBI-development projects are underway)
[5] PSA = Perennial Stream Assessment
[6] SNARL = Sierra Nevada Aquatic Research Laboratory; ABL = Aquatic Bioassessment Laboratory; QAPP = Quality Assurance Project Plan
[7] SAFIT = Southwest Association of Freshwater Invertebrate Taxonomists

Table 1. Continued.

Step	Status[8] – Benthic Macroinvertebrates	Status – Algae
Develop user-support materials (*e.g.*, taxonomic keys and photo-databases) to build capacity	SAFIT develops and releases these periodically	Initiated in CS (to be completed by 2010 for coastal Southern California); *Recommended for funding in 2009 or 2010 to expand to other parts of the State*
Screen metrics and develop draft IBI; run models	IBIs completed for North Coast, South Coast, and Eastern Sierra Nevada.	Completed in LR; To be initiated in 2008 for CS (+ O/E[9] model in Central Coast) – completed 2009
Validate draft IBI at new sites within regions where developed	Validation was part of all IBI development	To be initiated and completed in CS in 2009
Standardize a statewide protocol for algae sampling and lab work; refine QAPP as necessary	SWAMP protocols in place February 2007	*Recommended for funding to refine and standardize statewide protocols / QAPP*
Identify suite of reference sites statewide	Reference strategy (RCMP[10]) in review, sampling starts 2008	*Recommended for coordination with BMI reference site selection*
Conduct field and taxonomy training workshops to build capacity	Ongoing	Initial workshops scheduled for 2009 for CS; *Recommended for funding to support additional workshops beyond 2010*
Conduct studies on index period (*i.e.*, appropriate times of year to sample) and stream type (*e.g.*, applicability of IBI in intermittent streams, non-wadeable, *etc*.)	No formal documentation of index period for benthic macroinvertebrates; non-perennial stream studies underway	Pilots initiated in CS in 2007 (to be completed in 2009); *Pending results of pilots, recommended for funding for additional studies in 2010*
Test applicability of IBI(s) to new regions in the State	Some testing done, plan to develop new regional IBIs and O/E models for under-represented regions	*Recommended sampling at PSA/SWAMP sites starting in 2008; can test preliminary IBIs (when complete) on this dataset*
Create new metrics/IBIs as necessary to expand scope to statewide	Ongoing, see above	*Recommended for funding to start 2010 pending results of tests of the IBI(s) in other parts of the State*
Implement IBI(s) statewide	IBIs implemented regionally, O/E implemented statewide 2005	*Recommended to start 2010*
Identify thresholds/ endpoints for ALUs, NNE[11], *etc.*	ALU threshold setting is part of index development	*Recommended to start 2010*
Define approach for integrating results of multiple indices		*Recommended for funding to start 2012*

[8] As of March 2008
[9] O/E = Observed/Expected, refers the number of taxa observed at a site relative to the number expected under reference conditions.
[10] RCMP = Reference Condition Management Plan
[11] ALU = Aquatic Life Uses; NNE = Nutrient Numeric Endpoint

TECHNICAL ISSUES AND RECOMMENDATIONS FOR INDICATOR DEVELOPMENT AND IMPLEMENTATION

A number of technical issues need to be considered, and choices made, in the course of developing and implementing algal bioassessment. The following section addresses these issues and provides recommendations for SWAMP. The major issues include:

- Approaches to assessing algal biomass
- Choice of algal assemblage(s) to monitor for taxonomic composition
- Laboratory issues
  - enumeration of specimens
  - taxonomic specificity (*e.g.*, genus *vs*. species)
  - taxonomic congruence among datasets
- Sampling design and sample-collection methodology
- Supplemental/explanatory parameters to measure
- Data reduction and interpretation
- Metric development
- Reference sites

A number of issues related to bioindicator development and implementation are presented below, followed by recommendations for approaches and further applied research.

Potential Indicators: *Pros* and *Cons*

Developing and testing tools for bioassessment is a time-consuming and relatively expensive process. Decisions about how to invest limited dollars in development should involve a consideration of the benefits and challenges associated with potential indicators. Table 2 provides an overview of several types of indicators that could be used (or are already used, at least to some extent) in the State, along with the strengths of each, and some of the challenges and costs associated with their implementation. In the section that follows, technical issues specific to the various types of *algal* indicators are discussed in more depth.

Table 2. Comparison of algal and other indicators used, or under development, in California.

Indicator	Assessment Uses	Status in California	Challenges	Estimated Cost/Sample (FY2007/2008)[12]
Chlorophyll *a* (from benthic and floating algae)	Stream productivity measured as abundance of microalgae[13] (+ macroalgae[14]); key indicator for the NNE framework	Sampled in LR and CS; has been used in several types of studies throughout State; will be sampled for PSA; sampling methods not standardized – *recommended for funding to standardize sampling approach*	Influenced by recent scour, herbivory, light; content varies between species and within species depending on light and nutrients; may be difficult to draw conclusions based on these confounding factors	$71 (laboratory work only)
Ash-free dry mass, AFDM (from benthic and floating algae)	Stream productivity measured as biomass of biofilm (+ macroalgae); key indicator for the NNE framework	Sampled in LR and CS; has been used in several types of studies throughout State; will be sampled for PSA; sampling methods not standardized – *recommended for funding to standardize sampling approach (can co-occur with development of chlorophyll-a sampling standardization)*	Influenced by recent scour, herbivory, light; confounded with non-algal organic matter (exacerbated with inclusion of depositional samples)	$43 (laboratory work only)
Reach-wide algal percent cover	Amount of algae (microalgae + macrofilaments + floating mats) in the stream reach	Sampled in CS; conducted with a gridded viewing bucket, or as point-intercept concomitant with conducting PHab pebble counts – *the latter is recommended*	Difficult to assess in deep and/or swift and/or highly turbid streams	Included in PHab data collection, if part of pebble count
Diatoms	Trophic status; organic enrichment; low DO; siltation; pH; metals	Preliminary IBI completed for LR[15] and in progress for CS; has been used in some other studies in the State; efforts to build capacity have been initiated (see Table 1)	Influenced by recent scour, herbivory, light; may require SEM[16] for some species and subspecies-level determinations; currently limited capacity for taxonomic analysis in CA	$315 (laboratory work only)

[12] Values in boldface type are based on the list of prices for SWAMP program in the fiscal year 2007/2008
[13] Microscopic, benthic algae that coat the surface of substrata
[14] The macroalgal component of stream algae is not always included in sampling.
[15] LR = Region 6 (where the preliminary algae IBI was developed, for the Lahontan Region); CS = Regions 3, 4, 9, and coastal part of Region 8 (corresponding to the current algae IBI-development projects underway on California's central coast and in coastal southern California)
[16] SEM = Scanning Electron Microscope

Table 2. Continued.

Indicator	Assessment Uses	Status in California	Challenges	Estimated Cost/Sample
Soft-bodied algae	Nitrogen limitation/ trophic status; siltation; pH; nuisance/toxic algal blooms	Preliminary IBI completed for LR and in progress for CS; has been used (at least to genus) in some other studies in the State; non-traditional laboratory methods are under development to improve taxonomic resolution; efforts to build capacity have been initiated (see Table 1)	Influenced by recent scour, herbivory, light; some genera difficult to identify to species; long-term sample storage can be difficult; currently limited capacity for taxonomic analysis (to species) in CA	$315 (laboratory work only)
Suspended chlorophyll-*a*	Enrichment of upstream impoundments; stream enrichment in large, slow rivers; potential explanatory variable for low benthic biomass (due to shading); indicator for the NNE framework	Collected in some monitoring efforts in the State, but has been discontinued in others due to questionable value of the data	Influenced by flow (*e.g.*, can be imported from an upstream impoundment)	$71 (laboratory work only)
BMIs	General water quality; instream habitat condition; alterations to hydrology; organic enrichment/low DO	IBIs implemented regionally, O/E implemented statewide 2005	Influenced by recent scour, substrate type/habitat availability; some taxa are difficult to identify to species; may not be applicable in ephemeral streams	$674 (laboratory work only; cost is *per* sampling method: targeted and multihabitat.)
PHab	BMI and fish habitat quality; flow and sedimentation regimes; riparian habitat quality; local anthropogenic stressors	Methodology available statewide and implemented regionally	Full PHab can be expensive, and time requirements can be daunting for inexperienced field crews	$1,750-$3,360 (includes sampling BMIs, algae, and water chemistry)
California Rapid Assessment Method (CRAM)	Riparian habitat quality; channel and flood plain structure; hydrologic modifications; buffer quality	Methodology available statewide and used, or planned for use, in various programs	CRAM can take 2 - 3 hours for inexperienced field crews[17] and requires some preparation prior to fieldwork; also requires some basic knowledge of the local macrophyte flora	No standard cost set for SWAMP
Fish	Hydrologic modifications; degradation of riparian and instream habitat; low DO	Indices developed in parts of California (Moyle and Randall 1998; Moyle and Marchetti 1999), but no statewide IBI available	Low native species diversity in California; high endemism; barriers to (re)colonization; many non-native/ invasive species; not amenable to ephemeral streams	No standard cost set for SWAMP

[17] Experienced crews may take 1-2 hours per site

Types and Applications of Algal Indicators

Measurement of biomass

Indicators commonly used to measure algal biomass, and therefore productivity, in streams include chlorophyll-*a,* a photosynthetic pigment, and AFDM, which corresponds to the organic content of a given sample. Chlorophyll-*a* is determined by homogenizing the sample and extracting the chlorophyll from solid matter using acetone, then using photometric methods to detect the amount of chlorophyll-*a*. AFDM is determined by obtaining the total dry weight of a sample, combusting the sample to incinerate all the organic matter, and then reweighing the sample to determine its remaining ash content. The difference in weight before and after combustion represents the AFDM. Because it is presumed that algae comprise at least some portion of the sample, AFDM is considered to serve as an approximation of algal biomass (Steinman and Lamberti 1996).

Algal abundance in a given reach, and therefore results for both types of biomass indicator, can be limited by nutrients (Francoeur 2001) and light (Hill 1996) and reduced by recent scour (Scrimgeour and Winterbourn 1989, Peterson 1996) and herbivory (Steinman 1996). Because of these potential confounding factors, it can be difficult to interpret the results of these assays. In addition, technical issues specific to chlorophyll-*a* include the fact that it can vary among different species of algae and can even vary within a species (*e.g.*, as a function of exposure to light; Hill 1996). Furthermore, the method for AFDM is not selective for algae, and therefore other organisms such as bacteria, protozoans, and fungi can contribute to the AFDM measurement, as can fine organic debris from decaying leaves and wood (Steinman and Lamberti 1996). Programs in some states and countries have elected not to assess chlorophyll-*a* or AFDM because of uncertainty about the value of these measurements, not only because of confounding influences by various factors, but sometimes also because of dissatisfaction with the level of repeatability realized with these measures (Appendix A).

Despite some technical issues that can present challenges to interpretation of biomass results, these indicators are very attractive for several reasons. The processes to collect and analyze biomass samples are relatively inexpensive and straightforward, and therefore reasonably accessible to a wide array of practitioners to address different assessment needs. In addition to this, measurements of chlorophyll-*a* and AFDM lend themselves well to assessments of beneficial uses thresholds that have been proposed (Dodds *et al*. 1998, Biggs 2000). Furthermore, various studies have indicated utility of these measures for assessment of biomass in relation to factors such as nutrient enrichment and/or surrounding land uses (Biggs 2000, Berkman and Porter 2004, Lavoie *et al*. 2004, Busse *et al*. 2006).

Given some of the difficulties inherent in interpreting chlorophyll-*a* and AFDM, it is helpful to collect both types of data, and assess them in conjunction with one another for estimating biomass (Stevenson 1996). Collection of both types of biomass data also facilitates determination of the "autotrophic index," which is calculated as the ratio of AFDM to chlorophyll-*a* and reflects the autotrophic component of the biomass contained in the sample (Collins and Weber 1978). If the benthic flora shifts to a more heterotrophic community in response to organic enrichment, the index value is expected to increase. Biggs (1989) found a strong relationship between the autotrophic index and biological oxygen demand. Moreover, from the standpoint of the California NNE, the ratio of the biomass values improves the

predictive capability of modeling tools for determination of nutrient numeric targets (Tetra Tech 2006). It should be noted that it is also beneficial to collect information on ambient parameters that may be influencing these biomass measures so that they can be evaluated in light of such factors. These parameters are discussed below.

In addition to the quantitative laboratory methods described above to estimate algal biomass, techniques exist for assessing algal cover that are carried out entirely in the field. Cover estimates of algae, in terms of biofilms coating substrates, and attached filaments and floating mats, can be collected using gridded viewing buckets placed at specific points along a stream reach (EPA Rapid Bioassessment Protocol; Stevenson and Bahls in Barbour *et al*. 1999). Alternatively, during the course of conducting the pebble count that is part of the PHab portion of the SWAMP Bioassessment protocol (Ode 2007), algal abundance can be assessed via a point-intercept method by noting, for each piece of substrate where a sampling point falls, whether or not a "microalgal" layer is present, and if present, how thick the layer is. This approach has been used in NAWQA sampling (J. Berkman, *pers. comm*.) It can also be noted whether the sampling point falls onto macroalgae (*e.g.*, in the form of attached filamentous algae or an unattached floating mat). These data can be compiled to provide a profile of the extent of algal cover in different strata within the steam. The field protocol used by the Southern and Central California IBI development projects incorporates this approach to algal-cover assessment (Appendix C).

It should be noted that a more comprehensive assessment of reachwide algal biomass would require information about the thickness of the algal filaments and mats. This is difficult to measure in a meaningful way, because the mats vary in terms of density, thus obscuring thickness. Furthermore, it is not always clear what stratum a given algal specimen belongs to and therefore current methods still require some refinement. Despite these drawbacks, algal percent cover is an attractive approach to estimating productivity within a stream reach, because it involves a reasonably simple procedure that can economically be incorporated into existing SWAMP biomonitoring activities. Furthermore, thresholds for impacts to beneficial uses have been proposed for this parameter (Biggs 2000), and studies have indicated its utility in assessments of the effects of anthropogenic influences on algal nuisance (Busse *et al*. 2006, Busse 2007, Tetra Tech 2007).

It is recommended that chlorophyll-*a*, AFDM, and algal percent cover assessment be included in SWAMP monitoring, and that biomass of detached, floating macroalgae (when present) be analyzed separately from attached/benthic, at least for the initial stages of developing the algae bioassessment program. We recommend that SWAMP fund an evaluation of the results of these initial assessments when sufficient data are available, in order to determine whether there is substantial value in continuing to collect each of the types of biomass data, and that protocols be refined and standardized for statewide use.

Choice of algal assemblage

In biomonitoring that involves assessment of algal assemblage, sometimes only benthic diatoms are used, and in other cases, soft-bodied algae are also included. Data collected for this latter assemblage may include only macroalgal forms, which are filaments and mats that we can easily see in the stream, or it may also include the "microalgal" coating on stream substrata.

While diatom communities have a history of extensive use for bioassessment in various parts of the world (Appendix B), and much has been accomplished to establish them as bioindicators (Round 1991, van Dam *et al*. 1994, Kelly and Whitton 1995, Stoermer and Smol 1999), opinions are more variable about the utility of soft-bodied algae assemblages, and they are not always included in algae-based bioassessment efforts. Furthermore, in at least one published case, soft-bodied algae were included but deemed, in retrospect, not to merit the extra effort (Lavoie *et al*. 2004). SWAMP will need to evaluate whether soft-bodied algal data provide sufficient information, beyond that which is provided by diatoms, in order to determine whether to continue to monitoring this assemblage over the long term.

The preliminary algal IBI for the eastern Sierra Nevada (Herbst and Blinn 2007) utilizes both diatoms and soft-bodied algae; also, EMAP and NAWQA have both included this assemblage in their monitoring efforts. Of all the states surveyed that use algal assemblage measures as a component of their bioassessment programs, nearly half of them assess taxonomic composition of both diatoms and soft-bodied algae (Appendix A), and soft-bodied algae are also included in algae bioassessment efforts carried out in New Zealand and some parts of Europe (Appendix B). The remainder of states and countries surveyed use diatoms only, and none use soft-bodied microalgae alone in algal assemblage assessments. Some of the reasons for not including soft-bodied algae are based on laboratory considerations, and are discussed below.

Because approaches exist for collecting soft-bodied algae concurrently with diatoms, there is minimal additional effort necessary in the field portion of the work in order to sample this assemblage[18], and there are several reasons to include it in biomonitoring. From a biomass perspective, soft-bodied taxa are often the major component of the algal community in a given stream (Wehr and Sheath 2003), so to ignore them is to tell only part of the story about stream algae and productivity. Stevenson and Bahls (1999) recommend inclusion of soft-bodied algae because some impacts of interest may selectively affect, or be derivative of, this assemblage. For instance, soft-bodied algae (including cyanobacteria) are involved in toxic blooms (Baker *et al*. 2001, Izaguirre *et al*. 2007), and are frequently implicated in water taste and/or odor problems (Watson and Ridal 2004; reviewed by Jüttner and Watson 2007). However, Stevenson and Bahls (1999) also recommend that, if only one of the two assemblages can be assessed (due to financial constraints, for instance), diatoms should be chosen, because the diatom component of a given sample tends to be more species-rich and many metrics are based on differences in taxonomic composition.

Herbst and Blinn (2007) found soft-bodied algae to provide a useful signal, and included a metric based on this assemblage (*i.e.*, density of *Stigeoclonium* species) in their Eastern Sierra Nevada preliminary IBI. Other investigators have also found soft-bodied algae to be valuable indicators, particularly in relation to their responsiveness to nutrients (Douterelo *et al*. 2004, Berkman and Porter 2004, Parikh *et al*. 2006, Vis *et al*. 2008), and Foerster *et al*. (2004) were able to define reference stream classes in Germany based entirely on soft-bodied algal assemblages. Autecological information has been generated for many taxa in this assemblage (Leland and Porter 2000, Leland *et al*. 2001, Potapova 2005, Porter *et al*. 2008) and soft-bodied algal metrics

[18] Additional effort involves collection of supplemental "qualitative" samples of macroalgae to assist in laboratory determinations.

have been included in a number of IBIs (*e.g.*, Hill *et al.* 2000, Griffith *et al*. 2005, Herbst and Blinn 2007).

Metrics exist for percent nitrogen fixers and percent seston[19] in microalgae; both of these indicator types are largely represented by soft-bodied algae. Percent nitrogen-fixers can be used to identify sites with low nitrogen conditions, while increases in percent seston are useful in evaluating general stream condition in low-gradient agricultural areas. An advantage of these metrics is that they do not rely on species-specific information, further contributing to the attractiveness of soft-bodied algae as an indicator (J. Berkman, *pers. comm*.).

The TAC recommends that both diatom and soft-bodied algal assemblages be included in SWAMP monitoring, at least for the initial stages of developing the State's algal bioassessment program. The results from the first cycles of SWAMP/PSA algal monitoring, along with data from the Lahontan and Central and Southern California IBI development projects, should be used for an evaluation of the cost/benefit of continuing to assess both indicators.

Laboratory and taxonomic issues

There are a number of reasons why soft-bodied algae are not always included in bioassessment programs. For one thing, inclusion of this assemblage roughly doubles the laboratory labor associated with taxonomic analysis per site. Soft-bodied algae are more difficult than diatoms to preserve and store over long periods. They can also be more difficult to identify to species, and some taxa can be identified down to this level only if they happened to be in a sexual stage at the time of collection and fixation (Biggs 2000, Wehr and Sheath 2003), or if live material can be cultured in the laboratory and successfully induced into a sexual stage. Finally, soft-bodied algae can be challenging to enumerate when conducting quantitative assessment of the assemblage *via* commonly used approaches (*e.g*., Stevenson and Bahls 1999). However, an approach is currently being employed in southern California that addresses some of these issues.

The time and expertise needed for species-level identification of algal taxa (both diatoms and soft-bodied algae) has compelled some investigators to examine the value of genus-level taxonomic information for assessment purposes. The appeal of an index using genus-level information is not only in that it reduces analysis time, but it could be much more accessible for application in lower-budget efforts like citizen's watershed monitoring groups. Various investigators have created general pollution-assessment indices based on diatom genus-level taxonomic information (Rumeau and Coste 1988 and Coste and Ayphassorho 1991, both cited in Stevenson and Smol 2003). Hill *et al*. (2001) demonstrated that diatom assemblage attributes based on species- as well as genus-level sensitivity and tolerance values were "consistently and reliably related to gradients of human disturbance within a catchment." However, the relative value of genus-level metrics was a function of the types of metrics used. For instance, when looking at attributes such as abundance of eutraphentic and pollution-tolerant diatoms, correlations between the calculated values at the genus and the species levels were weak, and the investigators concluded that a "significant loss of information" was realized when restricting identification to genus.

[19] Suspended fine particulate material that can include planktonic algae.

Despite the potential appeal of genus-level metrics, many investigators have cautioned against such an approach (Round 1991) because of existence of sometimes-large ecological differences among congeners (Stevenson and Bahls 1999). Some have also cited intraspecific differences in autecologies as a reason to err toward taxonomic "splitting" rather than "lumping." Potapova and Charles (2007) have suggested that some common species of diatom may actually constitute a group of multiple, indistinguishable *de facto* species or ecotypes. This was based on the discovery of differences in reported autecological characteristics for each of the species in question in different parts of the world. They therefore recommended erring toward more refined taxonomic treatment rather than lumping similar-looking taxa into morphospecies.

As revealed in the lessons learned from other states surveyed (Appendix A), taxonomic congruence is a crucial element of an effective biomonitoring program. The TAC therefore recommends that SWAMP support the activities of an algal taxonomic workgroup, after the fashion of SAFIT, in order to foster the highest-quality taxonomic information possible for the implementation of algae bioassessment in the State. The main focus of this workgroup should be a standard algal taxonomic effort and it should include periodic workshops and development and maintenance of a webpage. The standard taxonomic information from algal assemblages, as well as all other biological data, should be stored together in the SWAMP database. Products of the taxonomic workgroup should include a standard taxonomic list and a standard taxonomic effort document.

A preliminary workgroup has already been initiated through the southern California and central coast algal IBI-development projects. It is recommended that SWAMP take advantage of the opportunity to leverage this initial effort to build an algal taxonomy forum that will exist beyond the term of these grants. The southern California IBI project team is also developing preliminary taxonomic support resources for end users, such as a regional flora for diatoms and soft-bodied algae, specimen photos, and taxonomic keys. It is therefore also recommended that SWAMP build upon these support materials to expand their applicability to the flora of the State as a whole.

Sampling Issues

Sampling design

One of the highest-priority decisions to be made early in the process of implementing algae-based bioassessment is what sampling protocol(s) to use throughout the State. As with BMIs, there are two general approaches to collecting quantitative samples of algae: 1) *targeted sampling*, in which specific types of substratum are sampled separately (*e.g.,* the USGS NAWQA quantitative protocols; Moulton *et al*. 2002), and 2) *multihabitat/reachwide sampling*, in which substrata are selected objectively, in proportion to their relative abundances within the stream reach (*e.g*., the USEPA EMAP protocol; Peck *et al*. 2006). In the latter approach, algae from any number of substrata (*e.g.*, from cobbles, sand, gravel, concrete, *etc*.) may be collected and composited into a single sample. Each approach has its *pros* and *cons*, and the decision about the protocol(s) to use statewide will depend upon a consideration of these differences because here are tradeoffs associated with adopting either method for statewide monitoring.

In the case of targeted sampling, because no single habitat type is present in all wadeable streams in the State, certain streams could be left out of ambient assessments, or it may not be feasible to compare data between certain stream types (for which different sampling methods would have to be applied, based on targeted substrate types.) Another disadvantage of targeted sampling is the need for a different set of reference sites for each targeted substrate type. There is also a possibility that indices might have to be fine-tuned for the different substrata (but see the discussion about substrate affinities below). Finally, there could be a greater potential for error associated with sampling bias, because of the potential for subjectivity inherent in identifying the richest targeted habitat.

The multihabitat/reachwide approach, on the other hand, would mean one method is used everywhere, which could allow for a single database and assessment methodology for all California sites, and could therefore facilitate comparison of sites across the State. Benefits include the fact that dischargers and/or consultants would need to know only one method, which would make it much easier for Water Board permit writers to incorporate bioassessments into permit requirements. An important statistical argument for using a multihabitat sampling approach is that, because the sampling points are assigned objectively, the resulting composite sample is *representative* of the stream *reach*. However, a problem with this method is the fact that sampling points may sometimes fall upon spots in the stream that cannot be sampled (*e.g.*, deep pools).

While algal taxa can have substrate affinities (Burkholder 1996), literature on the topic indicates that algal metrics can be developed that are not highly sensitive to the method of sample collection (Pan *et al*. 1996, Potapova and Charles 2005, and Weilhoefer and Pan 2007), or habitat type (Winter and Duthie 2000a, Fore 2002). This suggests that either method might be acceptable in terms of its ability to generate results that would be useful for our purposes.

A pilot sampling-method comparison study is being conducted by the southern California algae IBI project team. Results of this study should provide some insight into the sensitivity of the metrics/IBI that will be developed to the sampling methods employed, at least in that region. In the interim, until the results of these studies are available, the TAC recommends that algae be collected by SWAMP using at least the multihabitat/reachwide approach. It is further recommended that SWAMP fund, as a high priority, a "calibration" study of the targeted *vs*. reachwide algae-sampling methods in the Lahontan Region (LR). This is where the first algae-based IBI in California was developed. The results of such a study would allow us to determine whether existing datasets from that region, based on materials collected using a targeted-sampling approach, are comparable to data collected using a multihabitat approach, and if not, what additional steps may be necessary to be able to combine these data. Funding and contracting for such a study should begin as soon as possible.

It is also recommended that SWAMP fund studies to refine the index period for algae sampling; however, in the interim, sampling should be conducted concurrently with BMIs, and should occur at least 30 days after any large storm or flow event. Also with regard to sampling period, it should be recognized that there are periods in some parts of the State when access for sampling may be limited or precluded (*e.g.*, periods of high snow and ice cover in the high Sierra, periods

of high spring runoff in all parts of the State), and these periods should be accounted for both when planning sampling events and in the course of data interpretation.

Additional parameters to measure in the field

A number of environmental parameters can influence benthic algal communities, and an understanding of the factors at play can enhance interpretation of algal biomass and assemblage results. For instance, high-velocity flows can scour the benthos and remove biomass from the stream (Scrimgeour and Winterbourn 1989, Peterson 1996). Shading by a riparian canopy, or by suspended matter in the water column, can limit the amount of light accessible to the streambed, therefore curtailing biomass accrual. This may also select for taxa that are more tolerant of low-light conditions (Hill 1996). The effects of environmental factors can also manifest themselves by virtue of the various growth forms of different taxa. For example, diatom taxa that grow on stalks, and filamentous algae, can form canopies over prostrate taxa (those appressed to the substrate) that occupy the biofilm understory. Such characteristics influence patterns of recolonization post-disturbance and community succession, and can also confer differential resistance to high-velocity flows/scour, vulnerability to herbivory, and exposure to light (Poff *et al*. 1990, Hill 1996, Peterson 1996, Steinman 1996).

Important environmental indicators to assess in conjunction with the collection of algal samples include many of the same data already collected for the PHab component of standard SWAMP bioassessment (Ode 2007), such as **flow habitats and flow velocity/discharge, canopy cover, and water depth and turbidity,** which can shade the benthos (Hill 1996). Pebble count data are valuable because of the responsiveness of the benthic algal assemblage to siltation (indicated by percent fines), which can select for motile taxa that are able to migrate to the surface when buried. A higher proportion of such taxa could reflect higher reproduction because of competitive dominance of these "fugitive" taxa. The "siltation index" based on prevalence of motile taxa can be used as a metric (Bahls 1993). In the course of conducting the pebble count, information about reachwide algal percent cover can also be collected. Information about the BMI assemblage can be helpful to explain algae bioassessment results by providing an indicator of herbivore pressure in the system. For example, Hirst *et al*. (2002) found grazer abundance to be a significant predictor of diatom assemblage characteristics.

Water-chemistry parameters, including **turbidity, alkalinity, conductivity, nutrients (e.g., total nitrogen, nitrate, total phosphorus, orthosphosphate), pH, and DO** (preferably diel), help in the interpretation of algal data. Water-column chlorophyll-*a* can provide a means of identifying potential eutrophication in larger slow-moving systems, or upstream impoundments (Wehr and Sheath 2003). It can also serve as a potential explanatory variable for low benthic algae biomass (due to shading of the benthos; Hill 1996). The importance of measuring this parameter may vary depending on location of the monitoring. For example, it is likely less important in shaded, high-gradient streams than in more open, lowland systems with surrounding agricultural land uses. It should be noted that some monitoring programs in the State measured this parameter historically, but have since eliminated it because it did not seem to provide sufficiently useful information (*e.g.*, San Francisco Bay RWQCB monitoring efforts, San Gabriel River watershed monitoring program).

The TAC recommends measuring all of the parameters indicated above in bold to accompany algal bioassessment. Water-column chlorophyll-*a*, however, should be measured only in larger, slow-moving systems and those downstream of impoundments.

Analytical Issues

Assemblage data reduction and interpretation

Various approaches can be used to summarize information about algal communities for bioassessment purposes; many are similar to those commonly used in BMI studies. A thorough discussion of analytical approaches is beyond the scope of this document, so the main focus of this section will be on basic aspects of IBI development and application. A preliminary algal IBI has already been developed for use in the eastern Sierra Nevada (Herbst and Blinn 2007), and additional algal IBIs are currently under development in coastal watersheds of central and southern California.

It should be noted that in addition to the IBI a second, very different, analytical approach to site assessment will also be used by at least the central California study group: An algae-based analog of the River Invertebrate Prediction and Classification System (RIVPACS; Wright 1995). This latter approach has been successfully applied to algal data in a recent study by Mazor *et al*. 2006. RIVPACS employs a predictive model to assess the degree to which the assemblage at a given site reflects that which would be expected in the absence of anthropogenic influences. It is, however, still unclear how widely applicable this approach may be, and both approaches to utilization of biomonitoring data have their strengths and weakness, as discussed by Karr and Chu (2000) and by Norris and Hawkins (2000).

Examples of metrics used in algal IBIs

Algal IBIs consisting of metrics using diatoms only, or including information about soft-bodied algae, have been employed for bioassessment by numerous practitioners (Hill *et al.* 2000, Fore 2002, Fore and Grafe 2002, Hill *et al*. 2003, Griffith *et al*. 2005, Wang *et al*. 2005, Herbst and Blinn 2007). Stoermer and Smol (1999) define metrics as "attributes of assemblages that change in response to human alterations of watersheds." As with BMI assemblages, there are many different classes of metric that can be used to describe the nature of the algal assemblage of interest. For example, some metrics address "guilds" that may describe the autecological[20], or morphological, aspects of the various taxa that comprise the sample. Other metrics relate to the relative tolerance, sensitivity, or requirements of taxa with respect to specific water-quality parameters (such as DO or pH ranges), or to more general factors such as "general pollution," eutrophication, or organic pollution. A substantial amount of autecological information for the more common diatom species has been generated by numerous investigators (*e.g.*, Lowe 1974, Lange-Bertalot 1979, Bahls 1993, van Dam *et al*. 1994), and an increasing body of knowledge is being developed for soft-bodied algae as well (Leland and Porter 2000, Leland *et al*. 2001, Potapova 2005, Porter *et al*. 2008).

[20] Refers to the ecological conditions under which the taxon in question is known to occur. This type of information is useful for bioassessment applications.

Several metrics have been developed for using algae as indicators of eutrophication and organic pollution. Examples include percent eutrophic taxa, percent nitrogen heterotrophs, and percent saprobic taxa (van Dam *et al.* 1994). Nitrogen heterotrophs can use, or even require, organic nitrogen, and therefore tend to increase in relative abundance with increasing organic enrichment. Prevalence of saprobic taxa is indicative of high organic matter and low oxygen conditions. As mentioned previously, percent nitrogen fixers (*i.e.*, nitrogen-fixing cyanobacteria taxa + diatom taxa that have cyanobacterial endosymbionts) is indicative of stream nitrogen status (Berkman and Porter 2004), with higher values corresponding to more nitrogen-poor systems.

Although algae are often recognized and utilized for their high value as indicators for trophic status and organic wastes, they also have applications for assessment of other pollutant classes. Several studies have identified toxic effects of certain metals to algal taxa (reviewed by Genter 1996), and others have demonstrated relationships between metals and benthic algal communities (Hill *et al*. 2000, Hirst *et al*. 2002, Ivorra *et al*. 2002, Griffith *et al*. 2005). Hirst *et al*. (2002) generated a list of diatom species' relative tolerances to metals based on results of their study. Diatoms can be particularly useful as indicators for metals, because at least some taxa can manifest the effects of metal stress through easily observed morphological deformations. This phenomenon forms a basis for the metric defined by percent aberrant diatoms (McFarland *et al*. 1997).

The "siltation index" (Bahls 1993) is calculated based on the relative abundance of motile diatom taxa in the sample. When covered by sediment, individuals in these genera can migrate toward the surface. As such, higher values of this index correspond to increased siltation. The percent of live diatoms (Hill 1996) is reflective of health of the diatom assemblage, and can be used as an indicator for siltation.

There are also diatom metrics more geared toward general water quality. These include the Pollution Tolerance Index (PTI; Kentucky DEP 2002), which is based on pollution-tolerance values assigned to diatom taxa. This index is calculated as the weighted average of the tolerance values represented by the taxa in the sample. Other examples are the Specific Polluosensitivity Index (SPI; Coste in CEMAGREF 1982) and the standardized Biological Diatom Index (BDI; Lenoir and Coste 1996). A software package called "Omnidia," that was developed in France, is available for calculation of these and other diatom indices (Lecointe *et al*. 1993). It should be noted that, while it can be useful to conduct exploratory analyses using taxon-specific autecological information that has been developed in other regions, there may be a need for local fine-tuning as these values may vary geographically (Potapova and Charles 2007). It is anticipated that the algal data that have and will be generated throughout the State will form the basis of a database that can be used to begin validating/determining autecologies of the taxa by region.

Once a surplus of metrics has been calculated using the taxonomic data, the metrics are screened according to a variety of criteria that reflect their potential utility for bioassessment purposes. Examples of screening criteria include how well the metrics correlate with measures of disturbance, their signal-to-noise ratios, the degree to which they are redundant with other metrics, and whether a given metric's calculated values cover a range of values sufficient to be

useful for discriminatory purposes (Fore 2003). After a suite of viable metrics has been selected, they can be aggregated into multimetric indices for testing of index responsiveness to disturbance and selection of a final set of the appropriate number of metrics to comprise the index.

Reference sites

There are many factors capable of influencing stream algal communities that are not necessarily related to anthropogenic stress. These can include geologic setting (Biggs 1996, Stevenson 1997), which in turn can influence hardness, conductivity, and alkalinity (Foerster *et al*. 2004). Stream physical attributes relating to canopy cover, slope, and stream order can also come into play (Mazor *et al*. 2006). It will be important for a statewide program to determine how such factors influence algal communities in California, and what allowances will need to be made, perhaps in addition to what is required for BMIs, in order to define and utilize reference sites.

The European Union's Water Framework Directive (WFD) provides an example of defining criteria for a reference-site network that is sensitive to the biota used for monitoring. It requires that stream types be classified in order to facilitate the comparison of "apples to apples" when evaluating monitoring results *vis-à-vis* reference expectations. To fulfill this requirement for monitoring activities in Germany, Foerster *et al*. (2004) empirically defined three types of rivers and streams based on benthic algal assemblage information: 1) organic sites (influenced by peat), and 2) siliceous and 3) calcareous sites (influenced by basin geology). Foerster *et al*. (2004) found that, even among stream reaches that are essentially unimpacted by human activities, stream type was a significant determinant of algal assemblage. Without this kind of knowledge it would be difficult to establish whether deviations of algal assemblage taxonomic composition among assessed reaches were attributable to human activities alone, or natural variation in parameters unrelated to anthropogenic stress.

Atmospheric deposition of nitrogen is also a potential concern in reference-site identification, at least for stream algae. It has been shown to contribute to nitrogen loading of streams in certain parts in the state (Fenn and Poth 1999) and may influence the algal flora even in otherwise "reference"-quality reaches in undeveloped catchments. Atmospheric deposition is likely to be most important in the vicinity of major metropolitan areas (such as the Los Angeles Basin). While modeling and on-the-ground deposition assessment can be used to identify hotspots of deposition, knowledge of the extent and magnitude of this phenomenon throughout the state is still limited.

An interesting advantage of using diatoms for bioassessment is the amenability of this assemblage to historical reconstruction. Diatom frustules[21] can remain well preserved over time, facilitating taxonomic identification even after cells die and their contents decompose. Diatoms on herbarium macrophyte specimens have been used to reconstruct the diatom assemblage of certain streams prior to major anthropogenic impacts (van Dam and Mertens 1993), thus providing insights into expected assemblage composition under reference conditions. In Canada, diatoms in the stomach contents of museum fish specimens are now being used for this same

[21] The siliceous covering of a diatom cell.

purpose (I. Lavoie, *pers. comm.*). Techniques such as these may become increasingly important as true reference streams, particularly in certain landscapes, become rarer.

Ode and Schiff (2008) recently drafted a Reference Condition Management Plan (RCMP) for California streams. Algal bioassessment in the State should take advantage of this effort to the greatest extent possible for opportunities to coordinate reference site selection and utilization with BMI and other bioassessment. Reference sites will need to be identified that cover the range of values of parameters found to influence algal assemblages under natural conditions. Sites should be classified in a way that allows comparison of monitoring reaches to reference reaches within the same class, allowing the signal of response to anthropogenic factors to be distinguished from background variation.

Work toward development of a reference network for algae should include research that uses existing and newly generated datasets to establish patterns of occurrence of taxa across important chemical and physical gradients within the variety of reference reach settings that occur across the State. As the stream algal flora of the western United States becomes better defined through ongoing research and monitoring efforts in California and neighboring states, the nature of communities in pristine and minimally impacted reaches will come into focus.

Partnerships should be formed with scientists in institutions in the State that study atmospheric deposition of nitrogen (*e.g.*, the US Forest Service) in order to begin understanding where this phenomenon could most likely influence algal communities in reference reaches. Finally, other techniques, such as historical reconstruction of algal assemblages, should be undertaken for stream types for which it is now difficult to understand what reference conditions were like prior to human influences, such as low-gradient, high order systems.

INTEGRATION WITH OTHER BIOMONITORING DATA

SWAMP will eventually need to determine whether to assess all potential bioindicators at every site, or customize a suite of assessment tools on a case-by-case basis. It will also be necessary to determine how to integrate algae data with other types of data being collected, such as BMIs, PHab, and water chemistry.

Complementarity of Bioindicators – Responses to Stress

Selection of bioindicators depends on the goals of the assessment and the stressor type being assessed (Sonneman *et al*. 2001, Fore 2003, Hering *et al*. 2006, Newall *et al* 2006). Johnson and Hering (2004) acknowledge that, of BMIs, diatoms, macrophytes, and fish, the various assemblages can provide somewhat redundant information, and not all need to be assessed in every monitoring circumstance. They provide suggestions about which assemblages to monitor depending on the goal(s) of the monitoring (*e.g.*, surveillance monitoring, operational monitoring, or investigations of catchment land-use effects) and the type of stream. Hering *et al*. (2006) stated that, of the four assemblages, diatoms were most responsive to eutrophication and nutrients. Diatoms also responded most strongly to land-use gradient, but it was suggested that this could be attributed, at least in part, to differences in life histories between the various assemblages.

Hering *et al*. (2006) stated that, of the four above-mentioned assemblages if all cannot be used, then BMIs and benthic diatoms should be prioritized, because these assemblages are the most diverse and best reflect the major stress gradients. (It should be noted that soft-bodied algae were not considered in their assessment.) They further stated that, in small (European) mountain streams, fish assemblages were usually too species-poor, thus limiting the ability to construct metrics able to detect stressors. They also found patchy distribution patterns to limit applicability of macrophytes in some systems. If the interest of the investigation is on nutrient enrichment, Hering *et al*. (2006) recommended that algae and/or macrophytes be used. If the focus is on organic pollution, then BMIs and/or fish should be used, because of their more direct responsiveness to low DO.

In justifying the value of using multiple assemblages, Newall *et al*. (2006) provided the example of a nutrient-rich discharge entering a rural or urban stream with low physical/habitat quality. Under such a scenario, BMIs might not perform well above *or* below the discharge, but diatoms could likely still detect a water-quality difference, as they are less prone to yield a low index value based on habitat considerations. Another argument for using multiple assemblages was noted by Hirst *et al*. (2002), who included information about grazer abundance in analyses and found it to be a significant predictor of diatom assemblage characteristics, suggesting the importance of understanding interactions among biotic factors in interpreting monitoring results.

Complementarity of Bioindicators – Varying Temporal Scales

Temporal patterns of responsiveness to changes in the environment should influence the choice of bioindicator for different assessment needs. Johnson and Hering (2004) consider diatom communities to be “early warning indicators.” Fore (2003) found that most of the variance in diatom assemblage associated with repeat visits to a given site was between site visits within a

year, rather than year-to-year. The opposite was true for fish and BMIs. These differences were interpreted as arising from differences in life cycles, with diatoms' being the shortest, in general.

Rimet *et al*. (2005) determined that different diatom metrics can have different "integration intervals," meaning they require different periods of time to show response to changes in the environment. These investigators took sandstone blocks colonized with diatoms from a set of streams subject to different levels of human influence and transferred them all to a reference site, for subsequent analysis at varying time intervals. Depending on the index, it took anywhere from under 40, to as long as 60, days for indices calculated for the assemblages on the transferred blocks to "equilibrate" to their new environments. Lavoie *et al*. (2008) found that the integration times for diatom assemblages could vary from less than one week to as much as five weeks, and found stream trophic state to be a significant determinant of integration time.

SUMMARY OF RECOMMENDATIONS

Below is a summary of recommended general guiding principles for the development and implementation of algal bioindicators for California:

- Develop algal indicators with the primary goal of application in ALU assessment.
- Prioritize development for use in wadeable, perennial streams.
- Ensure that the algal indicator tools developed are applicable throughout the State.
- Coordinate with other SWAMP bioassessment components whenever possible, as well as with other monitoring and assessment programs around the State.
- Use results from the first cycles of State algal monitoring, along with data from recent IBI development projects in the State, to evaluate the cost/benefit of continuing to assess the full suite of TAC-recommend algal indicators: taxonomic composition of diatom and soft-bodied algal assemblages, chlorophyll-a, ash-free dry mass, and algal percent cover.
- Use the multihabitat/reachwide method for algae collection at all sites and recommend its use by other monitoring programs. (Note: A method-calibration study that assesses compatibility between results from this method, and the targeted-habitat method is also recommended to be carried out in the Lahontan Region; see Table 3).
- Sample algae during spring/summer, concurrently with BMIs sampling, and waiting at least 30 days after any large storm/flow events. (Note: Research on optimal index periods, and frequency, for sampling algae in different ecoregions of the State is recommended; see Table 3).

Table 3 provides a breakdown of specific recommendations regarding the algal indicators to develop for SWAMP monitoring, how to begin implementing them, and some of the anticipated research needs to address as the program matures.

Table 3. Summary of recommendations for development and implementation of algal bioindicators for SWAMP.

ID	Recommendation	Priority	Integration with Existing BMI Program Elements	Cost Range[22]	Cost Type	Duration	Comments
1	Sample algae in conjunction with SWAMP and PSA monitoring; evaluate utility of the inclusion of **diatoms, soft-bodied algae, chlorophyll-a, ash-free dry mass, and algal percent cover** after initial results	high	add-on to BMI	$$ - $$$ (depends on number of sites)	annual	ongoing	• Use the multihabitat/reachwide sampling method • Conduct taxonomic identifications for diatoms and soft-bodied algae to the lowest taxonomic level possible • Assess biomass based on chlorophyll-*a* and AFDM
2	Augment the statewide QAPP to include algal assemblage indicators	high	add-on to BMI	$	one time	< 1 yr	
3	Adapt SWAMP database and field forms to include algal assemblage indicators	high	add-on to BMI	$$	one time	< 1 yr	• Maintain all SWAMP biological data in a single database
4	Develop a standard algae-sampling protocol	high	new element	$$	one time	< 1 yr	• Build upon protocol used by current algal IBI development projects, which is based upon elements of the existing SWAMP bioassessment protocol (Ode 2007) and presented in Appendix C of this document • Solicit feedback from all practitioners utilizing the protocol in 2008 in order to refine the protocol
5	Establish a taxonomic workgroup for algae based on the SAFIT model for BMIs and hold regular workshops	high	new element	$$	annual	ongoing	• Build upon taxonomic workshops initiated by current algal IBI development projects • Develop SAFIT-like standardization products (standard taxonomic effort document, standard taxonomic lists, SWAMP algae database tables)

[22] **$** = less than $20k; **$$** = 20k and 100k; and **$$$** = greater than100k. For add-ons to BMI elements, cost range indicated is what would be additional, beyond current BMI expenditures, to incorporate algae.

Table 3. Continued.

ID	Recommendation	Priority	Integration with Existing BMI Program Elements	Cost Range[23]	Cost Type	Duration	Comments
6	Fund/conduct a method "calibration" study to determine compatibility of results from targeted and reachwide algae-sampling methods	high	new element	$$$	one time	1 - 2 years	• Conduct the study in the Lahontan Region, where a preliminary IBI has been developed based on data collected *via* targeted sampling
7	Fund/conduct research on optimal index periods, and frequency, for sampling algae in different ecoregions of the State	high	new element	$$$	one time	1 - 2 years	• Build upon results of the pilot study initiated under the southern California IBI project
8	Identify a suite of reference sites statewide, including a definition of "stream types" if necessary (see Foerster *et al*. 2004)	medium	add-on to BMI	$$	one time	1 - 2 years	• Coordinate with current Reference Condition Management Program (RCMP) efforts
9	Standardize laboratory protocols	medium	new element	$	one time	< 1 yr	• Build upon protocols used by current algal IBI development projects
10	Conduct field / taxonomy training workshops	medium	new element	$$	periodic	ongoing	• Build upon workshop materials created by current southern California algal IBI development project
11	Determine applicability of existing and soon-to-be-developed metrics/IBIs to statewide and/or appropriate ecoregional levels	medium	new element	$$	periodic	ongoing	• Can use algal data from PSA and SWAMP regional monitoring (and other more local efforts, where applicable)

[23] **$** = less than $20k; **$$** = 20k and 100k; and **$$$** = greater than 100k. For add-ons to BMI elements, cost range indicated is what would be additional, beyond current BMI expenditure, to incorporate algae.

Table 3. Continued.

ID	Recommendation	Priority	Integration with Existing BMI Program Elements	Cost Range[24]	Cost Type	Duration	Comments
12	Define an approach for integrating the results of multiple (bio)indicators in order to achieve an assessment of condition based on multiple lines of evidence.	medium	new element	$$	one time	< 1 yr	• Can use data from PSA and SWAMP regional monitoring (and other more local efforts, where applicable)
13	Fund/conduct studies to determine how best to include unattached, floating macroalgae in bioassessment	medium	new element	$$$	one time	1 - 2 years	
14	Fund/conduct studies on optimal placement of sampling points for algae	medium	new element	$$	one time	1 - 2 years	• As an example, from the standpoint of algae, is it better to sample along stream margins, rather than at points 25, 50, and 75% across the stream?
15	Expand in-State capacity for algal taxonomic work by developing user-support resources	low	new element	$$$	periodic	ongoing	• Build on resources initiated through the current algal IBI development project in southern California (floras, specimen photographs, taxonomic keys) • Identify and support a host for long-term updating and maintenance of online support materials • Identify an appropriate institution in California to archive voucher specimens (*e.g.*, diatom herbarium at the California Academy of Sciences)
16	Assess the utility of indices based on genus-level (and higher) taxonomic information	low	new element	$$	one time	< 1 yr	• Can use algae data from the PSA and SWAMP regional monitoring (and other more local efforts, where applicable)

[24] **$** = less than $20k; **$$** = 20k and 100k; and **$$$** = greater than 100k. For add-ons to BMI elements, cost range indicated is what would be additional, beyond current BMI expenditure, to incorporate algae.

Additional studies may be necessary in order to tailor bioassessment approaches for region-specific needs as algal bioassessment capability is developed statewide. These include research to address the following questions:

- How do natural gradients in physical, chemical, and environmental aspects of California streams influence algal monitoring results, and potentially our interpretation of the data?
- Do algal assemblages in a specific reach respond more to local, or watershed-level conditions?
- Do different metrics/indices respond to factors at different spatial scales?
- What were "reference" diatom communities like in lowland California streams prior to major anthropogenic impacts?
- On what time scale (*e.g.*, days, weeks, months) do benthic algal assemblages shift in response to changes in their environment (*e.g.*, stressors)?
- Is there utility in using artificial substrates for monitoring (*e.g.*, to normalize across different stream types that have different dominant substrata)?

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APPENDIX A: SUMMARY OF ALGAL BIOASSESSMENT IN OTHER STATES

Introduction

This appendix provides a summary of feedback from program directors and other staff involved in algae work in several other states in the U.S. The algae programs in these states are either currently being implemented (a minority of those surveyed) or are under development. The information was obtained in mid-to-late 2007 through interviews with staff members (generally *via* phone and email) and a review of pertinent documents and online resources.

The states that currently have some form of algae bioassessment in progress, and for which information could be gathered for the present survey are:

Alabama	Maine	Pennsylvania
Alaska	Massachusetts	South Dakota
Arizona	Missouri	Tennessee
Delaware	Montana	Virginia
Florida	New Jersey	West Virginia
Idaho	New Mexico	Wisconsin
Indiana	New York	Wyoming
Kentucky	Oklahoma	

Most existing algae bioassessment programs, as well as those currently under development, aim to establish expectations for algae abundance and characteristics of the assemblage along a gradient of human disturbance. This gradient generally includes minimally disturbed reference sites as well as highly altered urban sites. The result is a taxonomic tolerance scale from which multiple metrics can be derived to establish a biological index using algae.

While all state programs seek ultimately to utilize algal indices for stream monitoring, there are slight differences in approach from state to state. These differences can be categorized as follows:

- taxonomic focus
- biomass assessment
- percent cover assessment
- sampling methodology
- physical habitat assessment

Taxonomic Focus

Unless cost prohibitive, all states surveyed utilize diatoms in their algae biomonitoring programs, and a subset utilize both diatoms and soft-bodied algae. Diatoms are classified to the lowest possible level, typically species or variety, whereas soft-bodied algae are classified to family or genus. Diatoms are generally considered to be a more robust and consistent indicator of the integrity of the stream. Some respondents commented that soft-bodied algae seem to be more affected by confounding factors, which result in variability in abundance and taxonomic composition unrelated to anthropogenic disturbance. Because of this, some states have abandoned development of soft-bodied algae as an indicator. Those states that continue to pursue development of soft-bodied algae for bioassessment reasoned that it is too prevalent to be ignored. They are therefore taking steps to eliminate confounding factors.

Budgetary constraints often dictate what data can be collected. As a result of insufficient funding, some states are unable to generate taxonomic data and are restricted to chlorophyll-*a* and/or density surveys. Table 1 shows the taxonomic focus of each state surveyed.

Table 1. Taxonomic focus by state.

	Diatoms Only	**Diatoms + Soft-bodied Algae**	**No Taxonomy (Chlorophyll or Density only)**
State	AL, AZ, ID, MO, NJ, NM, NY, WV, WI	DE, FL, ME, MA, MT, PA, SD, VA, WY	IN, OK, TN

Several states mentioned that they have experienced problems related to taxonomic inconsistencies between laboratories. To ameliorate this, the Phycology Section of the Patrick Center for Environmental Research at the Academy of Natural Sciences in Philadelphia is leading an effort to generate a national taxonomic guide and is providing taxonomic training to several state algae programs.

Biomass assessment

State algae programs are divided on the issue of how to assess algal biomass within a stream reach. The primary methods used are chlorophyll-*a*, ash-free dry mass (AFDM), or a combination of both. While many states collect biomass data, most reported that they are not seeing any significant correlation with their taxonomic metrics or with stream chemistry. Furthermore, the variability between duplicate samples is often large, which casts some doubt on the reliability of the measures. In addition, while chlorophyll-*a* is straightforward to collect from cobbles and other hard substrates, it is difficult to collect from fine-grained streams and the variability between duplicate samples in such systems is often so large as to make the values uninterruptible. As a result many states have abandoned the biomass assessments and others are considering abandoning it.

Florida uses an assessment protocol that allows for the collection of both biomass and percent cover simultaneously. Their protocol lays out 99 points over a 100-meter reach. At each point

they assess whether algae are present and the thickness of the mat at that location. Biomass assessment approaches for the various states are summarized in Table 2.

Table 2. Biomass assessment by state.

	Chl a	AFDM	Chl a + AFDM	Other	None
State	AL, MT, NM, NY, OK, WY	WV, WI	DE, IN, NJ, PA, SD, VA, WV	FL	AZ, ID, KY, ME, TN

Percent Cover Assessment

To assess percent cover of algae in a stream reach, most states are using either the Rapid Periphyton Survey, which creates visual estimates with the aid of a viewing bucket with 50-dot grid marked on the bottom (Stevenson and Bahls 1999), or a protocol that generates an estimate of percent cover by presence/absence at points along transects. Some of the RBP states are thinking of switching to the transect approach; however, this is considered to be more time-consuming and costly. Due to budgetary constraints, some states are only able to conduct a rough visual estimate in quartiles (0-25%, 25-50%, 50-75%, 75-100% cover) across the reach as a whole, and some are unable to collect percent cover data in any form. All states agreed that a more comprehensive and quantitative protocol would be more valuable. Table 3 provides a summary of the approaches used to assess algal percent cover by various states.

Table 3. Percent cover assessment by state.

	RBP method (viewing bucket)[25]	Transects, point intercept	Rough Visual Estimate	None
State	AL, KY, ME, NJ, OK, PA, TN, WI	FL, NM, SD	AZ, KY, MO, NY, VA, WV, WY	DE, ID, IN

Sampling Approach

There are two basic approaches to collection of algae samples: targeted substrates, and reachwide/multihabitat. These methods are described in more detailed in the main body of this document. Of the algae programs that target a specific substrate, cobbles located in riffles and runs that have low canopy cover are the preferred substrate type for the states surveyed. Typically programs target cobbles, wood, and emergent plants in that order, which is congruent with the approach used by the USGS NAWQA Program (Moulton *et al*., 2002.) This particular set of substrates, which represent the "richest targeted habitat" for stream algae, is preferred for ease of comparability between sites that possess these habitats. Furthermore, cobbles in riffles are often the habitat targeted for benthic macroinvertebrate (BMI) sampling, so it is deemed efficient to send a single field team to assess both algae and BMIs. Such coordinated sampling is cost-effective and facilitates comparisons between the data sets.

[25] Stevenson and Bahls 1999 in Barbour *et al*. 1999

States that assess mixed habitats within a diverse reach have usually chosen this approach either because they have a large number of streams that lack hard substrates (*e.g.* coastal plain states) or because they want to collect samples that are more representative of the reach overall, than focused only on specific habitat types. Those in the latter category feel that sampling a single substrate is too restrictive and does not adequately reflect impacts to the entire reach. However, all states sampling mixed habitats reported difficulties sampling sand and silt. Most of these states are continuing to refine methods to obtain consistent results from fine-grained habitats in streams. Kentucky's approach to this dilemma is to apply different sampling protocols depending on whether the stream is high gradient (targeted substrate) or low gradient (reachwide/multihabitat).

Some states have tried utilizing an artificial substrate, flagging tape, or a depositional plate placed in a riffle/run habitat for a set period of time. Riffles and runs are used so that the artificial substrate will not get buried before retrieval. Arizona is the only state that continues to use this protocol. States that have abandoned the protocol indicated that they were unable to distinguish the effects of the disturbance associated with installing the artificial substrate in the stream from ambient anthropogenic stressors. Table 4 shows a summary of the algae sampling approaches used by various states.

Table 4. Substrates assessed by state.

	Targeted (rocks, wood, plants)	**Multihabitat/ Reachwide**	**Artificial Substrate**
State	DE, ID, IN, KY (high gradient), ME, NJ, NM, NY, PA, TN, WV, WI, WY	AL, FL, KY (low gradient), MO, OK, SD, VA	AZ

Physical/ Habitat Assessments

Budgetary constraints were commonly cited as the main driver of how many physical/ habitat parameters are assessed during algae collection. All states recognize that site-specific habitat and physical characteristics will have large influences on algal communities. Thus, characterization of these differences is critical to interpretation of the algal taxonomic data. Most states are switching to using the EMAP/RBP protocol for habitat assessment (Barbour et al. 1999; Table 5), but as noted above, budget constraints sometimes limit whether or not a full habitat assessment can be conducted at each site. All programs include measures of stream width and depth, velocity, riparian habitat, point sources, and canopy cover, but some programs are more extensive than others.

Table 5. Types of physical/habitat assessments by state.

	Full Habitat Assessment*	Limited Habitat Assessment+
State	AL, FL, ID, KY, MO, NJ, NM, PA, SD, WV, WI, WY	AZ, DE, IN, ME, OK, VA

*Full EMAP physical/habitat assessment
+Limited EMAP: canopy cover, pebble counts, flow, stream width, depth, point sources only.

Algae IBI Development

Among the states surveyed, there were a variety of approaches to developing algal indices of biotic integrity (IBI), and many of the states surveyed are still very early in the process (Figure 1).

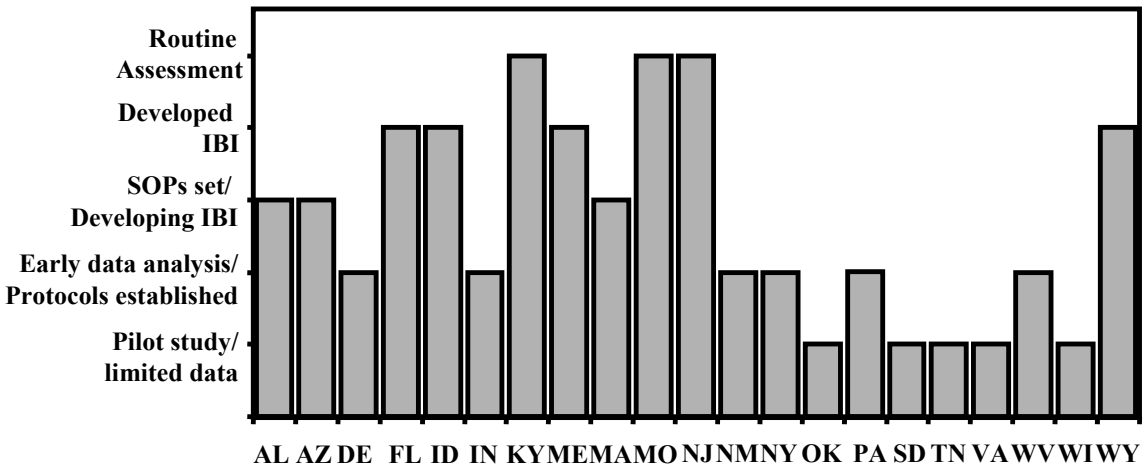

Figure 1. Comparison of State's progress in development and implementation of an algal IBI in their stream monitoring.

The following section discusses the approaches of various states with respect to the following aspects of their algal index development efforts:

- Determination of reference conditions and/or gradients of human disturbance
- Inclusion/exclusion of nonperennial streams
- Coordinated sampling with other bioindicators
- Linkages to nutrient criteria development, 303(d) listings, and TMDLs

Reference Sites/ Gradients of Human Disturbance

For most states, determination of reference sites is still largely based on best professional judgment. However, some states have begun development of statistical filters for a more quantitative and objective approach, and others are planning to follow suite. Most states are currently using watershed characteristics such as land-use, extent of hydrologic alteration, presence of discharges, and other human disturbances to identify reference locations. This is typically done using GIS layers that are verified in the field. Many states that have access to sufficient historical data are able to further refine reference site designations by assessing changes in stream chemistry and biological communities over time. Table 6 indicates how the various states identify reference sites.

Table 6. Reference condition determination by state.

	Best Professional Judgment	Statistical Filter	None
State	ID, IN, KY, ME, NJ, NM, PA, TN, WV, WI, WY	AL, AZ, FL, MO, VA	DE, NY, OK, SD

In addition to sampling streams across a gradient of human disturbance for algal index development, several states noted the importance of stratifying streams based on similarities in climate, habitat, geology, and geomorphology. Examples of classification strata include ecoregions, warm water *vs.* cold water, and gradient. Other factors used by some states when segregating streams for the purposes of data interpretation include the extent of light penetration, flow velocity/discharge, density of grazers, and water chemistry (dissolved oxygen, hardness, conductivity, and alkalinity.)

Assessment of Nonperennial Streams

While nonperennial streams represent a significant portion of stream miles in many states, most states have avoided sampling nonperennial streams due to the difficulties involved in distinguishing "natural" stresses due to seasonal dry periods from anthropogenic stresses. Of concern to the non-arid, eastern states, was the fact that it is difficult to define what is "intermittent." Some streams may be dry in a drought year, but typically flow during other years.

Nonperennial streams are considered a unique water body type and the main reason for not including these systems in bioassessment efforts is that there is no budget to develop an IBI for a second water body type. However, most of the arid states surveyed (MO, AZ, ID, WY, NM) recognize the importance of including nonperennial streams in bioassessment activities and hope to develop protocols for them in the future.

Coordinated Sampling

All states plan to coordinate algae collection with sampling for benthic macroinvertebrates, nutrient chemistry, and habitat assessment. Some will coordinate with fish collection as well. Most states envision having multiple indicators for nutrient criteria development, 303d listings,

and TMDLs such that decisions for listings and remediation are firmly supported by the best available science.

Nutrient Criteria

All states surveyed plan to link algal bioassessment to nutrient criteria. However, most states are still in the early stages of this process, and actual "criteria" have not been set by any state. All states prefer to set thresholds at "biologically meaningful" values rather than percentiles, but determination of these thresholds is not anticipated in the near future. Most states have only conducted initial surveys and are still conducting their data analysis and establishing their IBIs.

All states surveyed plan to utilize expert panels, statistical methods, and stakeholder input when establishing their algae nutrient criteria. Most states mentioned that they would use algae together with a habitat assessment, benthic macroinvertebrates, nutrient concentrations, and/or fish in a "weight of evidence" approach.

303(d) Listings and TMDLs

Most states plan to use the algal bioassessment for 303(d) listing and TMDLs but they do not have enough data to support criteria for listings yet. However, a few states have expressed concern that algal metrics might not work consistently or with sufficient confidence.

Summary of Lessons Learned

One of the primary precautionary notes made by survey respondents related to the importance of taxonomic consistency. Different laboratories were sometimes found to produce significantly different results when examining the same sample. States agreed that there is a need to develop a universal taxonomy that everyone can use to expedite comparisons among states and regions. As a corollary to this, personnel need consistent training in identification. As a first step to resolving this issue, it was noted that the Philadelphia Academy of Sciences has taken the lead in offering training courses and developing taxonomies for several states.

Several difficulties have been discovered with respect to common algae sampling approaches. For all these reasons, protocols in the states surveyed are continuously being refined and updated as new information becomes available.

- Many states noted that biomass measurements (chlorophyll-*a* and ash-free dry mass) are not producing consistent or highly useful results.
- Percent cover measurements do not seem to be very quantitative or consistent.
- Artificial substrates have been found not to produce results consistent with human disturbance or nutrient enrichment.
- Sampling in shifting sandy- or silty-bottomed streams presents a challenge for algal assessment, both in the field collection phase, and in the laboratory analysis phase.
- There is some disagreement over whether sampling a targeted substrate or reach-wide is a better approach.
- Despite their potential relationship to nutrient enrichment, soft-bodied algae are not as consistent an indicator as diatoms.

Despite some shortcomings noted by respondents, algal assemblages are seen as a powerful tool, especially when combined with other bioindicators, such as macroinvertebrates and/or fish. Respondents felt that algal assemblages are most sensitive to stream chemistry, whereas fish are most sensitive to physical stress, and macroinvertebrates are sensitive to both chemistry and physical stress. Thus, the combination of indicators can be a very valuable for assessing stream condition and providing insights into the causes of impairment.

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APPENDIX B: SUMMARY OF ALGAL BIOASSESSMENT IN SELECTED OTHER COUNTRIES

Bioassessment efforts incorporating algal indicators are undertaken in many parts of the world. In order to understand some of the motivations for algal bioassessment, approaches used, and insights gained through experiences of others, we conducted a survey of activities and programs in regions outside the United States. This appendix provides a summary of survey findings; it is not meant to be an exhaustive account of all applicable monitoring programs or efforts.

European Union

The history of utilization of benthic algae for water-quality assessment purposes goes back 100 years in Europe (Kolkwitz and Marsson 1908). The continued widespread application of algae in stream monitoring in many parts of Europe today testifies to the fact that algae remain highly valued as bioindicators. According to the European Union's (EU) Water Framework Directive (WFD), all member countries are required to evaluate waters and meet WFD criteria, which include all water bodies achieving "good Ecological Status" by 2015. The WFD expressly includes "Composition and Abundance of Aquatic Flora" as "Quality Elements" to be used for the assessment of Ecological Status and potential in rivers and streams. "Flora" in their definition includes both macrophytes and benthic algae, and encompasses higher aquatic plants, mosses, and water ferns, as well as diatoms and cyanobacteria (WFD 2003).

In order to best utilize algal indicators to facilitate monitoring *per* the WFD, some countries have developed detailed bioassessment protocols. These sometimes include supporting materials such as descriptions and pictures of algal taxa from the local floras (Schaumburg *et al*. 2005, Gutowski and Foerster 2007, Pfister and Pipp 2007). Approaches for integration of algae with other assemblages in biomonitoring (Johnson and Hering 2004, Pfister and Pipp 2007) have also been developed.

Within the general guidelines of the WFD, different countries design and implement their own algal bioassessment programs. For instance, while most countries for which survey data were gathered regularly use taxonomic composition of diatom assemblages alone (*e.g.*, Poland, Spain, Sweden, United Kingdom), a minority (*e.g.*, Austria, Germany) also include soft-bodied algae. With respect to biomass, there appears to be a strong preference for estimation of percent cover (if anything) as opposed to analysis of chlorophyll-a and AFDM. None of the respondents reported regular use of the latter in their programs, but most assess percent cover in some manner. While an exhaustive survey of all algal biomonitoring programs in Europe is beyond the scope of this appendix, the program in Austria will be highlighted as an example of one country's decisions about what to monitor and how, within the WFD framework.

In Austria, the primary goals for the algal component of biomonitoring efforts are for assessing organic enrichment and nutrient impairment. Cobbles are considered the preferred substratum from which to sample, but if they are not present, then the sediment surface is sampled. While biomass measurement in terms of chlorophyll-*a* and AFDM are not included in the assessments, percent algal cover is estimated using a viewing bucket, as is thickness of microalgal layers on

substrata. Both diatom and non-diatom algal assemblages (minus Charaphytes) are assessed, along with cyanobacteria. Taxonomic identifications are to species level, or as low as possible without having to use more involved techniques (such as scanning electron microscopy or culturing) for finer taxonomic resolution. Soft-bodied algal taxa and diatoms are given equal weight in analyses, and relative abundances of the taxa in each assemblage are determined. Three types of index are calculated from the algal assemblage data: 1.) tropic state, 2.) saprobic state, and 3.) observed/expected (O/E) taxa, using assemblages from reference sites for comparison. An Ecological Quality Ratio is calculated based on the worst performer of the three indices, and ultimately, a single value is derived based on the algae and other bioindicators.

The WFD requires a comparison of the benthic algal assemblage of each monitored stream with a reference community from the same type of water body. To facilitate this, sites are stratified by physical and geographic variables (such as stream type, ecoregion, and elevation), and reference sites are identified within each stratum. The more "reference" species (and the fewer "tolerant" species) that are found in a given stream, the higher the assigned Ecological Status for that water body. Conversely, the greater the deviation of species composition in the assessed stream from reference assemblages, the more degraded it is deemed, and the lower the Ecological Status category assigned.

As is the case with California, the issue of how to deal with sampling and interpreting data from intermittent streams is a major concern in the semi-arid region of Mediterranean Europe, which includes parts of Italy, France, Spain, Portugal, and Greece. However, no standardized approach has been developed to address any specials needs of intermittent systems. As such, they are sometimes excluded from bioassessment efforts.

Lessons learned and recommendations from the European Union component of this survey include the following:

- Some respondents expressed the importance of identifying algal taxa to species whenever possible. It has been estimated that when ~30% or more of taxa cannot be identified to species, taxonomic resolution tends to be insufficient for use of the data in bioassessment analyses (Pfister and Pipp 2007).
- Sampling of algae should be conducted at the end of the dry season, and at least 30 days should be allowed to pass following the most recent storm.
- Assessment and reference sites should be stratified according to physical and geographic factors that can influence algal communities but are relatively insensitive to anthropogenic influences. This will provide a stronger signal to stressors above background variation.

In addition, Johnson and Hering (2004) made the following specific recommendations about using multiple assemblages for biomonitoring:

- In small mountain streams, benthic diatoms (soft-bodied algae were not considered) should be used for eutrophication and acidification effects, and BMIs for "various stressors"

- In medium-sized mountain streams and lowland streams, benthic diatoms or macrophytes should be used for eutrophication and land-use effects, and BMIs or fish for hydromorphological and land-use effects

However, it was also noted that benthic diatoms and macrophytes might serve as good complementary indicators for nutrient enrichment, due to different temporal ranges, with diatoms serving as early-warning indicators and macrophytes as late-warning. The same would be true for using BMIs (which, depending on the taxon, could be considered either early- or late-warning) in conjunction with fish (late-warning) for hydromorphological and land-use effects.

New Zealand

Algae are an important component of biomonitoring activities in New Zealand pursuant to the Resource Management Act (RMA) of 1991, which states that the life-supporting capacity of the environment must be maintained, and that "there shall be no undesirable biological growths as a result of any discharge of a contaminant into water". Major goals of the RMA include protection of aquatic ecosystem purposes, fish spawning, contact recreation, water supply, irrigation, and industrial abstraction. Because of the emphasis on control of nuisance algae to protect these uses, algal biomass is a cornerstone of many types of monitoring efforts in New Zealand; however other bioindicators are also employed, depending upon the goals of the assessment. These can include diatom and soft-bodied algal assemblages, as well BMIs and/or fish.

Biggs (2000) produced a guideline document to help water managers with facilitating the intent of the RMA by determining human impacts on stream algae. This was accompanied by a comprehensive methods manual (Biggs and Kilroy 2000) that discusses a variety of assessment needs, such as ambient surveys or upstream-*vs*.-downstream monitoring at a point-source discharge point, and recommendations for the appropriate sampling method for each. While algae sampling in New Zealand generally focuses on targeted substrata, allowances are made for collections from either erosional (*e.g.,* rock or macrophyte) habitats, or depositional areas (*e.g.,* sand), and multihabitat sampling is even included in some bioassessment efforts.

For routine assessments, algal percent cover and thickness are most commonly measured, while biomass analyses of chlorophyll-*a* are generally included only when there are issues of eutrophication. Some types of monitoring efforts, such as pre-development environmental impact assessments, often incorporate synoptic assessments of algal assemblage as well. When taxonomic enumerations are carried out, both diatoms and soft-bodied algae are considered, as the full complement of algal assemblage information is deemed much more informative for environmental resource decision-making than that of diatoms alone. Calculation of indices based on the taxonomic information is generally not undertaken due to the perception that a significant amount of information is lost in the data-reduction process. Rather, there is a tendency to use other ways of summarizing the data, such as basic graphing of results (B. Biggs, *pers. comm*.)

Lessons learned in New Zealand include the recognition of a need for repeated sampling to give useful biomass results. While biomass has been found to serve as a good indicator for some questions, such data are perceived to be particularly valuable when a time series of samples is collected. Pooling of such samples for analysis has been found to provide valuable information

while affording an economy of resources to help offset the need for large sample sizes over time (B. Biggs, *pers. comm.*)

Canada

While benthic algae are routinely monitored in some parts of Canada (such as the Province of Alberta), the assemblage is not currently used as standard bioindicator in any national water quality monitoring programs. It is, however, used as a eutrophication indicator in the development of nutrient standards. There is currently an effort to develop national (and regional) standards and sampling approaches to satisfy the goals of the National Agri-Environmental Standards Initiative (NAESI) which seeks, in part, to identify/validate robust and reliable bioindicators of stream trophic status.

Studies have been conducted in recent years with the goal of providing guidance pursuant to the NAESI in terms of indicators of, and targets for, "aquatic plant" abundance, composition, or production that define trophic status of streams (Vis *et al*., 2007). Data collected have included cover of macrophytes and mosses, diatom species composition and soft-bodied algal genus composition, as well as biomass measurements. With respect to algae, cobbles have been targeted for taxonomic analysis as well as for determination of chlorophyll-*a* and AFDM, however, a multi-habitat approach has also been used for a semi-quantitative sampling of the soft-bodied algae. Several methods have also been piloted for assessing algal percent cover.

Some of the lessons learned and recommendations that have been generated from the studies of Vis *et al*. (2007) are as follows:

- Since filamentous algal length was found to be correlated with total phosphorus and cover total nitrogen, the utility of metrics based on filamentous algae should be tested further in a larger number of streams
- Data on macroalgal genera should be combined with percent cover data to develop quantitative models and metrics of eutrophication.
- The effects of riparian zone vegetation on light availability should be considered when setting stream eutrophication guidelines.
- Benthic samples for biomass determination should be collected from both open and closed canopy areas within the same site.

South Africa

The South African National Aquatic Ecosystem Monitoring Program (NAEMP) is multi-institutional in scope and has the overall goal of delivering "the ecological information for rivers and the broader aquatic ecosystems required to support the rational management of these systems". The River Health Programme (RHP) that supports the NAEMP seeks to generate information required to report on the ecological state of South Africa's river systems. Along with physical and chemical indicators, the RHP program has traditionally focused on the following bioindicators: 1) benthic macroinvertebrates, 2) fish, 3) riparian vegetation, and 4) habitat integrity. More recently, however, diatoms have been developed for inclusion into the suite.

For the purposes of the RHP, diatoms are identified to species. The results are currently summarized in a generic biological diatom index, but development of a specific diatom index is currently underway. Data on algal biomass and percent cover are not included in the monitoring.

Taylor *et al*. 2007 produced a methods manual for collection and analysis of diatom samples for bioassessment. While sampling is generally from cobbles in riffles or stems of vegetation, methods have been developed for sampling from other substrata, when necessary, such that all stream types can be included in assessment. Both perennial streams and intermittent streams are sampled for diatoms, however there are currently no special sampling or analytical methods in place that distinguish between the two stream types. With respect to lessons learned, investigators in South Africa expressed finding that genus-level information about diatom assemblages is of little if any value for bioassessment purposes, while species-level information is very powerful (W.R. Harding, *pers. comm*.)

Other Countries

Benthic algae have also been used in regional monitoring efforts and water-quality studies in many other nations, such as Israel (Barinova *et al*. 2006), India (Nandan and Aher 2005), Brazil (Lobo *et al*. 2004a,b), Argentina (Gomez and Licursi 2001, Lobo *et al*. 2004b), and Australia (Chessman *et al*. 2007).

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APPENDIX C: EXAMPLE OF A PROTOCOL FOR SAMPLING ALGAE

DRAFT

A Reachwide/Multihabitat Approach for Stream Algae and Associated Physical Habitat Sample and Data Collection

Based on Elements from the Standard Operating Procedure for SWAMP Bioassessment by Ode (2007)

May 2008

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LIST OF FIELD SUPPLIES FOR ALGAE SAMPLE AND ASSOCIATED PHAB DATA COLLECTION

General

- Full sets of datasheets on Rite-in-the-Rain paper (including at least one spare set)
- Fine-tipped and thick-tipped, waterproof pens
- Clipboards (at least two)
- Clipboard carriers (optional)
- Site dossiers containing site maps, aerials, etc.
- Thomas Guides and regional maps
- Batteries (AA, 9-volt)
- Ice chests with wet ice
- Dry ice (if not returning to lab immediately following the day's fieldwork)
- First-aid kit
- Cell phones
- Sunscreen/hats/sunglasses
- Bug repellant
- Tecnu (for poison oak)
- Snake chaps
- Drinking water, snacks

Algae sample collection

- White washtub, rectangular, plastic
- Composite sample receiving bottle, 1 L, plastic (one per site)
- Graduated cylinder, 250 mL and 25 mL, plastic
- PVC delimiter with 4-cm diameter
- Spatula
- Rubber delimiter with 4-cm diameter
- Algae brushes (clean toothbrushes)
- Syringe scrubber, 60 mL syringe barrel with end cut off and plunger fitted with Velcro
- White (**non-pigmented**) scrubby pads cut to size for the syringe scrubber (several circles per site)
- Metric calipers
- Scissors
- Calculator
- Snapping Petri dishes, 47 mm (2 per site)
- Filter forceps
- Glass fiber filters, 47 mm, 0.7 µm pore size (including foil-wrapped, pre-combusted filters for AFDM) (2 of each type per site)
- Filtering tower, 47 mm
- Aluminum foil
- Wash bottles
- DI water

- Hand vacuum pump
- 25% glutaraldehyde solution (at least 10 mL per site)
- Latex gloves, powder-free (at least 1 pair per site)
- Razor blades or Swiss army knife
- Turkey baster
- Sample labels (4 per site)
- Clear plastic tape (5 cm wide)
- Centrifuge tubes, 50 mL, plastic (2 per site)
- Whirl-pak bags, 100 mL (at least 2 per site)
- Viewing bucket (gridded not necessary)

PHab data collection

- GPS receiver
- Measuring tape
- Lengths of rope (7.5 m and 12.5 m)
- Small metric ruler (waterproof)
- Digital watch and random number table
- Digital camera
- Stadia rod
- Clinometer
- Autolevel and tripod
- Current velocity meter and top-setting rod
- Convex spherical densiometer, taped to expose only 17 intersections of the grid
- Transect flags, orange and yellow, labeled with transect and inter-transect names, respectively
- Rangefinder

1. GETTING STARTED

1.1 Before Setting Out for the Field

- Use the equipment checklist to make sure all necessary supplies are brought along.
- Have in mind at least 3 sites to visit that day (target 2 and have another site in mind as a back up if one of the first two sites is not useable.)
- Check site dossiers to make sure they are complete with maps/directions to sites and aerial photo. Bring along county maps, atlases, and Thomas Guides to further aid location of sites. Also bring along any site access permits, passes, and/or keys, as needed.

1.2 Before Leaving Vehicle for Site

Make sure car is parked in a safe spot and there are no "No Parking" signs. Stick a business card with cell phone number in the driver's window. Be sure to display the brown administrative pass placard if you are on National Forest land (or the letter of permission that is in your site dossier, if applicable).

1.3 Upon Arriving at the Site

Your site dossier contains maps, an aerial photograph, and in some cases, a USGS quad sheet, all of which indicate the *approximate* location of the area of stream intended for our assessment. These coordinate may come from previous monitoring efforts where investigators may have taken GPS readings in adjacent parking lots or from nearby roads or bridges, or using a GPS unit with poor reception/low accuracy. Because of this, they may not have a very high level of accuracy, and should not be interpreted literally.

If you are conducting a repeat visit at a site where data were collected previously for this project, your dossier should contain an aerial with the upstream and downstream transect locations indicated so that you may return to them and collect from the same area collected from previously. Site photos of transects A and K should also be included to assist identification of upstream and downstream limits of the reach. Finally, coordinates corresponding to transects A and K should be pre-programmed into the GPS.

1.4 Determining whether the site is appropriate for sampling

Once the site has been located, make an initial survey of the reach from the stream banks (being sure to not disturb the instream habitat). Ensure that there is sufficient flowing water along the length of the reach of interest to collect water samples and algae. If there is insufficient water, document this, but do not use this site for the study at this time. Before leaving, take some photographs of the site, and fill out information on the *Site Reconnaissance* datasheet. This site may be suitable for use during a subsequent sampling period if there is water in the channel at some later date. The information recorded will be useful for determining whether the site may be of interest for incorporation into the study at that time.

2. PREPARING FOR SAMPLE AND DATA COLLECTION

It is imperative that you confirm throughout the data collection effort at each site that all necessary data have been recorded correctly, by double-checking values, and confirming spoken values with your partner(s). As a general practice, you should conduct a final check across all datasheets that there are no missing values before you leave the site, and rectify any blanks.

2.1 Documenting the Reach

If the site is deemed useable for the day of the visit, fill out the *Reach Documentation* section of the field forms. Determine the geographic coordinates of the downstream or upstream end of the reach (wherever you're at at that time) with a GPS set for the NAD83 datum. Record in decimal degrees to five decimal places. *Note: Later, once you have established all your transects, you will also record the coordinates for the other end of the reach.*

Be aware that some GPS units re-set themselves to factory default settings when the batteries are changed. This can include the datum. Therefore, anytime you remove batteries from your unit, double check that the unit is still using the NAD83 datum once the batteries are replaced.

2.2 Delineating the Study Reach

Staying out of the channel, you'll need to scout the study reach in its entirety in order to make sure that it is of adequate length for our purposes (150m or 250m-long[26].) Conversely, if the reach cannot be that long (for reasons stated below), you'll need to determine the useable length of the reach, and how to space your transects so that you can fit in 11 of them at equal distances from one to the next.

Start out a little bit outside of what you anticipate will be the outer boundary of the reach (based on aerials and maps), count at least 150 large paces (for most adults, a large step is roughly equal to a meter.) Note what average wetted width[27] appears to be. If the average wetted width is ≤ 10 m, you will end up using a 150-m study reach for your data collection. If the average wetted width is > 10 m, you'll use a 250-m reach length. You can either estimate this by eye as you go along, or make your determination by a few taking cross-sectional width measurements at a locations along the way that are "representative" of the reach at large. However, if you choose the latter method, try to ***avoid stepping into the water*** in the channel as you pull the tape measure across the channel. Only cross where there are rocks or other emergent objects you can walk upon.

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[26] The standard sampling layout consists of a 150-m reach (length measured along the bank) divided into 11 equidistant transects that are arranged perpendicularly to the direction of flow. Ten additional transects (designated "inter-transects" here) located between the main transects give a total of 21 transects per reach. Main transects are designated A through K while inter-transects are designated by their nearest upstream and downstream transects (e.g., AB, BC, etc.). "A" is the downstream most transect. In extreme circumstances, reach length can be shorter than 150 m (e.g., if upstream and downstream barriers preclude a 150-m reach), but this should be avoided whenever possible. Streams > 10 m wetted width should use a reach length of 250 m. If the actual reach length is other than 150 m or 250 m this should be noted and explained on the field forms. This approach is based on the guidance for SWAMP bioassessment collection of Physical Habitat data (Ode 2007.)

[27] Wetted Width~ The wetted channel is the zone that is inundated with water and the wetted width is the distance between the sides of the channel at the point where substrates are no longer surrounded by surface water. Measure the wetted stream width and record this in the box at the top of each transect form.

A study reach should be free of any hydrologic inputs that could potentially modify the water-chemistry environment across the reach. Thus, there should be no tributaries or "end-of-pipe" outfalls feeding into the channel along the study reach. Look for any such features along the banks as you are pacing off the reach length, and if any occur, decide whether to define the reach as occurring entirely above or entirely below that feature. Alternatively, if you encounter such a feature when you have nearly reached the 150m (or 250m) target length of your study reach, then record what the current pace count is, and use that as your study reach length. Divide the paced reach length by 20. This will be the distance between the alternating adjacent Main, and Inter-, transects. Other features that should also not be present within a study reach are: bridge crossings, changes between natural and man-made (*i.e.*, concrete) channel bottoms, waterfalls, impoundments (dams and weirs), *etc*. Whatever your study reach length turns out to be (150m, 250m, or other), record it on the datasheet under "*Reach Length*."

2.3 Marking the Transects

Once you have determined that the study site will provide a reach of adequate length, record the upstream or downstream GPS point (depending on where you are when you start out) and include it on the datasheet under "*Reach Documentation*". Put down an orange flag at water's edge on one of the banks to indicate the first "Main Transect". Establish the positions of the remaining transects by heading along the entire length of the study reach (again, staying out of the water/channel as much as possible) and using the segment of rope of appropriate length to measure off successive segments of 7.5 m (for streams of wetted width ≤ 10 m), or 12.5 m (for streams > 10 m wetted width), or use the tape measure for whatever alternative length you calculated, based your measured study-reach length (see above). As you measure, always follow the curvature, or sinuosity, of the stream channel, not the water's edge", which may be irregular, and not reflective of the true stream linear footage. Estimate transect positions (and where on the banks to place the flags) by visually projecting perpendicularly from the mid-channel to the banks. (Refer to Figure 1 for a visual clarification of transect alignment relative to the stream's direction of flow.) At the end of each measured segment as you head along the stream, mark the transect location on the bank with flag. Alternate between two different flag colors (*orange* will correspond to "*Main Transects*", and *yellow* to "*Intertransects*".) When you have finished, the downstream-most flag will correspond to Main Transect "A", and the upstream-most flag (the 21st in the entire series of Main and Inter- transects) will correspond to Main Transect "K".

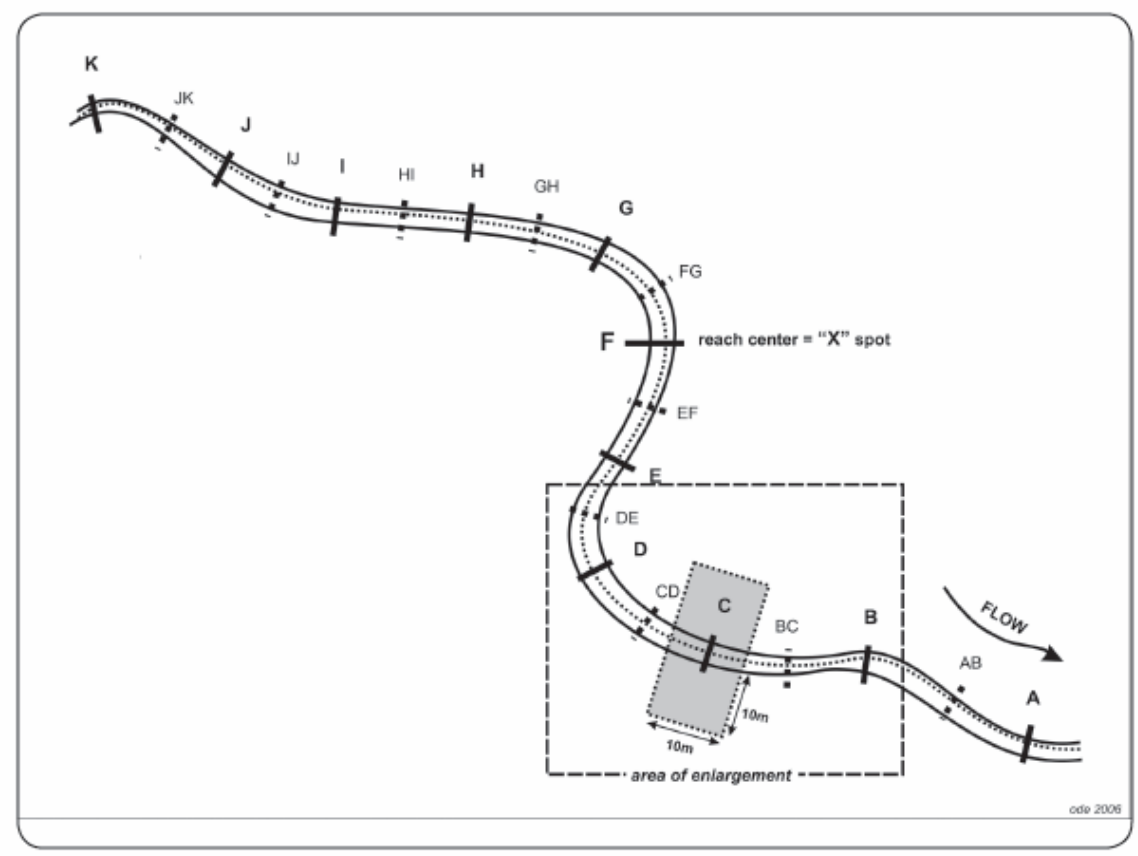

Figure 1. Reach layout geometry for physical habitat and biological sampling showing positions of 11 main transects (A – K) and the 10 supplemental inter-transects (AB- JK). The area highlighted in the figure is expanded in Figure 8. Note: reach length = 150 m for streams ≤ 10-m average wetted width, and reach length = 250 m for streams > 10-m average wetted width.

2.4 Notable Field Conditions

Record under "*Notable Field Conditions*" any evidence of recent flooding, fire, or other disturbances that might influence algae samples. Especially note if flow conditions have been affected by recent rainfall, which can cause significant under-sampling of algae biomass and diversity. If you are unaware of recent fire or rainfall events, select the "no" option on the forms. Record the dominant land use and land cover in the area surrounding the reach by evaluating land cover within 50 m of either side of the stream reach. You can use your scaled aerial photograph of the site and vicinity to guide you. (Note that a yellow line corresponding to 150m has been drawn on the aerial photograph for each site roughly along a portion of the stream. This can be used to give the assessors a rough idea of scale of the aerial, which is useful for scoring several of the field parameters.)

3. ALGAE SAMPLE COLLECTION

Algae should be collected from each transect prior to PHab data collection, so as not to disturb the algae by "trampling" the transects before the samples are collected. Furthermore, to avoid disturbing the transects for the collection of PHab data, collect algae at a distance of 1 m downstream of each transect. Algae (and PHab) data collection begins at Transect A and proceeds upstream to Transect K.

This protocol focuses on collection of algae from multiple habitats composited into one sample. This "reachwide" method seeks to sample from the variety of microhabitats that exist in the stream reach, in proportion to which those microhabitats occur. For this method, we use as guidance the approach followed by EPA's Environmental Monitoring and Assessment Program (EMAP; Peck, *et al.*, 2006.) The "multihabitat" procedure for algae collection employs an objective method for selecting subsampling locations that is built upon the 11 Main Transects used for benthic macroinvertebrate collection and PHab measurements in SWAMP bioassessment (Ode 2007.). This procedure can be used to sample any wadeable stream reach, since it does not target specific habitats. Because sampling locations are defined by the transect layout, the position of individual sub-samples may fall within a variety of "erosional" or "depositional" habitats.

For the multihabitat method, the sampling position within each transect is alternated between the left, center, and right positions along a transect (defined as the points at 25%, 50% and 75% of wetted width, respectively) as you move upstream from transect to transect. Starting with the downstream transect (Transect A), identify a point that is 25% of the stream width from the left bank (as you are facing downstream). *Note: The actual sampling location should be displaced one meter downstream of the Main Transects in order to avoid disturbing substrates for subsequent PHab assessments.*

During algae collection and processing, make every attempt to keep the sample material out of the sun as much as possible. Try to do most or all work in the shade, and process samples as quickly as possible, because chlorophyll a begins to degrade when exposed to light.

Also, before you begin sampling at any given site, make sure that the washtub has been very carefully cleaned since the last site, so that no algal material is carried over to contaminate the current sample. The same applies to all other algae collection apparati (brushes for scrubbing, graduated cylinder, turkey baster, PVC and rubber delimiters, spatulas, syringe scrubber, etc.)

3.1 Multihabitat Sample Collection

Step 1:
1) Starting with Transect A, determine whether the selected sampling point is located in an erosional (*e.g.*, riffle) habitat or a depositional (slack-water, pool) habitat. Based on this, collect a single sample at the point using the appropriate procedure outlined in Step 2. You will gather substrates into the plastic washtub as you proceed from one transect to the next. Depending on the types of substrate encountered, you may end up with a washtub containing cobbles, and/or

sand, and/or gravel, and/or pieces of wood, *etc*. As you collect, tally the number of samples from each substrate type on the *Algae Sample Collection Worksheet*, as well as what apparatus was used to delimit the sampling area for each.

Step 2:

***a. Erosional habitats* (e.g., rock, wood, *etc*.):**

1) If the erosional substrate that falls beneath your sampling point is small enough, pick it up and place it in the CLEAN plastic washtub.
2) Once all 11 transects have been sampled (see below), it is time to isolate the algae from the pieces of substrate in the washtub. For erosional samples, use a CLEAN rubber delimiter (made from a bicycle tire; Figure 2) to define a 12.6 cm^2 area on the upper surface of the substrate. *Take care to ensure that the surface that is being scrubbed is truly the* ***upper*** *(generally at least somewhat "slimy") surface of the substrate as it had been oriented in the stream.* Dislodge attached algae from the portion of substrate within the delimiter by brushing it with a CLEAN stiff-bristled toothbrush. If there is a thick mat of algae, use a forceps or razor blade first to dislodge the larger matter, then scrub with the brush.

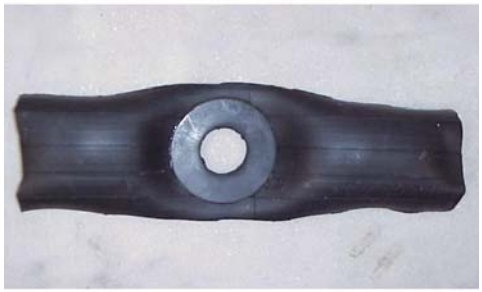

Figure 2: Rubber tire delimiter.

3) Fill a wash bottle or turkey baster with stream water. Using as minimal a volume of water as possible, rinse the scrubbed algae from the substrate, the delimiter, and the brush into the washtub. Use water sparingly. Attempt to use no more than 500 mL total for the 11 samples to be collected along the transects; however, sometimes it will be necessary to use a little more than this, when there is a lot of material in the sample to be cleaned. Make sure that the entire surface within the delimiter has been scrubbed and rinsed well in order to remove all the algae in that area. It should feel relatively rough when you have finished, meaning that essentially all of the algae have been removed.

***b. Depositional habitats* (*e.g.*, sediment, sand, gravel, etc.):**

1) Using a CLEAN PVC delimiter (plastic coring device with an internal diameter of 4 cm; Figure 3), sample algae from depositional habitats by pressing into the top 1 cm of sediment, sand, or gravel. (To facilitate consistent sampling, it is useful to paint a bright line indicating a depth of 1 cm around the bottom of the sampling device.)
2) Gently slide a masonry or kitchen spatula beneath the delimiter, being careful to keep the collected sediment contained within the delimiter.
3) Remove extra sediment from the spatula around the outside of the delimiter.

Figure 3. PVC delimiter

4) Transfer the contents held in the delimiter by the spatula to the washtub. Once material corresponding to all 11 Main Transects has been collected, any sand, gravel, silt, or portions of leaves in the tub will need to be massaged gently with the fingers in order to dislodge any clinging algae.

Follow Steps 2a/b for all transects to produce an algae composite sample for the stream reach by rotating through the 3 collection positions as you move from transect to transect heading upstream in the following order: left at one transect (*e.g.*, Transect A), center at the next transect (e.g., Transect B), then right at the next transect (*e.g.*, Transect C), and so on. In the end, you want a total of 11 samples to have been included in the composite. Remember to tally substrate type collected as you go.

If the substrate that is "hit" along a sampling transect cannot be removed from the water (as in the case of bedrock, a partially buried boulder, or a concrete channel bottom), use a "syringe scrubber" (Davies and Gee 1993; Figure 4) to collect an algae sample from it. To do this, affix a **NEW** scrubby pad circle onto the bottom of the syringe plunger using the Velcro hooks on the end of the plunger. With the scrubby pad flush with the edge of the syringe, cover it with a clean spatula, and submerge it into the water. Position the end of the syringe just above the spot to be sampled. Gently slide the spatula away without disturbing the algae on the surface of the submerged substrate. Press the barrel of syringe firmly against the substrate, and "grind" the scrubby pad against the substrate by rotating the syringe sampler 3 times. Gently retract the plunger just slightly, so it's not up against the substrate anymore, but not so much that it pulls a lot of water into the barrel. Carefully slide the spatula back under the syringe barrel, trying not to allow too much water to rush into the barrel, and pull the instrument back up out of the water. Hold the instrument over the washtub and then remove the spatula, allowing any water to fall into the tub. Carefully detach the pad from the plunger, and place the pad in the washtub. Remove as much algal material from the pad as possible by rinsing it off and wringing it into the washtub before discarding the used pad.

Figure 4. Syringe scrubber.

If the substrate you hit on a given transect is a mat of macroalgae that is native to the reach being sampled (*i.e.*, it is obviously not imported from upstream), use the PVC delimiter and the spatula to "cut" a circle out of the macroalgae. Remove any extra material from around the edges of the delimiter before adding the sample to the washtub. Likewise, if the substrate hit is part of an immersed macrophyte, or old, dead leaves settled at the bottom of a pool, use the PVC delimiter/spatula combination to isolate a constant-area section of those substrates, and discard the extra material that falls outside the delimiter. A razor blade can be used for cutting this away. As with the sand and gravel, the pieces of macrophyte or dead leaves isolated with the PVC delimiter should be massaged in the washtub in order to remove all algae coating them.

If other substrate types are encountered, they can be sampled from as long as there is good reason to believe that they were not recently introduced into the stream, either by flowing from the upstream regions, or by recently falling into the stream, as they would then not be representative of the local instream environment. Use the collection instrument you deem to be most appropriate to sample the substrate and be sure to indicate the type of substrate, and the collection instrument used, on the data sheet. This will be important for calculating total area sampled for the composite.

Once algae have been removed from all substrates in the washtub, gently agitate the washtub and then start pouring the liquid portion of its contents into a graduated cylinder, leaving all substrate material behind. Make note of the volume of the liquid poured off, and then transfer this liquid into a CLEAN 1L plastic bottle. Repeat this process (regularly agitating the mixture in order to keep the microalgae in the sample in suspension as much as possible, while minimizing the amount of suspended sand and silt) until all the liquid has been measured in the graduated cylinder and poured off into the sample bottle. Rinse the sand, *etc*, with the squirt bottle to remove as much as possible of the residual algae, and also measure the rinsate and add to the sample bottle. Because you are leaving as much as possible of silt, sand, and any large substrate material behind, the final composite volume should reflect only the liquid component of the sample. *Record the volume of the composite sample on the Algae Sample Collection Worksheet. This value will also be recorded on all algae sample labels (*i.e., *for the diatom and soft-bodied algae taxonomic ID samples, the ash-free dry mass, and the chlorophyll-*a*; see below.)*

Step 3:
Four different types of laboratory samples are prepared from the composite sample:

- ID/enumeration samples
  - 1 for identification of diatoms
  - 1 for identification of soft-bodied algae
- 1 chlorophyll *a* ("chl *a*") sample (or two, if collecting duplicates at that site)
- 1 biomass (ash-free dry mass, of "AFDM") sample (or two, if collecting duplicates at that site)

These samples are prepared as described below.

3.2 Sample Processing

The ID/enumeration samples will each be aliquoted into 50-mL centrifuge tubes, chemically preserved, and refrigerated, whereas the chlorophyll-*a* and AFDM samples will be collected on filters and stored on wet ice in the field, and then frozen as soon as possible after returning from the field. The filters are to be kept frozen until analysis (which should occur within 30 days of collection). If you are spending the night in a hotel, you will need to buy dry ice to freeze the filters upon finishing the day's fieldwork, and keep on dry ice until the samples can be transferred to the freezer back at the lab.

Record on each sample label the volume of the composite sample, as well as the volume aliquoted (for the taxonomic ID samples) or filtered (for the chlorophyll-*a* and ADFM samples). All of these volumes should also be recorded on the *Algae Sample Collection Worksheet*. On the sample labels, also circle the sample type: "diatom", "soft", "per chl" (for "periphyton" = benthic algal chlorophyll-*a*), and "AFDM". Finally, complete all the remaining information on each label, like Site Code, Date, and Sample ID.

ID/enumeration samples: For the two taxonomic ID/enumeration samples, material from the composite sample will be aliquoted into CLEAN, plastic centrifuge tubes and the samples will be preserved with glutaraldehyde. To set up the tubes, completely fill out a label for each, and designate one for diatoms and one for soft-bodied algae, as indicated above. Remove the backs of the labels and affix the sticky sides to the sample tubes. Cover the labels completely with clear

plastic tape to prevent the writing on the label from smearing when it is later placed in the wet-ice chest.

The following procedure is used to make the taxonomic ID/enumeration samples. Sometimes there is a clump of macroalgae in the composite sample. If this is the case, the clump is first removed from the composite liquid, squeezed out gently, and rolled into a cylinder shape that is relatively even in thickness along its length. If there is more than one type of macroalgae in the sample, they should be layered on top of one another lengthwise so that they are represented in roughly constant proportions across the length of the "cylinder". A quarter of the cylinder, lengthwise, is cut off and put into the (still empty) soft-bodied algae ID centrifuge tube. The clump is pushed down into the tube, and the top is flattened, so that the volume of the clump can be estimated using the graduations on the tube. The estimated volume of this clump will be used in a calculation (see below). The remaining three-quarters length of cylinder is set aside in the shade/cool.

The liquid portion of the composite is agitated to suspend the microalgae, and is poured into the soft-bodied algae sample tube (on top of the clump of macroalgae, if present) to the 45 mL mark; however, midway through pouring, the composite sample should be swirled some more to ensure that the material is still fully suspended. Once the sample in the tube is at the 45 mL mark, add 5 mL of a 25% solution of glutaraldehyde for a total volume of 50 mL in the tube (and a final glutaraldehyde concentration of 2.5%). *Note: Be sure to wear latex gloves and glasses or goggles before opening the glutaraldehyde, as it should never be touched with bare hands or allowed to splash into eyes. Also make sure you open it only in a very well-ventilated place (like outdoors) and avoid breathing in fumes. Glutaraldehyde from the sample must not be allowed to ooze outside the tube, as it could cause the ink on the bottle label to smear if it came into contact with it.*

Cap the tube tightly and agitate to mix the glutaraldehyde into the sample as thoroughly as possible. *Note: if there is a clump of macroalgae stuck in the bottom of the sample tube, it helps to dislodge it before adding the glutaraldehyde, because once the volume in the tube is the full 50mL, it is more difficult to mix.*

After the soft-bodied algae sample has been dispensed, in preparation for dispensing the diatom, chlorophyll-*a*, and AFDM samples, the volume in the remaining composite sample must be reduced to equal three-quarters of the original volume. This is done by pouring off excess composite sample. For example, if the original composite volume was 480mL, you will be discarding enough composite sample to get down to 360 mL. For convenience, you can use this formula to calculate how many mL to pour off and discard from the composite:

volume (mL) of composite to pour off = (0.25 * C) – 45 + A

where "**C**" is the original composite volume and "**A**" is the approximate volume of the clump of macroalgae that was placed in the soft-bodied algae sample tube (tamped down and flattened).

As always, be sure to agitate the composite adequately in order to ensure that the sample is properly suspended before pouring off the calculated volume. Once the required amount has

been discarded, the remaining three quarters of the macroalgal clump ("cylinder") is cut into *very* fine pieces with a scissors, and these are added back to the composite liquid. Cap the composite bottle and shake vigorously to homogenize the bits into the liquid as much as possible, while not agitating so hard as to risk busting cells and releasing chlorophyll. Aliquot 45mL of this homogenate into the diatom ID sample tube, again swirling the bottle midway through pouring, and add 5mL of 25% glutaraldehyde, as was done for the soft-bodied algae sample. Cap tightly and store both the diatom and soft-bodied algae sample tubes on wet ice in the field. Refrigerate them upon return to the lab. The remaining composite sample will be used to prepare the chlorophyll-*a* and AFDM filters, as described below.

*Note: If no macroalgal clumps were present in the composite sample, then simply aliquot 45 ml of the well-mixed composite sample into each of the labeled centrifuge tubes for diatoms and soft-bodied algae, preserve with the glutaraldehyde, and put on ice, as described above. Then proceed to filtering the composite sample for chlorophyll-*a *and AFDM.*

Chlorophyll-*a* samples: *Note: The procedure to filter chlorophyll samples should be carried out quickly, and in the shade as much as possible, to minimize exposure of the sample to light, and minimize chlorophyll degradation thereby*. For the chlorophyll-*a* samples, use a CLEAN filter forceps to center a glass-fiber filter onto the mesh platform of a CLEAN filtering tower apparatus, and rinse the filter a little with DI water to seat it well into the mesh before attaching the filter reservoir on top. *Never touch the filters with hands or anything other than a clean forceps.* Agitate the algae composite sample to suspend all the algal material in the sample. Carefully measure 25 mL from the composite sample using a small, clean graduated cylinder. Midway through pouring the 25 mL, swirl the composite sample again to ensure that the material is still fully suspended. Pour the remainder of the 25 mL, and then pour the measured sample into the filter reservoir. Once empty, rinse the graduated cylinder with a few mL of DI water, and add this to the reservoir. To filter the sample, create a gentle vacuum with the hand pump. *Be sure to proceed very slowly, and pump only one stroke at a time until all of the liquid in the sample is passed through the filter.* If it becomes impossible to filter a whole 25 mL of the sample and remove the water efficiently, discard the filter and try again with a smaller volume (*e.g.*, 10 mL.) *For all samples, be sure to record the volume of the composite sample that was actually filtered, both on the Algae Sample Collection Worksheet, and on the sample label.* Rinse the sides of the filter reservoir with a few mL of DI water, and continue filtering until the water is drawn down. *The filter should not be sucked dry, but rather left slightly moist, in order to avoid applying excessive pressure to the sample, which could cause algal cells to burst and consequent loss of chlorophyll.*

After all the liquid has passed through, check the filter to see if there are any bits of non-algal plant matter (like tiny seedlings or bits of leaves). If so, remove them with a clean forceps, being careful not to remove any algae in the process. Then remove the filter from the filtering device, fold the filter in half using the forceps, and place it inside a clean, snap-top Petri dish. Envelope the Petri dish completely in a small sheet of aluminum foil in order to prevent any light from reaching the filter. Place the covered Petri dish and its corresponding, completely filled-out sample label (face outward) into a Whirl-pak bag, purge as much of the air out of the bag as possible, "whirl" it shut, and seal it tightly with its wire tabs, **so that water in the cooler cannot enter the bag**. Shove the sample packet down into the ice in your cooler and go on to the next

sample to filter. Collect a duplicate benthic algal chlorophyll-*a* sample at at least 5% of your sites. *Always thoroughly rinse the sides of the filter reservoir and the interface between the mesh filter seating and the screw-on part of the reservoir with DI water between samples.* Also periodically dump the filtrate from the receiving chamber so it doesn't overflow during filtration.

Ash-free dry mass (AFDM) samples: For the AFDM samples, you must use glass-fiber filters that have been precombusted. *Never touch the filters with hands or anything other than a clean forceps.* The filters to use should be labeled "for AFDM", and stored in aluminum sleeves. Follow the same process as that used for chlorophyll-*a* sample filtering. After all the liquid has passed through, check the filter to see if there are any bits of non-algal plant matter (bits of leaves or wood). If so, remove them with a clean forceps, being careful not to remove any algae in the process. Then use the forceps to fold the AFDM filter in half and wrap each filter individually, loosely in a small sleeve of clean aluminum foil. Be careful not to squeeze the filter, which could cause the sample to ooze from the filter onto the aluminum sleeve.

Store each wrapped AFDM filter in a sealed Whirl-pak bag containing a completely filled-out sample label, including the volume that was filtered (*i.e.*, 25mL or otherwise). As with the chlorophyll-*a*, purge as much of the air out of each bag as possible, "whirl shut", and seal tightly with the wire tabs. Submerge all filter packages well into the ice inside your cooler immediately upon preparation, and keep them as cold as possible until the samples can be frozen back at the lab that evening, or placed on dry ice, until they can be put into the lab freezer. *Note that if the Whirl-pak bags contain a lot of air, they will float on top of the ice water in the cooler, and they then run the risk of not being kept cold enough.* As with the chlorophyll-*a*, collect duplicate samples of ADFM at at least 5% of sites. The holding time for the chlorophyll *a* and AFDM samples is 30 days from collection, when kept frozen.

NOTE: If the project calls for determining the contribution to biomass of unattached, floating algal mats relative to truly benthic algal biomass (*i.e.*, if it requires separate estimates for unattached *vs*. truly benthic algae) then you will need to collect a duplicate set of unattached, floating macroalgal samples at every transect where that is the substrate type upon which the sampling point falls. Sample the duplicates so that they are as similar as possible to the originals in terms of thickness and density. Composite the macroalgal duplicates into a bottle, separately from the original composite sample, and make note of how many duplicates were collected in total across the transects, as this information will be needed for calculation of unattached *vs*. truly-benthic algal biomass.

3.3 Qualitative Algae Sample Collection

At every study reach, also collect a "qualitative" sample for both soft-bodied algae and diatoms. The qualitative samples consist of a composite of all types of algae visible within the reach. This is of value because it can provide a fairly exhaustive list of algae taxa present at the site. It is also very important for soft-bodied algae identification later in the laboratory, because it allows larger, more intact specimens to be collected than those that may end up in the more "homogenized" quantitative sample (described above), and it facilitates culturing of specimens, which can also aid identifications.

For qualitative samples, collect specimens of all obviously different types of macroalgal filaments and mats, microalgae (in the forms of scrapings using a razor blade or knife), and depositional samples (sucked up from along the surface of sediments using a clean turkey baster). Collect from as many distinct locations as possible throughout the reach so as to capture as much of the apparent diversity in the reach as possible. Also, for macroalgae, when possible, try to grab part of the holdfast structures that attached the algae to the substrate, as theses structures can be useful for taxonomic identification.

Since these samples are merely qualitative, and not quantitative, you needn't worry about collecting them in a manner that is representative of their relative abundances within the reach. Note, however that if there is only a small amount of macroalgae in the stream, it should be allocated preferentially to the soft-bodied algae laboratory sample, as opposed to the diatoms, because it is primarily needed for the soft-bodied algal identification work (although diatoms can live as epiphytes on macroalgae, so macroalgal samples are also of values for the diatom work.)

Using a thick, waterproof marker, label each of two Whirl-pak bags with the Site Code, Date, Sample ID, and either "diatom" or "soft". Fill each with a total volume of up to 100 mL of qualitative algae sample + water. Purge any extra air from the bags, seal with the wire tabs by twisting them together (not just folding them, as this can result in leakage), and store in the cooler on wet ice in the field. Refrigerate the samples immediately upon return to the lab. Unlike with the quantitative samples, **do not add glutaraldehyde** (or any other preservative) to these qualitative samples. Because they are not preserved, these samples should be examined by a taxonomist as soon as possible (within a week at most), as they can decompose fairly rapidly. Decomposition is of particular concern for the soft-bodied algae sample.

4. PHAB TRANSECT-BASED MEASUREMENTS TO ACCOMPANY ALGAE BIOASSESSMENT

Once all algae samples have been collected at a given transect, PHab data collection can begin there. Data for the following parameters will all be entered on Transect-specific datasheets (one corresponding to each of the 11 Transects). Be sure to label each transect data sheet with the appropriate transect name. The guidance for the parameters below have been adapted from the SWAMP Bioassessment protocol (Ode 2007).

4.1 Wetted Width

The wetted channel is the zone that is inundated with water and the wetted width is the distance between the sides of the channel at the point where substrates are no longer surrounded by surface water. Measure the wetted stream width and record this in the box at the top of the Transect data form.

4.2 Bankfull Width

The bankfull channel is the zone of maximum water inundation in a normal flow year (one-to-two year flood events). Since most channel formation processes are believed to act when flows are within this zone, bankfull dimensions provide a valuable indication of relative size of the waterbody.

Scout along the stream margins to identify the location of the bankfull margins on either bank by looking for evidence of annual or semi-annual flood events. Examples of useful evidence include topographic, vegetative, or geologic cues (changes in bank slope, changes from annual to perennial vegetation, changes in the size distribution of surface sediments). While the position of drift material caught in vegetation may be a helpful aid, this can lead to very misleading measurements. Note: The exact nature of this evidence varies widely across a range of stream types and geomorphic characteristics. It is helpful to investigate the entire reach when attempting to interpret this evidence because the true bankfull margin may be obscured at various points along the reach. Often the bankfull position is easier to interpret from one bank than the other; in these cases, it is easiest to infer the opposite bank position by projecting across the channel. Additionally, height can be verified by measuring the height from both edges of the wetted channel to the bankfull height (these heights should be equal).

Stretch a tape from bank to bank at the bankfull position. Measure the width of the bankfull channel from bank to bank at bankfull height and perpendicular to the direction of stream flow.

4.3 Bankfull Height

Measure bankfull height (the vertical distance between the **water surface** and the height of the bank, Figure 3) and record in the boxes at the top of the Transect data form under "*Bankfull Width*" and "*Bankfull Height*".

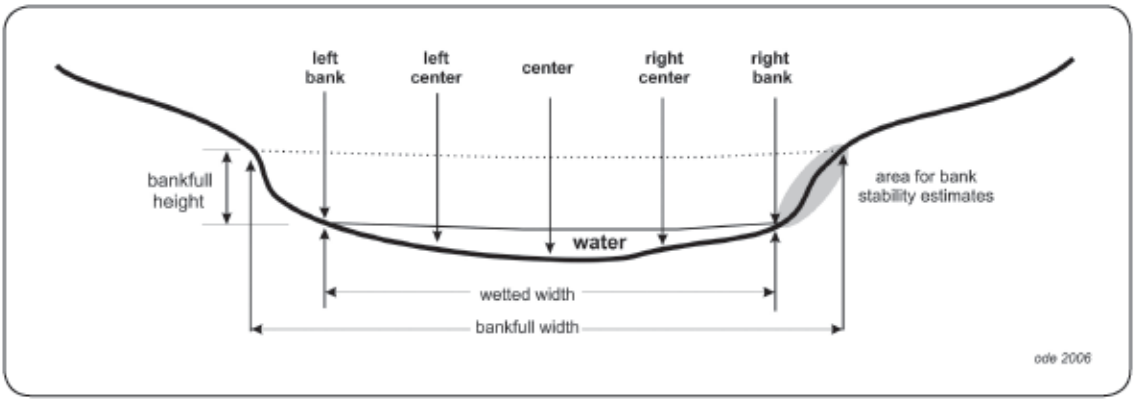

Figure 6. Cross sectional diagram of a typical stream channel showing locations of substrate measurements, wetted and bankfull width measurements, and bank stability visual estimates.

4.4 "Pebble Count": Transect Substrates

Particle size frequency distributions often provide valuable information about instream habitat conditions that affect benthic communities. The Wolman pebble count technique is a widely used and cost-effective method for estimating the particle size distribution and produces data that correlate with costly, but more quantitative bulk sediment samples. Coarse particulate organic matter (CPOM, particles of organic material such as leaves that are greater than 1.0 mm in diameter) is a general indicator of the amount of allochthonous organic matter available at a site, and its measurement can provide valuable information about the basis of the food web in a stream reach. The presence of CPOM associated with each particle is quantified at the same time that particles are measured for the pebble counts.

Transect substrate measurements are taken at five equidistant points along each transect (Figure 6). Divide the wetted stream width by four to get the distance between the five points (Left Bank, Left Center, Center, Right Center and Right Bank) and use a measuring device to locate the positions of these points (*e.g.*, a stadia rod or measuring tape). Once the positions are identified, lower a folding meter stick though the water column perpendicular to both the flow and the transect to identify the particle located at the tip of the meter stick. *It is important that you are not subjective about selecting a particle, as this will result in failing to generate an accurate assessment of the size class distribution of particles present in that stream reach.*

4.5 Depth

With the folding meter stick, measure the depth from the water surface to the top of the particle to the nearest cm and record on the datasheet.

4.6 Particle Size Class

Remove the particle from the streambed. Assign the particle to one of the size classes listed in Table 1 (these are also provided in a box on the transect form), based on its *intermediate axis length* (Figure 7). All particles less than 0.06 mm should be recorded as fines, and all particles

between 0.06 mm and 2.0 mm recorded as sand, *etc*. Record this information under Substrate size class.

Table 1. Particle size class codes, descriptions, and measurements.

Size Class	Code Size Class Description	Common Size Reference	Size Class Range
RS	bedrock, smooth	larger than a car	> 4 m
RR	bedrock, rough	larger than a car	> 4 m
XB	boulder, large	meter stick to car	1 - 4 m
SB	boulder, small	basketball to meter stick	25 cm - 1.0 m
CB	cobble	tennis ball to basketball	64 - 250 mm
GC	gravel, coarse	marble to tennis ball	16 - 64 mm
GF	gravel, fine	ladybug to marble	2 – 16 mm
SA	sand	gritty to ladybug	0.06 – 2 mm
FN	fines	not gritty	< 0.06 mm
HP	Hardpan (consolidated fines)		< 0.06 mm
WD	wood		
RC	concrete/ asphalt		
OT	other		

Be sure to use only the established codes for particle size class. Confirm the 2-letter codes for the particles as you call them out to your partner recording the data.

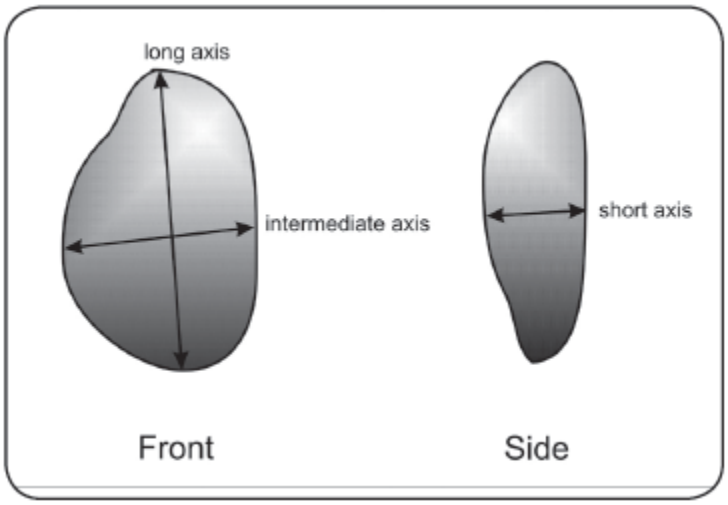

Figure 7. Diagram of three major perpendicular axes of substrate particles. The intermediate axis is recorded for pebble counts.

4.7 Cobble Embeddedness

It is generally agreed that the degree to which fine particles fill interstitial spaces has a significant impact on the ecology of benthic organisms and fish, but techniques for measuring this impact vary greatly. Here we define embeddedness as the volume of cobble-sized particles (64-250 mm) that is buried by fine and sand particles (<2.0 mm diameter).

Every time a cobble-sized particle is encountered during the pebble count, remove the cobble from the streambed and visually estimate the percentage of the cobble's volume that has been buried by fine/sand particles.

Record the embeddedness of all cobble-sized particles encountered during the pebble count. Embeddedness should be recorded to the nearest 5%. The cobble embeddedness scores do not have to correspond with the specific particles in the pebble count cells, but are merely a convenient place to record the data. If 25 cobbles are not encountered during the pebble count, supplement the cobbles by conducting a "random walk" through the reach. Starting at a random point in the reach, follow a transect from one bank to the other at a randomly chosen angle. Once at the other bank reverse the process with a new randomly chosen angle. Record embeddedness of cobble-sized particles in the cobble embeddedness boxes on the transect forms until you reach 25 cobbles. If 25 cobble sized particles are not present in the entire reach, then record the values for however many cobbles are present.

4.8 CPOM

Record the presence or absence of Coarse Particulate Organic Matter (CPOM) that is > 1 mm diameter, and within 1 cm of the particle.

4.9 Algal Cover

For each piece of substrate "hit" along the transects, also record information about algal cover on that substrate. For any film of algae ("Micro Algae" on the datasheet), estimate the presence / thickness category according to the scheme in Table 2. For thicker microalgal layers, a calipers or ruler can be used for measurement. For layers too thin to measure, use the diagnostic criteria listed in the last column of the table.

Table 2. Microalgal thickness codes and descriptions.

Code	Thickness	Diagnostics
0	None	No layer is visible, and the surface of the substrate feels rough.
0.5	Present, but not visible	No layer is visible, and scraping a fingernail scraped across the surface leaves no visible trail, BUT the surface of the substrate feels slimy.
1	<0.5mm	Layer is visible. Rubbing fingers on surface may produce a brownish tint on them, and scraping with a fingernail produces a visible trail.
2	0.5-1mm	
3	1-5mm	
4	0.5-2cm	
5	>2cm	
NA	(can't tell)	(see explanation below)

In the case of fine sediments and sand, it may not always be possible to determine conclusively whether there is a layer of algae on the grains. If no film is visible on the surface of the sediment, and there is no sliminess when grains are rubbed between your fingers, score as "NA".

In addition to marking cover of algae on the surfaces of substrate, mark the presence of algae in the water column, and floating mats on the water's surface, if they are intercepted by the sampling point. For submerged filamentous macroalgae that is intercepted at some point in the water column by a sampling point along a transect, estimate the length (in cm) of the filament, and fill this value in the appropriate cell on the data sheet. If no filaments are intercepted, enter "A" for "absent." For macroalgal floating mats that are **unattached** to the channel substrates, mark "P" for present and "A" for absent. Also, if a vascular plant ("macrophyte") is intercepted, mark "P" for "present". Otherwise, mark "A" for absent.

4.10 Dry Portions of Stream

If in the course of recording data at the 5 points along a given transect, a dry particle (substrate) is encountered, score size class, CPOM, and presence of macrophytes, as described above, but code everything else as follows (and shown as **highlighted/bold** examples on the table below): % embedded = **ND**; Depth = **0**; micro algae (thickness code) = **"DRY"**; macro-/filament = **"DRY"**; macro-/floating = **"DRY".**

Substrate Size Class	GC	GC	SB	GF	GC
% Embedded (if a cobble)	ND	ND	**ND**	ND	ND
Depth (cm)	10	4.5	**0**	1	3
CPOM (P/A)	P	A	A	P	P
Micro Algae (thickness code)	1	0.5	**DRY**	2	0
Macro-/Filament (length/units, "A" if absent)	A	A	**DRY**	A	A
Macro-/Floating (P/A)	A	A	**DRY**	A	A
Macrophytes (P/A)	A	A	A	P	A

4.11 Bank Stability

The vulnerability of stream banks to erosion is often of interest in bioassessments because of its direct relationship with sedimentation.

For each transect, record a visual assessment of bank vulnerability in the region between the wetted width and bankfull width of the stream margins and between the upstream and downstream inter-transects. Choose one of three vulnerability states: eroded (evidence of mass wasting), vulnerable (obvious signs of bank erosion or unprotected banks), or stable.

4.12 Human Influence

For the left and right banks, estimate a 10 x 10 m riparian area centered on the edges of the transect (see Figure 8). In the "*Human Influence*" section of the Transect data sheet, record the presence of 11 human influence categories in three spatial zones relative to this 10 x 10 m square (between the wetted edge and bankfull margin, between the bankfull margin and 10 m from the stream, and between 10 m and 50 m beyond the stream margins): 1) walls/rip-rap/dams, 2) buildings, 3) pavement/cleared lots, 4) roads/railroads, 5) pipes (inlets or outlets), 6) landfills or trash, 7) parks or lawns (e.g., golf courses), 8) row crops, 9) pasture/ rangelands, 10) logging/ timber harvest activities, 11) mining activities, 12) vegetative management (herbicides, brush removal, mowing), 13) bridges/ abutments, 14) orchards or vineyards. Circle all combinations of impacts and locations that apply, but be careful to not double-count any human influence observations.

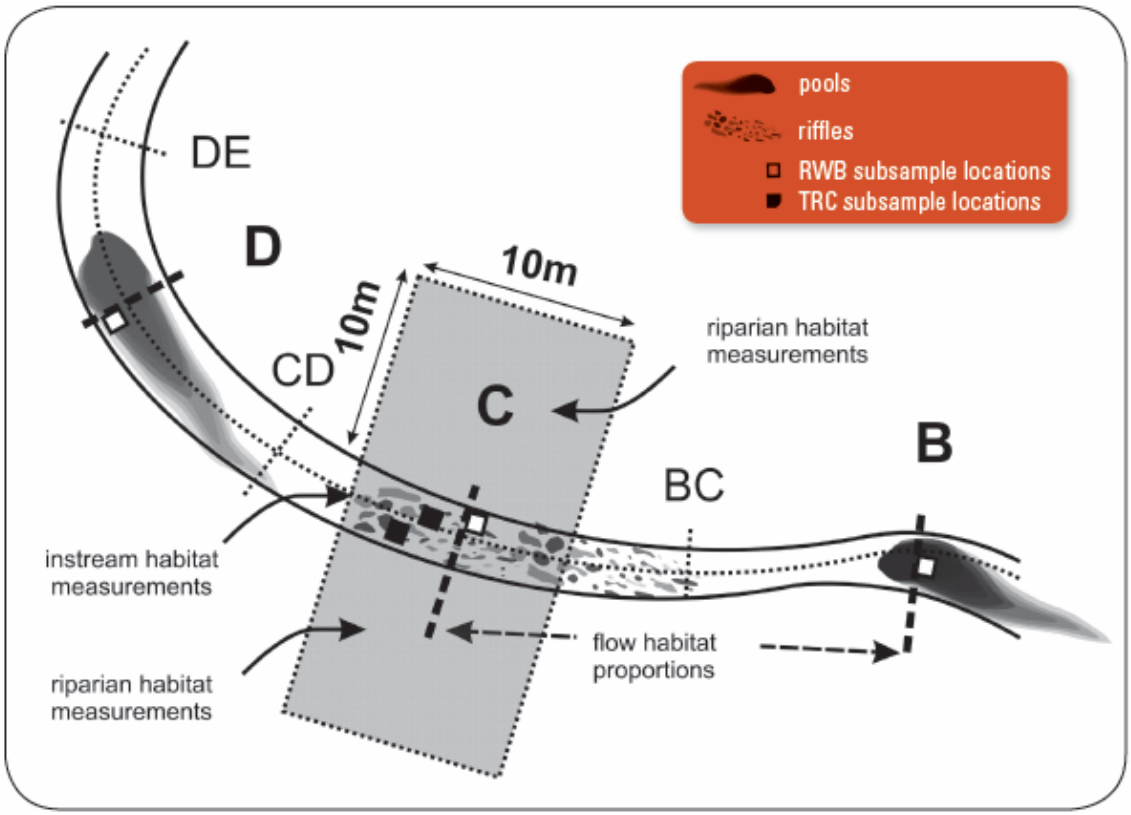

Figure 8. Section of the standard reach expanded from Figure 1 showing the appropriate positions for collecting algae samples (the white square, labeled "RWB" in the legend box) and flow habitat proportion measurements.

Record the presence of any of the 11 human influence categories in the stream channel within a zone 5 m upstream and 5 m downstream of the transect.

4.13 Densiometer Readings (Canopy Cover)

The densiometer is read by counting the number of line intersections that are obscured by overhanging vegetation. Before using, the densiometer should be modified by taping off the lower left and right portions of the mirror in order to emphasize overhead vegetation over foreground vegetation (the main source of bias in canopy density measurements; see Figure 9.)

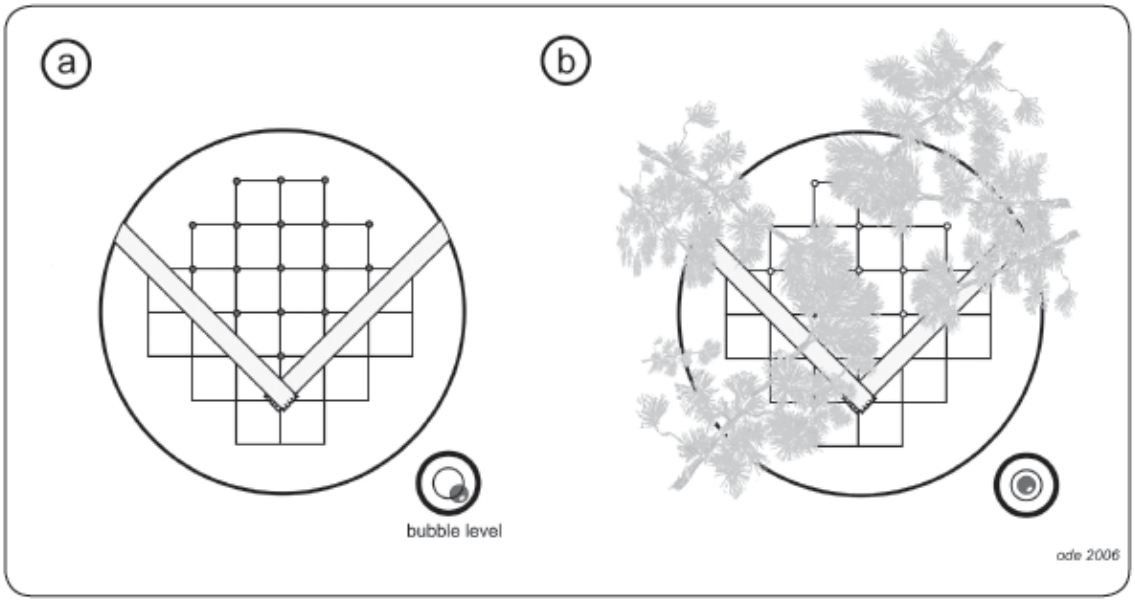

Figure 9. Representation of the mirrored surface of a convex spherical densiometer showing the position for taping the mirror and the intersection points used for the densiometer reading. The score for the hypothetical condition in (b) is 10 covered intersection points out of 17 possible. Note the position of the bubble level in (b) when the densiometer is leveled.

All densiometer readings should be taken with the bubble leveled, and 0.3 m (1 ft) above the water surface. The densiometer should be held just far enough from the squatting observer's body so that his/her forehead is just barely obscured by the intersection of the two pieces of tape.

Take and record four 17-point readings from the center of each transect: a) facing upstream, b) facing downstream, c) facing the left bank, d) facing the right bank.

5. PHAB INTER-TRANSECT-BASED MEASUREMENTS

While most measures are taken at or relative to the Main Transects, a few measures are recorded at transects located at the midpoint between Main Transects. These are called "Inter-transects". The following measurements are taken relative to the Inter-transects: 1) Wetted Width, 2) Flow Habitats, and 3). "Pebble Count": Transect Substrates (CPOM, and algal cover, as before)

5.1 Inter-transect Wetted Width

Measure the same way that *Transect* wetted width was measured.

5.2 Inter-transect Substrates and Algal Percent Cover

Collect these data the same way that *Transect* substrates and algal percent cover data were collected, except, in the case of Inter-transects, do not assess Cobble Embeddedness unless a total of at least 25 cobbles were not encountered across the Main Transects.

5.3 Flow Habitats

Because many benthic organisms prefer specific flow and substrate microhabitats, the proportional representation of these habitats in a reach is often of interest in bioassessments. There are many different ways to quantify the proportions of different flow habitats. This procedure produces a semi-quantitative measure consisting of 10 transect-based visual estimates.

At each Intertransect, identify the percentage of six different habitat types in the region *between the upstream Transect and downstream Transect*: 1) cascades, 2) falls, 3) rapids, 4) riffles, 5) runs, 6) glides, 7) pools, and 8) dry areas. Record percentages to the nearest 5% — the total percentage of surface area for each section must equal 100%.

A description of each of these flow habitat types is provided below:

- cascades: short, high-gradient drops in stream bed elevation often accompanied by boulders and considerable turbulence
- falls: high-gradient drops in elevation of the stream bed associated with an abrupt change in the bedrock
- rapids: sections of stream with swiftly flowing water and considerable surface turbulence (rapids tend to have larger substrate sizes than riffles)
- riffles: *"shallow/fast"*; riffles are shallow sections where the water flows over coarse stream bed particles that create mild to moderate surface turbulence (< 0.5 m deep, > 0.3 m/s)
- runs: *"deep/fast"*; long, relatively straight, low-gradient sections without flow obstructions. The stream bed is typically even and the water flows faster than it does in a pool (> 0.5 m deep, > 0.3 m/s)
- glides: *"shallow/slow"*; sections of stream with little or no turbulence, but faster velocity than pools (< 0.5 m deep, < 0.3 m/s)

- pools: *"deep/slow";* a reach of stream that is characterized by deep, low-velocity water and a smooth surface (> 0.5 m deep, < 0.3 m/s)
- dry: any surface area within the channel's wetted width that is above water

After you have collected all the above Transect-, and Inter-transect-, based measurements, collect data on Gradient. Also, if you haven't already done so, take photographs at specific Transects, as indicated below. After you have collected Gradient data at each Transect, and have taken photographs where indicated, remove the corresponding flag from the stream bank. Also, as you make your final trip along your study reach, keep your eyes open for a good section within which to take velocity measurements for calculating stream discharge (see below).

5.4 Photographs

Take a minimum of four (4) photographs of the reach at the following locations: a) Transect A facing upstream, b) Transect F facing upstream, c) Transect F facing downstream, and d) Transect K facing downstream. It is also desirable to take a photograph at Transect A facing downstream and Transect K facing upstream to document conditions immediately adjacent to the reach. Digital photographs should be used. Record the image numbers on the front page of the field form under "*Photographs*". *NOTE: An easy way to keep track of which site each series of photographs belongs to is to take a close-up of the front data sheet (containing legible site code and date) for that site prior to taking the series of photos.*

6. REACHWIDE MEASUREMENTS

6.1 Gradient

The gradient of a stream reach is one of the major stream classification variables, giving an indication of potential water velocities and stream power, which are in turn important controls on aquatic habitat and sediment transport within the reach. The data collected for gradient are recorded on the "*Slope and Bearing*" form.

Note: An autolevel should be used for reaches with a percent slope of less than or equal to 1%. Either a clinometer or an autolevel may be used for reaches with a percent slope of greater than 1%, and sometimes a clinometer is preferable in really steep areas that are also heavily vegetated. The following description is for clinometer-based slope measurements. *In reaches that are close to 1%, you will not know whether you are above or below the 1% slope cutoff. In these cases, default to use of an autolevel, which is described further below.*

Clinometer method: Transect to transect measurements taken with a clinometer are used to calculate the average slope through a reach. This measurement works best with two people, one taking the readings at the upstream transect ("backsighting") and the other holding a stadia rod at the downstream transect. If you cannot see the mid point of the next transect from the starting point, use the supplemental sections (indicating the proportion of the total length represented by each section). Otherwise, leave these blank.

Beginning with the upper transect (Transect K), one person (the measurer) should stand at the water margin with a clinometer held at eye level. A second person should stand at the margin of the next downstream transect (Transect J) with a stadia rod flagged at the eye level of the person taking the clinometer readings. Be sure you mark your eye level while standing on level ground! Adjust for water depth by measuring from the same height above the water surface at both transects. This is most easily accomplished by holding the base of the stadia rod at water level. Note: an alternative technique is to use two stadia rods pre-flagged at the eye-height of the person taking the readings.

Use a clinometer to measure the percent slope of the water surface (not the streambed) between the upstream transect and the downstream transect by sighting to the flagged position on the stadia rod. The clinometer reads both percent slope and degree of the slope. Be careful to read and record percent slope rather than degrees slope (the measurements differ by a factor of ~2.2). Percent slope is the scale on the right hand side as you look through most clinometers. Note: If an autolevel or hand level is used, record the elevation difference (rise) between transects and the segment length (run) instead of the percent slope.

If the stream reach geometry makes it difficult to sight a line between transects, divide the distance into two or three sections and record the slope and the proportion of the total segment length between transects for each of these sections in the appropriate boxes on the slope form (supplemental segments). Do not measure slope across dry land (e.g., across a meander bend).

Proceed downstream to the next transect pair (I-J) and continue to record slope and bearing between each pair of transects until measurements have been recorded for all transects. If you

have finished all the other transect and inter-transect based measurements for PHab, you may remove the transect flags as you go.

Autolevel method (preferred): To measure gradient using an autolevel, identify a good spot to set up the autolevel, preferably somewhere around the center of the reach (if there is good visibility from this location to both the upstream and downstream ends of the reach.) Set up the autolevel on very stable, and preferably fairly flat, ground. Set the height of the autolevel to comfortable eye level for the operator. Level the plane of view of the autolevel by balancing it using the bubble. Start by adjusting the legs, and then fine-tune the adjustment using the knobs. Once balanced, begin "shooting" the height of the water level of the stream at each of the transects. Try to start with one of the outer transects (like A). Have a field partner at Transect A hold the Stadia rod at water's edge and perpendicular to the ground. Viewing through the autolevel (and focusing as necessary), look at the Stadia rod and note to the smallest demarcation on the stadia rod the height at which the autolevel line of view (*i.e.*, the middle line in the viewfinder) hits. Record this information, and then have the Stadia rod holder proceed to the next transect (e.g., Transect B), again holding the base of the Stadia rod at water's edge. Very carefully, rotate the head of the autolevel so that it points to the new Stadia rod location. *Do not bump the autolevel out of its position, because if this happens, you will not be able to take a height measurement of Transect B's water surface relative to that of Transect A, to determine the slope between the two transects*.

If the autolevel is bumped out of position before all the measurements are done, or if there is a point along the reach at which there is no longer a clear line of site from the autolevel to the Stadia rod positioned at the transect, at water's edge, a new location must be set up for the autolevel. In order to maintain a relationship between water heights of the various transects already measured, it will be necessary to "re-shoot" the height of the water at the last transect for which a valid measurement was attained. From there, assuming there is no more disturbance to the position of the autolevel, you can continue cycling through the remaining transects from the new position. On the Slope Form corresponding to Autolevel use, indicate all the times that the autolevel's position was changed. This can be done by numbering them as "Position 1", "Position 2", etc. The same position number will be used for all transects whose water height was measured from that same autolevel position. If the autolevel is never moved through the entire series of transects, then position # will be "1" for all 11 of them. If it is necessary to move the autolevel at some point, the trasect that was measured from the original and the new position will be listed twice on the datasheet: once for the original position, and once for the new. After all transects have been satisfactorily shot with the autolevel, determine the differences in water height between each pair of transects within groupings based on autolevel position and enter on the form. Also indicate what distance was used between transects when setting up the reach. These pieces of information will later be used to determine the slopes between transects and for the reach as a whole.

6.2 Stream Discharge

Stream discharge is the volume of water that moves past a point in a given amount of time and is generally reported as either cubic meters per second (cms) or cubic feet per second (cfs). Because discharge is directly related to water volume, discharge affects the concentration of nutrients, fine sediments and pollutants; and discharge measurements are critical for

understanding impacts of disturbances such as impoundments, water withdrawals and water augmentation. Discharge is also closely related to many habitat characteristics including temperature regimes, physical habitat diversity, and habitat connectivity. As a direct result of these relationships, stream discharge is often also a strong predictor of biotic community composition. Since stream volume can vary significantly on many different temporal scales (diurnal, seasonal, inter-annually), it can also be very useful for understanding variation in stream condition.

It is preferable to take discharge measurements in sections where flow velocities are greater than 0.15 m/s and most depths are greater than 15 cm, but slower velocities and shallower depths can be used. If flow volume is sufficient for a transect-based "velocity-area" discharge calculation, this is by far the preferred method. If flow volume is too low to permit this procedure or if your flow meter fails, use the "neutrally buoyant object/ timed flow" method.

6.2.1 Discharge: Velocity Area Method

The layout for discharge measurements under the velocity-area (VA) method is illustrated in Figure 7. Flow velocity should be measured with either a Swoffer Instruments propeller-type flow meter or a Marsh-McBirney inductive probe flow meter.

Select the best location in the reach for measuring discharge. To maximize the repeatability of the discharge measurement, *choose a transect with the most uniform flow (select hydraulically smooth flow whenever possible) and simplest cross-sectional geometry*. It is acceptable to move substrates or other obstacles to create a more uniform cross-section before beginning the discharge measurements.

Data for this parameter will be entered in the "*Discharge Measurements*" section of the datasheet with the basic site information at the top ("*Reach Documentation*"). Measure the wetted width of the discharge transect and divide this into 10 to 20 equal segments. The use of more segments gives a better discharge calculation, but is impractical in small channels. A minimum of 10 intervals should be used when stream width permits, but interval width should not be less than 15 cm.

Record the distance from the bank to the end of the first interval. Using the top-setting rod that comes with the flow velocity meter, measure the median depth of the first interval.

Standing downstream of the transect to avoid interfering with the flow, use the top-setting rod to set the probe of the flow meter at the midpoint of each interval, at 0.6 of the interval depth (this position generally approximates average velocity in the water column), and at right angles to the transect (facing upstream). See Figure 10 for positioning detail.

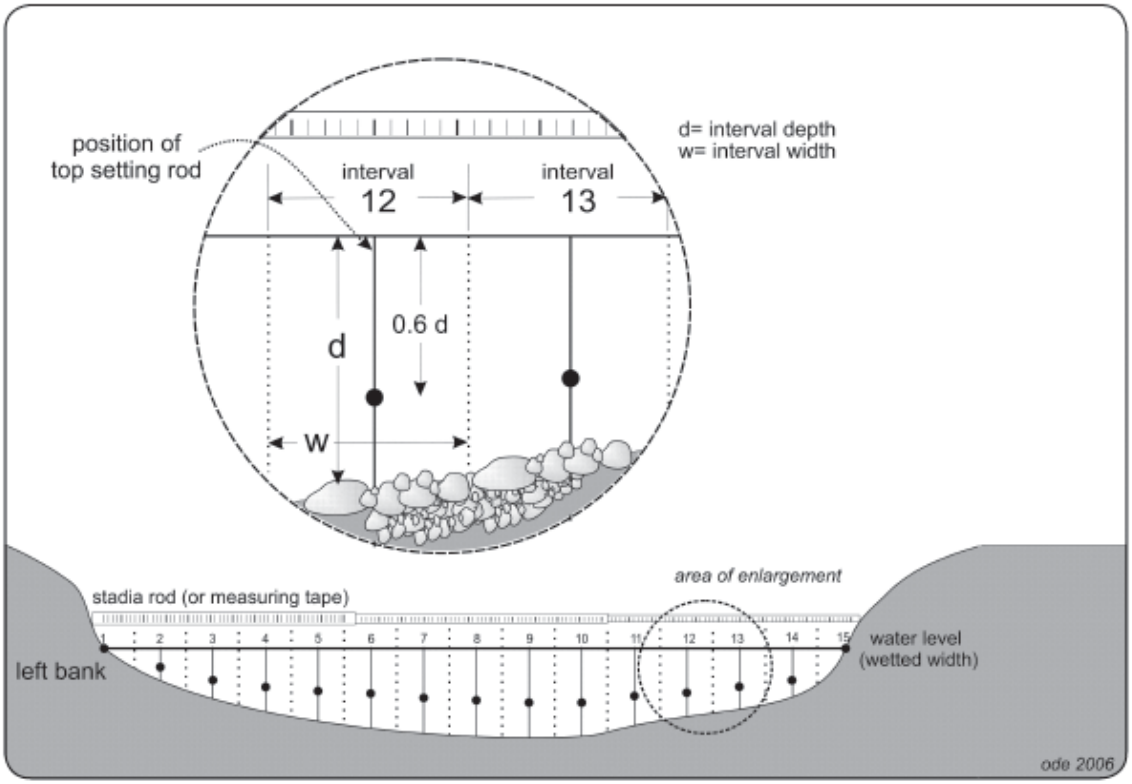

Figure 10. Diagram of layout for discharge measurements under the velocity-area method showing proper positions for velocity probe (black dots).

Allow the flow velocity meter to equilibrate for 10-20 seconds then record velocity to the nearest m/s. If the option is available, use the flow averaging setting on the flow meter. Note: Under very low flow conditions, flow velocity meters may register readings of zero even when there is noticeable flow. In these situations, record a velocity of 0.5x the minimum flow detection capabilities of the instrument.

Complete Steps 3 through 5 on the remaining intervals. Note: The first and last intervals usually have depths and velocities of zero.

6.2.2 Discharge: Neutrally Buoyant Object Method

If streams are too shallow to use a flow velocity meter, the neutrally buoyant object (NBO) method should be used to measure flow velocity. However, since this method is less precise than the flow velocity meter it should only be used if absolutely necessary. A neutrally buoyant object (one whose density allows it to just balance between sinking and floating) will act as if it were nearly weightless, thus its movement will approximate that of the water it floats in better than a light object. A piece of orange peel works well. To estimate the flow velocity through a reach, three transects are used to measure the cross-sectional areas within the test section sub-reach and three flow velocity estimates are used to measure average velocity through the test reach. To improve precision in velocity measurements, the reach segment should be long enough for the float time to last at least 10-15 seconds.

The position of the discharge sub-reach is not as critical as it is for the velocity-area method, but the same criteria for selection of a discharge reach apply to the neutrally buoyant object method. Identify a section that has relatively uniform flow and a uniform cross sectional shape.

The cross sectional area is estimated in a manner that is similar but less precise than that used in the velocity area method. Measure the cross sectional area in one to three places in the section designated for the discharge measurement (three evenly-spaced cross sections are preferred, but one may be used if the cross section through the reach is very uniform). Record the width once for each cross section and measure depth at five equally-spaced positions along each transect.

Record the length of the discharge reach.

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AN ANALYSIS OF THE EFFECTS OF TEMPERATURE ON SALMONIDS OF THE PACIFIC NORTHWEST WITH IMPLICATIONS FOR SELECTING TEMPERATURE CRITERIA

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ABSTRACT

To administer the Clean Water Act, the U.S. Environmental Protection Agency and state water quality agencies throughout the nation have adopted numeric and qualitative criteria that establish environmental conditions known to protect aquatic life from adverse effects. Pacific Northwest states have adopted temperature criteria designed specifically to protect fish with emphasis on salmonid species because water temperature plays a role in virtually every aspect of salmon life. Adverse levels of temperature can affect growth, behavior, disease resistance, and mortality. In recent years, the EPA and National Academies of Science and Engineering have promoted risk assessment techniques to develop water quality criteria, including formal protocols that have been peer reviewed nationally. Risk assessment is designed to combine the information from biological studies with an analysis of each population's exposure to quantified effects. Risk occurs when the stress' magnitude, frequency and duration exceed the species' ability to deal with that stress. A risk-based approach seems ideally suited to developing criteria for and assessing temperature risk to fish because exposure has been well documented through temperature monitoring and extensive research on the lethal and sublethal effects on salmon physiology has been conducted over the past 40 years. Nevertheless, risk-based approaches have not yet been used to establish temperature criteria in recent state agency reviews of water quality standards.

In this paper we develop a risk-based approach to analyze summertime temperature effects on juvenile salmon species. We use available research findings to quantitatively evaluate the biological effects of temperature in combination with measured stream temperature ranging from very cold to very warm. Many currently exceed Washington's temperature standard. Acute risk to high temperatures was assessed using laboratory-derived values of mortality in relation to duration of exposure. Despite warm temperatures, the risk analysis found that direct mortality from temperature is unlikely in the range of temperature in study streams because temperatures high enough to cause mortality are either never observed, or occur over too short of periods of time to cause death. The analysis suggested that there is little or no risk of mortality if annual maximum temperature is less than 26°C, although site-specific analyses are suggested when annual maximum temperature exceeds 24°C to affirm this result in local river conditions. Short-term occurrence of temperatures sufficient in duration and magnitude to cause mortality is feasible, within parts of the Pacific Northwest region, and therefore streams in other geographic areas or streams with known temperature extremes should be individually evaluated with the method. Chronic exposure to temperature was based on the growth potential of fish as assessed using a simplified bioenergetics approach developed in the report. This analysis found that growth predicted from ambient temperatures is somewhat less than the maximum potential growth in all streams regardless of temperature regime, because no stream experienced temperatures that fully optimized growth all of the time during the summer rearing period. Generally the effect of temperature regime on growth was small in the range of streams studied, but growth effects were evident at higher temperatures. The results suggest that quantitative analysis of growth effects can be determined with reasonably simple methods that can be applied at specific sites or at a region scale to identify appropriate temperature thresholds. Assuming a 10% growth loss represents an appropriate risk level, an upper threshold for the 7-day maximum temperature of 16.5^{o}C is appropriate for coho and 20.5^{o}C is appropriate for steelhead. Criteria derived in this manner are somewhat lower than those developed in a U.S.E.P.A. paper in 1977 and close to, but not identical, to those currently specified in Washington and Oregon criteria.

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SECTION 1 INTRODUCTION AND OBJECTIVES

Maintaining the quality of aquatic environments that allow fish and other organisms to grow and prosper is a primary objective of the Clean Water Act adopted by Congress in 1972. To administer the Act, the U.S. Environmental Protection Agency (EPA) and state water quality authorities throughout the nation have adopted numeric and qualitative criteria that establish environmental conditions known to protect aquatic life from adverse effects. Historically, physical environmental characteristics have been used to indicate the minimum requirements for biological health. The criteria address naturally occurring conditions that may be affected by human activities (e.g., temperature, sediment, dissolved oxygen, pH, and nutrients) and numerous exogenous pollutants introduced by manufacturing and agricultural activities. Water quality criteria are often a single value defining thresholds of favorable or adverse conditions (Suter et al. 1993). The public and the regulatory system have accepted simple physical criteria as indicators of biological health, although natural systems are dynamic and often exhibit a range of water quality conditions over time in response to many non-anthropogenic factors. Thus, even though criteria are often an over-simplification of real biological response, they have generally been accepted as necessary to effectively administer the regulatory system.

The Environmental Protection Agency and other agencies have conducted water quality research over the years to accomplish two major objectives: 1) develop sound cause-and-effect relationships between water quality conditions and biological response, and 2) develop repeatable methodologies that use research findings to craft regulatory water quality criteria grounded in sound science. A primary technique used by researchers is to subject fish and other aquatic organisms to pollutants in a controlled laboratory setting to determine the relationships between dosage, length of exposure and biological responses such as growth loss, stress, altered behavior, disease, or death. Such laboratory-based research has been a cornerstone of fisheries science during this century and its validity has been confirmed in field-based studies (Brett 1971, Shuter et al. 1980, Baker et. al. 1995, Filbert and Hawkins 1995). Conversely, field observations alone are often not reliable for deriving water quality criteria because of variability in the natural environment and the complexity of factors controlling natural systems and habitat response. Brett (1971) observed that "it is inherently difficult to examine existing conditions and deduce the important biological factors which have occurred in the past to explain the present." Laboratory studies were the basis for EPA recommended temperature criteria (U.S. EPA 1977), and field studies have been used mainly for validating the appropriateness of water quality criteria (Hansen 1989, Mount et al. 1984).

Most water quality criteria were originally adopted in the 1970s (e.g., U.S. EPA 1980) with relatively little revision since implementation (Hansen 1989). In recent years, water quality agencies in the Pacific Northwest have conducted scheduled reviews of criteria to reassure their effectiveness or change them if necessary (ODEQ 1995, WDOE 1999). Interest in the validity of temperature criteria has been particularly keen because of concern that temperature is one of the habitat elements that has contributed to the decline in certain runs of salmon and trout in the region (NAS Committee on Protection and Management of Pacific Northwest Anadromous Salmonids 1996). Within the home range of salmon in Washington, Oregon, and Idaho, over 2500 streams are currently listed on Clean Water Act section 303(d) lists, many for exceeding summer temperature criteria. High summertime temperatures in these streams are due in part to a variety of land use

and manufacturing activities that have historically impacted temperature regimes (Sullivan et al. 1990), as well as natural phenomenon that affect stream temperature.

The risk to salmon and trout populations associated with temperature is perceived to be high because: 1) the potential for biological effects exists according to laboratory-derived results; and, 2) many populations are already exposed to temperatures exceeding those believed to induce negative biological consequences. Water temperature plays a role in virtually every aspect of salmon life (Brett 1995; Weatherly and Gill 1995), and adverse levels of temperature can affect behavior (e.g. migration delays and timing), disease resistance, growth, and mortality (Brett 1956). Such concerns have led agencies to reconsider temperature requirements and tolerances of these species, with emphasis on those listed as threatened or endangered: chinook and coho salmon, steelhead trout, and bull trout. Recent reviews have called for lowering of temperature criteria to levels thought to be more desirable (less stressful) for these species (e.g. ODEQ 1995; WDOE 1999, U.S. EPA in preparation).

The scientific justification for these recommendations relies largely on review of the scientific literature and application of a number of implicit assumptions concerning the temperatures that occur and those that cause adverse effects. They also include safety factors to ensure that adverse effects and exposures are not underestimated. These assumptions and safety factors are usually developed using best professional judgment. A more objective risk assessment technique, where adverse effects are placed in an exposure context to identify population risk, has not yet been applied in these temperature criteria reviews, despite its accepted value for establishing criteria (Suter and Mabrey 1994) and risk for other pollutants (U.S. EPA 1995).

Risk assessment involves comparing effects and exposure periods to achieve probability of adverse effects for the defined exposure. This process includes: 1) biological effects characterization, 2) exposure characterization, and 3) a risk characterization that combines the two. The effects characterization requires a quantitative measure of the biological effects of temperature, and the exposure characterization requires a quantitative measurement of the temperatures occurring in the fish's environment. These quantitative measures are expressed as probabilities for the risk characterization, where the in situ temperature regime is related to the temperature biological effects relationships to estimate the likelihood of adverse biological impacts.

A risk-based approach seems ideally suited to developing criteria for and assessing temperature risk to aquatic life. Fish are constantly exposed to temperatures that vary by minutes, hours, days, weeks, and months depending on celestial forces that guide the earth around the sun. Fish are thermoconformers; that is, they cannot maintain body temperatures much different from the water in which they occur. Thus their exposure is variable, ranging over the full array of optimal and suboptimal temperatures. Considerable laboratory study has been conducted on a variety of salmon and trout species to characterize their responses to temperature; these data may be sufficient to characterize the responses of some species and life stages. Finally, temperature is easy to measure and there is an abundance of data available in Washington and elsewhere to characterize temperature regimes and to evaluate exposure with considerable precision.

The objectives of this paper are (1) to review relevant temperature research and (2) to evaluate the biological risks associated with ambient temperature regimens on populations of two species of juvenile salmonids using a probabilistic risk assessment. This

assessment is based on laboratory data concerning the effects of temperature on growth and mortality. The analyses concentrate on the summer rearing life history phase of species within the Salmonidae family that dwell in stream environments, namely juvenile coho salmon and steelhead trout. There has also been considerable study of the thermal requirements of chinook, sockeye, pink, and chum salmon, but since these species are not typically found in western Washington streams during the summer months, they will not be directly considered here. This analysis illustrates the use of risk analysis for objectively deriving temperature criteria; similar techniques could be applied to other species, stocks, and life history phases (Hokanson 1977). We also use results to evaluate the biological effects of existing and proposed temperature criteria in the context of risk assessment techniques.

This report contains:

- A review of the scientific literature regarding the effects of water temperature on direct acute mortality and growth of fish, with emphasis on salmonids during fresh water rearing (Section 2)

- A description of the temperature data collected from a variety of stream conditions in Washington used in the quantitative analyses, with a discussion of temperature indices (Section 3).

- A synthesis of available scientific information into a quantitative, risk-based approach to evaluating biological response to acute or lethal temperatures in natural streams (Section 4),

- A comprehensive development of a new, quantitative approach to assessing fish growth in response to long-term exposure to temperatures in natural streams (Section 5),

- A synthesis of the risk-based approaches to suggest temperature criteria for coho and steelhead (Section 6),

- A discussion of the use of scientific information, including methods developed in this report, to identify temperature standards in federal and state regulatory approaches (Section 7).

- A brief summary of key findings and a synthesis of information for policy-makers and scientists (Section 8).

SECTION 2 REVIEW OF THE PHYSIOLOGIC RESPONSE OF FISH TO ENVIRONMENTAL TEMPERATURE

ABSTRACT

In this section, the biological effects of temperature on fish are briefly reviewed, with emphasis on the fresh water rearing phases of salmonids. Lethal and non-lethal effects are discussed.

Key findings:

- Many of the lethal and non-lethal effects of temperature on salmonids are well understood and in many cases have been quantitatively established.
- Both lethal and sub-lethal effects of temperature depend on its magnitude in relation to duration of exposure.
- Fish have behavioral and physiological mechanisms to tolerate temporary excursions into stressful temperature levels. If exposure and magnitude limits are exceeded, mortality can occur.
- Growth has been widely used to evaluate the sub-lethal response of fish to temperature.

INTRODUCTION

Temperature is a dominant factor affecting aquatic life within the stream environment (Hynes 1970). Temperature influences all aspects of fish life, as well as those of the macroinvertebrates (Sweeney and Vannote 1986) and primary producers (algae, bacteria etc.) that dwell within the stream and serve as food for fish (Hynes 1970). As summarized by Brett (1956 pg. 76):

"Because of the all-pervading nature of environmental temperature, the fundamental thermal requirement of fishes is an external environmental temperature most suitable to their internal tissues… Temperature sets lethal limits to life; it conditions the animal through acclimation to meet levels of temperature that would otherwise be intolerable; it governs the rate of development; it sets the limits of metabolic rate within which the animal is free to perform; and it acts as a directive factor resulting in the congregation of fish within given thermal ranges, or movements to new environmental conditions."

Quantitatively defining the effects of temperature on key biological functions is essential for understanding how temperature contributes to fish success as well as how it places species at risk. Temperature effects have been extensively studies for all aspects of fish life. Although review of all temperature effects are beyond the scope of this report, we note that there are excellent references where temperature effects are discussed more fully (e.g., Groot et al. 1995), or where specific species are reviewed in detail (e.g. McCullough

1999 on chinook salmon). We narrow our review to aspects of temperature affecting the rearing of salmonid species in the fresh water environment.

Two important elements of temperature affect the growth and survival of fish: 1) the relationship between temperature, metabolism, and food conversion efficiency over long periods, and 2) the thermal tolerance of fish to lethal temperatures over relatively short periods. Both aspects are important because ambient stream temperature may vary from very low levels in winter to occasionally high peaks in summer (e.g., Beschta et al. 1987; Sullivan et al. 1990).

The thermal tolerance to temperature has been the focus of considerable laboratory testing for many fish species, including salmonids, beginning early in this century and continuing today (see reviews by Fry 1967, NAS/NAE 1973, Coutant 1977). Much of the available laboratory research on temperature tolerances was performed prior to 1980 and was stimulated principally by the need to assess the impact of heated effluent from power plants, dams and other facilities (Hokanson 1977). Since that time, temperature research has focused on studying additional species and refining the understanding of contributing factors such as the effect of acclimation temperatures, daily diurnal temperature fluctuations, food rations, and the interaction of temperature with other pollutants (e.g., Elliott 1976, Wurtsbaugh and Davis 1977, Brett et al. 1982, Thomas et al 1986, Coutant and Talmage 1977).

These and other studies show that fish respond to temperature through physiological and behavioral adjustments that depend on the magnitude and duration of temperature exposure. Upper and lower temperature extremes that cause death after exposures ranging from minutes to 96 hours are termed acute temperature effects. Temperatures causing thermal stress after longer exposures, ranging from weeks to months, are termed chronic temperature effects. Endpoints of exposure to temperature over longer periods (chronic

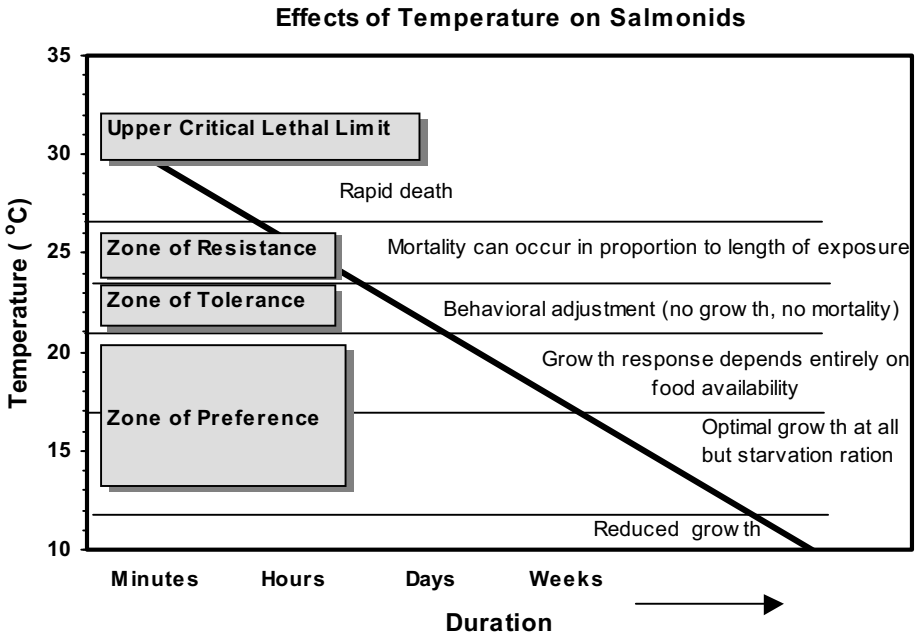


Figure 2.1 General biological effects of temperature on salmonids in relation to duration and magnitude of temperature.

effects) are sublethal and may include growth, competitive interactions, change in behavior, or disease. Temperature ranges defined by acute and chronic temperature effects are referred to as the zones of thermal resistance and tolerance (Elliott 1981, Jobling 1981). The range of physiological response relative to temperature is summarized in Figure 2.1. The range of temperature over which feeding occurs without signs of abnormal behavior is referred to as the optimum temperature range (Elliott 1981).

ACUTE TEMPERATURE EFFECTS

The acute effects of temperature are frequently expressed as effects on survival that result from exposure to elevated temperatures for specified time periods. Mortality, expressed as the median lethal time (LT50), and the ultimate upper incipient lethal threshold (Brett 1952) have been the most common endpoints measured. The median lethal time is the duration eliciting 50% mortality at a specific temperature. The ultimate upper incipient lethal limit is the temperature at which acute mortality does not increase with any further increase in the temperature.

Laboratory studies repeatedly show that salmon have the ability to extend their temperature tolerance through acclimation. Brett (1956) reports that the rate of increase in ability to tolerate higher temperatures among fish is relatively rapid, requiring less than 24 hours at temperatures above 20°C (e.g., Figure 2.2). Acclimation to low temperatures (less than 5°C) is considerably slower (Brett 1956). Studies of the acute temperature effects on salmonids have yielded remarkably consistent results between studies and among salmon species (Brett 1956; Lee and Rinne 1980), indicating temperature's influence on fish with similar biochemistry and physiology. The upper lethal limit, that is the temperature at which death occurs within minutes, ranges from 27° to 30°C for salmonids (Jobling 1981). Fish acclimated at cold temperatures can have upper lethal limits 3° to 4°C lower. Many species of fish have considerably higher upper thermal levels than members of the Salmonidae family, which are classified in cold water temperature guilds (Magnuson et al. 1979). At temperatures below the upper lethal limit, fish can tolerate each successively lower temperature for exponentially increasing intervals of time.

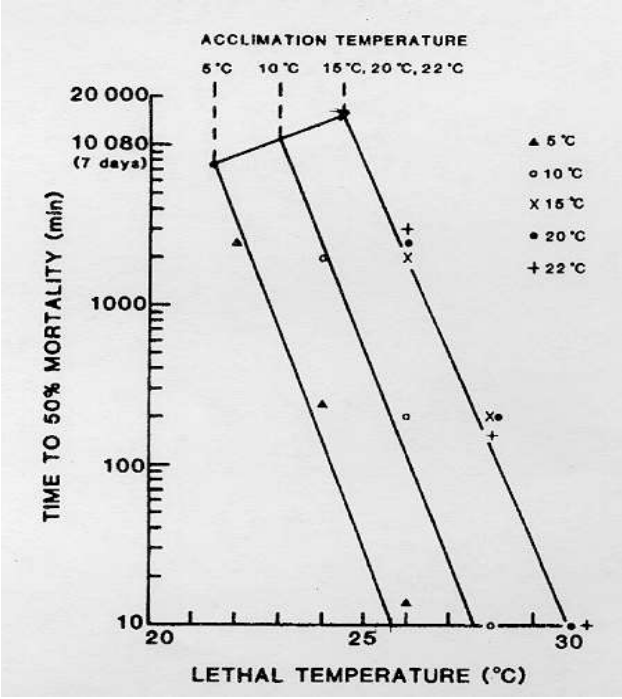


Figure 2.2 Example of a relationship between the time (min) for 50% mortality of brown trout (Salmo trutta, and the lethal temperature (oC) at different acclimation temperatures. (From Elliott 1981).

Behavioral mechanisms may allow fish in situ to resist short-term extreme temperature, and acclimation will promote resistance to high temperature, although there is an upper

limit to the temperature to which fish can acclimate (Jobling 1981). This resistance to the lethal effects of thermal stress enables fish to make excursions for limited times into temperatures that would eventually be lethal (Brett 1956; Elliott 1981). The period of tolerance prior to death is known as the "resistance time" and the duration-temperature is termed the "zone of resistance" (Figure 2.1) (Hokanson 1977, Jobling 1981). Laboratory studies have repeatedly found that salmon can spend very lengthy periods in streams of 24°C or less without suffering mortality. Thus temperature as a direct cause of death generally ceases at temperatures less than 24° C (Brett 1956). Acute effects are not generally considered below this level, because continuous long duration exposure to temperature of this magnitude is not likely to occur in natural environments within the species' normal geographical range. Laboratory studies testing daily fluctuations in temperature as large as 13.5°C did not shown effects on growth or mortality of salmonids, although lethal levels were never exceeded (Thomas et. al. 1986).

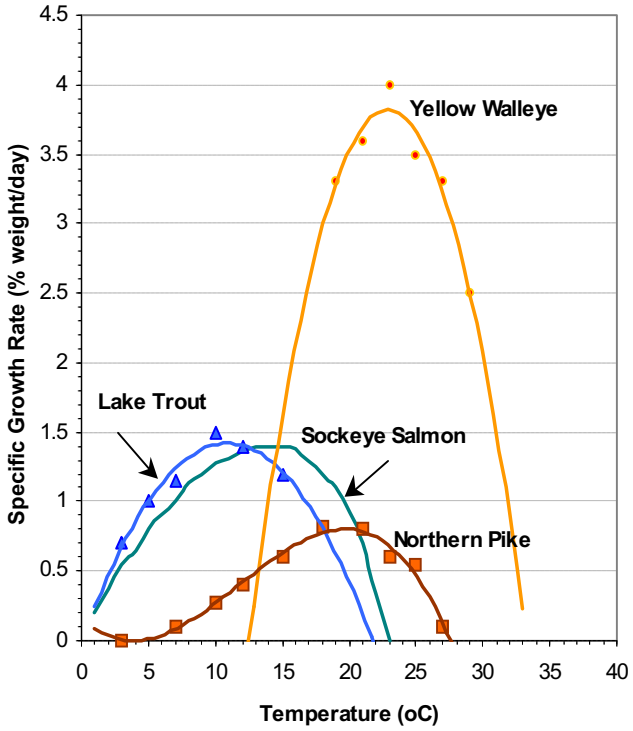


Figure 2.3 Example of a multi-family specific growth rate curves (after Christie and Regier 1988)

SUBLETHAL TEMPERATURE EFFECTS

Chronic exposure to sublethal temperatures can have a broad range of effects on the various functions of fish. Brett (1971) described 25 physiological responses for sockeye salmon and, similarly, Elliott (1981) identified 19 similar characteristics for brown trout. The relationship between these responses and temperature follow two general patterns: either the response (e.g., standard metabolic rate, active heart rate, gastric evacuation) increases continuously with rise in temperature, or the response (e.g., growth rate, swimming speed, feeding rate) increases with temperature to maximum values at optimum temperatures and then decreases as temperature rises (Brett 1971, Elliott 1981). In the latter case, the form of the responses to temperature and the optimum temperatures are not always the same for different functions, and the optimum temperature for a response may change if there is an alteration in another factor such as energy intake (Elliott 1981).

Based on this theory, fish rarely occur within a temperature regime that is optimal for all functions given the natural diel and seasonal variability in water temperature. Consequently, fish have developed mechanisms to survive various levels of thermal stress both above and below optimal ranges to maintain the health and survival of a population.

Several studies have indicated that growth under fluctuating temperatures is essentially the same as that under constant temperature if the fluctuating temperature is expressed as the time-weighted mean[1] (Thomas et al. 1986; Brett 1971; Everson 1973; Iverson 1972; Wurtsbaugh and Davis 1977).

Fish are poikilothermic and temperature plays a key role in regulating their metabolic functions. Fish tolerate suboptimal temperatures by metabolic adjustment and behavioral thermoregulation (Elliott 1981). For example, as temperatures increase above the optimum for feeding, the feeding rate declines and is completely inhibited at temperatures several degrees below the incipient lethal level (e.g, at 22°C for brown trout, Elliott 1981; and 24°C for sockeye and chinook salmon, Brett 1971). Similarly, the metabolic rate of and scope for activity declines, reducing the overall energy expenditure, which helps to conserve energy and reduce thermal stress. Behavioral adjustments, such as movements to cooler refuge sites, also enable fish to avoid thermal stress. Numerous observers have reported significant changes in salmonid activity at or near 22°C (Donaldson and Foster 1941; Griffiths and Alderdice 1972; Wurtsbaugh and Davis 1977; Lee and Rinne 1980; Bisson et. al. 1988; Nielsen et al. 1994, Tang and Boisclair 1995; Linton et al. 1997; Biro 1998). This temperature is consistent with a sharp drop in food consumption and conversion efficiency observed in laboratory studies (Brett et al. 1982). At very low temperatures, salmonids have been observed to cease feeding and seek cover under banks or within stream gravels (Everest and Chapman 1972).

How large fish grow is fundamentally determined by environmental and population factors that determine the availability of food. Temperature, however, regulates how much growth can occur with the food that is available. Growth is dependent on the energy consumed by the fish balanced by its energy expenditures to meet basic demands such as metabolism and swimming. What is left over can be used to grow body mass and reproductive capability. The long-term exposure of salmonids to environmental temperature during their freshwater rearing phase has an important influence on the size fish achieve and potentially the timing at which they reach readiness for smolting (Weatherly and Gill 1995).

The size of salmonids during juvenile and adult life stages influences survival and reproductive success. Although the large majority of anadromous salmonid growth occurs in the ocean environment, growth of juveniles in natal streams is especially important for anadromous salmonids that must reach minimum sizes before they can smolt (Weatherly and Gill 1995). Holtby and Scrivener (1989) and Quinn and Peterson (1996) demonstrated that the size achieved by juvenile coho at the end of their first summer growing period was a strong determinant of their later success in overwintering and smolting. Larger size generally conveys competitive advantage for feeding in the freshwater environment (Puckett and Dill 1985, Nielsen 1994) for both resident and anadromous species. Mason (1976) and Keith et al. (1998) found that the smaller fish tend to be those that are lost from rearing populations. Brett et al. (1971) described the freshwater rearing phase of juvenile sockeye as one of restricted environmental conditions and generally retarded growth. This synopsis is also generally true for salmonid species that dwell in stream and river environments for lengthy periods of time.

To explore the effects of prolonged exposure to temperature, numerous investigators have found growth to be a reliable and measurable integrator of a variety of physiological

[1] The maximum temperature studied cannot be high enough to elicit mortality.

responses (Brett 1971, 1995; Iverson 1972; Brungs and Jones 1977; Wurtsbaugh 1973). Growth rate is the most frequently reported measure of fish health from laboratory studies and occasionally from field studies. Growth can be viewed as the net effect of the environment on the relation between food consumption, metabolism, and activities of an organism (Warren 1971). Growth integrates a host of specific physiological responses to temperature, including metabolic rate (basal and active), feeding and digestion, and swimming performance or the ability to hold position with the current (Brett 1995; Weatherly and Gill 1995).

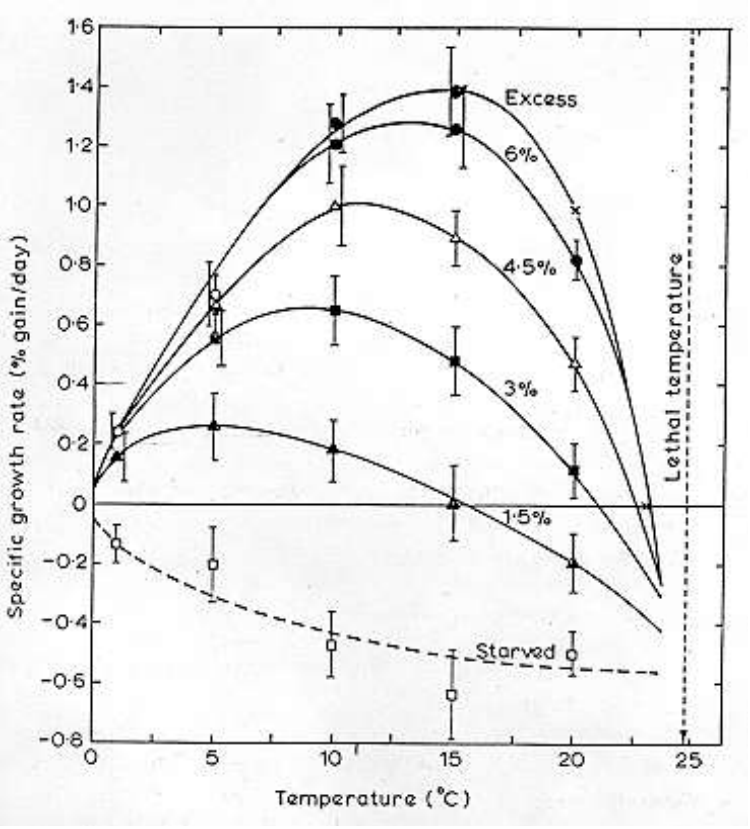


Figure 2.4 Basic relationship between temperature, ration and growth of 7-12 month-old sockeye salmon (from Brett et. al. 1969).

Laboratory studies demonstrate that virtually all fish, including salmonids, grow best within a range of temperatures. Optimal growth generally occurs at a midpoint of temperatures where the fish live, and it declines in waters that are warmer or cooler. The range of temperature at which growth occurs is generally wide, and usually reflects the ambient temperatures likely to be found within the natural range of the specie's habitats (Hokanson 1977). Significant differences in growth curves exist among fish families (Figure 2.3), from Christie and Regier 1988), but growth curves are often similar for species within the same genera and family. Because all salmonids have a similar biokinetic range of tolerance, performance, and activity, they are classified as temperate stenotherms (Hokanson 1977) and are grouped in the cold water guild (Magnuson et al. 1979).

The effect of temperature on growth varies significantly with the ration of available food (Figure 2.4). For example, in Figure 2.4, sockeye salmon held at optimum temperature and fed satiation rations achieved 600% more growth than fish held at optimum temperature with starvation rations. As ration increases from maintenance level (no net growth) to satiation or excess level (more than is needed for growth, metabolism, and all physiological functions), the optimum temperature for growth shifts progressively to higher temperatures. This response is consistent for all salmonids where laboratory studies are available (Brett 1971; Everson 1973; Iverson 1972; Wurtsbaugh and Davis 1977).

The relationship between food and temperature must be taken into account when considering the productivity of fish populations (Filbert and Hawkins 1995). Many studies have observed an increase in the growth and productivity of fish populations in streams when temperature (and correspondingly) food is increased. This tends to occur even in the cases where temperatures exceed preferred and sometimes lethal levels (Murphy et al. 1981, Hawkins et. al., 1983, Martin 1985, Wilzbach 1985). This situation indicates that starved fish require somewhat lower temperature, although the low environmental temperature tends to create conditions of low food supply (Weatherly and Ormerod 1990).

The forgoing discussion indicates that the optimum temperature for fish extends over a broad range depending on the function and the presence of other interacting factors. This optimum (preferred) range is defined by Elliott (1981) as the range over which feeding occurs and there are no external signs of abnormal behavior, i.e., thermal stress is not obvious. This delineates a wider range than the peak optimal temperatures where growth is maximized.

Within the optimum temperature range, research has identified a preferred temperature range, which is defined as the temperature around which all individuals will ultimately congregate regardless of their prior temperature exposure history (Fry 1947). Some investigators specifically define the optimal temperature as the temperature at which maximum growth occurs, and refer to the range of temperature where growth occurs as "preferred" temperatures. Determining this range, however has resulted in considerable variability within the same species due to different experimental test procedures and the multiplicity of environmental factors that affect fish preference (Elliott 1981, Jobling 1981). This uncertainty has led Elliott (1981) to conclude that the optimum temperature range defined based on physiologic response is a more realistic concept for studies on thermal stress then definitions based on concepts of "preference". Different uses of the terminology can create confusion.

Elliott's optimum temperature definition fits well with the behavioral response of fish to natural temperature regimes. For example, Brett (1971) showed how behavioral thermoregulation by juvenile sockeye resulted in energy conservation. Vertical movements in a thermally stratified lake over the course of a day enabled the juveniles to maximize the efficiency of food conversion into growth by controlling energy intake and metabolism as temperature followed the solar cycle. The sockeye salmon exhibited varied behavior in selecting temperatures that did not solely reflect the preferred temperature available to them within the lake. Other field studies have also documented salmonid utilization of temperatures outside of the preferred range when those within or near the preferred level were readily accessible (e.g. Matthews et al. 1994, Brett 1971, Biro 1998).

Metabolic characteristics are not the only response, but they are the most important and most easily quantifiable. Less quantifiable in a dose-response context are relationships involving temperature and disease resistance, and temperature effects on sensitivity to toxic chemicals and other stressors. It is well recognized that temperature can decrease disease resistance in the most sensitive individuals within each species' population and influence their sensitivity to certain toxic chemicals (e.g., Cairns et al. 1978). However, the study of Cairns et al. (1978) concluded that "temperature-toxicity interactions are far more complex than earlier literature has indicated," and increased temperature does not necessarily lead to increased sensitivity to toxic chemicals. For example, Linton et al. (1997) found that sublethal levels of ammonia enhanced growth at higher temperatures and Dockray et al. (1996) found better performance at high temperature when pH was

low. For temperature to affect the occurrence of disease, disease-causing organisms must be present, and either those organisms must be affected by temperature or fish must be in a weakened state due to the effect of temperature. In addition, some diseases may be more prevalent at high temperature, others are more prevalent at low temperature, and some are not apparently related to temperature. Therefore, for disease and pollutants, the specific nature and local presence of the disease-causing organism or pollutant influences its interaction with temperature.

The response of fish to temperature in natural streams is not only based on physiological functions but also on the overall interaction with other ecological factors (e.g., predators, prey abundance, and competitors). Differences among species can confer competitive advantages in relation to environmental variables that are reflected by the species' distribution (Brett 1971, Baltz et. al. 1982, Reeves et al. 1987, DeStaso and Rahel 1994). Natural stream environments nearly universally have increasing temperature from headwaters to their mouths (Hynes 1970), largely reflecting systematic changes in a variety of critical environmental factors that control heat transfer processes (Sullivan et al. 1990). Systematic changes in the occurrence or dominance of species within river systems in part reflects these temperature patterns.

ASSOCIATING BIOLOGICAL EFFECTS AND STREAM TEMPERATURE

Identification of appropriate temperature criteria to protect fish is complicated by the highly variable nature of temperature at stream sites, coupled with the differing temperature requirements of fish species. Water temperature at individual sites varies

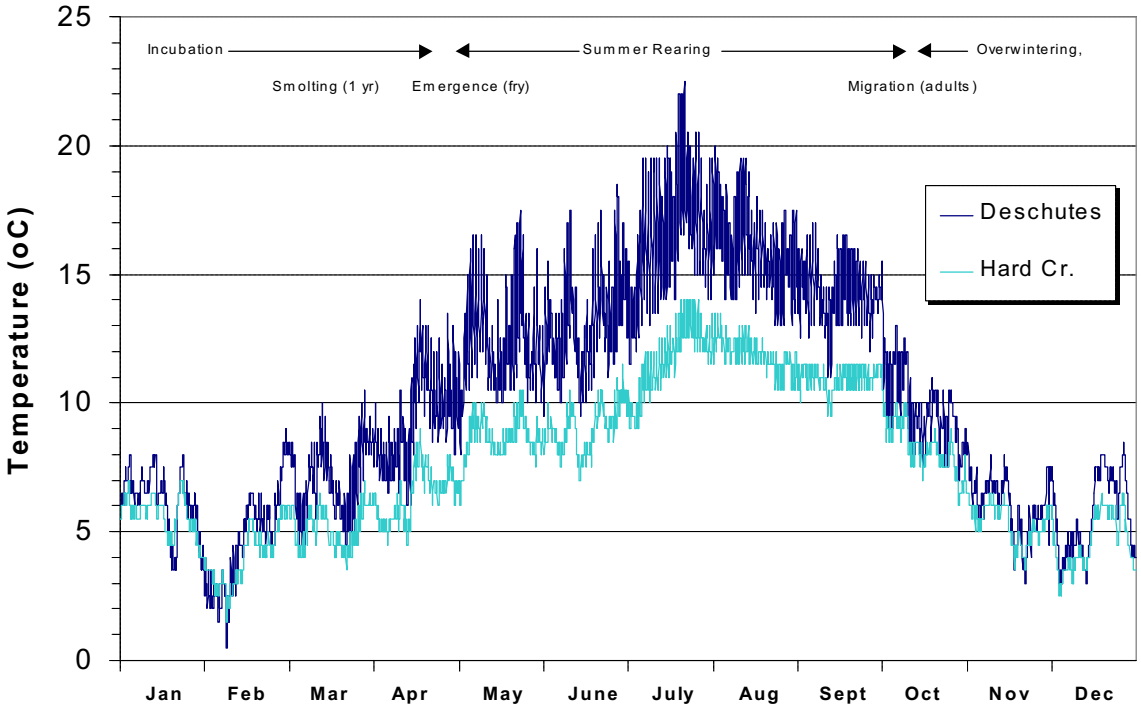


Figure 2.5 Annual temperature regime of the Deschutes River (148 km2) and Hard Creek (2.3 km2), a headwater tributary, near Vail, Washington. Data are hourly measurements.

significantly with time, ranging from lows in winter to highs in summer, with daily fluctuations depending on stream and climatic characteristics (Figure 2.5). The life history phases of salmonids are generally adapted to the prevalent temperature as illustrated for two stream sites in Figure 2.5, although species and stocks have specific life history timing (Weatherly and Gill 1995). Growth of alevins within the gravel bed and as fry and resident adults within the stream is a function of temperature; the timing of movement of alevins, fry and adults also depends, in part, on temperature.

The intent of temperature criteria is to index or describe key characteristics of the temperature regimen that have important measurable impacts on individuals or populations. Many authors favor identification of criteria appropriate for each life history phase (Bell 1973, Reiser and Bjornn 1979, Armour 1991) that reflect the temporal variability of temperature through the year. Hokannson (1977) described a quantitative means of establishing criteria for each life history phase of percids (perch, walleye) in a procedure he termed the "Envelope Method." Quantitative estimates of fish response to temperature for maturation cycles, spawning times, migrations, activity and spatial distribution are compared to seasonal changes in temperature. In Hokannson's example, natural history observations supplement experimental data where available. Temperature ranges that indicate optimal, sub-optimal, and lethal temperatures are plotted or tabulated for each life stage period (e.g., migration, spawning, incubation, rearing) to show the range and temporal distribution of temperature preference/tolerance regimes (temperature envelopes) during the hydrologic year.

Recent development of temperature standards in Oregon and Washington have also endorsed life history-based criteria for salmonid and char species, and promoted reach- and watershed-based approaches for determining criteria (ODEQ 1995; WDOE 1999). The intent is to identify a series of criteria that can be applied to limit impact on all species and life stages that may exist in a stream reach at that time of year. There has been some interest in "tailoring" criteria to specific time of the year, species, and even individual stream reaches. However, reach-, species-, or temporally-specific criteria can create enormous data collection and management issues.

Table 2.1 Characteristics of temperature regimes relevant to temperature criteria.

Regime Characteristic	Variables
Temperature Threshold	❑ Acute ❑ Sub-lethal
Temperature Fluctuation Characteristic	❑ Maximum ❑ Mean ❑ Minimum ❑ Fluctuation (maximum-minimum)
Averaging Period	❑ Instantaneous maximum ❑ 7-Day average ❑ Monthly or seasonal average

Criteria that can be applied on a regional basis require indices of the key characteristics of temperature regimes that are biologically meaningful, measurable without extraordinary means, and sensitive to human-caused effects. Factors to consider when reducing the variable summer temperature regime to simpler indices include: 1) the temperature threshold that reflects biological effects (e.g., usually a maximum but can be a minimum);

2) the temperature statistic within the amplitude of fluctuation (e.g., maximum, mean or minimum); and 3) the averaging period that characterizes temperature exposure (e.g., hourly, daily, or weekly) (Table 2.1).

ESTABLISHING WATER QUALITY CRITERIA

In recent years, the EPA and National Academies of Science and Engineering have promoted risk assessment techniques to develop water quality criteria, including formal protocols that have been peer-reviewed nationally (Parkhurst et al. 1996, U.S. EPA 1995). Risk assessment is designed to enhance understanding of the potential adverse effects of a pollutant on species by combining the information from biological studies with an analysis of each population's potential exposure to those effects. Risk occurs when the stress' magnitude, frequency, and duration exceed the species' ability to deal with that stress. Risk has little to do with the organisms' or species' sensitivity to a stress or to the concentration or level of environmental stress; risk depends entirely on whether the combination of exposure and sensitivity exceeds the organism's ability to withstand or adapt to the stress (Suter et al. 1993; U.S. EPA 1992).

Recent risk assessment techniques use more available data and disclose more uncertainties than assessments based on comparing a number denoting an effect, criterion or an exposure (Parkhurst et al. 1996; Solomon et al. 1996). Exposures and potential effects may be represented as probabilities of occurrence. Uncertainties about exposures and effects can also be expressed (e.g., as 95% confidence limits) and used in decision-making. Risk assessment techniques have been used to derive water quality criteria for aquatic life (U.S. EPA 1993), wildlife, and human health, and are being considered as one of the site-specific water quality criteria tools (Spehar and Adams, 1998). They can be used to evaluate broad effects if general patterns of exposure are known or to develop stream-specific criteria.

To derive a meaningful biological measure for specific life phase requirements, careful consideration must be given to both magnitude and duration of temperature, since these factors together have great effect on the risk that temperature poses to fish. In the remainder of this report, we will use a risk assessment approach to quantitatively estimate acute and chronic effects of temperature on salmonids. Risk assessment requires a quantitative analysis of fish response to temperature, and a quantitative assessment of the exposure to temperature that a fish may experience during the period of interest. The overlap between effects and exposure determines the risks associated with temperatures experienced in the aquatic environment.

CONCLUSIONS

The implications of this research to the question of establishing temperature criteria are:

- The effects of temperature on physiologic functions during the freshwater phase of salmonid life history are reasonably well understood, and in many cases have been quantitatively established in a laboratory setting.

- Salmon and trout have physiological and behavioral mechanisms that resist death at high and low temperatures unless extreme maximums are achieved.

Establishing temperature criteria for water quality standards is benefited by consideration of both duration and magnitude of temperature within these extremes.

- The effects of temperature on other factors, such as resistance to disease or pollutants, are more variable, depending on site conditions, and are less well characterized.

SECTION 3 TEMPERATURE CHARACTERISTICS OF STREAMS USED IN ANALYSIS

Abstract

Temperature data collected during the summer months from a number of streams and rivers in Washington are used for biological analysis in following sections of this report. In this section, we introduce these data and summarize the site and temperature statistics for each of the monitoring stations, and compare them among sites and with previous temperature studies. Temperature data span a range of temperatures from cold to warm, and many stream sites exceed current temperature criteria. Sites are shown to be broadly representative of temperatures observed in many Washington streams. Temperature indices, including annual maximum, 7-day maximum, and 7-day mean temperature are closely related at each site, and any can be used to index stream temperature measured over longer periods.

KEY FINDINGS INCLUDE:

- The data used in this report are broadly representative of stream temperatures in fish-bearing streams found in forested, rural, and urban streams in Washington. Temperature patterns are also probably representative of many streams throughout the Pacific Northwest.

- Temperatures span a range of temperatures, from 12° to 26°C in the annual maximum water temperature. This temperature range is within the range that salmonids may experience growth and lethal effects from short and long-term exposure.

- There is year-to-year variation in temperatures at sites, which affects short-duration temperature indices.

- Various temperature indices such as annual maximum, 7-day maximum, and 7-day mean are closely related to one another.

TEMPERATURE DATA

Analysis of the biological effects of temperature that follows in Sections 4, 5 and 6 is based on temperature recorded at 19 stream sites in the Chehalis, Deschutes, and Toutle river watersheds, located in the Coast Range and the west slopes of the Cascade Mountains in Washington. Temperature has been monitored over the years for various monitoring and research projects. All sites are located on portions of the river systems where forestry is the dominant land use. Sites with hourly temperature records varying from very cool headwater streams that support cutthroat steelhead, and coho populations to warm river mainstems with more diverse fish communities were selected.

Three sites are located in the mainstem of the headwaters of the Chehalis River near the town of PeEll and represent the largest river in our analysis. Bankfull stream widths

average 30 to 60 meters. The amount of shade varies with stream width, ranging from low to high. The river and its tributaries flow through second growth forests, and riparian areas are in various stages of regrowth following past logging-related disturbance. Eight tributaries to the headwaters of the Chehalis River were monitored. Each is approximately 5-10 meters in width at their confluence with the mainstem. Tributary streams were logged to the stream banks, and in some cases cleaned of woody debris, in the 1970's. Most are now well shaded with second-growth alder and Douglas-fir plantations. The mainsteam of the Chehalis River supports fall chinook nearly as far upstream as site 3. The lower portions of the tributaries support steelhead and coho spawning, incubation and rearing. Several of these streams are the location of marine nutrient and fish carcass supplementation research previously reported in the literature (Bilby et al., 1996, 1998). Porter Creek is a tributary to the lower Chehalis River flowing from the Capitol Forest near Olympia. It is well shaded with a predominantly alder overstory. This stream was the site of a woody debris addition study (Cederholm et al. 1997).

Four sites in the Deschutes River basin were monitored, including the mainstem, near the town of Vail and at the downstream end of the forest land use zone. A 2000-ha tributary, Thurston Creek, and two small streams (<300 ha) in the headwaters (Hard and Ware Creeks) have been monitored since 1974. Previous monitoring information is available in Sullivan et al. (1987). The smallest tributaries support cutthroat trout populations, while coho use the lower tributaries and mainstem. Anadromous fish are excluded from the upper tributaries by a barrier falls.

Two sites are located in the Mt. St. Helens blast zone. These streams have experienced vegetative recovery since the eruption in 1980, and currently support populations of steelhead and coho, that at times are supplemented by hatchery fish. Previous research on the interaction of temperature and fish production has been reported by Bisson et al. (1988).

Sites represent a range of small to large streams with shade varying from 0 to 100%. Maximum potential shade naturally varies among the sites with stream width. However, current shade is lower than potential at many sites due to past forest practices or natural disturbance.

Water temperature was sampled to the nearest 0ºC each hour by an electronic temperature recording device (HoboTemp® or Omnidata®) calibrated at the time of deployment and field-checked at least once each month. The temperature recorded by the instrument was the average temperature for the hour. Water temperature probes were placed in the stream near the bank and out of direct exposure to sunlight.

Temperature Characteristics

Temperatures span a range from predominantly cold to predominantly warm as indexed by the annual maximum temperature (the single highest hourly temperature during the year) (Table 3.1, Figure 3.1). Multiple years of data were available at some sites. The selection of years to include in the analysis was arbitrary, largely reflecting the ready access to data in the archives. Although additional years or sites could have been included, data would fall entirely within the range of data observed at the example sites. We did not feel that is was as important to include a large number of sites in this temperature analysis, as it was to select sites that span the range of temperatures likely to occur within Washington to the extent possible with the data available to us.

Table 3.1 Basin and temperature characteristics of 18 stream sites used in acute (Section 4) and growth risk analysis (Section 5). These sites are referenced as temperature study sites in the text.

Site	Watershed	Basin Area (km^2)	7-Day Maximum[a] °C	7-Day Mean[b] °C	Annual Maximum[c] °C	Season Median[d] °C	Year Measured
Deschutes River mainstem	Deschutes	145.0	21.0	18.4	22.5	15.0	1994
Thurston Creek	Deschutes	9.1	14.9	14.1	15.5	12	1994
Hard Creek	Deschutes	3.0	14.0	13.0	14.0	11.0	1994
Ware Creek	Deschutes	2.8	17.5	16.1	18.3	12.9	1994
Huckleberry Creek	Deschutes	5.3	18.4	17.6	18.5	15.5	1991
Chehalis River mainstem (Site 1)	Chehalis	181.8	21.1	18.9	22.1	15.6	1997
Chehalis River mainstem (Site 2)	Chehalis	57.5	22.1	18.2	23.2	14.5	1997
Chehalis River mainstem (Site 3)	Chehalis	29.5	20.6	18.6	21.4	14.3	1997
Crim Creek	Chehalis	22.0	18.8	16.9	19.4	14.3	1997
Lester Creek	Chehalis	10.4	18.4	16.3	19.0	14.2	1997
Thrash Creek	Chehalis	16.7	15.3	14.3	15.8	12.3	1997
Rogers Creek	Chehalis	13.1	15.7	14.1	16.1	12.6	1997
Big Creek	Chehalis	9.0	16.5	14.6	16.9	12.5	1997
Sage Creek	Chehalis	5.3	16.5	14.6	16.9	12.5	1997
Salmon Creek	Chehalis	8.9	15.8	14.2	16.2	12.3	1997
Mack Creek	Chehalis	2.8	12.9	12.5	13.1	11.7	1997
Porter Creek	Chehalis	25	17.5	16.3	18.6	14.4	1990
Hoffstadt Creek	Toutle	25.6	24.5	18.4	26.0	14.0	1988
Harrington Creek	Toutle	8	19.1	16.7	20.5	13.3	1988

[a] maximum value of the 7-day moving average of the daily maximum temperature
[b] maximum value of the 7-day moving average of the daily mean temperature
[c] instantaneous maximum
[d] median of daily mean temperature from June 1 to September 15

The coolest measured stream was Mack Creek. The temperature never exceeded 13°C at any time during the summer (Figure 3.1). The warmest temperatures recorded in the temperature study occurred in Hoffstadt Creek located within the Mt. St. Helens blast zone, although this stream continues to cool with vegetation regrowth since previous studies (Bisson et al. 1988). The mainstem of the Chehalis River (sites 1, 2 and 3) experienced the longest duration of high temperature at or above 20°C. The Chehalis River is among the warmest rivers in Washington and well exceeds existing state temperature standards. The contrast in seasonal temperature regime between a consistently warm and a consistently cool site within the same time period and watershed is shown in Figure 3.2. Except for Hoffstadt Creek, the temperatures of the other sixteen sites fell somewhere between these two. All streams that exceed 16°C annual maximum temperature exceed current Washington water quality temperature standards.

The minimum temperatures observed during the period between June 1 and September 15 were between 7 and 9 °C in all streams (Figure 3.3). This temperature is close to groundwater temperature and was typically experienced early in June. The maximum temperature observed reflects site characteristics such as openness to the sky, stream depth, and the extent of groundwater inflow (Sullivan et al. 1990). Despite large differences in the annual maximum temperatures among sites (Figure 3.1), most streams also spent a considerable amount of time at the same temperatures, most notably in the range between 12 and 17 °C. This temperature is coincident with the optimal temperature range of many salmonids.

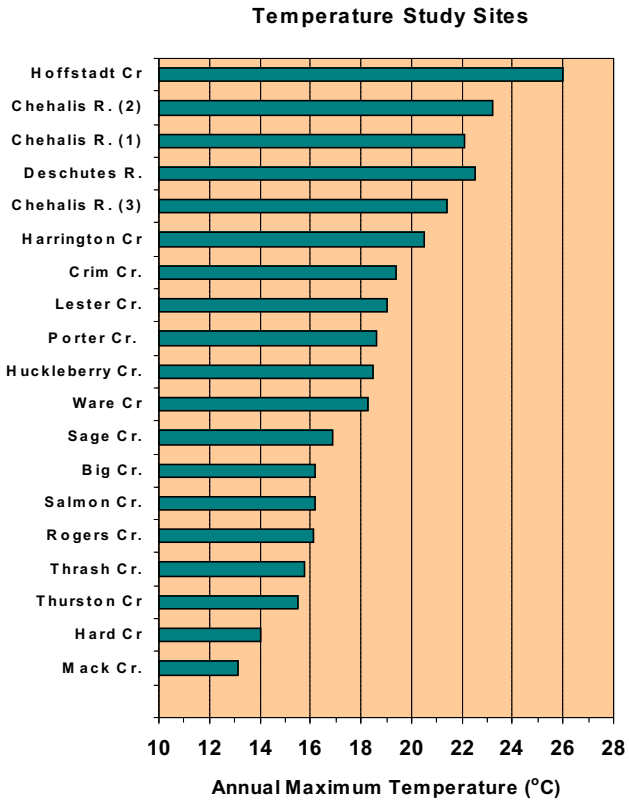


Figure 3.1 Annual warmest temperature at the 19 temperature study sites included in the temperature risk assessment.

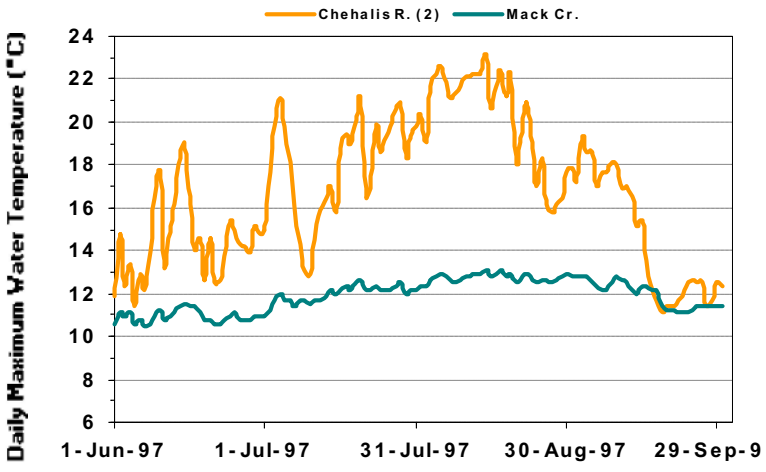


Figure 3.2 Daily maximum temperature at one of the warmest sites (Chehalis River site 2), and one of the coolest sites (Mack Creek).

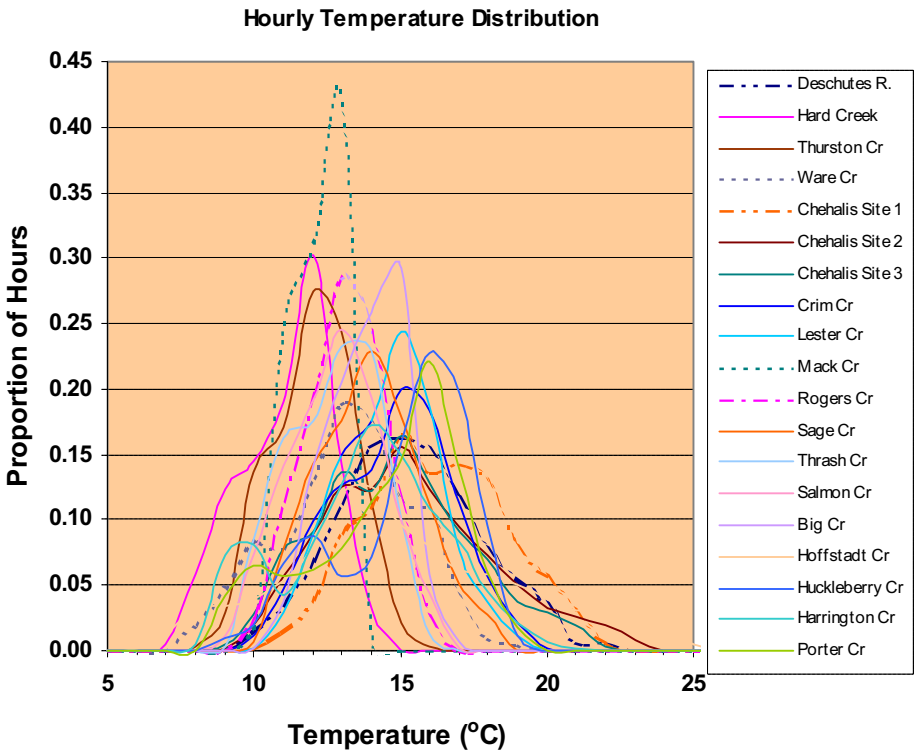


Figure 3.3 Proportion of 2567 hourly temperature observations by temperature at 19 temperature study sites measured between June 1 and September 15.

Comparison of Study Sites to Other Temperature Studies in Washington, Oregon and Idaho

Stream temperatures at the nineteen sites are representative of most other streams and rivers in Washington, and probably elsewhere in the Pacific Northwest as well. As an indication of how well the example data span the range of temperatures, we compare the relative occurrence of annual maximum temperature at sites included in other large-scale temperature studies that have been conducted in Washington. The 19 risk analysis sites represent temperature patterns in the same range as the 89 streams included in the 1990 Timber/Fish/Wildlife statewide temperature study; the earlier statewide, multi-agency study represented a broad range of stream conditions found primarily in forests located throughout Washington (Sullivan et al. 1990). Using the annual maximum temperature to index long-term temperature, the distribution of temperature at sites were similar between the two studies, although this analysis includes a few more warm sites and a few less cold sites (Figure 3.4). Temperatures from seven sites included in both studies tended to be warmer than expected with mature riparian vegetation, due in part to past land use or recent natural disturbance. The 1990 study contained a number of undisturbed sites.

Figure 3.4 also includes the cumulative distribution of maximum temperatures measured in a synoptic study of 570 urban/rural streams throughout the Puget Sound region coordinated by the University of Washington Center for Urban Studies. Temperature data were collected by volunteers within a 2-hour interval in the afternoon of August 19, 1998. Data from this study do not necessarily represent the hourly maximum temperature since temperatures did not necessarily coincide with the hottest hour of the year. However, the data are representative of the long-term average daily maximum for August (Derek Booth, pers. com.) and are likely to be within a few degrees of the annual maximum (Sullivan et al., 1990). Streams tended to be small tributary streams. Stream temperatures at these sites tended to be slightly cooler than risk analysis sites, and no streams were as warm as those included in this analysis.

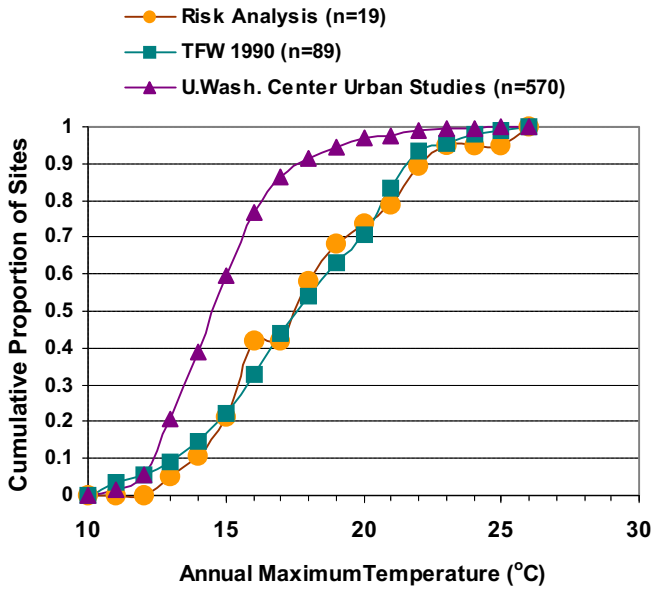


Figure 3.4 Cumulative distribution of the annual maximum temperature at temperature study sites included in this study in comparison to the 89 sites included in the statewide study of temperature conducted by Sullivan et al. (1990) and the 570 sites included in the University of Washington Center for Urban Studies synoptic survey of urban and rural streams in the Puget Sound area. The 1990 TFW study included sites located throughout Washington.

In further consideration of how the risk sites represent the range of high temperatures observed throughout the Pacific Northwest region, we examined published U.S. Geological Survey temperature records from Washington, Oregon and Idaho. We selected the year 1978-79 for several reasons: there were more sites recording temperature in the 1970's and 1980's than are operative today, and this was a period of rather high temperature throughout the region due to the 1977-78 drought. The annual maximum temperatures are shown by state in Figure 3.5. (Note differences in the number of sites in each state.) The U.S.G.S. sites are primarily on larger rivers, although some smaller streams are also included. For example, the Columbia River mainstem is represented 6 times in the Washington data and 3 times in the Oregon data. Rivers such as the Columbia, Skagit, Yakima, Snake, Deschutes (OR), Willamette, Rogue, and Umpqua, to name a few, are included in this data set. (See Appendix A for a listing of U.S.G.S. sites.) None of the sites in the Timber/Fish/Wildlife study, University of Washington survey, or the risk sites (Table 3.1) were located within the zone of influence of dams. Dams often cause local heating or cooling depending on the release depth from the upstream reservoir. A few of the U.S. Geological Survey sites were located below dams. These sites were generally colder than expected given the size of the river at these locations.

Of the 129 U.S.G.S. sites, 11 (8.5%) had an annual maximum temperature greater than 26°C, the highest temperature observed at the risk analysis sites. One of those was in Washington (Yakima River), 1 was observed in Idaho (Snake River) and 9 were observed in Oregon. The John Day River in eastern Oregon reached temperatures as high as 31°C. The remainder of the Oregon sites exceeding 26°C were concentrated in the southwestern corner of the state, including the Applegate, Siuslaw, N. and S. Fork Umpqua, Calapooia River, and Elk Creek.

The four sources of data cited in this report provide perspective on the temperatures of small forested and urban streams and moderate to large size rivers in both the dry interior and wet coastal zones. The sites included in the risk analysis are broadly representative of temperatures of moderate to small size streams (all sites had basin area less than 200 km^2). Larger rivers tend to fall within the temperature ranges observed in the smaller rivers. However, it is appropriate to recognize that the largest rivers, and those in some geographic areas, have different temperature regimes than most Pacific Northwest streams, and if temperature is of concern, these should be specifically evaluated to determine whether the duration of specific temperatures exceeds adverse levels.

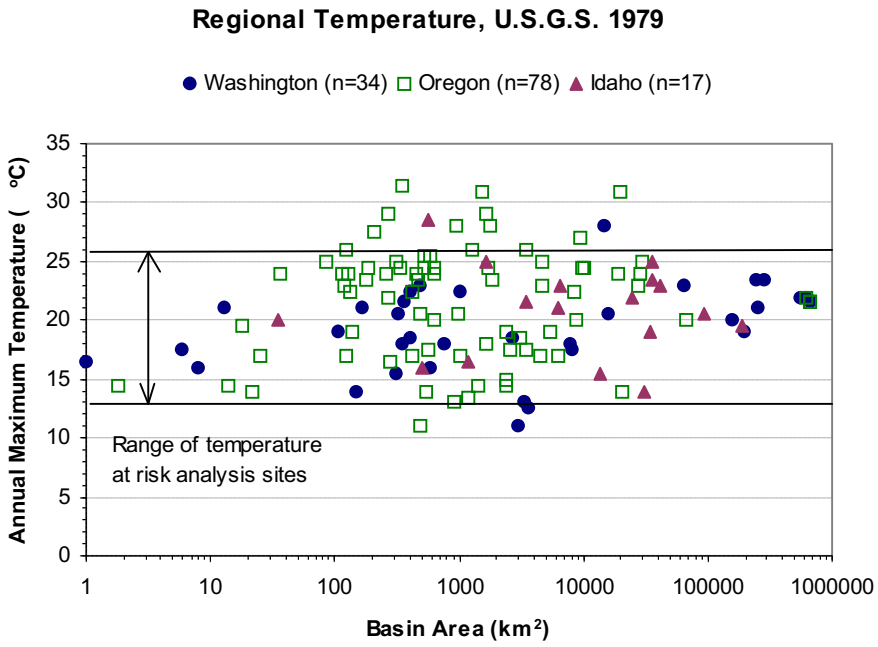


Figure 3.5. Annual maximum temperature for all stream and river sites listed in the U.S.Geological Survey Water resources data for Washington, Oregon, and Idaho for the year 1978-79.

The data from the University of Washington website, the statewide Timber/Fish/Wildlife study, and the U.S. Geological Survey are presented merely to establish how well the 19 risk analysis sites used in this report (Table 3) represent the streams found in a variety of geographic and land use settings that occur in the Pacific Northwest region. Only the records from the 19 sites are used for the analyses of acute and chronic temperature effects that follow in Sections 4,5, and 6 of this report.

We had no hourly temperature records for comparable time intervals from the coldest streams (e.g., <12°C). These are most likely to occur in well-shaded, small headwaters streams (Black, 2000). When well-shaded, these streams tend to hover near groundwater temperature (typically 6°-10°C during the summer, depending on geographic location) with little, if any, daily fluctuation. Such patterns were evident in Norwegian Creek (western Washington) and Cee Cee Ah Creek (eastern Washington) as examples taken from the TFW statewide study in 1990 (Sullivan et al. 1990). To represent this type of stream, we assigned constant temperatures through the summer. All temperature indices, including daily mean and daily maximum were set to 10°C for "Ten Site" and 8°C for "Eight Site".

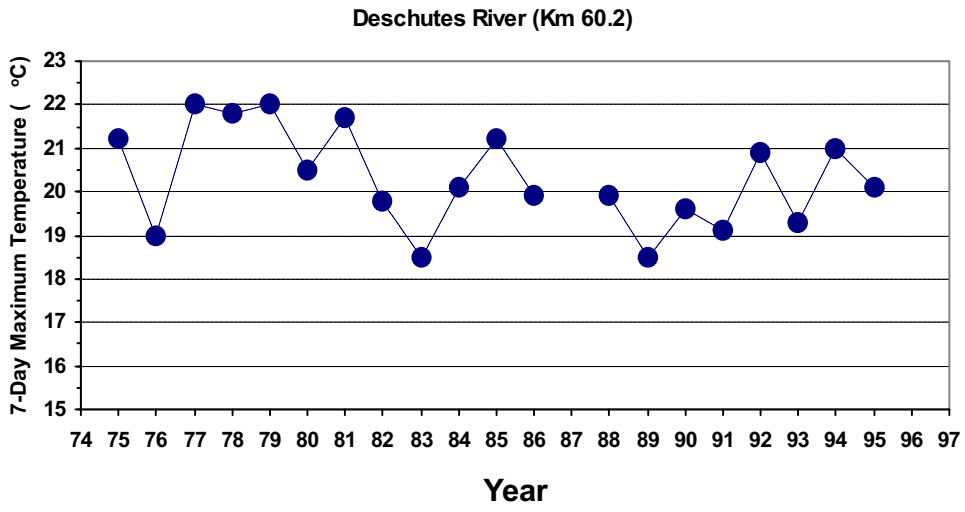


Figure 3.6 Annual maximum temperature of the Deschutes River near Vail, Washington from 1975-1995.

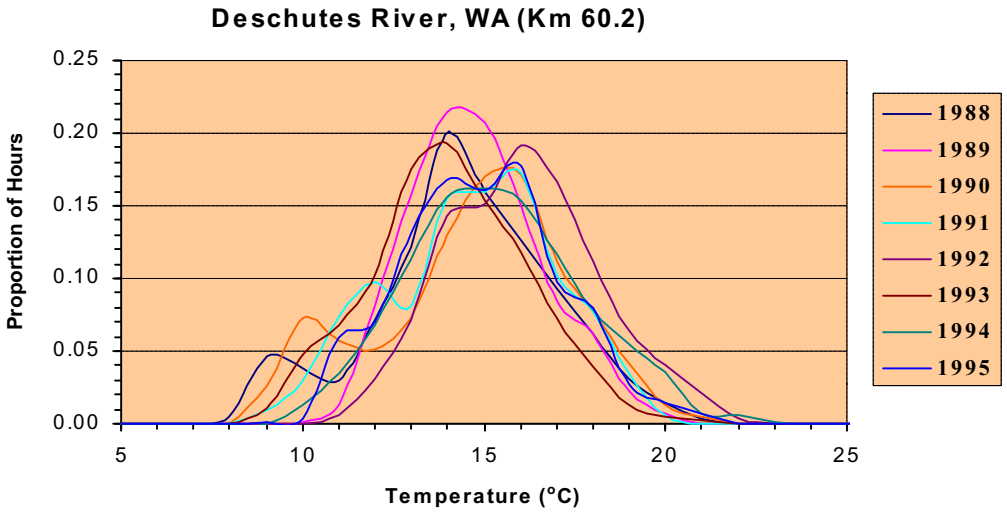


Figure 3.7 Frequency distribution of hourly temperature for 8 years in the Deschutes River near Vail, WA.

Temporal Variation at a Site

Temperature regimes at sites often vary somewhat from year to year due to climatic factors. Annual variation is illustrated in the 7-day maximum temperature at the Deschutes River mainstem (Figure 3.6). The long-term mean at this site was 20.3°C averaged over 20 years but the upper temperature ranged ±1.25°C the average. The shape of the frequency distribution, available in hourly increments for eight years since 1988, was similar from year to year, but tended to shift up or down the temperature scale (Figure 3.7). Therefore, the time-averaged characteristics of temperature are likely to vary on an annual basis at a site. However, the relationship between the indexing characteristics such as maximum 7-day temperature and the overall distribution of temperature during the same summer period should remain consistent.

Temperature Indices

Later in this report (Sections 6 and 7), we will discuss the temperature indices that have been used to characterize the complex long-term temperature regime experienced by the biological community inhabiting streams (e.g., Figures 2.5 and 3.2) in ways that are meaningful ecologically. These indices or metrics are considered necessary as per Clean Water Act requirements to establish temperature criteria that are protective of salmonids or other designated uses. When water quality criteria are exceeded in water bodies, activities that contribute to or cause the exceedances to those water bodies may be restricted. Many streams and rivers are currently identified as exceeding water quality criteria according to the 305b reports from the states in the Pacific Northwest region, with a large number of them listed for temperature impairment. Therefore, the temperature criteria take on significant legal and economic meaning, and their appropriateness is of great concern to the public, scientists, and regulators.

Temperature criteria generally specify a temperature threshold calculated over an averaging period (Table 2.1). For example, Washington's current criteria, sometimes also referred to as standards, specifies the annual maximum temperature, expressed as the maximum hourly temperature that occurs each year. Oregon specifies the average of the daily maximum temperature of the 7 warmest consecutive days (ODEQ 1995). The U.S. EPA (1977) recommends the average of the daily mean temperature of the 7 warmest consecutive days (MWAT). Each of these measures for each temperature site is listed in Table 3.1.

There is an implicit assumption with these indices that they are representative of temperatures that is biologically meaningful in some way. The relationship between short-term indices and acute temperatures, which are typically expressed for short intervals, may be direct as discussed in Section 4. However, the threshold values associated with state water quality criteria appear to be selected to prevent long-term chronic effects as discussed in Sections 5 and 6. Therefore, there is an implicit assumption that short-term indices, based on temperature measured for only a few hours each year, represent the effects of long-term exposure. This assumption is worthy of evaluation. Furthermore, there is no consensus on how to report stream temperature with meaningful but simplified measures: laboratory and field studies use a wide variety of methods, and seemingly, no two are alike. Lack of standardized methods for reporting temperature among both the physical and biological sciences makes comparison among

studies difficult, and the selection of temperature criteria based on field ecological and laboratory studies tenuous.

Our analyses of acute and chronic biological effects associated with natural stream temperatures that follow in Sections 5 and 6 of this report rely on hourly records summarized only to average daily temperature. These analyses are therefore not limited by the lack of consensus on methodology to compress long-term temperature regimes into very short duration indices. We will, however, use results based on detailed temperature records in Section 6 to evaluate whether short-term indices are reliable indictors of at least some long-term biological responses.

Nevertheless, although there is some debate as to whether short-term indices are appropriate to represent long-term exposure, it appears that all of the short-term indices are closely related to one another (Figure 3.8). This makes selection among them a matter of procedural and logistical questions, rather than a biological question, since all similarly index the characteristics of the upper tail of the distribution of the temperatures sampled.

Perhaps a more important question is how well the short-term measures correlate with temperature characteristics occurring over longer periods. The median temperature for the period from June 1 to September 15, a long-term measure, is shown in relation to the three short-duration indices in Figure 3.9. Although more variable, the short-term indices are well correlated with the season median, indicating that short-duration measures can meaningfully characterize seasonal temperature patterns, albeit with some loss of precision. Not surprisingly, the 7-day mean temperature (MWAT) is best correlated with the season median, probably because each is respectively characterizing the central tendency of the temperature within the daily and seasonal period.

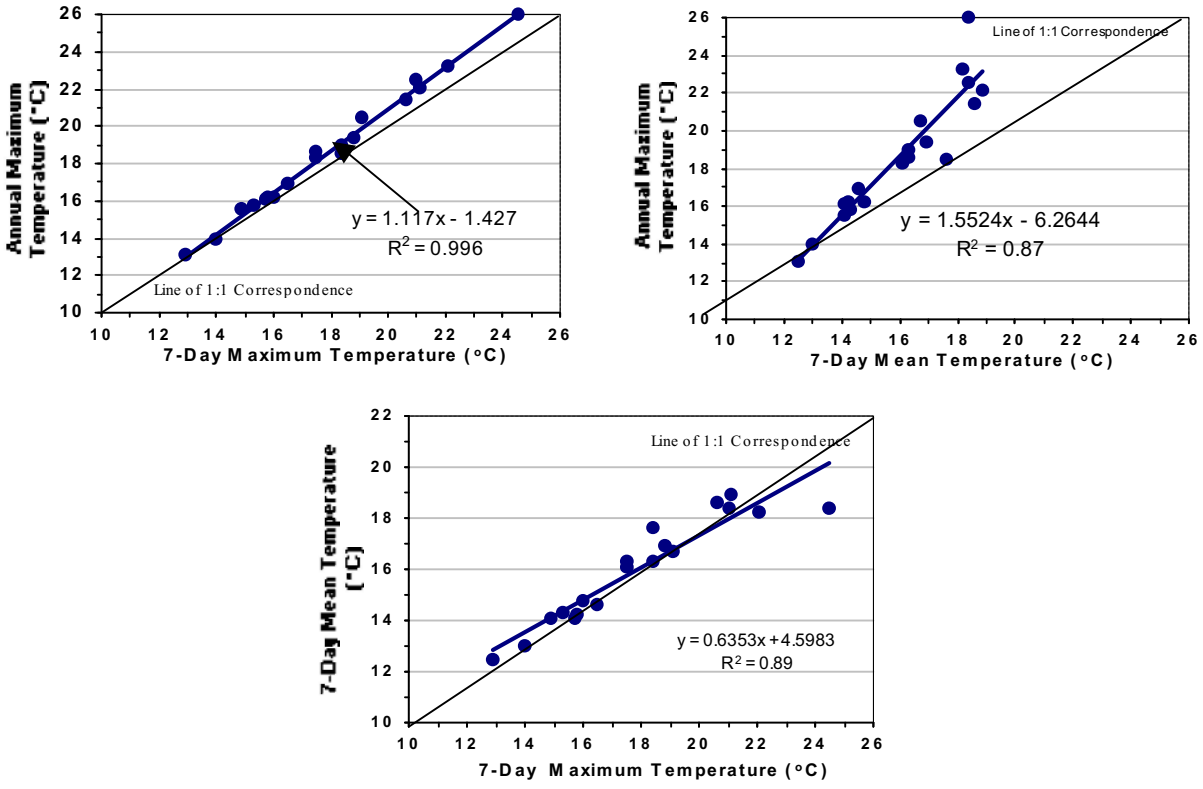


Figure 3.8 Relationships between temperature indices including annual maximum, 7-day mean (MWAT), and 7-day maximum.

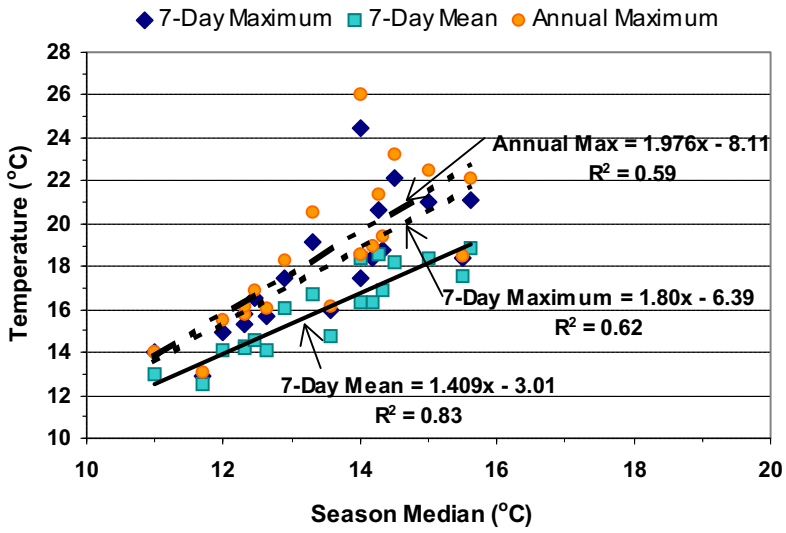


Figure 3.9 Relationship between season median temperature (June 1-Sept 15) with short duration indices.

CONCLUSIONS

- The data used in this report are broadly representative of stream temperatures in fish-bearing streams found in forested, rural, and urban streams in Washington. Their temperatures also appear to be representative of many streams throughout the Pacific Northwest, based on comparisons of data from other sources in the region.

- Observed temperatures at study sites span a range of temperatures, from 13° to 26°C in the annual maximum water temperature. This range encompasses most of the temperatures where salmonids may experience acute and chronic effects from short and long-term exposure.

- Various temperature indices such as annual maximum, 7-day maximum, and 7-day mean that are often used in temperature criteria are closely related to one another and can be compared or used interchangeably with the appropriate correlation relationships.

- Measures representing long duration exposure, such as the median temperature observed over the summer period are related to short-term measures.

- There is year-to-year variation in temperatures at stream sites, which is reflected in short-duration temperature indices.

SECTION 4 ASSESSMENT OF RISK OF SALMON SPECIES TO ACUTE TEMPERATURE IN STREAMS AND RIVERS

Abstract

In this section, we examine temperature records from streams and rivers in Washington spanning a range of summertime maximum temperatures to determine whether acute lethal temperature conditions exist, and if they could be associated with water quality temperature criteria. A relationship between temperature and duration of exposure sufficient to cause mortality was established based on previously published research. Hourly temperature records were scanned for occurrences of sufficient continuous duration, defined for each level of temperature to cause mortality within salmonid populations. Although at least one stream had temperature as high as 26°C, a temperature that can be lethal to salmonids, the length of exposure was not sufficient to cause mortality. We found no occurrence of acute lethal temperature conditions in any of the stream sites, which are broadly representative of streams and rivers in the Pacific Northwest.

Key findings of this chapter:

- There is sufficient information to quantitatively define the lethal effects of temperature on salmonids.
- No occurrences of acute lethal temperatures were observed at stream sites with a wide range of temperatures including many with annual maximum temperatures that well exceed current water quality standards.
- Nevertheless, lethal level temperatures of sufficient duration to cause mortality have been reported in the Pacific Northwest. Therefore, although not a common occurrence, attention should be paid to local site conditions that can lead to acute mortality.
- A temperature threshold of 26°C is suggested to prevent mortality of salmon and trout species in natural rivers and streams. Further analysis of temperature to determine exposure is suggested for streams where annual maximum temperature is between 24° and 26°C.

INTRODUCTION

Temperature duration and lethality relationships have been established through laboratory study for most salmon species. Acute effects of temperature typically have been assessed as effects on survival that result from continuous exposure to elevated temperatures for specified periods of time (usually from 1 to 96 hours). Mortality has been commonly expressed as the duration eliciting mortality of some specified portion of the population at a specific temperature (Brett 1952). This is a measure of mortality from temperatures occurring within the zone of resistance (Figure 2.1) (Fagerlund et al. 1995); that is, where the temperature must be experienced for some duration greater than 1 hour before

mortality occurs. These temperatures are more likely to occur than the ultimate lethal thresholds where mortality of most or all of the population occurs within a very brief time.

Risk analysis is performed by quantitatively relating key temperature characteristics with specific measures of probable population response to those temperatures. We examined the likelihood that exposure to temperature is of sufficient magnitude and duration that it causes direct mortality within the fish population using conventional probabilistic risk assessment procedures (Parkhurst et al. 1996). Laboratory mortality data available from the literature were used to develop temperature effects relationships. Temperature data from streams monitored continuously during the summer months were used to assess exposure. Acute effects would most likely be associated with the occasional spikes of warm temperature that may induce mortality.

ACUTE THERMAL EFFECTS CURVES ASSOCIATED WITH 50% MORTALITY

Past research has emphasized the exposure duration causing 50% mortality in the population at a given temperature, as the most common lethality measure. Data from several sources were used to generate curves showing the relationship between temperature and duration to 50% mortality (EPA 1977, Brett 1952, and Golden 1978). Each curve estimates the length of time that 50% of a population can survive at some temperature above its upper incipient lethal temperature. This temperature is referred to as the LT50. At each successively lower temperature, the duration of exposure must be longer to achieve the same amount of mortality (Figure 2.2).

EPA (1977, page 11 of text and page 38 of Appendix C) provides a regression equation relating exposure time (in minutes) to the LT50 (in °C):

$$\log_{10} t = a + b \cdot LT50 \qquad (4.1)$$

where t is the exposure time, and *a* and *b* are coefficients of the relationships. Equation 4.1 can be arranged to

$$LT50 = (\log_{10} t - a) / b \qquad (4.2)$$

The regression coefficients, *a* and *b*, are provided in EPA (1977) for many fish species, including all those identified above, except cutthroat trout (pages 55-58 of Appendix B). From the coefficients provided, curves can be generated for selected species of salmon and trout: pink salmon, chum salmon, coho salmon, sockeye salmon, and chinook salmon. The coefficients in EPA (1977) were gathered from many different sources, including Brett's 1952 paper summarizing his study of lethal temperatures for the five salmon species. It is a necessary assumption of this analysis that the data from these laboratory studies conducted on a small number of fish and a few stocks are representative of the species, and that these relationships correctly characterize the mortality/temperature relationships. Golden (1978, Figure 4 on page 14) provides regression coefficients for cutthroat trout. Steelhead LT50 curves were generated using data from Alabaster and

Table 4.1 Regression coefficients for the relationship between duration and percent mortality of the sample population for laboratory studies on salmon and trout species. Most of the data are taken from a summary U.S.E.P.A document (1977). Studies report LT50, unless otherwise noted.

Species	Acclimation Temperature (°C)	Source	Age/Size	a	b	N	R	Notes
Coho salmon	15	Brett 1952	Juvenile	20.4066	-0.6858	6	-0.9681	
	20	"	"	20.4022	-0.6713	4	-0.9985	
	23	"	"	18.9736	-0.6013	5	-0.9956	
	17	Coutant 1970	Adult	5.9068	-0.1630	5	-0.9767	Reported acclimation temp. was the Columbia River temp (at Priest Rapids) during fall migration.
Rainbow trout	15	Alabaster and Downing 1966	Juvenile	15.650	-0.5000	2	-	
(Steelhead)	18	Alabaster and Welcomme 1962	"	18.4654	-0.5801	5	-0.9787	D.O. at 7.4 mg/l
	18	"	"	13.6531	-0.464	5	-0.9742	D.O at 3.8 mg/l
	20	Alabaster and Downing 1966	"	19.6250	-0.6250	2	-	
	20	Craigie 1963	Yearling	14.6405	-0.4470	3	-0.9787	Raised in soft water, tested in soft water
	20	"	"	15.0392	-0.4561	3	-0.9917	Raised in soft water, tested in hard water
	20	"	"	15.1473	-0.4683	3	-0.9781	Raised in hard water, tested in soft water
	20	"	"	12.8718	-0.3837	3	-0.9841	Raised in hard water, tested in hard water
Cutthroat trout	23	Golden 1978	Juvenile	18.092	-0.56523	?	-0.996	Hatchery fish only
	13-25 (fluctuating)	"	"	22.543	-0.71999	?	-0.999	Hatchery fish only
	23	"	"	18.3166	-0.5723	?	-0.999	Hatchery and wild fish pooled
	13-25 (fluctuating)	"	"	18.1515	-0.5723	?	-0.992	Hatchery and wild fish pooled
Chinook salmon	20	Blahm and McConnell	Juv (spring run)	21.3981	-0.7253	3	-0.9579	50% mortality
	20	Unpub.data	"	22.6664	-0.7797	4	-0.9747	10% mortality
	20	"	"	20.9294	-0.7024	3	-0.9463	90% mortality
	20	"	Juv (fall run)	22.2124	-0.7526	4	-0.9738	50% mortality
	20	"	"	21.6756	-0.7438	4	-0.9550	10% mortality
	20	"	"	20.5162	-0.6860	3	-0.9475	90% mortality
Sockeye salmon	15	Brett 1952	Juvenile	15.8799	-0.5210	7	-0.9126	
	20	"	"	19.3821	-0.6378	5	-0.9602	
	23	"	"	20.0020	-0.6496	4	-0.9981	
	20	McConnell and Blahn 1970	Juv/underyearling	16.7328	-0.5473	6	-0.9552	
	20	Unpublished data	"	17.5227	-0.5861	6	-0.9739	10% mortality
	20	"	"	15.7823	-0.5061	6	-0.9539	90% morality

Downing (1966) and Alabaster and Welcomme (1962), as cited in the EPA document. Data were combined where studies were reasonably comparable. Coefficients for each species are provided in Table 4.1 for experiments that tested a range of acclimation temperatures. Generally, the higher the acclimation temperature, the higher the LT50 temperature.

The acute thermal effects curves were generated in Excel® using regression coefficients provided in EPA (1977) and Golden (1978) for a range of exposure times. While the equations provided in EPA (1977) were based on exposure times measured in minutes, we converted them to hours in order to be consistent with temperature measurements at field sites. To generate the hourly curves, equation 4.2 was modified to

$$LT50 = ((\log_{10} t \cdot 60) - a)/b \qquad (4.3)$$

Although it was assumed that the regression coefficients in Appendix B of EPA (1977) were correct, one appeared to be in error. The value for *a* was given as 16.2444 for pink salmon at an acclimation temperature of 20°C from Brett's study (1952). The resulting curve did not match the one presented in Figure 5 of Brett (1952). To generate a curve more representative of Brett's (1952) figure, a value of 13.2444 was used for *a* instead.

A few of the studies included in EPA (1977) were excluded from the analysis. These were studies in which the fish being tested showed signs of gas bubble disease or other effects of gas supersaturation.

COMPARISON OF LT50 and LT10 MORTALITY RELATIONSHIPS

Most of the available information on thermal effects is based on 50% survival. We felt that it was appropriate to use a more conservative population measure for risk assessment. Therefore, we also expressed acute effects as the duration of time needed to elicit 10% mortality (LT10) for each temperature and species studied. LT10 was selected because it is the amount of mortality considered acceptable in the control groups for acute toxicity tests (ASTM 1997), and 90% (100% - 10%) is a recommended protection level for species populations (SETAC 1994; Solomon et al. 1996).

In the EPA (1977) document, two unpublished studies provided regression coefficients for both 50% and 10% (LT10) mortality curves at acclimation temperatures of 15°C or higher. McConnell and Blahm (1970) calculated regression coefficients for sockeye salmon; and Blahm and McConnell (1970) calculated regression coefficients for both spring and fall runs of chinook salmon. Using the regression coefficients generated from these studies, LT50 and LT10 values for sockeye (Table 4.2) and chinook (Table 4.3) were calculated for a range of time periods, along with their ratio.

For the range of exposure times, the LT10 values were 98.0 to 99.7% of the LT50 values. This is consistent with Brett (1958, page 76 and Figure 4), who indicated that differences between temperatures for 50% mortality and those for <50% mortality are relatively small. This "implies that temperatures of this order have only to increase slightly to cause a large difference in mortality." Based on visual inspection of the LT50 and LT10 curves, the slopes were similar. That is, on the log-time scale, the differences between the LT50 and LT10 curves were approximately constant. (There was insufficient information

Table 4.2 Relationship between LT50 and LT10 for sockeye salmon. Acclimation temperature is 20°C. Data from McConnel and Blahm (1970), unpublished data (cited in U.S. EPA 1977).

Time (hrs)	LT50 (°C)[&]	LT10 (°C)[#]	LT10/LT50 Ratio (%)	Delta T (°C)
.1	29.2	28.6	98	0.6
.25	28.4	27.9	98.12	0.5
.5	27.9	27.4	98.21	.0.5
1	27.3	26.9	98.31	0.5
2	26.8	26.3	98.41	0.4
3	26.5	26.0	98.47	0.4
4	26.2	25.8	98.52	0.4
6	25.9	25.5	98.58	0.4
8	25.7	25.3	98.63	0.4
12	25.4	25.0	98.7	0.3
16	25.1	24.8	98.74	0.3
20	24.9	24.6	98.78	0.3
24	24.8	24.5	98.81	0.3
32	24.6	24.3	98.86	0.3
40	24.4	24.1	98.9	0.3
60	24.1	23.8	98.98	0.2
80	23.8	23.6	99.03	0.2

& regression coefficients a=16.7328, b=-0.5473

regression coefficients a=17.5227, b=-0.5861

Table 4.3 Relationship between LT50 and LT10 for chinook salmon. Acclimation temperature is 20°C. Data from McConnel and Blahm (1970), unpublished data (cited in U.S. EPA 1977).

Type	Time (hrs)	LT50 (°C)[&]	LT10 (°C)[#]	LT10/LT50 Ratio (%)	Delta T (°C)
Spring run[a]	0.1	28.4	28.1	98.74	0.4
	0.25	27.9	27.6	98.86	0.3
	0.5	27.5	27.2	98.95	0.3
	2	26.6	26.4	99.13	0.2
	4	26.2	26.0	99.23	0.2
	6	26.0	25.8	99.28	0.2
	8	25.8	25.6	99.33	0.2
	10	25.7	25.5	99.36	0.2
	16	25.4	25.2	99.43	0.1
	24	25.1	25.0	99.49	0.1
	40	24.8	24.7	99.57	0.1
	60	24.6	24.5	99.64	0.1
	80	24.4	24.3	99.68	0.1
	100	24.3	24.2	99.72	0.1
Fall run[b]	0.1	28.5	28.1	98.65	0.4
	0.25	28	27.6	98.6	0.4
	0.5	27.6	27.2	98.56	0.4
	2	26.8	26.3	98.49	0.4
	4	26.4	25.9	98.44	0.4
	6	26.1	25.7	98.42	0.4
	8	26	25.5	98.4	0.4
	10	25.8	25.4	98.39	0.4
	16	25.6	25.1	98.36	0.4
	24	25.3	24.9	98.33	0.4
	40	25	24.6	98.3	0.4
	60	24.8	24.4	98.27	0.4
	80	24.6	24.2	98.25	0.4
	100	24.5	24.1	98.24	0.4

&regression coefficients LT50:a=21.3981, b=-0.7253 lT10: a=22.6664, b=-0.7797

regression coefficients LT50:s a=22.2121, b=-0.7526 LT10 a=21.6756, b=-0.7438

presented in Appendix B of the EPA (1977) document to statistically compare the slopes.) Had the differences not appeared constant, the application of a singe adjustment factor would not have been appropriate.

ACUTE THERMAL EFFECTS CURVES AT 10% MORTALITY

The adjustment factor estimated from the McConnell and Blahm (1970) and Blahm and McConnell (1970) data for sockeye and chinook salmon was assumed to be appropriate to use in estimating LT10 curves for the other salmon and trout species. For the other studies from which LT50 curves were generated, LT10 curves were estimated by applying a factor of 0.98 to each LT50 curve. The equation used to calculate the estimated LT10 values is

$$LT10 = \frac{(\log_{10}(t * 60) - a)}{b} \cdot 0.98 \qquad (4.4)$$

The estimated LT10 curves for 15°C acclimation for four salmon species are provided in Figure 4.1. (Relationships for all species and acclimation temperatures are graphically depicted in Appendix C, under separate cover.)

The resulting LT10 lethal curves are very similar among salmon species although cutthroat trout have higher tolerance to high temperature than the other species (Figure 4.1). We note that using the relationship based on fluctuating acclimation temperature (Golden 1978) produced higher LT50's than when tested at constant temperature. Continuous exposures of 3 to 30 hours are necessary to cause mortality at temperatures between 24° to 26°C, varying by species. The duration of time necessary to cause mortality decreases sharply with small increments of temperature above approximately 26°C. Short duration excursions (less than two hours) above 27°C are very likely to cause mortality of some individuals in the population because only one hour duration is necessary

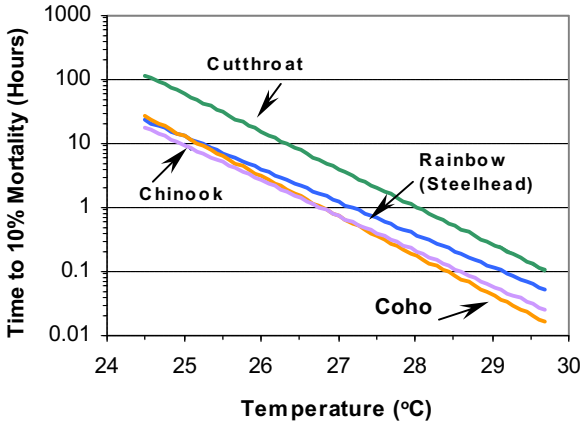


Figure 4.1 Duration curve for the LT10 acute effects of temperature for coho and chinook salmon and cutthroat and steelhead trout, acclimated at 15°C. (Data from Brett 1952, Alabaster and Downing 1966, Golden 1978; see Appendix C).

ACUTE EXPOSURE CHARACTERIZATION

The maximum temperatures juvenile salmonids experienced *in situ* were determined through exposure characterization, (U.S. EPA 1992). Summertime temperatures for sites described in Section 3 (Table 3.1) were assembled for this study. The occurrence of potentially lethal temperatures was determined by examining the hourly temperature record at each of the 19 temperature sites for exposure periods defined as the number of continuous hours at or above the exposure temperature (temperature was rounded to the nearest ^{o}C). We used a lower level of 16°C since it approximates the optimum temperature for several salmon species (Weatherly and Gill 1995) although it is important to note that acute mortality does not commence until 24ºC under naturally fluctuating conditions. Exposure was based on hourly temperatures so that we could capture relatively short duration effects and the LT10 data were expressed in hours.

An exposure period is the number of consecutive hours each temperature (measured to the nearest 1.0°C) occurred within a period when the temperature was at or above 16°. For example, if the temperature increased from below 16° to 16.6°, a count of one was added to 16°C. If the next hourly temperature was 18.5ºC, then a count of one was added to16^{o}, 17° and 18ºC. If the following hourly temperature decreased back to 17ºC, then a count of one was added to 16°, and 17°, and so forth. As soon as the next temperature retreated below each temperature degree category, the counting (i.e., duration of exposure) for that temperature ceased. When temperatures dropped below 16ºC, the entire exposure period was concluded. In the example above, there was one exposure period where temperature reached 16° for 3 hours, 17° for two hours, and 18° for one hour.

Exposure to temperatures above 16°C varied significantly among sites. Table 4.2 lists the number of exposure periods for temperatures greater than 16°C and the number of hours by temperature category for the warmest continuous exposure period at each site. At some sites there were no exposure periods at any time during the summer months, while at others both the magnitude and duration of exposure were relatively large. Hoffstadt Creek in the Mt. St. Helens Blast Zone experienced the warmest temperature (26.0^{o}C) which lasted one hour (Figure 4.3A and 4.4). This stream is shallow, and it heats and cools rapidly over the course of the day. The deeper Chehalis River sites (Figure 4.3B) did not reach quite as high a temperature (22°C), but experienced higher temperatures over much longer continuous periods.

Table 4. 4 Number of exposure sequences where temperature was continuously greater than or equal to 16° C for one or more hour at each of the sites and the duration of continuous exposure (hours) at each temperature for the warmest period.

		Number of Hours by Temperature for the Maximum Sequence at the Site										
Site	**Total Number of Sequences**	**_16_**	**_17_**	**_18_**	**_19_**	**_20_**	**_21_**	**_22_**	**_23_**	**_24_**	**_25_**	**_26_**
Big Creek	**6**	4	0	0	0	0	0	0	0	0	0	0
Chehalis River Main 1	**49**	455	70	21	16	12	8	2	0	0	0	0
Chehalis River Main 2	**69**	44	33	26	21	16	1	6	1	0	0	0
Chehalis River Main 3	**62**	44	32	23	17	11	0	0	0	0	0	0
Crim Creek	**54**	22	14	7	3	0	0	0	0	0	0	0
Deschutes River Main	**70**	139	65	17	14	10	7	5	0	0	0	0
Hard Creek	**0**	0	0	0	0	0	0	0	0	0	0	0
Harrington Creek	**36**	25	17	12	9	5	0	0	0	0	0	0
Hoffstadt Creek	**83**	19	16	15	13	12	7	8	7	5	5	1
Huckleberry Creek	**34**	405	65	12	0	0	0	0	0	0	0	0
Lester Creek	**47**	14	8	5	0	0	0	0	0	0	0	0
Mack Creek	**0**	0	0	0	0	0	0	0	0	0	0	0
Porter Creek	**30**	21	15	9	0	0	0	0	0	0	0	0
Rogers Cr.	**1**	2	0	0	0	0	0	0	0	0	0	0
Sage Cr.	**17**	7	0	0	0	0	0	0	0	0	0	0
Salmon Cr.	**2**	3	0	0	0	0	0	0	0	0	0	0
Thrash Cr.	**0**	0	0	0	0	0	0	0	0	0	0	0
Thurston Cr.	**0**	0	0	0	0	0	0	0	0	0	0	0
Ware Cr.	**24**	34	23	13	0	0	0	0	0	0	0	0

ACUTE RISK CHARACTERIZATION

To assess acute risk to lethal temperature, the periods when duration of temperature equaled or exceeded the LT10 curve (e.g. Figure 4.1) were examined to determine if the duration of exceedance was of sufficient length to cause mortality. If the time spent at any temperature equaled or exceeded the time necessary to elicit mortality at the LT10 level, then an exceedance occurred. If an exceedance occurred, we assumed that 10% of the population died. The number of exceedances that occurred during the summer interval was counted. It follows that if 10% of the population died at each exposure, then the cumulative risk to the population (Lethal Risk) could be calculated using the number of exceedances (n) experienced by the population:

$$\text{Lethal Risk} = \left[1.0 - (1.0 - 0.10)^{n}\right] \qquad (4.5)$$

where lethal risk is defined as the proportion of the population that dies due to the temperature exposure. For example, if a stream's temperature exceeded an LT10 once, the cumulative total mortality risk would be $[1.0-(0.90)^{1}]$ or 10%; if it exceeded an LT10 four times, the total mortality risk would be $[1.0-(0.90)^{4}]$ or 34%.

There were no indicated periods of acute exposure for chinook, coho, steelhead, or cutthroat at any of the stream locations despite higher temperatures at some sites. The warmest period of exposure at each of the 19 temperature study sites in relation to species' LT10 exposure curves is shown in Figure 4.2. Some sites did not exceed optimal temperature (approximately 16°C) at any time during the summer and do not appear on the figure. For those that exceeded acute lethal temperatures (24°C or greater), the exposure was generally much less than required to cause mortality.

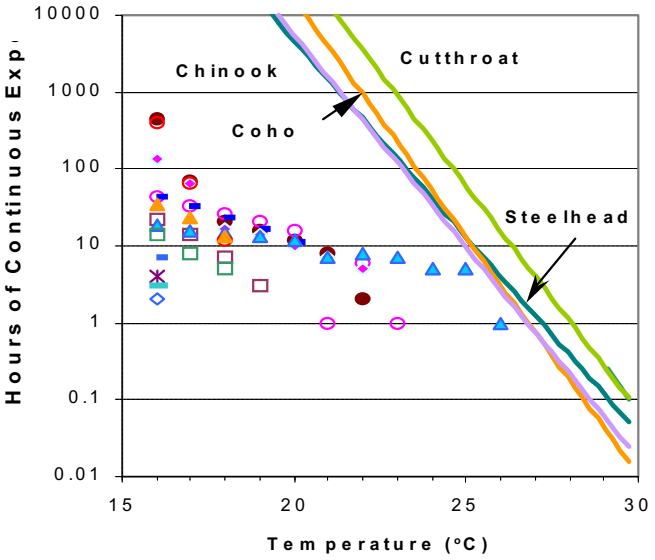


Figure 4.2 Hours of continuous exposure at temperature sites (see Table 4.1) and LT10 lethality relationships for fish species.

The only site that exceeded 24°C (the temperature zone where mortality depends on duration of exposure) was Hoffstadt Creek, which peaked at 26.0°C for one hour (Figure 4.2 and 4.3A). Hoffstadt Creek had an additional two exposure periods reaching 25°C (three-hour duration) and twelve reaching 24°C (five-hour duration). Although the one-hour maximum temperature approached the magnitude and duration that could elicit mortality at this site, the duration of exposure at 24°, 25°, and 26°C for Hoffstadt Creek was too short to directly cause mortality (Figure 4.3A). The Chehalis

River mainstem experienced much longer duration at higher temperatures (Figure 4.3B), but never came close to lethal temperatures.

No acute risks were identified since none of the water temperatures persisted long enough to exceed the lethal thresholds (LT10s) of salmonid species likely to occur in these streams. Since *n* equaled 0 at all sites, the probability of acute effects was 0.

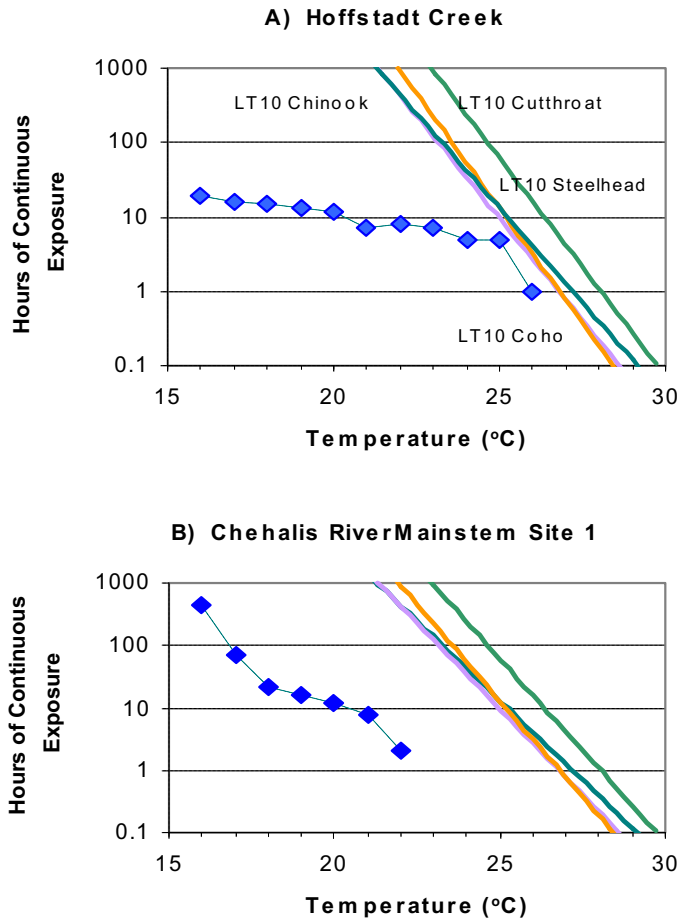


Figure 4.3 Example of how acute exposures were summarized: maximum number of sequential hours at each temperature for A) Chehalis River mainstem (site 1) and B) Hoffstadt Creek sites. Diamonds are the exposure for each temperature for the warmest period at each site.

Small to moderate size streams and rivers have sufficient fluctuation in the daily temperature that water does not spend long continuous duration at lethal temperature. The daily fluctuation is strongly dependent on stream depth (Adams and Sullivan, 1990, Sullivan and Adams, 1990). Within much of the Pacific Northwest, relatively shallow streams and rivers may be capable of achieving temperatures that can cause mortality within a few hours. Their shallowness, however, will generally preclude them from maintaining high lethal temperatures for more than a few hours during the day, and temperatures can fluctuate widely over the solar cycle (Brown 1969). For example, Figure 4.4 shows Hoffstadt Creek during its warmest 7-day period in 1990. The duration of lethal temperature is short.

Conversely, large deep rivers may maintain higher average temperature, but the daily fluctuation is smaller. For example, for much of the summer and its length, the Columbia River maintains an average temperature of 22°C with a daily fluctuation of 0.5 °C. In the U.S.G.S. water resource records discussed in Section 3, the S. Umpqua River in southern Oregon reached 30°C annual maximum temperature. Nevertheless, the daily minimum temperature on the hottest days did not exceed 21° to 23.5°C, indicating that duration of extreme temperature was short, and probably within lethal thresholds. Thus, duration of exposure at higher temperatures can be significant, but lethal temperatures that cause mortality in a few hours are not likely to occur in most cases. The dependence of daily fluctuation on stream depth makes the case that very large, deep rivers are different than most of the streams and rivers in the region (Section 3), and those rivers with extreme temperatures should probably be analyzed individually to fully understand their local site conditions.

Table 4.5 shows the calculated temperature for 1-hour and 6-hour exposure that would cause mortality of 10% of the population based on relationships provided in Table 4.1, and the calculation methods described in this section.

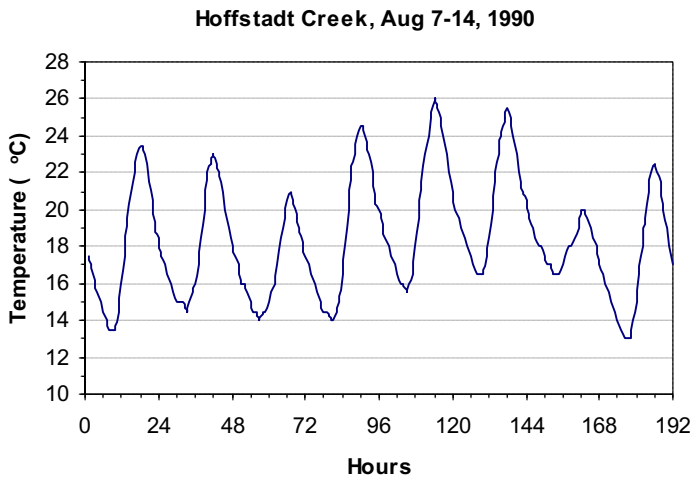


Figure 4.4 Hourly temperature during the warmest 7-day period at Hoffstadt Creek in 1990.

The temperatures at which mortality occurs at exposures of 1 hour and 6 hours if very similar among species. This temperature is between 25.4°C and 27.4°C, averaging 26.4°C. There is a low probability that the 6-hour duration temperature occurring in most natural streams in Washington, as suggested by Table 4.1. Therefore, an acute temperature for salmon of approximately 26°C in the annual maximum temperature is suggested to prevent mortality with a margin of safety. We also suggest that a site-specific analysis of temperature be performed when annual maximum temperature is between 24° and 26°C, to determine whether duration is sufficient to cause mortality. It would appear that in most cases it will not, but until more analyses are completed over a broader geographic range this will not be known with certainty. Site specific analyses would also be warranted at sites of thermal pollutant sources that alter the normal daily temperature fluctuation.

Table 4.5. Temperature of 1-hour and 6-hour duration that will cause mortality of 10% of the population for salmon and trout species.

Species	Age/size	Acclimation Temp (°C)	1-Hour Temperature (°C)	6-Hour Temperature (°C)
Coho salmon	juvenile	15	26.6	25.5
		20	27.2	26.1
		23	28.0	26.8
Rainbow trout	juvenile	15	27.2	25.7
		18	27.5	26.9
		20	28.0	26.8
Rainbow trout	yearling	20	28.2	26.5
		20	28.5	26.8
		20	28.0	26.3
		20	28.3	26.3
Cutthroat trout	juvenile	23	28.3	27.1
		13-25 (fluctuating)	28.5	27.9
		23	28.3	26.3
		13-23 (fluctuating)	28.0	26.7
Chinook salmon	juvenile	15	26.8	25.4
		20	27.5	26.8
	jacks	19	30.1	27.1
	juvnile spring	20	26.5	25.5
		20	26.8	25.8
	Juvenile fall	20	26.6	25.6
		20	26.8	25.7
Sockeye salmon	juvenile	15	26.5	25.1
		20	26.0	25.9
		23	27.5	26.3
	underyearling	20	26.8	25.4
Chum salmon	juvenile	15	26.3	24.9
		20	27.8	25.9
		23	28.2	26.6

Discussion

We conclude that direct mortality from temperature is unlikely to affect populations living in streams with temperatures similar to those evaluated in this paper.

Mortality associated with acute lethal temperatures has been previously reported from streams similar to those in this study. In both cases, natural and logging-related disturbance caused complete denudation of the watershed, including all riparian vegetation and in-channel cover. In the years immediately following the1980 eruption of Mt. St.

Helens, temperatures of streams within the blast zone were extreme relative to those typically recorded in the Pacific Northwest. Bisson et al. (1988) and Martin et al. (1986) reported temperatures in Hoffstadt Creek and other moderate size streams in the blast zone that exceeded 29°C for short daily intervals several times during the summer. The lethality curve suggests that even short duration exposure to such warm temperatures could cause mortality of individual fish and repeated exposures could have a measurable effect on salmon populations. In this case, the acute effects analysis would have predicted mortality, although we do not have temperature data from these earlier studies to calculate the cumulative mortality. Populations of juvenile coho salmon successfully survived the temperature episodes exceeding lethal levels (Bisson et al. 1988). However, Martin et al. (1986) also reported significant mortality of juvenile coho within populations in the same streams as Bisson et al. (1988) that was proportional to the magnitude of daily temperature fluctuations (maximum fluctuation of 17°C) when temperatures exceeded 26°C.

Temperatures have since sufficiently declined with vegetation re-growth that mortality is not expected at temperatures existing eight years after the eruption and beyond. Hall and Lantz (1969) reported no reduction in numbers of coho, and a 25% reduction in cutthroat trout, when summertime temperatures reached 30°C in a small Oregon stream (Needle Branch) after clearcut logging and severe burning.

Elsewhere in the Pacific Northwest, water temperatures greater than 24°C are measured relatively rarely in streams and rivers (see Section 3). Based on the foregoing analysis, one can conclude there is low risk of acute lethality to salmonid species juveniles from temperatures observed at the nineteen sites in this risk assessment. The temperatures at these sites are representative of the potentially lethal temperature of most of the natural streams up to 5th order found in the Pacific Northwest, including many with disturbed riparian forest cover (Sullivan et al. 1990). Streams in this analysis include many sites affected by land use and catastrophic natural disturbance. Nevertheless, if temperatures should reach as high as 28°C for as little as an hour, mortality of some portion of the population can be expected.

CONCLUSIONS

- There is sufficient information to quantitatively define the lethal effects of temperature on salmonids.
- No occurrences of acute lethal temperatures were observed at stream sites with a wide range of temperatures including many with annual maximum temperatures that well exceed current water quality standards.
- Nevertheless, lethal level temperatures of sufficient duration to cause mortality have been reported in the Pacific Northwest. Therefore, although not a common occurrence, attention should be paid to local site conditions that can lead to acute mortality.
- A temperature threshold of 26°C is suggested to prevent mortality of salmon and trout species in natural rivers and streams. Further analysis of temperature to determine exposure is suggested for streams where annual maximum temperature is between 24° and 26°C.

SECTION 5 DEVELOPMENT AND CORROBATION OF A BIO-ENERGETICS –BASED APPROACH TO EVALUATING SALMON GROWTH IN RELATION TO ENVIRONMENTAL TEMPERATURE

Abstract

Growth is an important biologic function for juvenile salmonids rearing in streams and rivers. In this section, we develop a quantitative method to evaluate the effects of the long-term temperature on the growth of salmonids. The mathematical model considers the effects of temperature and food consumption on daily growth rate. When applied over time to measured stream temperature regimes, the model simulates the weight gain of salmon species, and can be used to assess the importance of the cumulative or chronic effects of temperature on growth. At present, the model is formulated to assess the growth of juvenile salmonid species during the summer months with variable temperatures. Previous researchers have used similar approaches, although this specific method has not been explicitly described previously. We use well-established bioenergetics principles and models available in the scientific literature to help develop it.

The relatively simple formulation appears to predict weights well according to a number of comparisons of observed and predicted growth at stream sites where fish populations had been sampled. The method is sensitive to temperature, making it a useful tool for evaluating salmon response to temperature in natural streams, and it allows direct comparisons among sites and species if desired. Application of bioenergetics principles to field observations using this tool suggests ecological adaptation to environmental temperature and food supply. The model may prove useful for helping field investigators sort out the complex relationships between population dynamics, environmental temperature, and food supply that control growth in natural streams.

Because the model is central to determining the effects of temperature on fish growth in relation to temperature, the mathematical approach is developed in detail in this section. If the scientific basis for the growth analysis is not of interest, the reader is urged to move directly to Section 6, where the method is applied to develop temperature criteria.

Key findings include:

- Methods of predicting growth based on quantitative bioenergetics principles can be applied to streams to assess the effects of temperature on juvenile salmonid growth, with results that are consistent with observed wild fish population growth patterns.

- The method is sensitive to temperature and can be applied to the daily temperature regime making it a useful tool for assessing the biological impacts of temperature in natural streams.

INTRODUCTION

Of primary interest in selecting temperature criteria is the prevention of adverse effects of long-term exposure to temperatures detrimental to fish. To explore the effects of prolonged exposure to temperature, numerous investigators have found growth to be a reliable and measurable integrator of a variety of physiological responses (Brett 1971, 1995; Iverson 1972; Brungs and Jones 1977; Wurtsbaugh 1973). Growth rate is the most frequently reported measure of fish health from laboratory studies and occasionally from field studies. By corollary, the weight a fish gains over a time interval is, in part, determined by the ambient temperature of the water in which it lives.

The size of salmonids during juvenile and adult life stages influences survival and reproductive success. Although the large majority of anadromous salmonid growth occurs in the ocean environment, growth of juveniles in natal streams is especially important for anadromous salmonids that must reach minimum sizes before they can smolt (Weatherly and Gill 1995). Holtby and Scrivener (1989) and Quinn and Peterson (1996) demonstrated that the size achieved by juvenile coho at the end of their first summer growing period was a strong determinant of their later success in overwintering and smolting. Larger size also conveys competitive advantage for feeding in the freshwater environment (Puckett and Dill 1985, Nielsen 1994) for both resident and anadromous species. Mason (1976) and Keith et al. (1998) found that the smaller fish tend to be those that are lost from rearing populations. Brett et al. (1971) described the freshwater rearing phase of juvenile sockeye as one of restricted environmental conditions and generally retarded growth. This synopsis is generally true for salmonid species that dwell in stream and river environments for lengthy periods of time.

Growth can be viewed as the net effect of the environment on the relation between food consumption, metabolism, and activities of an organism (Warren 1971). The bioenergetics of many fish species, including salmonids, has been widely studied and quantified (reviewed by Adams and Breck 1990, Brett 1995, and others). The food fish consume is allocated to maintaining basic metabolic functions, growth and waste. The most generalized representation of bioenergetics is of the form:

$$\text{Consumption} = \text{Metabolism} + \text{Growth} + \text{Wastes}$$

Researchers have developed mathematical relationships for the rate functions for various energetic processes (summarized in Brett 1995). We propose that a bioenergetics approach can be used to assess the effects of temperature exposure because many of the energetic relationships are based on temperature and the energy balance determines growth.

Bioenergetics models vary in their formulations of specific functions and in the complexity with which they attempt to characterize the details of each (Ney 1993). The most comprehensive bioenergetics models consider all modes of energy intake and expenditures including consumption, respiration, active metabolism, specific dynamic action (swimming), wastes (including egestion and excretion), and growth (including body tissue and gonads) (Kitchell et al. 1974, Hewett and Johnson 1992). Bioenergetics models combine these relationships into an energy balance where the energy consumed and the energy expended to all functions must sum to one. Elliott's (1976) relationships for brown trout are also widely cited. Bioenergetics models have been developed for a number of applications in fisheries management and their uses are many and varied (Hansen et al. 1993, Ney 1993). They have been used routinely to manage the rearing of fish in hatcheries (McLean et al. 1993) and populations in natural environments (Hanson et al. 1997). Increasingly,

they have been used to explore ecological responses to environmental conditions (Filbert and Hawkins 1995, Preall and Ringler 1989, Railsback and Rose 1999).

J.F. Kitchell and colleagues at the University of Wisconsin have made bioenergetics analysis available to a wide variety of scientists and managers. They have summarized research for many fish species, including salmonids, and packaged the energy functions in software for easier use of the multiple mathematical statements required for the energy balance (Kitchell et al. 1974, Hewett and Johnson 1992, Hansen et. al. 1997). In practice, model users are urged to supply data to calibrate model parameters and to validate population growth. There are a variety of data needs in conducting full bioenergetics analysis. The Wisconsin models require a relatively large number of parameters (15-30), some of which are measured from the population and environment of interest (Hanson 1997). Default values are supplied if the user is unable to develop local data, often times borrowed from similar species that have received greater laboratory and field study. The proliferation of parameters, each with its own estimation error, has led some to criticize bioenergetic models for being insensitive statistically and difficult to apply (Hansen et al. 1993).

For practical applications, it is often desirable to construct the simplest model possible that can capture the key environmental or biological effects of interest (Kitchell et al. 1974). Moreover, Ney (1993) has suggested that elaborate energetic characterizations may not be necessary to provide satisfactory answers to some bioenergetics questions. Although grwoth is only one of the bioenergetic functions, many authors argue that it integrates a host of specific physiological responses to temperature, including metabolic rate (basal and active), feeding and digestion, and swimming performance or the ability to hold position with the current (Brett 1995; Weatherly and Gill 1995). For example, Brett et al. estimated weight gain of sockeye (1971) and chinook (1982) in relation to environmental temperature assuming that the relationship between temperature, food consumption and growth rate, such as illustrated in Figure 2.4, adequately integrates the organism's response to temperature. Mallet et al. (1999) applied a temperature-modified form of a von Bertalanffy growth model, which has no explicit of energetics, to estimate the growth of grayling in a European River. Up to 25 to 30% of the energy consumed by salmonids is allocated to growth and the remainder is allocated to the other energy demands (Brett et al. 1982, Brett 1995). With the exception of respiration, the pattern of response of all of the energetic functions to temperature is similar to that of growth rate, with maximums and minimums of activity peaking and declining at similar optimal temperatures (e.g. Brett et al. 1971, Hansen et al. 1997). Energy consumed by respiration continually increases reaching maximums at temperatures coincident with shut down of other metabolic functions, including growth (e.g., 24°C for salmonids, Brett 1995).

Growth, or more precisely, gain in weight for our purpose, is one of the few energetic functions that can be readily measured in natural environments, and it perhaps is the quality of greatest interest for juvenile salmonids. Because bioenergetic functions respond similarly to growth, the approach of Brett et al. (1982) assumes that the other components of the energy equation can be ignored yielding a modeling approach that requires only a few parameters.

In this section, we develop a mathematical approach to predict growth from temperature and food consumption, using realistic estimates of food supply. It follows the approach of Brett et al. (1971, 1982) in that only growth rate as mediated by temperature and food consumption are accounted for in the energy balance. However, we use the bioenergetics approach to estimate the interaction of food consumption with temperature. We develop the rationale for each of the components of the growth model, and parameterize them based on laboratory and field studies of fish populations. We then compare model simulation results with fish population weight gain at a number of stream

sites to evaluate model performance. This analysis considers growth during summer rearing because high water temperatures are of a particular concern in how they may restrict growth. The analysis focuses primarily on coho and steelhead species because 1) they occur widely in Pacific Northwest streams, penetrating well into the headwaters, and 2) necessary biological data were available for constructing the model and evaluating its performance. The growth model is then used in Section 6 to explore methods for quantifying growth response to identify biologically-based water quality criteria.

GROWTH MODEL

The basis for the mathematical formulation for daily weight gain in juvenile salmonids is its relationship to temperature and food consumption. This relationship has been graphically depicted for sockeye and chinook salmon by Brett and colleagues (summarized in Brett 1995 and Weatherly and Gill 1995). The relationship for sockeye salmon is shown in Figure 2.4 of this report.

The change in weight is calculated for defined scenarios of temperature, food availability, and species size characteristics on a daily basis, and summed through the growth period. Weight gain is determined by multiplying the daily specific growth rate by the body weight:

$$\Delta w_i = g_i \cdot w_i \tag{5.1}$$

where:

Δw_i = current day's growth, day i (gram $_{\text{growth}}$ /day)
g_i = specific growth rate, day i (gram $_{\text{growth}}$ /gram $_{\text{body weigh t}} \cdot$ day)
w_i = body weigh t, day i (gram $_{\text{body weigh t}}$)

Next day's weight is computed by adding the daily growth to the current day's weight:

$$\begin{aligned} w_{i+1} &= w_i + \Delta w_i \\ &= (1 + g_i) \cdot w_i \end{aligned} \tag{5.2}$$

Weight at some time t can be computed as a function of an initial weight w_0 and daily growth rate coefficients:

$$w_t = w_0 \cdot \prod_{i=0}^{t-1} (1 + g_i) \tag{5.3}$$

The daily specific growth rate is a function of the water temperature to which the fish are exposed that day and daily food consumption:

$$g_i = \mathrm{f}_g(T_i, C_i) \tag{5.4}$$

where:

T_i = temperatur e, day i (°C)

C_i = daily consumptio n day i (gram $_{\text{food}}$ /gram $_{\text{body weigh t}}$ · day)

In turn, the consumption is a function of the water temperature to which the fish are exposed that day, the weight of the fish, and the food supply (R_i):

$$C_i = \text{f}(T_i, W_i, R_i) \qquad (5.5)$$

Looking at equations 5.1, 5.4 and 5.5, one can see that growth is being modeled as a function of water temperature, consumption, and size of the fish. The interaction of these terms is discussed in detail as the mathematical relationships are developed. The fact that consumption is both a dependent and an independent variable of temperature introduces some complexity into the growthcalculation that must be addressed.

The growth model is developed in two parts. First, the relationship between consumption, temperature and weight (equation 5.5) is estimated following the approach discussed by Stewart and Ibarra (1991), and used, for example, in the Wisconsin bioenergetics model (Hewett and Johnson 1992, Hanson 1997). Second, the relationships between specific growth rate, temperature and consumption (equation 5.4) are developed for several salmon species. We draw from previously published laboratory experiments to establish these relationships. These studies exposed juvenile salmonids for periods sufficiently long to determine the rate of growth (e.g., change in weight from one interval to the next) of the sample population at a given temperature and food consumption. Experimental data for coho salmon (*Oncorhynchus kisutch*) were obtained from Everson (1973) and for steelhead trout (*Oncorhynchus mykiss*) from Wurtsbaugh and Davis (1977). We assumed that these experimental data are representative of the species' response to temperature and consumption in the natural environment. (Data from these experiments is provided in Appendix A.)

Consumption. There is a maximum level of food consumption for each species that constitutes satiation or fullness. There is also a minimum consumption required to maintain standard metabolism. Consumption is generally expressed as a proportion of food mass to fish body mass consumed each day (g $g_{bw}^{-1} d^{-1}$), or alternatively, as a percent of body mass per day. Within the range of consumption between satiation and minimum maintenance, the growth rate varies with consumption as illustrated for sockeye salmon in Figure 2.4.

The consumption rate at satiation, (C_s), and by corollary, at lesser amounts of food, varies with temperature and changes systematically with the fish's weight (Brett 1995). Salmonids respond physiologically to temperature by altering food consumption and the efficiency with which food is converted to growth (Weatherly and Gill 1995). C_s is at a maximum at optimal temperature and declines at colder and warmer temperatures (Brett 1971), yielding the characteristic shape of growth/temperature response (e.g., Figure 2.4). For example, coho consumption was 40% greater at 21°C than at 11°C in the laboratory experiments (Everson 1973), but dropped off sharply above 22°C (Brett et al. 1982). Consumption at satiation also declined with increasing fish weight (Brett 1995). The rate of consumption of Everson's (1973) experimental fish at 3.6 grams was 45% of that of fish weighing 2.0 grams at the same temperature.

There is a maximum consumption rate for each species, (C_{max}), a key benchmark established in laboratory studies at optimum temperature, low weight, and unlimited food supply. Generally, the

consumption at 1 gram of weight and optimum temperature is the highest consumption likely to be observed for the species (C_{max}), and serves as an important reference point for growth computations (Hanson 1997, Beauchamp et al. 1989, Hewett and Johnson 1987). The maximum consumption at satiation rations for other temperatures and weights (C_s) is less than C_{max}, and can be calculated as a proportion of maximum (p) according to equation 5.6.

$$p = \frac{C_s}{C_{\max}} \tag{5.6}$$

where:

p = normalized consumption (dimensionless)
$C_{\max}$ = satiation ration at reference weight and optimum temperature
(gram of food gram of body weight^{-1} day^{-1}, g g$_{bw}^{-1}$ d^{-1})

C_{max} varies by species (sockeye: Brett 1971; chinook: Brett et al. 1982; coho: Everson 1973, steelhead: Wurtsbaugh and Davis 1977).

To appropriately estimate growth rate (g), it is necessary to establish the consumption at each weight (C_w) and temperature (C_T). We follow the approach used in the Wisconsin bioenergetics model (Hanson 1997) where consumption equations are of the basic form:

$$C_T = C_{\max} \cdot p \cdot f(T) \tag{5.7}$$

$$C_w = CA \cdot W^{CB} \tag{5.8}$$

We develop equations for each independently, and then we will bring the two effects together by referencing consumption relative to C_{max} and calculating the reduction from that benchmark due to each of the two factors. Hanson (1997) notes that developing a set of parameters for these relationships may be accomplished by deriving them from published reports, estimating them from specifically designed field or laboratory experiments, or borrowing parameters from closely related species.

The allometric relationship between consumption and weight (eq. 5.8) generally has the form of a negative power function (Ricker 1975) whose terms are the intercept, *CA*, and the coefficient, *CB*. The intercept value of *CA* is the consumption of a 1-gram fish and has units of grams per gram of body mass per day (g g^{-1} $_{bw}$ d^{-1}). These terms must be estimated from *ad libit*um feeding experiments conducted at the optimum temperature. There are relatively few such laboratory studies reporting values for salmonid species of interest in this report, although several other salmon species have been extensively studied. The laboratory studies of juvenile growth for coho (Everson 1973) and steelhead (Wurtsbaugh and Davis 1977) were not designed specifically to determine the allometric relationship of consumption to weight. However, in both studies, a series of one-month long feeding trials were conducted on individuals drawn from a population of fish that was maintained in a natural stream between experiments over a year-long period. Thus, the fish grew at natural rates between experiments and represented a range of weights from 1 to 4 grams, which is within the range of size expected for salmonids in natural streams in the first year.

We examined the laboratory data of Everson (1973) and Wurtsbaugh and Davis (1977) to estimate *CA* and *CB* for coho and steelhead looking only at trials where: 1) fish weights were reasonably near 1 gram; 2) rations were considered to be at satiation; and 3) temperatures were optimal, as suggested by high growth rates. Data matching these criteria were limited and some of our selected data values only marginally fit these criteria. Nevertheless, a relationship between consumption and weight at satiation ration followed an allometric relationship with *CB* equal to –0.254 for coho (R^2=0.19) and –0.311 for steelhead (R^2=0.41), albeit the R^2 is relatively low. (The poor fit in the relationship could be because some of the experimental data points did not match the criteria as closely as desirable). Stewart and Ibarra (1991) and the Wisconsin user's manual recommend values for *CB* of –0.275 for coho, based on the work of Beauchamp et al. (1989), and –0.30 for steelhead based on Rand et al. (1993). Although these studies were conducted with larger fish, the results are very similar. Calibrating predictions of weight gain of populations in natural streams, as described later, we found that selecting values for *CB* of –0.275 for both coho and steelhead, as suggested by other researchers, produced satisfactory modeling results. Setting *CB* at –0.3 for steelhead slightly but consistently underestimated growth, suggesting that consumption was not declining at quite this high of a rate in natural populations.

Maximum consumption observed in a few of the laboratory trials suggested values for the intercept, *CA,* of 0.11 and 0.16 g $g^{-1}d^{-1}$ for coho and steelhead, respectively. The allometric relationship developed from all trial data suggested *CA* equaled 0.083 and 0.16 for coho and steelhead, respectively. Calibrating the model predictions in natural streams suggested that *CA* was closer to 0.10 for coho (10% body weight per day). The User's Manual for the Wisconsin model (Hanson 1997) recommends values of *CA* between 0.15 and 0.35, which are higher than those we derived using the laboratory data. We selected values for *CA* of 0.10 and 0.16 for coho and steelhead respectively. These are also the values of C_{max} for each species.

Bartell et al. (1986), Beauchamp et al. (1989) and Hanson et al. (1997) have noted that the allometric parameters for the dependence of consumption on body mass (CA and CB) are among the parameters that have the greatest influence on bioenergetics predictions. In subsequent model predictions, described later in this section, we found this to be true. Within the narrow range of values separating adult from juvenile studies, there was relatively little effect of CB on weight predictions, and we selected the widely cited values. However, the laboratory studies of juvenile fish did not support CA values greater than we selected. Growth predictions are sensitive to this parameter.

Food consumption in relation to weight as calculated with the allometric parameters is shown in Figure 5.1. There are significant differences in consumption levels between these two species.

The proportion of consumption at each weight (C_w) relative to C_{max} , is defined by the slope of the allometric equation (CB) and can be calculated as:

$$p_w = W^{CB} \qquad (5.8)$$

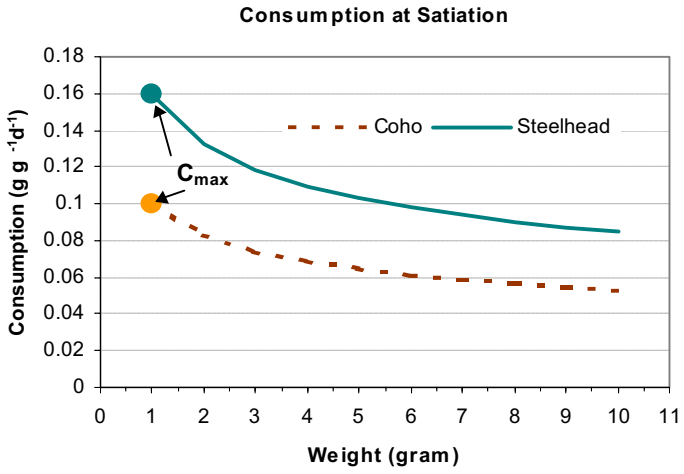


Figure 5.1 Consumption at satiation in relation to weight as modeled by selected parameters for CA and CB described in text.

To determine the effects of temperature on food consumption, a number of authors have used the Thornton and Lessem algorithm (1978) (Beauchamp et al. 1989, Stewart and Ibarra 1991, Hanson et al. 1997). The algorithm estimates the maximum consumption at each temperature, expressed as the proportion of the maximum consumption at the optimal temperature (p_t). The algorithm fits two sigmoid curves to specified parameters, which include the optimal temperature and the upper and lower temperatures where consumption nears zero. Thus, the general shape of the relationship between temperature and consumption is assumed and key temperatures must be known or estimated to fit the proper shape of the curve for each species. The user's manual for the Wisconsin bioenergetics model (Hanson 1997) suggests values for the key parameters of the Thornton and Lessem algorithm drawn from Stewart and Ibarra (1991) and Rand et al. (1993). We began with those parameters, but then calibrated them to fit the experimental data for coho (Everson 1973) and steelhead (Wurtsbaugh and Davis 1977) (Figure 5.2). Small adjustments to the suggested parameters appeared to slightly improve the fit compared to the laboratory observations, although our final curve for coho is very similar to that presented by Stewart and Ibarra (1991). The parameter values we derived are provided in Table 5.1 and the fitted relationships are shown in Figure 5.2. The Thornton and Lessem equation is awkward to use in an EXCEL® spreadsheet format. We fit a polynomial regression to the

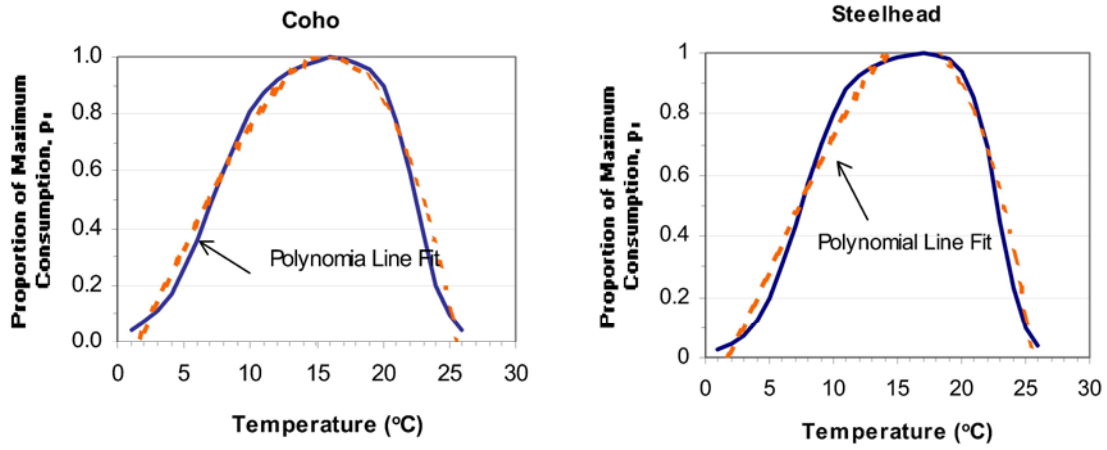


Figure 5.2 Maximum consumption in relation to temperature computed with the Thornton and Lessem algorithm (1978).

Thornton and Lessem algorithm results to provide an equation for calculating p_t at each temperature (Figure 5.2).

$$p_t = \lambda_0 + \lambda_1 \cdot T + \lambda_2 \cdot T^2 + \lambda_3 \cdot T^3 \qquad (5.9)$$

The fit was quite close (Figure 5.2), especially in the range of temperatures likely to be observed during the summer, when the relationship was used for growth modeling. The polynomial terms describing the equations are provided in Table 5.1.

We now have mathematical expressions that account for the influence of weight (p_w), and temperature (p_t) on consumption at satiation where each is expressed in proportion to C_{max}. The maximum consumption rate, p_s, at each combination of weight and temperature expressed relative to C_{max}, (a constant value for each species) is calculated according to equation 5.10:

$$p_s = p_w \cdot p_t \qquad (5.10)$$

and ranges between 0 and 1. The actual amount of food consumed (C_s), expressed in grams of prey mass in relation to grams of body mass per day, (g $g_{bw}^{-1}d^{-1}$), is equal to:

$$C_s = p_s \cdot C_{\max} \qquad (5.11)$$

Table 5.1 Estimated physiological parameter values used in equations calculating consumption for coho and steelhead.

Relationship	Parameter	Coho	Steelhead
Allometric	CA	0.10	0.16
	CB	-0.275	-0.275
Thornton and Lessem function for temperature dependence (1978)$^{\phi}$	CQ	7	5
	CK1	0.4	0.2
	CTO	15.6	14.0
	CTM	18	17.9
	CTL	24	24
	CK4	0.2	0.1
Regression fit to Thornton and Lessem algorithm generated by above parameters	λ_0	-0.1419	-0.1229
	λ_1	0.0544	0.0607
	λ_2	0.0061	0.0055
	λ_3	-0.0003	-0.0003

ϕ Terminology as used by Hanson et al. (1995), see Appendix B

The value of C_s computed over a range of temperature and weight is illustrated for coho in Figure 5.3. As expected from the formulation, the highest levels of consumption occur near optimal temperatures and at lowest weight. The deepest shades on the contour map represent starvation. Falling below the minimum maintenance consumption (approximately 0.03 g $g_{bw}^{-1}d^{-1}$ for coho juding from the laboratory trials) for extensive periods of time should result in no growth, or even

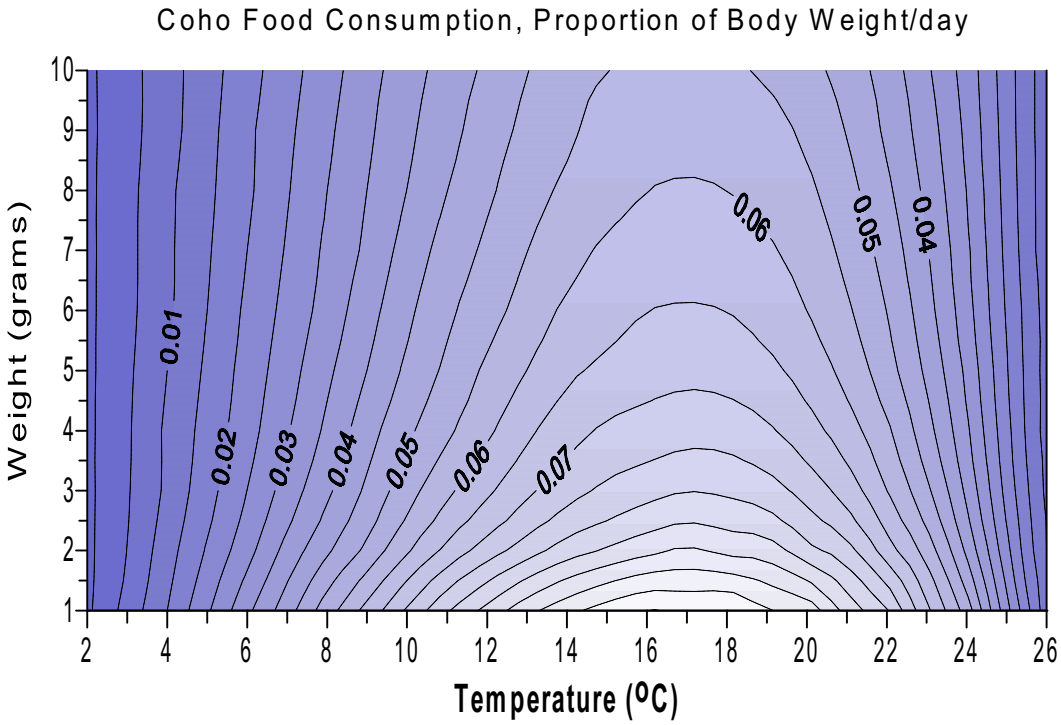


Figure 5.3 Illustration of the relationship of the maximum food consumption at satiation with temperature and coho weight. Contours are the daily consumption rate, C_s, expressed in prey mass per fish body mass per day (g g_{bw}^{-1} d^{-1}). This figure illustrates the maximum potential consumption where food supply is not limited and fish can eat to satiation.

weight loss. The maximum potential consumption is relatively moderate for most of the temperatures and weights that juveniles are likely to encounter in the freshwater growth phase of their life history due to the interaction of the temperature and weight. However, consumption is severely limited only at high and low temperatures at all weights. Consumption approaches the maximum potential (0.10 g $g_{bw}^{-1}d^{-1}$ for coho) only for a relatively few combinations of weight and temperature, and therefore for probably relatively little time during the life of a fish. Maximum consumption at all weights is achieved at optimal temperature (T_{opt}), where growth rate is greatest for each level of consumption (approximately 17°C for coho).

The food consumption illustrated in Figure 5.3 represents the upper maximum controlled by the physiology of the fish at each combination of weight and temperature. We refer to this as the maximum potential consumption. In the natural stream environment, as well as in the laboratory, the amount of food available to consume may be less than the maximum that the fish can potentially consume and the fish may experience some degree of hunger. We distinguish consumption, which we use to refer to the physiological response controlling food intake, from ration, which we use to refer to the food supply. Ration, which we express as % satiation, is 100% satiation at the maximum consumption (C_s) at each weight and temperature.

Consumption in natural streams depends on food supply, competition for food, and the size of the fish based on the past regime of water temperature. The Wisconsin model accounts for ecological constraints on the maximum consumption rate (C_s) by imposing an additional proportionality (P-value) that can also range from 0 to 1 at rations less than the physiological maximum (p_s). Thus, when modeling consumption at less than satiation for each temperature and weight, C_i may be calculated as

$$C_i = P_{value} \cdot p_s \cdot C_{\max} \qquad (5.12)$$

It's important to note that, on any given day, field consumption may be limited by either the physiological limits imposed by temperature or weight or by the food supply. Consumption in streams must be determined from in situ observations of feeding, or inferred from weight gain.

Specific Growth Rate. The specific growth rate (g) is the daily growth rate in relation to temperature and consumption, expressed in proportion of body weight per day. Specific growth rate functions ("growth curves") are defined with data from the laboratory studies. This relationship was established for sockeye by Brett (1971), and for chinook by Brett et al. (1982). Both Brett (1995 pp. 28-29) and Weatherly and Gill (1995) recently reaffirmed this relationship, some form of which appears to apply to all species of salmonids.

Growth rate curves for coho and steelhead have not been previously published, although the requisite laboratory studies were available to develop them. Experiments on growth of juvenile coho reported by Everson (1973) were conducted at temperatures between 11.1° and 22.5°C and rations between satiation and starvation. Experiments on steelhead growth reported by Wurtsbaugh and Davis (1977) were conducted at temperatures between 6.9° and 22.5°C and the full range of rations. Growth rate of the population during the experimental period, represented by the average population weights, was calculated as:

$$g = \frac{(w_e - w_0)}{(0.5 \cdot (w_e + w_0) \cdot t)} \qquad (5.13)$$

where w_e and w_0 are the weights at the end and beginning of the experiment, respectively, and t is the number of days (generally 25) in each trial. Dry weights were used to calculate the growth rates because the moisture content of fish is similar to that of their prey in natural streams (Winberg, 1971) and thus the dry weight relationships would appropriately match growth curves of fish living in natural environments to their natural food supply.

We used standard linear regression to build mathematical expressions for the growth rate g (g $g_{bw}^{-1}d^{-1}$) from food consumption, C, (g $g_{bw}^{-1}d^{-1}$), temperature, T, (°C), and initial weight, w_o, for coho and steelhead. To reduce multicollinearity problems during the model building process, the independent variables were centered by subtracting each sample value from the population mean. The models were built with the Reg procedure in SAS® Version 6.12 (SAS Institute Inc., 1989). The general form of the model is:

$$g = \chi_0 + \chi_1 \cdot T + \chi_2 \cdot T^2 + \chi_3 \cdot C + \chi_4 \cdot C^2 + \chi_5 \cdot C \cdot T + \chi_6 \cdot W \qquad (5.14)$$

The relationship for coho includes squared and linear terms for temperature and consumption and has high R^2 (0.93) and low root mean square error (0.0023). Similarly, the relationship for steelhead includes squared and linear terms for temperature and consumption as well as a linear term accounting for weight of the fish. This relationship also has high R^2 (0.97), and low root mean square error (0.0021). Statistically determined coefficients for these relationships are provided in Table 5.3. It is essential to note that the growth rate equation (eq 5.14) will compute erroneous growth rates if the consumption term is not appropriately constrained for each weight and temperature as described earlier. Thus, the use of this model always requires a two step process where consumption level is estimated and then growth rate is selected.

The growth curves for coho and steelhead resulting from the full growth model formulation calculated at a weight of 1 gram are shown in Figure 5.4. They show the familiar form of sockeye and chinook that have been previously published by Brett and others (Brett 1969, Brett et al. 1982, Weatherly and Gill 1995), although the curves in Figure 5.4 are derived mathematically. Brett et al. (1982) discussed how optimum temperature declines with decreasing ration, thus skewing the growth rate curves towards cooler temperature with less food. The mathematical formulation of equation 5.14 also produces skew in optimal temperature with declining consumption. The cross-product (χ_5) between temperature and consumption determines this shape.

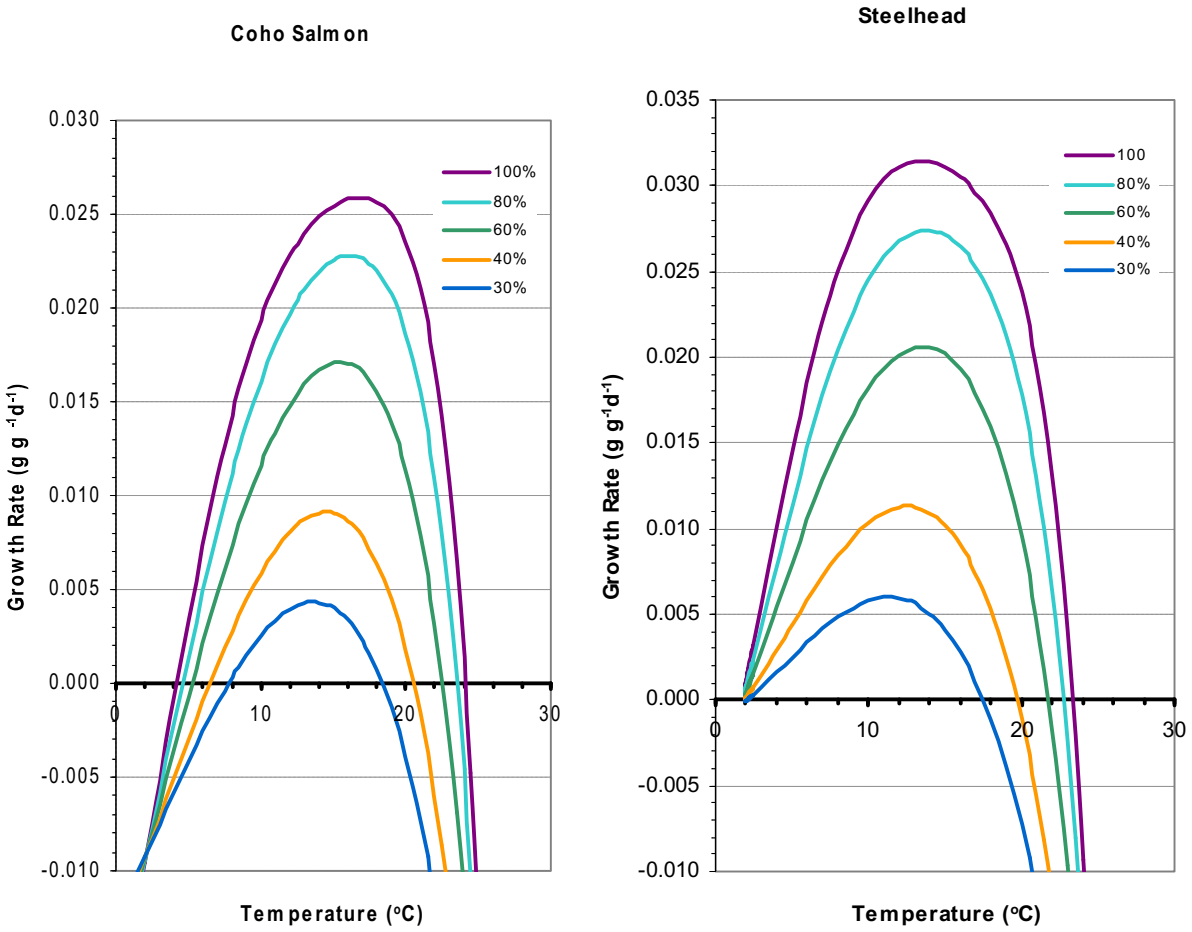
The growth curves for each species are similar, but differ in details such as optimal temperatures, growth rate, and consumption levels at which growth rates are achieved. One can see that the growth rate varies widely with the temperatures and food availability that salmon are likely to encounter in the natural environment of Pacific Northwest streams and rivers, suggesting that fish size should be strongly influenced by these two parameters.

In natural streams, temperature varies over the course of the day and some temperature value must be chosen to represent the daily temperature. Laboratory tests have noted that the daily average temperature approximates the constant exposure test conditions. Experiments where temperatures were fluctuated to mimic daily temperature regimes have found either no effect from variable temperature (Thomas et al. 1986, Dickerson and Vinyard 1999) or an improvement in growth (Spigarelli et al. 1982, Weatherly and Gill 1995). Water temperature fluctuated with natural stream temperatures in the experiments of Everson (1973) and Wurtsbaugh and Davis (1977). We select the daily mean temperature as appropriate to represent the temperature related to daily growth rate.

Table 5.2 Coefficients for specific growth rate relationship to temperature (T) and consumption (*C*). Coho data are from Everson (1973), Steelhead data are from Wurtsbaugh and Davis (1977).

Variable	Coho	Steelhead
χ_0	-0.010649	0.00631
χ_1	0.00096624	-0.0007403
χ_2	-0.00008312	-0.00003909
χ_3	0.450620	0.4302104
χ_4	-3.02056	-1.43765
χ_5	0.01677	0.00735
χ_6	NA	-0.00517
χ_7	NA	NA
Regression R-square	0.93	0.97

Figure 5.4. Specific growth rate curves for coho salmon, steelhead trout at 1 gram weight. Coho growth curves based on Everson (1973), steelhead curves based on Wurtsbaugh and Davis (1977). Each line is the ration is expressed in % satiation, p_s.



Growth Model

Substituting equations 5.13 and 5.11 back into equation 5.3 gives a model for computing weight as a function of initial weight and the time series of daily water temperatures and food supply to which a fish is exposed:

$$w_t = w_0 \cdot \prod_{i=0}^{t-1} (1 + \chi_0 + \chi_1 \cdot T_i + \chi_2 \cdot T_i^2 + \chi_3 \cdot C + \chi_4 \cdot C_i^{\,2} + \chi_5 \cdot C_i \cdot T_i + \chi_6 \cdot w_{i-1}) \quad (5.15)$$

The model simulates the change in mass of an individual fish or a cohort of specified size. We define a cohort as a group of similar aged fish of the same species experiencing identical environmental conditions (Hanson et al. 1997). Cohort weights may be represented by the average population weight. It is important to recognize that the estimates of weight gain do not consider population interaction effects (Walters and Post 1993). Thus, they do not account for changes in population density that can also affect the average weight and biomass of populations. Measuring growth as the difference in a cohort's weight between two dates is subject to biases from any size-dependent movement and mortality (Railsback and Rose 1999). Our estimates only address temperature and food effects with the assumption that changes in number or weight are unbiased by size.

The growth formulations (equations 5.7-5.12) were easily programmed into an EXCEL® spreadsheet to perform the calculations of growth over time. To estimate weight gain of populations in natural streams, three parameters must be determined: initial weight (w_0), temperature (T) and the food consumption (C_i) that must reflect the food supply.

APPLICATION OF THE METHOD FOR PREDICTING GROWTH IN NATURAL STREAMS

In the remainder of this section, we apply the growth model to fish populations observed in natural streams to demonstrate model behavior and corroborate its predictions. We show a number of simulations where the three input parameters were known with varying degrees of certainty. No new experiments to determine food consumption or to validate the growth model's ability to accurately predict weight gain were conducted. Instead, model performance is examined using data from a number of previously reported studies.

The parameters required by the model are rather modest. Daily mean temperature is known with certainty at any site where temperature is continuously recorded, and we restrict growth simulations to sites where this condition was met. Initial weight and food consumption must be determined from fish population characteristics observed in streams or from known food consumption amounts. Of these two variables, the consumption characteristics of juvenile salmonids in natural streams are by far the least well quantified (Filbert and Hawkins 1995, Railsback and Rose 1999) and difficult to obtain (e.g., Martin 1985). For this reason, we begin simulations with data from a field experiment where food was well known and the assumptions about the 3 input parameters were limited.

Mason's Feeding Experiment. Mason (1976) reported an experiment where juvenile coho in a natural stream on Vancouver Island, British Columbia were fed to satiation for a 2-month summer period. Data from this experiment were ideal for comparing observed with predicted growth since environmental limitations on food supply were reduced, if not

eliminated, for most of the individuals in the population. Thus errors associated with estimating consumption were minimized and the other two input parameters were well known.

Mason (1976) reported that temperatures were between 12° and 13°C during the study. We used a constant 12.5°C temperature for the simulation. Mason (1976) provided information on individual fish size within the population. We modeled three cases where the initial weight was set to the weight of the largest, average, and smallest fish at the start of the experiment. (Figure 5.5). Fish were feed daily at what Mason calculated was a satiation ration for the population. For this simulation, growth was predicted at the maximum potential consumption determined by the weight and temperature (eq. 5.11),

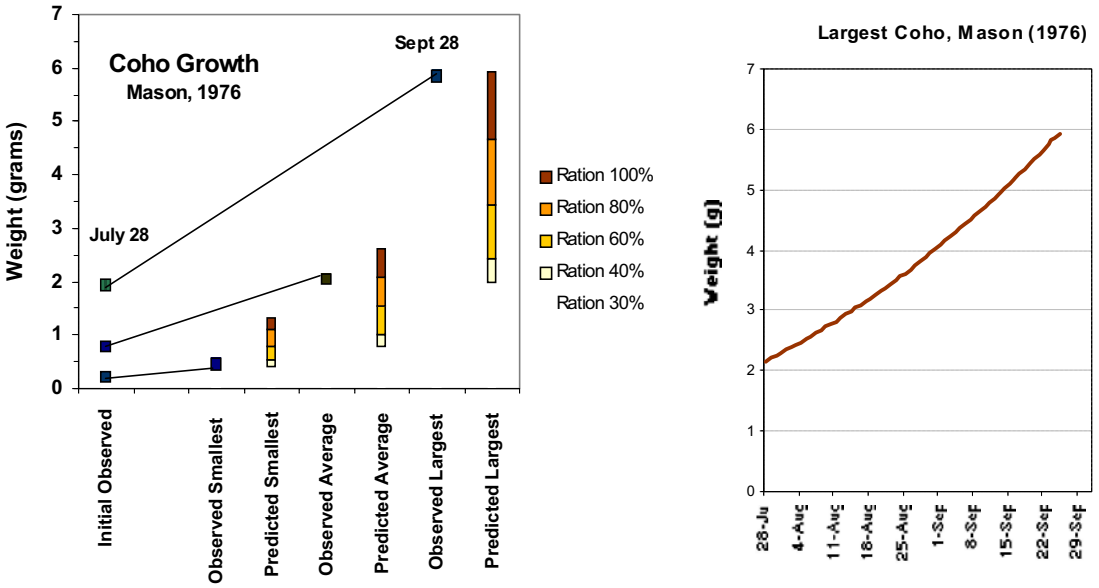


Figure 5.5. Observed and predicted growth of coho in an experimental feeding study in a natural channel in British Columbia (Mason 1976). The growth of the smallest, average and largest fish at the start of the feeding trial were modeled for the full range of satiation (shown in bars). Weight of the smallest, average and largest fish at the end of the experiment are shown relative to growth simulations. The predicted daily weight of the largest size fish is shown at right.

assuming that the available rations supplied 100% of the potential consumption and there was no food limitation. We also modeled the full range of rations (p_s) expressed as percentage of satiation of shown in increments of 80, 60, 40, and 30% in Figure 5.5.

After simulating growth for the two-month period, the estimated weights of the largest and average fish, computed at high food ration, were very similar to their observed weights (Figure 5.5). The largest fish in the population increased its weight by 286% (2 g to 5.9 g) during this period. The predicted weight for that fish, assuming 100% satiation, was within 2% of its observed weight. These results appear to corroborate growth predictions and confirm Mason's conclusion that some of the fish obtained satiation rations. Progressively smaller individuals within the population apparently ate at lesser rations than the largest individual. (It should be noted that it is not known whether the fish that held these ranks at the end of the study were the same individuals as those at the start.) The weight of the average size fish was consistent with growth predictions at 80% ration. The smallest fish did not fare nearly as well, achieving little weight gain consistent with

subsistence at minimum maintenance rations. Mason (1976) observed that the smaller fish tended to be those dying or migrating downstream, emphasizing the importance of larger size providing survival benefit through more effective feeding strategies (Puckett and Dill 1985, Nielsen 1994).

Overall, Mason (1976) observed many large fish remaining after the feeding experiment; moreover, the average population weight increased significantly. This has been taken as evidence that coho growth in streams tends to be limited by food supply. Other field experiments have showed improved growth resulting from activities that increased light (and temperature) in streams, presumably improving the food resources (Hawkins et al. 1983, Martin 1985, Bisson et al. 1988).

Fish Populations Living in Natural Stream Conditions. As they grow during the summer, juvenile fish living in streams in the Pacific Northwest experience temperatures that are relatively low in spring after emergence from the gravel, warm during the summer, and cool again in the fall after mid-September. Food resources may be limited and the manner in which natural populations regulate their numbers to match individual and population growth needs with available food supply is complex and largely unknown (Walters and Post 1993).

In the next set of simulations we estimate the average growth of a cohort of age 0 coho and steelhead in natural streams having natural and unknown food supplies. Fish population data were available from sites representing a number of treatments and controls in experiments previously reported in the literature (Table 5.3). Physical habitat characteristics varied among sites. Like many streams within the region, the stream segments where fish were sampled generally contained low amounts of large woody debris (LWD) and varying amounts of shade. The examples include sites with water temperature spanning very warm to cool (but not cold, e.g., less than 12°C). Porter Creek was the site of a habitat improvement experiment where LWD was added to increase pool habitat (Cederholm et al. 1997). Several sites were severely impacted by the Mount St. Helens eruption in 1980, but have since experienced recovery of vegetation (Bisson et. al 1988). A dam-break flood scoured portions of Huckleberry Creek and its floodplain in 1990 after several years of population monitoring during a feeding experiment (Fransen et al. 1993). Bear Creek is a tributary to the Bogachiel River, above a barrier falls, that flowed through undisturbed old growth forest (Martin 1985).

Although the experimental objectives and study designs differed, fish populations in these stream segments were sampled routinely in a similar way providing comparable data sets to draw from. Populations were sampled by electrofishing using the three-pass removal method (Young and Robson 1978, Bisson et al. 1988). The lengths of all captured fish were measured, while weights were sub-sampled. We selected a number of cases from the available data where fish populations were sampled at the beginning and end of the summer. A few sites were sampled mid-season. Early season sampling was conducted between March and July while end of season sampling was conducted between September and November. Coho occurred at all six sites and steelhead were found at four. The time periods encompassed by the temperature and fish population data did not always overlap at all sites, and, in a few cases, daily temperatures were not available.

Table 5.3. Characteristics of fish populations as determined by field surveys.

Data Sources					Temperature Characteristics			Fish Population Surveys					Model Predictions		
Species	Site	Experiment	Reference	Year	Regime	Season median (°C)	Annual maximum (°C)	Dates sampled	Days (t)	Initial weight (g)	End weight (g)	Increase in weight (%)	Ave. Daily Growth Rate (g $g^{-1}d^{-1}$)	Estimated weight (g)	Difference from observed (%)
Coho	Huckleberry	Artificial feeding	Fransen et al. 1993	1987	Cool	12.5	15.5	7/13-10/1	80	3.0	3.6	16	.0064	5.2	+44
				1988	Cool	11.6	15.0	5/12-10/24	163	0.6	4.2	600	.0114	3.8	-10
				1989	Cool	12.0	14.5	7/16-7/28	101	2.0	4.1	105	.0063	3.8	-7
		Dam-break flood		1991	Warm	15.5	18.5	5/15-10/9	147	0.9	3.2	240	.0082	3.1	-3
		altered valley		1991	Warm	15.5	18.5	6/20-10/9	113	4.1	6.3	54	.0082	5.8	-8
				1998	Warm	14.0	18.0	6/23-9/15	84	2.7	4.0	57	.0072	5.0	+16
	Porter	Placement of large woody debris	Cederholm et al. 1997	1988	Warm	13.5	18.0	6/28-9/28	92	3.0	6.1	103	.0069	5.7	-7
				1989	Warm	14.0	17.0	6/19-9/18	91	3.4	6.0	76	.0069	6.4	+7
				1990	Warm	14.6	18.6	6/18-8/27	70	3.7	6.5	76	.0085	6.6	+2
				1991	Warm	12.8	17.3	6/4-9/30	118	2.5	5.4	116	.0080	6.4	+19
	Harrington	Volcanic eruption	Bisson et al. 1988	1984ϕ	Very warm	16.5$^{\delta}$	29.0	6/24-10/9	108	1.3	6.3	380	NA	NA	NA
		Vegetation regrowth		1990	Very warm	13.3	20.5	6/22-9/20	88	3.3	6.0	82	.0066	5.8	-2
	Hoffstadt	Volcanic eruption	Bisson et al. 1988	1984ϕ	Very warm	16.7$^{\delta}$	29.5	6/26-10/3	100	2.4	5.6	133	NA	NA	NA
		Vegetation regrowth		1990	Very warm	15.0	26.0	6/21-9/20	88	3.6	6.1	69	.0054	5.9	-5
	Big	Salmon carcass enhancement	Bilby et al. 1996, 1998	1994	Cool	12.9	16.1	7/13-9/8	57	4.6	6.0	30	.0093	6.9	+15
	Salmon	Salmon carcass enhancement	Bilby et al. 1996, 1998	1994	Cool	12.6	16.2	7/20-9/8	50	3.6	5.5	53	.0069	5	-9
Steelhead	Porter	Placement of large woody debris	Cederholm et al. 1997	1988	Warm	13.5	18.0	6/28-9/28	92	0.8	3.5	338	.0173	3.9	+11
				1989	Warm	14.0	17.0	6/19-9/18	91	0.6	3.3	450	.0210	3.6	+9
				1990	Warm	14.6	18.6	6/18-8/27	70	0.6	3.2	433	.0235	3.1	-3
				1991	Warm	12.8	17.3	6/4-9/30	118	0.4	3.4	750	.0191	3.8	+12
	Harrington	Volcanic eruption	Bisson et al. 1988	1984	Very warm	16.5$^{\delta}$	29.0	6/24-10/3	102	0.7	2.9		.0228		NA
		Vegetation regrowth		1990	Very warm	13.3	20.5	6/22-9/14	84	0.5	3.7	640	.0076	4.2	+14
	Hoffstadt	Vegetation regrowth	Bisson et al. 1988	1990	Very warm	15.0	26.0	6/21-9/20	91	2.1	5.5	162	.0180	4.2	-24
	Salmon	Salmon carcass enhancement	Bilby et al. 1996, 1998	1994	Cool	12.6	16.2	7/20-9/8	50	1.4	3.2	129		3.4	+6
Cutthroat	Bear	Control for riparian buffer experiment	Martin, 1985	1978	Cool	12.2$^{\theta}$	14$^{\delta}$	7/6-11/11	128	2.2	3.4	54		NA	NA

ϕContinuously recorded temperature data not available; population weights not simulated with model.

$^{\delta}$Estimated from annual maximum temperature by relationship found in Section 3.

$^{\theta}$Through September

Consumption Rates in Natural Streams. Ideally, consumption rates in natural populations are determined by observation of food intake or availability (e.g., Martin 1985, Filbert and Hawkins, 1995). Such data are rare. In lieu of direct measurement, consumption can be approximated by examining the pattern of growth over the growing period (Beauchamp et al. 1989, Hanson et al. 1997). Consumption may be inferred by estimating how much food must have been consumed, given the prevailing temperature regime, to have maintained growth at the observed rate (Hanson et al. 1997). To estimate consumption indirectly, populations should be sampled several times over the summer duration, because consumption rates should decline through time as fish grow, based on the expected allometric effect. Such data are also rare.

A naturally-spawned coho population was sampled multiple times during the summer of 1991 at Huckleberry Creek. We selected 1991 data because fish were sampled a number of times over a long period from March to October, and we focused on the lower of two sites on the same stream because the population was naturally spawned fish with no augmentation. Coastal cutthroat trout were sampled multiple times at Bear Creek in 1978 (Martin 1985). We assume that the cutthroat trout sampled at this site are representative of steelhead trout, for the purposes of establishing feeding patterns only. We use these two sites to evaluate food consumption patterns and to establish the relationships used to estimate ration for growth simulation of the other populations in our study.

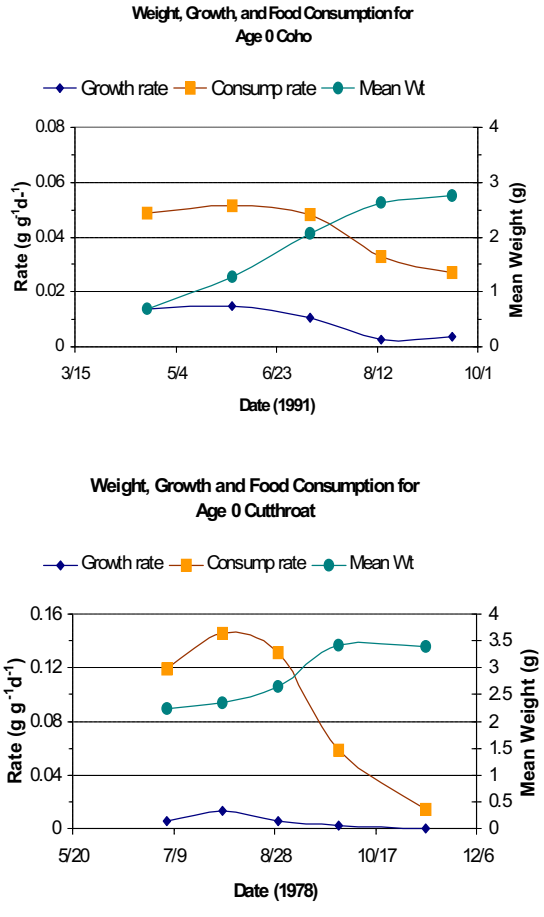


Figure 5.6. Mean weight and estimated consumption and growth rates for age 0 coho at Huckleberry Cr. , lower site, and age 0 cutthroat trout at Bear Creek.

The consumption of food by cutthroat trout at Bear Creek was measured using stomach evacuation techniques (Martin 1985). In situ measurements of food consumption were computed by the modified Bajkov method (1935).

At Huckleberry Creek, neither food consumption nor food supply was measured. Apparent food consumption by coho between each sampling was derived using the growth rate curve. First, growth rate was computed for the full range of consumption from maintenance to satiation at the mean temperature and population weight for each interval. Consumption was then inferred by selecting the value from the computed

range that corresponded most closely to the observed growth rate. Important assumptions accompany this analysis; only food and temperature influence the observed data, our growth equations capture these factors correctly, there are no effects from population dynamics and there are no sampling errors. Therefore, this approach is only an approximation and it is preferable to establish consumption estimates by direct measurement of food supply or intake, such as was done for cutthroat.

Average population weight and estimated (coho) and measured (cutthroat) growth and consumption rates for the two populations are shown in Figure 5.6. Growth rate was calculated using equation 5.13 assuming a linear growth rate between each sampling interval. Weight gain slowed late in the season and growth rate and consumption declined from initially higher rates for both species (Figure 5.6). This pattern is consistent with what would be expected for an allometric consumption relationship, where consumption declines with increasing weight. However, it can also suggest diminishing food supply that may accompany increasing size in an environment where food supply is fixed.

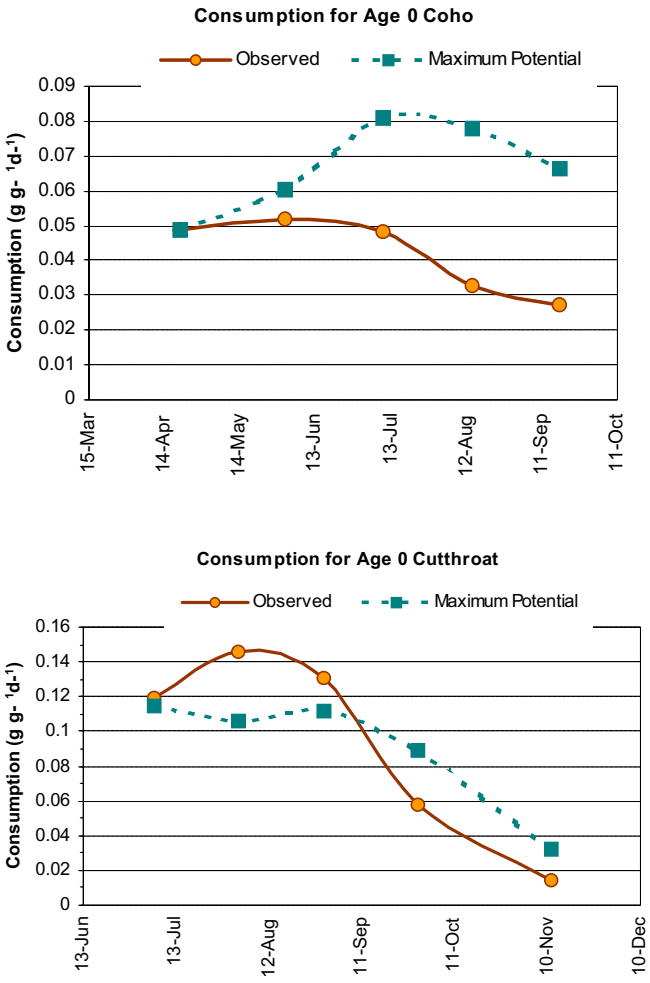


Figure 5.7. Maximum potential consumption based on temperature and weight for the period in relation to observed consumption.

The pattern of consumption observed at the sites is of particular interest with regard to its implications, vis-à-vis the physiological limits of temperature and weight versus food supply. Maximum potential consumption (C_s) was computed using the mean temperature and weight for each interval. It is plotted with apparent consumption in Figure 5.7. The apparent consumption was greatest during the early half of the summer and declined through the later half for both species. (Note that the time intervals differ for the two sites).

An important implication of the observations in Figure 5.7 is that the observed consumption of both species was remarkably similar to each species's physiologically-determined potential consumption. This was true for coho from soon after emergence from the gravels until the end of June or early July and into September for cutthroat trout. Cutthroat trout actually showed greater consumption than estimated during this period, but values were probably within the error range due to estimates of

average temperature and because the maximum potential is based on steelhead specific growth curves. During these periods, the data suggest that the physiological factors were controlling consumption and the average size fish was eating at satiation. That is, even if there were more food, the individual fish represented by the average population weight would not eat it. Later in summer, the apparent consumption was less than maximum potential for both species. The difference between the apparent and maximum potential consumption estimates suggests the degree of food limitation in the streams. The closer the observed lines are to potential, the closer available ration is to satiation.

It is interesting to note that it is during the early summper period that the number of individuals in a population following emergence is determined, suggesting that population density adjusts to match the food supply (Chapman 1966). Carl (1983) observed that the number of coho in a population adjusted in response to population density, but that their daily growth rates were not dependent on density during the period when population adjustment after emergence occurred (May to July). Similarly, rainbow trout growth rate was not correlated with their population density. Carl's (1983) observations of population dynamics and growth are consistent with results from our analysis of consumption.

For coho, the difference between apparent and potential consumption was much larger than for cutthroat in the later half of the summer. Apparent consumption declined to near starvation ration by the end of the summer, while estimated potential consumption remained relatively high because both temperature and weight were moderate. Potential consumption actually increased during part of this period reflecting favorable (closer to optimum) temperatures. Declining food supply for coho during this period could be explained by increasing size of individuals in the population and limited food supply. Although the effects of size on consumption are not great, the absolute volume consumed by each fish must increase since the consumption is expressed as a proportion of body weight each day (Hanson 1997). The same food supplies that may have been adequate for the population at small size may represent a much smaller proportion as the fish grow. The decline could also reflect a change in the food supply. Studies generally show fairly steady or increased food availability during the summer, depending on habitat conditions (e.g., under forested vs. open riparian canopies, Hetrick et al. 1998).

Observed and maximum potential consumption were similar during the entire period for cutthroat trout (Figure 5.7). During the time period coincident with coho, cutthroat were apparently consuming at or near maximum potential (satiation) and food supply did not appear to be a major factor limiting the food consumption by this species. The decline in potential consumption in the fall can largely be attributed to lower temperature. One reason that consumption is nearer the maximum for much of the summer period may be that the cutthroat fry emerge later and are smaller than the coho in late summer. Thus, satisfying juvenile food demands is less challenging.

The apparent consumption patterns observed in populations inhabiting natural streams have important implications for the growth simulations. When consumption can be assumed to equal maximum potential (eq 5.11) there is no need to calibrate the consumption estimates to account for the ecological constraints on food supply (eq 5.12). This appears to be a reasonable assumption for age 0 cutthroat throughout the summer. We assume that age 0 steelhead have similar feeding patterns as cutthroat, and therefore, we assume that we can use the maximum potential consumption to represent age 0 steelhead. This also appears to be a reasonable assumption for coho until the end of June.

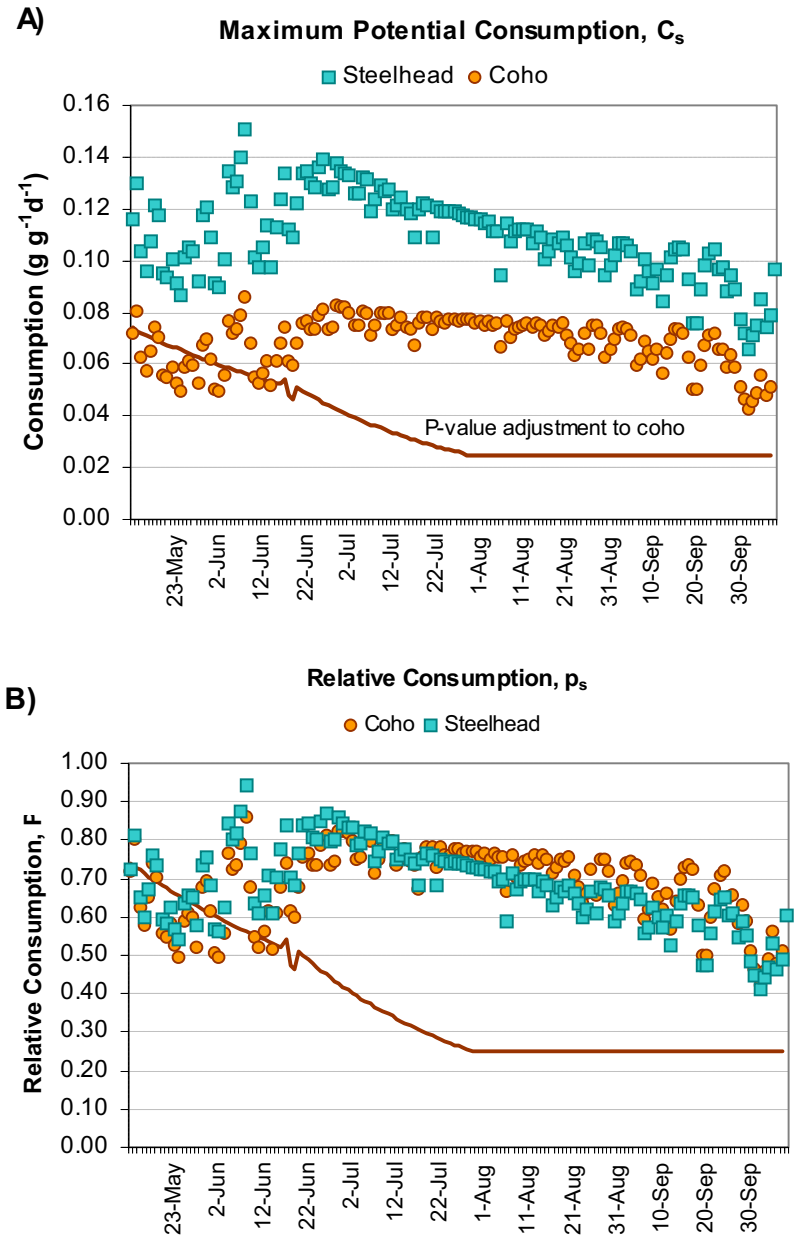


Figure 5.8 Estimates of consumption at Huckleberry Creek. Data points are estimates of maximum potential consumption based on temperature and weight: A) Consumption as a proportion of body mass; B) Relative consumption, calculated as daily consumption divided by *Cmax* generated by the consumption equations. The line is the P-value for coho that adjusts consumption based on field observations suggesting ecological constraints on food supply.

After June, apparent consumption by coho declined significantly relative to maximum potential and the consumption estimate must be modified by a factor reflecting food limitation (P-value in the Wisconsin model terminology). To do so for coho, we fit a linear regression to the apparent coho consumption from July to October (Figure 5.7)

using a dated time step. Maximum consumption values and the ecological adjusted relationship are shown in Figure 5.8A. For readers familiar with the Wisconsin model, the relative consumption for each day, (p_i), is also shown in Figure 5.8B. During growth simulation, each consumption value is calculated in the defined time frame (site adjusted P-Value and maximum potential) and the value that is lower is selected. (During the spring and early part of the summer, the P-value is not calculated since the continuation of the calculation outside the time interval on which it is based may estimate unrealistic values, although it does appear to fit the data during this interval as well.) Ideally, population weight data would be available at each site where the growth simulations are conducted, at least for coho. However, this information was not available at other sites (Table 5.4) since it is common to measure populations only at the beginning and end of the summer. Therefore, all population growth simulations for coho and steelhead that follow use the consumption estimates developed at Lower Huckleberry Creek, depicted in Figure 5.8A, to estimate consumption.

Comparison of Model Predictions to Observed Fish Growth

The apparent consumption estimates were used to simulate growth of the fish populations listed in Table 5.3, using initial weights and temperature recorded over the period between the initial and final sampling of populations. We first simulated coho population growth at the two sites at Huckleberry Creek where the coho consumption estimates were developed (Figure 5.8). Presumably, errors would be less here than at sites where consumption was not calibrated site-specifically. The simulation results and observed population weights at the two sites are shown in Figure 5.9

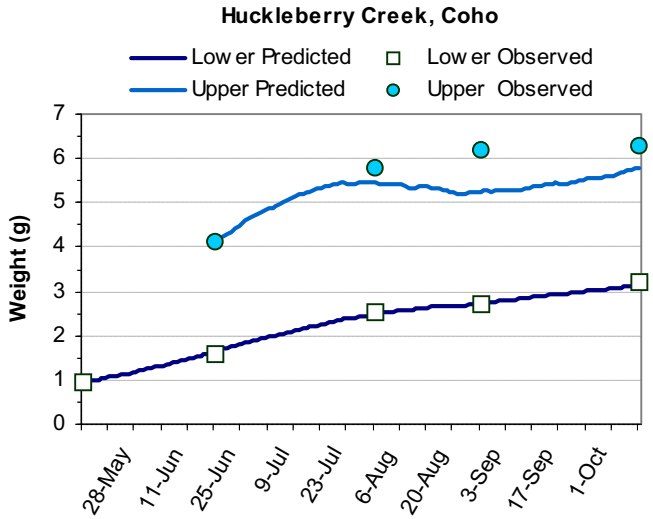


Figure 5.9 Observed and simulated weight gain at the lower and upper sites at Huckleberry Creek.

Between the first and last sampling time, the naturally-spawned coho at the lower site increased in weight more than threefold from 0.9 to 3.2 grams. The predicted weight was within 3% (0.1 g) of the observed weight at the end of the summer. The predicted and observed values are so close that the simulation line appears to connect the observations. The model correctly predicted the ending population weight and those observed at each mid-season sampling. This is perhaps not a surprising result given that the food consumption estimates (Figure 5.8) were developed at this site. However, the simulation shows that, when food intake is calibrated at a given location, the model can accurately predict weight gain.

Importantly, the model simulations are sensitive to the consumption estimates. For example, increasing daily consumption by 10, 20 and 30% above the values shown in Figure 5.8 through the simulation period yields final weights of coho at the lower Huckleberry site of 4.0, 4.9, and 6.0 grams respectively (+25, +53 and +88% greater than observed). Thus, errors have a cumulative effect since they are applied over time. Interestingly, this relatively moderate increase in consumption results in increased population weights that are proportionately consistent with those observed in field studies that found improved production in streams where shade had been removed, and presumably, food had increased. (Hawkins et al. 1983, Hetrick et al. 1998). These results suggest that food supply doesn't have to increase by a large amount to significantly affect the weight that fish achieve over the course of the summer.

Predicted weight at the upper Huckleberry site was also close to that observed, but predictions were not as accurate (-8%) (Figure 5.9). The upper site had a large influx of larger fish between the May and June sampling dates, so the simulation was initiated in June after the population was determined. The upper site had a slightly different P-value at the end of the summer, and the value was used to model this site only (not shown). Growth of this population was low during the latter part of the summer and the rate of decline of the P-value was greater at this site than the lower site, possibly because of the larger size of fish in the population. Nevertheless, despite nearing minimum maintenance ration at the end of the season, the large size of the population was maintained into the fall and no weight loss was observed. The model prediction was actually more accurate at the end of the season than at some of the mid-points, where it tended to underestimate the weight.

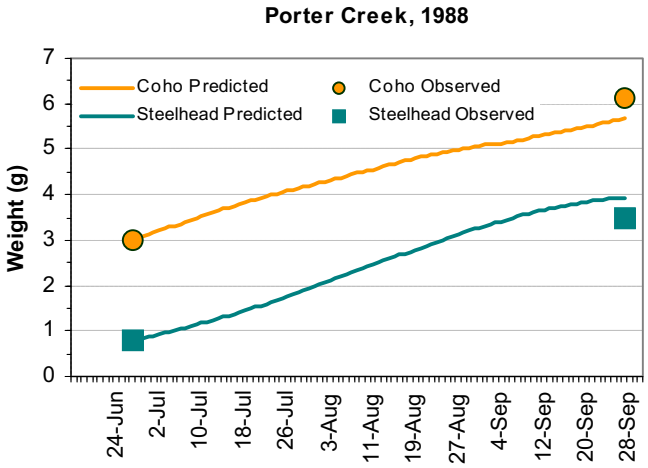


Figure 5.10 Weight prediction and observed fish weights for coho and steelhead populations at Porter Creek, 1988.

In the next set of simulations, we applied the model to the rest of the populations listed in Table 5.3, except those where continuously recorded temperature data were not available. The consumption estimates established for the population at the lower site at Huckleberry Creek in 1991 were used for all of the coho simulations. We would expect that applying these assumptions to other sites could be a significant source of error, since presumably food supply differs among sites and the growth estimates are sensitive to this parameter. Furthermore, errors accumulate due to the effect of weight on consumption. We show the simulation for coho and steelhead at Porter Creek (1988) in Figure 5.10. Porter Creek is exemplified because the prediction accuracy was average for both coho and steelhead (Table 5.3), the site was far removed from Huckleberry Creek, the simulation period was long, and both species were present. Predicted weights closely approximated observed weights for both species (Coho: -7%, Steelhead:+11%).

Predicted relative to observed weights at the end of the simulation period are shown for all of the site by year data sets in Figure 5.11 and listed in Table 5.3. The accuracy of the growth simulations was estimated by calculating the sum of unexplained residual variations between observed and simulated length for each cohort of coho (n=14) and steelhead (n=7) through the following equation:

$$SCE = \frac{1}{n}\sum_{i=1}^{n} \frac{(W_{predicted_i} - W_{observed_i})^2}{W_{predicted_i}} \qquad \text{(eq. 5.16)}$$

SCE for both coho and steelhead was 0.08 of the observed for both, while the average gain

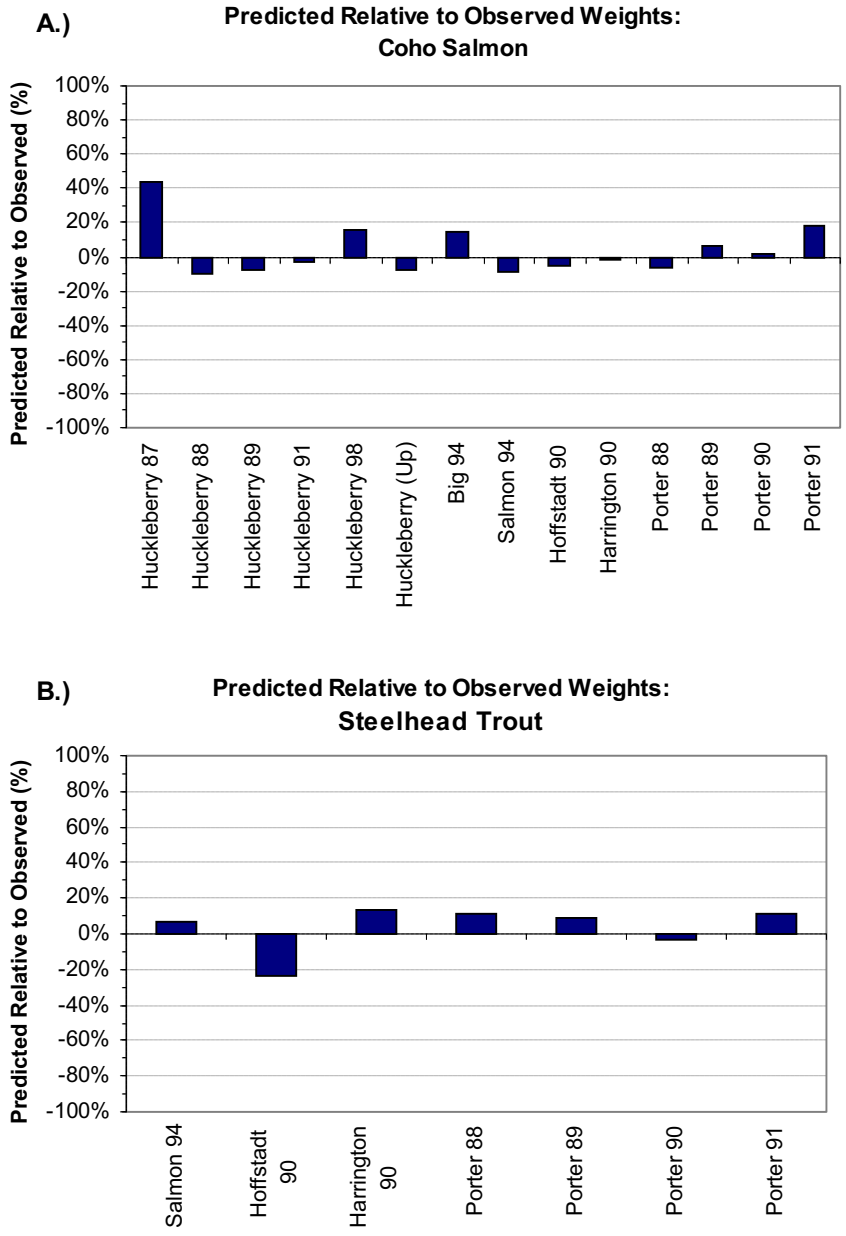


Figure 5.11. Differences between predicted and observed average weights of fish populations.

in weight during the period was 1.25 and 4.14 times initial weight, respectively. Some predictions were above and some were below the observed weights, with no apparent patterns. Model predictions averaged within 4% of observed for both species considering the sign of the difference between observed and predicted, and 11% when averaging its absolute value. The largest prediction error occurred at Huckleberry Creek in 1987 (+44%). There was very little weight gain at this site during this year and our consumption estimates were clearly too high. As another example, the steelhead population at Hoffstadt Creek was under-predicted by 24%, perhaps because the population was augmented by hatchery fish. Since there are no assumptions about food supply used to model steelhead, this error suggests that one or more of the model parameters were probably incorrect for this population and year. Our unexplained error is consistent with, but somewhat less than achieved by Mallet et al. (1999) for grayling in a European river where they used a similar approach for accounting for temperature but did not consider consumption.

The close correspondence of observed and predicted weights was welcome, if not somewhat surprising, given potential errors associated with using consumption estimates extrapolated from other streams in the case of coho, or from other species (cutthroat), albeit closely related, in the case of steelhead. While the physiological-based estimates of consumption should be broadly applicable to the species as formulated in this paper, varying perhaps by genetics among races, the ecological constraints on food supply can vary significantly among sites. Many factors potentially influence food supply; population dynamics and competition for food, (Walters and Post 1993), riparian, in-channel habitat characteristics that control primary and secondary production (Hawkins et al. 1983, Bilby and Bisson 1988, Hetrick, Murphy 1998, Railsback and Rose 1999) and even the energy content of prey (Stewart and Ibarra 1991). Information about these riparian, in-channel habitat and population characteristics are not directly measured, but are integrated by growth rate in the time series of daily temperatures, consumption and body weights. The average growth rate as a function of annual maximum temperature is shown in Figure 5.12. Railsback and Rose (1999) observed that measured growth rates of trout in the Sierra Nevada, and those predicted by the Wisconsin model, varied from year

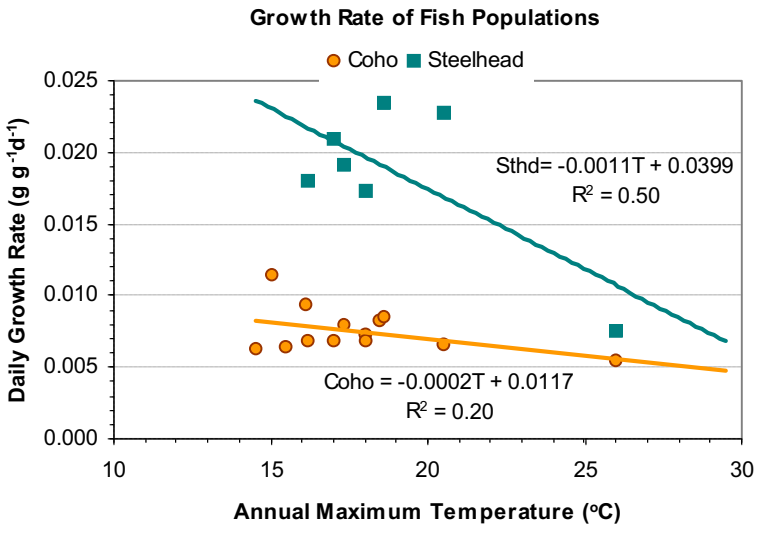


Figure 5.12 Growth rate calculated by the model averaged for the sampling period in relation to annual maximum temperature at each site.

to year and with site characteristics such as flow. We observed similar variation in the sites sampled in multiple years (Table 5.3), although we did not attempt to account for differences other than those caused by differences in temperature.

For the final two simulations, we examined how modeling weight over the full range of rations and weights of individuals within the population would relate to estimates based on averages. Presumably, individuals are feeding over the range of possible rations, from minimum maintenance to satiation, with consumption limited by their hierarchical position within the population (Puckett and Dill 1985, Nielsen 1994). In theory, some fish

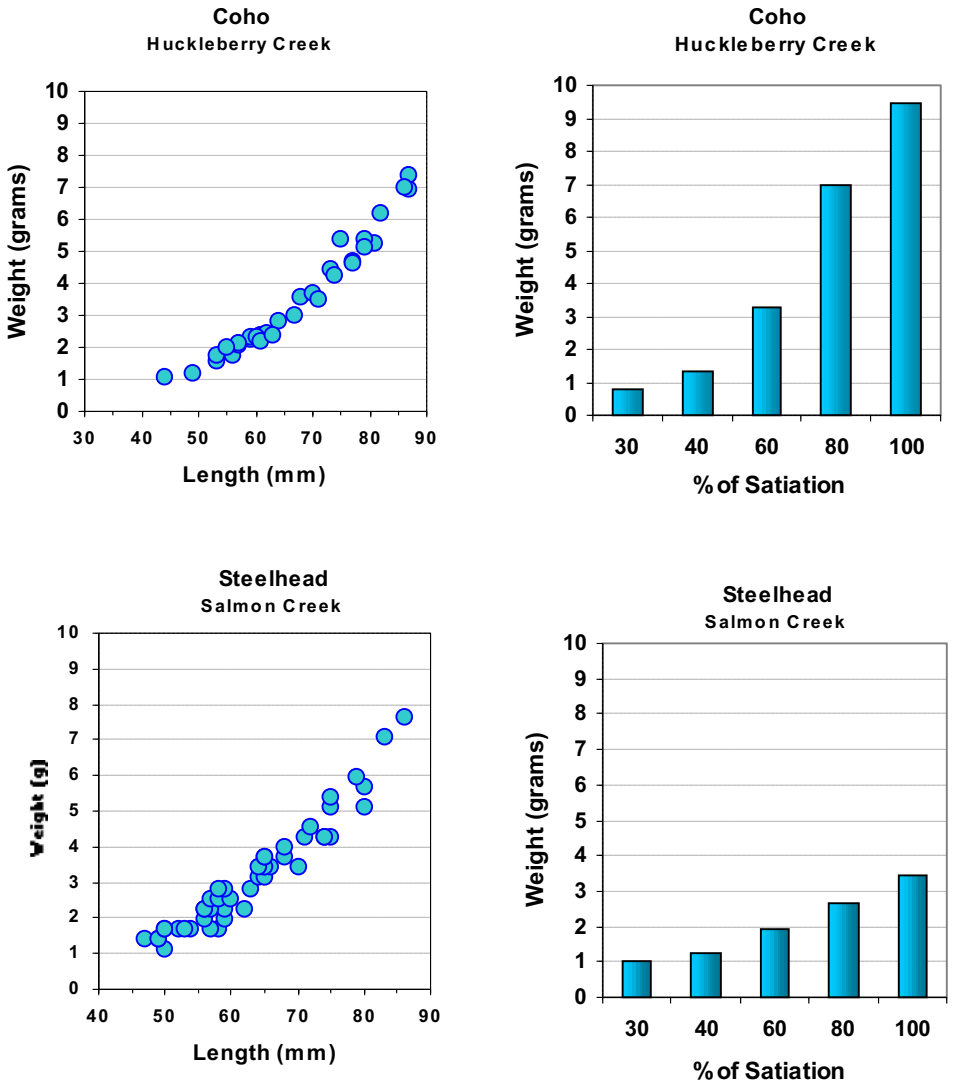


Figure 5.13. Examples of length-weight relationships for coho salmon population at the end of summer growing season at Huckleberry Creek and the steelhead trout population at Salmon Creek. Also shown are the predicted weight for each ration for Huckleberry Creek and Salmon Creek, calculated with the site's temperature from the period between population sampling, and a starting weight as observed at the site at the initial sampling.

may be feeding at satiation ration, although population density controls could prevent fish from achieving this level of ration (Brett 1995). Individuals feeding at less than minimum maintenance ration over extended periods of time are likely to be lost from the population due to starvation.

Weight gain was simulated for the coho population at lower Huckleberry Creek (1991) and the steelhead population at Salmon Creek (1994) for the intervals between fish population samplings, with weight initialized at the observed average population weight. The maximum potential consumption was computed each day based on temperature and fish weight, then categorized into 5 rations between 100% satiation and minimum maintenance (30, 40, 60, 80 and 100%). A minimum of 30% satiation was chosen because this is very near starvation but still allows some growth at some temperatures.

Predicted ending weight at each ration level is shown in comparison to the range of individual weights observed in the population on the final sampling date in Figure 5.13. The range of weights observed within the two populations near the end of the summer was wide, but typical of what is usually observed: the largest fish were 4 to 6 times larger than the smallest fish for both species. There was a range of weight among individuals within the population early in the season, although it was considerably narrower than it was at the end of the summer (Figure 5.14). The growth model predicted a range of weights that was similar to observed. Model predictions suggested that coho as large as 9.5 grams could occur at 100% satiation ration and the largest fish observed was 7.4 grams, a weight consistent with high consumption, but less than satiation. For steelhead, the largest predicted individual was about 3.5 grams, considerably smaller than the largest individual in the population assigned to the 0 age class by the field biologist. Seventy-five percent of the steelhead individuals were within the predicted range. The steelhead that are larger than the 100% ration prediction could actually be yearling fish since scale analysis was not performed, and it can be difficult to distinguish age of the fish from observation alone.

Exact correspondence in individual weights was not expected since the average population weight was used to initialize the simulation. If we apply the same analysis of the growth of the largest, average and smallest fish in the coho population at Huckleberry Creek as we did earlier for Mason's population, we estimate the average degree of satiation for each ranked fish (Figure 5.14). During this period there was only a small change in the number of fish in the population, although we do not know if the fish that held these ranks at the end of the summer were the same one's that held them at the beginning. As in Mason's experiment, the largest fish ate at a higher satiation level than smaller fish in the population. The largest fish is estimated to have eaten at 73% satiation, the average fish at 62%, and the smallest fish at 45% satiation, averaged over the growth period. These results are consistent with Fausch (1983), who found that dominant fish obtained more energy during natural feeding.

Modeling individuals within the range of population sizes produced qualitatively similar results as modeling the average fish for the range of rations, in terms of the range of weights predicted and the average consumption. Perhaps this is because the average population ration was in the mid-range of rations. Nevertheless, the growth model suggested a plausible range of weights at the individual scale using a range of rations, and the model closely approximated the average population weight and at the population scale using average weights and field-calibrated ration (Figure 5.11)

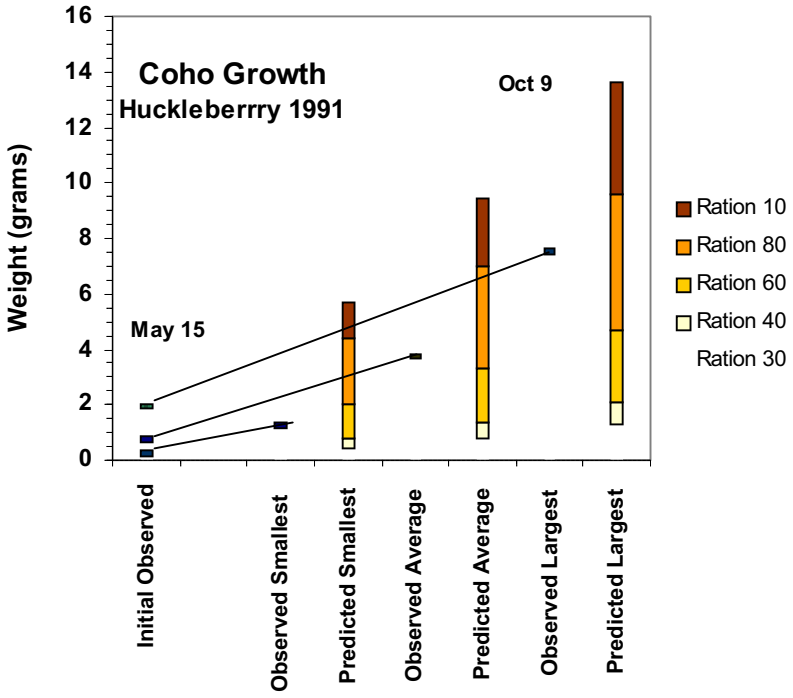


Figure 5.14 Observed and predicted weight of coho in Huckleberry Creek (1991). The growth of the smallest, average, and largest fish at the start of the summer (May 15) were modeled for the full range of satiation (shown in bars). Weight of each class at the end of the period (Oct 9) are shown at the end of the summer relative to growth simulations.

Finally, we conducted a brief sensitivity analysis to demonstrate model behavior over a range of temperatures and food consumption levels. Weight gain was simulated using the same time interval, starting weight, and range of rations from satiation to minimum maintenance, allowing only the temperature to vary for each site. June 1 to Sept 15 was selected to represent the primary growth period for coho and steelhead since both species should have emerged from the stream bed by this date, and our data set from temperature sites was complete during this interval. A representative initial weight was estimated by regressing weight of all the populations sampled early in the summer season with time. Steelhead tended to be very similar in weight early in the season, despite differences in sample dates, averaging 0.5 grams on June 1 (julian day 152). Coho weight varied more, and in some cases, included some sites with hatchery-raised fish. Coho averaged 1.4 grams on June 1. Temperature simulations included site temperature, which varied

through the season, as well as constant temperature for the period (Figure 5.15). Simulated weights based on each site's temperature regime are plotted as circles; constant temperature predictions are the solid parabolic lines at each ration, and the observed fish population weights are plotted as squares. The solid lines computed at constant temperature follow the growth rate curves on which they are based, but they reflect the effect of long-term exposure while compensating for effects of increasing weight on

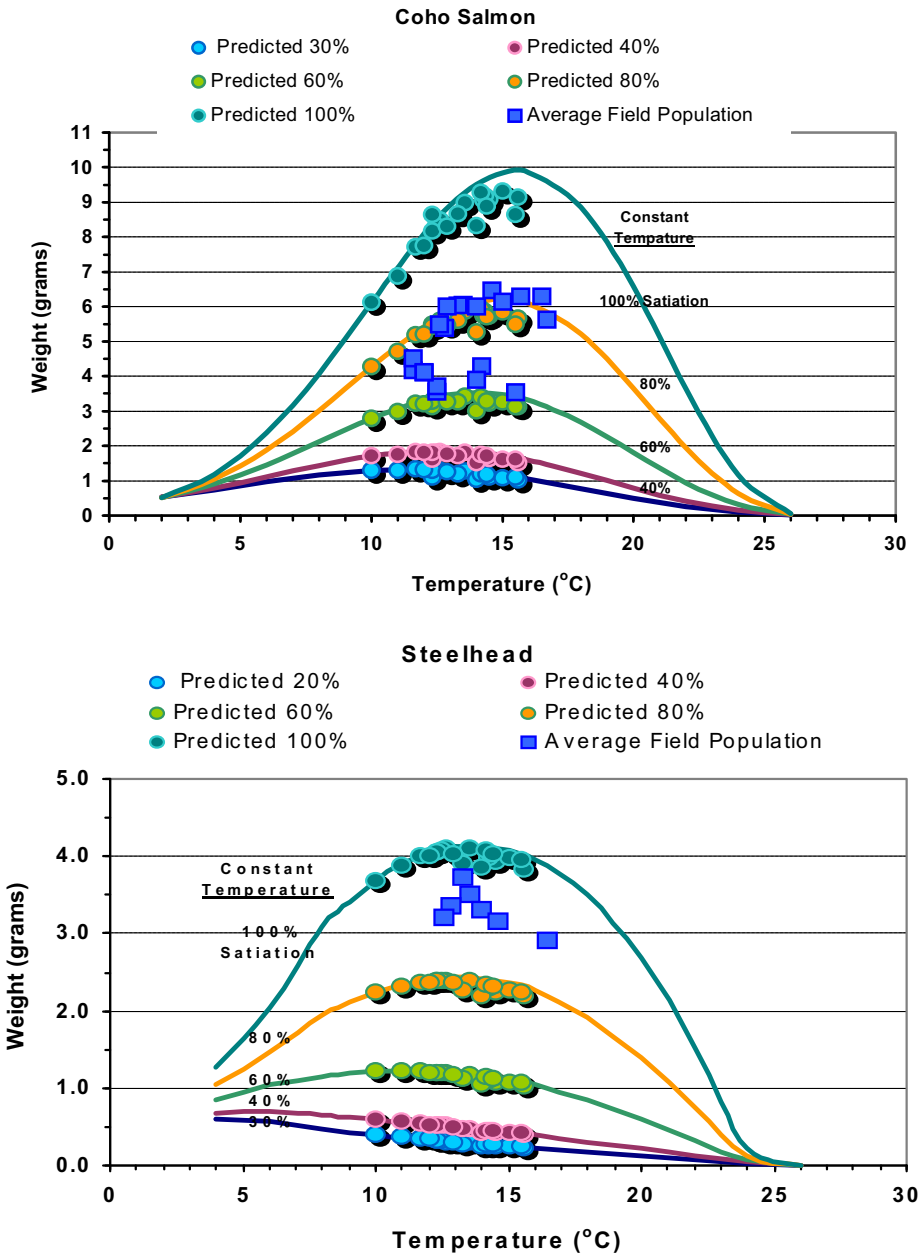


Figure 5.15. Summary of observed and predicted weights for coho salmon and steelhead trout. Solid lines are the weight predicted at constant temperature for 106-day simulation (June 1-Sept 15). Circles are the predicted weights at each site and ration based on the daily temperature regime for the period. Squares are the average weight of observed populations. Initial weight was 1.4 grams and 0.5 grams for coho and steelhead, respectively.

consumption.

Weight can be strongly affected by both the prevailing temperature and the amount of food available to fish. Either factor can have the same level of effect, although maximum weight can only occur when prevailing temperatures are near the species' physiological optimum temperature and food supply is high. Low to moderate weight can result from many combinations of temperature and food supply, perhaps helping to explain why it is difficult to determine whether food or temperature is limiting growth in natural streams from empirical field observations alone.

Weight is maximized when temperature over the course of the summer is closer to optimal temperature (Figure 5.15). Washington streams and rivers tended to be near optimal, despite significant differences in the temperature patterns at the sites when indexed by the annual extremes such as annual temperature (Figure 3.1). The effects of temperature are more pronounced at higher levels of food. Interestingly, observed weights of coho and steelhead populations show patterns consistent with those simulated across the range of temperatures, although food supply at sites was not well known. The biomass of fish populations measured at the study streams is moderate to high relative to those reported from the coastal areas of the Pacific Northwest and Alaska (Bisson and Bilby 1998). At very low levels of food, growth is very low, but is somewhat better at cooler temperatures.

The weights predicted using observed temperatures do not deviate far from those calculated with a constant temperature (Figure 5.15). Thus, since there is little loss of information using the constant temperature, these simulations suggest that the weight gain at sites much warmer and colder than those available in our data sets are realistic. The constant temperature can be represented by the median temperature of the period. Figure 5.13 suggests that the model is sensitive to temperature, and would estimate significantly different weights for significantly different temperature profiles. The similarity in the weights predicted with the growth simulation methods at many of the sites (Figure 5.15) does not appear to reflect lack of sensitivity of the model, but rather the relatively narrow range of average temperature at streams within the sample. Population weights should be less in streams with predominantly warmer or colder than occur in our data sets.

DISCUSSION

We have developed a bioenergetics-based approach to assessing the effects of temperature on growth of salmonids. At this time, it has only been applied to age 0 steelhead trout and coho salmon living in natural streams. Growth of other salmonids could easily be modeled with the same approach if the basic consumption and growth functions can be established.

There are many examples of growth modeling based on bioenergetics principles available in the literature. Most use similar methods for estimating consumption terms but provide more comprehensive evaluation of energetic functions in addition to growth (Beauchamp et al. 1989, Kitchell et al. 1974, Hewlett and Johnson 1987, Beauchamp et al. 1989, Hanson et al. 1997.). Our formulation differs from these in that energy consumed by growth, as evidenced by observed growth rate, is the only energy function considered, and we make no attempt to close the energy balance between intake and expenditure. Thus, we view our approach as bioenergetics-based but not a true bioenergetics model. However, the growth model developed here shares many key elements with bioenergetic

models, and therefore its application enjoys many of the same challenges and criticisms (Ney 1993, Hansen et al. 1993).

In a review of bioenergetics models, Ney (1993) noted that corroborative studies of bioenergetics models showed a number of deficiencies that appear to compromise their ability to estimate consumption and growth of non-captive fish accurately. Some critics feel the models are overly complex (Ney 1993) and prone to errors in parameter estimation (Boisclair and Leggett 1989). A comprehensive model of energy functions results in the proliferation of parameters, which may create difficulties in adequately informing a number of the input variables, and defining some of the energetic relationships. Hansen et al. (1993) comment that bioenergetics models having 20 or more input parameters, each with its own estimation error, can lead to estimates of consumption or growth that, in some circumstances may have to differ by 100% or more to be judged statistically different (Boiscalir and Leggett 1989.) This poses particular problems for trying to use these models to sort out complex ecological interactions. Beauchamp et al. (1989) noted that bioenergetics models are used more frequently to predict consumption than growth because of the additional errors associated with bringing in other equations. To the contrary, Hanson (1997) argues that forcing a balance of the energy budget acts to limit error propagation (Bartell et al. 1986).

The growth model developed in this paper is relatively simple, especially in field application, but the errors are unconstrained. Our model shares some of the same relationships that are most sensitive to the errors that are found in full bioenergetics models. Specifically, the consumption terms that apply to the physiologic controls of temperature and allometry, as well as the food supply, are both important in estimating growth (Stewart et al. 1983, Beauchamp et al. 1989, Bartell et al. 1986, Hanson et al. 1993). The physiologic relationships appear to be reasonably well established for salmonid species, given the similarity of parameter values developed from different studies (Hanson et al. 1997). We achieved good modelling results using these values.

There have been questions as to whether such laboratory study results can be used for predicting response of fish living in natural environments. Laboratory studies have unique conditions of food, environment, and population pressures that themselves may create stresses that may not be observed in natural settings. In our analyses, the gain in weight of fish living in stream environments was closely approximated by relationships derived from laboratory studies. This suggests that laboratory studies can be used with some confidence to predict responses in more natural ecological settings.

Achieving a quantitative understanding of the cause and effect linkage between food consumption and temperature in natural environments is a significant challenge, as suggested by Figure 5.14, where different conditions can produce similar population weight. Field studies are labor intensive and field estimates are laden with their own assumptions and subject to their own errors (Ney 1990). Trying to discern such relationships by empirical observation alone is problematic, given the multivariate and dynamic nature of the interaction and the difficulty of measuring some of the key fundamental relationships in natural environments (Brett 1971, Boisclair and Leggett 1991, Railsback 1997). While the growth model can not solve these problems, it can help field investigators to develop physiologically-based hypotheses that may help them understand the responses they observe.

We found that our simplified application of bioenergetics principles provided some useful structure to the analysis of field observations of environmental temperature and food supply that appeared to address some of the complexity of the interactions. This could lead to greater insight into their inter-relationships when compared to empirical observation alone. For example, our results suggest that food limitation existed for some species and not for others (at least at this age), and that food limitation varies in time in ways that have important implications for population dynamics. Additional study of food consumption and supply in natural streams, where data are extremely limited, would be very useful, given the importance of these factors in determining fish productivity and response to temperature. It seems clear from this analysis that there is more opportunity to affect productivity (population weight and density) by changing food supply than by changing temperature within the range of temperature observed in the study streams, at least during the summer months. This interpretation is consistent with field studies that have shown increased productivity with canopy removal, despite increases in temperature that at times have appeared to be adverse (Hawkins et al. 1983, Bisson et al. 1988).

Importantly, the hypotheses presented by the model can be explicitly tested in field experimentation, and rejected if model results fail to predict observed responses. In this first application, the model hypotheses were confirmed, but more carefully implemented field experiments would be beneficial. We caution that these results corroborate the utility of the model, but do not constitute a rigorous test of the model or its underlying assumptions (Hansen et al. 1993). Validation would best be achieved by field and laboratory experiments to confirm the growth curves and allometric functions and to independently determine food availability, rather than estimate consumption from observed change in average population weight through time (e.g. Filbert and Hawkins 1995, Martin 1985). Such tests would help refine the input parameters, as well as reveal whether our assumption that energetic functions, other than those captured in the allometric and growth rate functions, can be ignored in estimating growth effects of environmental temperature at a necessary level of precision.

It was somewhat surprising that we were able to achieve such good predictions of weight gain compared to observations of fish populations given the sparse amount of data used to develop consumption estimates. Weight estimates for populations of juvenile salmonids were generally within 11% of observed following growth over several months during a rapid growth phase. However, the model is always likely to perform best using site-specific estimates for food consumption. Nevertheless, extrapolated estimates proved satisfactory for our purposes.

We conclude that the methods developed in this section perform well for the purpose of assessing the effects of environmental temperature on juvenile salmonid growth. Ney (1993) concluded that, in their present state of development, bioenergetics models are best suited for making relative rather than absolute predictions such as comparing outcomes of different habitat and food availability scenarios. This is how we emphasize use of this method. The method is used in Section 6 to evaluate the effects of temperature regime on salmonid growth relative to temperature thresholds that could be used as water quality criteria.

Conclusions

- Methods of predicting growth based on quantitative bioenergetics principles can be applied to streams to assess the effects of temperature on juvenile salmonid growth, with results that are consistent with observed fish population growth patterns.

- The method is sensitive to temperature and can be applied to the daily temperature regime making it a useful tool for assessing the biological impacts of temperature in natural streams.

SECTION 6 QUANTIFYING GROWTH EFFECTS IN RELATION TO TEMPERATURE THRESHOLDS

Abstract

In Section 5, we developed a method to estimate the effects of temperature and food consumption on the gain or loss of weight of coho salmon and steelhead trout during the summer months. In this section, we use the methodology specifically to identify temperature indices, including the duration and magnitude of threshold temperatures that minimize the negative growth effects of the temperatures that occur over long periods of time. The analysis provides an objective method to establish temperature criteria based on protecting the opportunity for growth, rather than avoiding catastrophic impacts.

Analyses demonstrated that some effects from the ambient temperature occurred at all sites, because no stream spends all of its time at a fish's optimal temperature for growth. Sites with both chronically high and chronically low temperatures were estimated to experience significant growth loss. Using the 7-day maximum temperature, and allowing 10% growth loss, the upper threshold for coho salmon was found to be 16.5°C and the lower limit was 13.0°C. The range for steelhead was wider at 14.5 to 21°C. Many sites included in the analyses exceed current temperature criteria for Washington (annual maximum of 16°C). Streams that far exceed the criteria also were predicted to have high growth loss. Those near the threshold criteria (±1°C) appeared to experience the best temperatures for growth. Streams with lower temperature (<13°C) also had higher growth loss and temperature less than 10°C were adverse to growth of both coho and steelhead. The method could be used to identify thresholds for other temperature indices such as annual maximum and 7-day mean, or other levels of growth loss.

Key findings include:

- It is feasible to apply a risk-based approach that uses data without safety factors and produces an estimate of cumulative risks. This technique is a true quantitative benchmark that is measurable and testable.
- The majority of temperatures experienced by salmonids are generally suboptimal for growth, and these exert some cost on the maximum potential growth.
- Colder water temperatures are not necessarily better for rearing salmonids, and warmer water temperatures are not necessarily worse. Concepts of safety factors in selecting thresholds need to be exercised with some caution. Thresholds that are too low can also negatively effect growth.
- Despite what appear to be large differences in temperature among sites, especially with regard to the warmest temperatures that occur each summer, there was less of a difference in the predominance of temperatures that are important to growth. Sites with significantly different temperature regimes often have similar predicted growth risk.

- An upper threshold for the 7-day maximum temperature of 16.5°C minimizes growth losses for coho. A 7-day maximum temperature or 20.5°C minimizes growth losses for steelhead, based on an analysis that does not consider population dynamics.

Introduction

One of the most important aspects of temperature in natural environments is its effect on growth. Growth is regulated by a complex interrelationship between food supply, population dynamics, and the physiologic responses of the fish to temperature (Weatherly 1972). Trying to discern such relationships by empirical observation alone is problematic, given the multivariate and dynamic nature of the interaction and the difficulty of measuring some of the key fundamental relationships in natural environments (Brett 1971, Boisclair and Leggett 1991, Railsback 1997). The physiological responses, including energy consumption and expenditures are generally studied under laboratory conditions, and have been quantified for many species of salmonids (Weatherly and Gill 1995, Brett 1995). Field studies are labor intensive and they are laden with their own assumptions and subject to their own errors (Ney 1990). Consequently, there are relatively few field studies that have successfully established the linkage (Martin 1985, Filbert and Hawkins 1995). A combination of field and laboratory study offers the best hope for establishing a quantitative understanding of the cause and effect linkage between growth and temperature in natural environments (Hansen et al. 1993).

Laboratory studies have produced quantitative relationships between energy consumption and expenditure mechanisms. The rate at which most energetic functions proceed is mediated by ambient environmental temperature. Bioenergetics models have been developed to help manage understanding of the multitude of physiologic responses to temperature (Kitchell et al.1974), accounting for energy consumption and expenditures. Some have been packaged into software programs (Hewlett and Johnson 1992, Hanson et al. 1997), and have been proven to be useful tools for a number of applications in fisheries management (Hansen et al. 1993). These include the rearing of fish in hatcheries (McLean et al. 1993), and populations in natural environments (Hanson et al. 1997). The downside to such models is that they often require many parameters to inform a number of energetic functions, most of which are difficult to quantify in natural environments. Thus their application to explore ecological responses to environmental temperature are more limited, although researchers have recently found them promising for this purpose (Filbert and Hawkins 1995, Preall and Ringler 1989, Railsback and Rose 1999).

In Section 5, we developed and corroborated a bioenergetics-based approach that can be used to evaluate the effects on growth of the variable temperatures that occur over the juvenile rearing period in natural stream environments. The model treats the population as a cohort, and does not account for population density effects. Thus, the method allows us to focus on temperature differences among streams while minimizing biological data requirements. The mathematical model simulates weight gain over a specified duration, and requires only three input parameters (temperature, initial weight, and daily food consumption). The method is sufficiently simple that it can be applied in field experimental studies. Only the food consumption term is difficult to assess in streams (Filbert and Hawkins 1995). To our knowledge, no simple methodology for assessing food availability has been developed.

The ecological constraints on food supply can vary significantly among sites, and they are potentially influenced by many factors: population dynamics and competition for food, (Walters and Post 1993), riparian, in-channel habitat characteristics as they control primary and secondary production (Hawkins et al. 1983, Bilby and Bisson 1988, Hetrick, Murphy 1998, Railsback and Rose 1999) and the energy content of food prey (Stewart and Ibarra 1991). Information about these riparian, in-channel habitat and population characteristics is embodied in the time series of daily temperatures, consumption and body weights of fish as they grow in natural environments over time.

Despite difficulties in establishing *in situ* food consumption, we were able to generate estimates of consumption for juvenile coho and steelhead from observations of fish growth over time that produced close correspondence between simulated and observed weight gain, even when parameters were extrapolated among streams. Weight gain predicted for 16 populations of coho and 8 populations of steelhead were generally within 11% of the observed, during a rapid growth period where weight gain ranged from 67 to 415%. Based on corroboration with observed population growth, we concluded that the method is a useful tool for quantifying the effect of temperature regime on growth, though not biomass until population effects are accounted for.

In this section, we use the model to perform a series of relative comparisons of growth effects from observed stream temperatures from a number of stream sites with widely varying temperature profiles. We pay particular attention to interpreting results relative to temperature thresholds that are often used for water quality criteria.

Growth Simulation Method

The growth model was used to simulate weight gain for coho and steelhead using standard timelines, initial weights, and consumption estimates for each species (Table 6.1). Only the temperature varied, according to measured daily temperature at the 19 sites. Thus, this assessment isolated the effects of the long-term temperature on growth. Temperature profiles at the sites varied from very warm to cold (Table 6.2, and further described in Section 3), and many exceed the current Washington Department of Ecology temperature criteria. The temperature data set did not include very cold streams (12°C or less). These typically occur in the extreme headwaters, and are small and non-fish-bearing in this region (Black 2000). To represent these streams, we also conducted two simulations using a constant temperature of 8° and 10°C.

Table 6.1 Input variables for growth simulations. See Section 5 for a full description of the growth model and the determination of parameters.

Input Variables	Coho	Steelhead
Simulation Period	June 1-Sept 15	June 1-Sept 15
Initial Weight (g)	1.4	0.5
Food Consumption ($g\ g^{-1}d^{-1}$)	Declines through time with ecological constraint (see Section 5, Figure 5.8)	Assumed at maximum potential calculated by temperature and weight (see Section 5, Figure 5.8)
Temperature (°C)	Daily mean calculated from hourly temperature measurements	Daily mean calculated from hourly temperature measurements

Growth of coho and steelhead populations was characterized by the average population weight according to the parameters identified in Table 6.1. Simulations were run from June 1 through September 15

because we had a complete temperature record for all of the sites and this period encompasses most, if not all, of the growth occurring during the summer rearing period.

The consumption was varied according to observed or estimated rates inferred from growth of fish between time periods as described in Section 5. The analysis found that there are important differences between fish species in their consumption patterns. Age 0 steelhead appear to have no environmental constraint on food supply, subject only to physiological constraints imposed by temperature and weight. Coho show ecological constraint on food supply beginning in late June that lasts through the summer season. Fausch (1984) observed similar patterns, concluding that these differences are likely to influence the species' response to temperature.

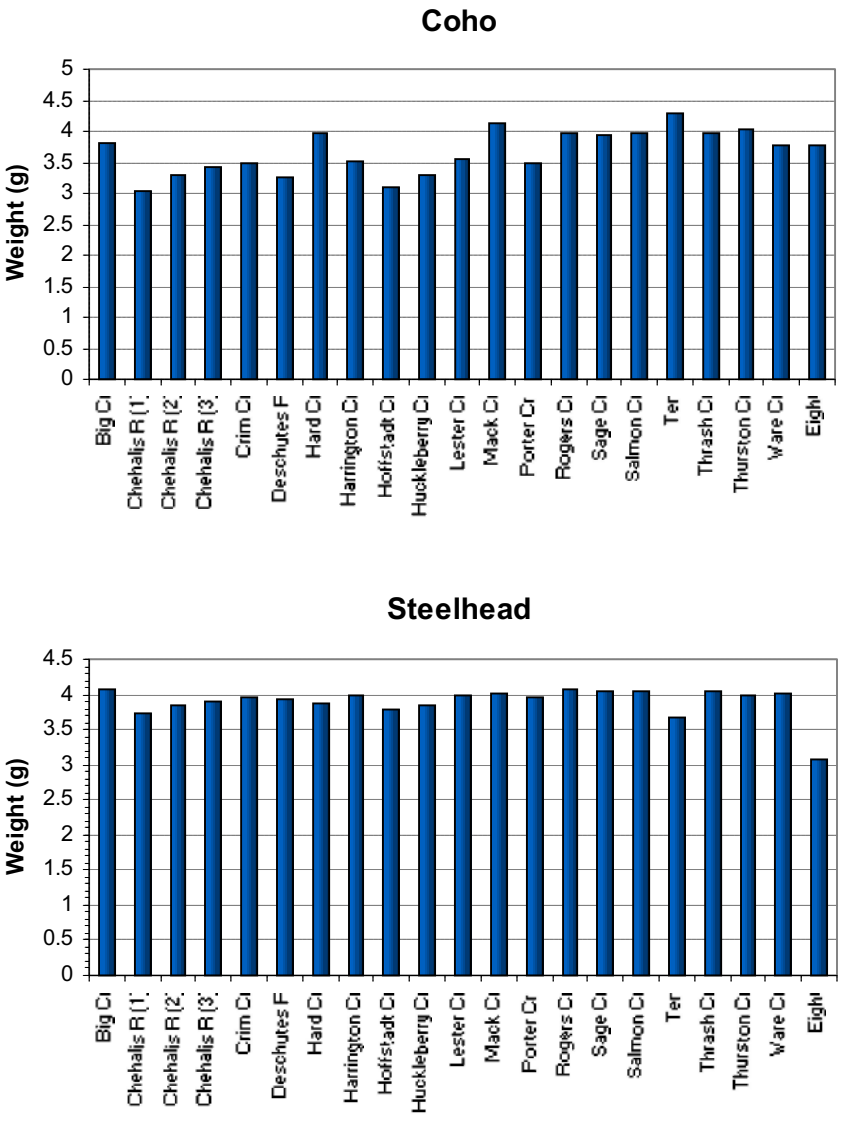


Figure 6.1 Estimated weight after 106-day growth period using the same initial weight and food consumption assumptions at each site.

Temperature Effects on Weight Gain

The predicted weights after 107 days of simulated growth are shown in Figure 6.1. Because the initiating assumptions are the same, the predicted weights are similar. Any differences in observed weight are due to the temperature at each of the sites. Coho vary up to 1.2 grams (31% of the mean), and cooler sites generally had greater weights. The predicted weights of steelhead vary by only 0.5 grams among sites (12% of the mean), despite large differences in the temperatures.

Relative Temperature Effects on Growth

Our approach to evaluating the effects of temperature on salmonid growth is to estimate the weight gain achieved during the summer according to the observed temperature regimes and estimates of food availability, then compare that growth to a reference point. Our reference point is the growth the fish would have achieved if temperatures had been at optimal for growth, and at the same level of food consumption. Brett (1971), Brett et al. (1982), Railsback and Rose (1997), Preall and Ringler (1989) used a similar reference approach, and growth models as a basis for prediction.

Establishing Optimal Temperature and Growth. Previous studies have established a maximum potential growth as the point of reference. Many have used the size calculated at constant optimal temperature and maximum consumption (a reference only observed at optimal temperature and low weight). (See Section 5 for a full discussion of this point). This represents the maximum possible growth that fish could achieve, and it is probably only observed in the laboratory setting where both of those parameters can be maintained at required levels and for a short period in a fish's life.

It's important to note that optimal temperature is not static but varies with weight and ration (Stewart and Ibarra 1991, Brett et al. 1971, Brett 1995). The change in optimal temperature with rations between the minimum required for basic metabolic functions and the maximum at satiation is shown for coho and steelhead in Figure 6.2. Note that consumption rates differ for the two species, as does the range of optimal temperatures.

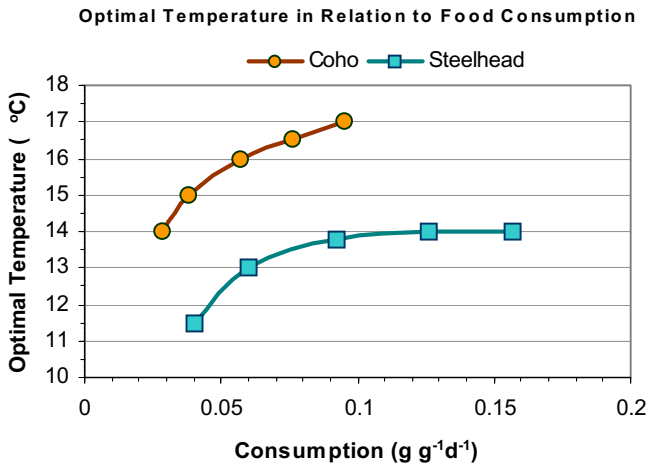


Figure 6.2 Optimal temperature in relation to food consumption. Consumption is expressed as grams of prey per gram of body mass per day. The range displayed is from satiation to minimum maintenance for each species.

There are also changes in consumption rates as the fish gain weight, referred to as allometric relationships (Brett 1995, Stewart and Ibarra 1991). In the optimal growth simulations, we reduce consumption according to fish weight and any ecological constraints on the food supply. Optimal temperature is then reduced accordingly. This yields realistic estimates of optimal growth reflecting well-documented allometric effects. By adjusting optimal temperature with consumption, we believe the reference optimal growth simulation realistically

represents the potential effects of temperature. It is not clear if previous researchers who have used optimal growth benchmarks have performed this adjustment.

In the second scenario, weight is calculated allowing the daily growth rate (g_i) to vary with temperature according to the specific growth curves in Figure 5.4, and food consumption assumptions (as illustrated in Figure 5.8). We express growth in terms of the *Reduction In Maximum Growth* (RMG). RMG is defined as the percentage of reduction in growth for the site specific temperature compared to the maximum growth achieved at the optimum temperature for each ration.

RMG (%) is calculated according to:

$$RMG = (1 - \frac{W_t}{W_{t=optimal}}) x100 \qquad (6.1)$$

A sketch of the calculation is provided in Figure 6.3. Since no stream had optimal temperature all of the time, the gain in weight with varible temperature should be less than that for the optimal case. The RMG is expressed as a percentage of the maximum weight. The lower the value of RMG, the less the deviation from the optimal growth rate. A RMG value of 0% suggests there is no growth loss due to the temperature at the site.

The reduction in maximum growth due to temperature varied among species (Table 6.2). It is clear that fish spent only a portion of their time in the optimal temperature range during their growth period, since RMG was greater than zero at all sites for both species. Consequently, there was some cost to growth for salmonids living in Pacific Northwest streams due to their temperatures during the rearing growth phase (Table 6.2). However, the RMG were generally within 20% for both species at all sites.

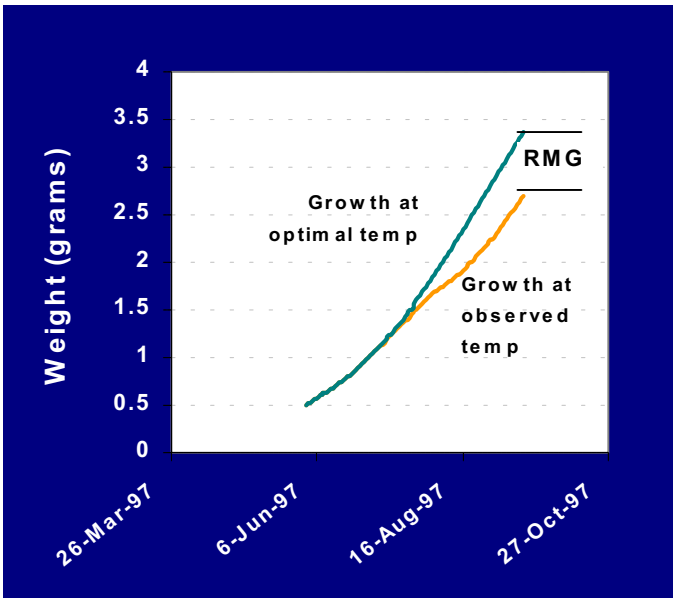


Figure 6.3 Illustration of the reduction in maximum growth based on two temperature scenarios; growth at constant optimal temperature and with the variable growth rate based on the site's temperature regime.

Table 6.2 Location and temperature characteristics of temperature sites used in reduction in growth analysis.

	Site characteristics			Temperature characteristics				Reduction from maximum growth (%)	
Site	Watershed	Basin Area (km^2)	Year	7-Day Maximum[a] °C	7-Day Mean[b] °C	Annual Maximum[c] °C	Season Median[d] °C	Coho	Steelhead
Deschutes River mainstem	Deschutes	145.0	1994	21.0	18.4	22.5	15.0	13.5	11.4
Thurston Creek	Deschutes	9.1	1994	14.9	14.1	15.5	12	10.0	9.5
Hard Creek	Deschutes	3.0	1994	14.0	13.0	14.0	11.0	19.2	13.7
Ware Creek	Deschutes	2.8	1994	17.5	16.1	18.3	12.9	14.7	8.7
Huckleberry Creek	Deschutes	5.3	1991	18.4	17.6	18.5	15.5	18.1	12.7
Chehalis River mainstem (Site 1)	Chehalis	181.8	1997	21.1	18.9	22.1	15.6	16.8	16.0
Chehalis River mainstem (Site 2)	Chehalis	57.5	1997	22.1	18.2	23.2	14.5	15.3	13.1
Chehalis River mainstem (Site 3)	Chehalis	29.5	1997	20.6	18.6	21.4	14.3	13.8	11.2
Crim Creek	Chehalis	22.0	1997	18.8	16.9	19.4	14.3	11.6	9.9
Lester Creek	Chehalis	10.4	1997	18.4	16.3	19.0	14.2	9.3	8.5
Thrash Creek	Chehalis	16.7	1997	15.3	14.3	15.8	12.3	8.8	8.1
Rogers Creek	Chehalis	13.1	1997	15.7	14.1	16.1	12.6	6.4	7.0
Big Creek	Chehalis	9.0	1997	16.5	14.6	16.9	12.5	6.2	6.9
Sage Creek	Chehalis	5.3	1997	16.5	14.6	16.9	12.5	9.1	7.7
Salmon Creek	Chehalis	8.9	1997	15.8	14.2	16.2	12.3	8.1	7.7
Mack Creek	Chehalis	2.8	1997	12.9	12.5	13.1	11.7	6.2	9.0
Porter Creek	Chehalis	25	1990	17.5	16.3	18.6	14.4	17.1	10.5
Hoffstadt Creek	Toutle	25.6	1990	24.5	18.4	26.0	14.0	24.6	15.1
Harrington Creek	Toutle	8	1990	19.1	16.7	20.5	13.3	16.5	9.5
Eight (Constant)	NA	NA	NA	8	8	8	8	28.1	35.4
Ten (Constant)	NA	NA	NA	10	10	10	10	7.1	18.3

[a] maximum value of the 7-day moving average of the daily maximum temperature
[b] maximum value of the 7-day moving average of the daily mean temperature
[c] instantaneous maximum
[d] median of daily mean temperature from June 1 to September 1

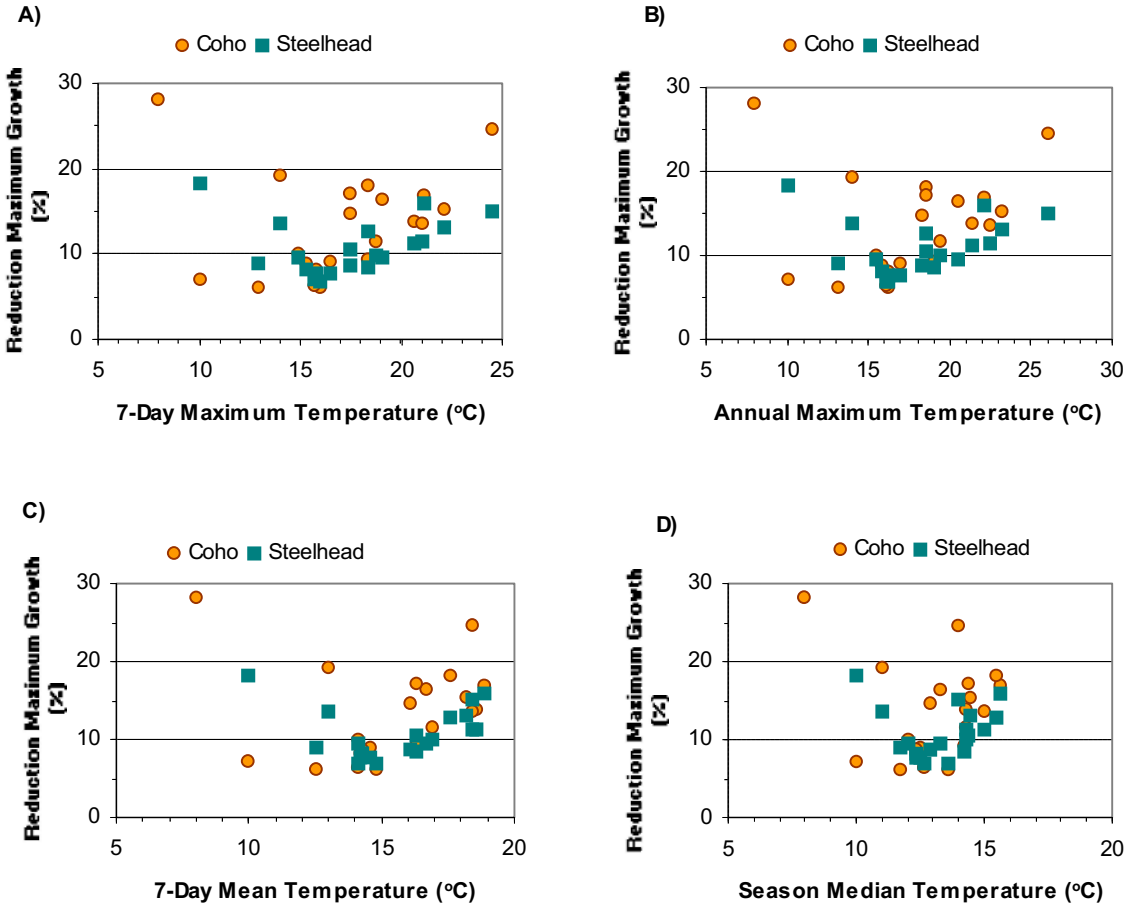


Figure 6.4 Estimated growth risk at temperature study sites in relation to several time-averaged temperature metrics: A) 7-day maximum, B) annual maximum, C) 7-day mean, and D) median temperature for the simulation period.

Temperature criteria for water quality standards are generally applied for time-averaged characteristics of temperature such as the warmest 7-day average of daily maximum and mean temperature, or the annual maximum temperature (instantaneous measure) (see Section 3). Growth reduction (RMG) is shown relative to various time-averaged temperature indices in Figure 6.4. RMG was at a minimum when the stream's temperature index most closed approximated the species'optimal temperature. All streams had some growth loss due to its long-term temperature, since no stream had RMG equal to 0. RMG tended to increase for streams significantly warmer or colder than the optimum or lowest point of the growth curves. Generally, the sites with lowest growth loss had indexing mean temperatures within the range of optimal temperatures (e.g., Figure 6.2). These are 14° to 17°C for coho and 11.5 ° to 14°C for steelhead using the 7-day maximum measure. Both species showed steep response in growth loss at higher and lower temperatures than their optimal range. There was significantly growth loss for both coho

and steelhead when the 7-day maximum temperature was less than 10°C and greater than 24°C. The patterns are similar for both species, although coho predictions are more variable with site temperature than steelhead. These two species often cohabit the same streams, and with the growth simulation method, they are predicted to have similar level of response at approximately the same temperatures, despite fundamental differences in their specific growth rate/temperature curves (Section 5).

The general patterns in RMG described for the 7-day maximum temperature also held true for all of the time-averaging periods (Figure 6.4). Of course, the range of temperature where growth was optimized varies with each of the temperature indices. The relationship with the least scatter was the 7-day mean temperature, suggesting it may be the best for temperature criteria.

While the species have similar patterns of response, there were also important, non-intuitive, differences in simulation results. Although the optimal temperatures for coho are higher than steelhead (Figure 6.2), their growth was maximized within a narrower and lower range of temperatures. Steelhead maximized growth at a wider and somewhat higher range of temperatures. We believe that these differences reflect the food supply with which each species is modeled. Because no food limitation was assumed for steelhead, their optimal temperatures were on the high end of the optimal range. This gave steelhead a broader temperature range where growth was not compromised by temperature. Coho had a narrower range of temperature where growth was optimized, and this range was consistent with the optimal growth range indicated by their specific growth curves. Assumptions of food supply restrictions helped ensure that the optimal growth for coho would include those temperatures associated with low consumption (13 to16.5 °C).

The short-duration indices appear to be useful for characterizing the long-term temperature pattern in a way that is meaningful to fish growth. In Figure 6.5, the daily mean temperature for the entire simulation period is shown for three sites. Some sites

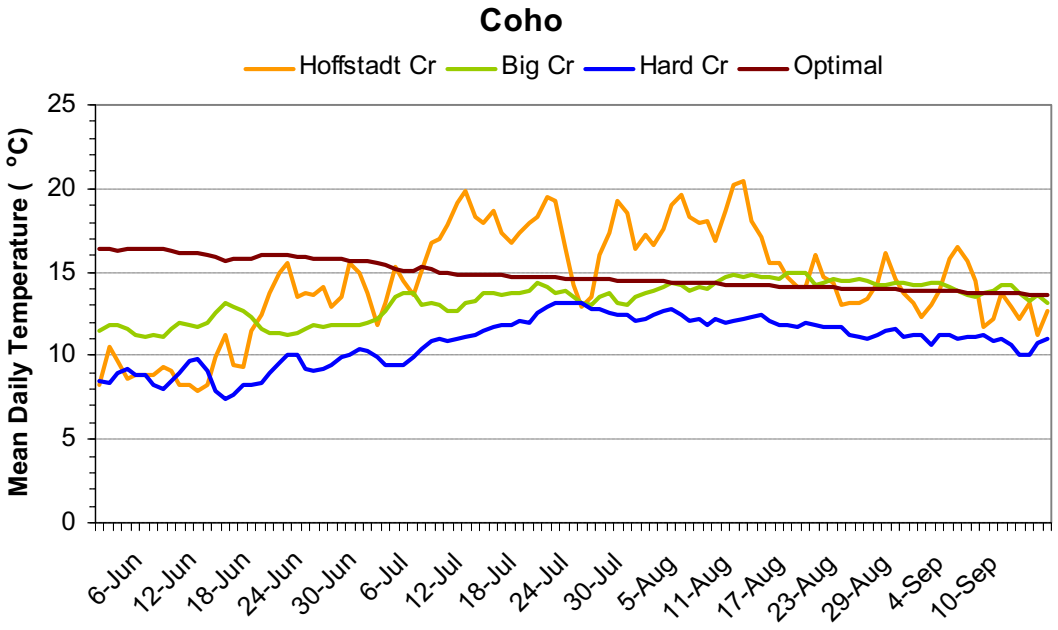


Figure 6.5 Temperature regime at selected sites with estimated optimal temperature.

spend a lot of time above optimal temperature (e.g., Hoffstadt Creek), and some spend all or most of the time below optimal (e.g. Hard Creek). Growth is impacted in both these cases by approximately 20%. The sites where temperature was close to optimal for the longest time (e.g., Big Creek), had the least effects on growth. Most site temperatures tended to be well below optimal early in the summer growing season when growth rates are maximized, partly because fish were smaller. Better growth early in the season appeared to compensate somewhat for very warm temperatures later in the season. Figure 6.5 also illustrates how optimal temperature declines through time with decreasing food consumption due to weight gain.

Since the sites span a range of temperature regimes, the site with the lowest growth loss represents the temperature profile that best encourages growth for that species. In a sense, this site fits the concept of an "index" stream, although in this case, the reference is defined by fish growth rather than its naturalness or lack of disturbance. Interestingly, Big Creek had the most optimal temperature for both coho and steelhead. This site has an annual maximum temperature of 16.9°C, nearly 1 degree over the Washington water temperature criteria.

Risk Associated with Growth Limitation

Holtby and Scrivener (1989) and Quinn and Peterson (1996) found that coho size at the end of summer was a primary factor influencing overwintering survival and smolting. Holtby and Scrivener (1989) provided an equation relating probabilities of overwintering success to coho length. We translated this relationship to an equation based on weight using a population length/weight relationship (Ricker 1975). The relationship between weight and the probability of overwintering success from these two studies are shown in Figure 6.6. Holtby and Scrivener (1989) found a large increase in overwintering success with increased size, possibly because the coho were so small at Carnation Creek (generally less than 2 grams). According to their relationship, weight of about 6 grams or more yields an 80% or better probability of successfully overwintering. Note that we have extended Holtby and Scrivener's relationship beyond the limits of their data to cover the larger fish sizes at our sites. Quinn and Peterson (1996) found more modest improvement in overwintering success at Big Beef Creek with fish size, although the fish in this stream were significantly larger than Carnation Creek. These authors found that the probability of successfully overwintering was about 50% for fish >89 mm (approximately 8 grams) and only 17% for fish <60 mm (approximately 2.5 grams). These values agree more closely with fish sizes in our study streams. We connect the two lines to determine a relationship of overwintering success with weight.

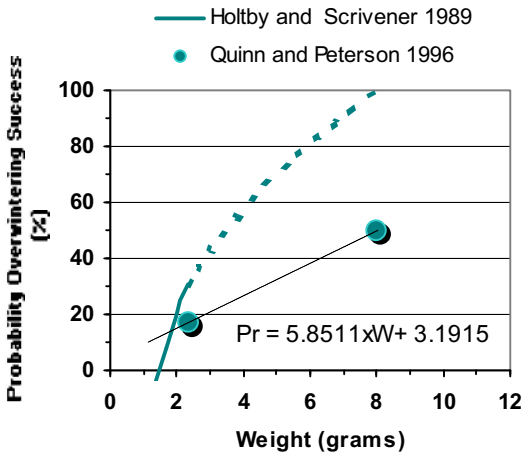


Figure 6.6 Probability of success for coho overwintering survival (from Holtby and Scrivener 1989) based on end of summer fish size. Data from Quinn and Peterson (1996) are also shown. The two points were connected with a linear regression.

We use both of the relationships to illustrate the potential effect of growth reduction on overwintering success. The probability of success for each individual in the population at Salmon Creek was calculated based on its weight (shown as actual weight in Figure 6.7). Quinn and Peterson's data are used in Figure 6.7A and Holtby and Scrivener's relationship is used to calculate Figure 6.7B. Despite the large differences in estimated probabilities with the two relationships, both produce similar relative results. There is a reduction in overwintering success with lower weight; the magnitude of change is approximately equal to the percentage change in weight. That is, a 10% reduction in growth calculated for the population results in an average reduction in overwintering success of 9%.

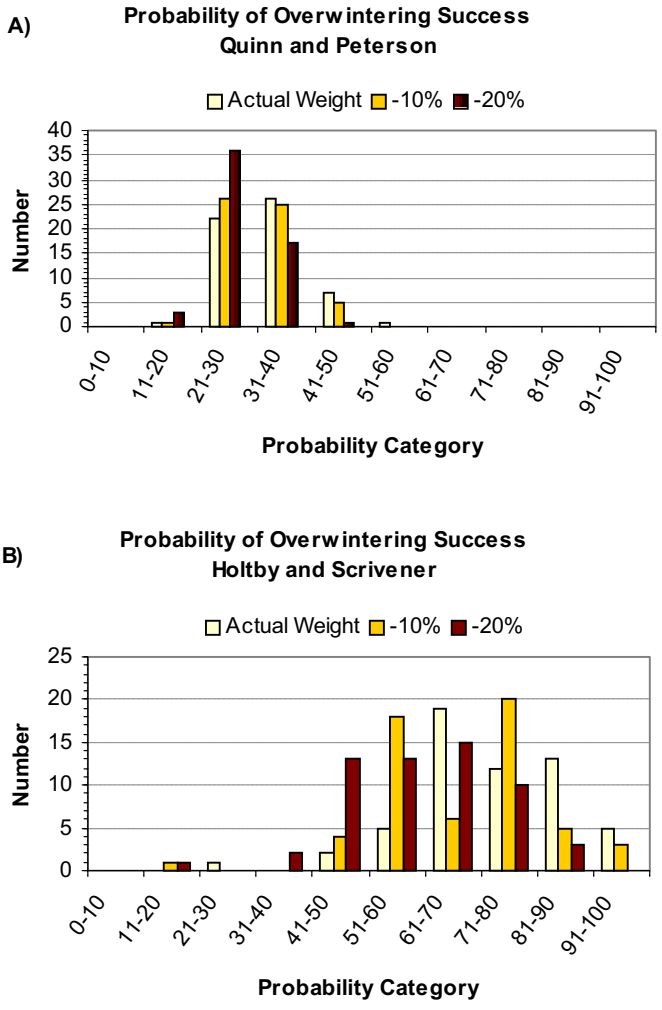


Figure 6.7 Histogram of probability of overwintering survival based on weight of individuals within the population and simulated effects with redcution in weight due to temperature. Probability calculated based on Quinn and Peterson results from Big Beef Creek, WA (A) and from Holtby and Scriverner's from Carnation Creek (B).

The important outcome of this analysis is the suggestion that the relatively small changes in weight that we calculate due to temperature (e.g. Figure 6.1) are sufficient to affect individual and population overwintering success to some extent. A 10% reduction in growth would be difficult to statistically detect given the typical range of sizes in natural populations. However, a 20% reduction should be detectable, especially when field experiments are guided by hypotheses generated from the growth model. Brett et al. (1982) suggested a 20% upper limit for change in weight due to temperature for chinook populations living in the Nechako River. This appears to be somewhat high for coho, based on implications for loss of overwintering success. However, it should be noted that many factors affect the survival of salmon in the marine environment.

Use of either relationship extends them beyond the original data or application developed by the authors. Therefore, even though we use both relationships to estimate the effect of growth reduction from temperature on overwintering success, we acknowledge uncertainty in this analysis. Additional research quantifying the effect of size on success at later life history stages would increase confidence in the analysis of risk to growth loss

due to temperature. This, in turn, creates uncertainty regarding the choice of 10% as the growth reduction limit. It appears clear that at least 5% growth loss can be expected at all sites due to long duration exposure, even when the bulk of temperatures are near optimal. The difference in temperature thresholds selected at 10 and 20% RMG is quite significant. Increased understanding of the role of juvenile size in determining success at later life history stages would improve confidence in selecting an appropriate limit to growth loss.

In the Carnation Creek study, improved growth of steelhead fry with increased temperature after logging did not translate to larger smolts after two to three years of rearing (Hartman and Scrivener 1990). Steelhead will usually spend at least one additional year in the stream regardless of size achieved in the first year. Thus the impacts on growth from temperature are shown to be small in this analysis, which is consistent with observations at Carnation Creek. The negative or positive effects on growth are not great enough to change weight sufficiently to change migratory patterns, that is, to speed up or delay them by one year.

This is in contrast to coho at Carnation Creek, where temperature increased growth sufficiently to bring some fish to smolting size in one year. It should be noted that Southern British Columbia represents the most northerly locale where coho are typically able to reach smolting size in one year (Sandercock 1991). Coho at Carnation Creek typically migrate at 2-years rather than one, presumably due to lower temperatures. In this case, increasing the temperature accelerated growth to the point where the coho outmigrated after the first season. This was interpreted as negative for the species, because the timing of their migration made them more susceptible to predation in the estuary and ocean environment. Where fish typically migrate in one year (e.g., Washington and Oregon), growth improvement would probably benefit their success by producing fish of larger size, according to Quinn and Peterson (1995).

Growth Loss and Temperature Criteria

We translate the RMG data (Figure 6.4) to zones of reduction in maximum growth to facilitate identifying thresholds of growth response in Figure 6.8. The range of temperatures was determined by ordering the site temperature data and estimating the temperature where the 10 and 20% boundaries occurred. The range of 20% reduction encompasses most of the stream temperatures typically observed in the region. The range of temperature where there was relatively little effect less than 10%) was fairly narrow for both species. It should be noted that at temperatures above and below the ranges illustrated, there is high growth loss due to temperature (30% or more).

Discussion

The temperature assessment approach provides a method for indexing the relative effects of stream temperature regimes on salmonid growth. A value of the approach is that the relative effects of temperature and food consumption can be evaluated independently of other habitat or population characteristics, and each other. Results can be also be used to directly compare growth effects among species. Because these factors are assumed constant in this analysis, the growth estimates only account for the direct effects of temperature, and do not account for population dynamics.

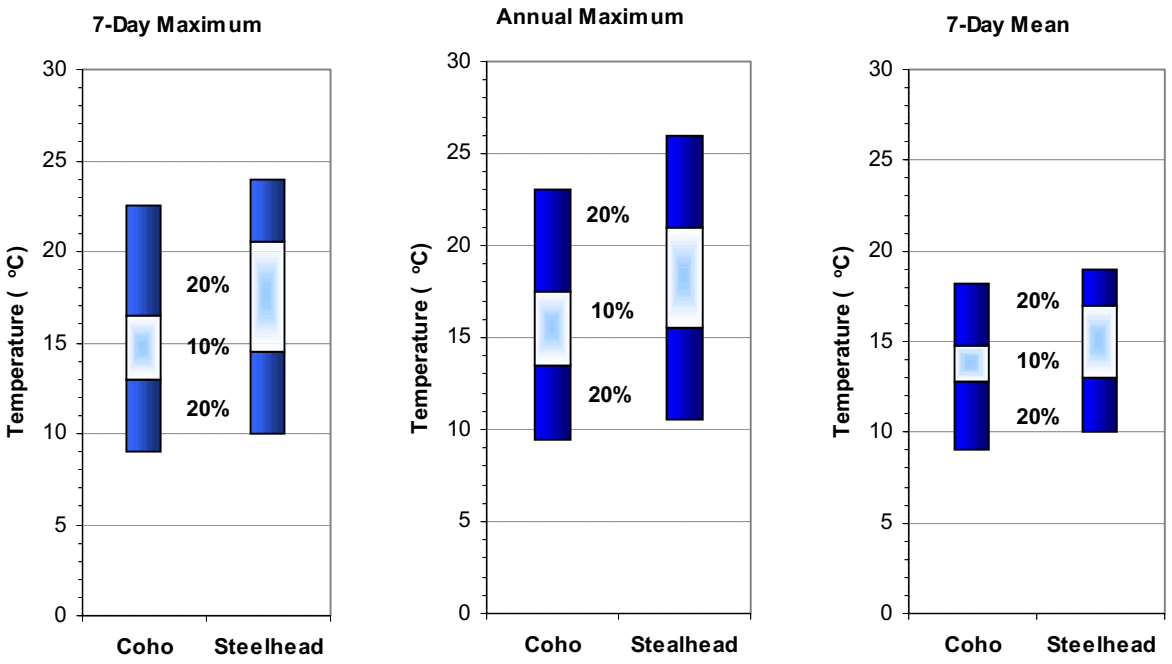


Figure 6.8 Ranges of temperature where reduction from maximum growth is 0-10% and 11-20%. At temperatures above and below these ranges RMG exceeds 20%.

Species were similar in their range of response. However, coho were more temperature sensitive, and steelhead tended to grow somewhat better at warmer temperatures than coho. If bioenergetics relationships are correct, this can be explained by differences in food supply. This, in turn, may reflect the different foraging strategies that each species utilizes when coexisting in the same streams (Bisson et al. 1988b). Selection of temperature criteria in management situations may be most useful if they reflect the most sensitive species (coho) when both species are present.

Fish were predicted to be growing near optimal within many streams, including a number that exceed current water quality standards. The temperature ranges observed at the sites included in this analysis are representative of current conditions in Washington streams and rivers. The vegetative overstory of many has been disturbed within the last 50 years, and therefore streams may be currently warmer than they have been at other times in their history. However, the range of temperature represented at these sites is likely to be representative of the range that has occurred historically, given the history and frequency of fire disturbance in the region (Agee 1993).

The patterns of biological growth response in relation to all of the time-averaged temperature regime metrics demonstrates that they can be used to index the temperature regimes of sites in biologically meaningful ways. Short averaging periods such as 7-day and even the annual instantaneous maximum temperature are strongly indicative of the long-term temperature regime that partially controls fish growth during the summer.

CONCLUSIONS

- It is feasible to apply a risk-based approach that uses data without undefined safety factors and produces an estimate of cumulative risks. This technique is a true quantitative benchmark that is measurable and testable.

- Modeled growth using measured temperature suggest that the majority of temperatures experienced by salmonids are generally suboptimal for growth, and these exert some cost on the maximum potential growth.

- Despite what appear to be large differences in temperature among sites, especially with regard to the warmest temperatures that occur each summer, there is considerable similarity in the predominance of temperatures that are important to growth. Sites with significantly different temperature regimes can have similar predicted effects on growth.

- An upper threshold for the 7-day maximum temperature of 16.5^{o}C minimizes growth losses for coho. A 7-day maximum temperature or 20.5^{o}C minimizes growth losses for steelhead.

- Concepts of safety factors in selecting temperature thresholds defined for salmonids need to be exercised with some caution. Thresholds that are both too low and too high can negatively affect growth.

- The criteria above assume 10% growth loss as the acceptable level of risk. There is uncertainty associated with this number, since there are relatively few quantitative data to base it on. Further research could help confirm acceptable risk levels.

SECTION 7 RELATIONSHIP BETWEEN EXISTING AND PROPOSED TEMPERATURE CRITERIA AND RISK ASSESSMENT FINDINGS

Abstract

Understanding the biological effects of temperature on fish is essential for effectively managing stream temperature under the Clean Water Act. One of the key elements of water quality management is to establish temperature criteria (e.g., water quality standards) that will limit human-caused impacts to the beneficial uses of the stream (e.g., fish). Ideally, criteria are based on an understanding of the interaction of fish physiology and ecology (biological effects) and the physical watershed and climatic processes that control the temperature of streams (exposure). Scientific understanding of these factors should then lead to criteria that are realistic and appropriate in assigning a temperature threshold that appropriately reflects temperature. In this section, we review and compare methods of determining temperature criteria used to select criteria, including those developed in this report.

Key findings of this chapter are:

- Risk assessment allows the effects of magnitude, duration and frequency of temperature on fish growth and survival to be quantified in an objective and repeatable manner.
- The U.S. EPA (1977) temperature criteria were found to be the most objectively defined and consistent with risk analysis results. They generally appear to allow up to 20% reduction in growth due to temperature.
- Criteria derived from review of scientific literature without quantitative synthesis are generally consistent with risk assessment and U.S.EPA methods, although they tend to overestimate the benefits of cold temperatures and slightly underestimate the positive growth effects at temperatures somewhat higher than optimum.

Introduction

From a scientific basis, methods for deriving temperature criteria should be explicitly defined and based on sound scientific data that pass data quality screening criteria (ASTM 1997). A criteria derivation protocol needs to have:

- clearly defined, transparent and repeatable methodology;
- data quality objectives, attributed data sources, and quality control screens;
- defined levels of protection for species populations, communities or ecosystems;

- stated assumptions, safety factors, and data extrapolation factors; and
- temperature criteria that incorporate magnitude, frequency, and duration as decision variables.

In previous sections of this report we: reviewed the scientific literature elucidating the growth and acute lethal response of salmon to temperature during the rearing life history phase (Section 2); explored relationships between long-term and short-term temperature indices (Section 3); performed risk analysis on the effects of temperature on mortality of salmon (Section 4); developed a quantitative method to asses effects of long-term exposure to temperature on growth (Section 5); and established temperature threshold criteria (Section 6). In this section we evaluate water quality temperature criteria derived from several methods that have been adopted or proposed by various authors and agencies relative to their biological effects, including the analyses developed in this report.

Criteria and Methods To Derive Them

Review of scientific literature and agency policy documents identified a number of different approaches to derive water temperature criteria for the summer maximum temperature. Methods fall into three general categories:

- criteria derived from experimental temperature tolerance studies;
- criteria derived from field observations of fish occurrence under different temperature regimes; and
- criteria derived from professional review of temperature information.

The degree of objectivity or subjectivity by which the information is synthesized into recommended criteria, the degree to which data forms the basis for the criteria, and the extent to which population effects can be probabilistically determined varies between methods.

Experimental Information-based Method (EPA)

The EPA has published temperature criteria for a number of fish species based on a review of laboratory-based research on the thermal tolerance of fish (Brungs and Jones, 1977, also cited as U.S.E.P.A. 1977). Brungs and Jone's method includes identification of acute and chronic threshold values, definition of averaging time of specific daily temperature characteristics, and explicit treatment of safety factors to ensure the recommended criteria control population level effects. Temperature criteria are based on temperature tolerance studies that generally follow the protocols developed by the NAS/NAE (1973). These protocols include procedures to derive specific temperature criteria for both chronic and acute exposure. Criteria for chronic exposure are derived from incipient lethal temperature and physiological (bioenergetic) performance (e.g., growth optima) data. The temperature assessment methods described in Sections 4,5 and

6 of this report are based on similar data such as the acute lethal and growth temperature/ration relationships.

From the perspective of selecting temperature criteria, some very simple principles can be derived from the growth curves that are meaningful (Figure 5.4). Beginning with the coolest temperatures (0° C), growth increases with temperature up to the temperature up to optimal where the maximum growth rate is achieved without any increase in ration (approximately 16° C). This improved growth is due to increased food conversion efficiency and consumption. At temperatures above the maximum growth rate, growth rates cannot be maintained because consumption declines and metabolic energy costs increase. Further increases or maintenance of growth rate must come from increased food, if possible within satiation limits. Because the shape of growth curves is broad at the maximum, there is little or no negative effect of temperature several degrees above optimum.

Brungs and Jones (1977) describe an objective method for developing threshold criteria based on optimal temperature and the range of preferred temperatures from laboratory derived growth curves available at the time. The criterion for chronic exposure is expressed as the maximum seasonal 7-day moving average of the daily mean temperature. Brungs and Jones (1977) refer to this metric as the "maximum weekly average temperature" (MWAT). This value may be derived for different seasons and life stages (e.g., summer rearing or fall/winter incubation). The scientific rationale for using the MWAT as a temperature limit is based on data showing that moderate temperature fluctuations can be tolerated as long as the incipient lethal temperature is not exceeded for long periods. The method also assumes that optimum temperatures are neither necessary nor realistic at all times to maintain viable fish populations (NAS/NAE 1973).

Criteria for protection from exposure to extreme temperatures are based on thermal tolerance data. Regression equations of median survival times (LT50) (e.g., Figure 2.2) are used to predict the upper incipient lethal temperature for a 24-hour exposure, and a 2°C safety factor is subtracted to derive a short-term criterion that will provide 100% survival (Brungs and Jones 1977). Since LT10's and LT50's are very close, the safety factor is sufficient to preclude effects on any fraction of the population.

Protocols for deriving criteria based on experimental temperature tolerance studies have not changed since being proposed by the Environmental Protection Agency (Brungs and Jones 1977). Various authors continue to recommend this method as an option for protecting fish habitat (Armour 1991).

The acute and chronic temperatures for the EPA protocol were computed for the rearing stage of seven native salmonids in Washington using the experimental temperature tolerance data that could be found in the literature (Table 6.1). This includes relevant data reported by the NAS/NAE (1973) and any newer data that could be found. Original criteria reported by Brungs and Jones (1977) are shown for comparison with the updated numbers. Note, the latter results are slightly different than criteria reported by Brungs and Jones (op cit) for the same species because our values are based on data from individual studies and not on the average of several studies. The results from multiple evaluations of the same species produced similar results (usually within 1°C), and differences among salmonid species were relatively small.

Table 7.1 Water temperature criteria (maximum weekly average temperature and acute exposure maximums during growth season) for salmonids based on the EPA methodology (Brungs and Jones 1977). Values reported by Brungs and Jones are shown for comparison.

Species	temp. (°C)	lethal level (°C)[a]	Median Survival Time		optimum	Source	Temperature criteria		
			intercept (a)	slope (b)			(°C)	maximum (°C)	data
Oncorhynchus clarki	13-23 fluctuating	25.5	18.1515	-0.5723	--	(a) Golden 1978	18.50		a, d
cutthroat trout	23	25.7	--	--	--	(b) Golden 1978	18.57		b,d
	16	22.6	--	--	--	(c) Vigg and Koch 1980		24.20	a
	constant	--	--	--	15	(d) Dwyer and Kramer 1975			
Oncorhynchus gorbuscha	24	23.9	14.7111	-0.4459	--	(e) Brett 1952	17.97		e,t
pink salmon								23.91	e
Oncorhynchus keta	23	23.8	15.3825	-0.4721	--	(f) Brett 1952	17.93		f,t
chum salmon	9	23.2	15.9272	-0.5575	--	(g) Blaham and Parente, unpublished in: NAS/NAE 1973	17.73		g,t
								23.89	f
								20.90	g
Oncorhynchus kisutch	23	25.0	18.9736	-0.6013	--	(h) Brett 1952	19.67		h,k
coho salmon	23	25.0				(hh) Dehart 1975			
	10	23.5	18.4136	-0.641	--	(i) Blaham and McConnel, unpublished in: NAS/NAE 1973	19.17		l,k
	10-13 fluctuating	26.0	--	--	--	(j) Thomas et al. 1986	20.00		j,k
	constant	--	--	--	17	(k) Averett 1968		24.30	h
								21.80	l
						Brungs and Jones (1977) estimate	18.00	24.00	
Oncorhynchus mykiss	18	26.5	18.4654	-0.5801	--	(l) Alabaster and Welcomme 1962	20.30		l,o
rainbow/steelhead	20	--	19.625	-0.625	--	(m) Alabaster and Downing 1966	19.17		l,p
	16	25.6	--	--	--	(n) Hokanson et al. 1977	19.83		l,q
	constant	--	--	--	17.2	(o) Hokanson et al. 1977	20.30		n,o
	fluctuating	--	--	--	15.5	(p) Hokanson et al. 1977	18.87		n,p
	fluctuating	--	--	--	16.5	(q) Wurtsbaugh and Davis 1977	19.53		n,q
								24.39	l
								24.35	m
						Brungs and Jones (1977) estimate	19.00	24.00	
Oncorhynchus nerka	23	24.8	20.002	-0.6496	--	(r) Brett 1952	18.27		
sockeye salmon	20	23.5	16.7328	-0.5473	--	(s) McConnel and Blahm, unpublished in: NAS/NAE 1973	17.83		
	constant				15	(t) Brett et al. 1969		23.93	
					15	(u) Shelbourn et al. 1973		22.80	
						Brungs and Jones (1977) estimate	18.00	22.00	
Oncorhynchus tshawytscha	20	25.1	22.9065	-0.7611	--	(v) Brett 1952	21.03		v,x
chinook salmon	20	24.7	21.3981	-0.7253	--	(w) Blaham and McConnel, unpublished in: NAS/NAE 1973	20.90		w,x
	--	--	--	--	19	(x) Brett et al. 1982		23.95	v
								23.15	w

a Data represent the ultimate upper incipient lethal temperature where available or the upper incipient lethal temperature when an estimate of the ultimate level was not available.

Differences between maximum and minimum MWAT and acute criteria are 3.3° and 3.5° C, respectively (Table 6.1). This exercise demonstrates that the EPA method is highly objective and reproducible; there were no difficulties in updating the analysis with results of more recent studies. Brungs and Jones also provide criteria for other life history stages.

Field Observation Methods

Observation of temperature at which fish occurrence is verified is another method used for estimating fish temperature requirements. Bovee (1978) recommended the use of fish observations where temperature is simultaneously collected to determine a "probability of use" curve based on the distribution of observations. This technique of characterizing physical environmental conditions in conjunction with fish observations forms the basis for the U.S. Fish and Wildlife Service Instream Flow Incremental Methodologies (IFIM) Habitat Suitability Index model (HSI) (McMahon 1983). This method has been used to evaluate population effects from physical habitat alterations. Presumably, this method would reflect preference temperatures of the fish, but their quantitative relationship to optimal temperature, growth, or lethal temperatures cannot be known since results would also strongly reflect the ambient temperature occurring when observations were made and may not indicate true preference or long-term exposure.

Eaton et al. (1995) proposed a technique for deriving the maximum thermal tolerance of fish matching stream temperature records with fish presence data. Their fish and temperature data matching system (FTDMS) provides a direct measure of the temperatures that are utilized by fish populations in nature. In this protocol, fish presence data are matched with weekly mean temperatures taken from the same location and time period to derive a fish presence by temperature frequency distribution. An estimate of the maximum temperature tolerance for a species is assumed to be equivalent to the temperature at which 95% of the fish observations occur for a large (n = 1000 matches) database that represents the geographic range limits of the species. The 95th percentile observation is proposed as a safe estimate of thermal tolerance to protect against inaccuracies in temperature records and biased observations of fish presence that may be contained in the database.

The FTDMS is recommended as an approach for determining the maximum temperatures that limit the distribution of salmonids. With regard to temperature criteria, this method seems to relate best to the acute temperatures rather than the chronic temperatures. Table 7.2 lists the mean weekly temperature derived from over 1000 field observations (Eaton et. al 1995). The field observation method of establishing upper lethal limits suggested by Eaton et al. (1995) produced very similar results to those of Brungs and Jones

Table 7.2 Water temperature criteria for salmonids based on the fish and temperature data matching system (FTDMS). Taken from Table 1 in Eaton et al. (1995).

Species	Mean weekly temperature (°C) for the 95th percentile observation
Oncorhynchus clarki (Cutthroat trout)	23.2
O. gorbushcha (pink salmon)	21.0
O. keta (chum salmon)	16.8
O. kisutch (coho salmon)	23.4
O. mykiss (steelhead/rainbow trout)	24.0
O. tschawytscha (chinook salmon)	24.0

(1977) which were based on laboratory tests (Table 7.1): field observation estimates were within 1°C of EPA's acute temperature criteria for all salmonids except chum salmon. These observations suggest that laboratory derived criteria can predict the thermal tolerance limits in nature reasonably well.

RISK ASSESSMENT APPROACH

The temperature assessment methods described in Sections 5 and 6 followed a risk assessment approach and provided a time-integrated and quantitative estimate of the influence of the temperature regime on the potential growth of salmon within selected stream reaches where temperature was known. This approach could be used to develop site-specific or regional temperature criteria for both acute and chronic effects on summer rearing. Here we use the results of the acute and growth analyses to evaluate generally applied temperature indices used as temperature criteria. The assessment of acute temperatures suggested that 26°C is threshold temperature for salmonid species (Section 4).

The reduction from maximum potential growth due to temperature regime was calculated for a number of stream segments with widely varying temperature regimes in Section 6, based on a growth model developed in Section 5. The range of temperatures where growth was within 10% and 20% of optimum based on those analyses is shown in Figure 7.1. For each temperature indices, coho and steelhead reduction from maximum growth (RMG) are

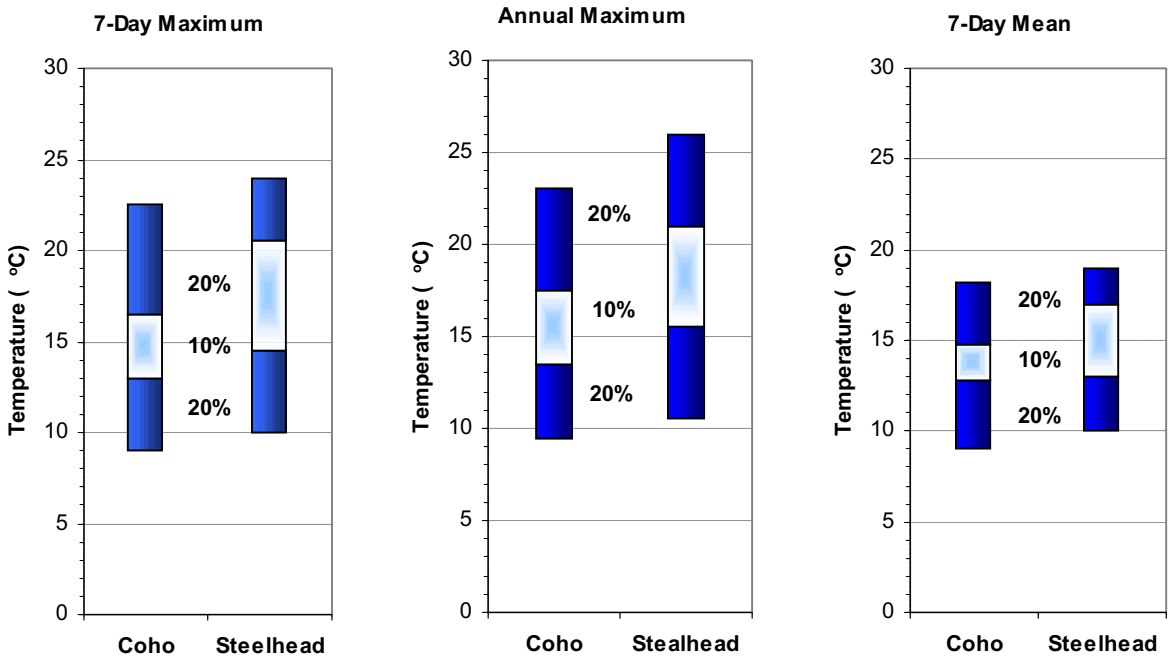


Figure 7.1 Range of temperature where reduction from maximum potential growth (RMG, %) was 10 and 20% during the summer months for coho and steelhead, using three temperature indices. (See Section 6 for methods and Table 6.2 for results by site. RMG is greater than 20% at temperatures outside of the temperature ranges indicated. RMG is minimized near the optimal temperature for each species and increases at temperatures warmer or cooler than the optimal.

plotted together to facilitate comparison among species. Growth is highest within the range of optimal temperatures, and declines at temperature higher and lower than optimal.

There is a narrow range of temperature where growth is optimized for each species. Growth rate is highest at sites with 7-day maximum temperatures between 9°C to 17°C. Patterns are similar for other temperature indices (7-day mean and annual maximum temperature), although the temperature range enveloping various levels of growth reduction vary with each temperature index.

Steelhead and coho often occur together in stream environments, and their growth responses are similar, although there are important differences in threshold values. Selecting the criteria based on the 10% RMG for the more thermally sensitive coho would suggest an upper threshold of 16.5°C for the 7-day maximum temperature and 14.8°C for the 7-day mean temperature. Selecting the criteria based on the 10% RMG for the steelhead would suggest an upper threshold of 20.5°C for the 7-day maximum temperature and 17.0°C for the 7-day mean temperature. The upper end of the temperature range is well below temperatures where behavioral avoidance has been observed (e.g. Bisson et al. 1988, Nielsen et al. 1994), and interspecies competitive interactions have been noted (e.g., Reeves et al. 1987; Taniguchi et al. 1998).

Table 7.3 Temperature criteria (°C) for growth of juvenile salmonids derived from temperature analysis at values of reduction from maximum growth (RMG) of 10% and 20%.

Temperature Index	Coho		Steelhead		MWAT (Updated EPA method (Table 6.1)
	10% RMG	20% RMG	10% RMG	20% RMG	
7-day Maximum[a] (°C)	13.0-16.5	9.0-20.5	14.5-20.5	10.0-24	
7-day Mean[b] (°C)	12.8-14.8	9.0-19.0	13.0-17.0	10.0-19.0	19.7 coho 19.6 steelhead
Annual Maximum[c] (°C)	13.5-17.5	9.5-23.0	15.5-21.0	10.5-26.0	

[a]maximum value of the 7-day moving average of the daily maximum temperature;

[b]maximum value of the 7-day moving average of the daily mean temperature;

[c] instantaneous maximum observed during the summer;

The growth effects predicted by the criteria will be the same wherever the fish live. Even though streams for resident trout may be naturally colder due to proximity to headwaters, the growth/food/and temperature effects should be the same. It should also be noted that these criteria are only appropriate for streams with normal seasonal and daily temperature fluctuations. Streams or other aquatic environments (e.g., thermal plumes at discharge sites) with significantly different temperature patterns would require site specific analysis, i.e., characterization of their temperature regimes to determine exposure.

Review Approach

Temperature criteria derived by the review approach are based on the professional interpretation of temperature requirement information organized by life stages and time periods for each species of interest. These temperature requirements are derived primarily from key review articles (e.g., Bjornn and Reiser 1991, Bell 1973, 1986). Measurements of performance optima from laboratory studies and field observations of temperature during different life stages may also be used.

Criteria, for example, are derived by selecting a temperature regime low enough to protect the most sensitive life stage for the summer juvenile rearing period. Protection of this life stage is assumed to protect all other life stages that may occur at the same time (e.g., adult holding). The review method is not a defined protocol, but rather is a general approach for evaluating temperature information. Review-based approaches are inherently more subjective as analysts attempt to explicitly synthesize a number of factors and species into one recommended criteria.

Table 7.4. Examples of four water temperature envelopes by life stage summaries for spring chinook salmon. (Temperature in °C.)

Life stage	Bell (1973)	Bjornn and Reiser (1991)	Armour (1991)[a]	ODEQ (1995)
Adult migration	3.3-13.3	3.3-13.3	3.3-13.3	3.3-13.3
Spawning	5.6-13.9	5.6-13.9	5.6-13.9	5.6-12.8
Incubation	5.0-14.4	5.0-14.4	5.0-14.4	4.5-12.8
Juvenile rearing	Optimum 7.2-14.4	Preferred 12-14	7.9-13.8	Positive growth 4.5-19.1 Optimum production 10.0-15.6

[a]All data are for the recommended temperature range

Data linking fish performance and temperature are evaluated by a professional, or group of professionals, who identify the temperature range that provides some level of protection. While the analysis may include laboratory or field derived data, the manner in which such data are used is not explicitly defined, as it is in the EPA and FTDMS methods (e.g. ODEQ 1995, WDOE 1998a). Also, the level of protection[1] generally is not explicitly defined and appears to vary depending on policy objectives and the amount of available information.

Bell (1973) conducted one of the first reviews of temperature to establish criteria, compiling most of the information known at the time, and presented the data in the form of temperature ranges or envelopes by species and life stage. Bell (1973) synthesized a temperature range from the available information to provide a recommendation. However, he did not describe the method by which the recommendations were derived, including consideration of safety factors, and he did not attribute the recommendations with specific citations (i.e., only a list of references is given). Thus the scientific source for each recommendation cannot be verified and the primary data sources that may have been used are not directly tied to the final recommendations.

[1] Level of protection refers to what percentage of the individuals representing a race, subspecies or species are protected (e.g., 90, 95 99, 100%). Similarly, it refers to the percentage of streams that would be protected, and what percentage of the time. For example, a goal may be to protect 95% of the salmonid races and streams 95% of the time.

A series of subsequent reviews have relied heavily on the work of Bell (1973) to develop and revise temperature criteria. For example both Armour (1991) and ODEQ (1995) cite Bjornn and Reiser (1991) as the source for some of their temperature recommendations. Bjornn and Reiser (op cit) reference Bell (1986), which is the second edition of Bell (1973), as source for their temperature information. The Bell (1973) report is also the basis for U.S. Fish and Wildlife Service recommended temperature criteria for coho salmon (Laufle et al. 1986), chinook salmon (Allen and Hassler 1986), and steelhead trout (Pauley et al. 1986). These references are also cited for temperature criteria in the "ManTech Report" sponsored by the National Marine Fisheries Service (Spence et al. 1996). The interdependence of these review reports results in recommended temperature criteria that are remarkably similar. For example, chinook criteria shown in Table 7.4 are the same in each of four different papers.

This review approach has formed the basis for temperature criteria in the Pacific Northwest in recent years, despite the lack of firmly documented primary data (ODEQ 1995, WDOE 1999). Criteria developed in Oregon (ODEQ 1995) and proposed in Washington (WDOE 1999a) appear to be based on less quantitative approaches than advocated by Hokanson (1977), Brungs and Jones (1977), Armour (1991) and Eaton et al. (1995), although experimental biological effects data are available for this purpose. The primary weaknesses of review approaches are the absence of a clearly defined decision process for selecting and evaluating temperature information, synthesizing factors of safety and uncertainty into the criteria, and lack of clear linkages to field and laboratory data. In some cases, the numbers for juvenile rearing derived from literature reviews are consistent with those produced from risk analysis and other quantitative methods (e.g., Bjornn and Reiser 1991). However, in most cases, the recommended ranges assume greater growth at lower temperatures than is likely to occur and less growth at warmer temperatures.

Temperature Criteria

Existing and proposed temperature criteria, including objective criteria and those that were derived primarily by the review method described above, are presented in Tables 7.5 and 7.6. Only criteria relevant to the growth period of juvenile salmon and trout, exclusive of bull trout, are shown for this example. The Oregon temperature criteria combine trout and salmon species together, with a different standard for bull trout. The proposed Washington criteria group salmon species and steelhead with one criteria, and cutthroat trout for another. Washington's proposed criteria also vary the maximum temperature by specified periods during the summer months, a detail we will not address during subsequent analyses.

Table 7.5 Existing and proposed temperature criteria for anadromous salmon species and steelhead derived from various methodologies relevant to the summer growth period. Numbers are maximum allowable values.

	ACUTE		SUB-LETHAL	
Method	Temperature (°C)	Metric	Temperature (°C)	Metric
EPA (Brungs and Jones 1977)	24.0	Annual instantaneous maximum [a]	18.0	Maximum 7-day moving average of the daily mean
Eaton et. al. (1995)	23.5	Maximum 7-day moving average of the daily mean	--	--
Risk Assessment (this report)	25.5	Annual instantaneous maximum [a]	16.5	Maximum 7-day moving average of the daily maximum
ODEQ (1995)	None specified	--	17.8 (64°F)	Maximum 7-day moving average of the daily maximum
WDOE proposed (1999)	21.0 (June-Sept)	Annual instantaneous maximum	16.5	Maximum 7-day moving average of the daily maximum
WDOE (current)	None specified	--	16.0 (AA)[b] 18.0 (A) 21.0 (B)	Annual instantaneous maximum

[a] assumed at least a 1-hour interval
[b] streams are classified as AA, B and C according to WAC 173-201-080

Each criterion/standard in Tables 7.5 and 7.6 typically is assumed to represent the no-effect level for the most sensitive life stage of the most sensitive species, plus a safety factor. The EPA's goal is to protect 95% of the species 95% of the time. This level of protection is extended to include economically important species, ecological keystone species, and threatened and endangered species (Stephan et al. 1985). Other groups of scientists have suggested that protecting 90% of the species will protect aquatic communities (SETAC 1994). It is not always necessary to protect 95% of the individuals in a population when it is desired to protect the species, based on rationales presented by Ricker (1975). However, in the case of the ODEQ and WDOE criteria, the actual level of protection embodied in the criteria has not been defined.

Temperature criteria from the various methods have the following similarities and differences (Tables 7.5 and 7.6):

- Most index the juvenile growth phase, which lasts several months, with the warmest 7-day period occurring during that interval.
- No criteria use an averaging period longer than a week. One specifies the annual instantaneous maximum (e.g., Washington's existing temperature criteria).
- Criteria vary in whether the daily maximum or mean is used to calculate temperature during the averaging period.
- No criteria state an acceptable level of variation in the threshold temperature, indicating that are likely to result from natural factors and uncertainty.

- Some criteria do not specify upper acute temperature levels, relying instead on the temperature criteria derived for chronic effects to control maximum temperature.

- For most of the criteria, the temperature range of 16° to 18°C is used as the upper maximum.

- No criteria establish a minimum threshold temperature.

The temperature criteria derived from the review approach are more variable, although much of the data used are similar among the evaluations (ODEQ, 1995 WDOE, 1999). The Oregon and proposed Washington criteria are reasonably similar to the EPA criteria for salmonids (Tables 7.5 and 7.6).

The differences in the temperature indices used by different sources makes it difficult to compare them. In Table 7.7 we translate each recommended threshold to each of the short-term indices, using the relationships between indices shown in Figure 3.7 (Section 3). When placed on a common footing, it is evident that there are differences among the recommended criteria.

Table 7.6 Existing and proposed temperature criteria cutthroat trout derived from various methodologies relevant to the summer growth period. Numbers are maximum allowable values.

	ACUTE		SUB-LETHAL	
Method	Temperature (°C)	Metric	Temperature (°C)	Metric
EPA (Brungs and Jones 1977)	24.2	Annual instantaneous maximum [a]	18.5	Maximum 7-day moving average of the daily mean
Eaton et. al. (1995)	23.2	Maximum 7-day moving average of the daily Mean	--	--
Risk Assessment (this report)	26.3	Annual instantaneous maximum [a]	16.5	Maximum 7-day moving average of the daily maximum
ODEQ (1995)	None specified	--	17.8 (64°F)	Maximum 7-day moving average of the daily maximum
WDOE proposed (1999)	14.5	Annual instantaneous maximum[a]	13.0	Maximum 7-day moving average of the daily maximum
WDOE (current)	None specified	--	16.0 (AA)[b] 18.0 (A) 21.0 (B)	Annual instantaneous maximum

[a] assumed at least a 1-hour interval
[b] streams are classified as AA, B and C according to WAC 173-201-080

Table 7.7 Threshold temperatures for short-term duration indices from various sources. Temperatures have been translated to common values using relationships among temperature indices developed in Section 3 (see Figure 3.7). Values in bold type are original reported numbers. Authors report recommendations in a variety of metrics. Each recommended value is also translated to the other metrics using the regression relationships presented in Section 3 to facilitate their comparison.

Species	Reference	Sub-Lethal Thresholds			Acute Threshold--
		Annual Maximum Temperature (°C)	7-Day Maximum (°C)	7-Day Mean (MWAT) (°C)	Annual Maximum Temperature (°C)
Coho salmon	EPA 1977	21.5	21.2	**18.0**	**24.9**
	Risk assessment (this report)	**17.5**	**16.5**	**14.8**	**25.5**
	ODEQ (1995)	19.0	**17.8**	16.0	--
	WDOE (existing)	**16.0**	15.5	14.3	--
	WDOE (proposed)	17.0	**16.5**	15.0	21.0
	Eaton (1995)	--	--	**23.4**	30.5
Steelhead trout	EPA 1977	24.0	23.0	**19.0**	**26.0**
	Risk assessment (this report)	**21.0**	**20.5**	**17.0**	**26.0**
	ODEQ (1995)	19.0	**17.8**	16.0	--
	WDOE (existing)	**16.0**	15.5	14.3	--
	WDOE (proposed)	17.0	**16.5**	15.0	21.0
	Eaton (1995)	--	--	**24.0**	31.0

The temperature analysis developed in this report produced similar though not identical criteria to those developed using a variety of other methods. The thresholds derived from the risk assessment methods are somewhat lower than the EPA recommendations (Brungs and Jones 1977), largely because of the restriction to 10% growth loss and the realistic accounting of food consumption. Brungs and Jones (1977) used the **7-day mean temperature** (MWAT) of 18°C for coho and 19°C for steelhead. The growth analysis suggests that an upper threshold for the 7-day mean temperature of 14.8°C for coho and 17.0°C for steelhead will maintain growth within 10% of optimum, and 19°C will maintain growth within 20% of optimum.

Eaton et al. (1995) primarily studied the upper temperature limiting salmonid distribution but not growth. Their numbers are several degrees higher than our recommendation for acute thresholds. Indeed, their thresholds are so high that it would suggest that coho and steelhead still live in natural streams until maximum temperatures reach upper critical lethal levels for a significant period of time (at least 1 week). This appears to confirm that the thresholds we have identified are conservative and not likely to result in population loss. No site included in the risk assessment had 7-day mean temperature anywhere close to the upper threshold that limits distribution, although this was not true for some rivers in the region found in U.S.G.S. water resources records (see Appendix B). Coho, steelhead

and/or cutthroat trout were present in all of these streams. We estimate that growth loss due to temperature for Eaton's (1995) upper limits for coho and steelhead would be approximately 50%.

Temperature criteria derived with the risk-based methods have only moderate agreement with criteria derived through various reviews. It appears that the review approach tends to recommend similar temperatures for the lower end of the range but lower temperatures for the upper end of the range, than was found by risk analysis and other methods. While the example ranges we cite are for chinook salmon, the temperature response curves for coho (this report) are very similar to those of chinook (Brett et al. 1982). It is difficult to directly compare with recommendations from these reviews since no indexing temperature measure is provided.

ODEQ (1995) criteria appear to match results of the growth assessment reasonably well, despite its reliance on reviews rather than laboratory data. ODEQ (1995) specifies the maximum 7-day temperature at 17.8°C. The **7-day maximum** criteria derived for coho are 16.5°C for 10% growth reduction and approximately 19°C for 20%. However, if just steelhead were considered, the threshold would be 20.5°C for 10% growth reduction.

Current WDOE criteria specifying an **annual maximum** of 16°C for Class AA streams are lower than that derived from the risk assessment approach. Risk assessment suggests the annual maximum should be between 13.5°C and 17.5°C for coho, or between 15.5 °C and 21.0°C for steelhead, to maintain no more than 10% growth loss. The current criteria for Class A (<18°C) and Class B (21°C) streams is more comparable to risk assessment results. The proposed temperature criteria published as a discussion draft by WDOE (1999) are very similar to those derived with the growth assessment for 10% growth loss for coho; 16.5°C 7-day maximum for all anadromous salmon rearing. This criteria is lower than needed for steelhead.

Discussion

The quantitative analysis confirmed that biologically meaningful temperature thresholds could be identified with and of the indices (annual maximum, 7-day maximum or 7-day mean). There is no consensus on what index to use for temperature criteria, introducing additional confusion in comparing among them. This study found that all of the most typical indices are closely related to one another, and that any could be used with satisfactory results. The 7-day mean temperature was most closely correlated with growth loss estimates and therefore may be the best indexing measure for this purpose. However, other measure are quite suitable. It is important that the selected temperature match the time-averaging period appropriately. It should be noted that the longer the averaging period, the lower the threshold value.

The growth analysis developed in this paper can form a basis for selecting temperature criteria, but some other methods also were reproducible and produced similar though not identical results. The risk assessment results described in this report rely on similar laboratory data as used by Brungs and Jones in developing EPA recommendations (1977). Our results suggest lower criteria by a few degrees, primarily because we use observed temperature regimes to estimate the growth of fish over the long-term, and because we account for realistic estimates of food consumption. Analyzing temperature relative to duration did affect the choice of thresholds. In the case of coho, temperature thresholds

were lowered, while in the case of steelhead the thresholds were similar, and could possibly be raised.

CONCLUSIONS

- Risk assessment-based approaches allows the effects of magnitude, duration and frequency of temperature on fish growth and survival to be quantified in an objective and repeatable manner.

- Moderate temperatures are likely to be more biologically productive for salmonid species than very warm or cold temperatures at the level of food availability that appears to exist in streams.

- The U.S. EPA (1977) temperature criteria were found to be the most objectively defined and consistent with risk assessment results. They generally appear to allow up to 18% reduction in coho growth due to temperature.

SECTION 8 A DISCUSSION OF THE SCIENTIFIC AND MANAGEMENT IMPLICATIONS OF FINDINGS

Introduction

In this section we review the information presented in the report and identify the scientific and management implications of the results. This section serves as both a summary of key findings and a synthesis of information for scientists and policy-makers.

For ease of reading, we conduct this discussion without extensive referencing from within the report or from external documents or the scientific literature. Although these sources of information are critical for the context of this discussion, they have been described and referenced in detail in the main body of the report. We have included several key figures found in previous chapters.

The Regulatory Context of Temperature Criteria

The Clean Water Act requires states to protect the public's values for water bodies. To administer the CWA, the state water quality agencies must:

- assign beneficial uses to each water body (e.g., fishable, swimmable, aquatic life),
- specify water quality criteria that are sufficient to protect the designated beneficial uses,
- assess and report on the condition of water bodies relative to those criteria (305b),
- identify the sources of pollutants,
- develop various management steps to protect or restore water body conditions to meet criteria,
- monitor the water quality on an ongoing basis.

The type of regulatory activities and management restrictions that may be imposed depends on the current and projected condition of the water body relative to the criteria. Therefore, the water quality criteria have enormous legal and economic meaning, and their appropriateness is of great concern to the public, scientists, and regulators.

States have specified fish species in the cold water guild (salmon and char) as the designated beneficial uses in many streams and rivers of the Pacific Northwest region. Water temperature plays a role in virtually every aspect of fish life, and adverse levels of temperature can affect behavior (e.g. feeding patterns or the timing of migration), growth, and vitality. Fish have ranges of temperature wherein all of these functions operate normally contributing to their health and reproductive success. Outside of the range, these functions may be partially or fully impaired, manifesting in a variety of internal and externally visible symptoms. Fish have a number of physiologic and behavioral mechanisms that enable them to resist adverse effects of temporary excursions into temperatures that are outside of their preferred or optimal range. However, high or low temperatures of sufficient magnitude, if exceeded for sufficient duration, can exceed their ability to physiologically adapt and can cause growth or weight loss, disease, competitive

displacement by species better adapted to the prevailing temperature, or even death. Fish are adapted over some evolutionary time frame to the prevailing water temperatures, and climatic gradient is among the primary factors that determine the extent of a species' geographic distribution.

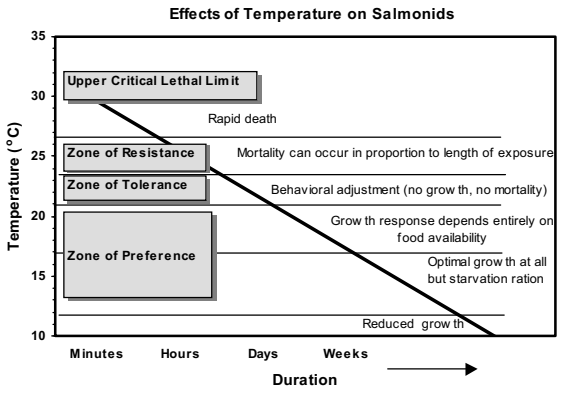


Figure 8.1 The general biological effects of temperature on salmonids. Effects depend on the level of temperature and its duration. Two important elements of temperature affect the growth and survival of fish: 1) the relationship between temperature, metabolism and food conversion efficiency as it controls growth over relatively long periods, and 2) the thermal tolerance of fish to lethal temperatures over relatively short periods. Fish have various physiological and behavioral mechanisms that enable them to resist adverse effects of temporary excursions into temperatures outside of their preferred or optimal growth range but within the upper critical lethal limit.

States in the Pacific Northwest have authorized numeric temperature criteria to protect fish for nearly three decades. Many are currently reviewing their criteria in the triennial review process specified in the Clean Water Act, with the help of the U.S. EPA, who must also approve them. Many streams and rivers in the Pacific Northwest region have been identified by the states as exceeding their current water quality criteria according to their 305b reports to Congress, with a large number of them listed for temperature impairment (303d lists). To further add to public concern, specific species or stocks within the salmon and char genera have also been listed as threatened or endangered under the Endangered Species Act in a number of geographic locations. The ESA does not require identification of a specific "pollutant" causing population decline, but high levels of stream temperature during the summer months are widely viewed as one of the primary habitat conditions that contributes to the decline of cold water fish species in freshwater habitats.

The Characteristics of Temperature Criteria

Temperature criteria typically have two key elements—a threshold temperature that signals when adverse biological response is likely to occur, and an averaging period that indexes the duration of exposure likely to trigger that response. The combination of the threshold temperature and the duration of exposure to that temperature are an expression of the risk imposed by the environmental temperature to the targeted fish species. Because of the ability of fish to acclimate and adapt to temperatures outside of their optimal conditions, both exposure duration and magnitude of temperature are necessary to determine the degree of risk that this fluctuation may pose to each species. Environmental temperature can annually range over the entire spectrum from optimal to adverse in response to the cyclic movement of the sun. Exposure to temperature is mediated by

stream, geographic, and riparian forest characteristics. A factor of safety is typically added when selecting numeric criteria to account for the uncertainties in knowledge associated with each of these elements and any factors that are not unaccounted for.

The averaging period has typically been either the annual maximum temperature (observed for a period as short as an hour, but more probably occurring for several hours on sequential days), or a weekly average (generally focused on the warmest seven consecutive days) observed for the year. For example, Washington's current criteria specify the annual maximum temperature, expressed as the maximum hourly temperature that occurs each year. Oregon specifies the average of the daily maximum temperature of the 7 warmest consecutive days. The U.S. EPA (1977) recommends the average of the daily mean temperature of the 7 warmest consecutive days (MWAT). Some have also argued that the daily temperature fluctuation should also be accounted for, but this characteristic has not been widely specified in states' criteria.

The Basis for Derivation of Temperature Criteria

A number of different approaches have been used to develop and justify the temperature criteria that are currently widely used in the Pacific Northwest region. All draw upon a large body of scientific research focused on the thermal tolerance of fish. There has been considerable laboratory testing for many fish species, including salmonids, beginning early in the 1900's and continuing today. Much of the available research on temperature tolerances was performed prior to 1980 and was stimulated principally by the need to assess the impact of heated effluent from power plants, dams and other facilities. Since that time, the research focus has been to add species and refine the understanding of contributing factors such as the effect of acclimation temperatures, daily diurnal temperature fluctuations, and food rations, and to enhance understanding of the interaction of temperature with other pollutants. A considerable amount of the available research has been performed in the laboratory setting. Ecological field studies have lagged behind laboratory work, although their application has increased in recent years.

Various methods have been used to analyze temperature effects on fish to develop criteria. The methods vary in terms of degree of objectivity or subjectivity by which the information is synthesized into recommended criteria, the degree to which data forms the basis for the criteria, and the extent to which population effects can be probabilistically determined. The temperature criteria in use in Pacific Northwest states have largely been drawn from professionals' review and interpretation of available scientific literature (e.g. ODEQ 1995). There also has been some effort to use the more well-established scientific relationships to synthesize objective analyses of threshold temperatures and the duration of exposure (e.g., U.S. EPA 1977). This approach has not been widely integrated into regulatory activity.

In recent years, the EPA and the National Academies of Science and Engineering have promoted risk assessment techniques to develop water quality criteria, including protocols that have been peer-reviewed nationally. Risk assessment is designed to enhance understanding of the potential adverse effects of a pollutant on a species by combining the information from biological studies with an analysis of each population's potential exposure to those effects. These methods are formal, objective, and analytical. They have been primarily applied to contaminant pollutants; guidance for other pollutants is still under development. Risk assessment can lead to site or season-specific criteria.

To date, naturally occurring "pollutants", such as water temperature, have not been addressed with risk assessment techniques to determine criteria. Instead, temperature criteria generally are simple indices that summarize the seasonal and diurnal range of temperature observed in natural streams into the averaging period, and that address the complex array of biological responses of all of the life functions with the temperature threshold value. Although there is a general interest in tailoring criteria to specific life functions at specific times of year, this has not been widely accomplished to date. In most states, simple numeric indices are applied over broad regions to primarily address the high temperatures that may occur during the warm summer months, targeting the most sensitive species that are likely to occur in the water body. The methods described earlier fall short of the objectively rigorous expectations of formal risk assessment.

Criteria selection teams are faced with a challenge. It is difficult to match simple criteria to multi-species communities dwelling in streams and rivers whose temperatures naturally vary with position in watershed and climate. Specifying the wrong criteria could have negative, possibly catastrophic, biological consequences. At the same time, the need for management solutions that may accompany even small changes in criteria can have large economic and legal consequences. In addition, all approaches to developing biologically meaningful temperature criteria face significant technical challenges. Some of these stem from the selection process itself. Subjective reviews often lack a clearly defined decision process for selecting and evaluating temperature information, and they fail to establish a clear linkage between field and laboratory data. Furthermore, subjective evaluations often use unquantified safety and uncertainty factors.

The more that scientific research can be used to quantitatively assess the extent that risk to fish is minimized, such as those promoted as risk assessment techniques, the more confident the public and regulators can be that temperature criteria are protective. Such confidence does not currently exist. Over the past 25 years since temperature criteria were first adopted, there has been considerable debate over them but little scientific experimentation to validate or improve them. While the subjective analyses that form the basis of current temperature criteria are apparently consistent with the scientific literature, they have failed to generate measurable hypotheses that can be scientifically tested and rejected.

The objective of this report was to synthesize relevant temperature research and to develop quantitative risk assessment techniques that could be objectively applied to natural streams 1) to identify the risks posed by ambient temperature and to suggest temperature criteria, and 2) to formulate experimentally testable hypotheses. Analysis focused on the summer rearing phase of juvenile salmonids because most existing temperature criteria target annual maximum temperatures, salmonids are of primary interest in much of the Pacific Northwest region, and there is a rich history of laboratory experimentation available to draw from.

Quantitative Analyses to Assess the Effects of Temperature on Fish in Natural Environments

The conceptual approach that frames this report is that temperature is a fundamental component of fish habitat. Water temperature is the thermostat that controls energy intake and expenditure. The overall success of individual fish is partially a result of the cumulative effect of its environmental temperature on its ability to grow and survive over

time. If energy intake is adequate to fuel the physiological energy consumption, mediated in large part by the environmental temperature, then the organism can live in a healthy state. The individual is not likely to be healthy if the water temperatures force energy consumption at a pace that cannot be sustained by food intake, dictated in part by appetite and in part by food supply, for long periods of time. If the duration of moderately negative temperatures is fairly short, cessation of feeding or refuge seeking by the individual fish may be sufficient to withstand short-term excursions into higher temperatures. If this continues for long, the fish loses growth opportunity, and may be displaced by competitors in the population. If temperatures reach a more severe level of impairment, it creates physiological stress, loss of appetite, and can leave the fish open to disease and competitive pressures from other species. Stress is exacerbated at high temperature because dissolved oxygen content of the water is inversely related to its temperature. If temperatures reach very high levels, it invokes significant stress that causes immediate death. For salmonids, this temperature occurs at approximately 30°C. Low temperatures can also induce cessation of feeding, but unless water freezes, the fish also can withstand excursions into cold water temperature by limiting activity. Temperature is not the only ecological factor of importance to biologic productivity, but if its central effect on the individual can be accounted for, then the influence of other environmental factors, such as food supply and population dynamics, may become more apparent in the complex ecology of natural environments.

We work from the assumption that there is a continuum of biologic response to temperature that ranges from healthy, as indicated by maximum growth, to unhealthy, culminating in direct mortality. Along this spectrum there are a variety of ways that temperature effects manifest in the organism's physiologic condition or its behavior. Some of these characteristics can be readily observed in natural environments and are simultaneously amenable to quantification and prediction based on measured temperature. These include the growth (weight change), direct mortality, and embryo development (not addressed in this report). These functions lend themselves to mathematical expressions, many of which have already been established for many species, including salmonids. Laboratory studies have shown that activity rates are closely correlated with temperature and that they can be predicted with some precision with linear or non-linear equations.

We were able to develop models for direct mortality and growth as a function of temperature for several species of salmonids using laboratory data and bioenergetic principles available in the scientific literature (Figure 8.2). An extensive portion of this report describes and corroborates these models. The relationships were formulated in a way that they can be applied in natural ecological settings. The growth model simulates weight gain over time in relation to daily temperature and food supply. Its formulation constitutes a new contribution to modeling fish biological response to habitat factors.

Importantly, the models predict qualities that allow them to be corroborated against measurable population characteristics, and therefore they produce hypotheses that can be rejected by direct observation. The methods are objective and repeatable. Our comparisons of simulated growth (or more specifically weight gain) of 21 populations living in natural streams showed consistent and close agreement with observed weight characteristics (Figure 8.3).

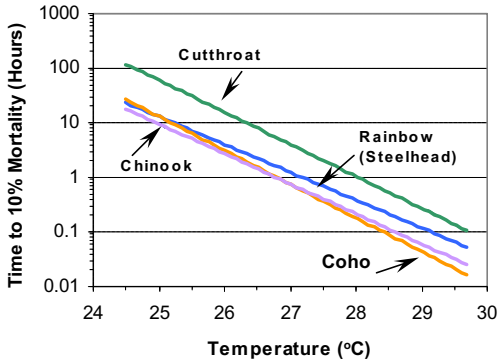
We were not able to fully corroborate the acute temperature model because, when temperature records available to us were scanned for occurrence of combinations of temperature and duration sufficient to cause mortality, none were found. The data

represented a wide variety of streams, including many with high annual maximum temperature. Therefore, although no mortality was reported in the field studies, model predictions cannot be considered fully corroborated until direct mortality is observed at predicted exposures. Failure to detect mortality is consistent with the general perception that direct mortality from temperature rarely occurs within the natural range of a species distribution. Nevertheless, lethal temperatures can and have occurred in the region, and there are situations where further analysis for risk of direct mortality to salmonids is warranted.

Some concern has been expressed that the use of information from laboratory studies to define temperature criteria for fish living in natural streams is inappropriate. Such concerns confuse the synthesis of scientific information into temperature criteria since so much of the most relevant information comes from laboratory experiments. Laboratory and field studies each have unique limitations. Laboratory studies are conducted in highly artificial environments that create stresses from the experimental procedures. Field studies are labor intensive, and discerning the effect of temperature by empirical observation in streams is problematic given the multivariate and dynamic nature of the interaction, and the difficulty of measuring some of the key fundamental relationships in natural

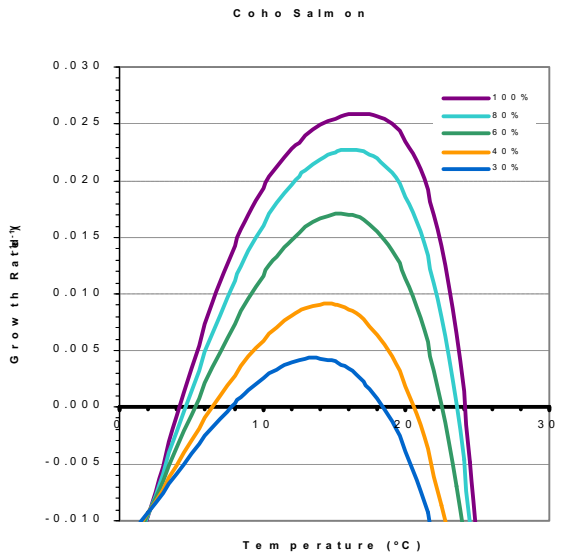
Figure 8.2 The acute and chronic effects of temperature species have been quantified for a number of salmonid species. Direct mortality in relation to exposure time for 4 species is shown in A. If the combination of temperature and continuous duration depicted by the regression lines occurs, 10% of the population is likely to die in each incidence of exceedence. In natural stream environments, stream temperatures must generally exceed the highest short duration temperatures (e.g. 26°C or higher) for there to be a risk of direct mortality because temperatures rarely remain at these temperatures continuously due to natural daily temperature fluctuation.

A.



The relationship between daily temperature, food consumption, and growth rate for coho salmon is shown in B. Growth rate is strongly influenced by temperature, with optimal growth occurring when fish feed at satiation ration and temperature is approximately 17°C (optimal temperature for growth). Growth rate declines with temperatures either warmer or colder than the optimal. Growth effects are significant at temperatures greater than 22°C and less than 9°C. Each line represents a level of food consumption. This relationship and one for steelhead (not shown) were used with daily temperature measured in a number of streams and rivers to assess the long-term effect of temperature on weight gain during the summer months. During this period, temperature in many of the study streams ranged over much of the spectrum of positive growth shown by the curves.

B.



environments. Many scientists have argued that best way to investigate ecological problems involves a combination of laboratory and field experiments.

Our results suggest that laboratory results are of fundamental value in explaining observed fish growth in natural streams. We could not reject the hypotheses regarding growth in relation to environmental temperature using simulations based on the laboratory research. In fact, the simulations were remarkably representative of the observed weight gain of naturally spawned and hatchery-raised populations in streams. We also believe that the direct mortality from the lethal temperature model would predict mortality consistent with the temperatures where death has been observed, but we do not know if the proportion of population experiencing mortality would be as we predict. Confirming this may be important for assessing the environmental factors controlling species distribution, but less important to establishing criteria. Temperature criteria should primarily target sublethal effects to protect fish health.

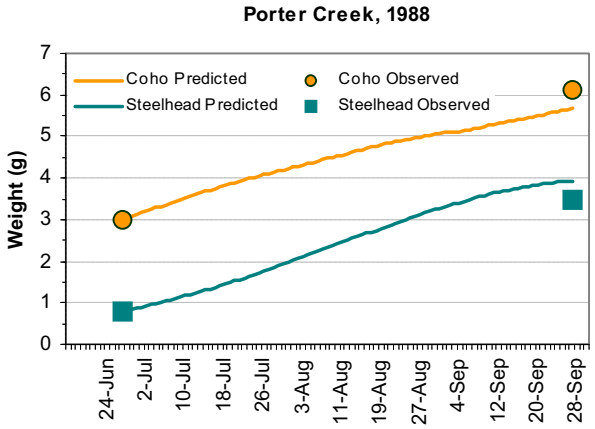


Figure 8.3 Simulation of weight gain for coho and steelhead in relation to temperature and food supply using the growth model developed in this report in relation to observed weight of populations living in natural streams. Model simulations computed daily weight gain using the measured daily temperature and estimates of food consumption derived from observing population growth rates and back calculating how much food had to have been consumed to account for the weight gain between two sampling intervals. Results shown for Porter Creek for both species are similar to those observed at most sites. Overall, predicted weight deviated only 8% from observed on average for both species in 21 population simulations. Such good modeling results establish confidence in use of the model to estimate the effects of temperature on growth for determining temperature criteria. It also confirms the strong signature of prevailing temperature on the size of fish in natural streams.

Some biological responses to temperature can be observed, but they are not amenable to mathematical expression or prediction. These include behavioral responses such as cessation of feeding and seeking refuge, and competitive interactions. There are internal physiological stress effects that stimulate such externally visible symptoms, and additional study associating stress measures with temperature characterization would be a useful augmentation of the analyses of growth. Although associated with environmental temperature, the occurrence of some responses depends on the presence of specific factors such as cold water refuges or disease organisms that respond consistently with the prevailing temperature. (The role of temperature in increasing incidence of disease is particularly problematic since some disease organisms are more virulent in cold temperatures while others are more virulent in warm temperatures.) There are also factors that interact directly, indirectly or independently of temperature, to affect the organism's condition. These include, but are not limited to, ecological constraints on food supply, population interactions, and genetic adaptability. Increased understanding of these in the context of environmental temperature would enhance understanding of the effects of environmental temperature.

The Scientific Basis for Translating Quantitative Biological Analyses to Temperature Criteria

A synthesis of the scientific literature supports the premise that the temperatures associated with the spectrum of biologic responses fall between low level growth loss and direct mortality, escalating as temperatures move towards the extremes of the tolerance range. The criteria suggested by our analyses for growth and direct mortality envelop these responses. For coho (one of the more comprehensively studied species), the approximate temperatures associated with various biological effects that we could broadly interpret from our modeling and the scientific literature are listed in Table 8.1.

On one end of the spectrum is direct mortality from short-term exposure to high temperature. Clearly, direct mortality is an unacceptable endpoint condition, and would not fully protect fish. However, it is important to be on the alert for these conditions, because there are some geographic, watershed, and climatic conditions where acute lethal temperatures have been documented in natural conditions or due to management activities. On the other end of the temperature spectrum, positive growth for juveniles, or weight maintenance for adults, is a measurable quality that is very responsive to temperature (among other factors). Therefore, it can be a sensitive and early indicator of the general health of individual fish. While a variety of ecological factors are known to influence population characteristics, the growth simulations showed that there is a very strong temperature signature in the size and condition of fish observed in natural streams.

Table 8.1 The spectrum of coho salmon response at temperature thresholds synthesized from this report and the scientific literature. Threshold values are approximations, due to lack of consistency in reporting results among studies. Results were standardized to 7-day maximum temperature using regression relationships between various temperature indices described in Section 3. Assumptions regarding the relationship between reported measures and 7-day maximum temperatures were assigned to standardize results.

Biologic Response	Approximate Temperature Threshold °C (Average of the 7-day daily maximum temperature)
Upper Critical Lethal Limit (death within minutes)	31
Geographic limit of species (Eaton 1995)	30
Growth loss 40% (simulated at average food supply)	30
Acute threshold (this report)	26
Acute threshold selected by U.S. EPA 1977	25
Complete cessation of feeding (laboratory studies)	24
Growth loss of 20% (simulated at average food supply)	22.5
Increased incidence of disease (under specific situations)	22
Temporary movements to thermal refuges	22
Growth loss of 10% (simulated at average food supply)	16.5
Optimal growth at range of food satiation (laboratory)	14-17
Growth loss of 10% (simulated at average food supply)	9.5
Cessation of feeding and movement to refuge	4

There is no consensus among physical or biological scientists as to how to report temperature regimes represented in their studies. Therefore, we had to translate these reported temperature measures to a common standard (7-day average of the daily maximum temperature) using relationships between temperature indices developed in the report. The values in Table 8.1 should therefore be viewed as approximate[1]. One can see that simulated growth loss values identify biologic effects closest to what appears to be the healthiest conditions. At the temperatures where avoidance behavior or competitive exclusion can be observed, the growth simulation would have predicted measurable and possibly significant growth loss.

Importantly, the analysis leads to the conclusion that the cumulative effects on potential weight gain due to the temperature regime for the summer rearing period can be a bell weather of more visible, and possibly more serious, effects observed at higher temperatures. It appears that temperature criteria selected on the basis of growth can be protective without explicitly accounting for all biologic responses or causal mechanisms. Concentrating on those that can be quantified and simulated (growth, direct mortality, incubation) allows the interactions between biologic response to environmental characteristics to be quantified. Thus, it may be the most sensitive indicator of effects that can also be measured in populations in natural streams without sacrificing fish. This also allows multiple species living in a common stream to be assessed and compared on the same objective basis, and in relation to observed and potential stream temperature regimens.

Temperature Thresholds Based on Risk Assessment

The growth simulation method was very sensitive to temperature, predicting a range of average population weights that varied with temperature regime. The method is capable of assessing a specific biological response on a continuous temperature scale. However, the results also support the concept that useful thresholds can be assigned, experimentally tested, and justified with probabilistic risk assessment. When this approach is applied at a site, with interpretation assisted by the mathematical model, it appears that rather small changes in average population weight could be detected. According to typical size distributions in populations of juvenile salmon populations, a minimum detectable weight loss or gain due to any factor would be approximately 20%. The growth simulation can associate such small changes with a temperature threshold. Without an assist in hypothesis formulation by the growth simulation techniques, it would probably be difficult to have confidence in interpreting the influence of temperature on population weight differences as small as 20% .

Risk level for establishing thresholds. A quantitative expression of the consequence of size completes the formal appraisal of risk. There is ample evidence to suggest that larger size conveys many competitive and survival benefits. We attempted to associate risk with growth loss to guide selection of threshold values. We did so for coho salmon based on scientific literature that suggests that size at the end of the juvenile growth phase contributes to the individual's success at later life history stages. We found that weight loss as small as 20% of the average population weight at the end of the juvenile summer rearing phase may be important in this context. However, the research results supporting this conclusion are neither abundant nor sufficiently consistent to have full confidence in using them to select risk criteria. For example, later success in the marine environment

[1] The 7-day maximum and annual maximum temperature are closely related and are often within 1° to 2°C of each other.

also depends on timing and location factors. Nevertheless, within the juvenile rearing phase, studies have consistently reported that larger size generally conveys a number of advantages such as better feeding position and lower mortality. Such observations indicate that working with growth or weight maintenance is a useful approach. The threshold level of growth loss is an important policy choice if it is used to determine the thresholds in numeric temperature criteria. Knowledge of the implications of growth and size to organism success is not as well quantified as desired to guide that important decision. Establishing the effect of size on organism success merits greater research attention.

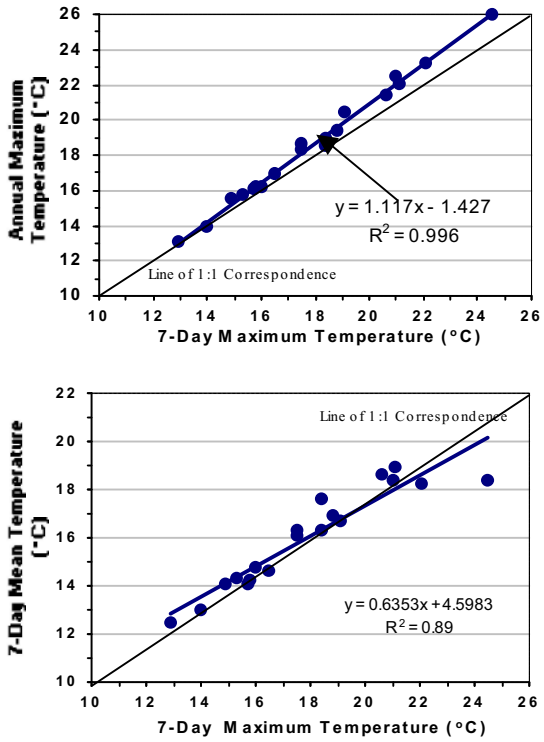


Figure 8.4 The relationship between various temperature indices currently used as the averaging period for temperature criteria. The averaging period has typically been either the annual maximum temperature (observed for a period as short as an hour, but more probably occurring for several hours on sequential days), or a weekly average (generally focused on the warmest seven consecutive days) observed for the year. For example, Washington's current criteria specify the annual maximum temperature, expressed as the maximum hourly temperature that occurs each year. Oregon specifies the average of the daily maximum temperature of the 7 warmest consecutive days. The U.S. EPA (1977) recommends the average of the daily mean temperature of the 7 warmest consecutive days (MWAT). All of these indices represent the upper tail of the distribution of temperatures observed during the summer months, and are closely related to one another. We conclude that any of the indices can be used for the purpose of temperature criteria because they are closely related. Furthermore, the short-term measures appear to adequately represent chronic exposure and long-term effects.

Nevertheless, several lines of evidence, as well as precedent in the scientific literature, suggest growth loss values between 10 and 20% as an appropriate, risk-guided threshold. We selected a growth loss of 10% as a threshold in our discussions and to compare temperature criteria with other existing criteria derived from other approaches. This level should prevent a statistically observable change in average population weight, assuming that population numbers remain consistent for the period. It is possible that somewhat higher growth loss would be acceptable, although we suspect that growth loss can't be much higher since temperatures associated with higher growth loss begin to coincide with the outward manifestation of other adverse effects such as avoidance behavior (Table 8.1). We do not attempt to quantify the response of resident adult fish to growth loss as an indicator of adverse temperature effects, although the same physiologic mechanisms manifest as weight loss in resident adults and undoubtedly have ecological ramifications.

Averaging periods for criteria. Temperature criteria use short-term averaging periods as indices of the long-term response. Results provided in this report confirm that these indices can be used reliably to represent the long-term temperature regime. All of the indices (annual maximum temperature, 7 day averages of the daily maximum or

daily mean temperature) characterize the upper tail of the sampled temperature distribution, and they are closely correlated with each other. This makes selection among them a matter of procedural and logistical concerns, rather than a biological question. Some standardization of reporting measures would be most helpful. We urge scientists to provide at least one of these indexing measures with their study results, thus enabling comparisons among them as well as their use in supporting the development of temperature criteria for regulatory purposes. We found that the average of the maximum 7 consecutive days of the daily mean temperature (MWAT, U.S. EPA 1977) was best correlated with growth simulations, but the annual maximum and 7-day maximum were also quite suitable. Appropriate temperature thresholds vary with each index.

Temperature Criteria Derived From Risk Assessment

Thresholds generated from risk assessment are reasonably consistent with criteria developed previously, including those derived from subjective review methods and objective analysis, and those currently authorized by states. The upper temperature thresholds associated with 10% weight reduction are 16.5° and 20.5°C for coho and steelhead respectively (Figure 8.4). Sub-lethal thresholds suggested by the risk assessment method tend to be slightly lower than those derived from objective methods (e.g. EPA 1977), probably because we directly accounted for realistic estimates of food

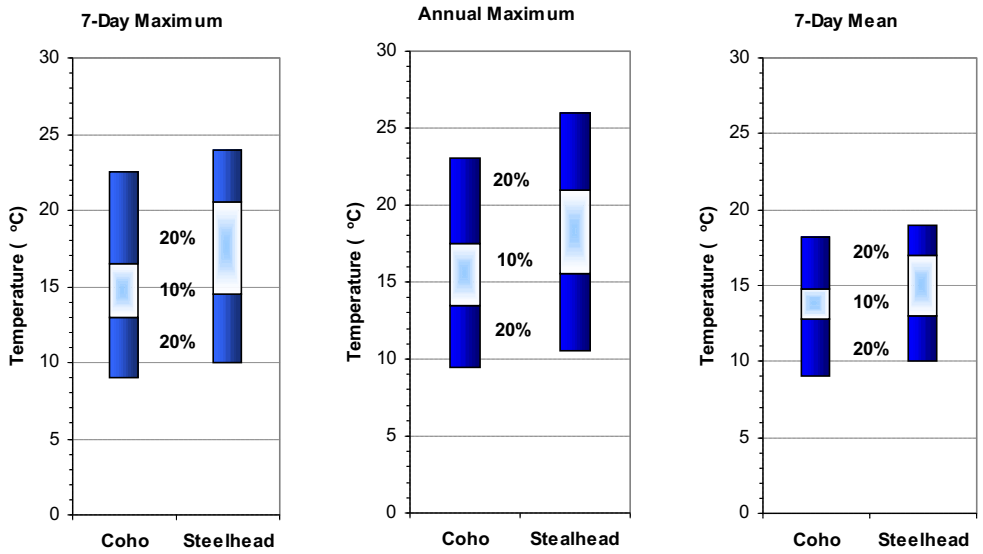


Figure 8.4 Temperature range for increments of growth loss associated with long-term temperature regime as expressed for 3 temperature indices and 2 species of salmonids. The inner range represents up to 10% growth loss and the outer range represents up to 20% growth loss. Above and below the ranges shown the growth loss exceeds 20% and was as high as 50% near the extremes of the temperature range. Risk assessment associated with growth loss suggests that a 10% limit would prevent any measurable effect on average coho population weight. A loss of 20% would be detectable and the temperature associated with this level of growth loss coincides with temperatures associated with avoidance behavior. Therefore, thresholds selected at 10% may be most appropriate for establishing temperature criteria. The threshold temperature varies with each index.

availability in the simulations. The risk-derived thresholds tend to be somewhat higher than those emerging from subjective evaluations (e.g. WDOE 1999), possibly because we did not add arbitrary safety factors (Figure 8.5). We believe that the choice of low thresholds of growth loss (e.g. 10%) provides an adequate margin of safety. Using the growth loss to set the risk level also prevents any unintended consequences of selecting values that are too low for a particular species. Our results demonstrated that temperatures that are low relative to a species' optimum have growth loss effects that are comparable to those associated with those that are high relative to the optimum.

When two or more species coexist, as is often the case, it may be appropriate to select the threshold for the more sensitive species. In the case of coho and steelhead, there would be no negative effect on steelhead by targeting lower temperatures appropriate for coho, the more sensitive species. If the margin between species is wider, the tradeoffs for species could be evaluated in selecting the temperature threshold if growth models for all species were available.

The fundamental relationship quantifying growth and mortality were similar, though not identical, for the two salmon species we modeled. However threshold temperatures

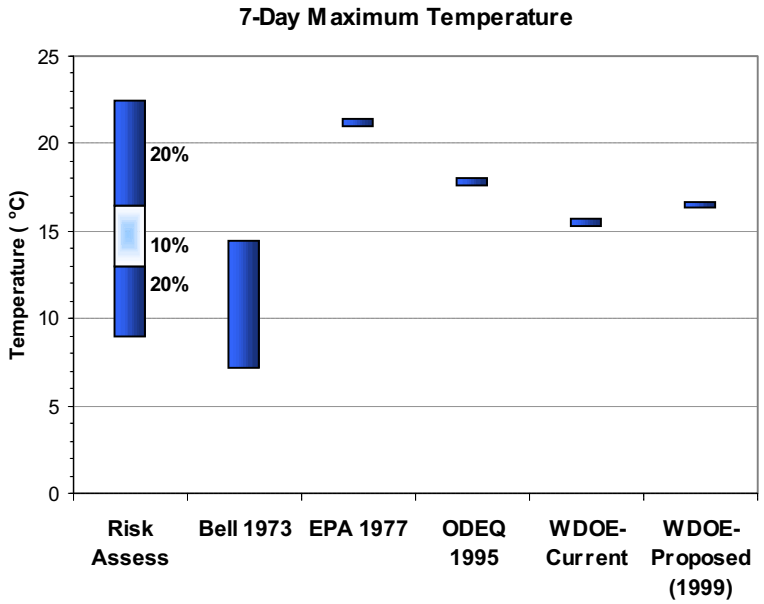


Figure 8.5 A comparison of temperature criteria for coho and recommended ranges from a variety of sources standardized to the 7-day maximum temperature. The risk assessment is the range of values developed in this report. Bell (1973) is the original source of temperature range recommendations that have been widely used as the basis for subjective analyses. These were used in part to form criteria used by Oregon (ODEQ 1995) and the current and proposed criteria for Washington (WDOE). The U.S. EPA used an objective approach based on the growth curves to determine threshold criteria. The various methods vary in terms of degree of objectivity or subjectivity by which the information is synthesized into recommended criteria, the degree to which data forms the basis for the criteria, and the extent to which population effects can be probabilistically determined. The temperature criteria in use in Pacific Northwest states have largely been drawn from professionals' review and interpretation of available scientific literature (e.g. ODEQ 1995). There has been some previous effort to use the more well-established scientific relationships to develop objective analyses of threshold temperatures and the duration of exposure (e.g., U.S. EPA 1977). This approach has not been widely integrated into regulatory activity.

generated through growth simulation varied between them, reflecting the differences in food consumption estimated by observing population growth in natural streams that was used in the modeling. This result highlights the importance of food availability as an important factor determining fish growth, a conclusion consistent with observations from field ecological studies. The simulation results suggest that coho populations ate at approximately 50% of satiation rations and steelhead, using a different feeding strategy, ate at 100% satiation. Importantly, food availability influences the temperature threshold for adverse effects. There is very little documentation of how much food is available for fish dwelling in streams and rivers, and how management activities may alter it. Greater understanding of how site and watershed conditions determine how much food is available and how it is allocated within populations would allow understanding of how temperature affects total productivity in addition to its effect on weight gain of the individuals in the population.

The analyses documented in this report addressed the juvenile rearing phase of coho salmon and steelhead trout. These species are widely distributed within the region, they are listed as threatened and endangered in a number of locations, and there was sufficient laboratory and population data to build models and corroborate them in natural streams. Nevertheless, this is a limited representation of the fish species that occur in the Pacific Northwest. Similar techniques could be applied to all fish species if the fundamental laboratory relationships used in the growth simulation method were available. Currently, there are a number of gaps in information for key functions used in modeling species of interest such as cutthroat trout and bull trout.

Analysis of lethal temperatures suggested that a threshold of 26°C for annual maximum temperature is a signal of imminent risk of direct mortality to salmonids. Although the occurrence of water temperature this high is rare, it has occasionally been observed in natural streams as well as in those impacted by anthropogenic activities in some situations. We also recommend site-specific analysis of duration of exposure when annual maximum temperature is between 24° and 26°C in order to assure that duration/magnitude thresholds are not exceeded. The relationship between thresholds for growth and mortality suggests that, if growth thresholds are met, lethal temperatures will not occur. However, there are situations where rivers and streams cannot be expected to meet these criteria, even under natural conditions. Acute criteria may be most helpful for triggering additional study in certain situations, and for prioritizing restoration activities.

It may be useful to vary temperature criteria on a seasonal basis matching fish requirements, although differing criteria for too fine a resolution of time may be difficult to administer and may offer relatively little additional benefit if ambient temperatures are generally within exposure duration limits. The risk-based approach could be used to investigate the need for more finely tuned seasonal criteria. or to develop site-specific criteria. The concept of selecting criteria for particular species appears valid, and the risk assessment method can be employed to help guide the selection of appropriate criteria for target species or it can be used to address multiple species living in the same location. There was no indication in our analysis that criteria for daily fluctuating temperature would improve biological characterization. Also, some states have a maximum allowable increase in temperature as well as an upper threshold. The value of this provision is not immediately apparent in the context of either acute or chronic effects analysis discussed in this report.

Uncertainties in Applying Criteria in Natural Environments

There are natural factors contributing to uncertainty and variability when it comes to administering temperature criteria. There are systematic patterns in temperature dictated by watershed and geographic conditions. It is important to recognize that the attainment of biologically based criteria will vary with watershed characteristics. Temperature regime also varies annually by as much as several degrees due to climatic factors, so it may be appropriate to establish confidence limits around threshold values to determine whether water quality standards are attained.

Conclusion

In conclusion, the analytical approaches to assessing risk to salmon associated with ambient environmental temperature presented in this report appear to be promising techniques for objectively defining temperature criteria. They could also assist ecological field studies to segregate the effects of temperature from other habitat and population factors that influence productivity. The risk-based analyses support the approach and general range of numeric threshold values currently used as temperature criteria by Pacific Northwest states. However, the specific numbers generated by quantitative risk analysis techniques vary slightly from existing authorized criteria. Assuming the most sensitive salmon species is used to select the threshold, and a growth loss threshold of 10%, the levels suggested by risk assessment are slightly higher than used by Washington and slightly lower than used by Oregon. Additional research is needed to develop the biological basis for other species of interest.

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SECTION 10 APPENDICES

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APPENDIX A

DATA USED TO DEVELOP RELATIONSHIPS BETWEEN GROWTH RATE, TEMPERATURE AND RATION AND CONSUMPTION DETERMINED FROM LABORATORY STUDIES

Coho salmon

Steelhead trout

DESCRIPTION OF METHODOLOGY

The temperature risk assessment relies on growth/ration/temperature relationships developed in laboratory experiments. In these experiments, the growth of individual or populations of fish are tracked over intervals of time under known temperature and food ration. Previously published studies were used to either obtain growth curves already developed by the authors (sockeye and chinook salmon), or to develop curves from original data provided by researchers (coho salmon and steelhead trout). In the studies used in this analysis, temperatures were maintained at constant levels for the duration of each trial, and various levels of food were provided as treatments. Trials were repeated at several levels of temperature.

Data used for growth of coho salmon was taken from Everson (1973). Growth of juvenile coho was studied in 60 trials where temperature was varied from 11.1^{o} to 22.4^{o}C and food ration was varied from satiation to near starvation. Experiments were replicated in 1969 and 1970. Everson reported growth rates of individual fish. Table A.1 shows the trial averages. The average for each trial at each temperature/treatment replication were used in to develop specific growth curves in the main body of the report.

Data used for growth of steelhead analysis taken from Wurtsbaugh and Davis (1977). Growth of juvenile steelhead was studied in the laboratory. A total of 44 trials were completed over the course of a year, varying temperature from 6.9^{o} to 22.5^{o}C and ration over the range from satiation to near starvation. Table A.2 shows data for each trial.

Both studies were conducted at Oregon State University, and local stocks were used. In both experiments, the fish were acclimated for approximated 14-16 days before trials, and fasted for 48 hours before tests began. The fish were fed for 23 days, and their weights were measured after 25 days.

Abbreviations used in the tables for coho:

Variable	Information
Season	Trials were run during 5 intervals of time over a 1 year time span (1969-70)
Temperature	Temperature was daily mean temperature averaged for the 30 day interval of the trial
Food Level	At each temperature, 4 food trials ranging from near starvation to satiation were run.. Each trial had 3-4 fish.
Rep	Rep appears on the Everson all sheet. It is the data for each of the 3-4 fish in the trial.
Initial Wet Weight (g)	Starting weight of the fish, measured.
Final Wet Weight (g)	Ending weight of the fish, measured.
Initial Dry Weight (g)	Starting dry weight of the fish, estimated based on dry to weight weight factor, Table 1
Final Dry Weight (g)	Ending dry weight of the fish, measured after sacrificing the fish.
Dry Food (mg)	Measured dry weight of the food fed to the fish during the trial.
Wet Food (mg)	Estimated wet weight of the food, based on factors in Table 1
Init Weight Wet Weight Consumption (g/g/day	Estimated consumption per day for wet weight of fish relative to the initial wet weight at beginning of trial.
MidWeight Wet Weight Consumption (g/g/day)	Estimated consumption per day for wet weight of fish relative to the midpoint between start and end wet weight.
Init Weight Dry Consumption g/g/day	Estimated consumption per day for dry weight of fish relative to the initial dry weight at beginning of trial.
Mid Weight Dry Consumption g/g/day	Estimated consumption per day for dry weight of fish relative to the midpoint between start and end dry weight.
% Fish Moisture Dry/Wet	Fish moisture factor, from Table 1
Daily Growth Rate—Wet (g/g/d)	Growth rate calculated as (end weight-start weight)(.5*(start weight+endweight)/30 using wet weights
Daily Growth Rate—Dry (g/g/d)	Growth rate calculated as (end weight-start weight)(.5*(start weight+endweight)/30 using dry weights

Note that rations and growth rates can be expressed as grams of body weight per day, referenced as g/g/d, g g^{-1} d^{-1}, or g/g/day. These are also sometimes referenced as % body

Table A.1 Experimental data for growth of coho salmon in relation to temperature and food consumption. Data is from Everson, 1973.

Trial	Fish Size	Temperature	Food Level	Initial Wet Weight (g)	Final Wet Weight (g)	Initial Dry Weight (g)	Final Dry Weight (g)	Dry Food (mg)	Wet Food (mg)	Init Weight Wet Weight Consumption (g/g/day	Mid Weight Wet Weight Consumption (g/g/day)	Init Weight Dry Consumption g/g/day	Mid Weight Dry Consumption g/g/day	% Fish Moisture Dry/Wet	Wet Daily Growth Rate (g/g/d)	Dry Daily Growth Rate (g/g/d)
Trial 1	Med	14.5	1	1.68	1.78	0.30	0.36	344	480	0.0098	0.0095	0.0395	0.035	0.1780	0.0019	0.0066
Trial 2	Med	14.5	2	1.88	2.82	0.34	0.60	924	1289	0.0235	0.0185	0.0946	0.067	0.1780	0.0135	0.0187
Trial 3	Med	14.5	3	1.69	2.91	0.30	0.63	1297	1809	0.0457	0.0310	0.1841	0.111	0.1780	0.0197	0.0251
Trial 4	Med	14.5	4	1.43	2.64	0.25	0.57	1344	1875	0.0443	0.0309	0.1783	0.109	0.1780	0.0200	0.0256
Trial 5	Med	18.6	1	1.58	1.60	0.28	0.30	345	481	0.0103	0.0102	0.0414	0.040	0.1780	0.0003	0.0020
Trial 6	Med	18.6	2	1.82	2.22	0.32	0.49	1023	1426	0.0269	0.0241	0.1083	0.086	0.1780	0.0068	0.0139
Trial 7	Med	18.6	3	3.09	3.91	0.55	0.91	1657	2311	0.0253	0.0222	0.1018	0.077	0.1780	0.0079	0.0165
Trial 8	Med	18.6	4	2.64	3.37	0.47	0.79	1912	2666	0.0350	0.0302	0.1410	0.103	0.1780	0.0084	0.0172
Trial 9	Med	20.8	1	1.33	1.21	0.24	0.23	342	477	0.0122	0.0128	0.0491	0.050	0.1780	-0.0032	-0.0016
Trial 10	Med	20.8	2	1.62	2.21	0.29	0.47	957	1334	0.0278	0.0234	0.1121	0.084	0.1780	0.0105	0.0164
Trial 11	Med	20.8	3	1.68	2.66	0.30	0.62	1392	1942	0.0397	0.0307	0.1597	0.106	0.1780	0.0147	0.0223
Trial 12	Med	20.8	4	2.23	3.75	0.40	0.87	2008	2801	0.0433	0.0315	0.1745	0.107	0.1780	0.0174	0.0252
Trial 13	Med	11.1	1	1.77	2.29	0.34	0.45	439	608	0.0116	0.0101	0.0434	0.037	0.1940	0.0086	0.0093
Trial 14	Med	11.1	2	1.92	2.94	0.37	0.62	793	1096	0.0195	0.0153	0.0728	0.054	0.1940	0.0142	0.0169
Trial 15	Med	11.1	3	1.67	2.62	0.32	0.56	949	1312	0.0274	0.0208	0.1022	0.073	0.1940	0.0151	0.0183
Trial 16	Med	11.1	4	1.81	3.38	0.35	0.73	1262	1745	0.0329	0.0227	0.1226	0.078	0.1940	0.0201	0.0233
Trial 17	Med	15.2	1	2.03	2.35	0.39	0.47	445	615	0.0106	0.0098	0.0396	0.075	0.1940	0.0051	0.0063
Trial 18	Med	15.2	2	1.77	2.44	0.34	0.53	764	1057	0.0202	0.0168	0.0751	0.075	0.1940	0.0108	0.0144
Trial 19	Med	15.2	3	1.49	2.86	0.29	0.61	1088	1504	0.0339	0.0232	0.1262	0.075	0.1940	0.0209	0.0237
Trial 20	Med	15.2	4	1.71	3.04	0.33	0.66	1256	1737	0.0345	0.0247	0.1288	0.075	0.1940	0.0186	0.0217
Trial 21	Med	17.8	1	1.59	1.82	0.31	0.36	443	612	0.0132	0.0122	0.0491	0.075	0.1940	0.0048	0.0054
Trial 22	Med	17.8	2	1.85	2.52	0.36	0.53	796	1101	0.0218	0.0181	0.0811	0.075	0.1940	0.0108	0.0133
Trial 23	Med	17.8	3	1.74	2.88	0.34	0.63	1071	1481	0.0286	0.0216	0.1067	0.075	0.1940	0.0160	0.0196
Trial 24	Med	17.8	4	2.42	3.96	0.47	0.89	1413	1954	0.0283	0.0212	0.1054	0.075	0.1940	0.0164	0.0210

Table A.1 Continued. Experimental data for growth of coho salmon in relation to temperature and food consumption. Data is from Everson, 1973.

Trial	Fish Size	Temperature	Food Level	Initial Wet Weight (g)	Final Wet Weight (g)	Initial Dry Weight (g)	Final Dry Weight (g)	Dry Food (mg)	Wet Food (mg)	Init Weight Wet Weight Consumption (g/g/day	Mid Weight Wet Weight Consumption (g/g/day)	Init Weight Dry Consumption g/g/day	Mid Weight Dry Consumption g/g/day	% Fish Moisture Dry/Wet	Wet Daily Growth Rate (g/g/d)	Dry Daily Growth Rate (g/g/d)
Trial 25	Large	9.4	1	4.11	4.46	0.86	0.95	472	633	0.0051	0.0049	0.0182	0.075	0.2100	0.0027	0.0031
Trial 26	Large	9.4	2	4.08	4.67	0.86	1.00	711	955	0.0078	0.0073	0.0277	0.075	0.2100	0.0045	0.0051
Trial 27	Large	9.4	3	3.70	4.59	0.78	0.99	873	1172	0.0106	0.0094	0.0374	0.075	0.2100	0.0072	0.0078
Trial 28	Large	9.4	4	3.80	4.99	0.80	1.09	1122	1505	0.0132	0.0114	0.0469	0.075	0.2100	0.0091	0.0103
Trial 29	Large	13.1	1	2.85	2.81	0.60	0.56	313	419	0.0049	0.0049	0.0174	0.075	0.2100	-0.0004	-0.0024
Trial 30	Large	13.1	2	3.30	3.67	0.69	0.76	569	764	0.0077	0.0073	0.0273	0.075	0.2100	0.0034	0.0031
Trial 31	Large	13.1	3	3.83	4.69	0.80	0.99	902	1211	0.0105	0.0095	0.0374	0.075	0.2100	0.0067	0.0068
Trial 32	Large	13.1	4	3.57	4.55	0.75	0.97	1066	1430	0.0133	0.0117	0.0473	0.075	0.2100	0.0079	0.0085
Trial 33	Large	15.8	1	2.96	2.87	0.62	0.56	330	443	0.0050	0.0051	0.0177	0.075	0.2100	-0.0012	-0.0036
Trial 34	Large	15.8	2	3.10	3.20	0.65	0.64	467	627	0.0069	0.0068	0.0246	0.075	0.2100	0.0011	-0.0003
Trial 35	Large	15.8	3	3.29	3.79	0.69	0.79	761	1022	0.0104	0.0096	0.0368	0.075	0.2100	0.0048	0.0047
Trial 36	Large	15.8	4	3.59	4.65	0.75	1.00	1099	1475	0.0137	0.0119	0.0487	0.075	0.2100	0.0086	0.0094
Trial 37	Small	11.4	1	0.70	0.73	0.12	0.12	142	208	0.0098	0.0098	0.0396	0.075	0.1700	0.0002	-0.0011
Trial 38	Small	11.4	2	0.76	0.90	0.13	0.16	202	295	0.0130	0.0119	0.0524	0.075	0.1700	0.0057	0.0065
Trial 39	Small	11.4	3	0.72	0.93	0.12	0.16	235	343	0.0158	0.0139	0.0636	0.075	0.1700	0.0081	0.0085
Trial 40	Small	11.4	4	0.69	1.01	0.12	0.18	321	469	0.0228	0.0185	0.0916	0.075	0.1700	0.0126	0.0141
Trial 41	Small	14.8	1	0.77	0.66	0.13	0.11	144	211	0.0091	0.0099	0.0366	0.075	0.1700	-0.0056	-0.0083
Trial 42	Small	14.8	2	0.58	0.55	0.10	0.09	145	212	0.0121	0.0125	0.0487	0.075	0.1700	-0.0024	-0.0034
Trial 43	Small	14.8	3	0.56	0.60	0.09	0.10	170	249	0.0149	0.0143	0.0598	0.075	0.1700	0.0023	0.0011
Trial 44	Small	14.8	4	0.63	0.75	0.11	0.13	267	390	0.0206	0.0188	0.0827	0.075	0.1700	0.0056	0.0061
Trial 45	Small	17.2	1	0.82	0.75	0.14	0.13	161	235	0.0096	0.0100	0.0385	0.075	0.1700	-0.0029	-0.0029
Trial 46	Small	17.2	2	0.65	0.54	0.11	0.08	139	203	0.0104	0.0114	0.0419	0.075	0.1700	-0.0059	-0.0094
Trial 47	Small	17.2	3	0.69	0.76	0.12	0.13	210	307	0.0149	0.0142	0.0599	0.075	0.1700	0.0030	0.0040
Trial 48	Small	17.2	4	0.74	0.89	0.13	0.16	277	405	0.0181	0.0165	0.0729	0.075	0.1700	0.0057	0.0068
Trial 49	Med	15.8	1	1.65	1.86	0.31	0.37	352	452	0.0091	0.0086	0.0376	0.075	0.1890	0.0037	0.0049
Trial 50	Med	15.8	2	1.83	2.38	0.35	0.53	643	825	0.0150	0.0131	0.0618	0.075	0.1890	0.0084	0.0131

Table A.1 Continued. Experimental data for growth of coho salmon in relation to temperature and food consumption. Data is from Everson, 1973.

Trial	Fish Size	Temperature	Food Level	Initial Wet Weight (g)	Final Wet Weight (g)	Initial Dry Weight (g)	Final Dry Weight (g)	Dry Food (mg)	Wet Food (mg)	Init Weight Wet Weight Consumption (g/g/day	Mid Weight Wet Weight Consumption (g/g/day)	Init Weight Dry Consumption g/g/day	Mid Weight Dry Consumption g/g/day	% Fish Moisture Dry/Wet	Wet Daily Growth Rate (g/g/d)	Dry Daily Growth Rate (g/g/d)
Trial 51	Med	15.8	3	1.70	2.49	0.32	0.55	823	1056	0.0207	0.0168	0.0854	0.075	0.1890	0.0126	0.0174
Trial 52	Med	15.8	4	1.93	3.14	0.36	0.73	1202	1543	0.0267	0.0203	0.1101	0.075	0.1890	0.0160	0.0221
Trial 53	Med	19.2	1	1.53	1.56	0.29	0.30	316	406	0.0088	0.0088	0.0364	0.075	0.1890	0.0005	0.0012
Trial 54	Med	19.2	2	1.84	2.22	0.35	0.48	626	804	0.0145	0.0132	0.0600	0.075	0.1890	0.0062	0.0102
Trial 55	Med	19.2	3	1.60	2.22	0.30	0.49	759	975	0.0203	0.0170	0.0838	0.075	0.1890	0.0108	0.0153
Trial 56	Med	19.2	4	1.64	2.62	0.31	0.65	1029	1320	0.0268	0.0207	0.1106	0.075	0.1890	0.0152	0.0226
Trial 57	Med	22.4	1	1.97	1.93	0.37	0.38	404	518	0.0087	0.0088	0.0361	0.075	0.1890	-0.0007	0.0007
Trial 58	Med	22.4	2	1.54	1.69	0.29	0.33	395	507	0.0109	0.0104	0.0451	0.075	0.1890	0.0032	0.0037
Trial 59	Med	22.4	3	1.62	2.03	0.31	0.45	742	952	0.0196	0.0174	0.0808	0.075	0.1890	0.0075	0.0124
Trial 60	Med	22.4	4	1.84	2.36	0.35	0.51	844	1084	0.0201	0.0173	0.0830	0.075	0.1890	0.0084	0.0126

Table A.2 Experimental data for growth of steelhead trout in relation to temperature and food consumption. Data is from Wurtsbaugh and Davis, 1977.

Trial	Temperature °C	Season	Initial Wet Weight (g)	Final Wet Weight (g)	Initial Dry Weight (g)	Final Dry Weight (g)	Dry Weight Consumption (g/g/d)	Mid Weight Dry Consumption (g/g/d)	% Fish Moisture Dry/Wet	Final Dry Weight %	Dry Daily Growth Rate (g/g/d)	Wet Daily Growth Rate (g/g/d)
Trial 1	6.9	Winter	2.03	1.82	0.443	0.337	0.5	0.04870	0.218	0.185	-0.011	**-0.436**
Trial 2	6.9	Winter	2.01	1.96	0.438	0.380	1.5	0.15345	0.218	0.194	-0.006	**-0.101**
Trial 3	6.9	Winter	1.95	2.1	0.425	0.456	2.5	0.27525	0.218	0.217	0.003	**0.296**
Trial 4	6.9	Winter	1.91	2.3	0.416	0.534	4.2	0.49874	0.218	0.232	0.010	**0.741**
Trial 5	9.4	Spring	2.35	2.35	0.470	0.430	2.5	0.28127	0.2	0.183	-0.004	**0.000**
Trial 6	9.4	Spring	2.25	2.71	0.450	0.526	4.9	0.59764	0.2	0.194	0.006	**0.742**
Trial 7	9.4	Spring	2.36	3.19	0.472	0.657	7	0.98800	0.2	0.206	0.013	**1.196**
Trial 8	9.4	Spring	2.23	3.38	0.446	0.690	10.2	1.44779	0.2	0.204	0.017	**1.640**
Trial 9	10	Autumn	0.98	0.96	0.190	0.177	2.2	0.10086	0.194	0.184	-0.003	**-0.082**
Trial 10	10	Autumn	1.04	1.31	0.202	0.261	4.3	0.24857	0.194	0.199	0.010	**0.919**
Trial 11	10	Autumn	1.02	1.64	0.198	0.341	7.9	0.53226	0.194	0.208	0.021	**1.865**
Trial 12	10	Autumn	1	1.89	0.194	0.412	14	1.06054	0.194	0.218	0.029	**2.464**
Trial 13	10.1	Winter	1.96	1.66	0.414	0.300	0.6	0.05355	0.211	0.181	-0.013	**-0.663**
Trial 14	10.1	Winter	1.96	1.82	0.414	0.351	1.5	0.14340	0.211	0.193	-0.007	**-0.296**
Trial 15	10.1	Winter	1.97	2.02	0.416	0.396	2.7	0.27391	0.211	0.196	-0.002	**0.100**
Trial 16	10.1	Winter	1.94	2.35	0.409	0.496	4.9	0.55443	0.211	0.211	0.008	**0.765**
Trial 17	12.6	Spring	2.29	2.29	0.463	0.428	3.8	0.42313	0.202	0.187	-0.003	**0.000**
Trial 18	12.6	Spring	2.33	2.82	0.471	0.541	6.1	0.77173	0.202	0.192	0.006	**0.761**
Trial 19	12.6	Spring	2.24	3.17	0.452	0.650	9.1	1.25390	0.202	0.205	0.014	**1.375**
Trial 20	12.6	Spring	2.28	3.75	0.461	0.810	12.7	2.01701	0.202	0.216	0.022	**1.950**
Trial 21	13	Winter	1.92	1.7	0.394	0.296	2	0.17235	0.205	0.174	-0.011	**-0.486**
Trial 22	13	Winter	1.84	1.72	0.377	0.316	3	0.26013	0.205	0.184	-0.007	**-0.270**
Trial 23	13	Winter	1.86	2.21	0.381	0.477	5.7	0.61180	0.205	0.216	0.009	**0.688**
Trial 24	13.3	Autumn	1	0.93	0.199	0.169	2.2	0.10127	0.199	0.182	-0.006	**-0.290**

Table A.2 Continued. Experimental data for growth of steelhead trout in relation to temperature and food consumption. Data is from Wurtsbaugh and Davis, 1977.

Trial	Temperature °C	Season	Initial Wet Weight (g)	Final Wet Weight (g)	Initial Dry Weight (g)	Final Dry Weight (g)	Dry Weight Consumption (g/g/d)	Mid Weight Dry Consumption (g/g/d)	% Fish Moisture Dry/Wet	Final Dry Weight %	Dry Daily Growth Rate (g/g/d)	Wet Daily Growth Rate (g/g/d)
Trial 25	13.3	Autumn	0.98	1.17	0.195	0.227	4.6	0.24265	0.199	0.194	0.006	**0.707**
Trial 26	13.3	Autumn	1.02	1.55	0.203	0.315	7.7	0.49822	0.199	0.203	0.017	**1.650**
Trial 27	13.3	Autumn	0.97	2.11	0.193	0.473	16.5	1.37294	0.199	0.224	0.034	**2.961**
Trial 28	15.2	Spring	2.28	2.33	0.456	0.419	5.5	0.60184	0.2	0.18	-0.003	**0.087**
Trial 29	15.2	Spring	2.25	3.17	0.450	0.669	10.2	1.42656	0.2	0.211	0.016	**1.358**
Trial 30	15.2	Spring	2.25	3.73	0.450	0.791	15.4	2.38846	0.2	0.212	0.022	**1.980**
Trial 31	16.2	Summer	1.14	1.21	0.239	0.241	4.9	0.29412	0.21	0.199	0.000	**0.238**
Trial 32	16.2	Summer	1.23	1.57	0.258	0.345	6.8	0.51315	0.21	0.22	0.012	**0.971**
Trial 33	16.2	Summer	1.18	1.64	0.248	0.364	9.5	0.72661	0.21	0.222	0.015	**1.305**
Trial 34	16.2	Summer	1.2	2.13	0.252	0.494	14.3	1.33376	0.21	0.232	0.026	**2.234**
Trial 35	16.4	Autumn	0.94	1.29	0.185	0.258	8.3	0.45980	0.197	0.2	0.013	**1.256**
Trial 36	16.4	Autumn	0.92	2.04	0.181	0.469	20.1	1.63423	0.197	0.23	0.035	**3.027**
Trial 37	19.5	Summer	1.19	1.28	0.258	0.274	6	0.39911	0.217	0.214	0.002	**0.291**
Trial 38	19.5	Summer	1.21	1.53	0.263	0.341	7.9	0.59621	0.217	0.223	0.010	**0.934**
Trial 39	19.5	Summer	1.16	1.63	0.252	0.380	10.3	0.81307	0.217	0.233	0.016	**1.348**
Trial 40	19.5	Summer	1.18	2.02	0.256	0.475	15.7	1.43412	0.217	0.235	0.024	**2.100**
Trial 41	22.5	Summer	1.1	1.21	0.243	0.258	7.4	0.46327	0.221	0.213	0.002	**0.381**
Trial 42	22.5	Summer	1.1	1.25	0.243	0.273	9.2	0.59294	0.221	0.218	0.005	**0.511**
Trial 43	22.5	Summer	1.11	1.41	0.245	0.326	11	0.78515	0.221	0.231	0.011	**0.952**
Trial 44	22.5	Summer	1.16	1.61	0.256	0.390	13.4	1.08202	0.221	0.242	0.017	**1.300**

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APPENDIX B

REGIONAL TEMPERATURE DATA FOR THE PACIFIC NORTHWEST REGION, FROM U.S. GEOLOGICAL SURVEY WATER RESOURCES DATA

Washington

Oregon

Idaho

From 1978-79 Water Resources Data
U.S. Geological Survey

Table B.1 Annual maximum temperature for 1978-79 and most extreme temperature measured at all stream and river sites listed in the U.S.G.S. water resources inventory for Washington.

State	River	USGS Station Number	Basin Area (km^2)	1979 Annual Maximum Temperature (^oC)	Extreme Maximum (^oC)
Washington	Wynoochee River	12037400	401	22.5	24
	N.F. Skokomish River	12056500	148	14	15
	Skokomish River	12056500	588	16	20.5
	Nisqually River near National	12082500	344	18	18.5
	Nisqually River near LaGrande	12086500	756	18	18.5
	Green River	12113000	1,033	22.5	24
	Cedar River near Landsburg	12117500	313	15.5	19.5
	Cedar River near Renton	12119000	477	23	24
	M.F. Snoqualmie River	12141300	399	18.5	
	N. F. Snoqualmie River	1214200	166	21	
	S. F. Snoqualmie River		108	19	
	Skagit River	12179000	3,300	13	
	Tank Creek	12197040	6	17.5	
	Minkler Creek	12197110	13	21	21
	Black Creek	12197680	1	16.5	17.5
	Wiseman Creek	12197700	8	16	16.5
	Skagit River near Sedro Woolley	12199000	7,809	18	18
	Skagit River near Mount Vernon	12200500	8,011	17.5	17.8
	Kalama River	14223600	325	20.5	21.5
	Cowlitz River near Randall	14233400	2,668	18.5	19
	Cowlitz River below Mossyrock Dam	14234810	2,989	11	15
	Cowlitz River below Mayfield Dam	14238000	3,626	12.5	21
	Tilton River	14236200	365	21.5	24.5
	Columbia River at Warrendale	14128910	621,600	22	22.5
	Columbia River at Bradwood, OR	14247400	665,900	21.5	22.5
	Columbia River at Northport, WA	12433000	154,600	20	21
	Columbia River at Grand Coulee Dam	12472900	193,500	19	19
	Columbia River at Richland	12473520	251,000	21	21.5
	Columbia River at Umatilla	14019250	554,300	22	22.5
	Pend Oreille River	12398600	65,300	23	24.5
	Spokane River	12433000	15,590	20.5	24.5
	Yakima River at Kiona	12510500	14,543	28	29
	Snake River at Anatone	13334300	241,000	23.5	25
	Snake River at Burbank	13353200	281,800	23.5	24

Table B.2 Annual maximum temperature for 1978-79 and most extreme temperature measured at all stream and river sites listed in the U.S.G.S. water resources inventory for Oregon.

State	River	USGS Station Number	Basin Area (km^2)	1979 Annual Maximum Temperature (^oC)	Extreme Maximum (^oC)
Oregon	Columbia River at Rainier	14245295	664,900	21.5	23.5
	Columbia River at Wama	14247295	665,000	21.5	22.5
	Columbia River at Vancouver	14144700	624,200	22	23.5
	Owyhee River	13184000	29,300	25	25
	Meadow Creek near Starkey	13318050	86	25	25
	Meadow Creek above Bear Cr.	133`8060	125	26	26.5
	Minam River	13331500	622	24.5	27
	Umatilla River	14020000	339	24.5	25
	John Day River	14048000	19,600	31	33
	Deschutes River near Bend	14064500	4,556	17	17
	Deschutes River near Madras	14092500	20,250	14	18
	Deschutes River near Moody	14103000	27,200	23	23
	DonnerundBlitzen River	10396000	518	25.5	28.5
	Willamette at Portland	14211720	28,700	24	27.5
	Bull Run River	14138850	124	17	17
	Fir Creek	14138870	14	14.5	15
	N. F. Bull Run River	14138900	22	14	
	S.F. Bull Run River	14139800		17	
	M. F. Willamette near Oak Ridge	14144800	668	20	23
	Hills Creek	14144900	136	19	22.5
	M.F. Willamette above Salt Cr.	14145500	1,015	17	25
	M. F. Willamette below N. Fork	14148000	2,393	19	23.5
	M.F. Willamette near Dexter	14150000	2,593	17.5	18.5
	Fall Creek	14150300	306	25	25
	Wineberry Creek	14150800	114	24	26.5
	Fall Creek below Wineberry Cr.	14151000	482	20.5	26
	M.F. Willamette at Jasper	14152000	3,471	17.5	21
	Coast Fork Willamette River	14152500	187	24.5	25.5
	McKenzie River below Trail Cr. Dam	14158850	477	11	12
	McKenzie River at McKenzie Bridge	14159000	901	13	13.5
	S. Fork McKenzie	14159200	414	17	17
	S. Fork McKenzie near Rainbow	14159500	539	14	20
	Blue River	14161100	119	23	23
	McKenzie River near Vida	14162500	2,409	15	16
	Willamette River at Harrisburg	14166000	8,860	20	24
	Mary's River	14171000	412	22.5	23.5
	Calapooia River at Holley	14172000	272	29	29.5
	Calapooia River at Albany	14173500	963	28	28.5
	N. Santiam River below Boulder	14178000	559	17.5	19.5
	Breitenbush River	14179000	275	16.5	18
	N. Santiam River at Niagara	14181500	1,173	13.5	16.5
	S. Santiam River below Cascadia	14185000	451	24	25
	M. Santiam River near Cascadia	14185800	269	22	22.5
	Quartzville Creek	14185900	257	24	25.5
	S. Santiam River near Foster	14187200	1,443	14.5	15.5
	S. Santiam River near Waterloo	14187500	1,658	18	26
	Santiam River	14189000	4,640	23	23.5
	Willamette River at Salem	14191000	18,900	24	25.5
	Tualatin River near Gaston	14202500	126	24	
	Tualatin River at West Linn	14207500	1,829	23.5	27.5

Table B.2 Continued Annual maximum temperature for 1978-79 and most extreme temperature measured at all stream and river sites listed in the U.S.G.S. water resources inventory for Oregon.

State	River	USGS Station Number	Basin Area (km^2)	1979 Annual Maximum Temperature (^oC)	Extreme Maximum (^oC)
Oregon	Nehalem River	14301000	1,728	24.5	24.5
	Nestucca River	14303600	466	23.5	24
	Big Rock Creek	14304850	18	19.5	
	Siletz River	14305500	523	24.5	
	Siuslaw River	14307620	1,523	31	31
	S. Umpqua River at Days Cr.	14308600	1,660	29	30
	S. Umpqua River near Roseburg	14312260	4,657	25	29
	N. Umpqua River at Winchester	14319500	3,481	26	26.5
	Umpqua River	14321000	9,539	27	30
	Rogue River below Prospect	14330000	982	20.5	20.5
	S. Fork Rogue River	14335075	637	20	20
	Rogue River at McLeod	14335075	1.787	14.5	14.5
	Big Bull Creek	14337500	635	24	24
	Rogue River near McLeod	14337600	2,429	14.5	18
	Elk Creek	14337800	204	27.5	28.5
	W. Branch Elk Creek	14337870	37	24	25.5
	Elk Creek near Trail	14338000	344	31.5	31.5
	Rogue River at Dodge Bridge	14339000	3,147	18.5	20
	Rogue River at Raygold	1435900	5,317	19	22
	Rogue River at Grants Pass	14361500	6,369	17	23.5
	Rogue River near Merlin	14370400	8,472	22.5	25.5
	Rogue River at Marial	14372250	9,873	24.5	27.5
	Rogue River near Agnes	14372300	10,202	24.5	26.5
	Elliot Creek	14361600	134	22.5	23
	Carberry Creek	14361700	178	23.5	23.5
	Applegate River near Copper	14362000	583	25.5	26.5
	Applegate River near Applegate	14366000	1,251	26	28
	Applegate River near Wilderville	14369500	1,808	28	28

Table B.3 Annual maximum temperature for 1978-79 and most extreme temperature measured at all stream and river sites listed in the U.S.G.S. water resources inventory for Idaho.

State	River	USGS Station Number	Basin Area (km^2)	1979 Annual Maximum Temperature (^oC)	Extreme Maximum (^oC)
Idaho	Kootenai River at Leonia	12305000	30,407	14	
	Kootenai River near Copeland	12318500	34,710	19	24
	Kootenai River at Porthill	12322000	35	20	23.5
	Salmon River at Whitebird	13269000	35,090	25	28
	Yankee Fork Salmon River	13296000	505	16	17.5
	N. Fork Clearwater near Canyon	13340600	3,520	21.5	23
	Clearwater River near Peck	13341050	6,320	21	25
	Clearwater River at Spalding	13342500	24,790	22	28
	Bear River at Border, WY	10039500	6,439	23	23
	Salt River above reservoir, Alpin WY	13023000	1,160	16.5	21
	Snake River at Weiser	13269000	565	28.5	
	Snake River at Hells Canyon Dam	13269000	190,000	19.5	20
	Snake River near Irwin	13032500	13,533	15.5	18.5
	Snake River at Neeley	13077000	35,200	23.5	23.5
	Snake River at Minidoka	13081500	40,700	23	23.5
	Snake River at King Hill	13081500	92,700	20.5	23.5
	Willow Creek near Ririe	13058000	1,620	25	

APPENDIX C

ACUTE EFFECTS OF TEMPERATURE ON SALMON AND TROUT: DATA USED, ANALYSES AND ASSUMPTIONS

Chinook salmon
Chum salmon
Coho salmon
Cutthroat trout
Pink salmon
Rainbow trout
Sockeye salmon

DESCRIPTION OF METHODOLOGY

This memorandum summarizes how estimated acute thermal effects curves were generated for selected species of salmon and trout: pink salmon, chum salmon, coho salmon, sockeye salmon, chinook salmon, rainbow trout (steelhead), and cutthroat trout. Effects of elevated temperatures on these fish species were of interest; thus, curves were generated from available data for acclimation temperatures of 15°C and higher.

Most of the available thermal effects information is based on 50% survival; however, curves for 90% survival (10% mortality) were desired. The process by which 10% mortality curves were estimated from the 50% mortality information is detailed here. Three attachments are provided to illustrate the data used and analyses:

Attachment 1: Acute Effects of Temperature on Salmonids: Median Lethal Times (LT50) in Relation to Temperature

Attachment 2: LT50 to LT10 Conversion Factors for Pacific Salmon: Sockeye and Chinook.

Attachment 3: Acute Effects of Temperature on Salmonids: Times to 10% Mortality (LT10) In Relation to Temperature.

ACUTE THERMAL EFFECTS CURVES ASSOCIATED WITH 50% MORTALITY

Data from several sources were used to generate curves showing the relationship between temperature and duration to 50% mortality (EPA 1977, Brett 1952, and Golden 1978). Each curve estimates the length of time 50% of a species population can survive at some temperature above its upper incipient lethal temperature. For the remainder of this memorandum, this temperature will be referred to as the LT50, the temperature causing 50% mortality in a population of fish within a specified length of time.

EPA (1977, page 11 of text and page 38 of Appendix A) provides a regression equation relating exposure time (in minutes) to the LT50 (in EC):

$$\log[\text{exposure time}] = a + b*\text{LT50},$$

which can also be written as

$$\text{LT50} = (\log[\text{exposure time}] - a)/b.$$

The regression coefficients, *a* and *b*, are provided in EPA (1977) for many fish species, including all those identified above, except cutthroat trout (pages 55-58 of Appendix B). Golden (1978, Figure 4 on page 14) provides regression coefficients for cutthroat trout. The coefficients in EPA (1977) were gathered from many different sources, including Brett's 1952 paper summarizing his study of lethal temperatures for the five salmon species. In the attachments, the specific studies are cited rather than the EPA (1977) document.

The acute thermal effects curves provided in Attachment 1 were generated in Excel using regression coefficients provided in EPA (1977) and Golden (1978) and the second form of the regression equation presented above for a range of times (durations). For the five salmon species, Brett (1952) provided ultimate upper incipient lethal temperatures, and the acute curves were discontinued at these values. For rainbow trout and cutthroat trout, the curves were discontinued at 25 °C.

Although it was assumed that the regression coefficients in Appendix B of EPA (1977) were correct, one appeared to be in error. The value for *a* was given as 16.2444 for pink salmon at an acclimation temperature of 20 °C from Brett's study (1952). The resulting curve did not match the one presented in Figure 5 of Brett (1952). To generate a curve more representative of Brett's (1952) figure, a value of 13.2444 was used for *a* instead.

A few of the studies included in EPA (1977) were excluded from Attachment 1. These were studies in which the fish being tested showed signs of gas bubble disease or other effects of gas supersaturation.

COMPARISON OF LT50 AND LT10 CURVES

In the EPA (1977) document, two unpublished studies provided regression coefficients for both 50% and 10% (LT10) mortality curves at acclimation temperatures of 15EC or higher. McConnell and Blahm (1970) calculated regression coefficients for sockeye salmon; and Blahm and McConnell (1970) calculated regression coefficients for both spring and fall runs of chinook salmon. Using the regression coefficients generated from these studies, LT50 and LT10 values were calculated for a range of durations.

Attachment 2 contains two tables (one each for sockeye and chinook salmon) of the calculated values and their ratios (i.e, LT10/LT50). For the range of durations calculated, the LT10 values were 98.0 to 99.7% of the LT50 values. This is consistent with Brett (1958, page 76 and Figure 4), who indicated that differences between temperatures for 50% mortality and those for <50% mortality are relatively small, "implying that temperatures of this order have only to increase slightly to cause a large difference in mortality."

ACUTE THERMAL EFFECTS CURVES @ 10% MORTALITY

Based on the comparison of LT50 and LT10 curves generated from the McConnell and Blahm (1970) and Blahm and McConnell (1970) studies, and to be somewhat conservative, LT10 curves were estimated for the other studies by applying a factor of 0.98 to each curve. That is, each LT10 value was estimated to be 98% of the LT50 value calculated from the regression equation. The estimated LT10 curves are presented in Attachment 3.

Based on visual inspection of the LT50 and LT10 curves included in Attachment 1 from these two studies, the slopes were similar. That is, on the log-time scale, the differences between the LT50 and LT10 curves were approximately constant. (There was insufficient information presented in Appendix B of the EPA (1977) document to statistically compare the slopes.) Had the differences not appeared constant, the application of a singe adjustment factor would not have been appropriate.

KEY ASSUMPTIONS/ISSUES

The following text summarizes key assumptions used when evaluating the available data and estimating the LT10 curves. Other issues relevant to the use of these data are also identified. The information is presented in bullet form and can be expanded upon at a later date if desired.

- The most important assumption is that the data provided in EPA (1977) were representative of the same species from different locations (i.e., different stocks). There are many factors to consider with such an assumption: different environmental influences (water quality, temperature fluctuations), genetic differences, size, life stage, etc.

- As stated above, the regression coefficients reported in EPA (1977) were assumed to be correct.

- The adjustment factor estimated from the McConnell and Blahm (1970) and Blahm and McConnell (1970) data for sockeye and chinook salmon was assumed to be appropriate to use in estimating LT10 curves for the other salmon and trout species.

- Effects curves appear to differ for fish tested using a constant acclimation temperature versus a fluctuating one (see Attachment 1 for cutthroat trout). Can results based on constant acclimation temperatures be applied to fish living in streams with temperatures fluctuating on a daily and seasonal basis?

- For many of the studies, the test fish were obtained from a hatchery, and sometimes from a limited number of females. While this limited variability in the biological responses to temperature because of the genetics, it also may have limited the representativeness of the results for a wider population of fish of same species.

APPENDIX C REFERENCES

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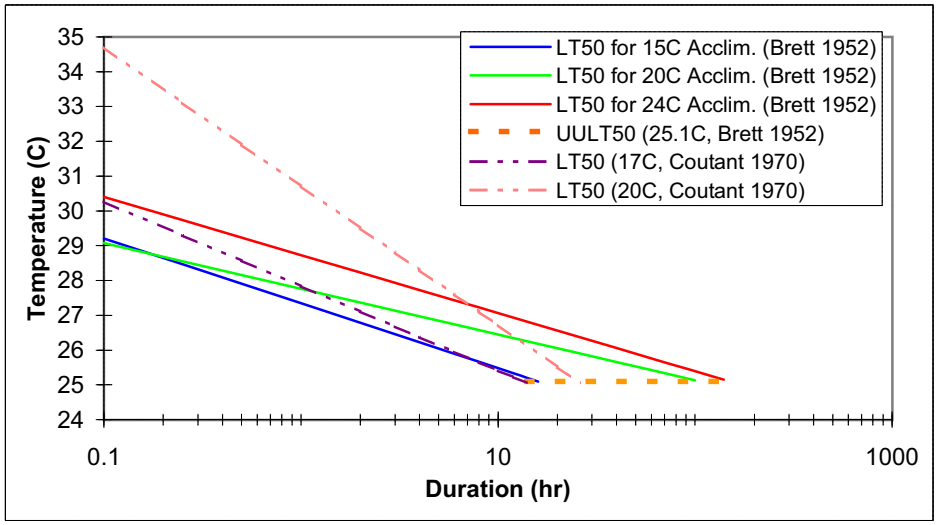
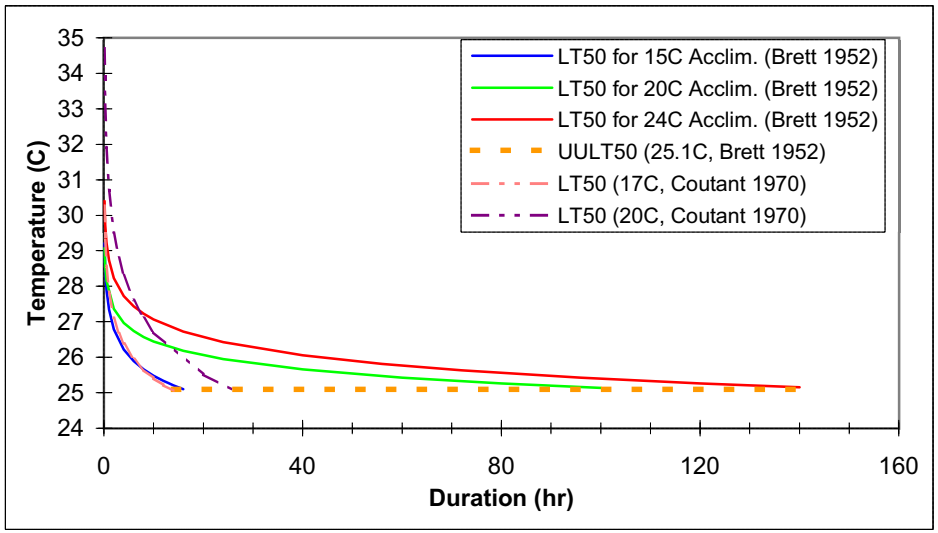
APPENDIX C
ATTACHMENT 1

Acute Effects of Temperature on Salmonids: Median Lethal Times (LT50) in Relation to Temperature

CHINOOK SALMON

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
15C	Brett(1952)	juv. frshwtr fry	16.4454	-0.5364	4	-0.9906	0.1	29.2
							0.25	28.5
							0.5	27.9
							1	27.3
							2	26.8
							4	26.2
							6	25.9
							8	25.7
							10	25.5
							12	25.3
							13	25.3
							14	25.2
							16	25.1
20C	Brett(1952)	juv. frshwtr fry	22.9065	-0.7611	7	-0.9850	0.1	29.1
							0.25	28.6
							0.5	28.2
							2	27.4
							4	27.0
							6	26.7
							8	26.6
							10	26.4
							16	26.2
							24	25.9
							40	25.7
							60	25.4
							80	25.3
							100	25.1
24C	Brett(1952)	juv. frshwtr fry	18.9940	-0.5992	9	-0.9923	0.1	30.4
							0.25	29.7
							0.5	29.2
							1	28.7
							2	28.2
							4	27.7
							6	27.4
							8	27.2
							10	27.1
							16	26.7
							24	26.4
							40	26.1
							56	25.8
							72	25.6
							96	25.4
							120	25.3
							140	25.1
17C	Coutant (1970)	"Jacks" (1-2 yrs)	13.2502	-0.4121	4	-0.8206	0.1	30.3
							0.25	29.3
							0.5	28.6



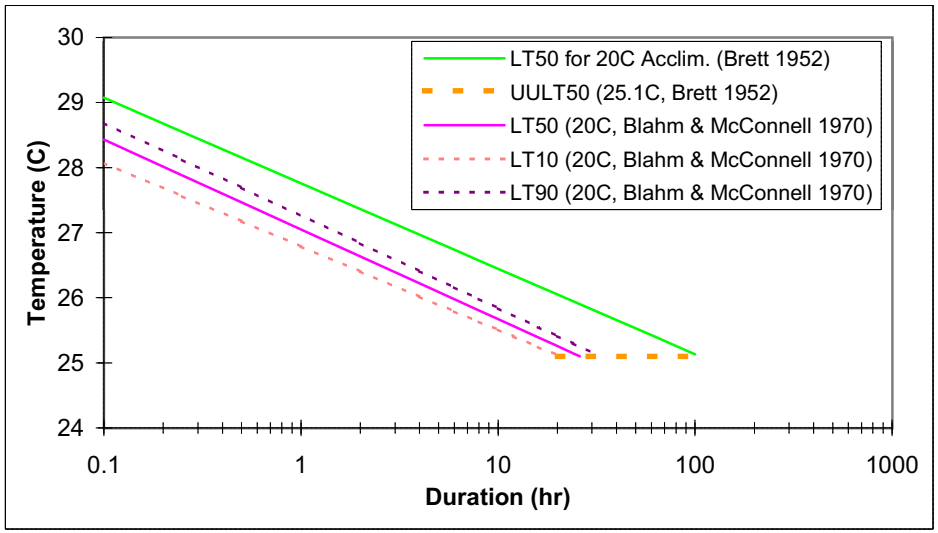


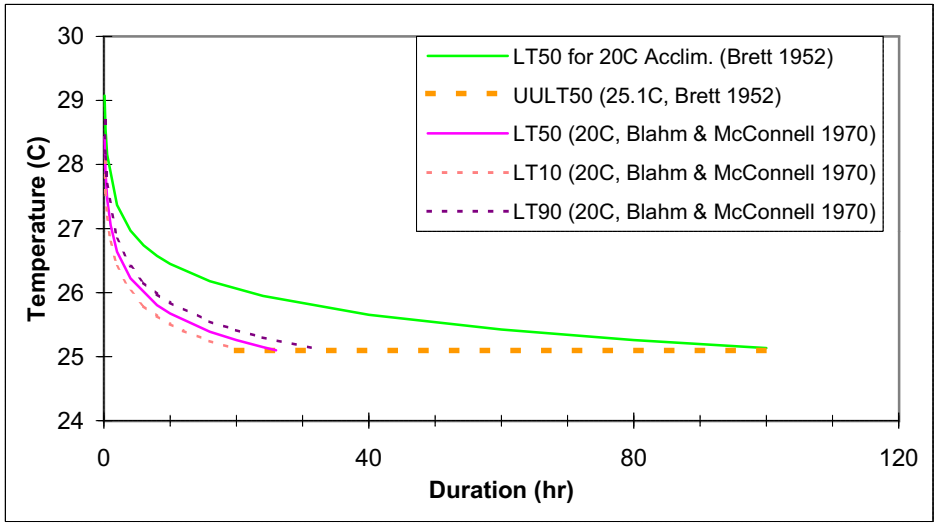
CHINOOK SALMON

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
							1	27.8
							2	27.1
	The 17C and 19C temperatures were Columbia River						3	26.7
	temperatures (at Grand Rapids Dam) during fall						4	26.4
	migrations two different years.						6	25.9
							8	25.6
							10	25.4
							12	25.2
							14	25.1
19C	Coutant (1970)	"Jacks" (1-2 yrs)	9.4683	-0.2504	4	-0.9952	0.1	34.7
							0.25	33.1
							0.5	31.9
							1	30.7
							2	29.5
							3	28.8
							4	28.3
							6	27.6
							8	27.1
							10	26.7
							20	25.5
							26	25.1

CHINOOK SALMON

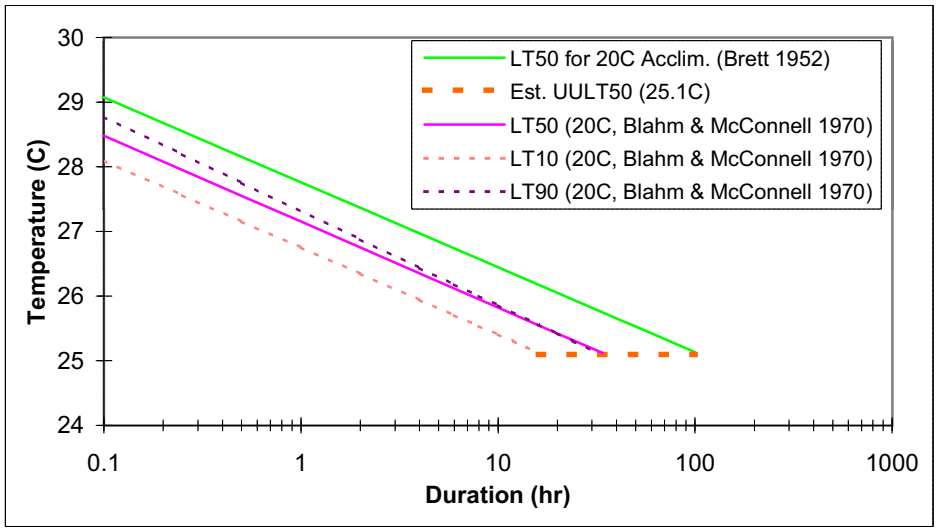
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
20C	Blahm & McConnell (1970) unpublished data	juv. (spring run)	21.3981	-0.7253	3	-0.9579	0.1	28.4
							0.25	27.9
							0.5	27.5
							1	27.1
							2	26.6
							4	26.2
							8	25.8
							10	25.7
							16	25.4
							20	25.3
							24	25.1
							26	25.1
20C	Blahm & McConnell (1970) unpublished data 10% mortality	juv. (spring run)	22.6664	-0.7797	4	-0.9747	0.1	28.1
							0.25	27.6
							0.5	27.2
							1	26.8
							2	26.4
							4	26.0
							6	25.8
							8	25.6
							10	25.5
							12	25.4
							16	25.2
							20	25.1
20C	Blahm & McConnell (1970) unpublished data 90% mortality	juv. (spring run)	20.9294	-0.7024	3	-0.9463	0.1	28.7
							0.25	28.1
							0.5	27.7
							2	26.8
							4	26.4
							6	26.2
							8	26.0
							10	25.8
							16	25.6
							20	25.4
							24	25.3
							32	25.1

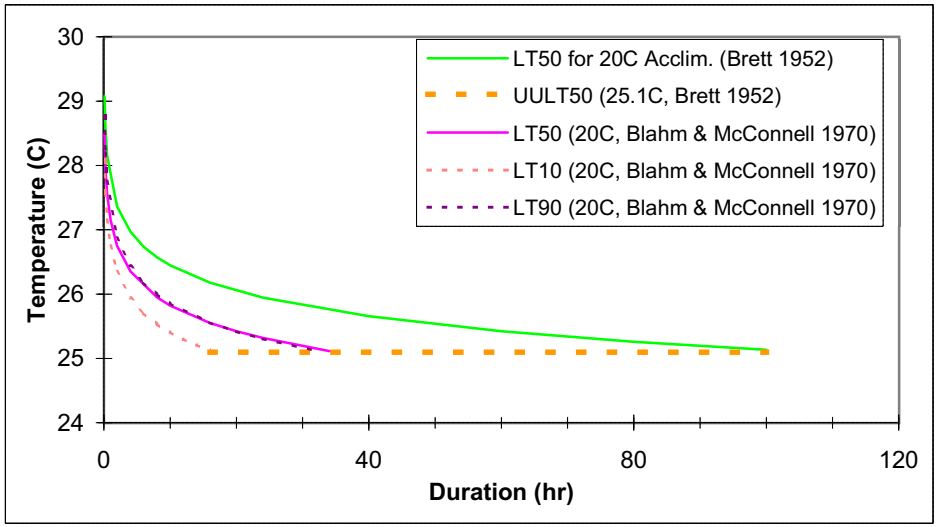




CHINOOK SALMON

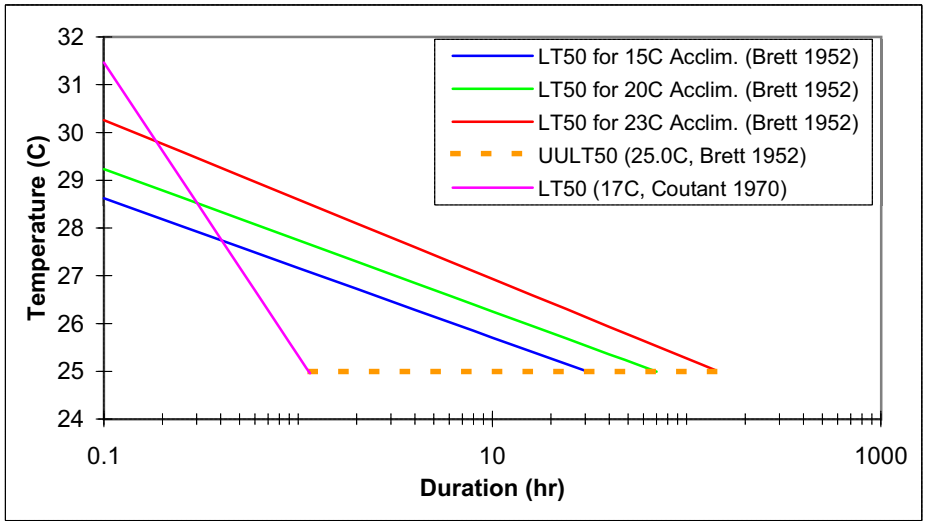
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
20C	Blahm & McConnell (1970) unpublished data	juv. (fall run)	22.2124	-0.7526	4	-0.9738	0.1	28.5
							0.25	28.0
							0.5	27.6
							1	27.2
							2	26.8
							4	26.4
							8	26.0
							10	25.8
							16	25.6
							20	25.4
							24	25.3
							34	25.1
20C	Blahm & McConnell (1970) unpublished data 10% mortality	juv. (fall run)	21.6756	-0.7438	4	-0.9550	0.1	28.1
							0.25	27.6
							0.5	27.2
							1	26.8
							2	26.3
							4	25.9
							6	25.7
							8	25.5
							10	25.4
							12	25.3
							14	25.2
							16	25.1
20C	Blahm & McConnell (1970) unpublished data 90% mortality	juv. (fall run)	20.5162	-0.6860	3	-0.9475	0.1	28.8
							0.25	28.2
							0.5	27.8
							2	26.9
							4	26.4
							6	26.2
							8	26.0
							10	25.9
							16	25.6
							20	25.4
							24	25.3
							32	25.1

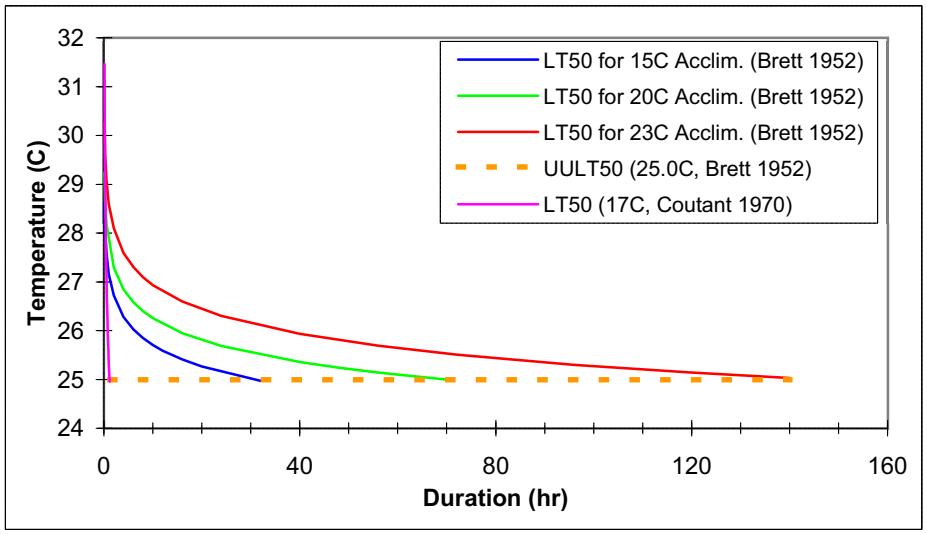




COHO SALMON

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
15C	Brett(1952)	juv. frshwtr fry	20.4066	-0.6858	6	-0.9681	0.1	28.6
							0.25	28.0
							0.5	27.6
							1	27.2
							2	26.7
							4	26.3
							6	26.0
							8	25.8
							10	25.7
							12	25.6
							16	25.4
							20	25.3
							32	25.0
20C	Brett(1952)	juv. frshwtr fry	20.4022	-0.6713	4	-0.9985	0.1	29.2
							0.25	28.6
							0.5	28.2
							2	27.3
							4	26.8
							6	26.6
							8	26.4
							10	26.3
							16	25.9
							24	25.7
							40	25.4
							48	25.2
							56	25.1
							70	25.0
23C	Brett(1952)	juv. frshwtr fry	18.9736	-0.6013	5	-0.9956	0.1	30.3
							0.25	29.6
							0.5	29.1
							1	28.6
							2	28.1
							4	27.6
							6	27.3
							8	27.1
							10	26.9
							16	26.6
							24	26.3
							40	25.9
							56	25.7
							72	25.5
							96	25.3
							120	25.1
							140	25.0
17C	Coutant (1970)	adult	5.9068	-0.1630	5	-0.9767	0.1	31.5
	Reported acclimation temp. was the Columbia River						0.2	29.6
	temp. (at Priest Rapids Dam) during fall migration.						0.3	28.5



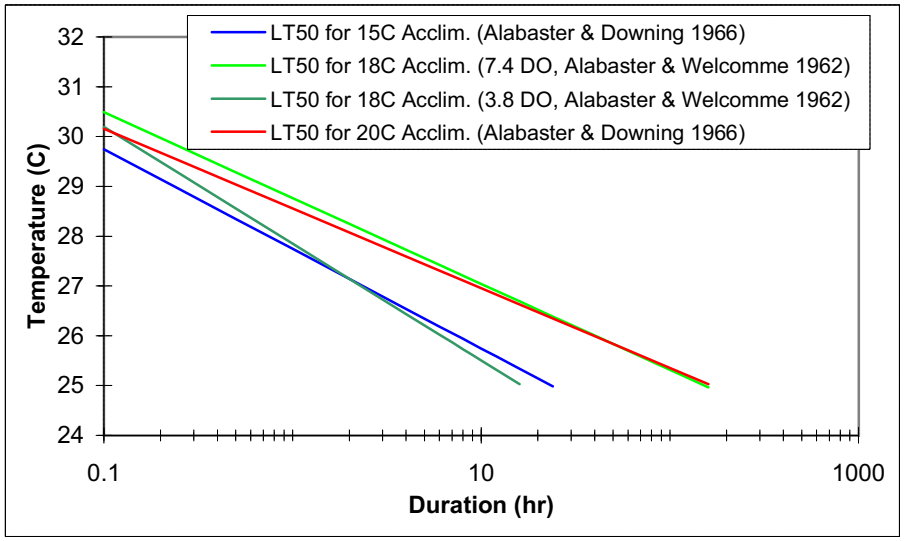


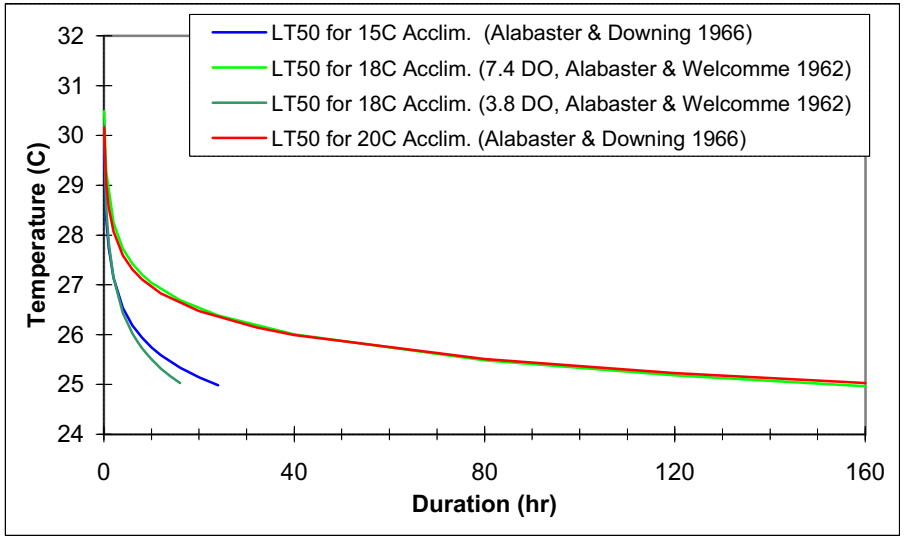
COHO SALMON

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
							0.4	27.8
							0.5	27.2
							0.6	26.7
							0.7	26.3
							0.8	25.9
							0.9	25.6
							1	25.3
							1.1	25.1
							1.15	25.0

RAINBOW TROUT

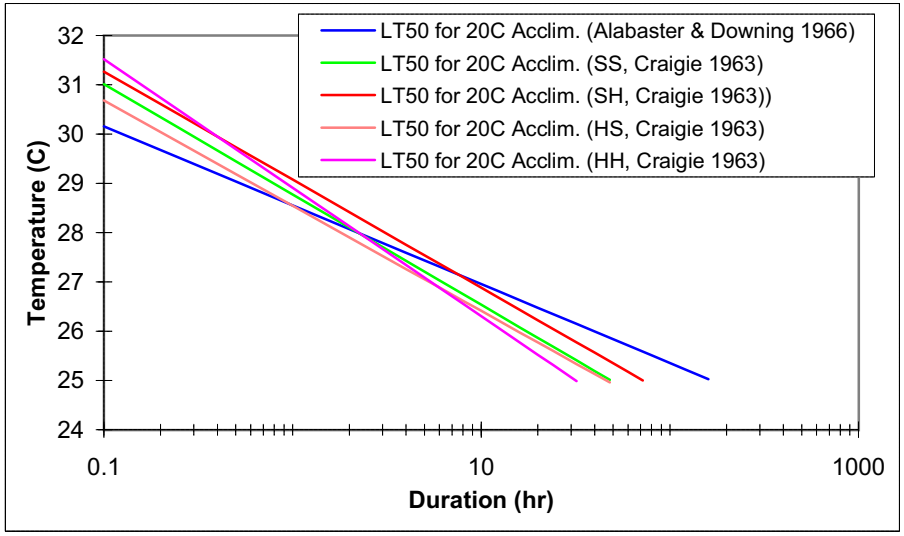
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
15C	Alabaster & Downing (1966)	juvenile	15.6500	-0.5000	2	---	0.1	29.7
							0.25	28.9
							0.5	28.3
							1	27.7
							2	27.1
							4	26.5
							6	26.2
							8	25.9
							10	25.7
							12	25.6
							16	25.3
							20	25.1
							24	25.0
18C	Alabaster & Welcomme (1962) Dissolved Oxygen at 7.4 mg/L	juvenile	18.4654	-0.5801	5	-0.9787	0.1	30.5
							0.25	29.8
							0.5	29.3
							2	28.2
							4	27.7
							6	27.4
							8	27.2
							10	27.0
							16	26.7
							24	26.4
							40	26.0
							80	25.5
							120	25.2
							160	25.0
18C	Alabaster & Welcomme (1962) Dissolved Oxygen at 3.8 mg/L	juvenile	13.6531	-0.4264	5	-0.9742	0.1	30.2
							0.25	29.3
							0.5	28.6
							1	27.8
							2	27.1
							4	26.4
							6	26.0
							7	25.9
							8	25.7
							9	25.6
							10	25.5
							12	25.3
							14	25.2
							16	25.0

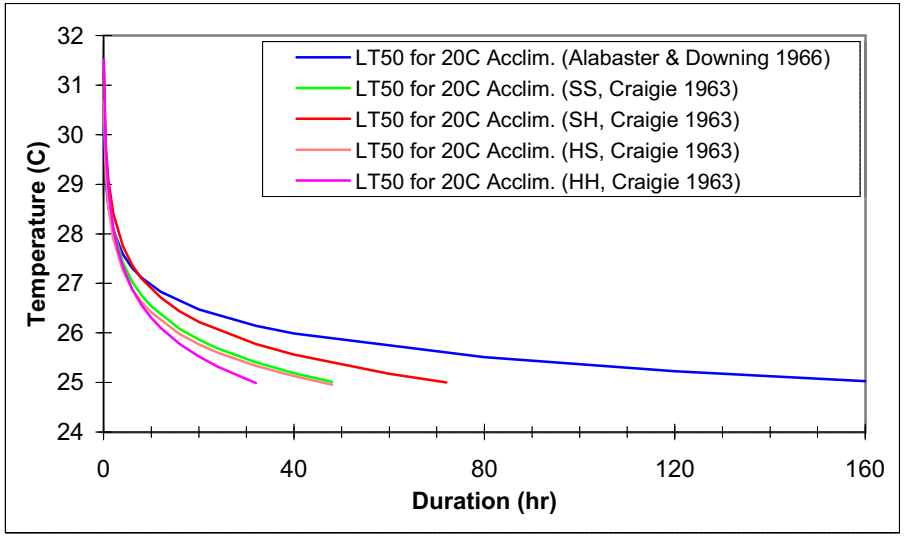




RAINBOW TROUT

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
20C	Alabaster & Downing (1966)	juvenile	19.6250	-0.6250	2	---	0.1	30.2
							0.25	29.5
							0.5	29.0
							1	28.6
							2	28.1
							4	27.6
							6	27.3
							8	27.1
							12	26.8
							20	26.5
							32	26.1
							40	26.0
							80	25.5
							120	25.2
							160	25.0
20C	Craigie (1963)	yearling	14.6405	-0.4470	3	-0.9787	0.1	31.0
	Raised in soft water, tested in soft water (SS)						0.25	30.1
							0.5	29.4
							1	28.8
							2	28.1
							4	27.4
							6	27.0
							8	26.8
							10	26.5
							16	26.1
							20	25.9
							24	25.7
							32	25.4
							40	25.2
							48	25.0
20C	Craigie (1963)	yearling	15.0392	-0.4561	3	-0.9917	0.1	31.3
	Raised in soft water, tested in hard water (SH)						0.25	30.4
							0.5	29.7
							1	29.1
							2	28.4





RAINBOW TROUT

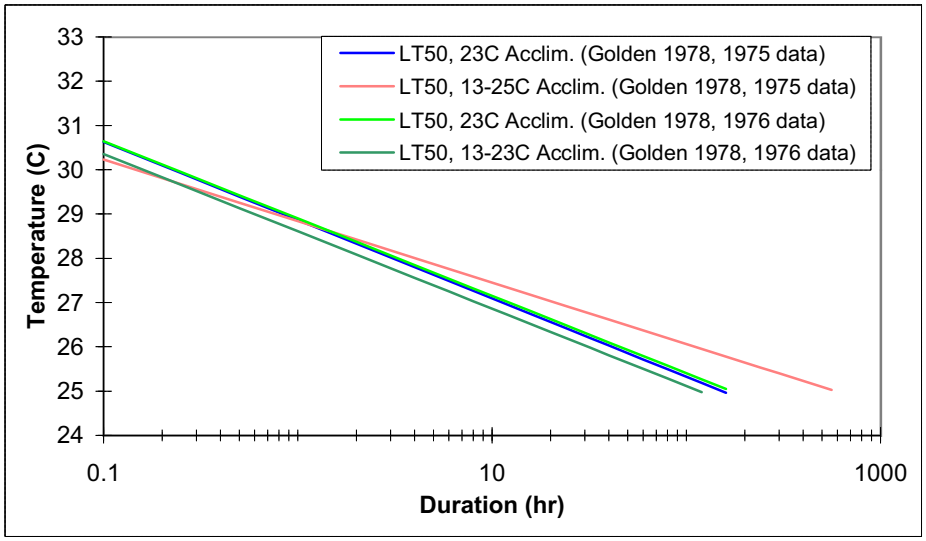
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
							4	27.8
							6	27.4
							8	27.1
							12	26.7
							16	26.4
							20	26.2
							32	25.8
							40	25.6
							60	25.2
							72	25.0
20C	Craigie (1963)	yearling	15.1473	-0.4683	3	-0.9781	0.1	30.7
	Raised in hard water, tested in soft water (HS)						0.25	29.8
							0.5	29.2
							1	28.5
							2	27.9
							4	27.3
							6	26.9
							8	26.6
							10	26.4
							16	26.0
							20	25.8
							24	25.6
							32	25.3
							40	25.1
							48	25.0
20C	Craigie (1963)	yearling	12.8718	-0.3837	3	-0.9841	0.1	31.5
	Raised in hard water, tested in hard water (HH)						0.25	30.5
							0.5	29.7
							1	28.9
							2	28.1
							3	27.7
							4	27.3
							6	26.9
							8	26.6
							10	26.3
							12	26.1

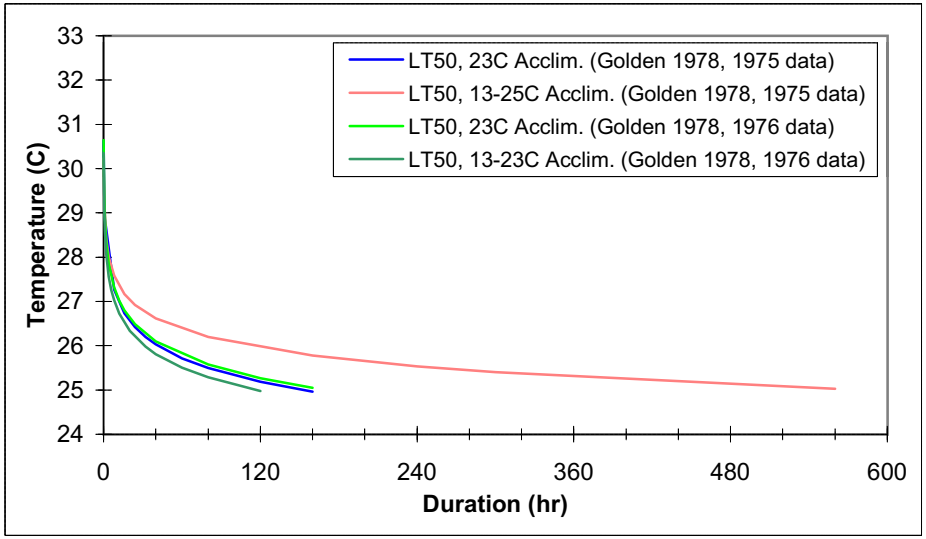
RAINBOW TROUT

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
							16	25.8
							20	25.5
							24	25.3
							32	25.0

CUTTHROAT TROUT

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
23C	Golden (1978)	juvenile	18.092	-0.56523	?	-0.996	0.1	30.6
	1975 tests, hatchery only						0.25	29.9
							0.5	29.4
							1	28.9
							8	27.3
							16	26.7
							24	26.4
							32	26.2
							40	26.0
							60	25.7
							80	25.5
							120	25.2
							160	25.0
13-25C	Golden (1978)	juvenile	22.543	-0.71999	?	-0.999	0.1	30.2
	1975 tests, hatchery only						0.25	29.7
							0.5	29.3
							2	28.4
							4	28.0
							8	27.6
							16	27.2
							24	26.9
							40	26.6
							80	26.2
							160	25.8
							240	25.5
							300	25.4
							560	25.0
23C	Golden (1978)	juvenile	18.3166	-0.5723	?	-0.990	0.1	30.6
	1976 tests, hatchery and wild trout data pooled						0.25	30.0
							0.5	29.4
							1	28.9
							2	28.4
							4	27.8
							8	27.3
							12	27.0
							16	26.8
							24	26.5
							40	26.1
							80	25.6
							120	25.3
							160	25.0



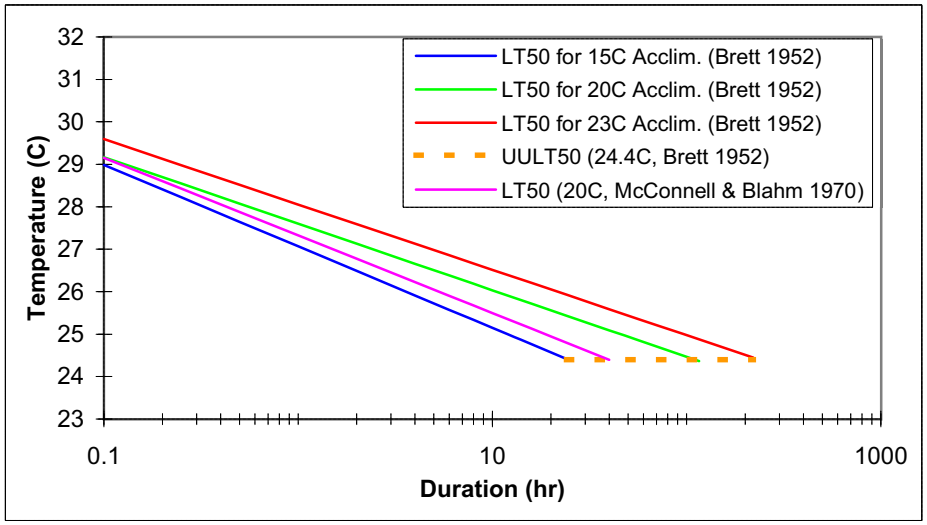


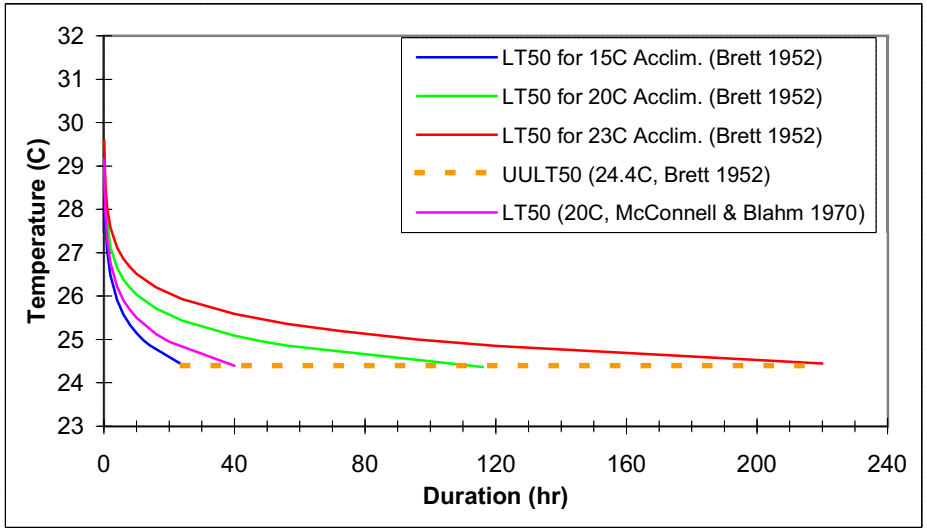
CUTTHROAT TROUT

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
13-23C	Golden (1978)	juvenile	18.1515	-0.5723	?	-0.992	0.1	30.4
	1976 tests, hatchery and wild trout data pooled						0.25	29.7
							0.5	29.1
							1	28.6
							2	28.1
							4	27.6
							6	27.3
							8	27.0
							12	26.7
							20	26.3
							32	26.0
							40	25.8
							60	25.5
							80	25.3
							120	25.0

SOCKEYE SALMON

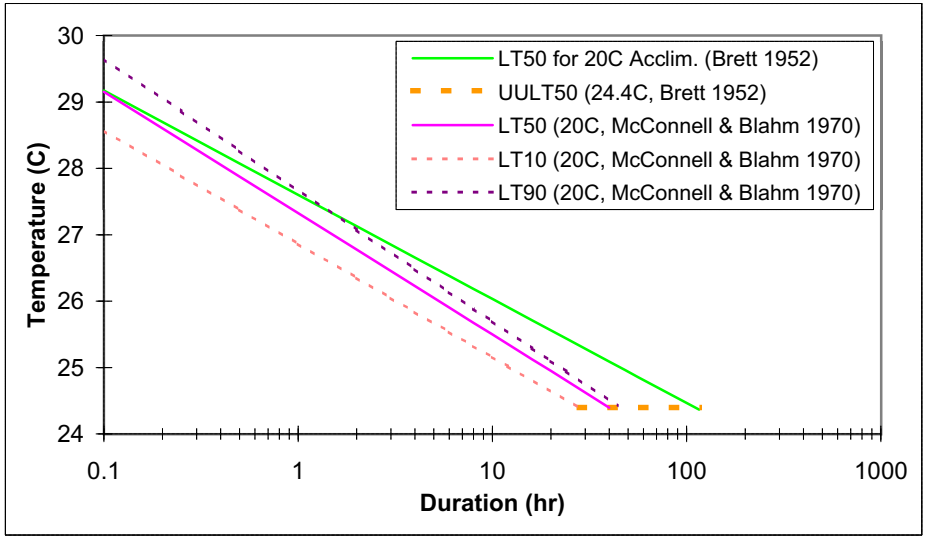
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
15C	Brett(1952)	juv. frshwtr fry	15.8799	-0.5210	7	-0.9126	0.1	29.0
							0.25	28.2
							0.5	27.6
							1	27.1
							2	26.5
							4	25.9
							6	25.6
							8	25.3
							10	25.1
							12	25.0
							13	24.9
							14	24.9
							24	24.4
20C	Brett(1952)	juv. frshwtr fry	19.3821	-0.6378	5	-0.9602	0.1	29.2
							0.25	28.5
							0.5	28.1
							2	27.1
							4	26.7
							6	26.4
							8	26.2
							10	26.0
							16	25.7
							24	25.4
							40	25.1
							48	25.0
							56	24.9
							116	24.4
23C	Brett(1952)	juv. frshwtr fry	20.0020	-0.6496	4	-0.9981	0.1	29.6
							0.25	29.0
							0.5	28.5
							1	28.1
							2	27.6
							4	27.1
							6	26.9
							8	26.7
							10	26.5
							16	26.2
							24	25.9
							40	25.6
							56	25.4
							72	25.2
							96	25.0
							120	24.9
							220	24.4

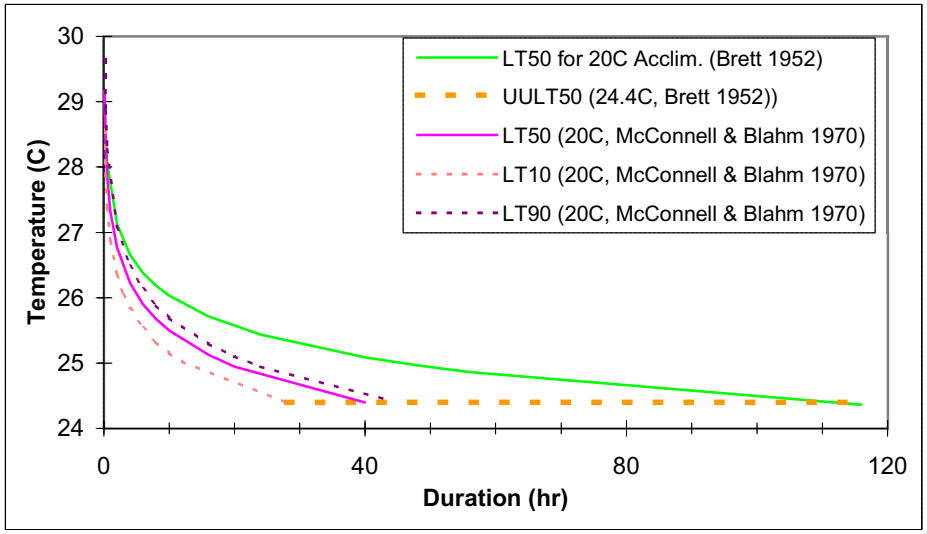




SOCKEYE SALMON

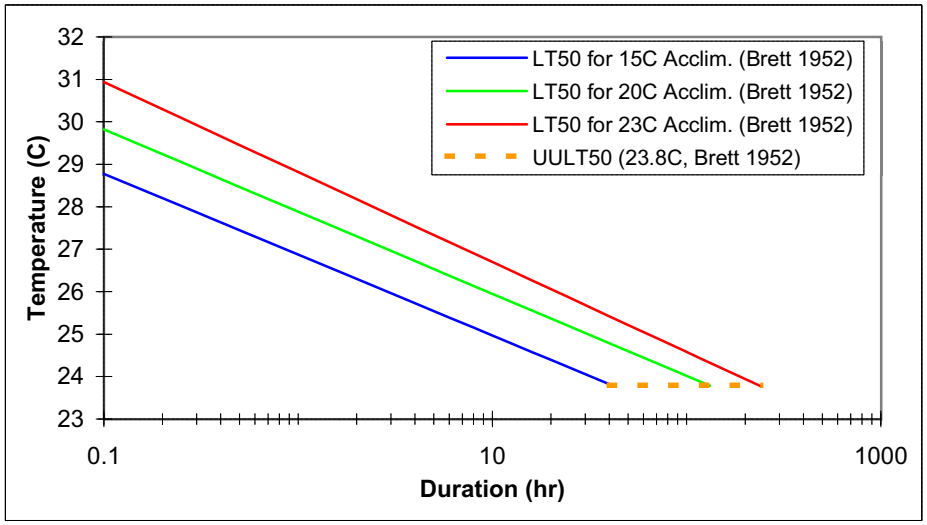
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
20C	McConnell & Blahm (1970) unpublished data	juvenile (under yearling)	16.7328	-0.5473	6	-0.9552	0.1	29.2
							0.25	28.4
							0.5	27.9
							1	27.3
							2	26.8
							4	26.2
							6	25.9
							8	25.7
							10	25.5
							16	25.1
							20	24.9
							40	24.4
20C	McConnell & Blahm (1970) unpublished data 10% mortality	juvenile (under yearling)	17.5227	-0.5861	6	-0.9739	0.1	28.6
							0.25	27.9
							0.5	27.4
							1	26.9
							2	26.3
							3	26.0
							4	25.8
							6	25.5
							8	25.3
							10	25.2
							12	25.0
							28	24.4
20C	McConnell & Blahm (1970) unpublished data 90% mortality	juvenile (under yearling)	15.7823	-0.5061	6	-0.9539	0.1	29.6
							0.25	28.9
							0.5	28.3
							2	27.1
							4	26.5
							6	26.1
							8	25.9
							10	25.7
							16	25.3
							20	25.1
							24	24.9
							44	24.4

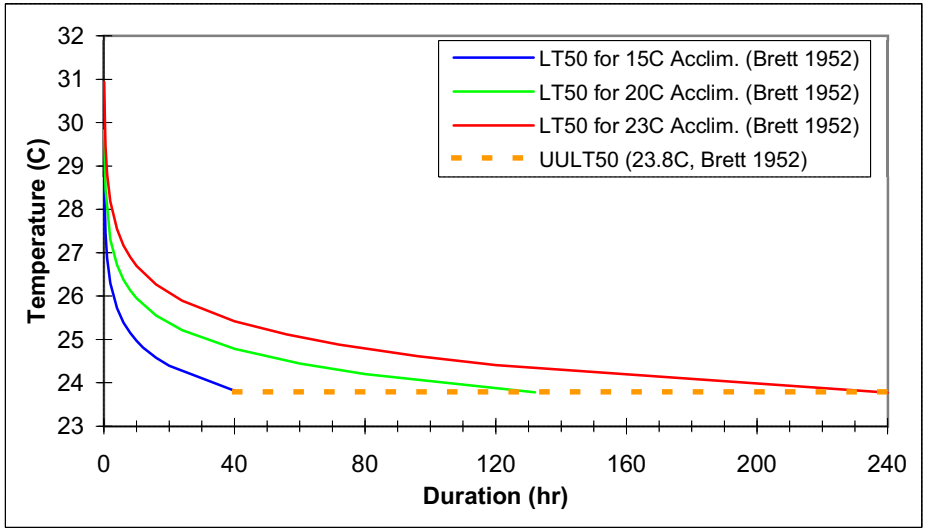




CHUM SALMON

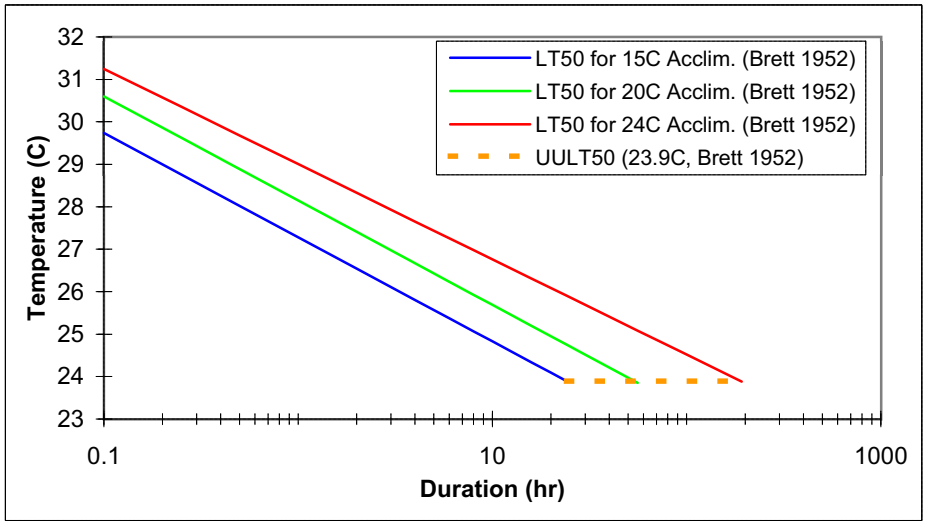
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
15C	Brett(1952)	juv. frshwtr fry	15.8911	-0.5252	8	-0.9070	0.1	28.8
							0.25	28.0
							0.5	27.4
							1	26.9
							2	26.3
							4	25.7
							6	25.4
							8	25.2
							10	25.0
							12	24.8
							16	24.6
							20	24.4
							40	23.8
20C	Brett(1952)	juv. frshwtr fry	16.1894	-0.5168	9	-0.9750	0.1	29.8
							0.25	29.1
							0.5	28.5
							2	27.3
							4	26.7
							6	26.4
							8	26.1
							10	26.0
							16	25.6
							24	25.2
							40	24.8
							60	24.4
							80	24.2
							132	23.8
23C	Brett(1952)	juv. frshwtr fry	15.3825	-0.4721	4	-0.9652	0.1	30.9
							0.25	30.1
							0.5	29.5
							1	28.8
							2	28.2
							4	27.5
							6	27.2
							8	26.9
							10	26.7
							16	26.3
							24	25.9
							40	25.4
							56	25.1
							72	24.9
							96	24.6
							120	24.4
							240	23.8

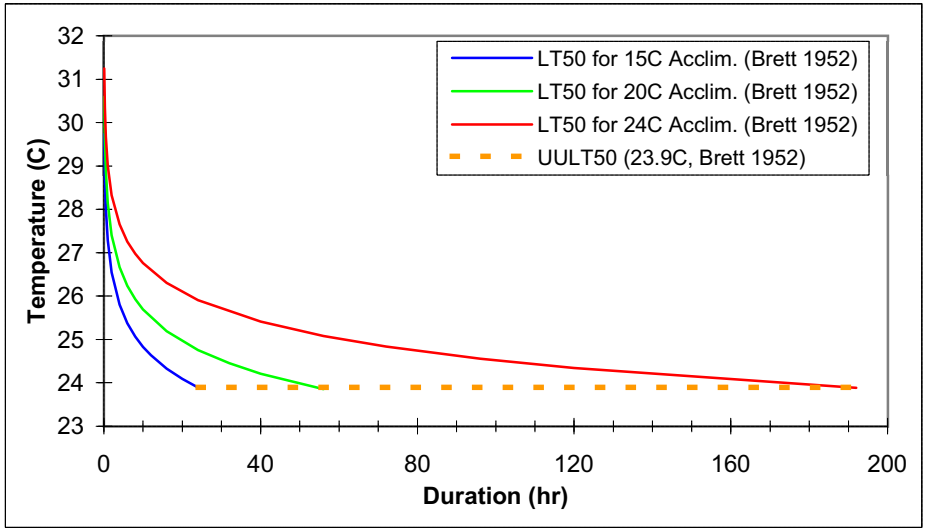




PINK SALMON

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT50(C)
15C	Brett(1952)	juv. frshwtr fry	12.8937	-0.4074	8	-0.9884	0.1	29.7
							0.25	28.8
							0.5	28.0
							1	27.3
							2	26.5
							4	25.8
							6	25.4
							8	25.1
							10	24.8
							12	24.6
							16	24.3
							20	24.1
							24	23.9
20C	Brett(1952)	juv. frshwtr fry	*13.2444*	-0.4074	7	-0.9681	0.1	30.6
			16.2444 in EPA (1977), but				0.25	29.6
			the resulting curve does not				0.5	28.9
			match the information				1	28.1
			presented in Brett (1952)				2	27.4
			<Fig. 5>				4	26.7
							6	26.2
							8	25.9
							10	25.7
							16	25.2
							24	24.8
							32	24.5
							40	24.2
							56	23.9
24C	Brett(1952)	juv. frshwtr fry	14.7111	-0.4459	6	-0.9690	0.1	31.2
							0.25	30.4
							0.5	29.7
							1	29.0
							2	28.3
							4	27.7
							6	27.3
							8	27.0
							10	26.8
							16	26.3
							24	25.9
							40	25.4
							56	25.1
							72	24.8
							96	24.6
							120	24.3
							192	23.9





APPENDIX C
ATTACHMENT 2

LT50 to LT10 Conversion Factors for Pacific Salmon: Sockeye and Chinook.

Attacment 2: Sockeye Salmon (20C Acclimation Temperature)
From McConnell & Blahm (1970) unpublished data

16.7328	-0.5473	17.5227	-0.5861	LT10/LT50	Delta T
Time(hr)	LT50(C)	Time(hr)	LT10(C)	Ratio	(C)
0.1	29.2	0.1	28.6	98.00%	0.6
0.25	28.4	0.25	27.9	98.12%	0.5
0.5	27.9	0.5	27.4	98.21%	0.5
1	27.3	1	26.9	98.31%	0.5
2	26.8	2	26.3	98.41%	0.4
3	26.5	3	26.0	98.47%	0.4
4	26.2	4	25.8	98.52%	0.4
6	25.9	6	25.5	98.58%	0.4
8	25.7	8	25.3	98.63%	0.4
12	25.4	12	25.0	98.70%	0.3
16	25.1	16	24.8	98.74%	0.3
20	24.9	20	24.6	98.78%	0.3
24	24.8	24	24.5	98.81%	0.3
32	24.6	32	24.3	98.86%	0.3
40	24.4	40	24.1	98.90%	0.3
60	24.1	60	23.8	98.98%	0.2
80	23.8	80	23.6	99.03%	0.2

Attachment 2: Chinook Salmon (20C Acclimation Temperature)
From Blahm & McConnell (1970) unpublished data

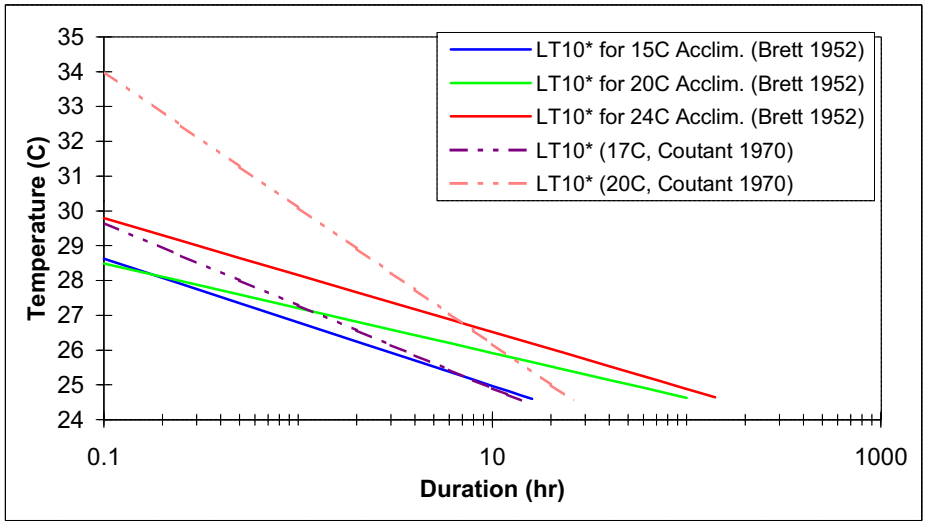
Spring Run						Fall Run						
21.3981	-0.7253	22.6664	-0.7797	LT10/LT50	Delta T	22.2124	21.6756	-0.7526	21.6756	-0.7438	LT10/LT50	Delta T
Time(hr)	LT50(C)	Time(hr)	LT10(C)	Ratio	(C)	Time(hr)	Time(hr)	LT50(C)	Time(hr)	LT10(C)	Ratio	(C)
0.1	28.4	0.1	28.1	98.74%	0.4	0.1	0.1	28.5	0.1	28.1	98.65%	0.4
0.25	27.9	0.25	27.6	98.86%	0.3	0.25	0.25	28.0	0.25	27.6	98.60%	0.4
0.5	27.5	0.5	27.2	98.95%	0.3	0.5	0.5	27.6	0.5	27.2	98.56%	0.4
2	26.6	2	26.4	99.13%	0.2	2	2	26.8	2	26.3	98.49%	0.4
4	26.2	4	26.0	99.23%	0.2	4	4	26.4	4	25.9	98.44%	0.4
6	26.0	6	25.8	99.28%	0.2	6	6	26.1	6	25.7	98.42%	0.4
8	25.8	8	25.6	99.33%	0.2	8	8	26.0	8	25.5	98.40%	0.4
10	25.7	10	25.5	99.36%	0.2	10	10	25.8	10	25.4	98.39%	0.4
16	25.4	16	25.2	99.43%	0.1	16	16	25.6	16	25.1	98.36%	0.4
24	25.1	24	25.0	99.49%	0.1	24	24	25.3	24	24.9	98.33%	0.4
40	24.8	40	24.7	99.57%	0.1	40	40	25.0	40	24.6	98.30%	0.4
60	24.6	60	24.5	99.64%	0.1	60	60	24.8	60	24.4	98.27%	0.4
80	24.4	80	24.3	99.68%	0.1	80	80	24.6	80	24.2	98.25%	0.4
100	24.3	100	24.2	99.72%	0.1	100	100	24.5	100	24.1	98.24%	0.4

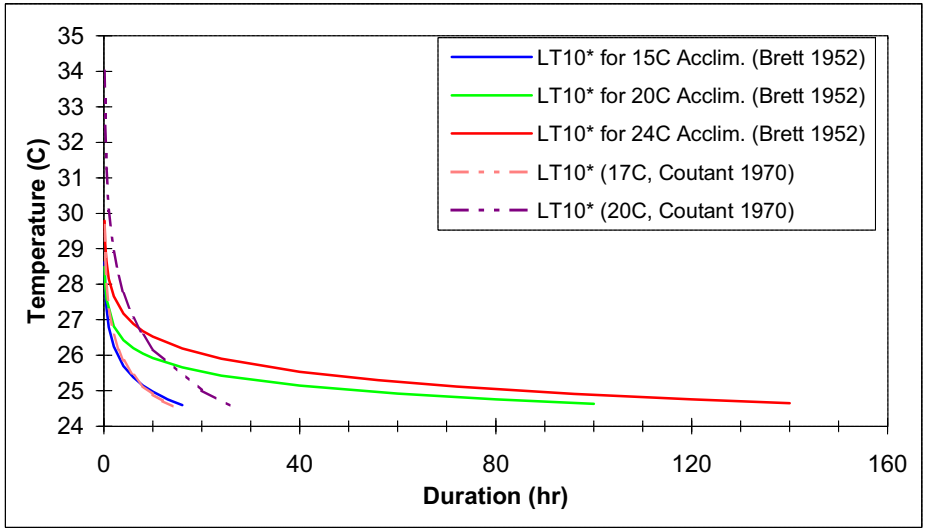
APPENDIX C
ATTACHMENT 3

Acute Effects of Temperature on Salmonids: Times to 10% Mortality (LT10) In Relation to Temperature.

CHINOOK SALMON -- Estimated LT10s

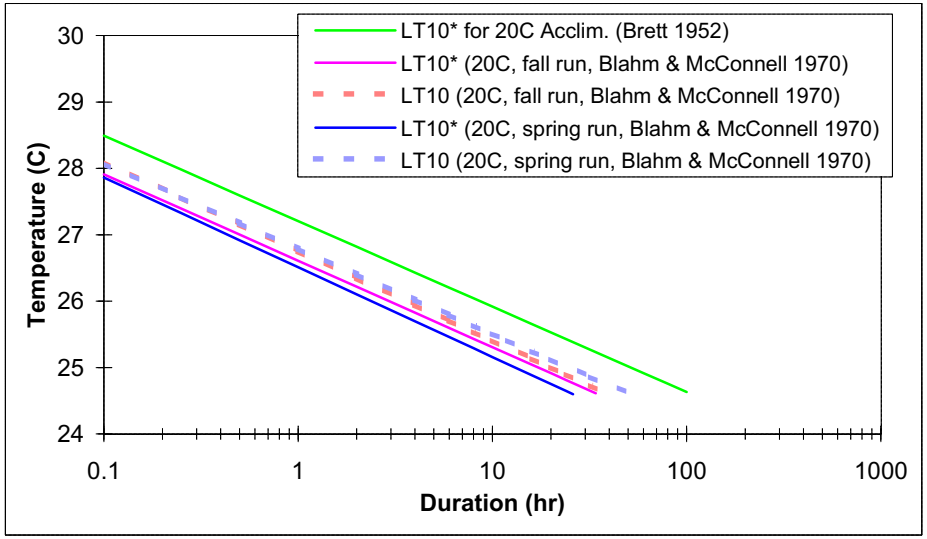
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
15C	Brett(1952)	juv. frshwtr fry	16.4454	-0.5364	4	-0.9906	0.1	28.6
							0.25	27.9
							0.5	27.3
							1	26.8
							2	26.2
							4	25.7
							6	25.4
							8	25.1
							10	25.0
							12	24.8
							13	24.8
							14	24.7
							16	24.6
20C	Brett(1952)	juv. frshwtr fry	22.9065	-0.7611	7	-0.9850	0.1	28.5
							0.25	28.0
							0.5	27.6
							2	26.8
							4	26.4
							6	26.2
							8	26.0
							10	25.9
							16	25.7
							24	25.4
							40	25.1
							60	24.9
							80	24.8
							100	24.6
24C	Brett(1952)	juv. frshwtr fry	18.9940	-0.5992	9	-0.9923	0.1	29.8
							0.25	29.1
							0.5	28.6
							1	28.2
							2	27.7
							4	27.2
							6	26.9
							8	26.7
							10	26.5
							16	26.2
							24	25.9
							40	25.5
							56	25.3
							72	25.1
							96	24.9
							120	24.8
							140	24.6

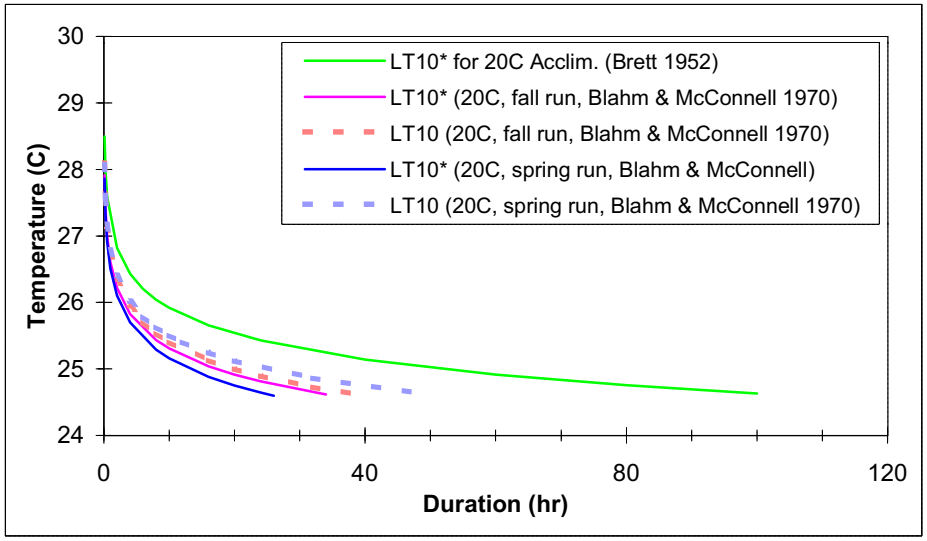




CHINOOK SALMON -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
17C	Coutant (1970)	"Jacks" (1-2 yrs)	13.2502	-0.4121	4	-0.8206	0.1	29.7
							0.25	28.7
							0.5	28.0
							1	27.3
							2	26.6
	The 17C and 19C temperatures were Columbia River temperatures (at Grand Rapids Dam) during fall migrations two different years.						3	26.1
							4	25.8
							6	25.4
							8	25.1
							10	24.9
							12	24.7
							14	24.6
19C	Coutant (1970)	"Jacks" (1-2 yrs)	9.4683	-0.2504	4	-0.9952	0.1	34.0
							0.25	32.5
							0.5	31.3
							1	30.1
							2	28.9
							3	28.2
							4	27.7
							6	27.1
							8	26.6
							10	26.2
							20	25.0
							26	24.6
20C	Blahm & McConnell (1970) unpublished data	juv. (spring run)	21.3981	-0.7253	3	-0.9579	0.1	27.9
							0.25	27.3
							0.5	26.9
							1	26.5
							2	26.1
							4	25.7
							8	25.3
							10	25.2
							16	24.9
							20	24.8
							24	24.6
							26	24.6



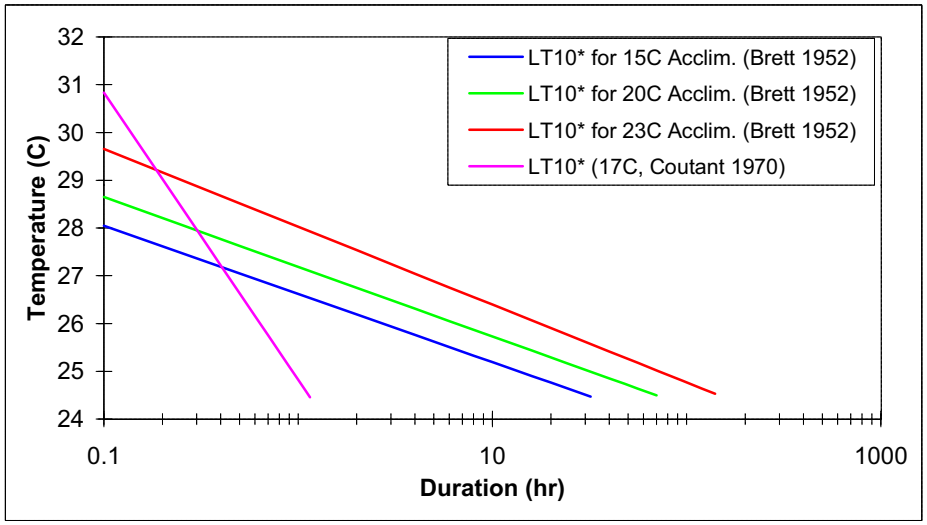


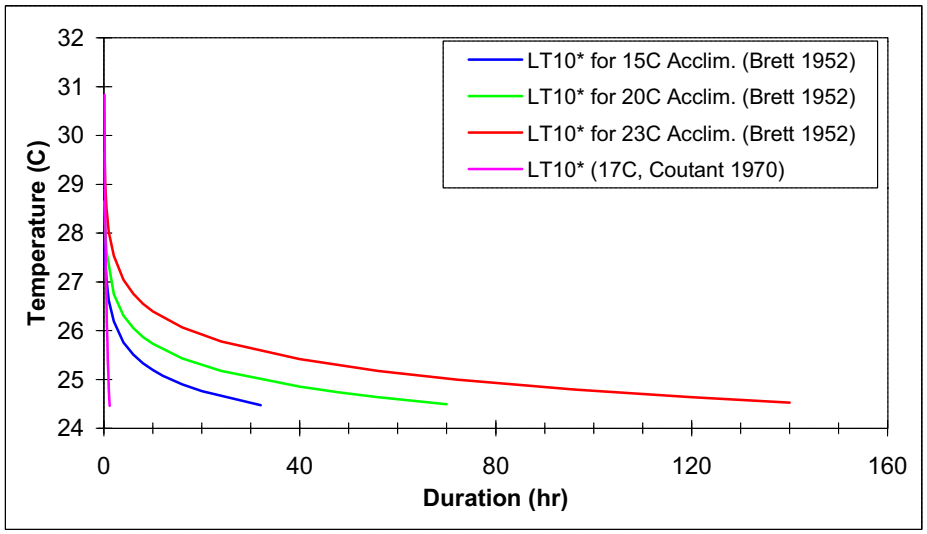
CHINOOK SALMON -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
20C	Blahm & McConnell (1970) unpublished data 10% mortality *NOT ADJUSTED*	juv. (spring run)	22.6664	-0.7797	4	-0.9747	0.1	28.1
							0.25	27.6
							0.5	27.2
							1	26.8
							2	26.4
							4	26.0
							6	25.8
							8	25.6
							10	25.5
							12	25.4
							16	25.2
							20	25.1
							32	24.9
							48	24.6
20C	Blahm & McConnell (1970) unpublished data	juv. (fall run)	22.2124	-0.7526	4	-0.9738	0.1	27.9
							0.25	27.4
							0.5	27.0
							1	26.6
							2	26.2
							4	25.8
							8	25.4
							10	25.3
							16	25.0
							20	24.9
							24	24.8
							34	24.6
20C	Blahm & McConnell (1970) unpublished data 10% mortality *NOT ADJUSTED*	juv. (fall run)	21.6756	-0.7438	4	-0.9550	0.1	28.1
							0.25	27.6
							0.5	27.2
							1	26.8
							2	26.3
							4	25.9
							6	25.7
							8	25.5
							10	25.4
							16	25.1
							20	25.0
							24	24.9
							32	24.7
							40	24.6

COHO SALMON -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
15C	Brett(1952)	juv. frshwtr fry	20.4066	-0.6858	6	-0.9681	0.1	28.0
							0.25	27.5
							0.5	27.0
							1	26.6
							2	26.2
							4	25.8
							6	25.5
							8	25.3
							10	25.2
							12	25.1
							16	24.9
							20	24.8
							32	24.5
20C	Brett(1952)	juv. frshwtr fry	20.4022	-0.6713	4	-0.9985	0.1	28.6
							0.25	28.1
							0.5	27.6
							2	26.7
							4	26.3
							6	26.1
							8	25.9
							10	25.7
							16	25.4
							24	25.2
							40	24.8
							48	24.7
							56	24.6
							70	24.5
23C	Brett(1952)	juv. frshwtr fry	18.9736	-0.6013	5	-0.9956	0.1	29.7
							0.25	29.0
							0.5	28.5
							1	28.0
							2	27.5
							4	27.0
							6	26.8
							8	26.6
							10	26.4
							16	26.1
							24	25.8
							40	25.4
							56	25.2
							72	25.0
							96	24.8
							120	24.6
							140	24.5



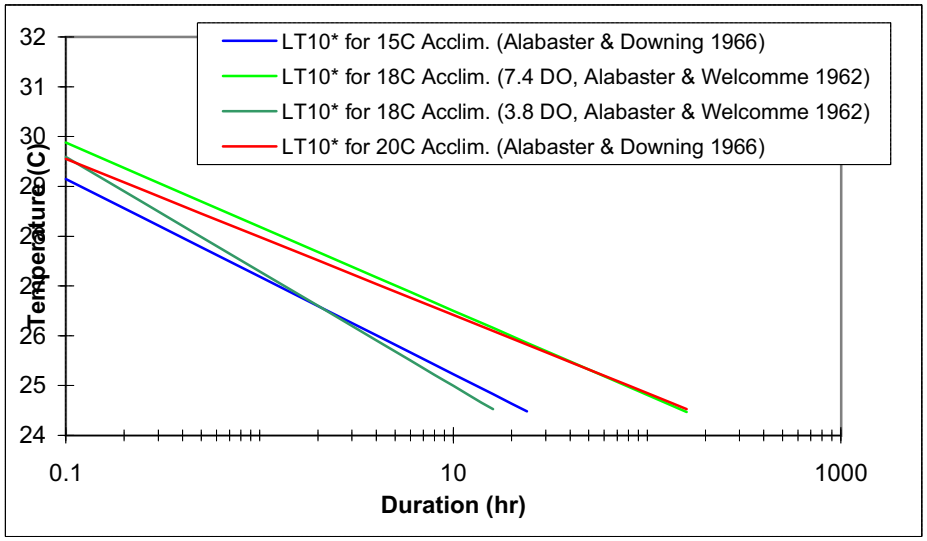


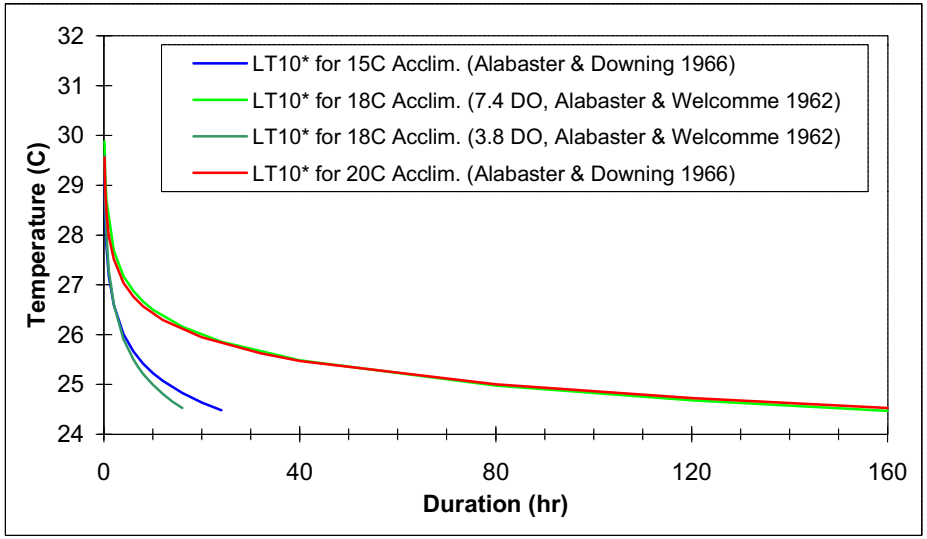
COHO SALMON -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
17C	Coutant (1970)	adult	5.9068	-0.1630	5	-0.9767	0.1	30.8
	Reported acclimation temp. was the Columbia River						0.2	29.0
	temp. (at Priest Rapids Dam) during fall migration.						0.3	28.0
							0.4	27.2
							0.5	26.6
							0.6	26.2
							0.7	25.8
							0.8	25.4
							0.9	25.1
							1	24.8
							1.1	24.6
							1.15	24.5

RAINBOW TROUT -- Estimated LT10s

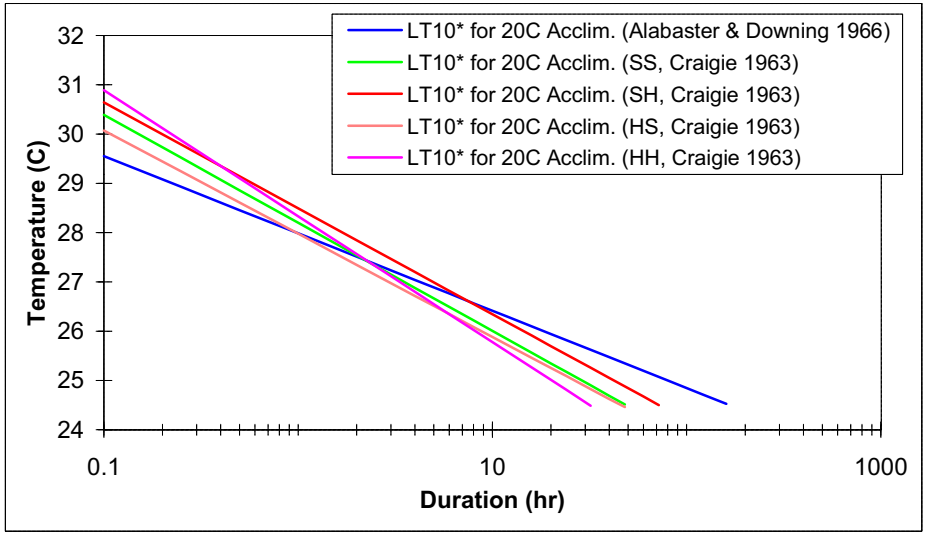
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
15C	Alabaster & Downing (1966)	juvenile	15.6500	-0.5000	2	---	0.1	29.1
							0.25	28.4
							0.5	27.8
							1	27.2
							2	26.6
							4	26.0
							6	25.7
							8	25.4
							10	25.2
							12	25.1
							16	24.8
							20	24.6
							24	24.5
18C	Alabaster & Welcomme (1962) Dissolved Oxygen at 7.4 mg/L	juvenile	18.4654	-0.5801	5	-0.9787	0.1	29.9
							0.25	29.2
							0.5	28.7
							2	27.7
							4	27.2
							6	26.9
							8	26.7
							10	26.5
							16	26.2
							24	25.9
							40	25.5
							80	25.0
							120	24.7
							160	24.5
18C	Alabaster & Welcomme (1962) Dissolved Oxygen at 3.8 mg/L	juvenile	13.6531	-0.4264	5	-0.9742	0.1	29.6
							0.25	28.7
							0.5	28.0
							1	27.3
							2	26.6
							4	25.9
							6	25.5
							7	25.4
							8	25.2
							9	25.1
							10	25.0
							12	24.8
							14	24.7
							16	24.5

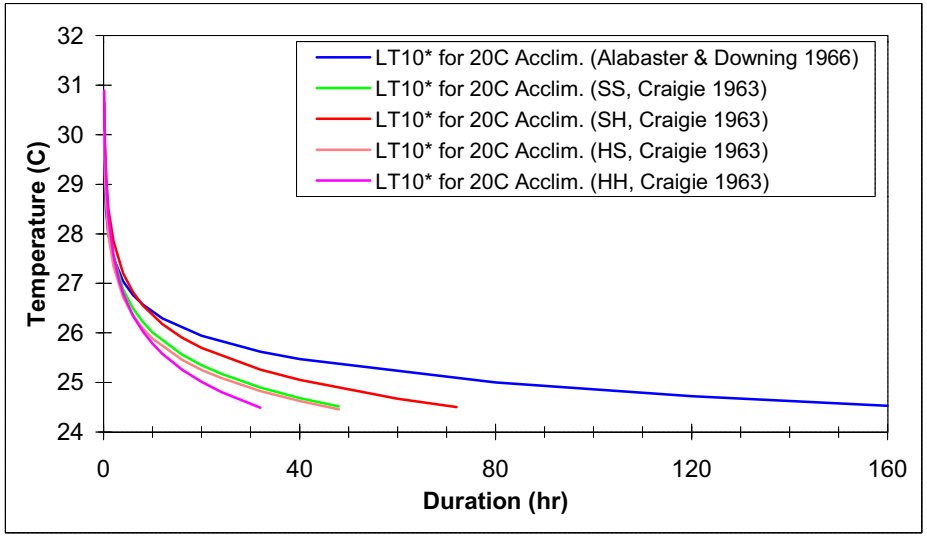




RAINBOW TROUT -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
20C	Alabaster & Downing (1966)	juvenile	19.6250	-0.6250	2	---	0.1	29.6
							0.25	28.9
							0.5	28.5
							1	28.0
							2	27.5
							4	27.0
							6	26.8
							8	26.6
							12	26.3
							20	25.9
							32	25.6
							40	25.5
							80	25.0
							120	24.7
							160	24.5
20C	Craigie (1963)	yearling	14.6405	-0.4470	3	-0.9787	0.1	30.4
	Raised in soft water, tested in soft water (SS)						0.25	29.5
							0.5	28.9
							1	28.2
							2	27.5
							4	26.9
							6	26.5
							8	26.2
							10	26.0
							16	25.6
							20	25.3
							24	25.2
							32	24.9
							40	24.7
							48	24.5





RAINBOW TROUT -- Estimated LT10s

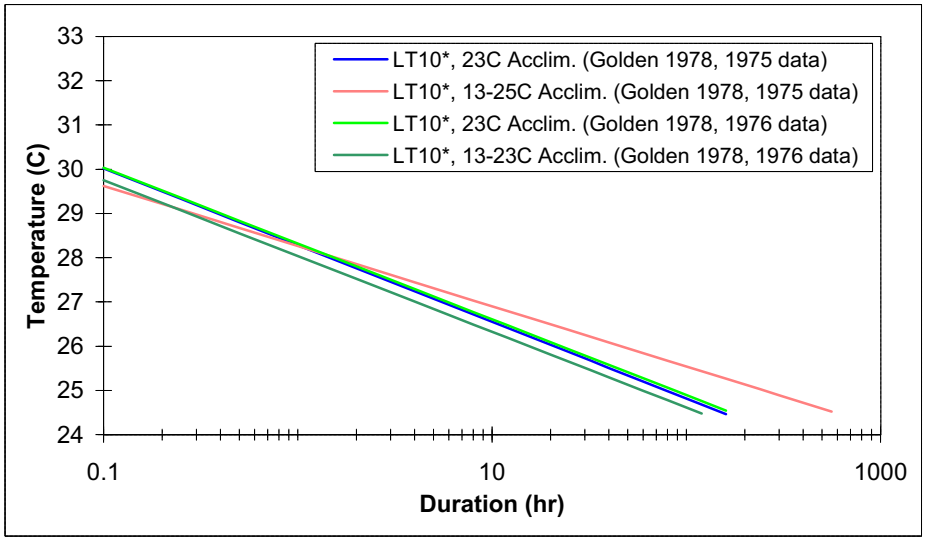
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
20C	Craigie (1963)	yearling	15.0392	-0.4561	3	-0.9917	0.1	30.6
	Raised in soft water, tested in hard water (SH)						0.25	29.8
							0.5	29.1
							1	28.5
							2	27.8
							4	27.2
							6	26.8
							8	26.6
							12	26.2
							16	25.9
							20	25.7
							32	25.3
							40	25.1
							60	24.7
							72	24.5
20C	Craigie (1963)	yearling	15.1473	-0.4683	3	-0.9781	0.1	30.1
	Raised in hard water, tested in soft water (HS)						0.25	29.2
							0.5	28.6
							1	28.0
							2	27.3
							4	26.7
							6	26.3
							8	26.1
							10	25.9
							16	25.5
							20	25.3
							24	25.1
							32	24.8
							40	24.6
							48	24.5

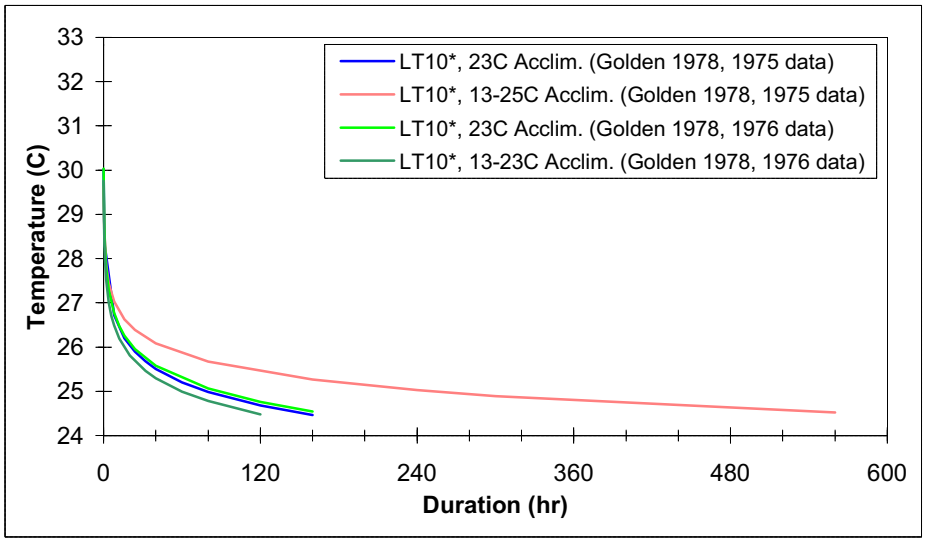
RAINBOW TROUT -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
20C	Craigie (1963)	yearling	12.8718	-0.3837	3	-0.9841	0.1	30.9
	Raised in hard water, tested in hard water (HH)						0.25	29.9
							0.5	29.1
							1	28.3
							2	27.6
							3	27.1
							4	26.8
							6	26.3
							8	26.0
							10	25.8
							12	25.6
							16	25.3
							20	25.0
							24	24.8
							32	24.5

CUTTHROAT TROUT -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
23C	Golden (1978)	juvenile	18.092	-0.56523	?	-0.996	0.1	30.0
	1975 tests, hatchery only						0.25	29.3
							0.5	28.8
							1	28.3
							8	26.7
							16	26.2
							24	25.9
							32	25.7
							40	25.5
							60	25.2
							80	25.0
							120	24.7
							160	24.5
13-25C	Golden (1978)	juvenile	22.543	-0.71999	?	-0.999	0.1	29.6
	1975 tests, hatchery only						0.25	29.1
							0.5	28.7
							2	27.9
							4	27.4
							8	27.0
							16	26.6
							24	26.4
							40	26.1
							80	25.7
							160	25.3
							240	25.0
							300	24.9
							560	24.5
23C	Golden (1978)	juvenile	18.3166	-0.5723	?	-0.990	0.1	30.0
	1976 tests, hatchery and wild trout data pooled						0.25	29.4
							0.5	28.8
							1	28.3
							2	27.8
							4	27.3
							8	26.8
							12	26.5
							16	26.3
							24	26.0
							40	25.6
							80	25.1
							120	24.8
							160	24.5



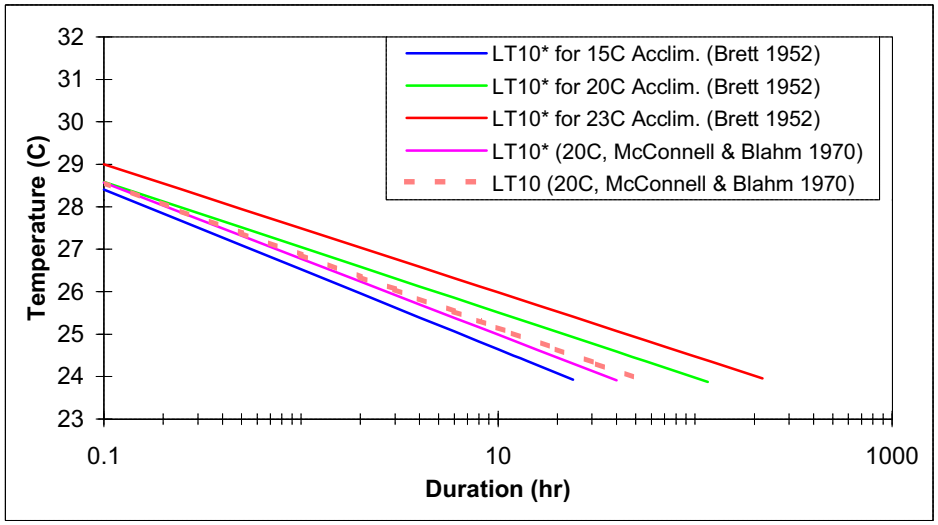


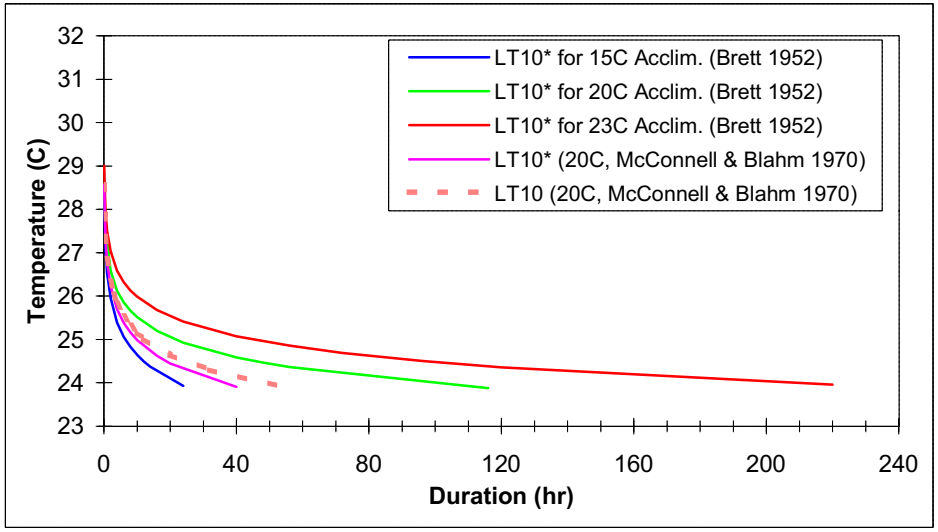
CUTTHROAT TROUT -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
13-23C	Golden (1978)	juvenile	18.1515	-0.5723	?	-0.992	0.1	29.7
	1976 tests, hatchery and wild trout data pooled						0.25	29.1
							0.5	28.6
							1	28.0
							2	27.5
							4	27.0
							6	26.7
							8	26.5
							12	26.2
							20	25.8
							32	25.5
							40	25.3
							60	25.0
							80	24.8
							120	24.5

SOCKEYE SALMON -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
15C	Brett(1952)	juv. frshwtr fry	15.8799	-0.5210	7	-0.9126	0.1	28.4
							0.25	27.7
							0.5	27.1
							1	26.5
							2	26.0
							4	25.4
							6	25.1
							8	24.8
							10	24.6
							12	24.5
							13	24.4
							14	24.4
							24	23.9
20C	Brett(1952)	juv. frshwtr fry	19.3821	-0.6378	5	-0.9602	0.1	28.6
							0.25	28.0
							0.5	27.5
							2	26.6
							4	26.1
							6	25.9
							8	25.7
							10	25.5
							16	25.2
							24	24.9
							40	24.6
							48	24.5
							56	24.4
							116	23.9
23C	Brett(1952)	juv. frshwtr fry	20.0020	-0.6496	4	-0.9981	0.1	29.0
							0.25	28.4
							0.5	27.9
							1	27.5
							2	27.0
							4	26.6
							6	26.3
							8	26.1
							10	26.0
							16	25.7
							24	25.4
							40	25.1
							56	24.9
							72	24.7
							96	24.5
							120	24.4
							220	24.0



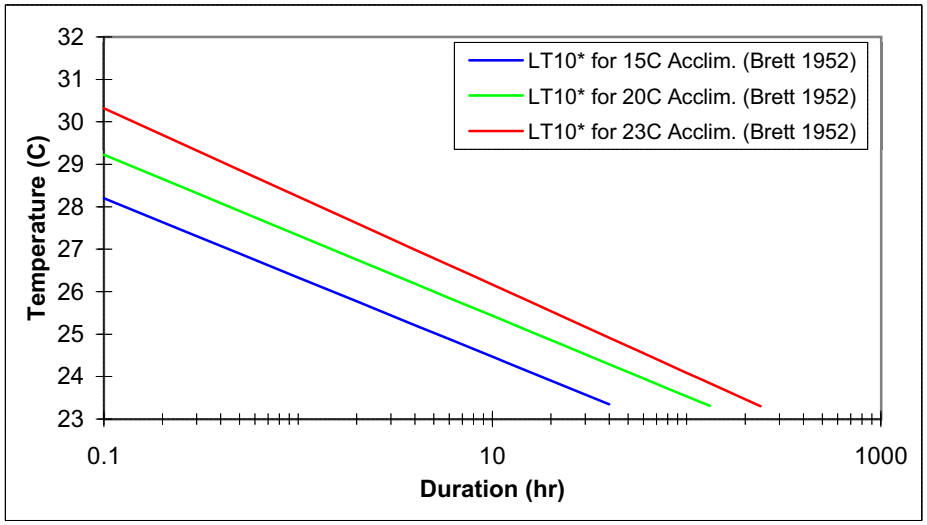


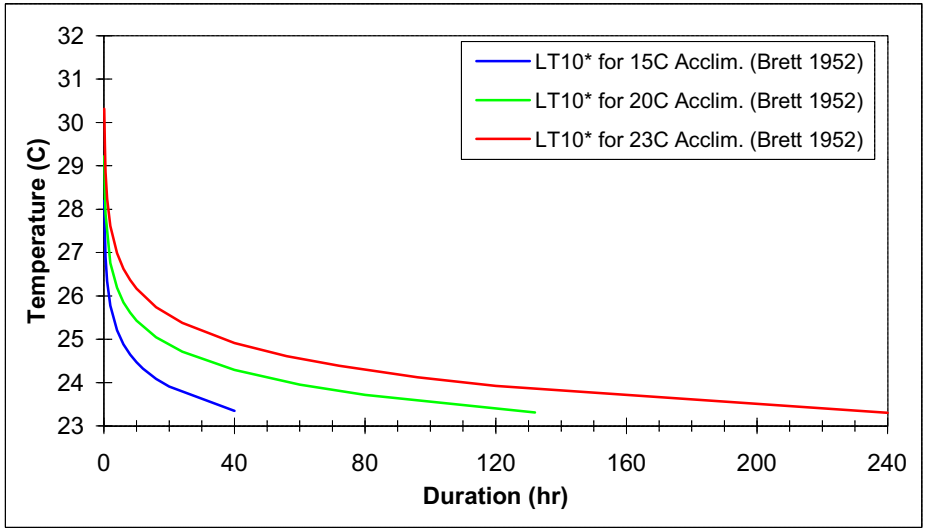
SOCKEYE SALMON -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
20C	McConnell & Blahm (1970) unpublished data	juvenile (under yearling)	16.7328	-0.5473	6	-0.9552	0.1	28.6
							0.25	27.9
							0.5	27.3
							1	26.8
							2	26.2
							4	25.7
							6	25.4
							8	25.2
							10	25.0
							16	24.6
							20	24.4
							40	23.9
20C	McConnell & Blahm (1970) unpublished data 10% mortality	juvenile (under yearling) *NOT ADJUSTED*	17.5227	-0.5861	6	-0.9739	0.1	28.6
							0.25	27.9
							0.5	27.4
							1	26.9
							2	26.3
							3	26.0
							4	25.8
							6	25.5
							8	25.3
							10	25.2
							12	25.0
							20	24.6
							32	24.3
							52	23.9

CHUM SALMON -- Estimated LT10s

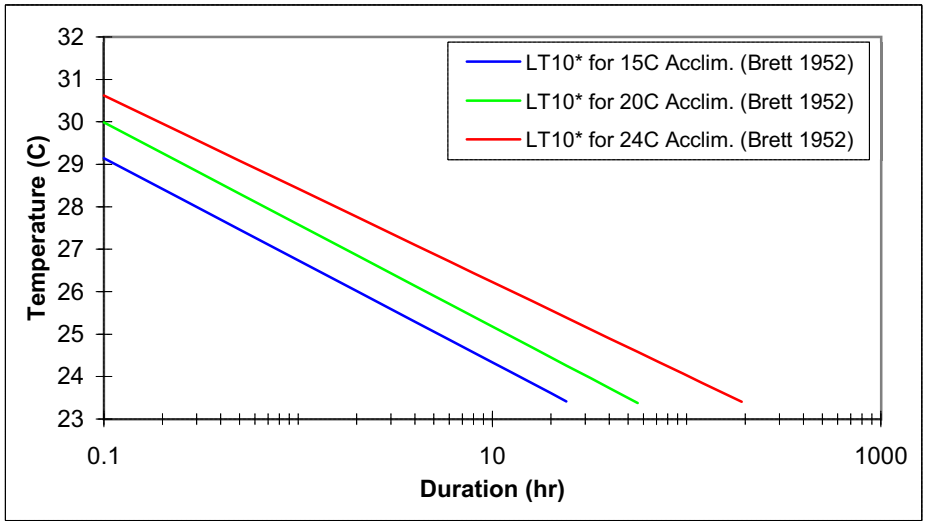
Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
15C	Brett(1952)	juv. frshwtr fry	15.8911	-0.5252	8	-0.9070	0.1	28.2
							0.25	27.5
							0.5	26.9
							1	26.3
							2	25.8
							4	25.2
							6	24.9
							8	24.6
							10	24.5
							12	24.3
							16	24.1
							20	23.9
							40	23.3
20C	Brett(1952)	juv. frshwtr fry	16.1894	-0.5168	9	-0.9750	0.1	29.2
							0.25	28.5
							0.5	27.9
							2	26.8
							4	26.2
							6	25.9
							8	25.6
							10	25.4
							16	25.0
							24	24.7
							40	24.3
							60	24.0
							80	23.7
							132	23.3
23C	Brett(1952)	juv. frshwtr fry	15.3825	-0.4721	4	-0.9652	0.1	30.3
							0.25	29.5
							0.5	28.9
							1	28.2
							2	27.6
							4	27.0
							6	26.6
							8	26.4
							10	26.2
							16	25.7
							24	25.4
							40	24.9
							56	24.6
							72	24.4
							96	24.1
							120	23.9
							240	23.3

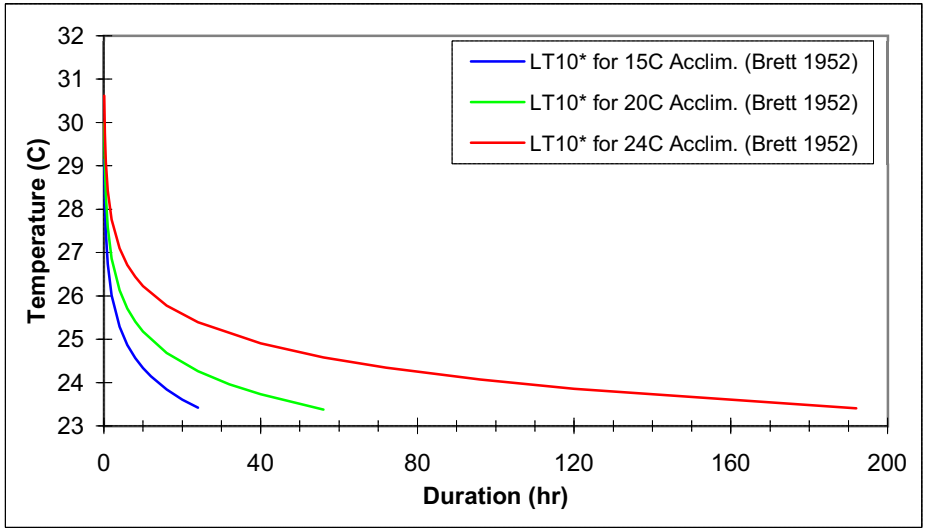




PINK SALMON -- Estimated LT10s

Acclim.	Source	Age/Size	a	b	N	r	Time(hr)	LT10*(C)
15C	Brett(1952)	juv. frshwtr fry	12.8937	-0.4074	8	-0.9884	0.1	29.1
							0.25	28.2
							0.5	27.5
							1	26.7
							2	26.0
							4	25.3
							6	24.9
							8	24.6
							10	24.3
							12	24.1
							16	23.8
							20	23.6
							24	23.4
20C	Brett(1952)	juv. frshwtr fry	*13.2444*	-0.4074	7	-0.9681	0.1	30.0
			16.2444 in EPA (1977), but				0.25	29.0
			the resulting curve does not				0.5	28.3
			match the information				1	27.6
			presented in Brett (1952)				2	26.9
			<Fig. 5>				4	26.1
							6	25.7
							8	25.4
							10	25.2
							16	24.7
							24	24.3
							32	24.0
							40	23.7
							56	23.4
24C	Brett(1952)	juv. frshwtr fry	14.7111	-0.4459	6	-0.9690	0.1	30.6
							0.25	29.7
							0.5	29.1
							1	28.4
							2	27.8
							4	27.1
							6	26.7
							8	26.4
							10	26.2
							16	25.8
							24	25.4
							40	24.9
							56	24.6
							72	24.3
							96	24.1
							120	23.9
							192	23.4





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Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems

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Abstract. Numerical sediment quality guidelines (SQGs) for freshwater ecosystems have previously been developed using a variety of approaches. Each approach has certain advantages and limitations which influence their application in the sediment quality assessment process. In an effort to focus on the agreement among these various published SQGs, consensus-based SQGs were developed for 28 chemicals of concern in freshwater sediments (*i.e.*, metals, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and pesticides). For each contaminant of concern, two SQGs were developed from the published SQGs, including a threshold effect concentration (TEC) and a probable effect concentration (PEC). The resultant SQGs for each chemical were evaluated for reliability using matching sediment chemistry and toxicity data from field studies conducted throughout the United States. The results of this evaluation indicated that most of the TECs (*i.e.*, 21 of 28) provide an accurate basis for predicting the absence of sediment toxicity. Similarly, most of the PECs (*i.e.*, 16 of 28) provide an accurate basis for predicting sediment toxicity. Mean PEC quotients were calculated to evaluate the combined effects of multiple contaminants in sediment. Results of the evaluation indicate that the incidence of toxicity is highly correlated to the mean PEC quotient (R^2 = 0.98 for 347 samples). It was concluded that the consensus-based SQGs provide a reliable basis for assessing sediment quality conditions in freshwater ecosystems.

Numerical sediment quality guidelines (SQGs; including sediment quality criteria, sediment quality objectives, and sediment quality standards) have been developed by various federal, state, and provincial agencies in North America for both freshwater and marine ecosystems. Such SQGs have been used in numerous applications, including designing monitoring programs, interpreting historical data, evaluating the need for detailed sediment quality assessments, assessing the quality of prospective dredged materials, conducting remedial investigations and ecological risk assessments, and developing sediment quality remediation objectives (Long and MacDonald 1998). Numerical SQGs have also been used by many scientists and managers to identify contaminants of concern in aquatic ecosystems and to rank areas of concern on a regional or national basis (*e.g.*, US EPA 1997a). It is apparent, therefore, that numerical SQGs, when used in combination with other tools, such as sediment toxicity tests, represent a useful approach for assessing the quality of freshwater and marine sediments (MacDonald *et al.* 1992; US EPA 1992, 1996a, 1997a; Adams *et al.* 1992; Ingersoll *et al.* 1996, 1997).

The SQGs that are currently being used in North America have been developed using a variety of approaches. The approaches that have been selected by individual jurisdictions depend on the receptors that are to be considered (*e.g.*, sediment-dwelling organisms, wildlife, or humans), the degree of protection that is to be afforded, the geographic area to which the values are intended to apply (*e.g.*, site-specific, regional, or national), and their intended uses (*e.g.*, screening tools, remediation objectives, identifying toxic and not-toxic samples, bioaccumulation assessment). Guidelines for assessing sediment quality relative to the potential for adverse effects on sediment-dwelling organisms in freshwater systems have been derived using a combination of theoretical and empirical approaches, primarily including the equilibrium partitioning approach (EqPA; Di Toro *et al.* 1991; NYSDEC 1994; US EPA 1997a), screening level concentration approach (SLCA; Persaud *et al.* 1993), effects range approach (ERA; Long and Morgan 1991; Ingersoll *et al.* 1996), effects level approach (ELA; Smith *et al.* 1996; Ingersoll *et al.* 1996), and apparent effects threshold approach (AETA; Cubbage *et al.* 1997). Application of these methods has resulted in the derivation of numerical SQGs for many chemicals of potential concern in freshwater sediments.

Selection of the most appropriate SQGs for specific applications can be a daunting task for sediment assessors. This task is particularly challenging because limited guidance is currently available on the recommended uses of the various SQGs. In addition, the numerical SQGs for any particular substance can differ by several orders of magnitude, depending on the derivation procedure and intended use. The SQG selection process is further complicated due to uncertainties regarding

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the bioavailability of sediment-associated contaminants, the effects of covarying chemicals and chemical mixtures, and the ecological relevance of the guidelines (MacDonald *et al.* 2000). It is not surprising, therefore, that controversies have occurred over the proper use of these sediment quality assessment tools.

This paper represents the third in a series that is intended to address some of the difficulties associated with the assessment of sediment quality conditions using various numerical SQGs. The first paper was focused on resolving the "mixture paradox" that is associated with the application of empirically derived SQGs for individual PAHs. In this case, the paradox was resolved by developing consensus SQGs for ΣPAHs (*i.e.*, total PAHs; Swartz 1999). The second paper was directed at the development and evaluation of consensus-based sediment effect concentrations for total PCBs, which provided a basis for resolving a similar mixture paradox for that group of contaminants using empirically derived SQGs (MacDonald *et al.* 2000). The results of these investigations demonstrated that consensus-based SQGs provide a unifying synthesis of the existing guidelines, reflect causal rather than correlative effects, and account for the effects of contaminant mixtures in sediment (Swartz 1999).

The purpose of this third paper is to further address uncertainties associated with the application of numerical SQGs by providing a unifying synthesis of the published SQGs for freshwater sediments. To this end, the published SQGs for 28 chemical substances were assembled and classified into two categories in accordance with their original narrative intent. These published SQGs were then used to develop two consensus-based SQGs for each contaminant, including a threshold effect concentration (TEC; below which adverse effects are not expected to occur) and a probable effect concentration (PEC; above which adverse effects are expected to occur more often than not). An evaluation of resultant consensus-based SQGs was conducted to provide a basis for determining the ability of these tools to predict the presence, absence, and frequency of sediment toxicity in field-collected sediments from various locations across the United States.

Materials and Methods

Derivation of the Consensus-Based SQGs

A stepwise approach was used to develop the consensus-based SQGs for common contaminants of concern in freshwater sediments. As a first step, the published SQGs that have been derived by various investigators for assessing the quality of freshwater sediments were collated. Next, the SQGs obtained from all sources were evaluated to determine their applicability to this study. To facilitate this evaluation, the supporting documentation for each of the SQGs was reviewed. The collated SQGs were further considered for use in this study if: (1) the methods that were used to derive the SQGs were readily apparent; (2) the SQGs were based on empirical data that related contaminant concentrations to harmful effects on sediment-dwelling organisms or were intended to be predictive of effects on sediment-dwelling organisms (*i.e.*, not simply an indicator of background contamination); and (3) the SQGs had been derived on a *de novo* basis (*i.e.*, not simply adopted from another jurisdiction or source). It was not the intent of this paper to collate bioaccumulation-based SQGs.

The SQGs that were expressed on an organic carbon–normalized basis were converted to dry weight–normalized values at 1% organic carbon (MacDonald *et al.* 1994, 1996; US EPA 1997a). The dry weight–normalized SQGs were utilized because the results of previous studies have shown that they predicted sediment toxicity as well or better than organic carbon–normalized SQGs in field-collected sediments (Barrick *et al.* 1988; Long *et al.* 1995; Ingersoll *et al.* 1996; US EPA 1996a; MacDonald 1997).

The effects-based SQGs that met the selection criteria were then grouped to facilitate the derivation of consensus-based SQGs (Swartz 1999). Specifically, the previously published SQGs for the protection of sediment-dwelling organisms in freshwater ecosystems were grouped into two categories according to their original narrative intent, including TECs and PECs. The TECs were intended to identify contaminant concentrations below which harmful effects on sediment-dwelling organisms were not expected. TECs include threshold effect levels (TELs; Smith *et al.* 1996; US EPA 1996a), effect range low values (ERLs; Long and Morgan 1991), lowest effect levels (LELs; Persaud *et al.* 1993), minimal effect thresholds (METs; EC and MENVIQ 1992), and sediment quality advisory levels (SQALs; US EPA 1997a). The PECs were intended to identify contaminant concentrations above which harmful effects on sediment-dwelling organisms were expected to occur frequently (MacDonald *et al.* 1996; Swartz 1999). PECs include probable effect levels (PELs; Smith *et al.* 1996; US EPA 1996a), effect range median values (ERMs; Long and Morgan 1991); severe effect levels (SELs; Persaud *et al.* 1993), and toxic effect thresholds (TETs; EC and MENVIQ 1992; Table 1).

Following classification of the published SQGs, consensus-based TECs were calculated by determining the geometric mean of the SQGs that were included in this category (Table 2). Likewise, consensus-based PECs were calculated by determining the geometric mean of the PEC-type values (Table 3). The geometric mean, rather than the arithmetic mean or median, was calculated because it provides an estimate of central tendency that is not unduly affected by extreme values and because the distributions of the SQGs were not known (MacDonald *et al.* 2000). Consensus-based TECs or PECs were calculated only if three of more published SQGs were available for a chemical substance or group of substances.

Evaluation of the SQGs

The consensus-based SQGs were critically evaluated to determine if they would provide effective tools for assessing sediment quality conditions in freshwater ecosystems. Specifically, the reliability of the individual or combined consensus-based TECs and PECs for assessing sediment quality conditions was evaluated by determining their predictive ability. In this study, predictive ability is defined as the ability of the various SQGs to correctly classify field-collected sediments as toxic or not toxic, based on the measured concentrations of chemical contaminants. The predictive ability of the SQGs was evaluated using a three-step process.

In the first step of the SQG evaluation process, matching sediment chemistry and biological effects data were compiled for various freshwater locations in the United States. Because the data sets were generated for a wide variety of purposes, each study was evaluated to assure the quality of the data used for evaluating the predictive ability of the SQGs (Long *et al.* 1998; Ingersoll and MacDonald 1999). As a result of this evaluation, data from the following freshwater locations were identified for use in this paper: Grand Calumet River and Indiana Harbor Canal, IN (Hoke *et al.* 1993; Giesy *et al.* 1993; Burton 1994; Dorkin 1994); Indiana Harbor, IN (US EPA 1993a, 1996a, 1996b); Buffalo River, NY (US EPA 1993c, 1996a); Saginaw River, MI (US EPA 1993b, 1996a); Clark Fork River, MT (USFWS 1993); Milltown Reservoir, MT (USFWS 1993); Lower Columbia River, WA (Johnson and Norton 1988); Lower Fox River and Green Bay, WI (Call *et al.* 1991); Potomac River, DC (Schlekat *et al.* 1994; Wade *et al.* 1994; Velinsky *et al.* 1994); Trinity River, TX (Dickson *et al.* 1989; US EPA 1996a); Upper Mississippi River, MN to MO (US EPA 1996a, 1997b);

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Table 1. Descriptions of the published freshwater SQGs that have been developed using various approaches

Type of SQG	Acronym	Approach	Description	Reference
Threshold effect concentration SQGs				
Lowest effect level	LEL	SLCA	Sediments are considered to be clean to marginally polluted. No effects on the majority of sediment-dwelling organisms are expected below this concentration.	Persaud *et al.* (1993)
Threshold effect level	TEL	WEA	Represents the concentration below which adverse effects are expected to occur only rarely.	Smith *et al.* (1996)
Effect range—low	ERL	WEA	Represents the chemical concentration below which adverse effects would be rarely observed.	Long and Morgan (1991)
Threshold effect level for *Hyalella azteca* in 28-day tests	TEL-HA28	WEA	Represents the concentration below which adverse effects on survival or growth of the amphipod *Hyalella azteca* are expected to occur only rarely (in 28-day tests).	US EPA (1996a); Ingersoll *et al.* (1996)
Minimal effect threshold	MET	SLCA	Sediments are considered to be clean to marginally polluted. No effects on the majority of sediment-dwelling organisms are expected below this concentration.	EC and MENVIQ (1992)
Chronic equilibrium partitioning threshold	SQAL	EqPA	Represents the concentration in sediments that is predicted to be associated with concentrations in the interstitial water below a chronic water quality criterion. Adverse effects on sediment-dwelling organisms are predicted to occur only rarely below this concentration.	Bolton *et al.* (1985); Zarba (1992); US EPA (1997a)
Probable effect concentration SQGs				
Severe effect level	SEL	SLCA	Sediments are considered to be heavily polluted. Adverse effects on the majority of sediment-dwelling organisms are expected when this concentration is exceeded.	Persaud *et al.* (1993)
Probable effect level	PEL	WEA	Represents the concentration above which adverse effects are expected to occur frequently.	Smith *et al.* (1996)
Effect range—median	ERM	WEA	Represents the chemical concentration above which adverse effects would frequently occur.	Long and Morgan (1991)
Probable effect level for *Hyalella azteca* in 28-day tests	PEL-HA28	WEA	Represents the concentration above which adverse effects on survival or growth of the amphipod *Hyalella azteca* are expected to occur frequently (in 28-day tests).	US EPA (1996a); Ingersoll *et al.* (1996)
Toxic effect threshold	TET	SLCA	Sediments are considered to be heavily polluted. Adverse effects on sediment-dwelling organisms are expected when this concentration is exceeded.	EC and MENVIQ (1992)

and Waukegan Harbor, IL (US EPA 1996a; Kemble *et al.* 1999). These studies provided 17 data sets (347 sediment samples) with which to evaluate the predictive ability of the SQGs. These studies also represented a broad range in both sediment toxicity and contamination; roughly 50% of these samples were found to be toxic based on the results of the various toxicity tests (the raw data from these studies are summarized in Ingersoll and MacDonald 1999).

In the second step of the evaluation, the measured concentration of each substance in each sediment sample was compared to the corresponding SQG for that substance. Sediment samples were predicted to be not toxic if the measured concentrations of a chemical substance were lower than the corresponding TEC. Similarly, samples were predicted to be toxic if the corresponding PECs were exceeded in field-collected sediments. Samples with contaminant concentrations between the TEC and PEC were neither predicted to be toxic nor nontoxic (*i.e.*, the individual SQGs are not intended to provide guidance within this range of concentrations). The comparisons of measured concentrations to the SQGs were conducted for each of the 28 chemicals of concern for which SQGs were developed.

In the third step of the evaluation, the accuracy of each prediction

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Table 2. Sediment quality guidelines for metals in freshwater ecosystems that reflect TECs (*i.e.*, below which harmful effects are unlikely to be observed)

	Threshold Effect Concentrations						
Substance	TEL	LEL	MET	ERL	TEL-HA28	SQAL	Consensus-Based TEC
Metals (in mg/kg DW)							
Arsenic	5.9	6	7	33	11	NG	9.79
Cadmium	0.596	0.6	0.9	5	0.58	NG	0.99
Chromium	37.3	26	55	80	36	NG	43.4
Copper	35.7	16	28	70	28	NG	31.6
Lead	35	31	42	35	37	NG	35.8
Mercury	0.174	0.2	0.2	0.15	NG	NG	0.18
Nickel	18	16	35	30	20	NG	22.7
Zinc	123	120	150	120	98	NG	121
Polycyclic aromatic hydrocarbons (in µg/kg DW)							
Anthracene	NG	220	NG	85	10	NG	57.2
Fluorene	NG	190	NG	35	10	540	77.4
Naphthalene	NG	NG	400	340	15	470	176
Phenanthrene	41.9	560	400	225	19	1,800	204
Benz[a]anthracene	31.7	320	400	230	16	NG	108
Benzo(a)pyrene	31.9	370	500	400	32	NG	150
Chrysene	57.1	340	600	400	27	NG	166
Dibenz[a,h]anthracene	NG	60	NG	60	10	NG	33.0
Fluoranthene	111	750	600	600	31	6,200	423
Pyrene	53	490	700	350	44	NG	195
Total PAHs	NG	4,000	NG	4,000	260	NG	1,610
Polychlorinated biphenyls (in µg/kg DW)							
Total PCBs	34.1	70	200	50	32	NG	59.8
Organochlorine pesticides (in µg/kg DW)							
Chlordane	4.5	7	7	0.5	NG	NG	3.24
Dieldrin	2.85	2	2	0.02	NG	110	1.90
Sum DDD	3.54	8	10	2	NG	NG	4.88
Sum DDE	1.42	5	7	2	NG	NG	3.16
Sum DDT	NG	8	9	1	NG	NG	4.16
Total DDTs	7	7	NG	3	NG	NG	5.28
Endrin	2.67	3	8	0.02	NG	42	2.22
Heptachlor epoxide	0.6	5	5	NG	NG	NG	2.47
Lindane (gamma-BHC)	0.94	3	3	NG	NG	3.7	2.37

TEL = Threshold effect level; dry weight (Smith *et al.* 1996)
LEL = Lowest effect level, dry weight (Persaud *et al.* 1993)
MET = Minimal effect threshold; dry weight (EC and MENVIQ 1992)
ERL = Effect range low; dry weight (Long and Morgan 1991)
TEL-HA28 = Threshold effect level for Hyalella azteca; 28 day test; dry weight (US EPA 1996a)
SQAL = Sediment quality advisory levels; dry weight at 1% OC (US EPA 1997a)
NG = No guideline

was evaluated by determining if the sediment sample actually was toxic to one or more aquatic organisms, as indicated by the results of various sediment toxicity tests (Ingersoll and MacDonald 1999). The following responses of aquatic organisms to contaminant challenges (*i.e.*, toxicity test endpoints) were used as indicators of toxicity in this assessment (*i.e.*, sediment samples were designated as toxic if one or more of the following endpoints were significantly different from the responses observed in reference or control sediments), including amphipod (*Hyalella azteca*) survival, growth, or reproduction; mayfly (*Hexagenia limbata*) survival or growth; midge (*Chironomus tentans* or *Chironomus riparius*) survival or growth; midge deformities; oligochaete (*Lumbriculus variegatus*) survival; daphnid (*Ceriodaphnia dubia*) survival; and bacterial (*Photobacterium phosphoreum*) luminescence (*i.e.*, Microtox). In contrast, sediment samples were designated as nontoxic if they did not cause a significant response in at least one of these test endpoints. In this study, predictive ability was calculated as the ratio of the number of samples that were correctly classified as toxic or nontoxic to the total number of samples that were predicted to be toxic or nontoxic using the various SQGs (predictive ability was expressed as a percentage).

The criteria for evaluating the reliability of the consensus-based PECs were adapted from Long *et al.* (1998). These criteria are intended to reflect the narrative intent of each type of SQG (*i.e.*, sediment toxicity should be observed only rarely below the TEC and should be frequently observed above the PEC). Specifically, the individual TECs were considered to provide a reliable basis for assessing the quality of freshwater sediments if more than 75% of the sediment samples were correctly predicted to be not toxic. Similarly, the individual PEC for each substance was considered to be reliable if greater than 75% of the sediment samples were correctly predicted to toxic using the PEC. Therefore, the target levels of both false positives (*i.e.*, samples incorrectly classified as toxic) and false negatives (*i.e.*, samples incorrectly classified as not toxic) was 25% using the TEC and PEC. To assure that the results of the predictive ability evaluation were

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Table 3. Sediment quality guidelines for metals in freshwater ecosystems that reflect PECs (*i.e.*, above which harmful effects are likely to be observed)

	Probable Effect Concentrations					
Substance	PEL	SEL	TET	ERM	PEL-HA28	Consensus-Based PEC
Metals (in mg/kg DW)						
Arsenic	17	33	17	85	48	33.0
Cadmium	3.53	10	3	9	3.2	4.98
Chromium	90	110	100	145	120	111
Copper	197	110	86	390	100	149
Lead	91.3	250	170	110	82	128
Mercury	0.486	2	1	1.3	NG	1.06
Nickel	36	75	61	50	33	48.6
Zinc	315	820	540	270	540	459
Polycyclic aromatic hydrocarbons (in μg/kg DW)						
Anthracene	NG	3,700	NG	960	170	845
Fluorene	NG	1,600	NG	640	150	536
Naphthalene	NG	NG	600	2,100	140	561
Phenanthrene	515	9,500	800	1,380	410	1,170
Benz[a]anthracene	385	14,800	500	1,600	280	1,050
Benzo(a)pyrene	782	14,400	700	2,500	320	1,450
Chrysene	862	4,600	800	2,800	410	1,290
Fluoranthene	2,355	10,200	2,000	3,600	320	2,230
Pyrene	875	8,500	1,000	2,200	490	1,520
Total PAHs	NG	100,000	NG	35,000	3,400	22,800
Polychlorinated biphenyls (in μg/kg DW)						
Total PCBs	277	5,300	1,000	400	240	676
Organochlorine pesticides (in μg/kg DW)						
Chlordane	8.9	60	30	6	NG	17.6
Dieldrin	6.67	910	300	8	NG	61.8
Sum DDD	8.51	60	60	20	NG	28.0
Sum DDE	6.75	190	50	15	NG	31.3
Sum DDT	NG	710	50	7	NG	62.9
Total DDTs	4,450	120	NG	350	NG	572
Endrin	62.4	1,300	500	45	NG	207
Heptachlor Epoxide	2.74	50	30	NG	NG	16.0
Lindane (gamma-BHC)	1.38	10	9	NG	NG	4.99

PEL = Probable effect level; dry weight (Smith *et al.* 1996)
SEL = Severe effect level, dry weight (Persaud *et al.* 1993)
TET = Toxic effect threshold; dry weight (EC and MENVIQ 1992)
ERM = Effect range median; dry weight (Long and Morgan 1991)
PEL-HA28 = Probable effect level for *Hyalella azteca*; 28-day test; dry weight (US EPA 1996a)
NG = No guideline

not unduly influenced by the number of sediment samples available to conduct the evaluation of predictive ability, the various SQGs were considered to be reliable only if a minimum of 20 samples were included in the predictive ability evaluation (CCME 1995).

The initial evaluation of predictive ability was focused on determining the ability of each SQG when applied alone to classify samples correctly as toxic or nontoxic. Because field-collected sediments typically contain complex mixtures of contaminants, the predictability of these sediment quality assessment tools is likely to increase when the SQGs are used together to classify these sediments. For this reason, a second evaluation of the predictive ability of the SQGs was conducted to determine the incidence of effects above and below various mean PEC quotients (*i.e.*, 0.1, 0.5, 1.0, and 1.5). In this evaluation, mean PEC quotients were calculated using the methods of Long *et al.* (1998; *i.e.*, for each sediment sample, the average of the ratios of the concentration of each contaminant to its corresponding PEC was calculated for each sample), with only the PECs that were found to be reliable used in these calculations. The PEC for total PAHs (*i.e.*, instead of the PECs for the individual PAHs) was used in the calculation to avoid double counting of the PAH concentration data.

Results and Discussion

Derivation of Consensus-Based SQGs

A variety of approaches have been developed to support the derivation of numerical SQGs for the protection of sediment-dwelling organisms in the United States and Canada. MacDonald (1994), Ingersoll and MacDonald (1999), and MacDonald *et al.* (2000) provided reviews of the various approaches to SQG development, including descriptions of the derivation methods, the advantages and limitations of the resultant SQGs, and their recommended uses. This information,

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along with the supporting documentation that was obtained with the published SQGs, was used to evaluate the relevance of the various SQGs in this investigation.

Subsequently, the narrative descriptions of the various SQGs were used to classify the SQGs into appropriate categories (*i.e.*, TECs or PECs; Table 1). The results of this classification process indicated that six sets of SQGs were appropriate for deriving consensus-based TECs for the contaminants of concern in freshwater sediments, including: (1) TELs (Smith *et al.* 1996); (2) LELs (Persaud *et al.* 1993); (3) METs (EC and MENVIQ 1992); (4) ERLs (Long and Morgan 1991); (5) TELs for *H. azteca* in 28-day toxicity tests (US EPA 1996a; Ingersoll *et al.* 1996); and (6) SQALs (US EPA 1997a).

Several other SQGs were also considered for deriving consensus TECs, but they were not included for the following reasons. First, none of the SQGs that have been developed using data on the effects on sediment-associated contaminants in marine sediments only were used to derive TECs. However, the ERLs that were derived using both freshwater and marine data were included (*i.e.*, Long and Morgan 1991). Second, the ERLs that were developed by the US EPA (1996a) were not utilized because they were developed from the same data that were used to derive the TELs (*i.e.*, from several areas of concern in the Great Lakes). In addition, simultaneously extracted metals–acid volatile sulfide (SEM-AVS)–based SQGs were not used because they could not be applied without simultaneous measurements of SEM and AVS concentrations (Di Toro *et al.* 1990). None of the SQGs that were derived using the sediment background approach were used because they were not effects-based. Finally, no bioaccumulation-based SQGs were used to calculate the consensus-based TECs. The published SQGs that corresponded to TECs for metals, PAHs, PCBs, and organochlorine pesticides are presented in Table 2.

Based on the results of the initial evaluation, five sets of SQGs were determined to be appropriate for calculating consensus-based PECs for the contaminants of concern in freshwater sediments, including: (1) probable effect levels (PELs; Smith *et al.* 1996); (2) severe effect levels (SELs; (Persaud *et al.* 1993); (3) toxic effect thresholds (TETs; EC and MENVIQ 1992); (4) effect range median values (ERMs; Long and Morgan 1991); and (5) PELs for *H. azteca* in 28-day toxicity tests (US EPA 1996a; Ingersoll *et al.* 1996).

While several other SQGs were considered for deriving the consensus-based PECs, they were not included for the following reasons. To maximize the applicability of the resultant guidelines to freshwater systems, none of the SQGs that were developed for assessing the quality of marine sediments were used to derive the freshwater PECs. As was the case for the TECs, the ERMs that were derived using both freshwater and marine data (*i.e.*, Long and Morgan 1991) were included, however. The ERMs that were derived using data from various areas of concern in the Great Lakes (*i.e.*, US EPA 1996a) were not included to avoid duplicate representation of these data in the consensus-based PECs. In addition, none of the SEM-AVS–based SQGs were not used in this evaluation. Furthermore, none of the AET or related values (*e.g.*, NECs from Ingersoll *et al.* 1996; PAETs from Cubbage *et al.* 1997) were used because they were not considered to represent toxicity thresholds (rather, they represent contaminant concentrations above which harmful biological effects always occur). The published SQGs that corresponded to PECs for metals, PAHs, PCBs, and organochlorine pesticides are presented in Table 3.

For each substance, consensus-based TECs or PECs were derived if three or more acceptable SQGs were available. The consensus-based TECs or PECs were determined by calculating the geometric mean of the published SQGs and rounding to three significant digits. Application of these procedures facilitated the derivation of numerical SQGs for a total of 28 chemical substances, including 8 trace metals, 10 individual PAHs and PAH classes, total PCBs, and 9 organochlorine pesticides and degradation products. The consensus-based SQGs that were derived for the contaminants of concern in freshwater ecosystems are presented in Tables 2 and 3.

Predictive Ability of the Consensus-Based SQGs

Matching sediment chemistry and toxicity data from various locations in the United States were used to evaluate the predictive ability of the consensus-based SQGs in freshwater sediments. Within this independent data set, the overall incidence of toxicity was about 50% (*i.e.*, 172 of the 347 samples evaluated in these studies were identified as being toxic to one or more sediment-dwelling organisms). Therefore, 50% of the samples with contaminant concentrations below the TEC, between the TEC and the PEC, and above PECs would be predicted to be toxic if sediment toxicity was unrelated to sediment chemistry (*i.e.*, based on random chance alone).

The consensus-based TECs are intended to identify the concentrations of sediment-associated contaminants below which adverse effects on sediment-dwelling organisms are not expected to occur. Sufficient data were available to evaluate the predictive ability of all 28 consensus-based TECs. Based on the results of this assessment, the incidence of sediment toxicity was generally low at contaminant concentrations below the TECs (Table 4). Except for mercury, the predictive ability of the TECs for the trace metals ranged from 72% for chromium to 82% for copper, lead, and zinc. The predictive ability of the TECs for PAHs was similar to that for the trace metals, ranging from 71% to 83%. Among the organochlorine pesticides, the predictive ability of the TECs was highest for chlordane (85%) and lowest for endrin (71%). At 89%, the predictive ability of the TEC for total PCBs was the highest observed among the 28 substances for which SQGs were derived. Overall, the TECs for 21 substances, including four trace metals, eight individual PAHs, total PAHs, total PCBs, and seven organochlorine pesticides, were found to predict accurately the absence of toxicity in freshwater sediments (*i.e.*, predictive ability $\geq$75%; $\geq$20 samples below the TEC; Table 4). Therefore, the consensus-based TECs generally provide an accurate basis for predicting the absence of toxicity to sediment-dwelling organisms in freshwater sediments.

In contrast to the TECs, the consensus-based PECs are intended to define the concentrations of sediment-associated contaminants above which adverse effects on sediment-dwelling organisms are likely to be observed. Sufficient data were available to evaluate the PECs for 17 chemical substances, including 7 trace metals, 6 individual PAHs, total PAHs, total PCBs, and 2 organochlorine pesticides (*i.e.*, $\geq$20 samples predicted to be toxic). The results of the evaluation of predictive ability demonstrate that the PECs for 16 of the 17 substances meet the criteria for predictive ability that

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Table 4. Predictive ability of the consensus-based TECs in freshwater sediments

Substance	Number of Samples Evaluated	Number of Samples Predicted to Be Not Toxic	Number of Samples Observed to Be Not Toxic	Percentage of Samples Correctly Predicted to Be Not Toxic
Metals				
Arsenic	150	58	43	74.1
Cadmium	347	102	82	80.4
Chromium	347	132	95	72.0
Copper	347	158	130	82.3
Lead	347	152	124	81.6
Mercury	79	35	12	34.3
Nickel	347	184	133	72.3
Zinc	347	163	133	81.6
Polycyclic aromatic hydrocarbons				
Anthracene	129	75	62	82.7
Fluorene	129	93	66	71.0
Naphthalene	139	85	64	75.3
Phenanthrene	139	79	65	82.3
Benz(a)anthracene	139	76	63	82.9
Benzo(a)pyrene	139	81	66	81.5
Chrysene	139	80	64	80.0
Dibenz(a,h)anthracene	98	77	56	72.7
Fluoranthene	139	96	72	75.0
Pyrene	139	78	62	79.5
Total PAHs	167	81	66	81.5
Polychlorinated biphenyls				
Total PCBs	120	27	24	88.9
Organochlorine pesticides				
Chlordane	193	101	86	85.1
Dieldrin	180	109	91	83.5
Sum DDD	168	101	81	80.2
Sum DDE	180	105	86	81.9
Sum DDT	96	100	77	77.0
Total DDT	110	92	76	82.6
Endrin	170	126	89	70.6
Heptachlor epoxide	138	90	74	82.2
Lindane	180	121	87	71.9

were established in this study (Table 5). Among the seven individual trace metals, the predictive ability of the PECs ranged from 77% for arsenic to 94% for cadmium. The PECs for six individual PAHs and total PAHs were also demonstrated to be reliable, with predictive abilities ranging from 92% to 100%. The predictive ability of the PEC for total PCBs was 82%. While the PEC for Sum DDE was also found to be an accurate predictor of sediment toxicity (*i.e.*, predictive ability of 97%), the predictive ability of the PEC for chlordane was somewhat lower (*i.e.*, 73%). Therefore, the consensus-based PECs for arsenic, cadmium, chromium, copper, lead, nickel, zinc, naphthalene, phenanthrene, benz[a]anthracene, benzo(a)pyrene, chrysene, pyrene, total PAHs, total PCBs, and sum DDE provide an accurate basis for predicting toxicity in freshwater sediments from numerous locations in North America (*i.e.*, predictive ability of ≥75%; Table 5). Insufficient data were available (*i.e.*, fewer than 20 samples predicted to be toxic) to evaluate the PECs for mercury, anthracene, fluorene, fluoranthene, dieldrin, sum DDD, sum DDT, total DDT, endrin, heptachlor epoxide, and lindane (Table 5).

The two types of SQGs define three ranges of concentrations for each chemical substance. It is possible to assess the degree of concordance that exists between chemical concentrations and the incidence of sediment toxicity (Table 6; MacDonald *et al.* 1996) by determining the ratio of toxic samples to the total number of samples within each of these three ranges of concentrations for each substance. The results of this evaluation demonstrate that, for most chemical substances (*i.e.*, 20 of 28), there is a consistent and marked increase in the incidence of toxicity to sediment-dwelling organisms with increasing chemical concentrations. For certain substances, such as naphthalene, mercury, chlordane, dieldrin, and sum DDD, a lower PEC may have produced greater concordance between sediment chemistry and the incidence of effects. Insufficient data were available to evaluate the degree of concordance for several substances, such as endrin, heptachlor epoxide, and lindane. The positive correlation between contaminant concentrations and sediment toxicity that was observed increases the degree of confidence that can be placed in the SQGs for most of the substances.

While the SQGs for the individual chemical substances provide reliable tools for assessing sediment quality conditions, predictive ability should be enhanced when used together in assessments of sediment quality. In addition, it would be helpful to consider the magnitude of the exceedances of the SQGs in such assessments. Long *et al.* (1998) developed a procedure for evaluating the biological significance of contaminant mixtures through the application of mean PEC quotients. A three-

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Table 5. Predictive ability of the consensus-based PECs in freshwater sediments

Substance	Number of Samples Evaluated	Number of Samples Predicted to Be Toxic	Number of Samples Observed to Be Toxic	Percentage of Samples Correctly Predicted to Be Toxic
Metals				
Arsenic	150	26	20	76.9
Cadmium	347	126	118	93.7
Chromium	347	109	100	91.7
Copper	347	110	101	91.8
Lead	347	125	112	89.6
Mercury	79	4	4	100
Nickel	347	96	87	90.6
Zinc	347	120	108	90.0
Polycyclic aromatic hydrocarbons				
Anthracene	129	13	13	100
Fluorene	129	13	13	100
Naphthalene	139	26	24	92.3
Phenanthrene	139	25	25	100
Benz(a)anthracene	139	20	20	100
Benzo(a)pyrene	139	24	24	100
Chrysene	139	24	23	95.8
Fluoranthene	139	15	15	100
Pyrene	139	28	27	96.4
Total PAHs	167	20	20	100
Polychlorinated biphenyls				
Total PCBs	120	51	42	82.3
Organochlorine pesticides				
Chlordane	193	37	27	73.0
Dieldrin	180	10	10	100
Sum DDD	168	6	5	83.3
Sum DDE	180	30	29	96.7
Sum DDT	96	12	11	91.7
Total DDT	110	10	10	100
Endrin	170	0	0	NA
Heptachlor epoxide	138	8	3	37.5
Lindane	180	17	14	82.4

NA = Not applicable

step process is used in the present study to calculate mean PEC quotients. In the first step, the concentration of each substance in each sediment sample is divided by its respective consensus-based PEC. PEC quotients are calculated only for those substances for which reliable PECs were available. Subsequently, the sum of the PEC quotients was calculated for each sediment sample by adding the PEC quotients that were determined for each substance; however, only the PECs that were demonstrated to be reliable were used in the calculation. The summed PEC quotients were then normalized to the number of PEC quotients that are calculated for each sediment sample (*i.e.*, to calculate the mean PEC quotient for each sample; Canfield *et al.* 1998; Long *et al.* 1998; Kemble *et al.* 1999). This normalization step is conducted to provide comparable indices of contamination among samples for which different numbers of chemical substances were analyzed.

The predictive ability of the PEC quotients, as calculated using the consensus-based SQGs, was also evaluated using data that were assembled to support the predictive ability assessment for the individual PECs. In this evaluation, sediment samples were predicted to be not toxic if mean PEC quotients were <0.1 or <0.5. In contrast, sediment samples were predicted to be toxic when mean PEC quotients exceeded 0.5, 1.0, or 1.5. The results of this evaluation indicated that the consensus-based SQGs, when used, together provide an accurate basis for predicting the absence of sediment toxicity (Table 7; Figure 1). Sixty-one sediment samples had mean PEC quotients of <0.1; six of these samples were toxic to sediment-dwelling organisms (predictive ability = 90%). Of the 174 samples with mean PEC quotients of < 0.5, only 30 were found to be toxic to sediment-dwelling organisms (predictive ability = 83%; Table 7).

The consensus-based SQGs also provided an accurate basis for predicting sediment toxicity in sediments that contained mixtures of contaminants. Of the 173 sediment samples with mean PEC quotients of > 0.5 (calculated using the PECs for seven trace metals, the PEC for total PAHs [rather than the PECs for individual PAHs], the PEC for PCBs, and the PEC for sum DDE), 147 (85%) were toxic to sediment-dwelling organisms (Table 7; Figure 1). Similarly, 92% of the sediment samples (132 of 143) with mean PEC quotients of > 1.0 were toxic to one or more species of aquatic organisms. Likewise, 94% of the sediment samples (118 of 125) with mean PEC quotients of greater than 1.5 were found to be toxic, based on the results of various freshwater toxicity tests. Therefore, it is apparent that a mean PEC quotient of 0.5 represents a useful

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Table 6. Incidence of toxicity within ranges of contaminant concentrations defined by the SQGs

Substance	Number of Samples Evaluated	Incidence of Toxicity (%, number of samples in parentheses)		
		≤TEC	TEC-PEC	> PEC
Metals				
Arsenic	150	25.9% (15 of 58)	57.6% (38 of 66)	76.9% (20 of 26)
Cadmium	347	19.6% (20 of 102)	44.6% (29 of 65)	93.7% (118 of 126)
Chromium	347	28% (37 of 132)	64.4% (38 of 59)	91.7% (100 of 109)
Copper	347	17.7% (28 of 158)	64.0% (48 of 75)	91.8% (101 of 110)
Lead	347	18.4% (28 of 152)	53.6% (37 of 69)	89.6% (112 of 125)
Mercury	79	65.7% (23 of 35)	70.0% (28 of 40)	100% (4 of 4)
Nickel	347	27.7% (51 of 184)	62.7% (32 of 51)	90.6% (87 of 96)
Zinc	347	18.4% (30 of 163)	60.9% (39 of 64)	90.0% (108 of 120)
Polycyclic aromatic hydrocarbons				
Anthracene	129	17.3% (13 of 75)	92.9% (26 of 28)	100% (13 of 13)
Fluorene	129	29% (27 of 93)	85.7% (12 of 14)	100% (13 of 13)
Naphthalene	139	24.7% (21 of 85)	94.1% (16 of 17)	92.3% (24 of 26)
Phenanthrene	139	17.7% (14 of 79)	88.2% (30 of 34)	100% (25 of 25)
Benz(a)anthracene	139	17.1% (13 of 76)	70% (14 of 20)	100% (20 of 20)
Benzo(a)pyrene	139	18.5% (15 of 81)	75.7% (28 of 37)	100% (24 of 24)
Chrysene	139	20% (16 of 80)	68.1% (32 of 47)	95.8% (23 of 24)
Fluoranthene	139	25% (24 of 96)	82.5% (33 of 40)	100% (15 of 15)
Pyrene	139	20.5% (16 of 78)	63.0% (29 of 46)	96.4% (27 of 28)
Total PAHs	167	18.5% (15 of 81)	65.1% (43 of 66)	100% (20 of 20)
Polychlorinated biphenyls				
Total PCBs	120	11.1% (3 of 27)	31.0% (9 of 29)	82.3% (42 of 51)
Organochlorine pesticides				
Chlordane	193	14.9% (15 of 101)	75.0% (15 of 20)	73.0% (27 of 37)
Dieldrin	180	16.5% (18 of 109)	95.2% (20 of 21)	100% (10 of 10)
Sum DDD	168	19.8% (20 of 101)	33.3% (1 of 3)	83.3% (5 of 6)
Sum DDE	180	18.1% (19 of 105)	33.3% (1 of 3)	96.7% (29 of 30)
Sum DDT	96	23% (23 of 100)	0.0% (0 of 1)	91.7% (11 of 12)
Total DDT	110	17.4% (16 of 92)	100% (23 of 23)	100% (10 of 10)
Endrin	170	29.4% (37 of 126)	40.0% (4 of 10)	NA% (0 of 0)
Heptachlor epoxide	138	17.8% (16 of 90)	85.0% (17 of 20)	37.5% (3 of 8)
Lindane	180	28.1% (34 of 121)	65.9% (29 of 44)	82.4% (14 of 17)

Table 7. Predictive ability of mean PEC quotients in freshwater sediments

Mean PEC Quotient	Mean PEC Quotients Calculated with Total PAHs Predictive Ability (%)	Mean PEC Quotients Calculated with Individual PAH Predictive Abilities (%)
<0.1	90.2% (61)	90.2% (61)
<0.5	82.8% (174)	82.9% (175)
>0.5	85% (173)	85.4% (172)
>1.0	93.3% (143)	93.4% (143)
>1.5	94.4% (125)	95% (121)

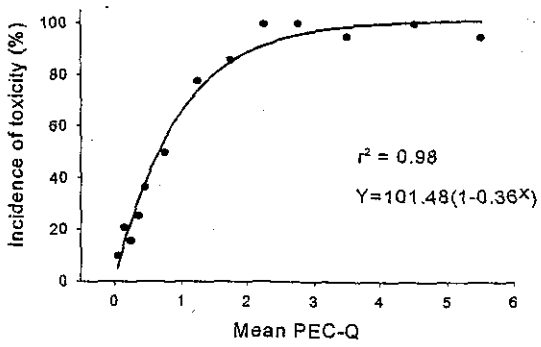

Fig. 1. Relationship between mean PEC quotient and incidence of toxicity in freshwater sediments

threshold that can be used to accurately classify sediment samples as both toxic and not toxic. The results of this evaluation were not substantially different when the PECs for the individuals PAHs (*i.e.*, instead of the PEC for total PAHs) were used to calculate the mean PEC quotients (Table 7). Kemble *et al.* (1999) reported similar results when the mean PEC quotients were evaluated using the results of only 28-day toxicity tests with *H. azteca* (n = 149, 32% of the samples were toxic).

To examine further the relationship between the degree of chemical contamination and probability of observing toxicity in freshwater sediments, the incidence of toxicity within various ranges of mean PEC quotients was calculated (*e.g.*, < 0.1, 0.1–0.2, 0.2–0.3). Next, these data were plotted against the midpoint of each range of mean PEC quotients (Figure 1). Subsequent curve-fitting indicated that the mean PEC-quotient is highly correlated with incidence of toxicity ($r^2 = 0.98$), with the relationship being an exponential function. The resultant

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equation can be used to estimate the probability of observing sediment toxicity at any mean PEC quotient.

Although it is important to be able to predict accurately the presence and absence of toxicity in field-collected sediments, it is also helpful to be able to identify the factors that are causing or substantially contributing to sediment toxicity. Such information enables environmental managers to focus limited resources on the highest-priority sediment quality issues and concerns. In this context, it has been suggested that the results of spiked sediment toxicity tests provide a basis for identifying the concentrations of sediment-associated contaminants that cause sediment toxicity (Swartz *et al.* 1988; Ingersoll *et al.* 1997). Unfortunately, there is limited relevant data available that assesses effects of spiked sediment in freshwater systems. For example, the available data from spiked sediment toxicity tests is limited to just a few of the chemical substances for which reliable PECs are available, primarily copper and fluoranthene. Additionally, differences in spiking procedures, equilibration time, and lighting conditions during exposures confound the interpretation of the results of sediment spiking studies, especially for PAHs (ASTM 1999). Moreover, many sediment spiking studies were conducted to evaluate bioaccumulation using relatively insensitive test organisms (*e.g.*, *Diporeia* and *Lumbriculus*) or in sediments containing mixtures of chemical substances (Landrum *et al.* 1989, 1991).

In spite of the limitations associated with the available dose-response data, the consensus-based PECs for copper and fluoranthene were compared to the results of spiked sediment toxicity tests. Suedel (1995) conducted a series of sediment spiking studies with copper and reported 48-h to 14-day LC_{50} for four freshwater species, including the waterfleas *Ceriodaphnia dubia* (32–129 mg/kg DW) and *Daphnia magna* (37–170 mg/kg DW), the amphipod *H. azteca* (247–424 mg/kg DW), and the midge *C. tentans* (1,026–4,522 mg/kg DW). An earlier study reported 10-day LC_{50}s of copper for *H. azteca* (1,078 mg/kg) and *C. tentans* (857 mg/kg), with somewhat higher effect concentrations observed in different sediment types (Cairns *et al.* 1984). The PEC for copper (149 mg/kg DW) is higher than or comparable to (*i.e.*, within a factor of three; MacDonald *et al.* 1996; Smith *et al.* 1996) the median lethal concentrations for several of these species. For fluoranthene, Suedel and Rodgers (1993) reported 10-day EC_{50}s of 4.2–15.0 mg/kg, 2.3–7.4 mg/kg, and 3.0–8.7 mg/kg for *D. magna, H. azteca*, and *C. tentans*, respectively. The lower of the values reported for each species are comparable to the PEC for fluoranthene that was derived in this study (*i.e.*, 2.23 mg/kg). Much higher toxicity thresholds have been reported in other studies (*e.g.*, Kane Driscoll *et al.* 1997; Kane Driscoll and Landrum 1997), but it is likely that these results were influenced by the lighting conditions under which the tests were conducted. Although this evaluation was made with limited data, the results suggest that the consensus-based SQGs are comparable to the acute toxicity thresholds that have been obtained from spiking studies.

A second approach—to identify concentrations of sediment-associated contaminants that cause or contribute to toxicity—was to compare our consensus-based PECs to equilibrium partitioning values (Swartz 1999; MacDonald *et al.* 1999). The equilibrium partitioning (EqP) approach provides a theoretical basis for deriving sediment quality guidelines for the protection of freshwater organisms (Di Toro *et al.* 1991; Zarba 1992). Using this approach, the US EPA (1997a) developed SQGs that are intended to represent chronic toxicity thresholds for various sediment-associated contaminants, primarily nonionic organic substances. The concentrations of these contaminants are considered to be sufficient to cause or substantially contribute to sediment toxicity when they exceed the EqP-based SQGs (Berry *et al.* 1996). To evaluate the extent to which the consensus-based SQGs are causally based, the PECs were compared to the chronic toxicity thresholds that have been developed previously using the EqP approach (see Table 2). The results of this evaluation indicate that the consensus-based PECs are generally comparable to the EqP-based SQGs (*i.e.*, within a factor of three; MacDonald *et al.* 1996; Smith *et al.* 1996). Therefore, the consensus-based PECs also define concentrations of sediment-associated contaminants that are sufficient to cause or substantially contribute to sediment toxicity.

Summary

Consensus-based SQGs were derived for 28 common chemicals of concern in freshwater sediments. For each chemical substance, two consensus-based SQGs were derived from the published SQGs. These SQGs reflect the toxicity of sediment-associated contaminants when they occur in mixtures with other contaminants. Therefore, these consensus-based SQGs are likely to be directly relevant for assessing freshwater sediments that are influenced by multiple sources of contaminants. The results of the evaluations of predictive ability demonstrate that the TECs and PECs for most of these chemicals, as well as the PEC quotients, provide a reliable basis for classifying sediments as not toxic and toxic. In addition, positive correlations between sediment chemistry and sediment toxicity indicate that many of these sediment-associated contaminants are associated with the effects that were observed in field-collected sediments. Furthermore, the level of agreement between the available dose-response data, the EqP-based SQGs, and the consensus-based SQGs indicates that sediment-associated contaminants are likely to cause or substantially contribute to, as opposed to simply be associated with, sediment toxicity at concentrations above the PECs.

Overall, the results of the various evaluations demonstrate that the consensus-based SQGs provide a unifying synthesis of the existing SQGs, reflect causal rather than correlative effects, and account for the effects of contaminant mixtures (Swartz 1999). As such, the SQGs can be used to identify hot spots with respect to sediment contamination, determine the potential for and spatial extent of injury to sediment-dwelling organisms, evaluate the need for sediment remediation, and support the development of monitoring programs to further assess the extent of contamination and the effects of contaminated sediments on sediment-dwelling organisms. These applications are strengthened when the SQGs are used in combination with other sediment quality assessment tools (*i.e.*, sediment toxicity tests, bioaccumulation assessments, benthic invertebrate community assessments; Ingersoll *et al.* 1997). In these applications, the TECs should be used to identify sediments that are unlikely to be adversely affected by sediment-associated contaminants. In contrast, the PECs should be used to identify sediments that are likely to be toxic to sediment-dwelling

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organisms. The PEC quotients should be used to assess sediment that contain complex mixtures of chemical contaminants.

The consensus-based SQGs described in this paper do not consider the potential for bioaccumulation in aquatic organisms nor the associated hazards to the species that consume aquatic organisms (*i.e.*, wildlife and humans). Therefore, it is important to use the consensus-based SQGs in conjunction with other tools, such as bioaccumulation-based SQGs, bioaccumulation tests, and tissue residue guidelines, to evaluate more fully the potential effects of sediment-associated contaminants in the environment. Future investigations should focus of evaluating the predictive ability of these sediment assessment tools on a species- and endpoint-specific basis for various geographic areas.

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United States
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Agency

Implementation Guidance for Ambient Water Quality Criteria for Bacteria

March 2004

U.S. Environmental Protection Agency
Office of Water (4305T)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

EPA-823-B-04-002

Foreword

We use water for swimming, drinking. white water rafting, surfing, kayaking, and simply for enjoying its aesthetic qualities while hiking or birdwatching. Protection of waterbodies begins with states, territories, and authorized tribes adopting appropriate water quality standards. The *Implementation Guidance for Ambient Water Quality Criteria for Bacteria* provides guidance to state, territorial, and authorized tribal water quality programs on the adoption and implementation of bacteriological water quality criteria to protect waters designated for recreation. This document may also serve as a useful resource for beach program managers and interested members of the public.

This guidance reflects valuable comments the Agency received on previous drafts and subsequent interactions with interested stakeholders. I believe you will find this document a useful resource. Should you have any questions or concerns, please do not hesitate to contact me (202-566-0430) or Denise Keehner, Director of the Standards and Health Protection Division (202- 566-0400).

_____

Geoffrey H. Grubbs, Director
Office of Science and Technology

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NOTICE

The *Implementation Guidance for Ambient Water Quality Criteria for Bacteria* is designed to address questions on implementing EPA's recommended water quality criteria for bacteria within state, territory, and authorized tribal water quality programs. It provides guidance to EPA Regions, States, Territories, and Tribes and the general public on how EPA intends to exercise its discretion in implementing the statutory and regulatory provisions that concern water quality criteria and standards for bacteria. The guidance is designed to implement national policy on these issues.

The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, it does not impose legally binding requirements on EPA, States, Territories, or Tribes, and may not apply to a particular situation based upon the circumstances. EPA, State, Territory, and Tribal decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions regarding a particular facility will be made based on the statute and regulations. Therefore, interested parties are free to raise questions and objections about the substance of this guidance and the appropriateness of the application of this guidance to a particular situation. EPA will, and States, Territories, and Tribes should, consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation. This guidance is a living document and may be revised periodically without public notice. EPA welcomes public comments on this document at any time and will consider those comments in any future revision of this guidance document.

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Executive Summary

The purpose of this document is to provide guidance for the implementation of water quality criteria for bacteria once adopted into state and tribal water quality standards. EPA is encouraging all states and authorized tribes to use *E. coli* or enterococci as the basis of their water quality criteria for bacteria to protect recreational waters. *E. coli* and/or enterococci are the indicators best suited for use in determining the potential risk of contracting acute gastrointestinal illness from incidental ingestion of fecally contaminated water during recreational activities. For coastal recreational waters (i.e., marine waters, coastal estuaries, and the Great Lakes that are designated for swimming and similar water contact activities), states are required to adopt by April 2004 criteria for *E. coli* or enterococci as protective of human health as EPA's Clean Water Act §304(a) criteria recommendations.

This document provides a summary of EPA's existing recommended water quality criteria for bacteria that it published in 1986 as well as recommendations on the implementation of bacteriological criteria for the protection of recreational uses once they have been adopted into a state or authorized tribe's water quality standards. The use of water quality standards to protect recreational waters encompasses a broad spectrum of waterbody types, from heavily-used oceanfront beach areas to remote mountain streams. This document attempts to acknowledge these different types of recreational uses and the different management choices that are available to states and tribes in managing these water resources.

States and authorized tribes must provide protection for recreation in and on the water wherever attainable for all surface waters within their jurisdiction. States and authorized tribes typically accomplish this by designating waters for primary contact recreation (i.e., activities that could be expected to result in ingestion of water or immersion) within their water quality standards. Once assigned as a designated use, states and authorized tribes must establish protective water quality criteria. In assigning designated uses for recreation to provide protection of human health, states and tribes should consider the use of the waterbody by children and other susceptible groups and conduct surveys to identify sources of fecal pollution when high levels of bacteria are observed. In many circumstances, waterbodies are impacted by not only human sources of fecal contamination, but also domesticated animals and wildlife. Although there have been few studies investigating the impact of fecal contamination from animal source, it is inappropriate to conclude that these sources present no risk to human health from waterborne pathogens, particularly when the animals in question are likely to have had frequent contact with humans and may harbor and shed human pathogens. Thus, EPA's bacteria criteria should apply to measures of human and domesticated animal fecal contamination, but may exclude the component from wildlife. As explained in detail in sections 3.2 and 3.4.2, this may be reflected in the expression of the criteria or in the assignment of the designated use.

States and authorized tribes have flexibility to tailor and refine recreational designated uses. In some instances, particularly in cold northern climates, states and authorized tribes may choose to adopt seasonal contact recreation uses to protect primary contact recreation during the time of year it occurs and to prevent excessive disinfection by dischargers during the winter months. For

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example, in those climates residual chlorine in effluents can result in the formation of disinfection byproducts such as trihalomethanes in surface waters, which can have an adverse effect on human health and aquatic life. In other circumstances where a state or authorized tribe has determined that primary contact recreation is not an existing use as defined by federal and state (or tribal) regulations, nor attainable for one of the reasons identified in the federal and state (or tribal) regulations, states and authorized tribes may adopt other categories of recreation such as intermittent primary contact recreation, wildlife impacted recreation, or secondary contact recreation.

States and authorized tribes have discretion in how they apply EPA's bacteria criteria. EPA's bacteria criteria represent a distribution of values over a recreation season that collectively are associated with a specific illness rate. That distribution is characterized by a geometric mean and a series of upper percentile values, based on the standard deviation of values around the mean. States and authorized tribes may choose from a range of risk levels and corresponding geometric means to characterize long term water quality. They may also choose from a range of upper percentile values for day-to-day management of a waterbody.

In addition to providing recommendations on the adoption of recreational uses and protective water quality criteria into water quality standards, this document also provides explanations of how standards should be used to form the basis for water quality-based national pollutant discharge elimination system permits, assess and determine attainment of water quality standards, and develop subsequent total maximum daily loads and wasteload allocations. While this document is focused primarily on the adoption and implementation of water quality criteria for bacteria as part of water quality standards, the relationships between standards and drinking water programs, shellfishing programs, and beach management activities are also briefly addressed. Where available, this document provides references where more information may be obtained.

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1. Background and Introduction

Water quality standards consist of designated uses, criteria necessary to protect those uses, and an antidegradation policy. Water quality standards establish the "goals" for a waterbody. Designated uses determine what criteria apply to the water body. Clean Water Act (CWA) §101(a)(2) set the national goal of achieving water quality which provides for the "protection and propagation of fish, shellfish, and wildlife" and "recreation in and on the water" wherever attainable. These national goals are commonly referred to as the "fishable/swimmable" goals of the Clean Water Act. CWA §303(c)(2)(A) requires water quality standards to "protect the public health and welfare, enhance the quality of water, and serve the purposes of this Act." EPA's regulations at 40 CFR Part 131 interpret and implement these provisions through a requirement that water quality standards provide for fishable/swimmable uses unless those uses have been shown to be unattainable. States have generally provided for the "swimmable" goal by designating "primary contact recreation" for their waters. Primary contact recreation encompasses activities that could be expected to result in ingestion of water or immersion. These activities logically include swimming, water skiing, surfing, kayaking, and any other activity where contact and immersion in the water are likely.

In 1986, the U.S. Environmental Protection Agency (EPA) published *Ambient Water Quality Criteria for Bacteria*–1986. That document contained EPA's recommended water quality criteria for bacteria to protect bathers from gastrointestinal illness in recreational waters. The water quality criteria are based on levels of indicator bacteria, namely *Escherichia coli* (*E. coli*) and enterococci, that demonstrate the presence of fecal pollution. EPA identified levels of these indicators which protect bathers in fresh and marine recreational waters. Indicator organisms such as these have long been used to protect bathers from illnesses that may be contracted from recreational activities in surface waters contaminated by fecal pollution. These organisms generally do not cause illness directly, but have demonstrated characteristics that make them good indicators of harmful pathogens in waterbodies. Prior to its 1986 recommendations, EPA recommended the use of fecal coliforms as an indicator organism to protect bathers from gastrointestinal illness in recreational waters. However, EPA conducted epidemiological studies and evaluated the use of several organisms as indicators, including fecal coliforms, *E. coli*, and enterococci, and subsequently recommended in 1986 the use of *E. coli* for fresh recreational waters and enterococci for fresh and marine recreational waters because they were better predictors of acute gastrointestinal illness than fecal coliforms. Some states and authorized tribes have replaced their fecal coliform criteria with water quality criteria for *E. coli* and/or enterococci; however, many other states and authorized tribes have not yet made this transition.

The main route of exposure to illness-causing organisms in recreational beach waters is through direct contact with polluted water while swimming, most commonly through accidental ingestion of contaminated water. In waters containing fecal contamination, many types of waterborne diseases that are spread through fecal contamination and subsequent ingestion (the "fecal-oral route") may affect bathers. These illnesses result from the following general categories of infection:

- Bacterial infection (such as cholera, salmonellosis, shigellosis, and gastroenteritis).

- Viral infection (such as infectious hepatitis, gastroenteritis, and intestinal diseases caused by enteroviruses).
- Protozoan infections (such as cryptosporidiosis, amoebic dysentery, and giardiasis).

Although the most common effects of bathing in contaminated water are illnesses affecting the gastrointestinal tract, other illnesses and conditions affecting the eye, ear, skin, and upper respiratory tract can be contracted as well. With these conditions, infection may occur when pathogenic microorganisms come into contact with small breaks and tears in the skin or ruptures in delicate membranes in the eye, ear or nose resulting during recreation in the water. These illnesses are not likely to be life-threatening for the majority of the population.

Microorganisms are ubiquitous in all terrestrial and aquatic ecosystems. Many types are beneficial, functioning as agents for chemical decomposition, food sources for larger animals, and essential components of the nitrogen cycle and other biogeochemical cycles. Some microorganisms reside in the bodies of animals and aid in the digestion of food; others are used for medical purposes such as providing antibiotics. Of the vast number of species of microorganisms present in the environment, only a small subset are human pathogens (i.e., capable of causing varying degrees of illness in humans). While some human pathogens are naturally occurring in the environment (e.g., Naeglaria or *Vibrio cholera*), the source of these microorganisms is usually the feces or other wastes of humans and various other warm-blooded animals.

Bacteria are unicellular organisms that lack an organized nucleus and contain no chlorophyll. Waste from warm-blooded animals is a source of many types of bacteria found in waterbodies, including the coliform group and streptococcus, lactobacillus, staphylococcus, and clostridia. However, most types of bacteria are not pathogenic.

Viruses are a group of infectious agents that are obligate intracellular parasites (i.e., require a host in which to live). The most significant virus group affecting water quality and human health originates in the gastrointestinal tract of infected animals. These enteric viruses are excreted in feces and include hepatitis A, rotaviruses, Norwalk-type viruses, adenoviruses, enteroviruses, and reoviruses.

Protozoa are unicellular organisms occurring primarily in the aquatic environment. Pathogenic protozoa constitute almost 30 percent of the 35,000 known species of protozoans. Pathogenic protozoa exist in the environment as cysts that hatch, releasing infective forms that attach to or invade cells, and then grow and multiply, causing associated illness. Encystation of protozoa facilitates their survival, protecting them from harsh conditions such as high temperature and salinity. Two protozoa of major concern as waterborne pathogens are *Giardia lamblia* and *Cryptosporidium parvum*.

The detection and enumeration of all pathogens of concern are impractical in most circumstances due to the potential for many different pathogens to reside in a single waterbody; lack of readily available and affordable methods; and the variation in likely pathogen concentrations. The use of fecal indicators provides regulators and water quality managers with a means to ascertain the

likelihood that human pathogens may be present in recreational waters. Specifically, the criteria published by EPA are intended, once adopted by states and authorized tribes, to control pathogens by keeping concentrations of indicator organisms at a level that corresponds with low levels of risk of acute gastrointestinal illness to recreational water users.

Of the different illnesses that may be contracted during recreational activities, gastrointestinal illness occurs most frequently (CDC 2000; CDC 1998). Gastroenteritis is a term for a variety of diseases that affect the gastrointestinal tract and are rarely life-threatening. Symptoms of the illness include nausea, vomiting, stomachache, diarrhea, headache, and fever. While other illnesses may be contracted from recreational activities, they are not specifically addressed by EPA's criteria recommendations. People who become ill as a result of bathing in contaminated water often do not associate their illness symptoms with swimming because symptoms often appear several days after exposure and are often not severe enough to cause individuals to go to the hospital or see a doctor. Most people afflicted by gastroenteritis will experience flu-like symptoms several days after exposure, rarely suspecting that ingestion of water while recreating is the cause of their illness and often assuming that the symptoms are a result of the flu or food poisoning. Consequently, disease outbreaks often are inconsistently detected and reported, leading to difficulty in ascertaining the total incidences of illness resulting from contact with recreational waters.

1.1 What is the purpose of this guidance?

This guidance provides recommendations to help states[1] and authorized tribes[2] implement EPA's recommended water quality criteria for bacteria for the protection of recreational waters. EPA strongly encourages states and authorized tribes that have not already done so to adopt the recommendations set forth in *Ambient Water Quality Criteria for Bacteria* – 1986 or to adopt other scientifically defensible water quality criteria for bacteria into their recreational water quality standards to replace fecal or total coliform criteria.

EPA's *Ambient Water Quality Criteria for Bacteria*–1986 was developed for the protection of waters designated for recreational uses. Under section 304(a) of the Clean Water Act (CWA), EPA is required to publish water quality criteria accurately reflecting the latest scientific knowledge for the protection of human health and aquatic life. The scientific foundation of the criteria is based on studies conducted by EPA demonstrating that for fresh water, *E. coli* and enterococci are best suited for predicting the presence of gastrointestinal illness-causing pathogens, and for marine waters, enterococci is most appropriate. *E. coli* and enterococci indicators provide a much better means of protecting recreators from contracting gastrointestinal illness than the use of fecal

[1]Note: The term "states" will be used to denote states and U.S. territories.

[2]Pursuant to section 518(e) of the CWA, EPA is authorized to treat an Indian tribe in the same manner as a state for the purposes of administering a water quality standards program. 40 CFR 131.8 establishes the criteria by which the Agency makes such a determination. At this time, 26 tribes have requested and been granted program authorization, and 22 tribes have adopted, and EPA has approved, water quality standards pursuant to section 303(c) of the Act, and the implementing federal regulations at 40 CFR 131.

coliforms. The transition to *E. coli* and enterococci bacterial indicators continues to be an Agency priority for states' and authorized tribes' triennial reviews of water quality standards. Further, the Beaches Environmental Assessment and Coastal Health Act of 2000 (BEACH Act of 2000) requires coastal and Great Lakes states, by April 2004, to adopt water quality criteria and standards for those pathogens and pathogen indicators for which the [EPA] Administrator has published criteria under §304(a) of the CWA. The pathogen indicator criteria and standards adopted by states must be as protective as EPA's criteria. The BEACH Act of 2000 further directs EPA to propose and promulgate such standards for states that fail to do so. Appendix A contains the full text of the Beach Act of 2000.

1.2 Why is EPA publishing this guidance?

Despite the studies (see Appendix B) demonstrating much better correlation between swimming-associated illnesses and concentrations of *E. coli* and enterococci, many states and authorized tribes continue to use either fecal or total coliform criteria to protect and maintain waterbodies designated for recreation. EPA recognizes there has been some uncertainty among states and authorized tribes with regard to how EPA's recommended 1986 bacteriological water quality criteria should be implemented and how the transition from fecal coliforms to *E. coli* and enterococci should be made. This guidance addresses those issues identified by states and authorized tribes as impeding their progress toward adopting and implementing EPA's current recommended water quality criteria for bacteria. This document includes the following parts:

- Section 2 contains an explanation of the relationship among state and tribal water quality standards, the requirements of the BEACH Act of 2000, and state and authorized tribal beach monitoring and advisory programs;

- Section 3 contains recommendations on the application of EPA's recommended water quality criteria to waters contaminated by non-human sources; provides recommendations for appropriate approaches for monitoring the safety of recreational waters in those tropical climates where *E. coli* and enterococci may exist naturally in the soil environment, possibly complicating the use of those organisms as indicators; and provides recommendations for appropriate approaches for managing risk in waters that are not designated for primary contact recreation, including waters impacted by high levels of indicator organisms during wet weather events or wildlife sources of fecal pollution;

- Section 4 contains recommendations for making the transition from fecal coliforms to EPA's recommended water quality criteria, including the use of multiple indicators during a transition period; contains recommendations on the development of wasteload allocations for the purpose of calculating total maximum daily loads; provides recommendations for the use of detection and enumeration methods in monitoring ambient and effluent water quality; and discusses the relationship of recommendations contained in this document to the protection of drinking water sources and shellfishing waters.

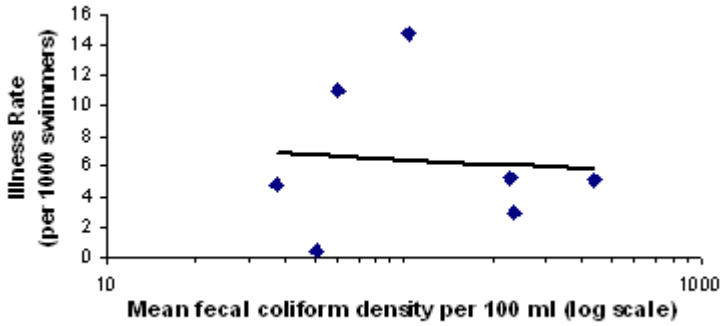
1.3 Who should use this guidance?

This guidance should be used by state and authorized tribal environmental agencies administering a water quality standards program. This guidance may also provide useful information for state, tribal, and local beach program managers and interested members of the public.

1.4 What is the basis for EPA's 1986 water quality criteria for bacteria?

Prior to publishing its recommended criteria in 1986, EPA conducted a series of epidemiological studies that examined the relationship between swimming-associated illness (namely, acute gastrointestinal illness) and the microbiological quality of the waters used by recreational bathers. The results of those studies did not demonstrate that fecal coliforms (the indicator originally recommended in 1968 by the Federal Water Pollution Control Administration of the Department of the Interior) correlated with swimming-associated gastroenteritis, as shown in Figure 1.1. However, two indicator organisms, *E. coli* and enterococci, exhibited a strong correlation to swimming-associated gastroenteritis, the former in fresh waters only and the latter in both fresh and marine waters (USEPA, 1986; USEPA, 1984; USEPA, 1983). The strong correlation (see Figure 1.3) may be due to the indicator organisms being more similar to the pathogens of concern in their ability to survive within the environment. In some cases, fecal coliforms are routinely detected where fecal contamination is absent, possibly resulting in inaccurate assessments of recreational safety. For example, *Klebsiella* spp., a bacterial organism that is part of the fecal coliform group and is generally not harmful to humans, is often present in pulp and paper and textile mill effluents (Archibald, 2000; Dufour et al., 1973). In contrast, *E. coli* and enterococci are less frequently found in environments where fecal contamination is known to be absent, making them more suitable as indicators of fecal contamination. Enterococci are also resistant to environmental factors, particularly saline environments, enhancing their utility as an indicator in marine waters.

Figure 1.1 Fecal Coliform and Illness Rates



Source: "Health Effects Criteria for Fresh Recreational Waters", EPA 1984

Based on these studies, EPA's *Ambient Water Quality Criteria for Bacteria* - 1986, published under section 304(a) of the CWA, recommended the use of criteria based on the indicator organisms *E. coli* and enterococci rather than fecal coliforms.

1.4.1 How were EPA's epidemiological studies conducted?

The data supporting the water quality criteria were obtained from a series of studies (USEPA, 1984; USEPA, 1983) conducted by EPA examining the relationships between swimming-associated illness and the microbiological quality of waters used by recreational bathers. These studies were conducted at three marine and two freshwater locations over several years. The EPA studies were unique at the time they were initiated because they attempted to relate swimmer illness to water quality at the time of swimming. This was done by approaching individuals as they were leaving the beach and asking if they would volunteer to take part in the recreational water studies. Individuals who had also been swimming during the previous week were excluded from the study. After seven to 10 days, the volunteers were contacted by telephone to determine their health status since the swimming event. Control non-swimmers, usually a member of the volunteer's family, were questioned in a similar manner. Data were collected on the bacteriological water quality and the incidents of gastrointestinal illness among swimmers as compared to non-swimmers. Multiple potential indicators were measured in each beach water sample. Multiple indicators were measured because it was unknown which one would best correlate to swimmer illness. The swimming-associated illness parameter was obtained by subtracting the non-swimmer illness rate from the swimmer illness rate using data collected over a summer trial. Additional study details may be obtained from *Health Effects Criteria for Marine Recreational Waters* (USEPA, 1983), *Health Effects Criteria for Fresh Recreational Waters* (USEPA, 1984), and the subsequent *Ambient Water Quality Criteria for Bacteria*–1986 (USEPA, 1986).

1.4.2 How were the data from EPA's epidemiological studies analyzed to provide EPA's recommended water quality criteria for bacteria?

For the purpose of analysis, the data collected at each of the sites were grouped by location and then by season. Each season at a beach was then averaged into one paired data point consisting of an averaged illness rate and a geometric mean of the observed water quality. These data points were plotted to determine the relationships between illness rates and average water quality (expressed as a geometric mean). The resulting linear regression equations were used to calculate recommended geometric mean values at specific levels of protection (e.g., 8 illnesses per thousand swimmers). Using a standard deviation and the geometric mean of the data collected, various upper percentiles were calculated and presented as "single sample maximum" values.

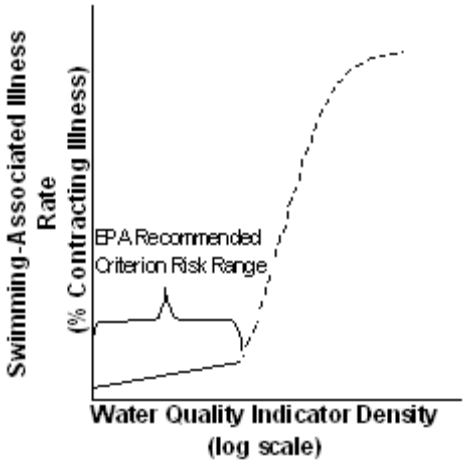
The criteria were developed based on exposures incurred during swimming with head immersion and are thus intended to be adopted by states and authorized tribes to protect their primary contact recreation uses. Other criteria values may be used to protect surface waters designated for recreational uses other than primary contact recreation; however, such a designation must be supported by a use attainability analysis consistent with federal regulations at 40 CFR 131.10(g) where appropriate. See sections 3.4 and 3.5 for further discussion.

1.5 What are EPA's recommended water quality criteria for bacteria?

Tables 1-1 and 1-2 on the following pages contain EPA's recommended water quality criteria for the protection of primary contact recreation. As described in the introduction, primary contact recreation encompasses activities that could be expected to result in ingestion of water or immersion. These activities logically include swimming, water skiing, surfing, kayaking, and any other activity where contact and immersion in the water are likely. EPA's criteria are essentially constructed as a series of frequency distributions of bacteria densities associated with specific risk levels (e.g., illness rates) over the course of a swimming season (i.e., several months). EPA characterizes each distribution (i.e., for a 1% risk level and higher risk levels where possible) using a geometric mean and upper percentile values. When the criteria were published in 1986, EPA recommended use of specific risk levels and associated geometric means for fresh and marine recreational waters. Further, upper percentiles of the associated frequency distribution (referred to as "confidence levels" in EPA's 1986 criteria document) were termed "single sample maximum" values, reflecting one possible way of using the information and applying the criteria. While the risk assessment and scientific basis for EPA's 1986 criteria remain unchanged, this guidance more fully recognizes and describes the risk management considerations in selecting an appropriate risk level and applying both the geometric mean and upper percentile values. The term "upper percentiles" is used in place of "single sample maximum" to more accurately reflect their derivation and more adequately reflect the range of recommended usage of this aspect of EPA's criteria.

In the 1986 criteria document, EPA recommended the use of a risk level associated with 8 illnesses per 1000 swimmers in fresh waters and 19 illnesses per 1000 in marine waters. This represents approximately a 1-2% risk that recreators will suffer from gastrointestinal illness from swimming in ambient recreational waters. These risk levels were identified based on the concentrations of *E. coli* and enterococci that roughly correlated to the previous fecal coliform criterion (a more complete discussion of the derivation of EPA's recommended criteria is contained in *Ambient Water Quality Criteria for Bacteria*-1986). However, it is appropriate for states and authorized tribes to exercise their risk management discretion when protecting recreational waters. Based on a review of the studies used in the derivation of EPA's §304(a) criteria for bacteria, EPA recommends states and authorized tribes select a risk level from the ranges displayed in tables 1-1 (for fresh waters) and 1-2 (for marine waters).

Figure 1.2 Exposure - Response



The conceptual relationship between pathogen density (as measured by the indicator organisms density on log scale) and illness rate is an "S" shaped curve as depicted in Figure 1.2. At relatively low pathogen densities, illness rates rise relatively slowly but constantly (i.e., a linear "straight line"); this observed relationship is shown in more detail in Figure 1.3. At some point as pathogen density reaches relatively high levels, the relationship intensifies and the corresponding illness rate rises sharply. At extremely high pathogen densities, the illness rate would again increase slowly, as it has already reached an acute epidemic level. The data supporting EPA's bacteria criteria fit linear regression models well, and

Table 1-1 Water Quality Criteria for Bacteria for Fresh Recreational Waters

Enterococci Criteria

Risk Level (% of swimmers)	Geometric Mean Density (per 100 ml)	Upper Percentile Value Allowable Density (per 100 ml)			
		75th Percentile	82nd Percentile	90th Percentile	95th Percentile
0.8	**33**	62	79	107	151
0.9	**42**	79	100	137	193
1.0	**54**	101	128	175	247

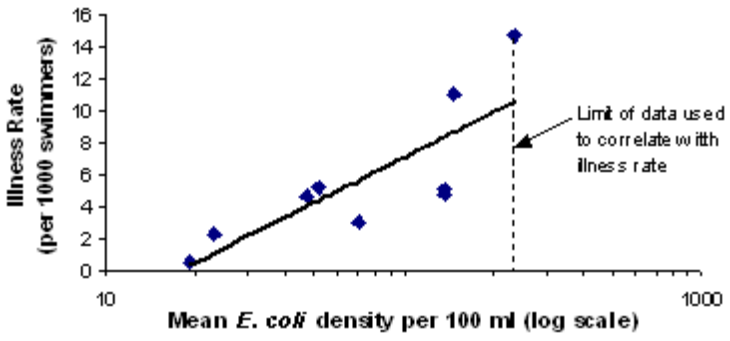
***E. coli* Criteria**

Risk Level (% of swimmers)	Geometric Mean Density (per 100 ml)	Upper Percentile Value Allowable Density (per 100 ml)			
		75th Percentile	82nd Percentile	90th Percentile	95th Percentile
0.8	**126**	236	299	409	576
0.9	**161**	301	382	523	736
1.0	**206**	385	489	668	940

are considered to characterize the initial "flat" portion of the conceptual dose-response relationship described above, where illness rates are relatively low (e.g., at the 1%-2% risk level range). While EPA recognizes that this range has generally represented an acceptable risk level for protection of recreational waters, it is important to ensure that the selected criteria do not extend beyond the demonstrated range of the linear dose-response relationship to avoid the potential of incurring risk well beyond this range (i.e., extending into the range where illness rate rises sharply).

The relationship between risk levels and fresh water bacteria densities is based on observed epidemiological data. The data points and the resultant regression line derived from the *E. coli* data are displayed in Figure 1.3. For *E. coli*, the maximum observed bacterial density was 236/100ml (this density corresponded to an illness rate of 14.7/1000 swimmers). Figure 1.3 clearly shows that, based on the regression line, any risk level chosen above 1.0% (e.g., 10 illnesses per 1000 swimmers) would result in a bacteria density greater than the observed data range.

Figure 1.3 *E. coli* and Illness Rates



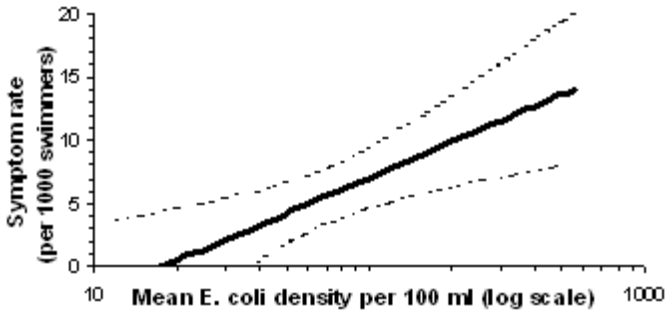
Source: "Health Effects Criteria for Fresh Recreational Waters", EPA 1984

Table 1-2 Water Quality Criteria for Bacteria for Marine Recreational Waters

***Enterococci* Criteria**

Risk Level (% of swimmers)	Geometric Mean Density (per 100 ml)	Upper Percentile Value Allowable Density (per 100 ml)			
		75th Percentile	82nd Percentile	90th Percentile	95th Percentile
0.8	**4**	13	20	35	63
0.9	**5**	16	24	42	76
1.0	**6**	19	29	50	91
1.1	**8**	23	35	61	110
1.2	**9**	28	42	73	133
1.3	**11**	34	51	89	161
1.4	**14**	41	62	107	195
1.5	**17**	49	75	130	235
1.6	**20**	60	91	157	284
1.7	**24**	72	109	189	344
1.8	**29**	87	132	229	415
1.9	**35**	104	158	276	501

Figure 1.4 Confidence Limits



Source: "Health Effects Criteria for Fresh Recreational Waters", EPA 1984

Another way of conveying the limits of extrapolating the data is by showing the associated statistical confidence limits around the linear relationship. For any given density the risk level falls within the range characterized by the confidence limits. Consequently, the precise risk level resulting from a specific density is somewhat unknown. However, as indicator densities increase beyond the densities observed in the studies the confidence that those densities correspond to a risk level along the regression line decreases (this is shown in Figure 1.4). In other words, selecting a risk level greater than 1.0% could potentially result in many more illnesses occurring than the regression line relationship would imply. Figure 1.4 also demonstrates that the difference among illness rates in the "flat" portion of the curve is actually much smaller than is often perceived. In general, any given indicator density is associated with a specific illness rate plus or minus approximately 3 illnesses per 1000 swimmers.

While EPA acknowledges that states and authorized tribes may wish to adopt criteria for both fresh and marine recreational waters associated with risk levels of up to 1.9% of swimmers to protect their waters designated for primary contact recreation (consistent with EPA's 1986 recommendations for marine waters), for the reasons described above EPA recommends that states and authorized tribes adopt fresh water criteria based on risk levels at or below 1.0%. Further discussion on this topic is contained in section 3.1.1.

There has been confusion surrounding the use of several terms related to EPA's 1986 bacteria criteria. First, the use of the term 'illness rate' implied a precision in predicting risk that current data do not support. There is a certain degree of uncertainty and variability associated with illness rates and indicator densities (as shown in Figure 1.4), and the term 'risk level' better captures the true meaning of the concept. In addition, the term 'single sample maximum' was named with its primary use in mind, i.e., beach monitoring. In those situations, an unacceptably high value for any given individual sample may trigger a beach advisory or closing. The 'single sample maximum' values allow beach managers to quantitatively determine when water quality at a particular site is likely not associated with long-term protective conditions (i.e., they are less likely to be associated with the protective central tendency). Implementation of this 'single sample maximum' is not limited to its use as a 'value not to be exceeded' when referring to attainment decisions and national pollutant discharge elimination system (NPDES) permitting under the Clean Water Act. A number of states and authorized tribes have incorporated the value in their attainment decisions and permitting. This is one acceptable approach to implementing bacteria criteria. Because 'single sample maximum' has led to confusion, EPA is dropping the use of the term in favor of the more statistically correct term "upper percentile value."

In terms of criteria setting, the targeted level of protection is the risk level, and the most direct relationship between measurements of bacteria levels and risk level is the geometric mean of measurements taken over the course of a recreation season. The best way to interpret a series of bacterial measurements taken over a period of time is in comparison to the geometric mean, and the best way to interpret any single measurement (or small number of measurements) is in comparison to the upper percentile value associated with the distribution around the geometric mean. For each geometric mean value, four different upper percentile values were identified based on the distribution of the observed data. These range from the 75th to the 95th percentiles (see appendix C for more discussion of this topic).

Percentiles describe the relative position of values in a distribution. For example, the upper 95th percentile represents the point where only 5 percent of the samples exceed, while 95 percent of the samples fall below this value. EPA recommends that states and authorized tribes acquire enough sample data to calculate site-specific upper percentile values to best characterize water quality for waters where greater precision in assessing risk and responding appropriately is particularly important (e.g., frequently used bathing beaches). Doing so would mean that local and state authorities do not have to rely on the assumption that the frequency distributions observed in EPA's epidemiological studies are representative of a particular waterbody. If a state or authorized tribe chooses not to calculate site-specific upper percentile values (or if the dataset is not robust enough) the upper percentiles derived by EPA should be used. Calculations and procedures for

generating waterbody-specific upper percentile values are described in Appendix C.

1.6 Is EPA planning on conducting additional epidemiological studies in the future?

The BEACH Act of 2000 requires EPA to perform an assessment of potential human health risks resulting from exposure to pathogens in coastal recreation waters. To meet this requirement, EPA is conducting additional epidemiological studies that may be used to revise and develop new water quality criteria for pathogens and pathogen indicators (See CWA §§104, 304(a) (33 U.S.C. 1254; 33 U.S.C. 1314); Section 2 contains more information on the BEACH Act of 2000 and EPA's BEACH program. Appendix A contains the full text of the BEACH Act of 2000). Future epidemiological studies and evaluation of new indicators and methods may provide new information to support the protection of recreation waters. EPA is conducting epidemiological studies to support the development of new water quality indicators and associated water quality criteria guidelines for recreational waters. The epidemiological studies will examine the illness rates in families with children as they relate to microbial contaminant levels in fresh and marine recreational waters. The studies will evaluate exposure to and effects of illness from microbial pathogens in recreational waters. A range of water quality indicators will be monitored in fresh and marine recreational waters. Recreational waters included in the study have been selected based on potential number of beach-goers, water quality, and sources of microbial pathogens to the water (domestic sewage versus animals). Pilot studies were conducted in summer 2002 and full-scale studies began in 2003 with completion scheduled for the end of the 2006 fiscal year. Pending their results, new criteria for the protection of recreation waters may be developed following the completion of these studies.

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2. Relationship Between Water Quality Standards and Beach Monitoring and Advisory Programs

CWA §303 requires states and authorized tribes to adopt water quality standards for waters of the United States within their jurisdiction sufficient to "protect the public health or welfare, enhance the quality of water and serve the purposes of [the CWA]." Further, §303(c) specifies that water quality standards shall include the designated use or uses to be made of the water and water quality criteria necessary to protect those uses. EPA has an oversight role in this process. EPA's implementing regulations at 40 CFR 131.11 require water quality criteria to be based on sound scientific rationale and to contain sufficient parameters to protect designated uses. States and authorized tribes may adopt water quality criteria based on EPA's recommended water quality criteria developed under §304(a) of the CWA or those based on other scientifically defensible methods.

EPA's current §304(a) criteria are used as the basis for Agency decisions, both regulatory and nonregulatory, until EPA revises and reissues pollutant-specific §304(a) criteria. EPA's §304(a) criteria serve two distinct purposes: (1) as guidance to states and authorized tribes in the development and adoption of water quality criteria which will protect designated uses, and (2) as the basis for promulgation of a superseding federal rule when such action is necessary. Once adopted by a state or authorized tribe into their water quality standards, or promulgated by EPA for a state or authorized tribe, the water quality criteria are used to establish national pollutant discharge elimination system (NPDES) water quality-based permit limits, to assess the attainment of water quality, and to provide the basis upon which total maximum daily loads (TMDLs) are developed.[3]

In addition to the purposes served by the state or tribal-adopted water quality criteria for bacteria listed above, some beach monitoring and advisory programs have used the state or authorized tribe's bacteriological criteria adopted into the state's or authorized tribe's water quality standards to issue beach advisories and make opening and closure decisions for identified beach areas. In general, waters designated for primary contact recreation within a state or authorized tribe's water quality standards comprise a much larger group of waterbodies than those falling under the purview of a state or tribal beach monitoring program. While waters designated for primary contact recreation may consist of a majority of a state or tribe's waters and may vary in type from remote streams to well-known and highly managed beach areas, beach programs generally focus on the latter subset.

EPA recommends beach programs use the state or tribal adopted water quality standards for beach advisories. EPA encourages coordination between state and tribal water quality standards programs and beach monitoring and advisory programs. For states and authorized tribes with coastal recreation waters, use of water quality standards that can be approved by EPA under CWA §303(c) for beach monitoring and notification is a requirement for receiving a grant under CWA §406.

[3] After a waterbody has been placed on a list by a state or authorized tribe for not attaining its water quality standards, a TMDL, which is an analysis apportioning pollutant loads to sources of the pollutant causing the impairment, is usually developed.

Although these relationships exist between water quality standards and beach monitoring and advisory programs, the use of bacterial water quality monitoring data as part of beach monitoring and advisory programs may differ slightly to account for some of the inherent differences between the two programs. For example, because a beach manager must make decisions based on water quality on a given day or weekend, he or she should focus more on recently collected data to determine whether a swimming advisory should be issued. Further, for beach programs, beach managers may wish to consider other types of data in addition to water quality data. This may include considering rainfall data when notifying the public that the standards have been exceeded or are expected to be exceeded. A recent EPA-funded study in Massachusetts at Boston Harbor beaches found that because the time necessary to obtain water quality monitoring results is at least 24 hours, levels of enterococci measured on the previous day were not always predictive of the water quality that existed when the monitoring results became available. The study found that using water quality data in conjunction with rainfall data as the basis for posting swimming advisories resulted in more accurate postings (MWRA, 2001).

The Environmental Monitoring for Public Access and Community Tracking (EMPACT) Program was established by EPA with the goal of helping communities bring to citizens up-to-date local environmental information they can understand and use in making daily decisions about protecting their health and environment. EPA's Office of Water and Office of Research & Development jointly conducted a study under the EMPACT program in 2002 to provide information on the various monitoring and sampling factors at beaches that were seen to have some association with indicator density. Five beaches participated in the study, including two freshwater, two marine, and one estuarine beach. The freshwater samples were analyzed for *E. coli*, while the marine and estuarine water samples were analyzed for enterococci. This project examined several beach environments to determine the factors that most influence the measurement of beach water quality and to define which characteristics are most significant with regard to monitoring approaches and protecting human health. Preliminary results from the study show little correlation between the 30 day rolling geometric mean and individual water quality measurements on subsequent days. The study showed that, given current analytical method procedures, the best predictor of tomorrow's condition would be today's measurement alone, and that the greater the period of time between measurements, the less their predictive value (USEPA, 2003).

The authority for administering beach programs varies among states and tribes and may rest with state, tribal, county, or municipal government. When the governmental body with the responsibility and authority for a beach monitoring and advisory program differs from the state or tribal water quality standards program, EPA encourages coordination of these programs to ensure the greatest efficiency and consistency in monitoring and data collection. Additional information on the use of EPA's recommended criteria for bacteria in beach monitoring and notification programs can be found in EPA's *National Beach Guidance and Required Performance Criteria for Grants* (EPA 823-B-02-004).

2.1 What is the BEACH Act of 2000 and how does it apply to waters designated for recreation under a state or tribe's water quality standards?

On October 10, 2000, the Beaches Environmental Assessment and Coastal Health Act (BEACH Act of 2000) was passed, amending the Clean Water Act to provide for monitoring of coastal recreation waters and public notification when the applicable water quality standards are not met or are not expected to be met. As defined by the Act, coastal recreation waters are the Great Lakes and marine coastal waters (including coastal estuaries) that are designated under CWA §303(c) by a state for use for swimming, bathing, surfing, or similar water contact activities. The BEACH Act of 2000 contains three significant provisions, summarized as follows:

1. The BEACH Act of 2000 amended the CWA to include §303(i), which requires states that have coastal recreation waters to adopt new or revised water quality standards by April 10, 2004, for those pathogens and pathogen indicators for which the [EPA] Administrator has published criteria under CWA §304(a). Criteria using those indicators must be as protective as the criteria published by EPA under CWA §304(a). See CWA §303(i)(1)(A). The BEACH Act of 2000 further directs EPA to promulgate such standards for states that fail to do so. See CWA §303(i)(2)(A).

2. The BEACH Act of 2000 amended the CWA to require EPA to study issues associated with pathogens and human health and, by October 10, 2005, to publish new or revised CWA §304(a) criteria for pathogens and pathogen indicators based on these studies. See CWA §104(v). Within 3 years after EPA's publication of the new or revised §304(a) criteria, states that have coastal recreation waters must then adopt new or revised water quality standards for all pathogens and pathogen indicators to which EPA's new or revised §304(a) criteria apply. See CWA §303(i)(1)(B).

3. The BEACH Act of 2000 amended the CWA to include a new section, §406, which authorizes EPA to award grants to states and authorized tribes for the purpose of developing and implementing a program to monitor for pathogens and pathogen indicators in coastal recreation waters adjacent to beaches that are used by the public, and to notify the public if water quality standards for pathogens and pathogen indicators are exceeded or likely to be exceeded. To be eligible for the implementation grants, states and authorized tribes must develop monitoring and notification programs that are consistent with performance criteria published by EPA under the Act. These performance criteria are contained in EPA's *National Beach Guidance and Required Performance Criteria for Grants*. Development grants were made available to all eligible states in 2001 and 2002. The first implementation grants were awarded in 2003. The BEACH Act of 2000 also requires EPA to perform monitoring and notification activities for waters in states that do not have a program consistent with EPA's performance criteria, using grants funds that would otherwise have been available to those states. See CWA §406(h). For the full text of the BEACH Act of 2000, see Appendix A.

2.2 How will EPA determine if a state's water quality standards for coastal recreation waters are as protective of human health as EPA's 1986 water quality criteria for bacteria for purposes of §303(i)?

As described in section 2.1, the BEACH Act of 2000 requires states with coastal recreation waters to adopt water quality criteria for bacteria as protective of human health as the criteria published by EPA under §304(a) of the Clean Water Act. This statutory provision refers to EPA's *Ambient Water Quality Criteria for Bacteria*-1986. EPA will assess the protectiveness of a state's water quality standards in light of this requirement codified in CWA §303(i), for state criteria applying to coastal and Great Lakes states. As part of EPA's assessment of a state's water quality standards for pathogens and pathogen indicators, EPA will include consideration of whether a state's standards:

1. Are based on EPA's recommended indicators;
2. Are derived from a scientifically defensible quantitative link to an acceptable risk level (as indicated by *Ambient Water Quality Criteria for Bacteria*-1986), and;
3. Identify and account for the statistical variability in bacterial monitoring (e.g., specify appropriate use of the geometric mean and upper percentile values)

When determining what criteria are appropriate for coastal recreation waters, states and tribes have two major risk management decisions to make: (1) what risk level is acceptable, and (2) how to use the corresponding geometric mean and upper percentile values for assessing monitoring data and establishing source controls. With respect to the first major risk management decision, states retain some flexibility to determine an acceptable risk level within the context of the requirement that states adopt water quality standards "as protective of human health as the criteria for pathogens and pathogen indicators for coastal recreation waters published by the Administrator". That flexibility is constrained by the bounds of acceptable risk levels identified in *Ambient Water Quality Criteria for Bacteria*-1986. Under the heading "Basis of Criteria for Marine and Fresh Recreational Waters", EPA's 1986 bacteria criteria document identifies the definition of "recreational water quality criterion" as a "quantifiable relationship between the density of an indicator in the water and the potential human health risks involved in the water's recreational use". The text further explains that "*from such a definition*, a criterion now can be adopted by a regulatory agency, which establishes upper limits for densities of individual bacteria in waters that are associated with acceptable health risk for swimmers" (emphasis added). In describing monitoring recommendations, the document refers to an assumption that "an acceptable risk level has been determined *from the appropriate criterion*" (emphasis added). Thus, it is clear from the criteria document itself that the published *criteria* is the *relationship* between indicator density and risk, coupled with the choice of an acceptable risk level. This is consistent with EPA's view of human health criteria for toxic effects, where the Agency recommends that states and tribes choose an acceptable cancer risk level (i.e., between 10^{-5} and 10^{-6} as long as no sub-population is exposed to greater than 10^{-4} risk).

With respect to identifying an acceptable risk level, *Ambient Water Quality Criteria for Bacteria* - 1986 includes an estimate of the historically accepted illness rate associated with the

previously recommended fecal coliform criterion as a geometric mean value. Based on ratios of *E. coli* and enterococci to fecal coliform densities, the historically accepted risk levels were estimated to be 0.8% of swimmers at fresh water beaches and 1.9% of swimmers at marine beaches. However, the analysis upon which these estimates is based is inherently uncertain because there was not an underlying correlation between illness rate and fecal coliform density. These risk levels were used to calculate the specific bacteria density values presented in tabular form in the 1986 criteria document, with associated text stating: "While this [risk] level was based on the historically accepted risk, it is still arbitrary insofar as the historical risk was itself arbitrary." Given that the intended *target* of the 200 fecal coliforms per 100 ml criterion was no detectable risk (with respect to statistical significance), "arbitrary" may not be the best description of the historical risk. Nonetheless, it is clear that there is a lack of precision and uncertainty around estimating the *actual* historically accepted risk level. Furthermore, it is also clear that the specific values presented in tabular form in the 1986 criteria document represent but one acceptable choice of risk level to apply to the criterion.

In defining the range of acceptable choices of risk level for coastal recreation waters, there are two considerations. The first is consideration of the estimated actual historically accepted risk levels as provided in the 1986 criteria document. Given that the estimates were independent, and that there is no reason to believe that the acceptable risk level should be any different in fresh water beaches than in marine beaches, consideration of the range between 0.8% and 1.9% of swimmers is appropriate for all coastal recreational waters. However, the second, and more important, consideration is assurance that the risk level remains low and represents conditions in the linear "flat" portion of the dose-response curve, as described in Chapter 1 of this guidance. Here, limits of data extrapolation constrain the risk level range to 0.8%-1.0% of swimmers for fresh waters to assure that the risk level remains on the linear portion of the dose-response curve.

In terms of the second major risk management decision for coastal recreation waters, states have the flexibility to choose a specific upper percentile value that corresponds with the selected risk level within the range of values presented in *Ambient Water Quality Criteria for Bacteria*-1986 (i.e., 75th to 95th percentile). Selecting a lower upper percentile (e.g., 75%) for comparison to single measurements will result in a more conservative estimate of whether the measurement is associated with a given distribution around a geometric mean value. This may result in a greater number of "false positive" determinations (i.e., bias toward concluding that criteria are not being met). In contrast, selecting a higher upper percentile (e.g., 95%) for comparison to single measurements will result in a less conservative estimate of whether the measurement is associated with a given distribution around a geometric mean value. This may result in a fewer number of "false positive" determinations. As explained in *Ambient Water Quality Criteria for Bacteria* - 1986, under the heading "Recommendations on Bacterial Criteria Monitoring" EPA considers the range from the 75th to the 95th percentiles to represent an appropriate balance between "false positives" and "false negatives" for determining whether or not bacteria levels represent an unacceptable risk to bathers.

The table of "single sample maximum" values presented in the 1986 criteria document included qualitative descriptors of beach usage associated with different confidence levels (USEPA 1986). This represents one approach to risk management, one that reflects a strong bias toward

avoiding the potential for greater numbers of illnesses at more heavily used recreational waters. In practice, the choice of an upper percentile depends on several considerations, including the degree of confidence that the variability associated with the standard deviation accurately reflects the variability at the site [i.e., if the site (or group of recreational waters) exhibits enormous variability in bacteria levels, then a lower upper percentile (e.g., 75%) may be more appropriate, at least until a site-specific standard deviation is determined].

EPA will review state and tribal submissions of section 303(i) standards for coastal recreation waters for the adoption of both a geometric mean and upper percentile value. Because the criteria are used for several purposes under the CWA, adoption of both a geometric mean and an upper percentile value will give states and authorized tribes the necessary components to best implement their adopted criteria for developing water quality-based effluent limits, determining whether a waterbody is attaining its water quality standards, and issuing beach notifications and advisories. Section 3.1 contains a discussion of how water quality standards might be written to accomplish this. In some circumstances, after evaluation of their monitoring data for a particular waterbody, states and authorized tribes may conclude that, while the geometric mean is consistently met, the distribution of water quality data is such that the upper percentile values are routinely exceeded. In this case, as described in *Ambient Water Quality Criteria for Bacteria*–1986, a state or authorized tribe may calculate a standard deviation specific to the waterbody and subsequently adopt upper percentile values based on the observed distribution of data into water quality standards. For any state or authorized tribe choosing this option, data used should be sufficient in number and representative of the waterbody, and should demonstrate that the waterbody is meeting its geometric mean requirement. Additional information on calculating waterbody-specific upper percentile values is contained in Appendix C.

2.2.1 How should the water quality criteria for bacteria be used in beach monitoring and notification programs?

States, authorized tribes, and local governments carrying out beach monitoring and notification programs under CWA §406 monitor certain coastal recreation waters for attainment of applicable water quality standards, and notify the public whenever those standards are exceeded or are likely to be exceeded. EPA recommends that states and tribes use only the upper percentile value as the basis for making public notification decisions. The geometric means expressed in EPA's criteria represent a central tendency over the course of an entire swimming season (e.g., several months). As such, water quality measurements taken on any given day could be above the geometric mean and still represent conditions that are protective of the primary contact designated use over the course of the swimming season, as long as they are balanced with measurements that fall below the geometric mean. Thus, comparing an individual water quality measurement to a long term geometric mean could result in beach closures nearly half the time at a beach which has sufficiently protective conditions over the course of the entire season and where the use would ultimately not be deemed impaired.

Use of collective data from shorter periods of time than an entire season (e.g., 30 day rolling

geometric means) may likewise be of limited utility. As mentioned above, preliminary results from the EMPACT study show little correlation between the 30 day rolling geometric mean and individual water quality measurements on subsequent days. The study showed that, given current analytical method procedures, the best predictor of tomorrow's condition would be today's measurement alone, and that the greater the period of time between measurements, the less their predictive value (USEPA, 2003). The most appropriate basis for comparison of individual or one day's measurements is an upper percentile value. Individual measurements on a given day that fall outside the bounds of the expected frequency distribution (or above specified upper percentile values) have a high probability of representing water quality that is not associated with long-term protective conditions (i.e., they are less likely to be associated with the protective central tendency). The geometric mean is most useful in indicating long term water quality conditions, especially chronic pollution. Frequent excursions from the geometric mean will likely indicate that a chronic contamination problem exists and that a sanitary survey should be conducted to determine the cause.

When a bacterial concentration exceeds the appropriate component of a water quality standard, a state, tribe, or local government should immediately either issue a public notification, or resample if there is reason to doubt the accuracy or certainty of the first sample (for more information, refer to the *National Beach Guidance and Required Performance Criteria for Grants* discussion in Section 4.2.1, When to Conduct Additional Sampling).

- If the results of a sampling effort are determined to be accurate and standards are indeed being exceeded, the agency must issue its public notification. Notification should remain in effect until resampling indicates that water quality standards are no longer being exceeded and approved quality control requirements are being met for sample accuracy. When standards are no longer being exceeded the basic sampling approach may be resumed, provided no heavy rainfall or other pollution events have occurred.
- Resampling is acceptable after a state or tribal water quality standard has been exceeded, if there is reason to doubt the accuracy or certainty of the first sample, based on predefined quality assurance measures. EPA recommends that additional samples be taken as soon as possible if the first sample exceeds water quality standards.

Note: The above are requirements for those states receiving grants under the BEACH Act of 2000. EPA recommends that states not receiving beach grants follow the same procedures.

EPA's *National Beach Guidance and Required Performance Criteria for Grants* also contains detailed information and recommendations regarding when and how to provide public notification for beaches covered under the state or authorized tribe's program. EPA recommends a "tiered" beach classification system in which beaches are sorted into various tiers, depending on beach risk and/or amount of use. Further, CWA §406 requires states, authorized tribes, and local governments to prioritize the use of grant funds for monitoring and notification programs based on the use of the waterbody and the risk to human health presented by pathogens or pathogen indicators. Thus, "Tier 1" would include those beaches likely to have the greatest risk and/or highest use. Under

this approach, the specific notification actions and sampling frequency may be tailored to each category. In areas where regular monitoring occurs less frequently, monitoring should be conducted as soon as possible after a single, very high sample is detected. If a state, authorized tribe, or local government has developed a good quality assurance/quality control plan, requiring the collection of replicate samples would provide it with further information with which to assess whether the observed high bacteria level is representative of conditions or is an "outlier." In general, EPA recommends that states, tribes, and local governments monitor most often at the Tier 1 and Tier 2 beaches. More information on the prioritization and tiering of beaches is available in the *National Beach Guidance and Required Performance Criteria for Grants*.

In addition to the available EPA-approved methods for enumerating E. coli and enterococci in ambient waters, EPA is investigating several additional ambient water quality monitoring methods for bacteria that are easily portable and relatively inexpensive, which should facilitate states', authorized tribes', and local governments' ability to conduct additional monitoring should the need arise. More discussion on analytical methods is provided in section 4.5.

The approach outlined above will meet the BEACH Act requirement that states adopt water quality standards for their coastal waters "as protective of human health as" EPA's recommendations. In using this approach, states will achieve the protection of recreational waterbodies consistent with EPA's criteria recommendations.

References

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3. Appropriate Approaches to Managing Risk in Recreational Waters

Recreation occurs in many forms throughout the United States and frequently centers around waterbodies and activities occurring in and on the water. To protect the public while recreating in surface waters, states and authorized tribes have adopted primary contact recreation uses and bacteriological criteria for the majority of waterbodies in the United States. Pursuant to federal regulations, primary contact recreation uses must be adopted for waterbodies unless such uses are shown not to be attainable. Further, primary contact recreation uses must be adopted wherever necessary to protect such uses downstream. See 40 CFR 131.10(b), 40 CFR 131.10(j).

EPA recommends states and authorized tribes help assure protection of recreational waters through:

- frequent monitoring of known recreation areas to establish a more complete database upon which to determine if the waterbody is attaining the water quality criteria;
- assuring that where mixing zones for bacteria are authorized, they do not impinge upon known primary contact recreation areas; and
- conducting a sanitary survey when higher than normal levels of bacteria are measured.

Sanitary surveys are an important element of protecting recreational waters and have long been used as a means to identify potential sources of contamination. A sanitary survey is an examination of a watershed to determine if unauthorized sanitary discharges are occurring from sources such as failed septic tank leach fields or cesspools, sewage leakage from broken pipes, sanitary sewer overflows from hydraulically overloaded sewers, or overflows from storm sewers that may contain illegal sanitary sewer connections. The survey should use available public health and public works department records to identify where such septic tanks and sewer lines exist so that observations are focused in the right places. A sanitary survey might also use dyes or other tracers in both dry and wet weather to see if unauthorized discharges are occurring from septic tanks and sewers. In addition, EPA recommends that sanitary surveys identify other possible sources, including confined animal areas, wildlife watering points, and recreational spots, such as dog running/walking areas, since these are also sources of fecal pollution. Additional guidance for conducting sanitary surveys may be found in several sources: The *National Beach Guidance and Required Performance Criteria for Grants* contains a section discussing the use of sanitary surveys in recreational waters and contains a summary of recent publications on the subject. Additional resources include the *Guidance Manual for Conducting Sanitary Surveys of Public Water System* (USEPA, 1999), the *National Shellfish Sanitation Program Model Ordinance* (NSSP, 1999), and California's *Guidance for Salt Water Beaches* (draft) and *Guidance for Fresh Water Beaches* (draft) (CA DHS, 2000a; CA DHS, 2000b).

Sanitary surveys, in addition to being a tool that can be used to identify sources of contamination, can provide useful data in characterizing a recreational waterbody and determining the relative contributions of fecal pollution sources. This type of information can be useful in

deciding how to control sources as well as in providing useful information to a state or authorized tribe that may be contemplating a change to the recreational use. While many waters are suitable for recreation of some sort, there are circumstances where primary contact recreation may not be attainable. This section identifies these situations and provides recommendations to appropriately protect these waters.

3.1 Where should the primary contact recreation use apply?

States and authorized tribes should designate primary contact recreation and adopt water quality criteria to support that use unless it is shown to be unattainable, to reduce the risk of gastrointestinal illness in recreators. In particular, states and authorized tribes should assure that primary contact recreation uses are designated for waterbodies where people engage, or are likely to engage, in activities that could result in ingestion of water or immersion. These activities include swimming, water skiing, kayaking, and any other activity where contact and immersion in the water are likely. Certain conditions, such as the location of a waterbody, high or low flows, safety concerns, or other physical conditions of the waterbody may make it unlikely that these activities would occur. However, states and authorized tribes should take into consideration that there will be individuals, particularly children, who may be more likely to swim or make other use of the waterbody such that ingestion may occur. States and authorized tribes should take those populations into account when making designated use determinations.

3.1.1 What water quality criteria for bacteria should states and authorized tribes adopt to protect waters designated for primary contact recreation?

In adopting criteria to protect primary contact recreation waters, EPA recommends states and authorized tribes use enterococci and/or *E. coli* criteria based on a risk level no greater than 1.0% in fresh waters and no greater than 1.9% for marine waters, based on the limits of available data. These recommendations are described in section 1.5. In adopting water quality criteria for bacteria to protect waters designated for primary contact recreation, states and authorized tribes should adopt both a geometric mean and an upper percentile, using the values or equations described in Appendix C, and further specify which of these components is used for various applications. An example of one approach states and tribes may use to formulate their standards is contained in Figure 3-1. This is just one example of an approach states and authorized tribes can take to specify appropriate usage of the criteria components; EPA encourages states and authorized tribes to work with their EPA Regional offices to develop approaches that best fit specific situations. For recommendations on refining recreation uses for waters where primary contact recreation is not attainable, see section 3.4.

Figure 3-1 Example Water Quality Standards

Primary Contact Recreation

Water Quality Criteria for Fresh Waters

Enterococci	Geometric mean:	33 / 100 ml
	75th percentile	62 / 100 ml
	95th percentile	151 / 100 ml

Water Quality Criteria for Marine Waters

Enterococci	Geometric mean:	35 / 100 ml
	75th percentile	105 / 100 ml
	95th percentile	502 / 100 ml

Assessing ambient water quality

For purposes of assessing ambient water quality of fresh surface waters designated for primary contact recreation under CWA §303(d) and §305(b), the geometric mean and upper percentile values shall be used:

- Frequently used recreational waters (including State parks and lifeguarded beaches) shall be determined to be impaired if the geometric mean is exceeded or if more than five samples exceed the 95th percentile value[1] (based on data compiled during the swimming season). The swimming season is the time from April 15 through September 15.
- All other waters designated for primary contact recreation shall be determined to be impaired if an individual sample or average daily values exceed the 95th percentile on two or more occasions over the course of the swimming season.
- The list of frequently used recreational waters is available on the state website.

Development of water quality-based effluent limits for NPDES permits

For the purposes of developing water quality-based effluent limits for NPDES permits, the geometric mean value shall be used to establish monthly average effluent limits; the upper percentile value shall be used to establish maximum daily limits.

Issuance of beach advisories

For waters of the state where beach advisories may be issued by the state or local departments of health, samples exceeding the 75th percentile value shall result in the issuance of a beach advisory or resampling until subsequent samples indicate enterococci concentrations are below this level.

1. States and authorized Tribes may use descriptive or inferential statistical procedures to make these evaluations. See section 4.3.2 for more information.

States and authorized tribes that opt to protect primary contact recreation waters with criteria associated with risk levels within the ranges outlined in section 1.5 should recognize that this is a risk management decision by the state or authorized tribe similar to the selection of alternate risk levels when adopting human health criteria for carcinogens, and thus would not require a use attainability analysis as described by the federal regulations at 40 CFR 131.10. Exercising such discretion should assure, however, that downstream uses are protected, including downstream uses across state or tribal boundaries. As with any addition or revision to a state or authorized tribe's water quality standards, any changes resulting from these risk management decisions are subject to the public participation requirements at 40 CFR 131.20(b).

In utilizing this risk management discretion, states and authorized tribes may wish to

establish more than one category of primary contact recreation use. For example, Colorado has two categories of primary contact recreation use in addition to their secondary contact recreation designated use (CDPHE, 2001). The Recreation Class 1A use is the default use category, and is assigned an *E. coli* criterion of 126 colony forming units (cfu) per 100 milliliters (ml) as a geometric mean, based on a risk level of 8 illnesses per 1000 swimmers. In these waters, primary contact recreation uses have been documented or are presumed to be present. The Recreation 1B use is intended to protect waters with the potential to support primary contact recreation uses and may be assigned only if a reasonable level of inquiry has failed to identify any existing primary contact recreation uses of the waterbody. This use category is assigned an *E. coli* criterion of 206 cfu per 100 ml as a geometric mean, based on a risk level of 10 illnesses per 1000 swimmers. Finally, under Colorado regulation, the secondary contact recreation use (known as Recreation Class 2 in the Colorado water quality standards) may be assigned only where a use attainability analysis has been conducted consistent with 40 CFR 131.10 that further demonstrates there is no reasonable potential for primary contact recreation uses to occur within the next 20-year period. This use category is assigned an *E. coli* geometric mean criterion of 630 cfu per 100 ml.

3.1.2 When is it appropriate to adopt seasonal recreational uses?

A seasonal recreation use may be appropriate for those states and authorized tribes where ambient air and water temperatures cool substantially during the winter months. For example, in many northern areas, primary contact recreation is possible only a few months out of the year. Several states and authorized tribes have adopted, and EPA has approved, primary contact recreation uses and the associated microbiological water quality criteria only for those months when primary contact recreation occurs. Those states and tribes then rely on less stringent secondary contact recreation water quality criteria to protect for incidental exposure in the "non-swimming" season. The federal regulation (40 CFR 131.10(f)) allows for seasonal uses, provided the criteria adopted to protect such uses do not preclude the attainment and maintenance of a more protective use in another season.

This is an appropriate approach, particularly where treatment of discharges sufficient to meet the primary contact recreation use would result in the use of chlorine for disinfection and thus, the release of residual chlorine in the effluent. Total residual chlorine in effluents discharging to surface waters can react with organic compounds to produce disinfection by-products such as trihalomethanes. Trihalomethanes have an adverse impact on human health and aquatic life, and are consequently of particular concern in waterbodies used for drinking water and areas where aquatic life may be adversely impacted. Thus, in some cases states and authorized tribes have adopted seasonal uses to allow for the reduction or suspension of effluent chlorination during the colder months which consequently reduces risk to human health and aquatic life.

The rationale provided by states and authorized tribes to EPA to support a change in water quality standards resulting in adoption of a seasonal recreation use for a waterbody need not be burdensome. EPA's regulations do not require a formal use attainability analysis for the adoption of seasonal recreation uses. Generally, for a state or authorized tribe contemplating such a revision

to its recreational water quality standards, EPA would expect that the state or authorized tribe provide information on why the particular season is being chosen. This information may include information relating to the times of year when the ambient air and water temperatures support primary contact recreation, activities in and use (or lack thereof) of the waterbody during the proposed non-recreation months, and other relevant information.

3.2 What is EPA's policy regarding high levels of indicator organisms from animal sources?

In the 1994 *Water Quality Standards Handbook*, EPA established a policy that states and authorized tribes may apply water quality criteria for bacteria to waterbodies designated for recreation with the rebuttable presumption that the indicators show the presence of human fecal contamination. This 1994 policy stated:

> States may apply bacteriological criteria sufficient to support primary contact recreation with a rebuttable presumption that the indicators show the presence of human fecal pollution. Rebuttal of this presumption, however, must be based on a sanitary survey that demonstrates a lack of contamination from human sources. The basis for this option is the absence of data demonstrating a relationship between high densities of bacteriological water quality indicators and increased risk of swimming-associated illness in animal-contaminated waters.

In short, under this policy a state or authorized tribe could justify a decision not to apply the criteria to a particular waterbody when bacterial indicators were found to be of animal origin. This policy was based on the absence of data correlating non-human sources of fecal contamination and human illness and on the belief that pathogens originating from animal sources present an insignificant risk of acute gastrointestinal illness in humans.

The position taken in the 1994 Water Quality Standards Handbook is no longer supported by the available scientific data. The available data suggest there is some risk posed to humans as a result of exposure to microorganisms resulting from non-human fecal contamination, particularly those animal sources with which humans regularly come into contact, i.e., livestock and other domestic animals. As a result, states and authorized tribes should not use broad exemptions from the bacteriological criteria for waters designated for primary contact recreation based on the presumption that high levels of bacteria resulting from non-human fecal contamination present no risk to human health.

Recent evidence indicates that warm-blooded animals other than humans may be responsible for transmitting pathogens capable of causing illness in humans. Examples include outbreaks of enterohemorrhagic *E. coli* O157:H7, *Salmonella, Giardia*, and *Cryptosporidium*, all of which are frequently of animal origin. Livestock, domestic pets, and wildlife are carriers of human pathogens and can transmit these pathogens to surface waters as well as contribute significant numbers of indicator bacteria to waterbodies.

Incidents where these pathogens have been spread to humans through water have been documented in recent years. In the case of *E. coli* O157:H7, several cases have been cited in which fecal contamination from animals was the probable source of the pathogen. The most prominent examples have included contamination of water supplies, including an outbreak in Alpine, Wyoming, in June 1998, affecting 157 people, and a major outbreak in Walkerton, Ontario, in May and June of 2000 causing more than 2,300 people to become ill and causing seven deaths (CDC, 2002; CDC, 2000; Ontario's Ministry of the Attorney General, 2000). In the former case, contamination by wildlife of the community water supply is the suspected source, and in Walkerton, Ontario, heavy rains causing agricultural runoff to leak into city wells is suspected. The 1993 Milwaukee *Cryptosporidium* outbreak is a well-known example of water supply contamination that resulted in 403,000 illnesses and approximately 100 deaths. The source of the oocysts was not identified, but suspected sources include agricultural runoff from dairies in the region, wastewater from a slaughterhouse and meat packing plant, and municipal wastewater treatment plant effluent (Casman, 1996; USDA, 1993). In addition, *Cryptosporidium* was the known cause of 15 other outbreaks associated with drinking and recreational water affecting 5,040 individuals in the U.S. between 1991 and 1994 (Gibson et al., 1998). While many of the reported outbreaks have occurred through the consumption of contaminated drinking water, other incidences of *E. coli* O157:H7 infection from exposure to surface waters have been documented. **[For example, in the summer of 1991, 21 *E. coli* O157:H7 infections were traced to fecal contamination of a lake where people swam in Portland, Oregon (Keene et al., 1994)]**

The relative health risk from waters contaminated by human sources versus non-human sources has been the subject of recent debate, particularly related to the application and implementation of EPA's recommended water quality criteria for bacteria. While **[EPA believes] that]** non-human sources are capable of transmitting pathogens that can cause the specific kinds of gastrointestinal illness identified in EPA's original epidemiological studies, the specific risk from these sources has not been fully determined. The risk presented by fecal contamination of waters by non-human sources is possibly less significant; however, the increasing number of cases described above in which animals are the likely cause of the contamination and resulting illness present a compelling case to protect waters where human contact or consumption are likely to occur. In addition, because the presence of bacterial indicators provides evidence of fecal pollution, high levels of these indicator organisms originating from animal sources may also indicate the presence of pathogens capable of causing other human illnesses in addition to acute gastroenteritis.

Animals are more likely to carry or be infected with human pathogens when those animals are in close proximity to humans and their waste. The closer the association between animals and humans, the more likely it is that human pathogens will pass back and forth between humans and animals. The more crowded an animal herd, the more likely it is that human pathogens will be shared between animals of the herd. These pathogens are transmitted to others in the herd because of the direct contact between animals and their fecal matter. Fecal contamination from these infected herds, unless sufficiently treated or contained, can find its way into surface or ground waters and present a potential exposure route for people using the contaminated waters for recreation or drinking. This scenario potentially applies not only to animal feeding operations but also to herds of wildlife (deer, for example). However, the threat from livestock herds is likely to be greater given

the typical herd size and the resultant quantity of fecal wastes. Wild herds are typically more dispersed and smaller and therefore likely represent a smaller risk to watersheds. In addition, wildlife are not typically in routine daily contact with humans, as may be the case for livestock and other domestic animals.

It is essential that states and authorized tribes provide recreators with an appropriate level of protection in their water designated for recreational uses. Based on increased knowledge of the potential hazards associated with animal wastes, fecal contamination from all sources should be considered and evaluated for their relative risk contribution. The current state of knowledge regarding risk from wildlife sources is limited: it is apparent there is some risk, but that risk has not been quantified adequately. However, **[EPA believes that]** livestock and other domestic animals have the potential to pose a more substantial risk to humans than wildlife. This is based partly on the quantities of waste generated by herds of livestock, but also on the knowledge that domestic animals are more likely to carry human pathogens in general and carry a larger number of human pathogens than most species of wildlife. Therefore, at a minimum, it is appropriate to account for bacteria from all non-wildlife sources in state and authorized tribal water quality standards. Alternatively, states and authorized tribes may choose to provide their designated bathing areas with a more protective approach which accounts for all sources of bacteria, including wildlife. Such an approach may be appropriate in special cases where states and authorized tribes believe wildlife may contribute to disease in humans because of unique circumstances associated with, for example, their number, species, and/or proximity to human populations.

There are several ways to accomplish this. The option that takes full advantage of the public participation process would be to create a subcategory of primary contact recreation that accounts for the potential impact of fecal contamination from wildlife sources (i.e., create a separate "wildlife impacted recreation use" with a less stringent criterion). This option would allow states and authorized tribes to refine uses only where necessary. A complete discussion of this option is in section 3.4.2.

[Another way would be to simply express the criteria as "non-wildlife enterococci" or "non-wildlife *E. coli*".] The presumption for interpreting any measurement or permitting any source would be that the enterococci or *E. coli* is non-wildlife. However, if it is strongly suspected that the bacteria are solely or primarily from wildlife, then the responsible authority may conduct analysis (i.e., sanitary survey, source tracking, etc.) to determine the percent contribution of the bacteria measurement that represent wildlife bacteria (in situations where there are no human or domesticated animal sources of fecal pollution, the responsible authority could conclude that wildlife is the source of the measured bacteria). The relative contribution provided by wildlife can then be applied to the measurement prior to comparison with the protective criterion so that wildlife contributions are discounted. This approach has at least two advantages. First, with proper application, it is unnecessary to change the underlying designated use. Second, it allows continued appropriate permitting of unquestioned sources of non-wildlife bacteria, such as sewage treatment plants separate and apart from relying on antidegradation provisions. Section 3.4.2 provides more information on source tracking techniques.

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Other approaches may also be appropriate, in addition to the approaches described here. EPA will work with states and authorized tribes interested in developing such approaches to assure they meet the requirements of the Clean Water Act and federal regulations. In conjunction with the non-wildlife criteria and/or reference waterbody approaches, a state or tribe may issue precautionary bathing advisories in waters where wildlife bacteria exceed the non-wildlife bacteria criteria to warn would-be recreators of the unknown and uncertain risks of exposure to human pathogens that could be associated with wildlife.

3.3 What is EPA's policy regarding high levels of indicator organisms originating from environmental sources in tropical climates?

Recent research has raised the possibility that EPA's recommended bacterial indicators, *E. coli* and enterococci, may not be appropriate for assessing the risk of gastrointestinal illness in tropical recreational waters. *E. coli* and enterococci have been found to persist in soils and waterbodies (Fujioka et al., 1999; Fujioka and Byappanahalli, 1998; Lopez-Torres et al., 1987). Some researchers have hypothesized that these bacteria have developed mechanisms to maintain viable cell populations for significant periods of time under uniform tropical conditions (Fujioka, 1998). Because of these observations, some states have expressed a concern that the use of EPA's recommended indicator organisms will result in high observed concentrations of these bacteria that are not indicative of human health risks.

3.3.1 Does EPA recommend a different indicator for tropical climates?

At this time, EPA does not recommend that states and authorized tribes use different bacterial indicators for recreational waters in tropical climates. EPA's continued recommendation to apply *E. coli* and/or enterococci criteria for the protection of recreational waters in tropical climates is consistent with existing EPA policy and has not been altered by an expert workshop held on this issue and the scientific information available to date.

In March 2001, the University of Hawaii conducted a Tropical Water Quality Indicator Workshop; EPA provided funds, assisted with planning and participated in the workshop. The workshop, which was held in Hawaii, was designed to evaluate the existing scientific body of information on the adequacy of current indicators for tropical waters. International experts who either have conducted studies or who were otherwise very familiar with the scientific database regarding *E. coli* or enterococci indicator persistence and growth in tropical environments were tasked to determine if these indicators remained appropriate for determining water quality and associated exposure risks for gastrointestinal disease in recreational waters. Participants were asked to:

- critically evaluate published findings and monitoring data related to sources, persistence, and multiplication of EPA-approved fecal indicators in tropical locations and the impact of such findings on the suitability of existing water quality criteria for

these locations.

- critically evaluated published reports and other kinds of monitoring data related to the use of alternative water quality indicators in tropical locations, and
- reach conclusions on the identified problems and to provide suitable recommendations to address these problems.

The workshop resulted in four "consensus statements" (although not all were unanimous):

- Consensus Statement One: Soil, sediments, water, and plants may be significant indigenous sources of indicator bacteria in tropical waters.

- Consensus Statement Two: The inherent environmental characteristics of the tropics affect the relationships between indicators of fecal contamination (*E. coli*, fecal coliforms, enterococci) and health effects observed in bathers, which may compromise the efficacy of EPA guidelines.

- Consensus Statement Three: Fecal indicators of bacteria (fecal coliforms, *E. coli*, enterococci) can multiply and persist in soil, sediment, and water in some tropical/subtropical environments (Hawaii, Guam, Puerto Rico, south Florida).

- Consensus Statement Four (the preferred alternative): Recreational water quality guidelines for the tropics/subtropics should be supplemented with additional alternative indicators *C. perfringens*, coliphages) for watershed assessment (or sanitary survey).

- Consensus Statement Four (the alternate version): In the absence of a predominant point source pollution, recreational water quality guidelines for the tropics/subtropics should be supplemented with additional alternative indicators *C. perfringens*, coliphages) for watershed assessment (or sanitary survey).

In addition, the workshop concluded by identifying overall recommendations and research needs. The final report from this expert workshop, *Proceedings and Report, Tropical Water Quality Indicator Workshop*, was published in 2003. For additional information, go to the University of Hawaii at Manoa website at http://www.wrrc.hawaii.edu/tropindworkshop.html.

Based on EPA's participation in the workshop and review of the final report, the evidence is still not sufficiently compelling to change EPA's recommendation for states and authorized tribes to use *E. coli* or enterococci criteria to ensure protection of their tropical recreational waters. The Agency believes there currently are insufficient data and information concerning possible adverse health implications to support a recommendation for the use of different tropical indicators. EPA will consider further research to determine whether or not environmental mechanisms favoring the persistence or growth of *E. coli* and enterococci indicators impact upon correctly determining the safety of tropical recreational waters. Also, EPA is reviewing the research needs identified in the tropical indicators workshop report to decide upon an approach to pursue future research on

alternative indicators that may be better suited for characterizing tropical recreational water quality.

3.3.2 What options are available to states and authorized tribes to address the applicability of EPA's recommended water quality criteria for bacteria in tropical climates?

States and authorized tribes have several options to modify their water quality standards and/or implementation procedures to address the potential for bacterial indicators to persist in tropical climates. First, a state or authorized tribe may develop water quality criteria applicable to recreational waters in tropical climates using alternative indicators. If a state or authorized tribe wishes to pursue this approach, they should apply a risk-based methodology to the development of the water quality criteria to establish a correlation between alternative indicator organism concentrations and gastrointestinal illness. This approach would be consistent with EPA's requirements for the development of scientifically defensible criteria. See 40 C.F.R. §131.11(b)(1)(iii). In addition to demonstrating a statistically significant relationship to gastrointestinal illness, an alternative indicator should be indicative of recent contamination and be detectable and quantifiable using acceptable peer-reviewed analytical methods.

Clostridium perfringens has been identified as a candidate organism having potential as a bacteriological indicator of fecal pollution. However, studies have yet to be conducted demonstrating a correlation between *C. perfringens* and the incidence of gastrointestinal illness. In addition, because *C. perfringens* forms spores that can survive for extended periods of time, EPA continues to have concerns regarding the ability of *C. perfringens* to indicate recent fecal contamination. However, for states and authorized tribes that do not wish to undertake resource-intensive epidemiological studies, *C. perfringens,* or another microorganism associated with fecal pollution may be adopted as a supplemental indicator of fecal pollution. EPA recommends the use of enterococci (expressed both as a geometric mean and upper percentile value) as the primary bacteriological indicator for marine and fresh waters (or *E. coli* for fresh waters), with a supplemental indicator of human fecal contamination if desired. For a state or authorized tribe with tropical waters that chooses this approach, the use of EPA's recommended criteria and a supplemental indicator of fecal contamination, in conjunction with site surveys, should be adequate to protect primary contact recreation. EPA will work with states and authorized tribes concerned about the applicability of EPA's recommended criteria in tropical waters on developing appropriate implementation procedures that take into account the behavior of indicator organisms in tropical climates.

Another option is the adoption of a subcategory of recreation use with appropriate criteria reflecting these natural conditions similar to the process described in section 3.4.2 for waterbodies impacted by high levels of wildlife fecal pollution. An approach such as this would be appropriate if it can be shown that primary contact recreation is not an existing use, the source of pollution is not from anthropogenic sources, and that the primary contact designated use cannot be attained due to naturally-occurring pollutant concentrations preventing the attainment of the use. (See section 3.4.2 for additional details.)

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Other approaches may also be appropriate, in addition to the approaches described here. EPA will work with states and authorized tribes interested in developing such approaches to assure they meet the requirements of the Clean Water Act and federal regulations. In general, the above approaches are applicable to any tropical area with high background concentrations of indicator bacteria. However, prior to any change to water quality standards or implementation procedures, EPA strongly recommends conducting sanitary surveys in addition to bacterial indicator monitoring, especially in areas where higher than normal bacteria densities are observed during monitoring. A discussion of sanitary surveys and additional related resources is provided at the beginning of this chapter.

3.4 What options exist for adopting subcategories of recreation uses?

States and authorized tribes may adopt subcategories of recreational uses. More choices in subcategories of recreational uses allow states and authorized tribes to better tailor the level of protection to the waterbody where it is most needed, while maintaining appropriate protection for unanticipated recreation in waters where primary contact recreation is unattainable. Examples of such categories are: (1) primary contact recreation uses modified to reflect high flow situations or (2) waterbodies significantly impacted by wildlife sources of fecal contamination, where states or authorized tribes choose to take a more cautious approach in terms of expected risk to humans from wildlife sources of fecal contamination. In determining the appropriate recreational use for a waterbody, states and authorized tribes should consider that, in certain circumstances, people will use whatever waterbodies are available for recreation, regardless of the physical conditions, and that adopting a recreational use subcategory may necessitate a concurrent plan or action by the state or authorized tribe to communicate to the public the potential risks or hazards associated with recreating in certain waterbodies.

In adopting recreational subcategories with criteria less stringent than those associated with primary contact recreation, some analysis is expected. States and authorized tribes have in many circumstances designated primary contact recreation broadly for waters without conducting waterbody-specific analyses. In some instances, states may find that recreation is not an existing use.[4] In addition, if one of the six factors in 40 CFR 131.10(g) is met, recreation uses may be removed altogether. The level of analysis required will vary depending upon the type of recreation use being designated. These uses can include the designation of intermittent, secondary, or seasonal recreation uses. Subject to the provisions of 40 CFR 131.10, recreational uses other than primary contact recreation may be applicable to waters where, for example, human caused conditions combined with wet weather events cannot be remedied, or where meeting the primary contact recreation use at all times would result in substantial and widespread social and economic impact. Where states and authorized tribes have adopted uses less than primary contact recreation, federal

[4] 40 CFR 131.3(e) defines existing uses as "those uses actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the water quality standards."

regulations require a re-examination every three years to determine if any new information has become available to support the designation of a primary contact recreation use. See 40 CFR 131.20.

3.4.1 When is it appropriate to modify primary contact recreation uses to reflect extreme wet weather situations?

An intermittent recreation use may be appropriate when the water quality criteria associated with primary contact recreation are not attainable due to wet weather events. The water quality criteria associated with primary contact recreation may be suspended during defined periods of time, usually after a specified infrequent hydrologic or climatic event. EPA intends this intermittent primary contact recreation use to be adopted for waterbodies in a limited number of circumstances, contingent upon a state or authorized tribe demonstrating that the primary contact recreation use is not attainable through effluent limitations under CWA §301(b)(1)(A) and (B) and §306 or through cost effective and reasonable best management practices, and meets one of the six reasons listed under 40 CFR 131.10(g).[5] The length of time the water quality criteria (and, thus, the recreation uses) should be suspended during these events should be determined on a waterbody-by-waterbody basis, taking into account the proximity of outfalls to sensitive areas, the amount of rainfall, time of year, etc.

EPA anticipates that the use of extreme wet weather exclusions associated with an intermittent recreation use will be primarily applicable to flowing waterbodies and still waters impacted by flowing waterbodies, where high flows are accompanied by high indicator levels that cannot be remedied. For example, in an urbanized watershed there may be specific times after rainfall events where bacteria criteria cannot be met even after implementation of an appropriate storm water management plan. When considering whether an extreme wet weather exclusion may be appropriate for a particular waterbody, states and authorized tribes should evaluate the effects of the wet weather events on the recreation use. For example, in some waterbodies, high flows routinely provide a highly attractive recreation environment (e.g., for kayakers), making such waters

[5] One of the six conditions listed under 40 CFR 131.10(g) must be met in order to remove a designated use which is not an existing use, or to establish sub-categories of a use:

(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or

(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the atttainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasibile to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(5) Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

poor candidates for such an exclusion. In other circumstances, high wet weather flows result in dangerous conditions physically precluding recreation (e.g., arroyo washes in the arid west), thus indicating that primary contact recreation is not or should not be occurring. Waterbody flow and velocity vary greatly among waterbodies depending on a combination of many factors (such as the amount of impervious surface, slope, soil texture, vegetative cover, soil compaction, and soil moisture). The conditions affecting velocity also vary with the depth and width of the waterbody's channel. These variables affect the relationship between wet weather events and the resulting indicator levels.

Swift water conditions created by engineered flood control channels (which are constructed to reduce the incidence of flooding in urbanized areas by rapidly conveying storm water runoff to the ocean or other discharge points as efficiently as possible) provide an example of a hydrologic condition that precludes primary contact recreation. In Los Angeles county, the inherent danger of recreating in engineered flood channels during and immediately following storm events is widely recognized. Protocols have been set for locking access gates to flood control channels and preparing for possible swift-water rescues in these channels during defined, forecasted storm events. In response, a categorical UAA for all engineered flood control channels during defined storm events was developed, and the primary contact recreational use designations for engineered channels are temporarily suspended during and for 24 hours following a storm event of ½-inch per day or greater. Further, it is not feasible to restore the water body to its original condition or operate the modifications in such a way as to attain the use during the defined storm conditions.

Adoption of an extreme wet weather exclusion should be based on scientific assessment and should reflect public input. If the waterbody is impacted by combined sewer overflows, the supporting analysis for any water quality standards revision should be consistent with, or reflected in, the Long Term Control Plan (LTCP). Additionally, such an exemption should apply on a case-by-case basis (rather than state-wide, for example), should be tailored to the waterbody (rivers, as distinct from lakes), and should clearly identify the situation where it applies. For flowing waters, one approach is to specify the flow conditions when an exceedance may be allowed. Alternatively, for either flowing or still waters, a state or authorized tribe may identify specific rainfall events, after which the bacteriological criteria may be exceeded for a limited time. In general, flow itself may not correspond well to increases in bacterial density associated with storm runoff. Typically, the highest spike will occur early in the hydrograph (i.e., at the "first flush") prior to peak storm flow.

If a state or authorized tribe adopts an intermittent recreation use with an extreme wet weather exclusion, it should address several questions:

- Will other uses of the waterbody continue to be protected even when the exclusion is triggered?
- Would the conditions during these events attract recreational uses (including kayaking) that typically occur during high velocity flows?
- What triggers the exclusion and for how long would the exclusion apply and how was the length of time determined?
- Will the state or authorized tribe adopt the exclusion as a condition/ criteria,

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or create a recreational subcategory that correlates to the exclusion?

- Has there been a demonstration that one of the factors relating to establishing a subcategory of use (40 CFR 131.10(g)) has been met?
- Have cost-effective and reasonable best management practices been considered?

States and authorized tribes designating a waterbody with an intermittent recreation use, or some other subcategory of primary contact recreation (such as an extreme wet weather exclusion), should include provisions for maintaining and protecting the primary contact recreational use when normal conditions prevail and for protecting downstream uses. EPA envisions that states and authorized tribes could apply a methodology on a site-specific basis using the waterbody channel and landscape characteristics. States and authorized tribes could also create a subcategory of the recreational uses to which the exclusion would apply. As with other changes in designated uses, the public must have an opportunity to comment on the proposed revision to the water quality standard before a state or authorized tribe adopts and submits it to EPA for approval or disapproval under CWA §303(c).

For states and authorized tribes using this approach, EPA encourages the development of a plan to communicate to the public the conditions under which recreation should not occur. For waterbodies that are known to be beaches or heavily used recreation areas, EPA encourages caution in adopting intermittent suspensions of the primary contact recreation use. If the state or authorized tribe finds after public comment that such a revision to water quality standards for a beach area is supported, EPA encourages beach managers to issue advisories during the exclusion conditions unless monitoring data are collected indicating it is safe to recreate. This is the most appropriate implementation measure for those waters heavily used for recreation since the adoption of such an exclusion presumes that, under the conditions specified by the state or authorized tribe, the bacteriological criteria will be exceeded and, thus, may present a hazard to swimmers.

Further guidance on refining water quality standards specifically for combined sewer overflow receiving waterbodies is contained in the *Coordinating CSO Long-Term Planning With Water Quality Standards Reviews* (USEPA, 2001).

3.4.2 When is it appropriate to adopt wildlife impacted recreation uses?

In addition to the option outlined in section 3.2, states and authorized tribes may refine designated uses if it can be demonstrated that primary contact recreation is not an existing use and natural sources preclude the attainment of water quality criteria related to that use. Prior to exercising this option, a state or authorized tribe should gather data to address the following questions:

- Is the waterbody publicly identified, advertised, or otherwise regularly used or known by the public as a beach or swimming area where primary contact recreation activities are encouraged to occur?

- What is the existing water quality? If it is not currently meeting the applicable recreational water quality standards, do the exceedances occur on a seasonal basis, in response to rainfall events, or at other times due to other conditions or weather-related events?
- Is the primary contact recreation use attainable through the application of effluent limitations under CWA §301(b)(1)(A) and (B) and §306 or through cost effective and reasonable best management practices?
- What are the sources of fecal pollution within the waterbody? What are the relative contributions of these sources?

The first two questions will assist the state or authorized tribe in determining whether or not primary contact recreation is an existing use. In answering these questions, both water quality and the actual use that has occurred since November 28, 1975 should be considered. See 40 CFR 131.3(e). Information provided by the public should be considered by the state or authorized tribe in making this determination. The state or authorized tribe should provide documentation of the waterbody's historical water quality, if available, and the use of the waterbody for recreation in support of its conclusion that primary contact recreation is not an existing use.

Secondly, the state or authorized tribe should determine that natural sources, and not leaking septic tanks or other anthropogenic sources, prevent attainment of water quality standards. To ascertain whether natural sources are the cause of impairment, several tools are available. Sanitary surveys may be conducted to identify the sources contributing to a waterbody. Recommendations on conducting sanitary surveys and additional references are contained at the beginning of section 3. Detection of detergents, dyes, or caffeine may indicate human sewage as the source of fecal pollution. Knowledge of land use patterns within a watershed may also assist states and authorized tribes in determining the relative contribution sources of fecal contamination within a watershed. In addition, other analytical tools are becoming more common in identifying the sources of fecal contamination. While Bacterial Source Tracking methods such as ribotyping and Antibiotic Resistance Analysis are becoming more common, such methods may be cost prohibitive for many states and authorized tribes to use on a large scale (See, for example, Dombeck et al., 2000; Harwood et al., 2000, Wiggins et al., 1999).

The results of the sanitary survey or other methods demonstrating that natural sources preclude attainment of primary contact recreation should be sufficient to conclude that primary contact recreation is not attainable under 40 CFR 131.10(g)(1), on the grounds that naturally-occurring pollutant concentrations prevent the attainment of the use. When removing a CWA §101(a) goal use or adopting subcategories of those uses, under 40 CFR 131.10(g), states and authorized tribes are required to submit an analysis demonstrating that the use is not an existing use and justifying the removal of that use based on one of the six reasons listed in that section. When contemplating revisions to water quality standards based upon impacts from natural sources, EPA encourages states and authorized tribes to use scientifically defensible methods in their supporting analyses. EPA will review this information as part of its review and action on any revised water

quality standards. Answering the questions identified above should assist the state or authorized tribe in making a scientifically defensible determination that natural sources preclude attainment of the primary contact recreation use.

Once the initial analysis has been completed, states and authorized tribes have several options for revising their recreational water quality standards. A state or authorized tribe could pursue adopting a wildlife impacted recreation use as a recreational use subcategory, or, for waterbodies where water quality sufficient to support primary contact recreation is unattainable and location or barriers make recreation unlikely to occur, consider adopting a secondary contact recreation use or removal of recreation uses. Establishing a wildlife impacted recreation use would be appropriate for waters where limited recreational activities may still occur. EPA recommends that states and authorized tribes wishing to adopt a wildlife impacted recreation use adopt a criterion reflecting the natural levels of bacteria and, because the specific risk to people recreating in these waters is unknown, develop a plan to communicate to the public the potential risk of recreating in waters designated with this use. This communication could include public announcements or sign posting along the waterbody. Ideally, the state or authorized tribe should have monitoring and/or modeling data that would assist in identifying the natural levels of indicator organisms. Because such contributions are often correlated with rainfall events, the state or authorized tribe should consider the level of bacterial indicators present during dry and wet weather as well as any other spatial or temporal variability to assist in the establishment of an appropriate criterion. EPA envisions that a wildlife impacted recreation use category would provide greater protection than a secondary contact recreation use. However, wildlife sources of fecal contamination may still present some additional risk to recreators. Therefore, if the state or authorized tribe is adopting a less stringent criterion, the increment of change should correspond only to the estimated amount of the bacteria that is present due to natural sources.

Where it is shown that primary contact recreation is not an existing use and that the waterbody is significantly impacted by wildlife contamination, states and authorized tribes may adopt a secondary contact recreation use or remove the recreation use altogether. In determining whether recreation is an existing use, states and authorized tribes should consider the location of the waterbody and any barriers that may exist that would preclude the use of the waterbody for primary contact recreation. See Section 3.5 for a discussion of secondary contact recreation uses and criteria.

Other water quality standards approaches beyond those described here may also be appropriate. EPA will work with states and authorized tribes interested in developing such approaches to assure they meet the requirements of the Clean Water Act and federal regulations. Regardless of the option a state or authorized tribe pursues, EPA emphasizes the importance of public participation in revising its water quality standards.

Use of this approach can provide states and authorized tribes with the means to acknowledge the source(s) of fecal pollution that exists and its potential risk to recreators. Concern has been expressed that the use of this approach may provide existing NPDES permitted dischargers with relaxed effluent limitations. In the case where a discharger has a water quality based effluent limitation (WQBEL) for bacteriological criteria, it would not be eligible for less stringent effluent

limitations unless an antidegradation analysis was performed consistent with the federal and state (or tribal) regulations. See 40 CFR 131.12. In addition, an analysis should be performed as part of the development of the WQBEL that considers the receiving waterbody's water quality and to determine whether the discharge has the reasonable potential to cause or contribute to the exceedance of applicable water quality standards. See 40 CFR 122.44(d).

3.5 What is EPA's policy regarding secondary contact recreation uses?

EPA defines secondary contact uses as including recreational activities where most participants have very little direct contact with the water and where ingestion of water is unlikely. States and authorized tribes may be able to justify the adoption of a secondary contact use, in lieu of a primary contact use, by completing a use attainability analysis. Subject to the provisions of 40 CFR 131.10, a secondary contact recreation use may be appropriate for waters that are, for example, impacted by human caused conditions that cannot be remedied, or where meeting the criteria associated with the primary contact recreation use would result in substantial and widespread social and economic impact.

3.5.1 When is it appropriate to designate a secondary recreation use?

EPA considers waters designated for primary contact recreation and waters designated for secondary contact recreation -- but with criteria sufficient to support primary contact recreation -- to have "swimmable" standards consistent with the CWA §101(a) goal[6]. States and authorized tribes may assign less than "swimmable" standards where adoption of such a standard is adequately justified by a use attainability analysis (UAA). A UAA is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors. See 40 CFR 131.3(g), 131.10(g), and 131.10(j). Removing a "swimmable" standard and replacing it with a less than "swimmable" standard (or no recreation standard at all) is acceptable only where the revision is adequately justified by a UAA. It is also important to remember that all waters where less than "swimmable" standards have been assigned must be re-examined by the state or authorized tribe every three years to determine if new information has become available. If such new information indicates that "swimmable" standards are attainable, the standards are to be revised accordingly. See 40 CFR 131.20.

Where a UAA demonstrates that a "swimmable" standard is not attainable, the state or authorized tribe should evaluate whether a subcategory of recreation use with less stringent criteria is appropriate. States may elect to establish several categories of recreation uses, and perhaps even several categories of secondary contact uses, and assign criteria which are appropriate to the types of activities to be protected. However, any decision to assign a less than "swimmable" standard to

[6] For purposes of this discussion, waters with "swimmable" standards consistent with the CWA § 101(a)(2) goal are defined as including waters with a primary contact use and criterion, and waters with a secondary contact (or other) recreation use, but criteria sufficient to protect primary contact uses.

a particular segment must be adequately supported by a UAA. Less than "swimmable" standards may be considered, for example, where flowing or pooled water is not present within a waterbody during the months when primary contact recreation would otherwise take place and the waterbody is not in close proximity to residential areas, thereby indicating that primary contact uses are not likely to occur. Also, if a state or authorized tribe can demonstrate that natural, ephemeral, intermittent, or low flow conditions or water levels prevent attainment of the primary contact recreation use, a secondary contact recreation use may be appropriate. Another example would be a discharger that is not able to meet the limits necessary to protect the primary contact recreation use without causing substantial and widespread social and economic impact, but can meet limits that would assure protection of a secondary contact recreation use. In addition, as discussed in section 3.4.2, designating a secondary contact recreation use may be appropriate where primary contact recreation is not an existing use and high levels of natural or uncontrollable fecal pollution exist. These demonstrations would fulfill the requirements of and address one of the six conditions contained in 40 CFR 131.10(g) supporting the removal of a designated use.

3.5.2 What information should be contained in a use attainability analysis to identify the appropriate recreation use?

A recreational use attainability analysis (UAA) should be an objective collection of site-specific facts that are relevant to deciding what designated use is most appropriate. Not all recreation UAAs will support a conclusion that a "swimmable" standard is not attainable. The water quality standards coordinators in EPA's Regional offices should be consulted when developing UAA methods/guidance or specific workplans for individual UAAs. Consultation with appropriate EPA staff regarding the study objectives and methods, prior to any field work, is recommended.

Although each situation is different and may require a UAA workplan with special provisions to address unique circumstances, the information included in a use attainability analysis for recreation uses may need to include the following:

- information concerning any existing recreational activities that occur in the waterbody, by type of activity, and including frequency information (e.g., gathered from surveys or interviews with knowledgeable individuals, entities, or organizations);
- information that is useful in assessing the potential for various types of recreational uses to occur in the waterbody, which may include:
  - physical analyses addressing: features that facilitate public access to the waterbody (e.g., road crossings, trails), facilities promoting recreation (e.g., rope swings, docks, picnic tables), features limiting access to the waterbody or that discourage recreation uses (e.g., fences, signs), location of the waterbody including proximity to residential areas, schools, or parks, projections of population growth/development in the area, safety considerations, water temperatures, flows, velocity, depth, and width, and other physical

attributes of the waterbody such as substrate characteristics;
- chemical analyses of existing water quality for key parameters (bacteria, nutrients), including a comparison of available representative data for indicator bacteria to the criteria adopted by the state or authorized tribe (which may include both geometric mean and upper percentile values);
- identification of sources of fecal pollution, and an assessment of the potential for reduced loadings of bacterial indicators; and
- economic/affordability analyses.

(See also sections 3.4.1 for changes to recreation uses for waterbodies impacted by bacteria associated with high flow conditions and 3.4.2 for waterbodies impacted by non-human sources.)

On the subject of physical analyses, EPA has previously stated that, "Physical factors, which are important in determining attainability of aquatic life uses, may not be used as the basis for not designating a recreational use consistent with the CWA section 101(a)(2) goal" (USEPA, 1994). In fact, 40 CFR 131.10(g)(5), which refers to physical conditions as a factor to consider when determining whether or not to remove a designated use, applies only to aquatic life uses. Therefore, physical factors alone are not sufficient justification for removing or failing to designate a primary contact recreation use.

Likewise, the general Agency policy is to place emphasis on the potential uses of a waterbody and to do as much as possible to protect the health of the public (see the preamble to the amendments to the water quality standards regulation, 48 FR 51401, November 8, 1983, and Section 2.1.3 of the Water Quality Standards Handbook). In certain instances, the public will use whatever waterbodies are available for recreation, regardless of the flow or other physical conditions. Accordingly, EPA encourages States to designate primary contact recreation uses, or at least to require a level of water quality necessary to support primary contact recreation, for all waterbodies with the potential to support primary contact recreation.

EPA's suggested approach to the physical factors issue is for states and authorized tribes to look at a suite of factors such as whether the waterbody is actually being used (or has been used) for primary contact recreation; existing water quality; water quality potential; access; recreational facilities; location (i.e., proximity to recreational facilities); safety considerations, and; physical attributes of the waterbody in making any use attainability decision. Any one of these factors, alone, may not be sufficient to conclude that a "swimmable" standard is not warranted.

In general, adoption of "swimmable" standards is appropriate wherever it is feasible to achieve water quality levels necessary for the protection of primary contact uses. However, there are a few instances where physical considerations may play an important role in informing a state or authorized tribe's decision regarding what recreation use is most appropriate. This may include a waterbody where access is prevented by fencing or in an urban waterbody that also serves as a shipping port or has close proximity to shipping lanes. A physical analysis may lead to a conclusion

that flowing or pooled water is not present during certain times of the year, or that the waterbody is not in proximity to residential areas. In instances such as these, an analysis of the physical attributes may help determine when and where primary contact recreation occurs in waterbodies where another §131.10(g) factor already prevents attainment.

Some types of primary contact activities require more substantial flows and/or depths, while others can and do occur when water flows and depths are quite low. For example, whereas white water rafting may not be possible in a certain water body when flows are low, that same water body might have sufficient flow to support a variety of summertime activities by children that may involve ingestion of water. As such, it is not appropriate to establish broad methods that result in assignment of less than "swimmable" standards where flows or water depths are below a certain fixed level. Rather, UAA methods should address a suite of factors. Regarding water flows and depths, UAA determinations should consider the particular recreational activities that are likely to occur. In particular, flows and depths should be evaluated differently in areas where children have easy access to the water body.

EPA understands that substantial and widespread social and economic impacts are often determining factors in assessing whether or not "swimmable" standards can be attained. EPA has published guidance to assist states and authorized tribes in considering economic impacts when adopting water quality standards (USEPA, 1995). The cost of placing additional control measures on sources of fecal contamination are often cited as the reason a water cannot attain the primary contact recreation use and the associated water quality criteria in all waters at all times. In the use attainability analysis process, the federal regulation at 40 CFR 131.10(g) lists the factors that may be used to demonstrate that a primary contact recreation use cannot be met; these factors include substantial and widespread social and economic impact, and natural conditions. Water quality criteria are derived to address the effects of pollution on the environment and human health, while under the federal regulation, the setting of designated uses may take into account social and economic considerations. See 40 CFR 131.10(g).

3.5.3 What water quality criteria should be applied to waters designated for secondary contact recreation?

For waterbodies where a state or authorized tribe demonstrates through a use attainability analysis that "swimmable" standards are not attainable, adoption of secondary contact uses and the associated water quality criteria may be appropriate. EPA defines secondary contact uses as including activities where most participants would have very little direct contact with the water and where ingestion of water is unlikely. Secondary contact activities may include wading, canoeing, motor boating, fishing, etc. Many states and authorized tribes have adopted secondary contact recreation uses for waterbodies. States and authorized tribes with fecal coliform criteria generally have adopted a secondary contact water quality criterion of 1000 cfu/100ml geometric mean, which is five times the geometric mean value typically used to protect primary contact recreation. This water quality criterion has been applied to secondary contact uses and to seasonal recreation uses during the months of the year not associated with primary recreation. The *Ambient Water Quality*

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Criteria for Bacteria –1986, which recommended *E. coli* and enterococci as indicators, did not provide criteria recommendations for recreation uses other than primary contact recreation. States and authorized tribes have cited this as one reason why they have not adopted EPA's recommended water quality criteria.

EPA is unable to derive a national criterion for secondary contact recreation based upon existing data, because secondary contact activities involve far less contact with water than primary contact activities. During the development of this guidance document, EPA explored the feasibility of deriving criteria for secondary contact waters and found it infeasible for several reasons. In reviewing the data generated in the epidemiological studies conducted by EPA that formed the basis for its 1986 criteria recommendations, EPA found that the data would be unsuitable for the development of a secondary contact criterion. The data collected were associated with swimming-related activities involving immersion. Secondary contact recreation activities generally do not involve immersion in the water, unless it is incidental (e.g., slipping and falling into the water or water being inadvertently splashed in the face).

Despite the lack of epidemiological studies/data necessary to develop a risk-based secondary contact recreation criterion, waters designated for secondary contact recreation should have an accompanying numeric criterion. Adopting a numeric criterion for the secondary contact recreation use provides the basis for the development of effluent limitations and, where applicable, the implementation of best management practices. Such an approach provides a mechanism to assure that downstream uses are protected and, where adopted as part of a seasonal recreation use, helps to assure that the primary contact recreation use is not precluded during the recreation season. Adoption of a secondary contact criterion is also consistent with historical practices for most states and authorized tribes. Accordingly, states and authorized tribes may wish to adopt a secondary contact criterion which is five times their primary contact criterion. EPA recommends that secondary contact criteria be geometric mean values using a 30 day, seasonal, or annual averaging period. Clearly identifying the averaging period is very important to support attainment and permitting decisions. Another approach would be the adoption of a secondary contact criterion as a maximum, not to be exceeded value. This would also be an appropriate approach, particularly for states and authorized tribes that are unable to collect sufficient monitoring data to calculate a geometric mean value. States and authorized tribes may also pursue other approaches for secondary contact waters, and EPA will work with the state or authorized tribe to ensure the approach is protective of the designated use and meets the above objectives.

3.5.4 Will EPA publish risk-based water quality criteria to protect for "secondary contact" uses?

EPA's *Ambient Water Quality Criteria for Bacteria* – 1986 are designed to protect the public from gastrointestinal illnesses associated with accidental ingestion of water. EPA has not developed any water quality criteria for secondary contact recreation uses. As part of EPA's requirements under the BEACH Act amendments, EPA intends to gather additional data and investigate the development of water quality criteria for transmission of organisms that cause skin, eye, ear, nose, respiratory

illness, or throat infections. Some elements of such future water quality criteria may potentially be applicable to secondary contact uses.

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4. Implementation of EPA's *Ambient Water Quality Criteria for Bacteria* – 1986 in State and Authorized Tribal Water Quality Programs

4.1 What is EPA's recommended approach for states and authorized tribes making the transition from fecal coliforms to *E. coli* and/or enterococci?

EPA recognizes that states and authorized tribes that have yet to adopt EPA's recommended 1986 water quality criteria for bacteria may be concerned about how to ensure consistency and continuity within their regulatory programs. Specifically, states and authorized tribes may have concerns about making regulatory decisions during this transition period while an adequate monitoring database is being established. To facilitate this period of transition, states and authorized tribes may include both fecal coliforms and *E. coli*/enterococci in their water quality standards for the protection of designated recreational waters for a limited period of time, generally one triennial review cycle. The dual sets of applicable criteria will enable regulatory decisions and actions to continue while collecting data for the newly adopted *E. coli* or enterococci criteria. For states and authorized tribes choosing this approach, EPA expects that during this limited period of time, states and authorized tribes will be actively collecting data on *E. coli* and/or enterococci and be working to incorporate *E. coli* and/or enterococci water quality criteria into their water quality programs, e.g., national pollutant discharge elimination system (NPDES), 305(b), and 303(d) programs. Alternatively, states and authorized tribes may elect to concurrently adopt a delayed effective date to allow for time in which to collect data on the newly adopted criteria. With these options available, lack of data should not delay states' and authorized tribes' adoption of *E. coli* and/or enterococci. Once *E. coli* and/or enterococci are adopted into state or tribal water quality standards, EPA encourages states and authorized tribes to remove the fecal coliform criterion as it applies to recreational waters during its next triennial review, since retaining the fecal coliform criterion for recreational waters may result in additional permitting and monitoring requirements.

Once adopted as water quality standards by states, authorized tribes, or EPA, these water quality criteria form the basis for water quality program actions, both regulatory and non-regulatory. For example, water quality criteria are used in establishing NPDES water quality-based effluent limitations (WQBELs), listing impaired waters under section 303(d), and beach monitoring and advisory programs. How the adopted criteria will be used in these different programs should be clearly explained in states' and authorized tribes' water quality standards or supporting implementation documents.

EPA recommends that states and authorized tribes adopt water quality criteria for bacteria containing both the geometric mean and upper percentile value components. This allows states and authorized tribes the flexibility to utilize the appropriate criteria component based on the situation. EPA recommends the use of the geometric mean when assessing and determining attainment of waters designated for primary contact recreation, provided a sufficient number of samples has been taken over the course of the recreation season. In situations where sampling is infrequent it is appropriate to use the upper percentile value in determining attainment.

With regard to interpreting the geometric mean component of the criteria, there has been a

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common misconception of how water quality data should be used to determine whether or not a waterbody has attained the applicable geometric mean value. Some states and authorized tribes have mistakenly interpreted the water quality criteria as requiring a minimum number of samples in order to determine the attainment of the geometric mean component of the water quality criteria. The confusion may have arisen because the water quality criteria recommend a monitoring frequency of five samples taken over a 30-day period. The recommendation does not intend to imply that five samples are needed before a geometric mean can be calculated. The minimum number of samples used in the 1986 water quality criteria for bacteria is for accuracy purposes only; clearly, more frequent sampling yields more confidence when determining whether or not a waterbody is meeting its geometric mean. Further, in some instances averaging periods greater than 30 days may be appropriate (e.g., data collected over a recreation season). Unless specified otherwise in a state or authorized tribe's water quality standards or assessment methodology, the geometric mean should be calculated based on the *total number of samples collected* over the specified monitoring period, and used in conjunction with an upper percentile value to determine attainment of the numeric water quality criteria (e.g., CWA §303(d) listing for fresh and marine waters). This interpretation encourages the collection and use of data and is what has always been intended. EPA notes that this interpretation was used by the Agency when promulgating water quality standards for the Colville Confederated Tribes (40 CFR 131.35).

4.2 How should states and authorized tribes implement water quality criteria for bacteria in their NPDES permitting programs[7]?

States and authorized tribes have discretion in how NPDES water quality-based effluent limits for bacteria are specified. The following sections describe how limits may be established by the permitting authority for different discharge types and be consistent with the applicable federal requirements. Two scenarios are discussed: first, the period of time during which states and authorized tribes are making the transition from fecal coliform criteria to *E. coli* or enterococci criteria, and second, developing limits once the *E. coli*/enterococci criteria have been established in state and tribal water quality standards.

4.2.1 While transitioning from fecal coliforms to *E. coli* and/or enterococci, how should states and authorized tribes implement water quality criteria for bacteria in their NPDES permitting programs?

If a state or authorized tribe chooses to retain its fecal coliform criterion during a transition period after adoption of *E. coli* and/or enterococci as water quality criteria, any new or reissued permits would need to contain water quality-based effluent limits, reflecting both criteria unless

[7]Pursuant to section 518(e) of the CWA, EPA is authorized to treat an Indian tribe in the same manner as a state for the purposes of administering a NPDES program. 40 CFR 123.31-121.34 establishes the procedures and criteria by which the Agency makes such a determination. At this time, several tribes are in the process of requesting program authorization; however, to date no tribe has been granted authorization to administer an NPDES program.

specified otherwise in a state or authorized tribe's water quality standards, to be consistent with the federal requirement at 40 CFR 122.44(d)(1)(i). This provision requires water quality-based permits containing limits for those pollutants (including all bacterial pollutants) the permitting authority determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an exceedance of any applicable water quality standard. In this case, the existence of "reasonable potential" for fecal coliforms would also indicate the existence of reasonable potential for any other criterion for bacteria adopted by the state or authorized tribe. In most cases, wastewater treatment plants that have used secondary and tertiary treatment for fecal coliforms should find that this treatment also adequately addresses *E. coli* and enterococci (Miescier and Cabelli, 1982). However, wastewater treatment plants chlorinating their effluent may find enterococci more resistant to chlorination than fecal coliforms or *E. coli* (Oregon Association of Clean Water Agencies, 1993; Miescier and Cabelli, 1982).

4.2.2 Once *E. coli* and/or enterococci have been adopted by states and authorized tribes, how should the water quality criteria for bacteria be implemented in NPDES permits ?

Many states and authorized tribes have raised concerns regarding how state and tribal water quality standards based on EPA's 1986 water quality criteria for bacteria should be implemented through NPDES permits. Under the Clean Water Act and the implementing federal regulations, states and authorized tribes have flexibility in how they translate water quality standards into NPDES permit limits to ensure attainment of designated uses. In implementing state and tribal water quality standards that include both the geometric mean and upper percentile value components, there are multiple acceptable approaches. Because effluent limits are generally based on monthly averages, EPA recommends that states and authorized tribes use the geometric mean component for NPDES water quality-based effluent limits. For those permits that include maximum daily limits, the upper percentile value should be used. Alternatively, states and authorized tribes could use *both* the geometric mean and upper percentile value in the development of NPDES water quality-based effluent limits. EPA is aware that states have taken different approaches in deriving WQBELs for bacteria to ensure the ambient water quality criteria are met. For example, many states apply the ambient water quality criteria for bacteria directly to the discharge with no allowance for in-stream mixing (often referred to as "criteria end-of-pipe"). Alternatively, some states provide mixing zones for bacteria and derive permit limits that account for in-stream dilution. EPA has also stated that for certain types of regulated discharges (e.g., municipal separate storm sewer systems [MS4s] and concentrated animal feeding operations [CAFOs]), the most appropriate permit requirements may be non-numeric effluent limitations expressed in the form of best management practices (BMPs). The underlying principle, however, is that whichever approach is selected, the permitting authority must determine that permit limits and requirements derive from and comply with applicable water quality standards. See 40 CFR 122.44(d)(1)(vii)(A).

In determining a discharger's compliance with any effluent limitation, the federal regulation requires that discharge monitoring for any pollutant should never occur less than once per year. Further, monitoring requirements should be established case-by-case based on the nature of the

effluent. See 40 CFR 122.44(i)(2). More frequent sampling may be appropriate if the discharge is in close proximity to beach areas or known recreation areas.

With respect to determining whether WQBELs for bacteria are needed for a specific discharge, the Agency expects permitting authorities to use the same approach that applies to other pollutants. Thus, the permitting authority must include a WQBEL in the NPDES permit for a discharger if it determines that a pollutant (including all bacteria pollutants) is or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an exceedance of any state or tribal water quality standard. See 40 CFR 122.44(d)(1)(i). When a state or authorized tribe adopts, and EPA approves, new water quality criteria for *E. coli* and/or enterococci, the permitting authority (in most cases, the state) must immediately begin implementing these criteria through limits incorporated into any new or reissued NPDES permit, unless the state or tribal water quality standards authorize another approach. Additionally, if the state or authorized tribe chooses to retain an existing water quality criterion for fecal coliforms, the permitting authority must continue to implement this criterion in the form of a WQBEL as well, unless otherwise specified in the state or tribal water quality standards. In some cases where a discharge is released into a waterbody designated for both recreation and shellfishing, even after removal of the fecal coliform criterion for recreation, the permit will likely continue to contain effluent limitations for both parameters since the fecal coliform criterion will continue to apply to waters designated for shellfishing.

Following state or tribal adoption and EPA approval of water quality criteria for *E. coli* and/or enterococci, permitting authorities will typically not need to reopen existing permits prior to their expiration dates to incorporate WQBELs based on the newly-adopted water quality criteria. Instead the Agency expects that existing WQBELs for fecal coliforms will continue to be enforced through the existing permit's term, and that permitting authorities will incorporate WQBELs based on newly adopted water quality criteria (as needed) at the time of permit reissuance.

4.2.3 How do the antibacksliding requirements apply to NPDES permits with effluent limits for bacteria?

Dischargers that previously had NPDES water quality-based effluent limits for fecal coliforms, and subsequently have water quality-based effluent limits based on a state or authorized tribe's newly adopted *E. coli* and/or enterococci criteria should also be aware of federal NPDES "antibacksliding" provisions. The CWA and implementing NPDES federal regulations contain specific restrictions on when an existing WQBEL may be removed or replaced with a less stringent effluent limitation in a reissued NPDES permit. See CWA section 402(o); 40 CFR 122.44(l). When a state or authorized tribe replaces a fecal coliform criterion with water quality criteria for *E. coli* and/or enterococci, that replacement will not generally result in less stringent effluent limits in the permit (i.e., replacing a 200 cfu/100 ml fecal coliform criterion with an *E. coli* criterion of 126 cfu/100 ml or an enterococci criterion of 33 cfu/100 ml for fresh water or 35 cfu/100 ml enterococci criterion for marine water). In other words, if all other factors are unchanged, EPA expects that the WQBEL(s) based on the newly adopted water quality criteria for bacteria (for *E. coli* and/or enterococci), while perhaps expressed in a different form, will not be less stringent than the previous

WQBEL (for fecal coliform) and that, therefore, the backsliding prohibitions in section 402 of the CWA and its implementing regulations will not apply.

If a state or authorized tribe chooses to adopt *E. coli* or enterococci water quality criteria greater than, for fresh waters, an *E. coli* criterion of 206 cfu/100 ml or an enterococci criterion of 54 cfu/100 ml or, for marine waters, an enterococci criterion of 35 cfu/100 ml (generally occurring through the adoption of a subcategory of primary contact recreation use, other recreational subcategories, or secondary contact recreation use), the antibacksliding elements of the CWA and federal regulations would apply. In these instances, the CWA and federal regulations would allow for backsliding in some circumstances as described below. EPA has consistently interpreted section 402(o)(1) of the CWA to allow relaxation of WQBELs if the requirements of CWA section 303(d)(4) are met. (While CWA §402(o)(2) allows for backsliding to occur when new information is present, revised water quality standards regulations do not constitute "new information" under this provision.)

Section 303(d)(4) has two parts: paragraph (A) which applies to "non-attainment waters" and paragraph (B) which applies to "attainment waters."

- **Non-attainment water**–Section 303(d)(4)(A) allows the establishment of less stringent WQBELs for waters identified under CWA §303(d)(1)(A) as not meeting applicable water quality standards (i.e., a "nonattainment water"), if two conditions are met. First, the existing WQBEL must be based on a total maximum daily load (TMDL) or other wasteload allocation. Second, relaxation of a WQBEL is only allowed if attainment of water quality standards will be assured.
- **Attainment water**–Section 303(d)(4)(B) applies to waters where the water quality equals or exceeds levels necessary to protect the designated use, or to otherwise meet applicable water quality standards (i.e., an "attainment water"). Under section 303(d)(4)(B), WQBELs may only be relaxed where the action is consistent with the state or authorized tribe's antidegradation policy.

It is important to note that these exceptions to the prohibition on antibacksliding as a result of a change to water quality standards are only applicable to permits with water quality-based effluent limitations. They are not applicable to relax limitations based on technology-based treatment standards for the pollutants at issue.

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4.3 How should state and tribal water quality programs monitor and make attainment decisions for the water quality criteria for bacteria in recreational waters?

Monitoring protocols and assessment methodologies for recreational waters may differ depending upon the location of the waterbody, level of use, and program resources. The following sections describe appropriate approaches in the development and implementation of state and tribal monitoring and assessment programs for bacteria. Specifically, section 4.3.1 provides recommendations applicable to the period during which a state or authorized tribe may be transitioning from fecal coliforms to *E. coli* or enterococci. Section 4.3.2 focuses on general recommendations and examples for evaluating monitoring data, assessing water quality, and determining attainment of water quality standards.

4.3.1 While transitioning from fecal coliforms to *E. coli* and/or enterococci, how should states and authorized tribes monitor and make attainment decisions for their water quality criteria for bacteria?

Once a state or authorized tribe has adopted *E. coli* and/or enterococci into its water quality standards and EPA has approved the new standards, states and authorized tribes should not delay listing waterbodies for exceedances of water quality criteria for bacteria where historical data (whether for fecal coliforms or for the newly adopted criteria) indicate an impairment. Further, current Agency guidance and policy reject the notion that states and authorized tribes can avoid listing waters in anticipation of a change to a state or authorized tribe's water quality standards. Thus, if a state or authorized tribe has fecal coliform data that indicate a particular waterbody is not attaining the applicable water quality standards, the waterbody should still be listed even if the state or authorized tribe anticipates replacing its fecal coliform criteria with *E. coli* or enterococci in the near future.

For waterbodies previously listed under section 303(d) for not attaining water quality standards for fecal coliforms, EPA recommends that the waterbody continue to be included in the state or authorized tribe's 303(d) impaired waters list for bacteria until sufficient *E. coli*/enterococci data are collected to either develop a total daily maximum load (TMDL) for bacteria or support a de-listing decision. Where possible, states and authorized tribes may wish to assign these waterbodies a lower priority ranking for development of TMDLs to accommodate the collection of data on *E. coli* and/or enterococci. This would allow a waterbody listed for fecal coliforms to have additional data collected for *E. coli* and/or enterococci and, if needed, a TMDL written based on these newer criteria. In some instances states and authorized tribes may find that a waterbody not meeting its previous fecal coliform criterion will meet the newer *E. coli* or enterococci criterion. In a recent EPA-funded study conducted at Boston Harbor beaches in Massachusetts, it was found that the enterococci criterion was met more often than the fecal coliform criterion (MWRA, 2001). Proceeding in this manner to accommodate the collection of additional data would also preclude the need for a future TMDL revision if it had initially been written based on fecal coliforms.

Where there is an immediate threat to public health or where a waterbody has been listed

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under 303(d) on the basis of fecal coliform exceedances, and the waterbody is a priority due to court order or state (or tribal) statute or regulations, states and authorized tribes should not delay developing a TMDL. In these situations, the state or authorized tribe should develop the TMDL using the fecal coliform criterion, and monitor progress toward meeting all bacterial water quality standards, including the fecal coliform criterion (if it has been retained in the state or authorized tribe's water quality standards during a transition period) and *E. coli* and/or enterococci. Because data may not yet exist on the newly-adopted criteria, this would be one approach to meeting the requirement that TMDLs be based on the water quality criterion in effect at the time of development. If data collected over time indicate that the waterbody is meeting the *E. coli*/enterococci criteria, this would constitute an acceptable measure of attainment of the TMDL. Alternatively, if later data show a continuing problem under the *E. coli*/enterococci criterion that has not been adequately addressed under the fecal coliform TMDL, revisions to the TMDL may be necessary once data on *E. coli*/enterococci are collected.

After a state or authorized tribe adopts criteria for *E. coli* and/or enterococci, the amount of data necessary to support a listing or de-listing decision will vary among states' and authorized tribes' monitoring programs. This information should be contained either in states' and authorized tribes' assessment and listing methodologies or in their water quality standards. The design of the state or authorized tribe's monitoring program and the conclusiveness of the data collected will affect the length of time before a state or authorized tribe is able to make regulatory decisions and take appropriate actions. For example, if a state or authorized tribe routinely collects monitoring data and finds within a relatively short period of time that the data collected indicate an exceedance of the water quality criteria, EPA expects the state or authorized tribe to conclude that the waterbody is impaired. Further, monitoring designs should reflect the way in which the state or authorized tribe's water quality standards are expressed.

4.3.2 Once *E. coli* and/or enterococci have been adopted, how should recreational waters be assessed and attainment determined for waters where the bacteriological criteria apply?

Implementing water quality criteria for bacteria within a state or authorized tribe's monitoring and listing program is a recurring topic within the ongoing dialogue EPA has with states, authorized tribes, and other stakeholders, particularly during the recent development of the *Consolidated Assessment and Listing Methodology* (USEPA, 2002a). Version 1 of the Methodology addresses water quality monitoring strategies, data quality and data quantity needs, and data interpretation methodologies. This effort is focused on helping states and authorized tribes improve the accuracy and completeness of their CWA §303(d) lists and §305(b) reports as well as streamlining these two reporting requirements. In addition, this document provides recommendations for the listing and assessment of waters designated for primary contact recreation and specifically refines previous recommendations on assessing attainment of the water quality criteria for bacteria.

States and authorized tribes have questioned how the criteria should be interpreted when

assessing waterbodies under CWA §305(b) and determining attainment under CWA §303(d). As discussed earlier, EPA recommends states and authorized tribes adopt both a geometric mean and an upper percentile value. Although the upper percentile value is intended primarily for beach monitoring and notification programs, including it in water quality standards provides states and authorized tribes the flexibility to determine the circumstances where the geometric mean and the upper percentile value would be most appropriate for determining attainment.

Historically, states and authorized tribes have used simple descriptive statistics to determine attainment consistent with these recommendations. Using this approach, the geometric mean of the total number of samples taken over a certain period of time is calculated and the results compared to the geometric mean component of the criterion. For situations where only a few (or even individual) samples have been taken, the monitoring data are compared to the upper percentile value (historically referred to as a single sample maximum value) to assure that no sample has exceeded the upper percentile value. Using simple descriptive statistics such as this, while acceptable to EPA, has several drawbacks. Most notably, use of this approach assumes that the entire population was representatively sampled, i.e., that the samples fully captured the range and variability of the ambient concentrations existing over the period of time in which the samples were taken.

States and authorized tribes may also use what is known as inferential statistics (e.g., Students t-test, binomial and chi-square tests). The primary difference between the descriptive statistical approach described above and inferential statistics is how they handle uncertainty (i.e., decision error) and the likelihood that the sample data represent the population they are used to characterize. While descriptive statistics do not address uncertainty in the statistics used to describe the population of interest, inferential statistics assume a potential for error in using sample data to characterize the population and specifically address the likelihood that the sample data represent the population by setting targets for reasonable decision error. States and authorized tribes that define acceptable decision error have taken on a greater responsibility for monitoring programs, because these states and authorized tribes are systematically defining—and, it is hoped, committing the resources to collect—sufficient samples to support the tests.

Of these two general approaches, EPA prefers that, if sufficient data are collected, states and authorized tribes use inferential statistical models due to the ability of these models to provide the greatest certainty in making attainment decisions. Recommendations and discussions of the use of different statistical approaches are provided in EPA's *Consolidated Assessment and Listing Methodology* (USEPA, 2002a) and are also contained in EPA's *Guidance for Choosing a Sampling Design for Environmental Data Collection* (USEPA, 2000). Using statistical approaches enables the assessor to estimate, based on the samples taken and a specified confidence level and statistical power, whether or not the criterion is being attained. In order for these approaches to provide reliable results, a certain amount of data must be collected as determined by data quality objectives, which in turn reflect individual state or tribal standards. Alternatively, states and authorized tribes have employed other statistical approaches. For example, some states and authorized tribes calculate confidence intervals, the upper limits of which are compared to the upper percentile value to determine compliance with that component of the criterion. Additional guidance on the use of alternate assessment approaches is provided in the *Consolidated Assessment and Listing Guidance*.

In addition to these two approaches, states and authorized tribes may develop their own approaches; however, any monitoring and/or assessment protocol developed by the state or authorized tribe should be consistent with the relevant water quality standards. If the state or tribal water quality standards define how the standards are to be interpreted, the state or authorized tribe must follow its prescribed approach when assessing attainment. If the state or authorized tribe's standards are silent on how to interpret data to make ambient attainment decisions, the state or authorized tribe should describe its process. The state or authorized tribe may either follow EPA recommendations or develop implementation procedures that are consistent with its water quality standards. For example, if a state or authorized tribe's water quality criteria for bacteria consist of a geometric mean and an upper percentile and specify that the geometric mean is to be calculated based on five samples taken over a thirty day period and that no sample may exceed the upper percentile value, the state or authorized tribe's monitoring and assessment protocol should be consistent with these water quality standards provisions. In some circumstances, states and authorized tribes may find that revisions need to be made to their water quality standards to clarify how the water quality standards will be interpreted for assessment and attainment determinations.

Many states and authorized tribes use information on bathing area advisories and closures to determine attainment with recreation-based water quality standards. This information often comes from state, tribal, or local health departments and may be based on water quality monitoring, calibrated rainfall alert curves, or precautionary information. Before using this information on use restrictions and closures, it is important to document the basis for them. For example, the water quality agency may want to verify that the health department uses indicators and thresholds that are consistent with the state or authorized tribe's water quality standards.

In general, water quality-based bathing closures or advisories that are consistent with the state or authorized tribe's water quality standards and assessment methodology and are in effect during the reporting period should be considered as an indicator of water quality standards attainment. There are some exceptions, however. Bathing areas subject to precautionary administrative closures such as automatic closures after storm events of a certain intensity may not trigger an impairment decision if monitoring data show an exceedance of applicable water quality standards has not occurred. Similarly, closures or restrictions based on other conditions like rip-tides or sharks should not trigger a nonattainment decision (USEPA, 2002a). It is also acceptable to base day-to-day beach closure decisions on an upper percentile value, while using the geometric mean as the basis for long-term attainment over an assessment period (see Chapter 3).

Regardless of the monitoring protocol used by a state or tribe, EPA recommends, at a minimum, that primary contact recreation waters be monitored throughout the swimming season, ideally on a weekly basis, to ensure human health is adequately protected, particularly waters that are beach areas. EPA has prepared additional guidance contained in chapter 4 of the *National Beach Guidance and Required Performance Criteria for Grants* recommending monitoring approaches for identified beach areas, as well as recommendations on how to use the data in making beach closures and advisories. This document is available through EPA's Beach Watch web site at http://www.epa.gov/waterscience/beaches.

EPA recognizes that there may be some waterbodies that merit less frequent monitoring. These waterbodies may include those where public access is purposely restricted or limited by location and other waterbodies that are not likely to be used for primary contact recreation. Due to resource or other constraints, states and authorized tribes may not be able to collect sufficient samples for these waterbodies to perform a robust statistical analysis or to collect sufficient samples within a specified period of time to perform the recommended mathematical analysis. In these cases of small sample size (e.g., less than 5 samples), EPA recommends that measured values be compared to an upper percentile value to either assess attainment or trigger additional monitoring. Examples of two types of assessment approaches that may be applied to infrequently used recreational waters are described in Table 4-1.

Limited state or tribal resources may result in a state or tribe not being able to collect sufficient samples to calculate a meaningful geometric mean for comparison with the criterion. While EPA continues to encourage frequent monitoring of beaches and heavily-used recreation areas, for those waterbodies that are remote or, for other reasons, rarely used, EPA recommends states and authorized tribes develop alternative monitoring protocols that describe how these waterbodies will be monitored. States and authorized tribes should assure that any alternate monitoring protocols developed are consistent with its water quality standards (an example of how a set of water quality standards might look is at Figure 3.1). In some cases, states and authorized tribes may wish to revise their water quality standards to clarify these approaches. Alternatively, states and authorized tribes may choose to specify their monitoring procedures in their CWA §303(d) listing methodology. Regardless of where this information is contained, states and authorized tribes should assure that their monitoring protocols and interpretation of the monitoring data are consistent with the expression of the applicable water quality standards.

Table 4-1. Assessment approaches for less frequently used primary contact recreation waters

Example #1

Samples for remote waters not identified as public or high use beaches are compared to the upper percentile value, serving as a trigger for collecting additional data. If routine monitoring finds an exceedance (or certain number of exceedances) of an upper percentile value, then the state or tribe collects additional samples to calculate the geometric mean. The state or tribe then uses the geometric mean to make an attainment/nonattainment decision (i.e., both the geometric mean and the upper percentile value need to exceed the state or tribal standards for the waterbody to be identified as impaired under CWA §§305(b) and 303(d)). This approach differs from Example #2 in that the assessment decision is made only after additional data are collected.

Example #2

Samples for remote waters not identified as public or high use beaches are compared to the upper percentile value to determine attainment status. If the specified number of samples (individual or multiple samples, based on the adopted methodology) exceeds the upper percentile value, the waterbody is determined to be impaired. This approach differs from Example #1 in that the assessment decision is made after comparison only with the upper percentile value. An exceedance results in a nonattainment decision by the state or tribe as opposed to triggering more monitoring.

When considering the spectrum of different types of waterbodies designated for recreation,

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approaches states and authorized tribes take to monitor their waterbodies may vary with the uses assigned, since prioritization of monitoring resources may be directed more toward the heavily used recreation areas. For example, a state or authorized tribe may choose an inferential statistical approach for the monitoring and evaluation of data for high use or identified bathing areas since more data are likely to be collected in these areas. Alternatively, states and authorized tribes may choose an approach that relies on fewer data for other waterbodies that are primary contact recreation waters, but are not heavily used. (See section 3.1.1 for a discussion of how states and authorized tribes may bifurcate their primary contact recreation use designations.) Regardless of the approach used, states and authorized tribes should specify which monitoring approaches they will be using. Additionally, states and authorized tribes may find it useful to identify and provide to the public a list of recreation waters and the frequency with which they will be monitored.

4.4 How should a state or authorized tribe's water quality program calculate allowable loadings for TMDLs?

If a state or authorized tribe finds that its bacteriological criteria are not being attained on a particular waterbody, the state or authorized tribe will need to develop a TMDL consistent with CWA §303(d). A TMDL establishes the allowable loadings for specific pollutants that a waterbody can receive without exceeding water quality standards, thereby providing the basis for states and authorized tribes to establish water quality-based pollution controls. A TMDL identifies the loading capacity for a pollutant in a waterbody, the allocation of that pollutant to point and nonpoint sources contributing the pollutant, and the seasonal variation and margin of safety so that the TMDL will result in attaining the water quality standard.

For states and authorized tribes that have adopted *E. coli* and/or enterococci into their water quality standards, state and authorized tribe's water quality programs need to keep in mind the basis and assumptions inherent in the development of the applicable water quality standard when calculating a waterbody's total allowable load of the impairment-causing pollutant. EPA's recommended *E. coli* and enterococci criteria are generally expressed both as a geometric mean and as an upper percentile value. The geometric mean is based on a comparison of the average summer exposure to the risk level; the upper percentile value is a calculation of a daily exposure that is statistically related to the geometric mean. The calculated allowable load will need to reflect these: that is, the allowable load is a seasonal or 30-day average load (depending on how the criterion is expressed in the water quality standards) if based on the geometric mean, and a single day load if based on the upper percentile value.

EPA has published guidance on how to calculate loadings that attain water quality standards for pathogens and fecal indicators (USEPA, 2001a). This guidance identifies analytical tools that are appropriate to calculate these loads:

- **Empirical approaches** – Empirical approaches use existing data to determine the linkage between sources and water quality targets. In cases where there are sufficient observations to characterize the relationship between loading and exposure concentration across a range of loads, this

information could be used to establish the linkage directly, using, for example, a regression approach.

- **Simple approaches** – Where the sole source of indicator bacteria are NPDES permitted sources, these sources should always be required to meet water quality standards for indicator bacteria at the point of discharge or edge of the mixing zone, as specified in the state or tribal water quality standard. Simple dilution calculations and/or compliance monitoring (for existing discharges) are often adequate for this task.

- **Detailed modeling** – In cases where sources of bacteria are complex and subject to influences from physical processes, a water quality modeling approach is typically used to incorporate analysis of fate and transport issues. Modeling techniques vary in complexity, using one of two basic approaches: steady-state or dynamic modeling. Steady-state models use constant inputs for effluent flow, effluent concentration, receiving water flow, and meteorological conditions. Generally, steady-state models provide very conservative results when applied to wet weather sources. Dynamic models consider time-dependent variation of inputs. Dynamic models apply to the entire record of flows and loadings; thus the state or tribal water quality program does not need to specify a design or critical flow for use in the model. A daily averaging time is suggested for bacteria.

When detailed modeling is used, different types of models are required for accurate simulation for rivers and streams as compared to lakes and estuaries because the response is specific to the waterbody:

- **Rivers and Streams**. Prediction of bacteria concentrations in rivers and streams is dominated by the processes of advection and dispersion and the bacteria indicator degradation. One-, two-, and three-dimensional models have been developed to describe these processes. Waterbody type and data availability are the two most important factors that determine model applicability. For most small and shallow rivers, one-dimensional models are sufficient to simulate the waterbody's response to indicator bacteria loading. For large and deep rivers and streams, however, the one-dimensional approach falls short of describing the processes of advection and dispersion. Assumptions that the bacteria concentration is uniform both vertically and laterally are not valid. In such cases two- or three-dimensional models that include a description of the hydrodynamics are used.

- **Lakes and Estuaries.** Predicting the response of lakes and estuaries to bacteria loading requires an understanding of the hydrodynamic processes. Shallow lakes can be simulated as a simplified, completely mixed system with an inflow stream and outflow stream. However, simulating deep lakes

with multiple inflows and outflows that are affected by tidal cycles is not a simple task. Bacteria concentration prediction is dominated by the processes of advection and dispersion, and these processes are affected by the tidal flow. The size of the lake or the estuary, the net freshwater flow, and wind conditions are some of the factors that determine the applicability of the models.

Given that most sources of bacteria are related to rainfall and higher river flow events, and that water quality standards apply over a wide range of flows, states and authorized tribes will most likely find that they need to calculate allowable loads for a wide variety of river flows. For this reason, EPA recommends that states and authorized tribes use dynamic modeling to calculate these loads. EPA recommends three dynamic modeling techniques to be used when an accurate estimate of the frequency distribution of projected receiving water quality is required: continuous simulation, Monte Carlo simulation, and log-normal probability modeling. These methods are described in detail in EPA's guidance (USEPA, 2001; USEPA, 1991b). Models capable of simulating bacterial concentrations are also described in EPA's guidance (USEPA, 2002b; USEPA, 1997).

In using dynamic modeling techniques, the state or authorized tribe will first develop, calibrate, and verify a water quality model for existing loads, and then will try different scenarios of load reductions until the water quality standards are attained. The wasteload allocations are then directly calculated from the dynamic model using the permit derivation techniques described in the *Technical Support Document for Water Quality-based Toxics Control* (USEPA, 1991b). The load allocations are calculated from the percent reduction or pounds reduction used to attain the water quality standard. Because the comparison of bacteriological indicator concentrations to illnesses was conducted on a daily basis, EPA recommends using the daily average effluent flow for calculating loads based on the upper percentile value.

If a state or authorized tribe elects not to use a dynamic model, generally because there are not sufficient data to develop such a model, then the program will need to use a steady state model approach. This entails specifying a design flow for riverine systems to apply to the water quality criterion in the standards. As discussed above, this flow will need to reflect the basis and assumptions inherent in the development of the water quality criterion. Specifying the flow will also be a challenge because the water quality standards must be attained over a range of flows, and where the loadings are rainfall related, a critical drought flow approach will generally not be representative of the conditions when the standards might be exceeded. In lakes and estuaries, the flow is not as responsive to rainfall events, and an average water circulation can be used.

Most TMDLs for bacteria will include intermittent or episodic loading sources (e.g., surface runoff) that are rain-related and thus have serious water quality impacts under various flow conditions. Usually, maximum impacts from rain-related loading occur at high flows instead of at low flows. For example, elevated spring flows associated with snowmelt can contain high concentrations of bacteria, especially when snowmelt originates from agricultural areas where manure is spread in winter or from urban areas where residents practice poor pet curbing. As another example, a small tributary may deliver bacteria to a river. The river's bacteria load is positively,

although not linearly, correlated with flow in the higher-order stream. (Both waters respond to regional precipitation patterns.) The in-stream concentration from the tributary load will be affected by the competing influences of increased load and increased dilution capacity, resulting in a peak impact at some flow greater than base flow. If a point source was also present, a dual design condition might be necessary.

For these reasons, if a state or authorized tribe elects to use a steady state model for a riverine system, EPA recommends a dual design approach where the loadings for intermittent or episodic sources are calculated using a flow duration approach and the loadings for continuous sources are calculated based on a low flow statistic. The flow duration approach has been used to establish a number of TMDLs for rivers in Kansas (Stiles, 2001).

The flow duration approach calculates a load duration curve by first calculating the cumulative frequency of the historical daily stream flow data over a period of time and then multiplying that by the water quality criterion. This in essence calculates the allowable load for every flow event, and portrays those loads as the percentage of days that a loading can be exceeded without exceeding the water quality criterion. The geometric mean criterion should be multiplied by the 30-day average stream flow, and the upper percentile value criterion should be multiplied by each daily stream flow. The flows used should reflect the long term history of a river, although those periods may be shortened due to major disruptions to rivers, such as reservoir operations or ground water depletion.

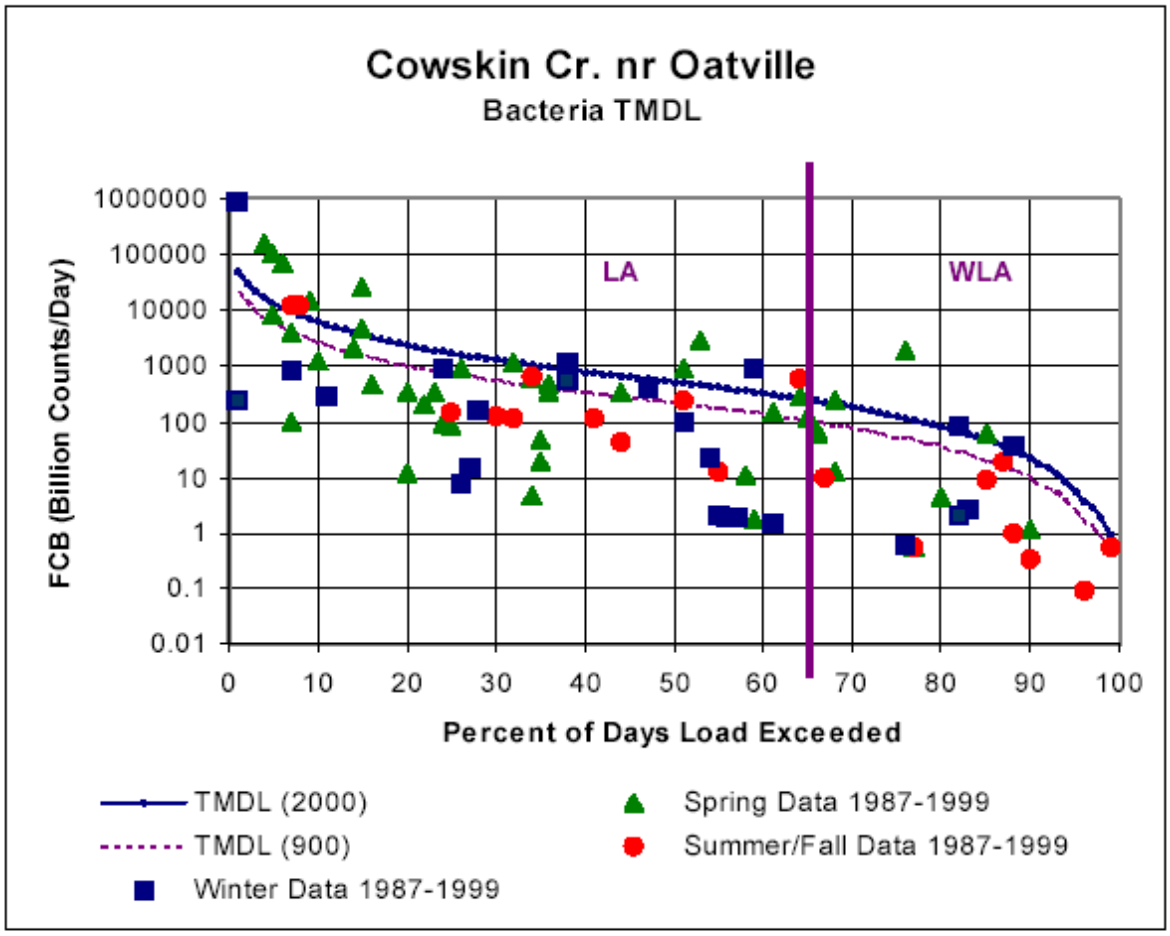
This approach requires the availability of long-term flow data to develop flow duration curves as well as daily flow values associated with dates of sampling. Where there are no gauging stations present at the sampling site, the state or authorized tribe may need to monitor flow itself or rely on USGS-developed methods to estimate flow duration curves from ungauged areas.

The distribution of existing loads is calculated by multiplying the sampled quality data by the daily flow on the date of sample, and plotting these calculations on the load duration curve above. The state or authorized tribe can then compare the actual loadings to what is needed to attain water quality standards. An example of this approach for Cowskin Creek near Oakville, Kansas, is shown in Figure 1 (Stiles, 2001). While this example has used the state's existing fecal coliform criterion, the approach is also applicable to either *E. coli* or enterococci criteria.

The overall reduction in loading necessary to attain the water quality standards is calculated as the reduction from the distribution of the existing loadings to that of the loadings necessary to attain the standards. This reduction also defines the necessary load reduction for nonpoint sources in the Load Allocation as well as continuous and intermittent or episodic point sources in the Wasteload Allocation.

Continuous loadings, that is, sources that discharge at about the same level regardless of the rainfall, often most greatly impact water quality under low-flow, dry-weather conditions, when dilution is minimal (USEPA, 1991a). For these sources, EPA recommends that the allowable loading be calculated for the geometric mean as the product of the geometric mean water quality

FIGURE 1. EXAMPLE OF A TMDL LOAD DURATION CURVE FOR BACTERIA



Source: Stiles, 2001

criterion and the 30Q5 flow statistic (i.e., the highest 30-day flow occurring once every five years), and for the individual sample as the product of the upper percentile value water quality criterion and 1Q10 flow statistic (i.e., the highest one-day flow occurring once every 10 years) or the low flow specified in the state or tribal water quality standards, if one is so specified. These flows reflect the characteristics of the criteria, that is, a 30-day average flow for the 30-day average geometric mean and a one day flow for the upper percentile value. By using extreme flow values, the loading calculation ensures that the criteria are rarely exceeded. The 30Q5 is EPA's recommendation for human health criteria for non-carcinogens and the 1Q10 is EPA's recommendation for calculating loadings for criteria that represent a daily or hourly averaging period (USEPA, 1991b).

4.5 What analytical methods should be used to quantify levels of *E. coli* and enterococci in ambient water and effluents?

The permit writer is responsible for specifying the analytical methods to be used for monitoring in an NPDES permit. Typically, the methods specified are those cited in 40 CFR 136 in the standard conditions of the permit, unless other test procedures have been specified. In the case of the development of permits for *E. coli* and enterococci, for ambient waters, EPA has published final methods in 40 CFR 136, and is planning to publish final methods in 40 CFR 136 for effluent waters in the near future, although methods do not yet exist in 40 CFR 136 for these constituents. Pursuant to 40 CFR 122.41(j)(4), permit writers have the authority to specify methods that are not contained in 40 CFR 136. In addition to commercially available test methods there are several EPA-approved methods permit writers may specify in permits, including the mE and the mEI agar methods for enterococci and the modified mTEC and mTEC agar methods for *E. coli*.

4.6 How do the recommendations contained in this document affect waters designated for drinking water supply?

Waterbodies that are used as drinking water supplies are an important resource that share many of the same human health concerns with recreational waterbodies. Both types of waterbodies have a need to be protected against contamination by sources of fecal pollution. Like recreational waterbodies, the primary route of exposure is through ingestion. However, unlike recreation, consumption and other uses of water are intensive and typically in much larger quantities.

EPA recognizes that programs under the Clean Water Act (CWA) are some of the most important tools in protecting sources of drinking water from contamination. As such, EPA is committed to promoting full utilization of CWA programs to help protect drinking water sources wherever possible. The operating principle of these policy efforts is that, while public water systems are legally accountable for the delivery of safe drinking water to their consumers, no water system should have to provide more treatment than that which is necessary to address naturally occurring pollutant concentrations.

To date, EPA has not developed criteria recommendations under section 304(a) of the CWA specifically aimed at the protection of drinking water sources from microbiological contaminants. Some states and authorized tribes have adopted EPA's recommended water quality criteria for bacteria to protect waters designated for drinking water supplies. In the absence of nationally recommended water quality criteria specifically targeted to the microbiological organisms and exposure routes of concern in drinking water supplies, adoption of the current 304(a) bacteria criteria may afford some additional protection to waters designated as drinking water supplies Even though public water systems are required to remove microbial pathogens to safe levels for consumption, the adoption of EPA's recommended water quality criteria for bacteria to protect drinking water supplies provides an additional and critical measure of public health protection. State and tribal adoption of EPA's bacteriological criteria recommendations into their water quality standards for the protection of drinking water supplies can provide a mechanism by which water quality may be maintained and

protected and sources of fecal pollution controlled. EPA is contemplating the development of water quality criteria specifically targeted toward the protection of waters designated for drinking water supplies.

4.7 How do the recommendations contained in this document affect waters designated for shellfishing?

EPA's criteria recommendations for the use of fecal coliform criteria to protect designated shellfishing waters are contained in its *Quality Criteria for Water 1986* (also known as the Gold Book) (USEPA, 1986). While EPA continues to recommend states and authorized tribes use fecal coliform criteria to protect shellfishing waters, EPA's current recommendation that states and authorized tribes use enterococci for marine recreational waters and either enterococci or *E. coli* for fresh recreational waters, are causing states and authorized tribes that have adopted these criteria to now monitor for two different indicators. While EPA realizes that this may cause some inconvenience and additional resources to conduct monitoring, data and information do not yet exist that would support the use of *E. coli* or enterococci as criteria to protect waters designated for shellfishing.

The 1986 *E. coli* and enterococci criteria were developed to protect against human health effects, namely acute gastroenteritis, that may be incurred due to incidental ingestion of water while recreating. These criteria do not account for exposure that may be incurred by the consumption of shellfish, and therefore, are not appropriate for evaluating compliance with the shellfishing designated use. If data and information are compiled that support the use of these indicator organisms in shellfishing waters, EPA will revisit this issue in coordination with the Food and Drug Administration, the National Oceanic and Atmospheric Administration, and the Interstate Shellfishing Sanitation Conference, and consider the development of a revised criterion that appropriately takes into account the exposure pathways associated with the consumption of shellfish. In the meantime, EPA continues to recommend the use of fecal coliforms for the protection of shellfishing waters.

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Appendix A: Beaches Environmental Assessment and Coastal Health Act of 2000

An Act

To amend the Federal Water Pollution Control Act to improve the quality of coastal recreation waters, and for other purposes.
Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Beaches Environmental Assessment and Coastal Health Act of 2000".

SECTION 2. ADOPTION OF COASTAL RECREATION WATER QUALITY CRITERIA AND STANDARDS BY STATES.

Section 303 of the Federal Water Pollution Control Act (33 U.S.C. 1313) is amended by adding at the end the following:

(i) **Coastal Recreation Water Quality Criteria.**—

(1) **Adoption by States.**—

(A) **Initial Criteria and Standards.**—Not later than 42 months after the date of the enactment of this subsection, each State having coastal recreation waters shall adopt and submit to the Administrator water quality criteria and standards for the coastal recreation waters of the State for those pathogens and pathogen indicators for which the Administrator has published criteria under section 304(a).

(B) **New or Revised Criteria and Standards.**—Not later than 36 months after the date of publication by the Administrator of new or revised water quality criteria under section 304(a)(9), each State having coastal recreation waters shall adopt and submit to the Administrator new or revised water quality standards for the coastal recreation waters of the State for all pathogens and pathogen indicators to which the new or revised water quality criteria are applicable.

(2) **Failure of States to Adopt.**—

(A) **In General.**—If a State fails to adopt water quality criteria and standards in accordance with paragraph (1)(A) that are as protective of human health as the criteria for pathogens and pathogen indicators for coastal recreation waters published by the Administrator, the Administrator shall promptly propose regulations for the State setting forth revised or new water quality standards for pathogens and pathogen indicators described in paragraph (1)(A) for coastal recreation waters of the State.

(B) **Exception.**—If the Administrator proposes regulations for a State described in subparagraph (A) under subsection (c)(4)(B), the Administrator shall publish

any revised or new standard under this subsection not later than 42 months after the date of the enactment of this subsection.

(3) **Applicability.**—Except as expressly provided by this subsection, the requirements and procedures of subsection (c) apply to this subsection, including the requirement in subsection (c)(2)(A) that the criteria protect public health and welfare.

SECTION 3. REVISIONS TO WATER QUALITY CRITERIA.

(a) **Studies Concerning Pathogen Indicators in Coastal Recreation Waters.**—Section 104 of the Federal Water Pollution Control Act (33 U.S.C. 1254) is amended by adding at the end the following:

(v) **Studies Concerning Pathogen Indicators in Coastal Recreation Waters.**—Not later than 18 months after the date of the enactment of this subsection, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall initiate, and, not later than 3 years after the date of the enactment of this subsection, shall complete, in cooperation with the heads of other Federal agencies, studies to provide additional information for use in developing—

(1) an assessment of potential human health risks resulting from exposure to pathogens in coastal recreation waters, including nongastrointestinal effects;

(2) appropriate and effective indicators for improving detection in a timely manner in coastal recreation waters of the presence of pathogens that are harmful to human health;

(3) appropriate, accurate, expeditious, and cost-effective methods (including predictive models) for detecting in a timely manner in coastal recreation waters the presence of pathogens that are harmful to human health; and

(4) guidance for State application of the criteria for pathogens and pathogen indicators to be published under section 304(a)(9) to account for the diversity of geographic and aquatic conditions.

(b) **Revised Criteria.**—Section 304(a) of the Federal Water Pollution Control Act (33 U.S.C. 1314(a)) is amended by adding at the end the following:

(9) **Revised Criteria for Coastal Recreation Waters.**—

(A) **In General.**—Not later than 5 years after the date of the enactment of this paragraph, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall publish new or revised water quality criteria for pathogens and pathogen indicators (including a revised list of testing methods, as appropriate), based on the results of the studies conducted under section 104(v), for the purpose of protecting human health in coastal recreation waters.

(B) **Reviews.**—Not later than the date that is 5 years after the date of publication of water quality criteria under this paragraph, and at least once every 5 years thereafter, the Administrator shall review and, as necessary, revise the water quality criteria.

SECTION 4. COASTAL RECREATION WATER QUALITY MONITORING AND NOTIFICATION.

Title IV of the Federal Water Pollution Control Act (33 U.S.C. 1341 et seq.) is amended by adding at the end the following:

SEC. 406. COASTAL RECREATION WATER QUALITY MONITORING AND NOTIFICATION.

(a) **Monitoring and Notification.**—

(1) **In General.**—Not later than 18 months after the date of the enactment of this section, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), and after providing public notice and an opportunity for comment, the Administrator shall publish performance criteria for—

(A) monitoring and assessment (including specifying available methods for monitoring) of coastal recreation waters adjacent to beaches or similar points of access that are used by the public for attainment of applicable water quality standards for pathogens and pathogen indicators; and

(B) the prompt notification of the public, local governments, and the Administrator of any exceeding of or likelihood of exceeding applicable water quality standards for coastal recreation waters described in subparagraph (A).

(2) **Level of Protection.**—The performance criteria referred to in paragraph (1) shall provide that the activities described in subparagraphs (A) and (B) of that paragraph shall be carried out as necessary for the protection of public health and safety.

(b) **Program Development and Implementation Grants.**—

(1) **In General.**—The Administrator may make grants to States and local governments to develop and implement programs for monitoring and notification for coastal recreation waters adjacent to beaches or similar points of access that are used by the public.

(2) **Limitations.**—

(A) **In General.**—The Administrator may award a grant to a State or a local government to implement a monitoring and notification program if—

(i) the program is consistent with the performance criteria published by the Administrator under subsection (a);

(ii) the State or local government prioritizes the use of grant funds for particular coastal recreation waters based on the use of the water and the risk to human health presented by pathogens or pathogen indicators;

(iii) the State or local government makes available to the Administrator the factors used to prioritize the use of funds under

clause (ii);

(iv) the State or local government provides a list of discrete areas of coastal recreation waters that are subject to the program for monitoring and notification for which the grant is provided that specifies any coastal recreation waters for which fiscal constraints will prevent consistency with the performance criteria under subsection (a); and

(v) the public is provided an opportunity to review the program through a process that provides for public notice and an opportunity for comment.

(B) **Grants to Local Governments.**—The Administrator may make a grant to a local government under this subsection for implementation of a monitoring and notification program only if, after the 1year period beginning on the date of publication of performance criteria under subsection (a)(1), the Administrator determines that the State is not implementing a program that meets the requirements of this subsection, regardless of whether the State has received a grant under this subsection.

(3) **Other Requirements.**—

(A) **Report.**—A State recipient of a grant under this subsection shall submit to the Administrator, in such format and at such intervals as the Administrator determines to be appropriate, a report that describes—

(i) data collected as part of the program for monitoring and notification as described in subsection (c); and

(ii) actions taken to notify the public when water quality standards are exceeded.

(B) **Delegation.**—A State recipient of a grant under this subsection shall identify each local government to which the State has delegated or intends to delegate responsibility for implementing a monitoring and notification program consistent with the performance criteria published under subsection (a) (including any coastal recreation waters for which the authority to implement a monitoring and notification program would be subject to the delegation).

(4) **Federal Share.**—

(A) **In General.**—The Administrator, through grants awarded under this section, may pay up to 100 percent of the costs of developing and implementing a program for monitoring and notification under this subsection.

(B) **Nonfederal Share.**—The non-Federal share of the costs of developing and implementing a monitoring and notification program may be—

(i) in an amount not to exceed 50 percent, as determined by the

Administrator in consultation with State, tribal, and local government representatives; and

(ii) provided in cash or in kind.

(c) **Content of State and Local Government Programs.**—As a condition of receipt of a grant under subsection (b), a State or local government program for monitoring and notification under this section shall identify—

(1) lists of coastal recreation waters in the State, including coastal recreation waters adjacent to beaches or similar points of access that are used by the public;

(2) in the case of a State program for monitoring and notification, the process by which the State may delegate to local governments responsibility for implementing the monitoring and notification program;

(3) the frequency and location of monitoring and assessment of coastal recreation waters based on—

(A) the periods of recreational use of the waters;

(B) the nature and extent of use during certain periods;

(C) the proximity of the waters to known point sources and nonpoint sources of pollution; and

(D) any effect of storm events on the waters;

(4) (A) the methods to be used for detecting levels of pathogens and pathogen indicators that are harmful to human health; and

(B) the assessment procedures for identifying short-term increases in pathogens and pathogen indicators that are harmful to human health in coastal recreation waters (including increases in relation to storm events);

(5) measures for prompt communication of the occurrence, nature, location, pollutants involved, and extent of any exceeding of, or likelihood of exceeding, applicable water quality standards for pathogens and pathogen indicators to—

(A) the Administrator, in such form as the Administrator determines to be appropriate; and

(B) a designated official of a local government having jurisdiction over land adjoining the coastal recreation waters for which the failure to meet applicable standards is identified;

(6) measures for the posting of signs at beaches or similar points of access, or functionally equivalent communication measures that are sufficient to give notice to the public that the coastal recreation waters are not meeting or are not expected to meet applicable water quality standards for pathogens and pathogen indicators; and

(7) measures that inform the public of the potential risks associated with water contact activities in the coastal recreation waters that do not meet applicable water quality standards.

(d) **Federal Agency Programs.**—Not later than 3 years after the date of the enactment of this section, each Federal agency that has jurisdiction over coastal recreation waters adjacent to beaches or similar points of access that are used by the public shall develop and implement, through a process that provides for public notice and an opportunity for comment, a monitoring and notification program for the coastal recreation waters that—

(1) protects the public health and safety;

(2) is consistent with the performance criteria published under subsection (a);

(3) includes a completed report on the information specified in subsection (b)(3)(A), to be submitted to the Administrator; and

(4) addresses the matters specified in subsection (c).

(e) **Database.**—The Administrator shall establish, maintain, and make available to the public by electronic and other means a national coastal recreation water pollution occurrence database that provides—

(1) the data reported to the Administrator under subsections (b)(3)(A)(i) and (d)(3); and

(2) other information concerning pathogens and pathogen indicators in coastal recreation waters that—

(A) is made available to the Administrator by a State or local government, from a coastal water quality monitoring program of the State or local government; and

(B) the Administrator determines should be included.

(f) **Technical Assistance for Monitoring Floatable Material.**— The Administrator shall provide technical assistance to States and local governments for the development of assessment and monitoring procedures for floatable material to protect public health and safety in coastal recreation waters.

(g) **List of Waters.**—

(1) **In General.**—Beginning not later than 18 months after the date of publication of performance criteria under subsection (a), based on information made available to the Administrator, the Administrator shall identify, and maintain a list of, discrete coastal recreation waters adjacent to beaches or similar points of access that are used by the public that—

(A) specifies any waters described in this paragraph that are subject to a monitoring and notification program consistent with the performance criteria established under subsection (a); and

(B) specifies any waters described in this paragraph for which there is no monitoring and notification program (including waters for which fiscal constraints will prevent the State or the Administrator from performing monitoring and notification consistent with the performance criteria established under subsection (a)).

(2) **Availability.**—The Administrator shall make the list described in paragraph

(1) available to the public through—

(A) publication in the Federal Register; and

(B) electronic media.

(3) **Updates.**—The Administrator shall update the list described in paragraph (1) periodically as new information becomes available.

(h) **EPA Implementation.**—In the case of a State that has no program for monitoring and notification that is consistent with the performance criteria published under subsection (a) after the last day of the 3year period beginning on the date on which the Administrator lists waters in the State under subsection (g)(1)(B), the Administrator shall conduct a monitoring and notification program for the listed waters based on a priority ranking established by the Administrator using funds appropriated for grants under subsection (i)—

(1) to conduct monitoring and notification; and

(2) for related salaries, expenses, and travel.

(i) **Authorization of Appropriations.**—There is authorized to be appropriated for making grants under subsection (b), including implementation of monitoring and notification programs by the Administrator under subsection (h), $30,000,000 for each of fiscal years 2001 through 2005.

SECTION 5. DEFINITIONS.

Section 502 of the Federal Water Pollution Control Act (33 U.S.C. 1362) is amended by adding at the end the following:

(21) **Coastal Recreation Waters.**—

(A) **In General.**—The term 'coastal recreation waters' means—

(i) the Great Lakes; and

(ii) marine coastal waters (including coastal estuaries) that are designated under section 303(c) by a State for use for swimming, bathing, surfing, or similar water contact activities.

(B) **Exclusions.**—The term 'coastal recreation waters' does not include—

(i) inland waters; or

(ii) waters upstream of the mouth of a river or stream having an unimpaired natural connection with the open sea.

(22) **Floatable Material.**—

(A) **In General.**—The term 'floatable material' means any foreign matter that may float or remain suspended in the water column.

(B) **Inclusions.**—The term 'floatable material' includes—

(i) plastic;

(ii) aluminum cans;

(iii) wood products;

(iv) bottles; and

(v) paper products.

(23) **Pathogen Indicator.**—The term 'pathogen indicator' means a substance that indicates the potential for human infectious disease.

SECTION 6. INDIAN TRIBES.

Section 518(e) of the Federal Water Pollution Control Act (33 U.S.C. 1377(e)) is amended by striking ''and 404'' and inserting "404, and 406''.

SECTION 7. REPORT.

(a) **In General.**—Not later than 4 years after the date of the enactment of this Act, and every 4 years thereafter, the Administrator of the Environmental Protection Agency shall submit to Congress a report that includes—

(1) recommendations concerning the need for additional water quality criteria for pathogens and pathogen indicators and other actions that should be taken to improve the quality of coastal recreation waters;

(2) an evaluation of Federal, State, and local efforts to implement this Act, including the amendments made by this Act; and

(3) recommendations on improvements to methodologies and techniques for monitoring of coastal recreation waters.

(b) **Coordination.**—The Administrator of the Environmental Protection Agency may coordinate the report under this section with other reporting requirements under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.).

Appendix B: Reaffirmation of EPA's Recommended Water Quality Criteria for Bacteria

The following sections describe the scientific rationale underlying EPA's 1986 guidance, EPA's re-evaluation of its recommended criteria, and subsequent research conducted following EPA's issuance of the 1986 guidance.

B.1 Does EPA continue to support its *Ambient Water Quality Criteria for Bacteria* – 1986?

EPA reviewed its original studies supporting its recommended 1986 water quality criteria for bacteria and the literature on epidemiological research studies conducted since EPA performed its marine and freshwater research studies of swimming-associated health effects. Based on these reviews, **[EPA continues to believe that]** when appropriately applied and implemented, EPA's recommended water quality criteria for bacteria are protective of human health for acute gastrointestinal illness.

The epidemiological and statistical methods used to derive EPA's water quality criteria for bacteria represent a sound scientific rationale. Aside from measuring pathogens directly, the use of bacterial indicators provides the best known approach to protecting swimmers against potential waterborne diseases that may be fecal in origin. Despite this fact, there are many known limitations of using indicators as the basis for protective criteria. The criteria published by EPA are targeted toward protecting recreators from acute gastrointestinal illness and may not provide protection against other waterborne diseases, such as eye, ear, skin, and upper respiratory infections, nor illnesses that may be transmitted from swimmer to swimmer. Also, certain subgroups of the population may contract illnesses more readily than the general population, such as children, the elderly, and immuno-compromised individuals. Because pathogens are not being measured directly, the concentration of pathogens causing acute gastrointestinal illness may not be constant over time and at different locations relative to the measured concentrations of bacterial indicators. For instance, depending upon the type of source and the type and number of pathogens contributed by the source of fecal pollution, the actual number of illnesses realized for a given level of bacteria may be more or less than the rates observed in EPA's epidemiological studies that formed the basis of the criteria. On this topic, the *Ambient Water Quality Criteria for Bacteria*–1986 stated:

> ...the major limitations of the criteria are that the observed relationship may not be valid if the size of the population contributing the fecal wastes becomes too small or if epidemic conditions are present in a community. In both cases the pathogen to indicator ratio, which is approximately constant in a large population becomes unpredictable and therefore, the criteria may not be reliable under these circumstances.

Lastly, new pathogens and strains of antibiotic resistant bacteria capable of causing gastrointestinal illness have been identified since EPA's studies were conducted. The introduction of these new pathogens into the environment may cause a greater number of illnesses to occur at a given level of

indicator organisms.

These uncertainties and limitations demonstrate the need for appropriate implementation of water quality criteria for bacteria. To assure protection of recreational water users, EPA recommends:

- frequent monitoring of known recreation areas to establish a more complete database upon which to determine if the waterbody is attaining the water quality criteria;
- assuring that where mixing zones for bacteria are authorized, they do not impinge upon known primary contact recreation areas; and
- conducting a sanitary survey when higher than normal levels of bacteria are measured. (See section 4 for additional information on conducting sanitary surveys.)

In addition to its re-evaluation of the original studies, EPA reviewed the literature for epidemiological research studies conducted after EPA performed its marine and freshwater studies of swimming-associated health effects. The review examined recent studies to determine if EPA's indicator relationship findings were supported or if different indicator bacteria were consistently shown to have quantitatively better predictive abilities. EPA's Office of Research and Development reviewed 11 separate peer-reviewed studies. This detailed review is contained in Appendix B. Following this review, EPA's Office of Research and Development concluded:

> The epidemiological studies conducted since 1984, which examined the relationships between water quality and swimming-associated health effects, have not established any new or unique principles that might significantly affect the current guidance EPA recommends for maintaining the microbiological safety of marine and freshwater bathing beaches. Many of the studies have, in fact, confirmed and validated the findings of the U.S. EPA studies. There would appear to be no good reason for modifying the Agency's current guidance for recreational waters at this time (Dufour, 1999).

As a result of this examination, EPA's 1986 water quality criteria for bacteria continue to represent the best available science and serve as a defensible foundation for protecting public health in recreational waters. EPA has no new scientific information or data justifying a revision of the Agency's recommended 1986 water quality criteria for bacteria at this time. When appropriately applied and implemented, EPA's recommended *Ambient Water Quality Criteria for Bacteria*–1986 are protective of human health for acute gastrointestinal illness.

B.2 Have subsequent studies affected EPA's recommended water quality criteria for bacteria?

In examining the relationships between water quality and swimming-associated gastrointestinal illness, the epidemiological studies conducted since 1984 offer no new or unique principles that significantly affect the current water quality criteria EPA recommends for protecting and maintaining recreational uses of marine and fresh waters. Many of the studies have, in fact, confirmed and validated the findings of EPA's studies. Thus, EPA has no new scientific information or data justifying a revision of the Agency's recommended 1986 water quality criteria for bacteria at this time.

None of the epidemiological studies examined by EPA in its recent review presented compelling evidence that necessitate revising the 1986 water quality criteria for bacteria recommended by EPA. Most of the studies used a survey plan similar to that used by EPA in the Agency's studies during the 1970's and 1980's. The study sites chosen by most of the investigators were similar to those studied by EPA. In the studies, one site was typically a beach with some fecal contamination, and the other site was usually a relatively unpolluted beach. Most of the bacteria loadings at the polluted beach sites came from known point sources. The results from these studies were similar to those found in the EPA studies, i.e., swimming in fecally contaminated water was associated with a higher rate of gastrointestinal illnesses in swimmers when compared to non-swimmers. This outcome was not observed in two of the reviewed studies. The reason for a negative finding is unclear, but could be related to factors such as the short length of time between the swimming event and the follow-up contact, the small numbers of children in the study groups, or the selection of a study site in which the pollution source was poorly defined.

Only a limited number of studies attempted to show a dose-response relationship between swimming water quality and gastrointestinal illness. Six of the studies (McBride et al., 1998; Kay et al., 1994; Cheung et al., 1990; Ferley et al., 1989; Seyfried et al., 1985) showed that as the level of pollution increased, there was also an increase in swimming-associated illness. Only two studies that looked for a relationship between swimming-associated illness and the level of water quality failed to find such a relationship (Kueh et al., 1995; Corbett et al., 1993). It is possible that these findings were related to the indicator organisms measured (i.e., fecal coliforms and fecal streptococci) or to the methodology used to detect the indicators. In general, the result of these studies was similar to the results found in the EPA studies: swimming-associated illness rates increased with increasing water pollution levels.

It has been shown that some indicator organisms are superior predictors of gastrointestinal illness in swimmers. In the EPA studies, *E. coli* and enterococci exhibited the strongest relationships to swimming-associated gastrointestinal illness. Some of the studies reviewed describe other microbes having strong relationships with swimming-associated gastrointestinal illness, such as staphylococci (Seyfried et al., 1985), *Clostridium perfringens* (Kueh et al., 1995), and *Aeromonas* spp. (Kueh et al., 1995). Most of the studies, however, had findings similar to those of the EPA studies in which enterococci were shown to be the most efficient indicators for measuring marine water quality. One of the two fresh water studies indicated that *E. coli* and enterococci both

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exhibited very strong correlations with swimming-associated gastrointestinal illness. In general, the best indicator organisms for measuring water quality in the reviewed studies were *E. coli* and enterococci, results similar to those documented in EPA's studies.

A recent review by Pruss[1] of all studies since 1953 that examined the relationship between swimming-associated gastroenteritis and water quality, indicated that nine separate marine studies and at least two fresh water studies were conducted since the EPA studies were completed in 1984. In this review, each of the later studies is summarized with regard to the size of the study, study design, water quality indicator bacteria measured, and the results of the study with respect to gastrointestinal illness. Some of the studies looked only at whether an association existed between swimming and illness at a polluted beach or a non-polluted beach, while other studies attempted to determine the relationship between increasing levels of poor water quality and the levels of gastrointestinal illness associated with those increases. This review does not address studies that examined non-enteric illnesses or infections unrelated to gastrointestinal disease. The intent of the review is to carefully examine all of the studies conducted subsequent to the EPA studies and to determine if they have a significant impact on the current water quality criteria for bacteria recommended by the Agency.

Marine Water Studies

In 1987, Fattal et al.[2] reported on a study of health and swimming conducted at beaches near Tel-Aviv, Israel. The study design was the same that used by EPA. (In those studies described here using the same design as the epidemiological studies conducted by EPA in support of its 1986 water quality criteria for bacteria recommendations, it will state that the EPA design was used rather than describing it in detail each time.) Beach water quality was measured using fecal coliforms, enterococci, and *E. coli*. Three beaches with different water qualities were studied. Symptoms among bathers were analyzed according to high and low categories of bacterial indicator densities in the seawater. The high and low categories for fecal coliforms were above and below 50 colony forming units (cfu) per 100 ml. The limits for enterococci and *E. coli* were 24 cfu per 100 ml. Excess illness was observed only in swimmers 0-4 years old at low categories of the indicators. Significant differences in risk levels between swimmers and non-swimmers occurred only at high indicator densities. Enterococci were the most predictive indicator for enteric disease symptoms.

In 1990, Cheung and his co-workers[3] reported on a health effects study related to beach water pollution in Hong Kong. The basic EPA design was used in conducting this investigation. Nine microbial indicators were examined as potentially useful measures of water quality. They included fecal coliforms, *E. coli, Klebsiella* spp., fecal streptococci, enterococci, staphylococci, *Pseudomonas aeruginosa, Candida albicans*, and total fungi. The study was carried out at nine beaches that were polluted either by human sewage discharged from a submarine outfall or carried by storm water drains into the beaches. Two of the beaches were contaminated mainly by livestock wastes. Approximately nineteen thousand usable responses were obtained, of which about 77% were from swimmers. The enterococci densities at the beaches ranged from 31 to 248 cfu per 100 ml. The range for *E. coli* was from 69 to 1,714 cfu per 100 ml. The overall gastrointestinal risk levels were significantly higher in swimmers than in non-swimmers. Children under 10 years old were more

likely to exhibit gastrointestinal illness (GI) and highly credible gastrointestinal illness (HCGI) symptoms than individuals older than 10 years. The best relationship between a microbial indicator density and swimming-associated health effects was between *E. coli* and HCGI.

Health risks associated with bathing in sea water in the United Kingdom were described by Balarajan et al.[4] in 1991. This study also used the EPA design for their trials. The study was conducted at one beach where 1,883 individuals participated (1,044 bathers and 839 non-bathers). The methods used to measure water quality were not given. Ratios of illness in swimmers to non-swimmers were developed. The rate of gastrointestinal illness was found to be significantly greater in bathers than in non-bathers. The risk of illness increased with the degree of exposure, ranging from 1.25 in waders, 1.31 in swimmers, to 1.81 in surfers or divers. The authors concluded that the increase was indicative of a dose-response relationship.

Von Schirnding and others[5] conducted a study to determine the relationship between swimming-associated illness and the quality of bathing beach waters. A series of discrete, prospective trials was carried out at a relatively clean and a moderately polluted beach following the methodology used in the EPA studies. The beaches were situated on the Atlantic coast of South Africa. The moderately polluted beach was affected by septic tank overflows, storm water run-off, and feces-contaminated river water. A number of potential indicator organisms were measured including enterococci, fecal coliforms, coliphages, staphylococci, and F-male-specific bacteriophages. A total of 1,024 people were contacted, of whom 733 comprised the final study population. The moderately polluted beach was characterized by fecal coliforms and enterococci. The median fecal coliform density was 77 cfu per 100 ml and the median enterococci density was 52 cfu per 100 ml. The median fecal coliform and enterococci densities at the relatively clean beach were 8 and 2 cfu per 100 ml, respectively. The rates for gastrointestinal symptoms were appreciably higher for swimmers than non-swimmers at the more polluted beach as compared with the less polluted beach, but the differences were not statistically significant, either for children less than ten years of age or for adults. The lack of statistical significance may have been due in part to the uncertain sources of fecal contamination.

In 1993, Corbett et al.[6] conducted a study to determine the health risks of swimming at ocean beaches in Sydney, Australia. The study used a design slightly modified from the EPA approach. First, no one under the age of 15 was recruited for the study and, second, multiple samples were taken at the time of swimming activity. The inclusion of families and social groups was minimized. Water quality was measured using fecal coliforms and fecal streptococci. A total of 2,869 individuals participated in the study. Of this group, 32.2% reported that they did not swim. In general, gastrointestinal symptoms in swimmers did not increase with increasing counts of fecal bacteria. However, fecal streptococci were worse predictors of swimming-associated illness than fecal coliforms. Although no relationship was observed between the measured indicators and gastrointestinal illness, swimmers who swam for more than 30 minutes were 4.6 times more likely to develop gastrointestinal symptoms than were those that swam for less than 30 minutes. The lack of a relationship between increasing fecal coliform densities and gastrointestinal symptoms was similar to results noted in the EPA marine and freshwater studies where increasing risk levels were not associated with increasing fecal coliform densities.

In 1994, Kay et al.[7] conducted a series of four trials at bathing beaches in the United Kingdom to examine the relationship between swimming-associated illness and water quality. The design of this study differed from previous studies in that the study population was selected prior to each trial. On the trial date, half of the participants were randomly assigned to be swimmers, with the remaining participants were non-swimmers. Each swimmer swam in a designated area that was monitored by taking a sample every 30 minutes. Samples were analyzed for total and fecal coliforms, fecal streptococci, *Pseudomonas aeruginosa,* and total staphylococci. The total number of participants in the study was 1,112, of which 46% were selected as swimmers. All of the study volunteers were older than 18 years of age. Analysis of the data indicated that the rates of gastroenteritis were significantly higher in the swimming group than in the non-swimming group. Only fecal streptococci showed a significant dose-response relationship with gastroenteritis. The analysis suggested that the risk of gastroenteritis did not increase until bathers were exposed to about 40 streptococci per 100 ml.

In 1995, Kueh et al.[8] reported a second study conducted at Hong Kong beaches. Only two beaches were examined in the second study, rather than the nine beaches examined in the 1990 Hong Kong study. The study design for collecting health data was similar to that followed in the EPA studies. The ages of study participants ranged from 10 to 49 years of age. Unlike the EPA studies, follow-up telephone calls were made two days after the swimming event rather than seven to 10 days. Another aspect of the Hong Kong study differing from the EPA studies was the collection of clinical specimens from ill participants with their consent. Stool specimens were analyzed for Rotavirus, *Salmonella* spp., *Shigella* spp., *Vibrio* spp., and *Aeromonas* spp. Throat swabs were examined for Influenza A and B; Parainfluenza virus types 1, 2 and 3; Respiratory Syncytial Virus, and Adenovirus. Water samples were examined for *E. coli*, fecal coliforms, staphylococci, *Aeromonas* spp., *Clostridium perfringens, Vibrio cholera, Vibrio parahemolyticus, Vibrio vulnificus, Salmonella* spp., and *Shigella* spp. A total of 18,122 individuals participated in the study. Although the levels of indicator densities were not reported for the beaches, the gastrointestinal risk levels were significantly higher at the more polluted beach. This study did not find a relationship between *E. coli* and swimming-associated illness as had been found in the original Hong Kong study. This may have been, as pointed out by the authors, due to the fact that only two beaches were examined rather than nine. The cause of the infections could not be ascertained from the clinical specimens obtained from ill individuals.

In 1998, McBride et al.[9] reported prospective epidemiological studies on the possible health effects from sea bathing at seven New Zealand beaches. A total of 1,577 and 2,307 non-swimmers participated in the studies. Although the EPA study design was used, it was slightly modified in that follow-up interviews were conducted three to five days after the swimming event rather than the seven to 10 days used in the U.S. studies. Fecal coliforms, *E. coli*, and enterococci were used to measure water quality. The results of the study showed that enterococci were most strongly and consistently associated with illness risk for the exposed groups. Risk differences between swimmers and non-swimmers were significantly increased if swimmers stayed in the water for more than 30 minutes as compared to those in the water less than 30 minutes. The risk differences were slightly greater for paddlers than for swimmers.

The most recent study of possible adverse health effects associated with swimming in marine waters was conducted at beaches on Santa Monica Bay, California, by Haile and others.[10] The objective of this study was to determine if excess swimming-associated illness could be observed in swimmers exposed to waters receiving discharges from a storm drain. The study design was patterned after the U.S. EPA studies. Water samples were taken at ankle depth and collected from sites at the storm drain, 100 yards up-coast, and 100 yards down-coast. Samples were also collected 400 yards up-coast or down-coast of the storm drain, depending on which location would be used as a control area. The samples were analyzed for total coliforms, fecal coliforms, enterococci, and *E. coli*. One sample was collected each Friday, Saturday, and Sunday during the study period at the mouth of the storm drain and analyzed for enteric viruses. Subjects of all ages participated in the study. A total of 11,686 subjects volunteered to take part in the study. The results of the study with regard to associations between bacterial indicators and health outcomes were presented in terms of thresholds of bacterial densities, which were somewhat arbitrarily chosen. No positive associations, as measured by risk ratios, were observed for *E. coli* at bacterial density thresholds of 35 and 70 cfu per 100 ml. A less arbitrary analysis using a continuous model showed more positive associations, especially for enterococci. The model for enterococci indicated positive associations with fever, skin rash, nausea, diarrhea, stomach pain, coughing, runny nose, and highly credible gastrointestinal illness. The associations of symptoms with indicators were very weak in the case of *E. coli* and fecal coliforms. However, the authors found that the total coliform to fecal coliform ratio was very informative. Using a ratio of 5.0 as a threshold, diarrhea and highly credible gastrointestinal illness were associated with a lower total coliform to fecal coliform ratio regardless of the absolute level of fecal coliforms. When their analysis was restricted to subjects where the total coliforms exceeded 5,000 cfu per 100 ml, significantly higher risks were detected for most outcomes. One of the general conclusions of the study was that excess gastrointestinal illness is associated with swimming in feces-polluted bathing water.

Fresh Water Studies

In 1985, Seyfried et al.[11] reported on a prospective epidemiological study of swimming-associated illness in Canada. These investigations used the EPA methodology in carrying out the study. Water quality was measured with the following bacterial indicators of swimming water quality: fecal coliforms, fecal streptococci, heterotrophic bacteria, *Pseudomonas aeruginosa*, and total staphylococci. A total of 4,537 individuals participated in the study, of which 2,743 were swimmers and 1,794 were non-swimmers. Swimmers were found to have significantly higher gastrointestinal risk levels than non-swimmers, and swimmers under the age of 16 had substantially higher rates than swimmers 16 and older. Logistic regression analysis was performed to determine the best relationship between water quality indicators and swimming-associated illness. A small degree of correlation was observed between fecal streptococci and gastrointestinal illness. The best correlation was between gastrointestinal illness and staphylococcus densities.

In 1989, Ferley et al.[12] described an epidemiological study conducted in France that examined health effects associated with swimming in a freshwater river. A total of 5,737 individuals participated in the study. The quality of the water was measured by assaying for fecal coliforms,

fecal streptococci, and *Pseudomonas aeruginosa*. The study design for collecting health data was unique. The maximum latency period for the illness category groups examined in this study was three days. Illnesses occurring during the course of the study were assigned to the nearest day within the latency period on which a sample was taken. A weighted linear regression was performed to relate gastrointestinal morbidity incidence rates to different levels of exposure to indicator bacteria. Significant excess gastrointestinal illness was observed in swimmers. Furthermore, regression of gastrointestinal illness incidence to the concentration of indicator organisms showed a good relationship between swimming-associated illness for both fecal coliforms and fecal streptococci. The strongest correlations occurred between incidence rates of acute gastrointestinal disease and fecal streptococci densities. The authors indicated that their definition of fecal streptococci essentially included what the EPA studies call enterococci.

Summary of Research Conducted Since 1984					
Researcher	**Year**	**Location**	**Type of Water**	**Microorganisms Evaluated**	**Relevant Findings**
Fattal et al.[2]	1987	Israel	Marine	Fecal coliforms Enterococci *E. coli*	• Enterococci were the most predictive indicator for enteric disease symptoms
Cheung et al.[3]	1990	Hong Kong	Marine	Fecal coliforms *E. coli* *Klebsiella* spp. Enterococci Fecal streptococci Staphylococci *Pseudomonas aeruginosa* *Candida albicans* Total fungi	• Best relationship between a microbial indicator density and swimming-associated health effects was between *E. coli* and highly credible gastrointestinal illness.
Balarajan et al.[4]	1991	United Kingdom	Marine	Unknown	• Risk of illness increased with degree of exposure. If the non-exposed population risk ranked at 1, risk increased to 1.25 for waders, 1.31 for swimmers, and 1.81 in surfers or divers.
Von Schirnding et al.[5]	1992	South Africa (Atlantic coast)	Marine	Enterococci Fecal coliforms Coliphages Staphylococci F-male-specific bacteriophages	• Uncertainty in sources of fecal contamination may explain lack of statistically significant rates of illness between swimmers and non-swimmers.
Corbett et al.[6]	1993	Sydney, Australia	Marine	Fecal coliforms Fecal streptococci	• Gastrointestinal symptoms in swimmers did not increase with increasing counts of fecal bacteria. • Counts of fecal streptococci were worse predictors of swimming-associated illness than fecal coliforms.

Summary of Research Conducted Since 1984					
Researcher	**Year**	**Location**	**Type of Water**	**Microorganisms Evaluated**	**Relevant Findings**
Kay et al.[7]	1994	United Kingdom	Marine	Total coliforms Fecal coliforms Fecal streptococci *Pseudomonas aeruginosa* Total staphylococci	• Only fecal streptococci were associated with increased rates of gastroenteritis. • Risk of gastroenteritis did not increase until bathers were exposed to about 40 fecal streptococci per 100 ml.
Kueh et al.[8]	1995	Hong Kong	Marine	*E. coli* Fecal coliforms Staphylococci *Aeromonas* spp. *Clostridium perfringens* *Vibrio cholera* *Vibrio parahemolyticus* *Salmonella* spp. *Shigella* spp.	• Also analyzed stool specimens for rotavirus, *Salmonella* spp., *Shigella* spp., *Vibrio* spp., and *Aeromonas* spp.; throat swabs for Influenza A and B; Parainfluenza Virus types 1, 2, and 3; Respiratory Syncytial Virus; and Adenovirus. • Did not find a relationship between *E. coli* and swimming-associated illness [possibly due to low number of beaches sampled (only two)].
McBride et al.[9]	1998	New Zealand	Marine	Fecal coliforms *E. coli* Enterococci	• Enterococci were most strongly and consistently associated with illness risk for the exposed groups. • Risk differences significantly greater between swimmers and non-swimmers if swimmers remained in water for more than 30 minutes.
Haile et al.[10]	1996	California, USA	Marine	Total coliforms Fecal coliforms Enterococci *E. coli*	• Results for enterococci indicate positive associations with fever, skin rash, nausea, diarrhea, stomach pain, coughing, runny nose, and highly credible gastrointestinal illness. • Association of symptoms with both *E. coli* and fecal coliforms were very weak. • Total coliform to fecal coliform ratio very informative — below the cutpoint of 5.0, diarrhea and highly credible gastrointestinal illness were associated with a lower ratio regardless of the absolute level of fecal coliforms.

Summary of Research Conducted Since 1984					
Researcher	**Year**	**Location**	**Type of Water**	**Microorganisms Evaluated**	**Relevant Findings**
Seyfried et al.[11]	1985	Canada	Fresh	Fecal coliforms Fecal streptococci Heterotrophic bacteria *Pseudomonas aeruginosa* Total staphylococci	• Small degree of correlation observed between fecal streptococci and gastrointestinal illness. • Best correlation was between gastrointestinal illness and staphylococcus densities.
Ferley et al.[12]	1989	France	Fresh	Fecal coliforms Fecal streptococci *Pseudomonas aeruginosa*	• In this study, the definition of fecal streptococci is essentially the same as the U.S. definition of enterococci. • Good relationship between swimming associated illness and fecal coliform and fecal streptococci concentrations. • Strongest relationship was between gastrointestinal disease and fecal streptococci densities.

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Appendix C: Development of *Enterococci/E. Coli* Water Quality Criteria for Adoption into Water Quality Standards

This appendix describes how states can calculate enterococci and *E. Coli* water quality criteria based on different risk levels; calculate upper percentile values, and; adjust upper percentile values based on standard deviations calculated from local data. These methods are described in *Ambient Water Quality Criteria for Bacteria*–1986.

C.1 Geometric Mean

As described in this guidance, EPA recommends states and authorized tribes use a geometric mean as one component of their bacteria criteria. Whereas an arithmetic mean is equal to the sum of samples divided by the number of samples, a geometric mean is the *n*th root of the product of *n* samples; this helps to minimize the effect of measurements that might otherwise be considered outliers. In order to develop a geometric mean criterion, permitting authorities must decide upon a risk level, based on a gastrointestinal illness rate. Then, one can develop geometric mean criteria as the following:

Freshwater

Enterococci Geometric Mean Criteria = $4.656*10^{(1.064 * \text{acceptable illness rate})}$

E. Coli Geometric Mean Criteria = $17.742*10^{(1.064 * \text{acceptable illness rate})}$

Marine Water

Enterococci Geometric Mean Criteria = $0.963*10^{(0.822 * \text{acceptable illness rate})}$

The above equations are based on the numerical results from EPA's epidemiological studies *Health Effects Criteria for Marine Recreational Waters* (EPA-600/1-80-031) and *Health Effects Criteria for Fresh Recreational Waters* (EPA-600/1-84-004).

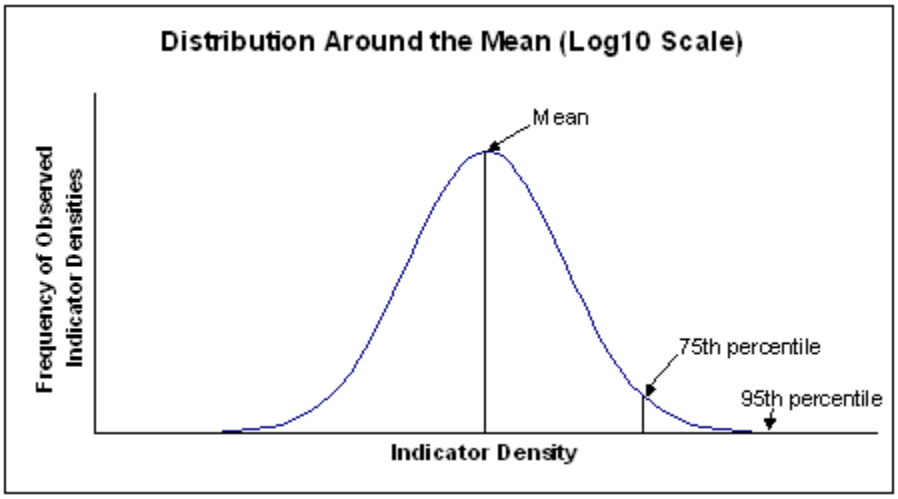
The geometric mean of *n* samples collected for monitoring is compared to a geometric mean criterion to determine whether the beach is in compliance. The geometric mean of *n* samples is computed by

$$\dot{X}_{GM} = \prod_{i=1}^{n} X_i^{\frac{1}{n}}$$

where X_i is the *i*th value of samples.

EPA recommends sampling frequency be related to the intensity of the use of the water body. In areas where weekend use is substantial, weekly samples collected during the peak use periods are reasonable. In less heavily used areas biweekly or monthly samples may be adequate to determine bacterial water quality. In general, samples should be collected during dry weather periods to establish so-called "steady state" conditions. Special studies may be necessary to evaluate the effects of wet weather conditions on waters of interest especially if sanitary surveys indicate the area may be subject to storm water effects.

C.2 Upper Percentile Value



Once water quality managers determine a waterbody is meeting its geometric mean requirements, they may consider the use of a site-specific upper percentile value. To set an upper percentile value, water quality managers should specify the "confidence level" factor[8] based on the use of recreational waters. The "confidence level" factors for the recommended criteria are specified as the following:

Upper percentile	Confidence Level Factor
75%	0.68
82%	0.94
90%	1.28
95%	1.65

Upper percentile values are computed as

Upper Percentile Value = **Geometric Mean** $*10^{(\text{Confidence Level Factor} * \sigma)}$

where σ is the standard deviation of the logarithm of indicator densities. EPA's studies show that the values of σ are 0.4 for freshwater *E. Coli* and Enterococci and 0.7 for marine water Enterococci. Each jurisdiction may establish its own σ or use the estimate of σ, $\hat{\sigma}$, based on similar indicator density data from the following equation:

$$\hat{\sigma} = \sqrt{\frac{\sum_{1}^{n}(\log X_i - \frac{\sum_{1}^{n}\log X}{n})^2}{n-1}}$$

[8]The "confidence level" factors can be found in the "z-score" table in most elementary statistical textbooks.

Tables C-1 and C-2 present geometric mean and upper percentile values for various risk levels using the equations and the values of σ from the above. The computed values are rounded to the nearest integers to represent count densities.

Table C-1 Water Quality Criteria for Bacteria for Fresh Recreational Waters

Enterococci Criteria

Risk level (% of swimmers)	Geometric Mean Density	Upper Percentile Allowable Density			
		75th Percentile	82nd Percentile	90th Percentile	95th Percentile
0.8	**33**	62	79	107	151
0.9	**42**	79	100	137	193
1.0	**54**	101	128	175	247

E. coli Criteria

Risk Level (% of swimmers)	Geometric Mean Density	Upper Percentile Allowable Density			
		75th Percentile	82nd Percentile	90th Percentile	95th Percentile
0.8	**126**	236	299	409	576
0.9	**161**	301	382	523	736
1.0	**206**	385	489	668	940

Table C-2 Water Quality Criteria for Bacteria for Marine Recreational Waters

Enterococci Criteria

Risk Level (% of swimmers)	Geometric Mean Density	Upper Percentile Allowable Density			
		75th Percentile	82nd Percentile	90th Percentile	95th Percentile
0.8	**4**	13	20	35	63
0.9	**5**	16	24	42	76
1.0	**6**	19	29	50	91
1.1	**8**	23	35	61	110
1.2	**9**	28	42	73	133
1.3	**11**	34	51	89	161
1.4	**14**	41	62	107	195
1.5	**17**	49	75	130	235
1.6	**20**	60	91	157	284
1.7	**24**	72	109	189	344
1.8	**29**	87	132	229	415
1.9	**35**	104	158	276	501

Appendix D: Data Used to Create Chapter 1 Figures

Source for all data: "Health Effects Criteria for Fresh Recreational Waters", EPA 1984

Figure 1.1 *E. coli* and Illness Rates

E. coli Density	Symptom Rate
23	2.3
47	4.6
137	4.8
236	14.7
146	11
138	5.1
19	0.5
52	5.2
71	3

Figure 1.2 Confidence Limits

Y	log(*Y*)	Predicted *X*	upper interval *X*	lower interval *X*
12	1.079181	-1.5957	3.718494354	-6.90989
15	1.176091	-0.68474	4.08871877	-5.4582
20	1.30103	0.489682	4.591664639	-3.6123
30	1.477121	2.14494	5.381913256	-1.09203
45	1.653213	3.800198	6.355532015	1.244863
60	1.778151	4.974622	7.25143933	2.697804
80	1.90309	6.149046	8.395429295	3.902662
120	2.079181	7.804304	10.43178017	5.176827
165	2.217484	9.104349	12.27375787	5.93494
210	2.322219	10.08886	13.75072976	6.426993
260	2.414973	10.96075	15.09565718	6.825842
300	2.477121	11.54494	16.01049737	7.079382
340	2.531479	12.0559	16.81757873	7.294225
380	2.579784	12.50997	17.5392383	7.480693
420	2.623249	12.91854	18.19163543	7.645451
480	2.681241	13.46367	19.06586369	7.861472
520	2.716003	13.79043	19.59170718	7.989156
560	2.748188	14.09297	20.07962439	8.106311

Figure 1.3 Fecal Coliform and Illness Rates

Fecal Coliform Density	Symptom Rate
37	4.8
104	14.7
60	11
436	5.1
51	0.5
230	5.2
234	3

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Urban Subwatershed Restoration Manual Series

10

Unified Stream Assessment: A User's Manual

Version 1.0

March 2004

CENTER FOR WATERSHED PROTECTION

Manual 10

Photo Acknowledgments

Table 10:	*R. Frymire (vegetation at outfall)*
Table 10:	*DEM, Fort Worth, TX (suds in pool; outfall staining)*
Figure 25:	*Friends of Sligo Creek (invasive plant removal)*
Figure 25:	*South River Federation (buffer planting)*
Figure 26:	*DEM, Forth Worth, TX (sewer overflow)*
Table 18:	*Clemson University (manhole examination)*
Table 18:	*US EPA (manhole stack deterioration; debris jams)*
Table 18:	*Restonpath.com (manhole in wetland)*
Figure 27:	*Mecklenburg County, NC (sewer line repair)*
Figure 27:	*Friends of Sligo Creek (fish barrier)*
Figure 28:	*Ft. Worth DEP, TX (sewer overflow)*
Figure 29/30:	*Friends of Sligo Creek (trash pickup)*
Figure 31:	*City of Austin, TX (no dumping sign)*
Table 21:	*Ellicott City VIEW (staff in culvert)*
Table 27:	*Mark Sommerfield (algae on rock)*

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Urban Subwatershed Restoration Manual No.10

Unified Stream Assessment: A User's Manual

Version 1.0

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Foreword

This manual distills two decades of experience evaluating the restoration potential of urban stream corridors during dozens of rapid stream assessments. We have attempted to assemble our basic assessment approach into a single package, known as the Unified Stream Assessment (USA). Over the past two years, Center staff have continuously sought to refine, test and expand this assessment technique in our watershed practice, and it has undergone at least four major revisions. We expect that it will be further adjusted over time; therefore, we refer to this manual as Version 1.0, and hope to update it based on user feedback as time and resources permit. So, please e-mail any comments or feedback to us at center@cwp.org.

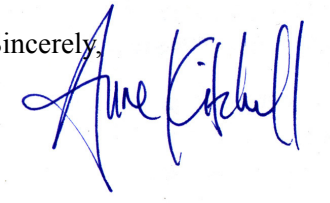
We would like to acknowledge the Maryland Department of Natural Resources teams that, under Ken Yetman, developed and tested the Stream Corridor Assessment Method as part of the state's Watershed Restoration Action Strategy program. The USA builds heavily upon this method and its associated database provided by the DNR.

Thanks also to our external reviewers, who included participants at our inaugural Watershed Restoration Institute as well as local watershed organizations, such as the Gwynns Falls Watershed Association, Jones Falls Watershed Association, South River Federation and others. Special thanks to the Chesapeake Bay Trust, Baltimore County Department of Environmental Protection and Resource Management, and the National Fish and Wildlife Foundation for providing community watershed grants that allowed us to keep on testing this method in a variety of urban watershed conditions.

The basic Center staff team that contributed to the development of the USA includes Ted Brown, Ken Brown, Karen Cappiella, Anne Kitchell, Chris Swann, Tom Schueler, Stephanie Sprinkle, Paul Sturm, Tiffany Wright, and Jennifer Zielinski. Special thanks to Tiffany Wright and Heather Holland for their assistance in editing, proofing and producing this manual, and to Jessica Brooks for developing the accompanying Access database.

This manual was produced under a cooperative agreement with US EPA Office of Water CP-82981501. Thanks are extended to our EPA project officer, Robert Goo, for his patience, insights and flexibility during the two years it took to produce this manual series.

Sincerely,



Anne Kitchell
Center for Watershed Protection

About the Restoration Manual Series

This is the tenth in a series of 11 manuals on techniques to restore small urban watersheds. The entire series of manuals was written by the Center for Watershed Protection to organize the enormous amount of information needed to restore small urban watersheds into a format that can easily be accessed by watershed groups, municipal staff, environmental consultants and other users. The contents of the manuals are organized as follows.

Manual 1: An Integrated Framework to Restore Small Urban Watersheds

The first manual introduces the basic concepts and techniques of urban watershed restoration, and sets forth the overall framework we use to evaluate subwatershed restoration potential. The manual emphasizes how past subwatershed alterations must be understood in order to set realistic expectations for future restoration. Toward this end, the manual presents a simple subwatershed classification system to define expected stream impacts and restoration potential. Next, the manual defines seven broad groups of restoration practices, and describes where to look in the subwatershed to implement them. The manual concludes by presenting a condensed summary of a planning approach to craft effective subwatershed restoration plans.

Manual 2: Methods to Develop Restoration Plans for Small Urban Watersheds

The second manual contains detailed guidance on how to put together an effective plan to restore urban subwatersheds. The manual outlines a practical, step-by-step approach to develop, adopt and implement a subwatershed plan in your community. Within each step, the manual presents a variety of desktop analysis, field assessment, and stakeholder involvement methods used to make critical restoration management decisions.

The next seven manuals provide specific guidance on how to identify, design, and construct the seven major groups of watershed restoration practices. Each of these “practice” manuals describes the range of techniques used to implement each practice, and provides detailed guidance on subwatershed assessment methods to find, evaluate and rank candidate sites. In addition, each manual provides extensive references and links to other useful resources and websites to design better restoration practices.

Manual 3: Storm Water Retrofit Practices

The third manual focuses on storm water retrofit practices that can capture and treat storm water runoff before it is delivered to the stream. The manual describes both off-site storage and on-site retrofit techniques that can be used to remove storm water pollutants, minimize channel erosion, and help restore stream hydrology. The manual then presents guidance on how to assess retrofit potential at the subwatershed level, including methods to conduct a retrofit inventory, assess candidate sites, screen for priority projects, and evaluate their expected cumulative benefit. The manual concludes by offering tips on retrofit design, permitting, construction, and maintenance considerations in a series of 17 retrofit profile sheets.

Manual 4: Stream Repair and Restoration Practices

The fourth manual concentrates on practices used to enhance the appearance, stability, structure, or function of urban streams. The manual offers guidance on three broad approaches to urban stream restoration: stream cleanups, stream repairs, and more sophisticated comprehensive restoration designs. The manual emphasizes the powerful and relentless forces at work in urban streams, which must always be carefully evaluated in restoration and design. Next, the manual presents guidance on how to set appropriate restoration goals for your stream, and how to choose the best combination of stream restoration techniques to meet them.

The manual also outlines methods to assess stream restoration potential at the subwatershed level, including basic stream reach analysis, more detailed project investigations, and priority restoration project screenings. The manual concludes by offering practical advice to help design, permit, construct and maintain stream restoration practices in a series of more than 30 profile sheets.

Manual 5: Riparian Management Practices

The fifth manual examines practices to restore the quality of forests and wetlands within the remaining stream corridor and/or flood plain. It begins by describing four site preparation techniques that may be needed to make a site more suitable for planting, and then profiles four planting techniques for the riparian zone, based on its intended management use. The manual presents several methods to assess riparian restoration potential at the subwatershed level, including basic stream corridor analysis, detailed site investigations, and screening factors to choose priority reforestation projects. The manual concludes by reviewing effective site preparation and planting techniques in a series of eight riparian reforestation profile sheets.

Manual 6: Discharge Prevention Practices

The sixth manual covers practices used to prevent the entry of sewage and other pollutant discharges into the stream from pipes and spills. The manual describes a variety of techniques to find, fix and prevent these discharges that can be caused by illicit sewage connections, illicit business connections, failing sewage lines, or industrial/transport spills. The manual also briefly presents desktop and field methods to assess the severity of illicit discharge problems in your subwatershed. Lastly, the manual profiles 12 different “forensic” methods to detect and fix illicit discharges.

Manual 7: Pervious Area Management Practices

The seventh manual reviews subwatershed practices that can improve the quality of upland pervious areas, which include techniques to reclaim land, revegetate upland areas, and restore natural area remnants. When broadly applied, these techniques can improve the capacity of these lands to absorb rainfall and sustain healthy plant growth and cover. This brief manual also outlines methods to assess the potential for these techniques at both the site and subwatershed scale.

Manual 8: Pollution Source Control Practices

Pollution source control practices reduce or prevent pollution from residential neighborhoods or storm water hotspots. Thus, the eighth manual focuses on a wide range of stewardship and pollution prevention practices that can be employed in subwatersheds. The manual presents several methods to assess subwatershed pollution sources in order to develop and target education and/or enforcement efforts that can prevent or reduce polluting behaviors and operations. The manual outlines more than 100 different “carrot” and “stick” options that can be used for this purpose. Lastly, the manual presents

profile sheets that describe 22 specific stewardship practices for residential neighborhoods, and 15 pollution prevention techniques for control of storm water hotspots.

Manual 9: Municipal Practices and Programs

The ninth manual focuses on municipal programs and practices that can directly support subwatershed restoration efforts. The five broad areas include improved street and storm drain maintenance practices, development/redevelopment standards, stewardship of public land, delivery of municipal stewardship services, and watershed education and enforcement. This last "practice" manual presents guidance on how municipalities can use these five programs and practices to promote subwatershed restoration goals. The manual also contains a series of profile sheets that recommends specific techniques to implement effective municipal practices and programs.

The series concludes with two user's manuals that explain how to perform field assessments to discover subwatershed restoration potential in the stream corridor and upland areas.

Manual 10: The Unified Stream Assessment: A User's Manual

The Unified Stream Assessment (USA) is a rapid technique to locate and evaluate problems and restoration opportunities within the urban stream corridor. The tenth manual is a user's guide that describes how to perform USA, and interpret the data collected to determine the stream corridor restoration potential for your subwatershed.

Manual 11: The Unified Subwatershed and Site Reconnaissance: A User's Manual

The last manual examines pollution sources and restoration potential within upland areas of urban subwatersheds. The manual provides detailed guidance on how to perform each of its four components — the Neighborhood Source Assessment (NSA), Hotspot Source Investigation (HSI), Pervious Area Assessment (PAA) and the analysis of Streets and Storm Drains (SSD). Together, these rapid surveys help identify upland restoration projects and source control to consider when devising subwatershed restoration plans.

Individual manuals in the series are scheduled for delivery throughout 2004, and each will be available for free downloading for a period of six months. After this window expires, they can be ordered online or as hard copies from the Center for a nominal charge. Be sure to check our website, www.cwp.org, to find out when each manual will be available and how it can be accessed.

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Introduction

This manual provides guidance on how to conduct the Unified Stream Assessment or USA. The USA is a continuous stream walk that systematically evaluates conditions and identifies restoration opportunities within the urban stream corridor. The manual is organized into 12 chapters.

Chapter 1: The Basics of the Unified Stream Assessment

This chapter introduces the USA and describes its nine components: eight impact assessments and one reach assessment. Impact assessments are performed at problem sites, such as storm water outfalls, severe erosion, impacted stream buffers, trash and debris, utility impacts, stream crossings, channel modifications, and other notable features. Reach assessments are performed to get an overall picture of stream corridor conditions over defined survey reaches.

The chapter then explores how the USA identifies restoration opportunities in the stream corridor and addresses problem sites. Four phases of the USA are described: preparation, field work, quality control, and data evaluation. The chapter concludes by describing how USA data are used in subwatershed restoration planning and providing tips on organizing and interpreting USA data.

Chapter 2: Preparing for a USA Survey

Every community has different assessment needs and capacity to conduct a USA. The second chapter reviews what is needed to prepare for a USA survey. This includes the mapping, equipment, data sheets, and staffing needed to get started, as well as the desktop analyses performed before going out in the field. The chapter also reviews how to generate useful field maps and concludes with guidance on budgeting and scoping USA surveys.

Chapters 3-10: (Impact Assessments)

Eight impact assessment forms are used to collect basic data on the location, condition, and restorability of individual problems encountered within the stream corridor. These impact assessments generate an inventory of potential restoration opportunities, and a chapter is devoted to each assessment:

Chapter 3: Storm Water Outfalls
Chapter 4: Severe Stream Erosion
Chapter 5: Impacted Stream Buffers
Chapter 6: Utilities in the Stream Corridor
Chapter 7: Trash and Debris
Chapter 8: Stream Crossings
Chapter 9: Channel Modifications
Chapter 10: Miscellaneous Features

Each chapter describes how these features can impact the stream corridor and why they are assessed in the USA. Additionally, each chapter includes guidance on completing the field form. Particular emphasis is given on how to determine the potential for restoration at each site. Where appropriate, pictures illustrate various aspects of the impact assessment and define important terminology. Also provided are recommended criteria for conducting impact assessments and tips for making field evaluations easier. Each chapter concludes with guidance on how site impact data can be used to generate a list of candidate restoration opportunities, subwatershed metrics, and planning maps.

Where appropriate, references are provided to other manuals in this series that describe techniques for designing and constructing effective restoration practices. In addition, these manuals provide extensive references to other helpful resources.

Chapter 11: Overall Conditions in the Survey Reach (RCH)

The last component of the USA is an overall assessment of survey reach conditions. The reach assessment form (RCH) collects general information over the entire survey reach, which is a uniform segment of the stream corridor. The RCH form characterizes overall conditions, such as average bank stability, in-stream and riparian habitat, and flood plain connectivity. The RCH form also tracks individual problem sites, screens restoration opportunities, and compares reach quality across the subwatershed.

This chapter begins with a discussion of how to delineate survey reaches and introduces the RCH form. Pictures and definitions are provided to illustrate various aspects of the RCH assessment and clarify important terminology. Recommended criteria to complete the RCH form and tips for field work are also provided. This chapter concludes with guidance on how RCH data can be used to compare reaches across the entire subwatershed, and between multiple subwatersheds.

Chapter 12: Interpreting and Using USA Data in Subwatershed Restoration Plans

The USA generates a significant amount of stream corridor data. Impact assessments generate a large inventory of potential restoration opportunities, and RCH assessments screen those opportunities across the entire stream corridor. When USA data are analyzed together with upland USSR data, you get a full picture of the restoration potential of an urban subwatershed.

The last chapter helps you manage and interpret USA data in an effective way. It begins with recommendations on how to manage data in the field and back in the office. The chapter provides advice on how to map USA data, perform quality control, and generate the right stream corridor counts and metrics needed to develop a stream corridor restoration plan. Finally, techniques for screening subwatersheds using USA data are discussed.

Appendices

The appendices provide blank forms and a sample database to manipulate USA data. Electronic versions of the field forms and the database are included with this manual, and can be easily customized to fit your local needs.

Chapter 1: The Basics of the Unified Stream Assessment

Urban watershed restoration has traditionally focused on the stream corridor. Urban streams are vulnerable to a wide range of physical, habitat, and water quality impacts. Communities need to systematically assess the range of impacts and restoration opportunities found along the entire stream corridor. Although various agencies and volunteer groups routinely survey streams, they lack the tools to comprehensively evaluate the stream corridor. Stream corridor conditions are hard to assess and interpret, but must be understood to develop effective restoration plans. Further, stream corridor data helps identify and screen potential restoration opportunities.

The Center for Watershed Protection has developed a continuous stream walk method —the Unified Stream Assessment (USA)— to systematically evaluate conditions and identify restoration opportunities within the stream corridor of small watersheds (Figure 1). The USA has undergone extensive field testing, and is a composite of many different stream assessment protocols, including the Stream Corridor Assessment Survey (Yetman, 2001); the Rapid Bioassessment Protocol (Barbour *et al.*, 1999); the Outfall Reconnaissance Inventory (Brown and Caraco, 2004); the Rapid Channel Assessment (Booth, 1994); and the Stream Keepers Field Guide (Murdoch and Cheo, 1999). The USA is designed to rapidly collect basic information needed to assemble a manageable list of potential restoration projects in the stream corridor. These projects include storm water retrofits, stream restoration, riparian management, and discharge prevention (see Manuals 3,4,5, and 6, respectively).

Figure 1: Variety of Impacts in Urban Streams
Urban streams and their adjacent flood plains exhibit many different local impacts. The USA systematically inventories potential restoration opportunities throughout the stream corridor.

The USA can be applied in both rural and urban streams. Local government staff, environmental consultants, and watershed groups can perform the USA with relatively minimal training and cost. The USA protocol can and should be adapted to fit your needs and skills, and should always be customized to address regional stream conditions and unique local restoration goals. For best results, the USA should be combined with its upland counterpart, the Unified Subwatershed and Site Reconnaissance (USSR). This "windshield" survey identifies pollution prevention opportunities in the subwatershed, and is described in Manual 11.

1.1 Nine Components of the USA

The USA consists of nine stream corridor assessments: eight **impact assessments** and a single overall **reach assessment** (Table 1). Impact assessments collect specific information at individual problem sites along the stream corridor, such as a storm water outfall, a severely eroded stream bank, or a sewer overflow. Reach assessments collect overall information along the entire **survey reach**, where many impact sites may be located. Each survey reach represents a relatively uniform set of conditions along the stream corridor and is used to characterize average bank stability, in-stream habitat, and riparian vegetation.

The reach assessment form (RCH) is completed for every survey reach in a subwatershed. The number of individual impact forms needed depends on the impacts and restoration opportunities discovered in the survey reach, and your assessment criteria. Impact assessment forms generate an inventory of potential restoration opportunities. The RCH form helps screen those opportunities by comparing reach conditions across the entire stream corridor. When these analyses are coupled with upland restoration projects identified during the USSR, you can get a full picture of the restoration potential of an urban subwatershed.

The basic information collected from each site impact and reach assessment is summarized in Table 2, along with associated restoration practices. Other manuals in this series should be consulted to learn more about these restoration practices.

Table 1: Components of the USA

Impact assessments are site-specific and record data on condition and "restorability" at each problem site. Impact forms comprise an initial inventory of restoration opportunities. The eight impact assessment forms are as follows:

- **Outfalls** (OT)—*all storm water and other discharge pipes*
- **Severe erosion** (ER)—*bank sloughing, active widening or incision*
- **Impacted buffer** (IB)—*lack of natural vegetation, width*
- **Utilities in the Stream Corridor** (UT)—*leaking sewer, exposed pipes susceptible to damage*
- **Trash and Debris** (TR)—*trash and illegal dumping*
- **Stream Crossing** (SC)—*culverts, dams, natural features, etc.*
- **Channel Modification** (CM)—*straightening, channelization, dredging, etc.*
- **Miscellaneous** (MI)—*unusual features or conditions*

The reach assessment form (RCH) characterizes the average physical conditions over the entire survey reach. The RCH assessment tracks individual problem sites and provides information used to compare reach quality throughout the entire stream corridor.

- **Reach Assessment** (RCH)—*average bank stability, in-stream habitat, riparian vegetation, flood plain connectivity, access, flow, and substrate over the entire reach.*

Table 2: USA Impact and Reach Assessment Forms and Restoration Practices			
Assessment Form	**What It Assesses**	**Information Collected** *(In addition to photo & GPS)*	**Restoration Practice** *(Manual No.)*
Outfalls **(OT)**	All discharge pipes or channels that discharge storm water or wastewater.	Basic type, source, and condition. If flowing, then flow conditions should be recorded and potentially reported to authorities.	Storm water retrofit (#3); Stream repair/restoration (#4) Pipe discharge correction (#6)
Severe Bank Erosion **(ER)**	Slope failures, bank sloughing, head cuts, and incision or widening in areas noticeably worse than the average erosive condition of the survey reach. Also infrastructure or property threatened by erosion.	Location (meander or straight section), threat to property or infrastructure, accessibility; and basic bank measurements (height, angle, and bottom and top widths).	Stream repair/restoration (#4)
Impacted Buffer **(IB)**	Corridor lengths >100 feet long that lack at least a 25 feet wide, naturally-vegetated riparian buffer on one or both sides of stream.	Diversity and density of vegetation, flood plain conditions, adjacent land use, available area for reforestation	Riparian management (#5)
Utilities in Stream Corridor **(UT)**	Leaking or exposed sewer, water, or other utility lines causing water quality, habitat, or channel stability problems. Includes manhole stacks, lines along bottom, in the bank, or above the stream susceptible to damage due to lack of maintenance or exposure.	Type, condition, and discharge characteristics associated with leaks (odors, color, etc). If leaking, report immediately to authorities. Record relevant information if potential fish barrier (see SC)	Stream repair/restoration (#4); Pipe discharge correction (#6)
Stream Crossing **(SC)**	All man-made or natural structures that cross the stream, such as roadways, bridges, railroad crossings, or dams. Pipe crossings and other overhead utilities are assessed under UT.	Type of crossing, culvert dimensions, relative information if suspected fish barrier (6" water drop, or less than ½" water depth during normal flow conditions)	Storm water retrofit (#3); Stream repair/restoration (#4)
Channel Modification **(CM)**	Channelized, concrete-lined, or reinforced sections of stream >50 feet in length, regardless of construction material used. Locations of existing stream restoration or bank stabilization projects included. Enclosed sections are assessed under SC or OT.	Type of modification, length of stream impacted	Stream repair/restoration (#4)
Trash and Debris **(TR)**	Areas of significant trash and debris accumulation greater than average levels observed across the survey reach. Any areas where potentially hazardous or unknown chemicals have been dumped.	Mobility, dispersal, amount and type of trash; level of effort and type of equipment required for removal; location on public or private property	Riparian management (#5) Stream repair/restoration (#4)
Miscellaneous Impacts **(MI)**	High quality areas or unusual feature or activity impacting the stream corridor that doesn't fit into other seven impact assessments. This may include fish kills, cattle access, near stream construction, flood plain excavation, adjacent wetlands, grade controls, or other notable features.		Depends on feature
Reach Level **(RCH)**	Average characteristics for each survey reach. Tracks locations of impact assessments; used for screening restoration opportunities and for comparing reaches across the subwatershed.		N/A

Why Use the USA?

- Cheap, fast
- Applies to all kinds of streams—rural and highly urban
- One of two basic tools used to initially assess restoration potential in the field
- Can and should be adapted to local needs
- Identifies problems in the stream corridor
- Collects basic feasibility factors on "restorability"
- Helps assemble initial inventory of stream corridor restoration sites, such as:

Discharge investigations
Stream daylighting projects
Storm water retrofits
Local stream repair/outfall stabilization
Bank stabilization or grade control
Buffer reforestation
Structural repairs to sewer lines
Stream cleanup sites
Fish barrier removal projects
Culvert repair/replacement sites
Natural channel design
De-channelization
Riparian wetland restoration
Enforcement actions

1.2 Stream Corridor Restoration Opportunities Identified by the USA

The USA provides a comprehensive picture of stream conditions and restoration opportunities available in the stream corridor of small watersheds. It has been designed to help you envision **restoration practices** that can address problem sites observed during your stream walk. For example, if you encounter a pipe leaking a foul substance into the stream, report the leak to proper authorities and consider potential restoration options such as structural repairs, pipe testing, citizen hotlines, or dry weather stream sampling.

The USA does not ask you to develop detailed concepts for restoration practices. Rather, the USA helps identify and screen potential project locations that can be subsequently investigated using detailed assessment methods described in Manual 2. The USA is an extremely valuable tool to create an initial inventory of potential restoration opportunities within the stream corridor.

Table 3 outlines some of the common stream corridor problems you may encounter, along with the corresponding restoration practices that can be used to address them. Table 3 also cross-references the appropriate restoration manual and profile sheet for each restoration technique.

1.3 Basic Steps to Conduct a USA

Field crews walk every surface stream and its flood plain corridor during the USA to map, locate, and collect basic data on significant impacts and average reach conditions. The four basic steps of a USA are as follows:

1. Pre-field preparation
2. Stream corridor assessment
3. Quality control
4. Data interpretation

The component tasks associated with each USA step are described in Table 4.

Pre-field Preparation

It is important to train field crews on the USA protocol before starting any field work. Crews should use the same terminology and understand best- and worst-case stream conditions within the region (Figure 2). Walking a highly impacted stream reach and a stable, undeveloped stream reach together can help standardize data gathering. Field crews should also be exposed to examples of various restoration practices so they can better envision restoration opportunities at problem sites.

After field crews are trained, schedules and routes can be established. Three trained individuals per field crew are recommended to handle equipment, complete field forms, and

Table 3: Restoration Techniques to Address Stream Corridor Problems		
ID	**Stream Corridor Problem Assessed**	**Potential Restoration Technique (Profile sheet numbers)***
OT	Suspected illicit discharge Enclosed stream Outfall location Outfall damage	Discharge investigations (D-1, D-2, D-5) Stream daylighting projects (R-27) Storage retrofit below outfall (SR-3) Local stream repair/outfall stabilization
ER	Nature and type of channel erosion Severity of bank erosion Threatened infrastructure Nick points	Potential sites for bank stabilization (R-3 to R-15) Grade control (R-18 to R-21)
IB	Encroachment in stream corridor Vegetative condition of buffer	Active reforestation (F-1) Greenway design (F-2) Natural regeneration (F-3) Riparian site preparation (SP-1 to SP-4) Bufferscaping (N-20)
UT	Sanitary sewer overflows Leaking sewer pipes and manholes Sewers crossing streams Power line rights-of-way impacting corridor	Structural repairs (D-10) Pipe testing (D-6) Citizen hotlines (D-5) Dry weather stream sampling (D-3) Active reforestation (F-1)
TR	Trash/debris in the stream Dumping in stream corridor	Stream clean-up sites (C-1) Stream adoption segments (C-2) Removal of trash/debris (SP-1) Storm drain stenciling (N-21)
SC	Fish barriers Stream interruption Potential runoff storage Scour/erosion below crossing	Fish barrier removal (R-30) Culvert repair/replacement (R-28, R-29) Upstream storage retrofit (SR-1, SR-2) Local stream repair (R-3 to R-21)
CM	Stream interruption Channelization Habitat degradation	Baseflow channel creation (R-25) Natural channel design (S-32) De-channelization (S-33)
MI	Wetlands and natural area remnants Land disturbance and erosion Livestock access/hobby farms Fish kills Nick points	Riparian wetland restoration (F-8) Enforcement (E-1) Exclusionary fencing, alternative water source Discharge prevention Grade controls (R-18 to R-21)
RCH	Poor stream corridor habitat Average streambank erosion Disconnected flood plains Flood plain encroachment Restoration feasibility factors	Tracking of all potential stream corridor restoration practices, with special emphasis on stream restoration and riparian management concepts

**The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series.*

- *SR- sheets can be found in Manual 3: Storm Water Retrofit Practices*
- *R-, S-, and C- sheets can be found in Manual 4: Stream Repair Practices*
- *F- and SP- sheets can be found in Manual 5: Riparian Management Practices*
- *D- sheets can be found in Manual 6: Discharge Prevention Practices*
- *N- sheets can be found in Manual 8: Pollution Source Control Practices*
- *E- sheets can be found in Manual 9: Municipal Practices and Programs*

make impact assessments, although experienced crews of two can do the job in a pinch. One person performs the impact assessments, the second keeps track of the reach assessment, and the third is responsible for taking photos, generating GPS points, and walking the stream corridor. Table 5 provides more detail on assigning responsibilities among a USA field crew.

The next step is to define survey reaches and plan assessment route for the field crews (see Chapter 2). The convention is to perform the USA while walking upstream, unless physical or logistical constraints make this impractical. Creatively planning where to drop off cars and pick up crews can help reduce excessive backtracking.

In some cases, you may want to inform landowners that have property adjacent to the stream corridor before crews actually go out in the field. Sending each land owner a letter that briefly describes the purpose and general time frame of the USA is usually sufficient. Contact information should be provided in the letter for land owners that do not want crews to trespass on their property.

Table 4: Unified Stream Assessment Steps

Step	Tasks	Chapter
1. Pre-field preparation	Establish and train field teams Get supplies in order Define survey reaches Generate field maps Plan your assessment route and schedule	2
2. Stream corridor assessment	Check routes and equipment Perform site impact and reach assessments Regroup to debrief and check field forms	3 -11
3. Quality control	Enter data into spreadsheet or GIS Quality control check Identify field assessment gaps	12
4. Data interpretation	Generate maps and metrics Compare survey reaches Generate inventory of restoration opportunities	12

Figure 2: Comparative Levels of Stream Bank Erosion

During training, show field crews a range of impacted and undeveloped stream conditions for comparison, such as streams with varying degrees of bank erosion, and discuss the types of restoration practices that can be envisioned at these impact sites.

Table 5: Suggested Field Crew Responsibilities			
Team Member	**Assessment Area**	**Tasks**	**Task**
# 1	Stream	Reach assessment	Responsible for navigation and direction of other team members, marking locations on map, and assessing the overall survey reach based on feedback of others. May also help with data collection at individual impact sites.
# 2	Stream	Impact assessments	Responsible for collecting information on outfalls, eroded banks, impacted buffers, stream crossings, etc.
# 3	Flood plain/ Stream	Photos, GPS	Responsible for taking pictures of all problem sites or other features, for evaluating flood plain conditions, and occasionally tracking the source of outfalls or headcuts. Because this person is "mobile" she/he should take the lead on communicating with curious citizens.

Stream Corridor Assessment

Where practical, each crew should start at the downstream end of the survey reach and walk up the stream corridor, noting overall bank and channel stability, in-stream aquatic habitat, riparian vegetation, and other impacts. As individual impact sites are encountered, they are mapped and photographed, and an appropriate impact assessment form completed. If multiple problems occur at a single impact site, an individual form should be completed for each distinct problem (Figure 3). Photos should be taken at each problem site, which can be valuable to document conditions and impacts over time. For tracking purposes, the location and ID number for each problem site should be drawn on the simple reach diagram located on the RCH form. Convention is to face downstream when determining problems for the left and right stream bank, respectively.

After crews have walked the entire survey reach, they should record their general impression of reach conditions on the RCH form. While physical conditions always vary across a survey reach, the RCH form asks you to assign an average, or overall condition. When conditions vary so much that average conditions cannot be characterized, the survey reach should be split into more uniform segments. An RCH form should be completed for every survey reach (Figure 4). Overall channel and riparian scores can be computed for each survey reach, which could be used during the data evaluation phase to identify the most restorable stream reaches in the subwatershed.

If more than one field crew is used, everyone should regroup at the predetermined meeting location at the end of the day to debrief (Figure 5). This field meeting is used to track stream

Figure 3: Site Impact Assessment at Outfall and Bank Erosion Location

Site impact assessments should be performed for each problem area in the survey reach. Here, two site assessments are being performed, one for a storm water outfall, and another for the bank erosion threatening public infrastructure.

miles covered, report general findings, and solve any logistical problems. It is also a good time to make sure all crews are measuring and recording information consistently. This can be particularly important when assessing erosion severity and site accessibility, or reporting emergency problems.

Crew leaders should also use this time to review field sheets for completeness and accuracy. Illegible handwriting should be neatened, more detail added to notes and sketches, and photos and GPS waypoints accurately cross-referenced. Field forms should always be organized in a master binder at the end of the debriefing.

Quality Control

Once you come back from the field, field data can be entered into a spreadsheet or directly into GIS. Appendix B provides a specially modified Microsoft Access database initially developed by Yetman (2001) to organize USA data. Linking this USA spreadsheet database into GIS can make manipulation and analysis of USA data much easier.

The field crew should enter their data immediately after fieldwork is complete. Data entry should be spot checked by the project manager using quality assurance protocols. Draft stream corridor maps with site impact assessment locations and survey RCH scores should be generated as quickly as possible and distributed to all field crews for review. Quality control helps identify inaccuracies in data entry and gaps in stream corridor coverage, and should always be done prior to any data analysis.

Data Evaluation

The ultimate goal is to create a detailed map of the stream corridor showing where non-degraded and degraded reaches are located, and where individual problem areas exist. Your subwatershed goals, available software, and GIS capabilities all play a role in what kind of maps are created. While GIS is highly recommended for data evaluation, it is not absolutely necessary.

USA data are also used to derive “metrics” of subwatershed characteristics, which are normally expressed as occurrences per stream

Figure 4: Team Performing Reach Assessment

Brief crew meetings at the end of each survey reach are helpful to agree on average, representative conditions of the stretch of stream and its associated flood plain.

Figure 5: Regrouping After Field Work

Take the time to regroup after a day of fieldwork. This is a good opportunity to make sure everyone is on the same page, and adjust USA procedures where needed.

mile. Examples include stream density (miles/mi^2), outfall density, suspect outfall density, % of network with impacted buffer, road crossings/mile, stream bank erosion severity, stream corridor habitat index, etc. These metrics can be used to compare restoration potential among many subwatersheds or reaches and to define initial restoration strategies. You will also want the capability to access details of impact sites in order to quickly identify candidate restoration sites for more detailed assessments.

1.4 Where the USA Fits into the Subwatershed Planning Process

The USA is one of two field assessment tools that evaluate restoration potential in the Small Watershed Restoration Framework introduced in Manual 2. The USA is typically combined with its counterpart, the Unified Subwatershed and Site Reconnaissance (USSR). Both surveys provide a comprehensive base to estimate the restoration potential of a subwatershed and provide insight into the interaction between the uplands and the stream corridor. This knowledge helps compare restoration potential across subwatersheds to assemble a manageable list of potential restoration candidate sites.

Candidate projects are assessed in the next step of the planning framework, where more detailed project investigations further refine the restoration inventory and develop initial concept designs for the high priority sites. Additionally, USA outputs and metrics can be used in the context of the Watershed Treatment Model to predict changes in pollutant loadings to the stream (Caraco, 2000).

USA data are used explicitly in several steps of the Small Watershed Restoration Framework:

- Comparative Subwatershed Analysis — *if performing assessment on multiple subwatersheds*
- Watershed Outreach/Stakeholder Identification —*generate maps and data on existing conditions for stakeholder education*
- Detailed Subwatershed Analysis —*provide basic data to identify problem sites and compare survey reaches*
- Devise a Subwatershed Restoration Strategy —*provide data to support strategy*
- Intensive Assessment of Individual Restoration Projects —- *provide initial data to choose sites for this more detailed analysis*
- Detailed Stream Corridor Project Investigations —*provide basic data used for this more detailed assessment*
- Subwatershed Treatment Analysis — *provide input into Watershed Treatment Model or other model*

1.5 Organizing and Interpreting USA Data

While the USA generates a wealth of data to compare restoration potential in the stream corridor, this information must be organized in a way that is easily transferable to stakeholders, funders, and other local agencies. Table 6 shows some of the ways to organize and interpret USA data to support subwatershed restoration planning. USA data can explain the current stream corridor conditions, identify strategies to restore or protect the stream corridor, and help answer the many questions about subwatershed restoration potential:

- Which of the four types of restoration practices (i.e. storm water retrofits, stream repair/restoration, riparian management, or discharge prevention) should be pursued in this particular subwatershed?
- Which reaches (or subwatersheds) are the most degraded?
- Where are wetlands or other natural remnants?
- Which outfalls should be further investigated for maintenance or illicit discharges?
- Are leaking sewer lines or sewer overflows prevalent?
- Where should civic groups target stream cleanups or stream watch programs?
- How many road crossings are potential fish blockages?

Table 6: Organization and Interpretation of USA Data
USA data can be organized to assess restoration potential in the stream corridor using: • Maps of condition of existing stream network • Simple counts of restoration projects • Maps of candidate restoration projects (storage retrofits, stream repair, reforestation, clean-up sites) • Maps of stream problems (map of fish barriers, suspect outfalls and overflows, riparian buffer continuity) • Designation of adopt-a-stream segments
USA data can be used to compare restoration potential among many subwatersheds or reaches using: • Subwatershed metrics, based on number of occurrences per stream mile surveyed (stream density, outfall density, suspect outfall density, % of network with impacted buffer, road crossings/mile, etc.) • Reach index maps (habitat quality, erosion severity, average condition, trashiness, etc.)

- Is room available for potential storm water retrofits within the stream corridor?
- How many miles of the stream network have adequate forested buffers, and where should reforestation efforts be targeted?
- How many miles of stream are actively eroding and where are the most severe reaches?
- Do opportunities exist to daylight piped streams?

USA data can be used to generate stream corridor metrics, riparian corridor maps, and assemble an inventory of restoration opportunities. Impact assessment data can be used to derive stream corridor metrics such as outfall density, number of leaking sewer pipes, miles of stream with impacted riparian buffers, number of severely eroding reaches, and length of potential daylighting opportunities, to name a few. Reach assessments can generate stream corridor metrics, such as stream density, a riparian habitat index, or an erosion severity index. Each of these data analyses helps determine the right restoration practices for the stream corridor, and prioritize which subwatersheds are the most restorable.

USA data can also be used to create impact-specific maps, such as suspect outfalls, trash cleanup locations, and natural area remnants for restoration planning. Impact assessment forms can be analyzed to create lists of potential restoration projects, such as storm water retrofits, reforestation sites, stream repairs. These opportunities can then be screened down to a more manageable list, based on feasibility factors and your overall restoration goals. Chapter 12 presents more guidance on data analysis methods to incorporate USA data in restoration planning.

Whenever possible, USA data should be integrated with USSR data to understand the relationship between upland areas and the stream corridor. For example, the USA may identify an eroded stream reach for a potential stream bank stabilization project. However, this project may not be feasible unless it is matched with upstream storage retrofits or a rooftop disconnection program identified during the USSR (Figure 6).

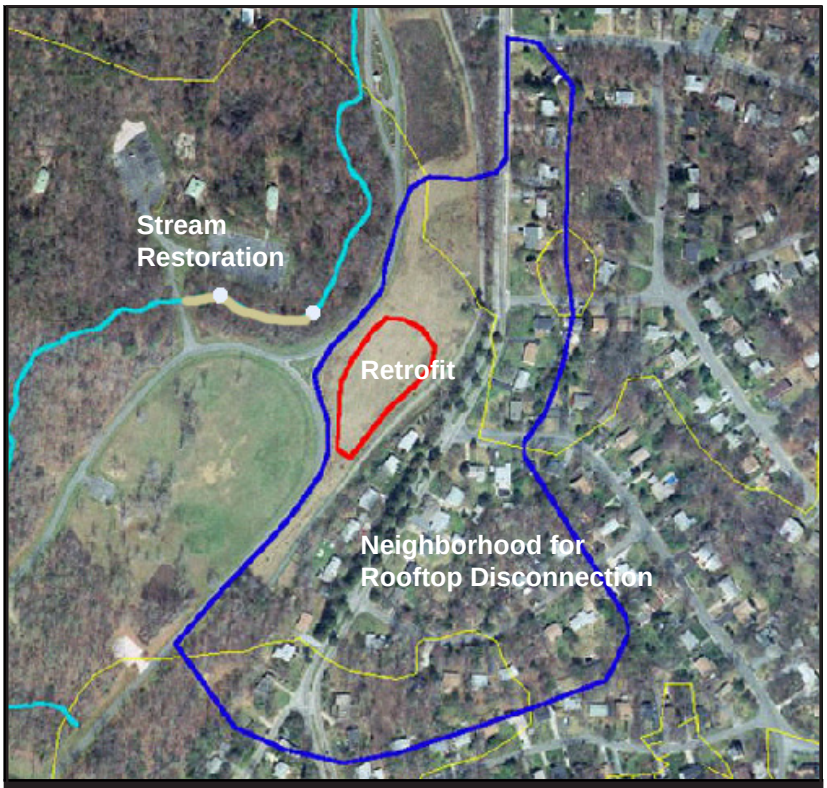


Figure 6: Linking Riparian and Upland Restoration Opportunities

The streambank stabilization project pictured here (in light green) is enhanced with a potential storm water retrofit upstream (in red), as well as a neighborhood targeted for downspout disconnection. The blue line shows the portion of the neighborhood that drains directly to the restoration sites.

Chapter 2: Preparing for a USA Survey

This chapter describes the equipment, mapping, and budget information needed for a USA survey. Not every community has access to fancy field equipment or extensive mapping resources, nor will every field crew be staffed by experienced “watershed naturalists” with skilled eyes for envisioning stream restoration opportunities. Therefore, this chapter provides basic guidance on how to prepare for your USA.

While the USA can be performed any time during the year, vegetation, stream flow, and temperature should always be considered when scheduling surveys. For example, summer vegetation can disguise outfalls, trash, and eroded banks, and make stream access and flood plain walking more difficult. Dry weather conditions are needed to find suspect outfalls, so surveys should be scheduled several days after major storms. Additionally, hot, humid, or freezing weather conditions may not be ideal for field crews.

2.1 What Do I Need to Get Started?

The USA requires minimal mapping, equipment, and staff resources. This section outlines what you will need to get started.

Field Maps

Field maps are required for the USA, but they don’t need to be fancy. Indeed, the scale and level of detail on your field maps should reflect your data needs, preferences and navigational skills of your field crew. While GIS can generate very detailed maps, simple paper maps may be sufficient. The basic purpose of the field map is to orient field crews as to where they are in the subwatershed, and help them record their findings accurately.

At a minimum, USA field maps should have labeled streets, hydrologic features (blue line streams, wetlands, and ponds), and delineated survey reaches. Urban landmarks, such as land use, property boundaries, and storm drain outfalls are often useful. USA maps can also be used to ground truth pre-existing maps that show outfall locations or riparian buffers.

Street maps offer the advantage of simplicity, availability, and well-labeled road networks and urban landmarks. Street maps, however, often fall short on hydrology and land use details, and maps such as a 1": 2000' scale USGS quad sheet or finer scale aerial photograph are often needed as a supplement. USGS quad sheets are readily available, and display major transportation networks and landmarks, blue line streams, wetlands, and topography. Quad sheets are adequate in less developed subwatersheds, but are not always accurate in more urban subwatersheds.

Recent aerial photographs are the best mapping format to delineate survey reaches, navigate the subwatershed, and assess existing land cover. On the other hand, aerial photos generally lack road names, are potentially costly, and may be difficult to record field notes. GIS-ready aerial photos and USGS quad sheets can be downloaded from the internet (try http://www.gisdatadepot.com/) or obtained from local planning, parks, or public works agencies.

Equipment

Basic field equipment needed for a USA consists of waders, measuring tapes, cameras, field forms, and GPS units. A complete list of recommended and optional equipment is provided in Table 7. GPS units are recommended to help track impact and reach

Table 7: Materials and Staffing Requirements of the USA		
Item	**Minimum Needed**	**Optional but Helpful**
Mapping	Roads Hydrology (streams, wetlands, ponds) Survey reaches	Aerial photos Topography Landmarks (buildings, towers, etc) Property boundaries Flood plain boundaries Storm drain network Known problem areas
Equipment	Waders Tape measure Camera Field maps Pencils Notebook/clipboard First aid kit Cell phone	GPS unit Spray Paint Clippers Sanitary wipes
Data Forms	8 impact assessment forms (OT, ER, IB, UT, TR, SC, CM, MI) Reach assessment form (RCH) Emergency response numbers	Photo Inventory Sheet Authorization letter
Staffing	Two staff per crew with basic training on USA	3rd team member Someone with stream restoration experience or knowledge of local plant species Volunteers

data spatially. Adequate ranging, water-resistant, downloadable GPS units can be purchased for less than $150 (try http://www.thegpsstore.com/). While the USA is designed for GPS users, pens and paper maps can be substituted. Digital cameras are preferred; however, conventional or disposable cameras can work, as long as they have flashes. Hand-held data recorders and customized software can also be used to electronically record text, photos, and coordinates in the field. While hand-held data records can eliminate field forms and tedious data entry, they may be prohibitively expensive for the one-time user. Waders, sanitary wipes, disposable gloves, cell phones, and first aid kits are recommended to protect field crews from potential perils lurking in the stream corridor.

Staffing

For safety and logistics, the USA requires at least a two-person crew. Three-person crews are preferred to help divide up tasks, and allow one person to assess the flood plain, check out adjacent land uses, and trace outfalls to their source. All crew members should be trained in using the USA, and be able to recognize impacted sites, assess average reach conditions, and envision the typical restoration techniques employed in those conditions. Specific knowledge of native flora, common invasive plants, and stream geomorphology are helpful, but not essential. Experienced teams can usually expect to cover about 2.5 miles per day, depending on stream corridor access and density of impacts.

Data Forms

Nine data forms are associated with the USA, including eight impact assessment forms and one reach assessment form. Depending on your goals and what you observe during your stream walk, you may choose not to use all eight of the impact forms. Each site impact form addresses a specific impact and is used to record necessary data at each problem along the stream corridor. The eight impact forms include the following:

- Outfalls (OT)—*all storm water and other discharge pipes*
- Severe Erosion (ER)—*bank sloughing, active widening or incision*

- Impacted Buffers (IB)—*lack of natural vegetation, width*
- Utility Impacts (UT)—*leaking sewer, exposed pipes in the stream corridor*
- Trash and Debris (TR)—*trash and illegal dumping in the stream corridor*
- Stream Crossings (SC)—*culverts, dams, natural features, etc.*
- Channel Modifications (CM)—*straightening, channelization, dredging, etc.*
- Miscellaneous Impacts (MI)—*unusual features or conditions in the stream corridor*

The reach assessment (RCH) form asks a series of questions to gauge overall survey reach conditions and help rank restoration priorities. The RCH form also contains a diagram of the survey reach that is used to spatially track individual impact assessment forms. The RCH form should be completed for every survey reach and should reference all recorded site IDs on the reach diagram.

Crews should always carry a list of contact phone numbers to report any emergency leaks, spills, or other problems to the appropriate local authorities directly from the field. Figure 7 shows an excellent example of a water pollution emergency contact list developed by Montgomery County, MD.

Two other helpful resources to take to the field include a photo tracking sheet and an authorization letter that describes why you are in the stream corridor. Photo tracking sheets are extremely helpful for organizing photos taken by multiple field crews so that you can easily reference locations and site descriptions for each photo (Figure 8). And since adjacent property owners, citizens, and police will inevitably approach you in the field to ask who you are and what you are doing, it is a good idea to take a one-page authorization letter explaining the purpose of the USA survey and who to contact for more information (Figure 9).

240-777-DUMP

WATER POLLUTION PHONE NUMBERS TO CALL WHEN A WATER QUALITY PROBLEM IS OBSERVED or TO OBTAIN FURTHER INFORMATION ABOUT WATER QUALITY ISSUES
Spring 2001

COUNTY AGENCIES

DEP: Department of Environmental Protection
DEPC: Division of Environmental Policy & Compliance
WMD: Watershed Management Division

DPS: Department of Permitting Services
LDS: Land Development Services
SWM: Stormwater Management
WS: Wells & Septic

INTER-COUNTY AGENCIES

MNCPPC: Maryland-National Capital Park & Planning Commission

DHCD: Department of Housing & Community Development

DPWT: Department of Public Works & Transportation

WSSC: Washington Suburban Sanitary Commission

PROBLEM/QUESTION	AGENCY & TELEPHONE NUMBER	
ILLEGAL DUMPING HOTLINE	**DEPC:**	**240-777-7700** Daytime hours ←
	→ Nighttime hours	**240/777-DUMP (3867) or 240-777-7788**
Blocked storm drain, inlet or pipe or erosion from public storm drain	DPWT:	240/777-ROAD (7623) Highway Maintenance)
Discolored public drinking water, odor to drinking water		301/206-4002
Erosion, flooding, drainage problems between private properties	DHCD:	240/777-3600 (Code Enforcement)
Erosion - stream banks on park land	MNCPPC:	301/495-2535
Fire & Rescue Services (emergencies: 911)	(Non-Emergencies):	240/777-0744
Recycling Programs/Special pick up services	DPWT:	240/777-6400 or 6466
Sanitary sewer problems	WSSC:	301/206-4002
Sediment (mud) from construction site entering streams	LDS:	240/777-6366
Septic Leaks/ Septic Tanks	WS:	240/777-6300
Stormwater Management, pond safety and maintenance	DEPC:	240/777-7744
Stormwater Management and Sediment Control Plan Review issues	SWM:	240/777-6320
Stream Clean-ups	WMD:	240/777-7712
Swimming Pool Discharges	DEPC:	240/777-7770
Trash and debris in parks and streams	MNCPPC:	301/495-2535
Water main break	WSSC:	301/206-4002
Water pollution (discharging, dumping, chemical spills into streams or storm drains)	DEPC:	240/777-7770
	LDS:	240/777-6260
Water quality monitoring programs for schools (Stream Teams)	WMD:	240/777-7714
Wells and Well Inspections	WS:	240/777-6300

askDEP.com

Figure 7: Emergency Contact Numbers
Example of a comprehensive emergency contact list for Montgomery County, MD of various water pollution problems field crews may want to report while performing the USA.

Photo Inventory

(By Camera)

Project: Smiley Run
Group: RK, EWB
Camera: A

This field sheetis to be completed AS photos are taken in the field. The intent is to force us to organize pictures taken on a camera basis. Fill out one sheet per camera (add sheets as needed). Only fill in Date/Reach/Location ID when you start in a new spatial or temporal location.

Date	Stream/ Reach	Location ID	Photo #	Description
3/10/03	102-1	OT-1	1	TEOG OUTFALL
		TR-1	2	SHOWING CATTLE IN STREAM
		ER-1	3	TEO MEASURING BANK HEIGHT
		"	4	LOOKING UPSTREAM FROM ERODED BANK
		UT-1	5	EXPOSED MANHOLE STACK/SEWER LINE @ ER-1

Figure 8: Excerpt From Photo Tracking Form

An example photo tracking form used to quickly reference locations and descriptions of each picture on a roll of film or camera. A blank form is provided in Appendix A.

CALVERT COUNTY
DEPARTMENT OF PLANNING & ZONING

150 Main Street
Prince Frederick, Maryland 20678
Phone: (410) 535-2348 • (301) 855-1243

Director
Frank A. Jaklitsch

Board of Commissioners
Gerald W. Clark
David E. Hale
Linda L. Kelley
Wilson H. Parran
Susan Shaw

January 29, 2004

Solomons Harbor Watershed Citizens:

Calvert County has employed the Center for Watershed Protection (CWP) to conduct environmental studies in the Solomons Harbor watershed and to develop a management plan for protecting environmental assets within the watershed. This study is a follow-up to the stream survey that was conducted last year. You should have received a letter last year about the stream survey.

Please give CWP staff your cooperation. They will be happy to answer your questions. If you have additional questions, please contact Dr. Dave Brownlee, Principal Environmental Planner by phone at xxx-xxx-xxxx ext.xx or by email xxxxx@xxx.com

Sincerely,

Frank Jaklitsch

3301 Courthouse Annex
Lewisburg, TN 37091
Phone: (931) 359-0547
Fax: (931) 359-0551

Environmental Coordinator Marshall County

June 7, 2002

This work crew stream service is surveying the Big Rock Creek as part of a project with Marshall County & Lewisburg. If there are any questions or concerns please contact the Marshall County Solid Waste Department. 410-XXX-XXXX

Thank you,

Solid Waste Department

Figure 9: Two Example Authorization Letters

Several copies of an authorization letter should be carried with you in the field and left on the dash of your car. These letters should contain a brief description of the field crew activities, as well as a contact number for more information.

2.2 Desktop Analysis to Support the USA

The two most critical desktop analyses to prepare for the USA are an estimate of total stream mileage and the generation of field maps. The stream mileage allows you to scope out how long the USA will take and how much it will cost. Field maps give field crews the minimum details to navigate around the subwatershed.

Delineating Survey Reaches

The most important component of a USA field map is the preliminary delineation of **survey reaches**. The stream network within your subwatershed should be delineated into discrete survey reaches that are assumed to be of uniform character. While delineations may not always be perfect, upfront time invested in them makes the USA smoother and more efficient.

Survey reaches should be established above the confluence of streams and between road crossings that may serve as grade control. In addition, survey reaches should be defined at the transition between major changes in land use in the stream corridor (e.g. forested land to commercial area), and limited to a quarter mile or less in length (1,500 feet) (Figure 10). Access through private or public property should also be considered during delineation. Often, survey reaches in lightly developed subwatersheds are longer than those in more developed subwatersheds, which is fine if uniform stream corridor conditions are expected. You should always expect that some desktop delineations may need to be adjusted to account for field conditions (e.g., underground streams or widely variable stream corridor conditions).

The following guidance is offered to help you delineate survey reaches. Generally, each survey reach should have the following characteristics:

- Be about a quarter mile in length (~1,500 feet)
- Have at least one convenient access point to the stream (from a road or open area)
- Be located between two major road crossings or the transition between a major land use change (always include culverts with downstream section)
- Contain a relatively homogeneous land use
- Be separated at the confluence of two streams
- Include only one stream channel
  Be reasonably accessible (check for private property and fences)

Figure 11 shows a subwatershed map illustrating how survey reaches were delineated in Towson Run, Baltimore County, MD. This 2.9 square mile subwatershed has 13.6 miles of blue line streams, some of which appear to be enclosed. Using the delineation criteria for breaking the stream network into survey reaches, it took an hour to delineate 26 survey reaches by hand. In this example, survey reaches were identified using letters and color coded by stream order. Linking survey reach data to a GIS can help you rapidly revise your reaches to reflect conditions on the ground, quantify miles covered, and generate field maps.

You may notice that not all survey reaches in Figure 11 fully met the delineation criteria. Some reaches were longer than a quarter mile, some drained diverse land uses, and others were questionable as to whether they actually were surface streams. This is acceptable since field crews will often need to adjust survey reaches once in the field. Still, this delineation system recognizes most confluences, road crossings, land use changes, and access considerations found in the subwatershed.

Figure 10: Criteria Used in Delineating Stream Reaches

Various physical factors control how survey reaches are delineated. (A) Survey reaches based on the confluence of stream tributaries. (B) A long tributary split into ¼ mile survey reaches. (C) Based on a major road crossing. You want to include the culvert in the downstream reach. (D) Based on significant changes in land use. Significant changes in stream features often occur at road crossings, and these crossings often define the breakpoints between survey reaches.

Naming Survey Reaches

You should establish a clear and consistent system to label survey reaches and provide a unique identifier for problem sites. Numerous conventions exist to label stream reaches, and you should check with the local natural resources agency before you establish a new one. As a general rule, survey reach labeling should be simple and flexible to prevent confusion among field crews.

The Strahler stream order system is frequently used to label survey reaches based on stream order. First order streams are defined as headwater streams with no tributaries. When two first order streams join, a second order stream is formed. Where two second order streams join, a third order stream is formed, and so on. When a stream of lower order joins a stream of higher order, stream order does not change. Starting at the bottom of each subwatershed, each first order stream reach is numbered starting with number 101, and continues in a clockwise direction until all first order reaches are numbered (i.e., 102, 103, etc.). The process is repeated for each second order reach (i.e., 201, 202, etc.) and each third

order reach (i.e., 301, 302, etc.), until all stream reaches in the subwatershed are assigned a three-digit identifying number, as depicted in Figure 12.

As an example, the first survey reach on a first order stream in Towson Run might be defined as follows:

Tributary Name-Reach Number-Survey Reach ID
(Towson Run-101-1)

While the Strahler system works well in larger subwatersheds, it may be unnecessarily complex for smaller ones. A simpler system can be used based on the name of the major stream followed by a single identifying number or letter. For example:

Stream Name-Section ID
(Towson Run-A)

If a survey reach is modified in the field, crews can simply add a number onto the end of the survey reach ID. For example, field crews may determine that Towson Run-A should be split into three separate survey reaches. The new identifier would be Towson Run-A1, Towson Run-A2, and Towson Run-A3. This simpler naming convention produces less cluttered maps and less confusion among field crews. You may also choose to use a more detailed naming convention in your internal tracking database (i.e., including stream order).

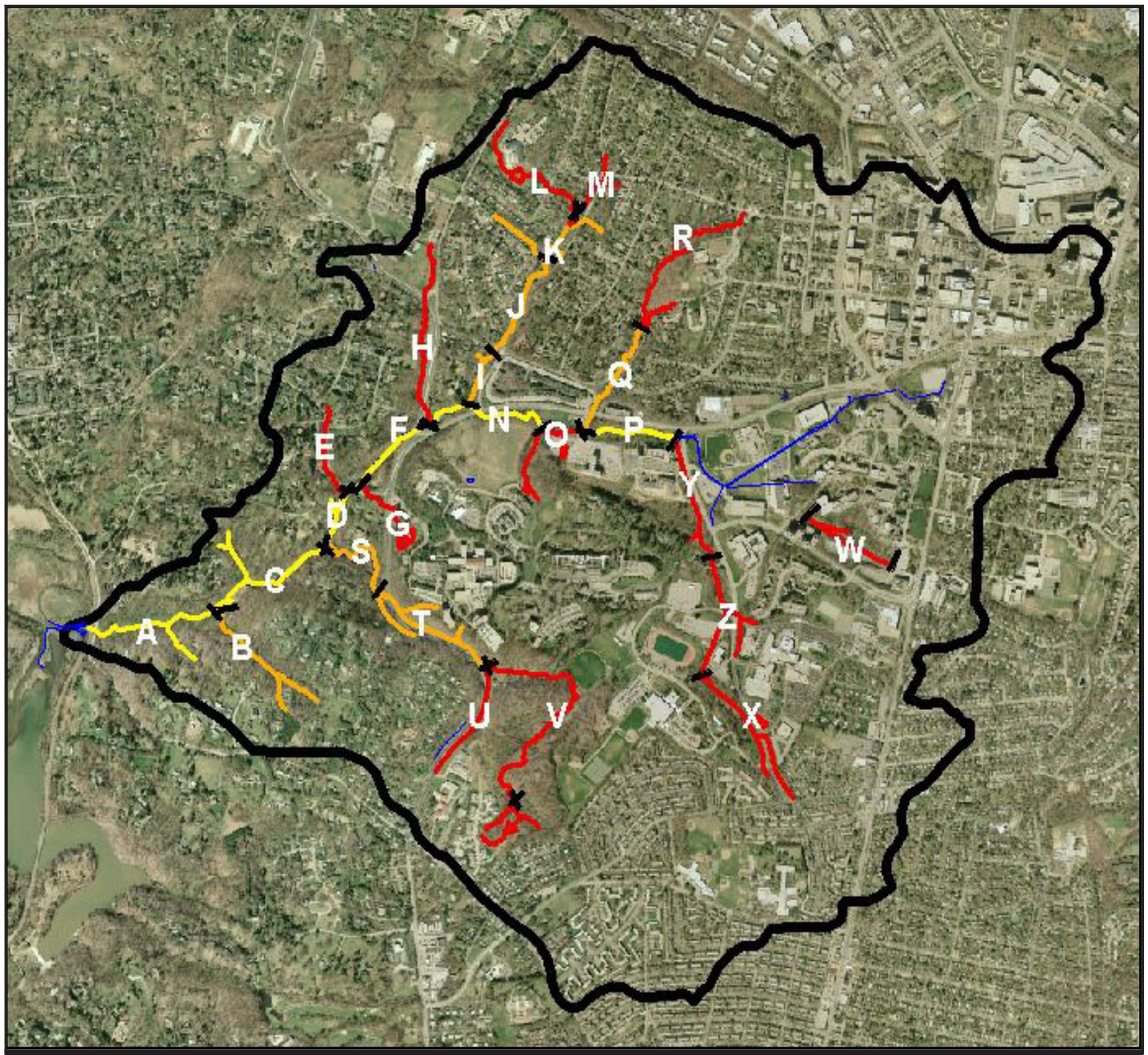


Figure 11: Preliminary Delineation of Survey Reaches in Towson Run

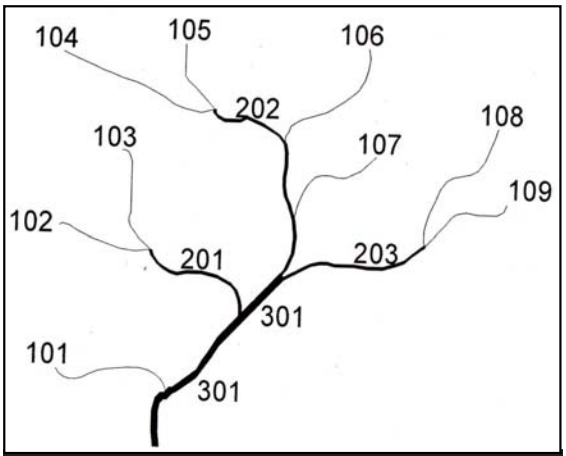


Figure 12: Strahler's Stream Order Diagram
This method is one way of numbering your stream reaches.

Similarly, the locations of individual stream corridor impacts can be labeled in various ways, but are usually assigned in consecutive order as they are observed. Since individual impact forms are tracked on the RCH form for the survey reach, simple identifiers can be used:

Problem Initials- Site ID
(OT-1, OT-2, OT-3, etc.)

Establish Database

You should set up your USA database before going out in the field. Appendix B provides a specially modified Microsoft Access database designed for this purpose. You are encouraged to modify this database to incorporate any changes made in the stream walk protocol.

2.3 Generating Stream Corridor Maps

A stream corridor map that shows subwatershed boundaries, roads, structures, streams, and labeled survey reaches is generated after all survey reaches are delineated. Adjacent neighborhoods and public lands (parks, schools, etc.) can also be included on the map. The stream corridor map should be of a scale that allows field crews to draw in significant features, and make field notes.

2.4 Budgeting and Scoping the USA

Several factors come into play when budgeting and scoping a USA survey, including the number of stream miles to cover, available staff, equipment needed, and the density of impacts in the stream corridor. The desktop analysis step can help estimate the total stream mileage for delineated reaches that will be surveyed, so that you can estimate staff time needed. For example, in a moderately urban subwatershed with 30 stream miles, you should expect to expend five to seven staff weeks of effort to complete all four USA steps. Assuming minimal supply needs and professional rates of $25/hour, you should expect to spend approximately $15,000 on a full USA survey. Note that significant cost savings can be achieved by using volunteers. Table 8 provides a generic budget breakdown for the cost of performing the USA on a 10 square mile subwatershed.

Always keep in mind that the pre-field preparation step always requires a lot of staff time (i.e., to track down maps, assemble supplies, and generate field maps). You should allow at least a week of staff time for this important preparation. Assuming three trained staff cover about two stream miles per day, you should plan for at least 45 staff days for actual fieldwork for a 10 square mile subwatershed (15 days for a team of three). Staffing estimates should be adjusted based on field crew experience, ease of access, number of survey reaches, and density of problem sites. At least two weeks of staff time should always be allocated to process and interpret USA data (e.g., data entry, quality control, and data evaluation). Manual 2 provides more detail on how to budget and scope subwatershed investigations to evaluate subwatershed restoration potential.

Table 8: Generic USA Budget for Hypothetical Subwatershed	
Salaries Task 1 General Prep for fieldwork Generating field maps Watershed Planner I@ $25/hr 40 hrs Task 2 Performing USA (3 staff @ 2 miles/day) Watershed Planner I@$25/hr 120 hrs Watershed Planner II@$25/hr 120 hrs Watershed Planner III@$25/hr 120 hrs Task 3 Data processing (quality control, evaluation) Watershed Planner I@$25/hr 80 hrs	$1,000 $9,000 $2,000
Supplies and Equipment GPS unit (@ $150/unit) Waders (3 pairs @ $70/pair) Digital camera (@ $300) Street maps/orthos ($40)	$700
Copying and Reproduction	$500
Total Costs	**$13,200**
Estimate assumes 10 square mile subwatershed with 30 miles of walkable streams	

Chapter 3: Storm Water Outfalls (OT)

The USA assesses all storm water outfalls or other pipes that discharge to the stream corridor. Specifically, you will be looking for suspected illicit discharges, enclosed pipes for potential daylighting, off-line storage retrofits, and local opportunities to stabilize or repair streams and outfalls.

3.1 About Outfalls

Storm water outfalls are ubiquitous to urban streams. They consist of open channels or closed pipes that discharge storm water runoff from the subwatershed into the stream corridor after a rain event. As impervious cover in the subwatershed increases, less rain water infiltrates into the ground and larger volumes of storm water runoff are conveyed through the storm drain system. This causes increased flooding, peak flows, and stream erosion, along with declines in stream habitat and water quality. In some cases, storm water outfalls may contain illicit discharges of sewage and other pollutants that can create water quality problems. Figure 13 illustrates some types of storm water outfalls you may encounter during the stream walk.

Outfalls are an important component of the USA for several reasons:

- *Suspected Illicit Discharges*: Many communities are regulated under NPDES Phase I and Phase II storm water permits, and must locate their storm water outfalls to assess illicit discharges. The USA is a useful tool to update existing outfall mapping information or create it from scratch. More importantly, the USA identifies dry weather flows and other "suspect" discharges that may warrant further investigation (Manual 6).

- *Outfall Damage*: The storm water outfall or adjacent stream bank may require maintenance or repair to maintain its integrity. Often, bank stability in the immediate vicinity is compromised by powerful flow velocities from the pipe, and bank stabilization practices should be pursued (Manual 4).

- *Storage Retrofits:* Some outfalls are suitable locations for storage retrofits where water quality storage is provided between the outfall and stream corridor (Manual 3). Also, outfall locations can influence the design of stream restoration projects.

Figure 13. Types of Outfalls to Expect

Storm water outfalls come in a variety of shapes and sizes. For example, not all outfalls will be closed pipes, such as the open channel draining the corner of a commercial parking lot (Panel A). Some outfalls may be single or double concrete pipes draining directly to the stream (Panel B), while others may be quite small, such as the six-inch diameter pipes discharging into the buffer in Panel C.

Questions to ask when assessing an outfall:

What is the general condition of the outfall?

Is there flowing discharge? If so, what are the characteristics of that flow?

Is there any noticeable stream or bank erosion near the outfall?

Is this outfall a candidate for retrofitting or daylighting?

- *Enclosed Streams:* Many outfall locations have enclosed channels that were once surface streams. In some cases, it may be possible to **daylight** these streams by removing the pipe and restoring the channel to a more natural condition (Manual 4).

3.2 Introduction to the OT Form

While an outfall is just the final discharge point of a much larger underground network of pipes, its physical characteristics can tell a lot about local restoration potential. This section introduces the outfall impact form (OT) used to evaluate outfalls encountered during your stream walk. The OT form is used to collect basic information on the location, condition, flow characteristics, and potential restoration opportunities at each outfall. This section describes each part of the OT form and gives guidance on how to complete it. A full version of the OT impact form can be found in Appendix A. A completed example OT form is included at the end of this chapter in Section 3.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

The first part of the OT form contains general header information common to all impact assessment forms, most of which is self-explanatory.

You may need to modify the header section depending on your reach and site labeling system, and whether you are using GPS units to fix locations. If you are using GPS units, record the coordinates for each site, the **GPS unit ID #,** and an **LMK** number. The LMK is an internal ID assigned to the latitude and longitude coordinates recorded by the GPS unit. This ID carries over when coordinates files are downloaded from the GPS unit to your computer. The LMK serves as a backup in case field crews are sloppy in recording location information on their field sheets. While not critical, recording the LMK on the field form also serves as a reminder to save the coordinates to the GPS unit so they can be downloaded.

The next part of the OT form asks for the location, type, size, and condition of the outfall and its immediate environs.

You need to determine if the outfall is an **enclosed pipe** or **open channel** and then record its material, shape, and dimensions. For enclosed pipes, record whether it is a single or a multiple pipe, its **pipe diameter**, and whether it discharges above the water level or is submerged. Pipe diameter at the outfall can be used to get a rough estimate of the upland area draining to the outfall (Table 9). Pipe diameters can vary, but most have a diameter that is a multiple of six inches (6, 12, 24, 36, and 48 inches). Trapezoidal channels have distinct angles, while parabolic channels are smoothly curved.

You should also note whether the outfall exhibits signs of **physical deterioration** such as corroding metal, cracking concrete, or peeling paint. Use your nose to detect any odors emanating from the pipe, which may suggest a potential illicit discharge worthy of follow-up investigation. For example, if you detect a sulfur, or “rotten egg” smell, this may indicate the presence of sewage or high organic loads. Rancid or sour smells are sometimes associated with food wastes or industrial discharges.

Table 9: Relationship Between Outfall Pipe Diameter and Contributing Drainage Area				
Pipe Diameter (inches)	**Area (sq. feet)**	**Discharge (cfs)**	**Avg Velocity (fps)**	**Drainage Area (approx acres)**
6	0.3	1	4	0.1 to 1
12	0.8	3	6	1 to 2
24	3.4	25	10	2 to 5
36	7.1	90	12	5 to 25
48	12.6	150	14	25 to 100
60	19	350	18	100 to 200
For concrete pipes flowing full, with 1% slope.				

Vegetative density refers to the presence of vascular plants directly below an outfall, whereas pipe **benthic growth** asks you to check for algal or bacterial growth within the pipe itself. Orange colored growths, called flocs, are generally derived from the natural presence of manganese and iron in the water and may not always indicate pollution. Green or brown growths, on the other hand, are often associated with high nutrient levels. If a **pool** has formed directly below an outfall, you should check to see if any suds, oil sheens, algae, or signs of water pollution are present. **Floatables** are defined as trash and debris carried in storm flows that float on the surface of the pool.

If you find a **flowing outfall**, check the color, turbidity, and physical content of the flow. These simple characteristics can help classify the likely sources of contaminants. If other concerns such as excessive trash, bank erosion, or heavy sediment deposition are associated with the outfall, note these on the OT form as well. Table 10 illustrates common characteristics to look for during an outfall assessment.

The last part of the OT form asks you to recommend any potential restoration projects you feel may be appropriate for the outfall.

Restoration projects might include further discharge investigations, stream daylighting, storm water retrofits, or local outfall or stream repairs. If dry weather flow is observed at the outfall, or unusual odors, stains, or growths are associated with it, it should be considered a suspect outfall for further discharge investigation (Figure 14). You should also assign a **discharge severity** score on a scale of one to five, where five is the most severe, based on the type of discharge observed. Descriptions to rate the severity score are included on the OT forms, which are used later to screen the most severe discharges in the subwatershed.

Daylighting is a stream repair practice that opens up a stream back up by uncovering and removing sections of storm drain pipe. Daylighting re-establishes historic streams that are currently enclosed, or are artificially channelized (see Manual 4). To evaluate daylighting potential, you should estimate the length above the existing pipe that is open and available (i.e., no structures or utilities), and the depth of over burden above the top of the pipe. Figure 15 shows potential locations for daylighting opportunities.

Stream repair techniques may be needed to protect infrastructure or stabilize an eroding stream bank near the outfall (Figure 16). As always, emergency maintenance concerns should immediately be reported to the local utility.

Storm water retrofit opportunities should be assessed at each outfall. Field crews are not expected to come up with detailed concept designs, just good locations that may warrant further investigation. First, trace the outfall pipe backward to assess the potential

Table 10: Outfall Characteristics to Note During Site Assessment		
Elliptical, single barrel, concrete pipe. You may want to measure both horizontal and vertical diameter	Small diameter (<2") plastic pipe. Often a sump pump (legal), or used to discharge laundry water (illicit).	Measuring the diameter of a partially submerged single barrel, concrete outfall
Excessive vegetation may indicate enriched flows associated with sewage	Bacterial growth at the outfall indicates nutrient enrichment and a likely sewage source.	This bright orange bacterial growth often indicates high manganese and iron concentrations
Green benthic growth on an outfall and high turbidity in pool	Suds in pool may indicate raw sewage	Unlike synthetic oils that swirl upon touch, sheen from bacteria such as iron floc forms a sheet-like film that cracks if disturbed
Check for staining or obvious deposits indicating suspect discharges	Floatables collecting in the discharge pool at an outfall location	Look for oils or other pollutants collecting at the outfall pool

feasibility of a storage retrofit within the flood plain. Key points to note are the elevation of the bottom of the pipe (known as the invert) in relationship to the stream channel. If the elevation difference is greater than three feet, look to see if unutilized land is available in the stream corridor to provide storage. Try to determine how much downgradient land area is available to insert an offline retrofit between the drain pipe and the stream. Figure 17 shows how a storm water retrofit can be inserted into the stream corridor. You should also check to see if the outfall is connected to a nearby storm water practice (e.g., pond , wetland, or other structure). Existing storm water practices should be noted for further investigation during a retrofit inventory (Figure 18).

Figure 14: Detailed Discharge Investigations
Discharge investigations will involve more extensive assessments at outfall locations. Local Illicit Discharge Detection and Elimination (IDDE) protocols often involve the physical marking of outfalls with spray paint and water quality sampling of suspected illicit discharges (Brown and Caraco, 2004).

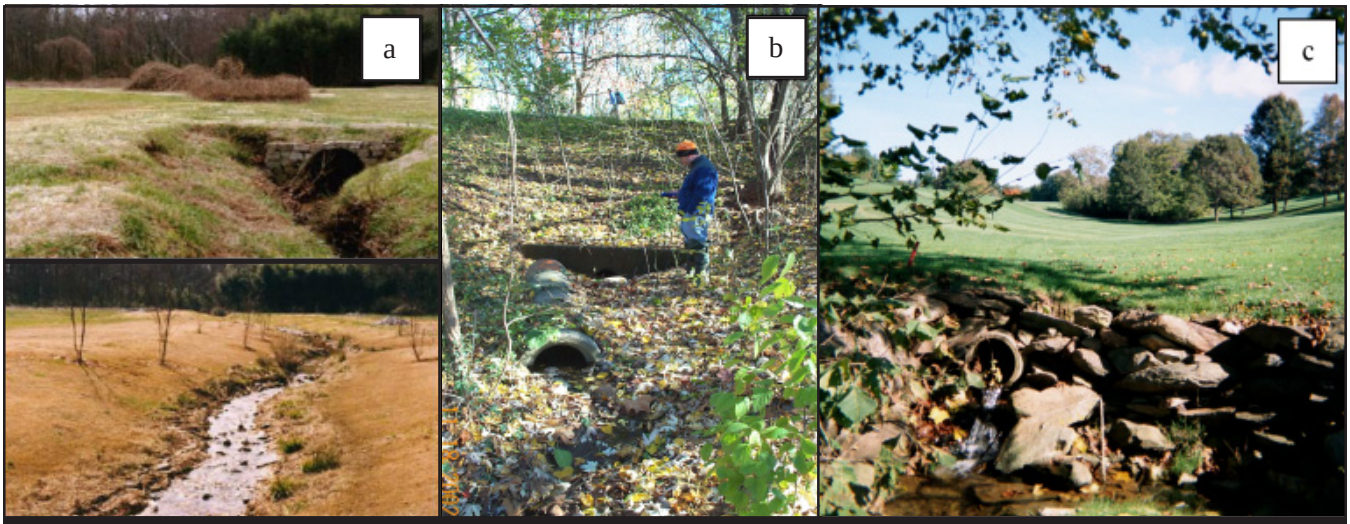


Figure 15: Evaluating Stream Daylighting Potential
Panel A shows a before and after example of a stream daylighting project. Notice the flat slope and grass vegetative cover of the site, which increased the feasibility of excavating the pipe and exposing the stream to its natural condition. In Panel B, the field crew is shown pondering the potential for opening this stream back up, particularly given the slope of this location. Panel C illustrates another location where daylighting could be combined with a reforestation effort.

Figure 16: Local Stream or Outfall Repair
This is an example of catastrophic failure of an outfall caused by significant erosion that could have been prevented if caught early. Conditions like this should be reported to the appropriate local authorities.

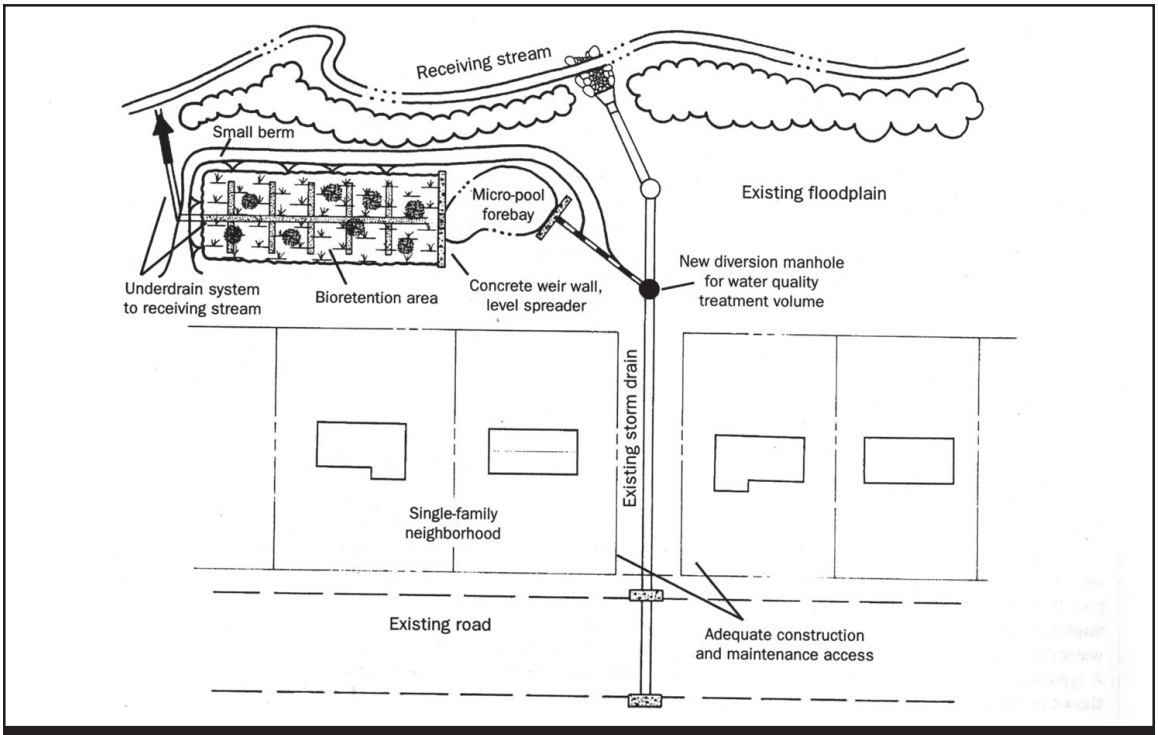


Figure 17: Schematic of Off-line Retrofit in the Riparian Corridor
This schematic details how a water quality retrofit can be inserted into the stream corridor.

3.3 What Outfalls Should I Assess?

You should decide in advance the minimum outfall diameter you will sample. Depending on your goals, you may sample all outfalls, or only record those that have suspect discharges. It is a good idea to assess **all** stormwater outfalls in highly urban subwatersheds, regardless of impact, diameter, or restoration potential (Table 11). In less developed watersheds, you may only want to sample outfalls with a diameter of six inches or greater.

3.4 Field Assessment Tips

Some quick tips for assessing outfalls are offered below:

- Thick vegetation can make outfalls hard to see or gain access to, so OT surveys work best during late fall, winter, or early spring.
- You may need to make more than one pass through the survey reach to discover all the outfalls.
- Illicit discharges are most easily discovered during extended periods of dry weather, when flows are more obvious.
- If you want to sample water quality at outfalls, take along test strips or field probes to sample water quality parameters, such as ammonia and conductivity.

Figure 18: Investigate Existing Storm Water Treatment Practices
When assessing an outfall, you may want to take a quick trip up-pipe to determine if the discharge is controlled by a storm water facility. In this case, the outfall is the discharge point for a dry pond. Dry ponds do little for water quality and are therefore good retrofit candidates.

Table 11: Recommended Outfalls to Assess

Types of outfalls you should count include:	Types of outfalls to ignore:
Large and small diameter closed pipes Open channels Outfalls that appear to be piped headwater streams Field connections to culverts Submerged or partially submerged outfalls Outfalls that are sedimented in or blocked with debris Pipes that appear to be outfalls from storm water treatment practices Flexible HDPE that appear to serve as slope drains Pipes that are clearly connected to roof drains Small diameter ductile pipes that appear abandoned	Drop inlets from roads in culverts Cross-drainage culverts in transportation right-of-way (i.e., can see through other end) Weep holes

- Not all outfalls discharge directly to the stream, so keep an eye out for outfalls that discharge farther away to slopes or flood plains. Often, you can find outfalls by tracing channels away from the stream corridor.
- Bridges and culverts should not be considered in the OT assessment unless you can clearly and safely see an internal outfall within a culvert.
- Natural oil sheens crack into irregular shapes when poked; synthetic oils will not break up.
- Don't taste anything.
- All outfalls with dry weather flows should be considered suspect and identified for further discharge investigations.
- Don't sweat the storm water retrofit potential, but you may want to review Manual 3 to get a feel for what different retrofit practices look like before doing an OT assessment.

3.5 Using OT Data in Subwatershed Restoration

Outfall data can be used for restoration planning in a number of ways. OT data can identify problem locations and suspect outfalls, generate a list of potential restoration practices, develop stream corridor metrics, and generate planning maps (Table 12). OT data can help you decide whether illicit discharges are a significant threat to your subwatershed. In addition, OT data can show whether retrofits or stream repairs should be a part of the overall restoration plan.

Table 12: How OT Data Can Be Used

Problem Assessed	Suspected illicit discharge Enclosed stream Outfall location Outfall damage
Potential Restoration Practice ***(Manual profile sheets)***	Discharge investigations (D-1, D-2, D-5) Stream daylighting projects (R-27) Storage retrofit below outfall (SR-3) Local stream repair/outfall stabilization
Stream Corridor Metric	Outfall density Suspected illicit outfall density Number of outfalls discharging uncontrolled storm water Treatable outfalls Length of potential daylighting
Output for Planning	Outfall map Map of potential storage retrofit sites Map of potential daylighting opportunities Map of threatened infrastructure

The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series. The codes are as follows:

- *SR- sheets can be found in Manual 3: Storm Water Retrofit Practices*
- *R- sheets can be found in Manual 4: Stream Repair Practices*
- *D- sheets can be found in Manual 6: Discharge Prevention Practices*

3.6 Example OT Form

The OT form is used to collect basic information on the location, condition, flow characteristics, and potential restoration opportunities at each outfall. A detailed explanation of how the field crew filled out each section of this example form is included on the next page.

Stormwater Outfalls **OT**

WATERSHED/SUBSHED: SMILEY RUN | **DATE:** 3/10/03 | **ASSESSED BY:** ACK, ENB

SURVEY REACH ID: 102-1 | **TIME:** 9:15 (AM)/PM | **PHOTO ID:** (Camera-Pic #) A /# 01

SITE ID (Condition-#): OT-1 | **LAT** ___°____'____" **LONG** ___°____'____" **LMK**____ | **GPS:** (Unit ID)

A.

BANK: ☐LT ☑RT ☐Head

FLOW: ☑None ☐Trickle ☐Moderate ☐Substantial ☐Other:

TYPE: ☑Closed pipe ☐Open channel

MATERIAL: ☑Concrete ☐Metal ☐PVC/Plastic ☐Brick ☐Other: ☐Concrete ☐Earthen ☐Other:

SHAPE: ☑Single ☑Circular ☐Double ☐Elliptical ☐Triple ☐Other: ☐Trapezoid ☐Parabolic ☐Other:

DIMENSIONS: Diameter: 48 (in) Depth: ____(in) Width (Top): ____(in) " (Bottom): ____(in) NOT APPLICABLE

SUBMERGED: ☑No ☐Partially ☐Fully

B.

CONDITION: ☑None ☐Chip/Cracked ☐Peeling Paint ☐Corrosion ☐Other:

ODOR: ☑No ☐Gas ☐Sewage ☐Rancid/Sour ☐Sulfide ☐Other:

DEPOSITS/STAINS: ☑None ☐Oily ☐Flow Line ☐Paint ☐Other:

VEGGIE DENSITY: ☑None ☐Normal ☐Inhibited ☐Excessive ☐Other:

PIPE BENTHIC GROWTH: ☑None ☐Brown ☐Orange ☐Green ☐Other:

POOL QUALITY: ☑No pool ☐Good ☐Odors ☐Colors ☐Oils ☐Suds ☐Algae ☐Floatables ☐Other:

FOR FLOWING ONLY									
COLOR:	☐Clear	☐Brown	☑Grey	☐Yellow	☐Green	☑Orange	☐Red	☐Other:	
TURBIDITY:	☐None	☑Slight Cloudiness	☐Cloudy	☑Opaque					
FLOATABLES:	☐None	☑Sewage (toilet paper, etc.)	☑Petroleum (oil sheen)	☐Other:					

OTHER CONCERNS: ☐Excess Trash (paper/plastic bags) ☐Dumping (bulk) ☐Excessive Sedimentation ☐Needs Regular Maintenance ☐Bank Erosion ☐Other: NONE

C.

POTENTIAL RESTORATION CANDIDATE ☐Discharge investigation ☐Stream daylighting ☐Local stream repair/outfall stabilization ☑no ☐Storm water retrofit ☐Other:

If yes for daylighting:
Length of vegetative cover from outfall: ____ft Type of existing vegetation:____ Slope: ____°

If yes for stormwater:
Is stormwater currently controlled? ☑Yes ☐No ☐Not investigated
Land Use description:____
Area available:

OUTFALL SEVERITY: *(circle #)*

5	4	3	2	1
Heavy discharge with a distinct color and/or a strong smell. The amount of discharge is significant compared to the amount of normal flow in receiving stream; discharge appears to be having a significant impact downstream.		Small discharge; flow mostly clear and odorless. If the discharge has a color and/or odor, the amount of discharge is very small compared to the stream's base flow and any impact appears to be minor / localized.		Outfall does not have dry weather discharge; staining; or appearance of causing any erosion problems.

SKETCH/NOTES:
DRAINS STORMWATER POND FOR GROCERY STORE PARKING LOT

REPORTED TO AUTHORITIES: ☐YES ☑NO

How the Example OT Form Was Completed

Part A

In the first part of the form, field crews performed an OT assessment on an outfall in the Smiley Run subwatershed in survey reach 102-1. They took a photo at this location (happened to be the first one of the day), which also happened to be the first outfall they came across.

Part B

The outfall, located on the right bank facing downstream, was a concrete, circular, single-barrel pipe. The pipe had a diameter of 48 inches, and no notable degraded conditions, odors, or growths were associated with it. No dry weather flow was observed when the crew examined the outfall.

Part C

In the last part of the form, the field crew made no restoration recommendation since no major problems identified were at the outfall. The field crew followed the pipe up and found a storm water pond that appeared to be functioning properly.

Chapter 4: Severe Erosion (ER)

The USA assesses the most severe eroding banks along the survey reach, particularly at places where valuable infrastructure is threatened. Specifically, you will look for potential stream repair or restoration opportunities such as bank stabilization or grade control.

4.1 About Erosion

Stream erosion reflects the natural process of channel migration and adjustment, whereby streams continuously meander, widen and narrow in an attempt to reach a stable equilibrium. The balance between sediment load and discharge can be disrupted by urbanization. Severe erosion can occur when a stream's current velocity exceeds stability thresholds for bank materials at channel boundaries. Reduced bank stability caused by increased bankfull flooding can lead to rapid and excessive bank erosion as the stream adjusts to the changing hydrologic conditions.

The process of channel widening or downcutting can worsen as streams become progressively disconnected from their flood plain. Nick points occur where significant changes in streambed elevation are caused by channel incision, and are indicators of dynamic channel processes at work. Eroding banks can cause loss of property, destroy in-stream habitat, and contribute significant sediment loads downstream. Trimble (1997) estimated that more than half of the sediment loads from highly urban watersheds were derived from eroded stream banks. Figure 19 shows various examples of stream erosion you may encounter while conducting an ER assessment.

Extensive bank erosion and channel headcuts should be expected in urban subwatersheds. The ER form only collects information on localized nick points and banks where erosion greatly exceeds average reach conditions. Broader bank stability conditions are assessed as part of the overall RCH assessment (Chapter 11).

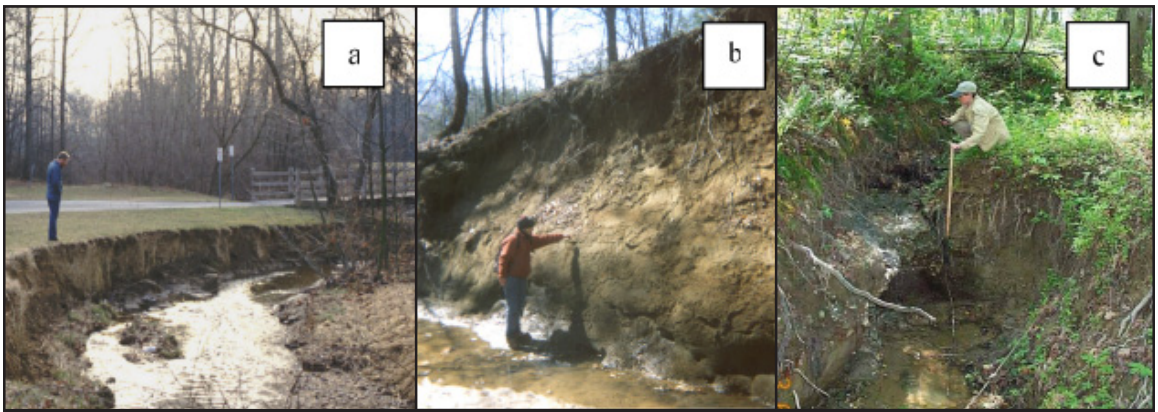


Figure 19: Types of Stream Erosion
Active bank erosion you can expect along meander bends in urban settings (Panel A), extreme erosion events that contribute significant sediment loads to receiving waters (Panel B), and in-stream nick points indicating channel erosion occurring in an upstream direction (Panel C) are examples of severe erosion you will want to record on ER forms.

Questions to ask when assessing eroded banks:

Is this area more severe than the rest of the survey reach?

Is infrastructure or property threatened?

What appears to be the cause of the erosion?

Are the banks actively contributing sediment to the stream?

Is this site a candidate for bank stabilization or grade control?

Severely eroded banks are evaluated during the USA for several reasons:

- *Nature and type of channel erosion*: Knowing the nature and type of erosion within urban streams can help determine how eroding areas are influencing upstream and downstream reaches. The dominant channel erosion process in an urban stream often dictates which types of stream repair and restoration practices should be applied, if any (Manual 4). Locating nick points or headcuts can indicate where upstream erosion problems may occur in the future given current hydrologic conditions. A quantitative estimate of bank erosion can be used to model subwatershed sediment loadings.

- *Severity of bank erosion*: While most urban streams exhibit some evidence of past or current bank erosion, the ER helps identify the most severe locations for potential bank stabilization or restoration (although they may not always be practical or feasible given overall subwatershed restoration goals).

- *Threatened infrastructure:* Excessive erosion may expose or undermine existing infrastructure such as outfalls, sewer lines, telephone polls, bridge abutments, roads, parking lots, or other structures built too close to the stream. In some cases, it may be critical to repair or stabilize eroding areas to prevent future damage to valuable infrastructure.

4.2 Introduction to the ER Form

This section introduces the severe erosion impact form (ER) that assesses individual locations of eroded stream banks encountered during your stream walk. You are asked to record basic data on the location of erosion sites, estimate current channel dynamics and dimensions, and identify potential bank stabilization opportunities at each problem site. This section describes each part of the ER form, and provides guidance on how to complete it. Appendix A contains a blank copy of the ER impact form. A completed example ER form is included at the end of this chapter in Section 4.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

The first part of the ER form contains general header information common to all impact forms, and is self-explanatory.

You may want to modify the header section to reflect your reach and site labeling system, and whether you are using GPS units to fix locations. If you are using GPS units, record the beginning and end coordinates for each site, the **GPS unit ID #** and an **LMK** number. If the eroded bank is less than 100 feet long, GPS cannot calculate an accurate length, and you should measure it by pacing or with a tape measure.

The next part of the ER form asks you to describe the general channel processes that affect the eroding bank or stream channel. You should note the location and dimensions of the eroding area, as well as the ownership of the adjacent stream corridor.

You are asked to determine the overall **channel process** affecting the erosion site (e.g., is it aggrading or degrading), and to characterize how the channel process exerts itself on the stream (e.g., scour, slope failure, etc.). Of significant interest are headcuts and **nick points**, which are locations where active channel erosion is migrating in an upstream direction. Nick points are excellent indicators of the active channel erosion dynamics and directly affect the design of stream restoration projects. **Headcuts** observed on the side of a stream may also indicate the presence of an outfall discharging to the flood plain or side slope. You should trace these headcuts to their source. **Scour** is the process of removing bed or bank material through the erosive action of flowing water. **Bank failure** occurs when the toe of the stream bank is eroded beyond the point of bank support. **Slope failure** is often used describe the failure at steep bank slopes.

While not everyone has a full understanding of urban stream geomorphology, Table 13 gives some tips on how to determine the dominant channel processes in the stream. Table 14 also illustrates what many of these channel processes look like in the stream. If you feel uncomfortable about describing the channel process, simply check the **currently unknown** box.

Each eroded bank section should be recorded as either left, right, or both banks, and whether it occurs on a bend in the stream, or along a relatively straight section. Headcuts branching off the stream should also be recorded as either left or right bank, while nick points are, by definition, located within the stream channel itself. Bank erosion is typically found along meander bends and may be enhanced if the bend occurs against a steep slope.

Table 13: Features Used to Determine Current Channel Process

Process	Definition	Geomorphic Evidence
Aggradation	The geologic process by which a streambed is raised in elevation by the deposition of additional material transported from upstream (opposite of degradation)*	Mid-channel bars Embedded riffles Siltation in pools Accretion on point bars Deposition in the overbank zone
Degradation	The removal of streambed materials caused by the erosional force of water flow that results in a lowering of the bed elevation throughout the reach (opposite of downcutting)*	Deepened or "entrenched" stream bed Cut face on bar forms Headcutting and nickpoint migration Suspended armor layer in bank Terrace cut through older bar material Exposed sanitary or storm sewers
Downcutting (or incision)	Deepening of stream channel cross section resulting from process of degradation*	Tall banks (may see stratification) Disconnection from flood plain May occur if widening prohibited
Headcutting	The erosion of the channel bed, progressing in an upstream direction*	Nickpoints Small drops in elevation (mini waterfalls) Abnormally steeped channel segments
Widening	Increased width of stream channel cross section resulting from degradation process	Falling/leaning trees Scour on both banks through riffle Exposed tree roots; Fracture lines along top of bank Exposed infrastructure
Stable	Channel in balance between aggrading and degrading forces	Water reaches toe of each bank Moss on rocks or extending down into bottom of bank Banks are stable; connected to flood plain Erosion is slight and limited to meander bends

** Definitions from the Washington State Aquatic Habitat Guidelines Program (2002)*

The ER form also asks for some basic channel and bank dimensions. Figure 20 provides guidance on how to measure the cross-sectional area of a stream channel. **Bank height** is typically the distance from top of water to top of bank. At streamside headcuts, be sure to estimate the length of active erosion, as well as its potential distance if the headcut has not migrated all the way to its source. For nick points, record the height and distance to the next upstream grade control structure such as a road crossing or channelized section. Alternatively, you can simply note the location of the next grade control structure and calculate the length back in the office.

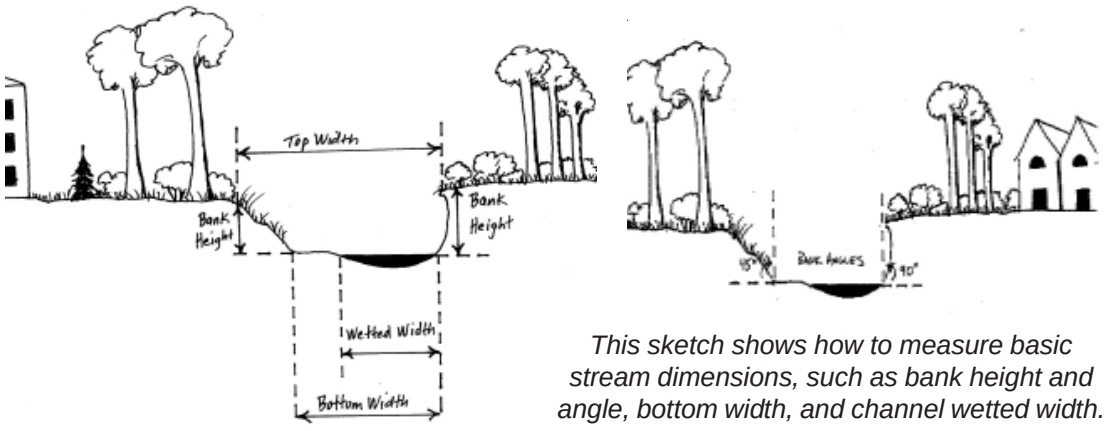
The last part of the ER form allows you to recommend any potential restoration practices that may be appropriate for the eroded bank (Box 6). Envisioning stream restoration potential can seem difficult at first, but can be acquired with a little study and a lot of practice. Some practices to consider include bank stabilization, grade control, or other stream restoration techniques. **Rigid bank stabilization** includes such things as boulder

Table 14: Erosion Characteristics to Note During Site Assessment

Stable reach, with low banks, stream still has access to flood plain at high flows.	Aggrading reach with obvious formation of mid channel bars.	Signs of degradation include visible stratification lines in stream bank
Downcutting reach with tall banks on either side	Presence of manhole stack in stream is evidence of stream widening process	Moss covered banks are indicators that banks have since stabilized
Extreme erosion can occur when streams cut into steep slopes. Check level of soil consolidation in these areas to see if actively eroding	Below this eroded bench is a stabilized stream bank. This should not be considered as active bank erosion.	Headcut rapidly migrating upwards towards an outfall. Note collapse of adjacent vegetation

revetments, root wads, rip rap, or other relatively hard structures. **Soft bank stabilization** practices include coir fiber logs, live fascines, brush mattresses, or other bioengineering techniques that use vegetation to protect the banks (Figure 21). **Grade control** techniques refer to step pools, rock vanes, or log drops that prevent the migration of headcuts (Figure 22). These and other stream repair practices are described in more detail in Manual 4.

The **erosion severity score** rates the extent of erosion on a five-point scale, where five is the most severe. You should also check to see if access is available to get heavy equipment to the site. Erosion severity and access scores should be marked on the ER form to identify the most severe and accessible eroded banks in the subwatershed.



This sketch shows how to measure basic stream dimensions, such as bank height and angle, bottom width, and channel wetted width.

Figure 20: Stream Features Diagram

Figure 21: Example Hard and Soft Bank Stabilization Practices
Panel A illustrates the use of rip rap to restore an eroded section of stream; Panel B shows the mixed use of coir fiber logs and riprap to stabilize outfall and repair adjacent stream bank.

4.3 Which Eroded Banks Should I Record?

Some bank erosion should be expected in most urban streams, and it is unrealistic to have field crews GPS and assess every foot of eroded bank if restoration is not practical. Therefore, slope failures, bank sloughing, incision, or channel enlargement should only be recorded for banks that are noticeably worse than the "average" eroded bank along the survey reach (Figure 23). Sites with average bank erosion should only be counted if adjacent infrastructure is threatened or significant property loss is evident. Streamside headcuts and channel nick points with elevation changes of at least two feet should always be recorded, since they signal that active channel erosion is migrating upstream.

4.4 Field Assessment Tips

This list provides some quick tips for assessing stream erosion:

- Track all headcuts to their source, even if they are lateral to the stream.
- Only include channel nick points if the vertical change in stream elevation is more than a foot.
- Look for root hairs on stream banks to determine active erosion.
- Look for signs of major sediment deposition to determine channel degradation.
- Stratified layers in the bank may be a clue that the stream is downcutting.
- Banks composed of unconsolidated materials such as gravel, sand, or silt are often more unstable than those of compacted clay.
- If bedrock is present, then stream widening may be the dominant channel process. In this case, bank height may not be greater than average reach conditions, but the increase in cross sectional area may be greater.
- Make sure to look behind overhanging vegetation to determine extent of bank erosion and vegetative cover.

Figure 22: Example Grade Control Practice
Steps pools can be used as grade control.

Figure 23: Expected Levels of Urban Bank Erosion
In highly urban settings, three- to four-foot eroded banks are probably the norm. This condition should be noted on the RCH form; however, impact assessments should be limited to the severely eroded sites.

- Be sure not to confuse historic channel migration features with newly formed, actively eroding benches.
- Don't worry if you can't envision stream restoration. Take a look at Manual 4, and tour some local stream restoration projects prior to performing the ER.

Table 15: How ER Data Can Be Used	
Problem Assessed	Nature and type of channel erosion Severity of bank erosion Threatened infrastructure
Potential Restoration Practice *(Manual profile sheets)*	Potential sites for bank stabilization (R-3, R-15) Grade control (R-18 to R-21)
Stream Corridor Metric	# of severe bank erosion sites Estimated bank erosion sediment load
Output for Planning	Map of erosion sites
**The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series. R- sheets can be found in Manual 4: Stream Repair Practices*	

4.5 Using ER Data in Subwatershed Restoration

Severe erosion data can be used to identify eroded banks, generate a list of potential stream repair practices, develop stream erosion metrics, and generate planning maps (Table 15). This information can show the degree to which channel erosion poses a significant threat in the stream corridor and how important stream stabilization and repair projects will be in the overall restoration plan.

4.6 Example ER Form

The severe erosion impact form (ER) assesses individual locations of eroded stream banks encountered during your stream walk. You are asked to record basic data on the location of erosion sites, estimate current channel dynamics and dimensions, and identify potential bank stabilization opportunities at each problem site. A detailed explanation of how the field crew filled out each section of this example form is included on the next page.

Severe Bank Erosion **ER**

A.

WATERSHED/SUBSHED: SMILEY RUN | DATE: 3/10/03 | ASSESSED BY: AOK, SUR

SURVEY REACH: 102-1 | TIME: 9:45 AM/PM | PHOTO ID (CAMERA-PIC #): A # 03-04

SITE ID: (Condition-#) ER-1 | START LAT ___ ° ___ ' ___ " LONG ___ ° ___ ' ___ " LMK ___ | END LAT ___ ° ___ ' ___ " LONG ___ ° ___ ' ___ " LMK ___ | GPS: (Unit ID)

B.

PROCESS: ☐ Currently unknown
☐ Downcutting ☑ Widening ☐ Headcutting ☐ Aggrading ☐ Sed. deposition
☐ Bed scour ☐ Bank failure ☐ Bank scour ☑ Slope failure ☐ Channelized

BANK OF CONCERN: ☐ LT ☑ RT ☐ Both (*looking downstream*)
LOCATION: ☐ Meander bend ☐ Straight section ☑ Steep slope/valley wall ☐ Other: TALL END BANKMENT

DIMENSIONS:
Length (*if no GPS*) LT — ft and/or RT 100 ft
Bank Ht LT — ft and/or RT 8.5 ft
Bank Angle LT ___ ° and/or RT 90 °
Bottom width 10 ft
Top width 15 ft
Wetted Width 7.5 ft

LAND OWNERSHIP: ☑ Private ☐ Public ☐ Unknown | LAND COVER: ☐ Forest ☐ Field/Ag ☐ Developed:

C.

POTENTIAL RESTORATION CANDIDATE: ☐ No ☐ Grade control ☑ Bank stabilization ☐ Other:

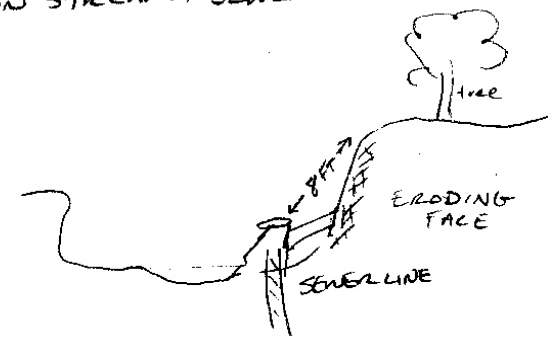
THREAT TO PROPERTY/INFRASTRUCTURE: ☐ No ☑ Yes (Describe): SEWER LINE

EXISTING RIPARIAN WIDTH: ☐ ≤25 ft ☑ 25 - 50 ft ☐ 50-75ft ☐ 75-100ft ☐ >100ft

EROSION SEVERITY(*circle#*) Channelized= ☐ 1	Active downcutting; tall banks on both sides of the stream eroding at a fast rate; erosion contributing significant amount of sediment to stream; obvious threat to property or infrastructure.		Pat downcutting evident, active stream widening, banks actively eroding at a moderate rate; no threat to property or infrastructure	Grade and width stable; isolated areas of bank failure/erosion; likely caused by a pipe outfall, local scour, impaired riparian vegetation or adjacent use.
	5	4	3	2 1
ACCESS:	**Good access:** Open area in public ownership, sufficient room to stockpile materials, easy stream channel access for heavy equipment using existing roads or trails.		**Fair access:** Forested or developed area adjacent to stream. Access requires tree removal or impact to landscaped areas. Stockpile areas small or distant from stream.	**Difficult access.** Must cross wetland, steep slope or other sensitive areas to access stream. Minimal stockpile areas available and/or located a great distance from stream section. Specialized heavy equipment required.
	5	4	3	2 1

NOTES/CROSS SECTION SKETCH:

BIG MESS!!
JUST UPSTREAM OF GROCERY STORE, BANK ACTIVELY ERODING, HEAVY SEDIMENT DEPOSITION IN STREAM, SEWER LINE EXPOSED.



REPORTED TO AUTHORITIES ☐ YES ☑ NO

How the Example ER Form Was Completed

Part A

The field crews in this example assessed an eroded bank in the Smiley Run subwatershed in survey reach 102-1. They took two photos at this location that also happened to be the first excessively eroded site they encountered in the reach.

Part B

In this part of the ER form, the eroded bank extended about 100 feet along the right bank and appeared to be threatening an embankment. Measured bank height was almost nine feet.

Part C

Here the field crew identified an eroded bank as a potential candidate for bank stabilization due to an exposed sewer line. Because of the immediate threat to infrastructure, the crew rated the bank erosion as a “5” for severity. Site access was considered good, although the best access was across private property.

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Chapter 5: Impacted Buffers (IB)

The USA assesses portions of the stream corridor that lack an adequate stream buffer. You will specifically be looking for sites where active reforestation, greenway design, natural regeneration, and buffer management practices can be targeted.

5.1 About Impacted Buffers

Streamside buffers are important to stabilize banks, create habitat, and remove pollutants. The vegetative species found in the stream buffer vary by ecoregion, but a mature forest represents the optimal condition in most temperate climates. Urbanization often results in encroachment, tree clearing and mowing of the buffer. These changes can interrupt the continuity of the stream buffer corridor and undermine its many benefits. Urban stream buffers may also be fragmented by road and utility crossings, and are often short circuited by storm water pipes. In commercial settings, buffers are often cleared and replaced with parking lots and rip-rap directly adjacent to the stream. Homeowners may also replace natural buffer cover with turf grass that lacks the root depth needed to maintain bank stability.

Remaining buffer fragments can become overrun with invasive plant species such as kudzu, ivy, and honeysuckle. As access to buffer fragments becomes more limited, active management and reforestation of remaining buffer areas becomes difficult. Figure 24 shows various types of stream buffers conditions you may observe during an IB assessment.

Impacted buffers are included in the USA for several reasons:

- *Encroachment in the riparian corridor*: The IB form can systematically show which areas of the stream network lack adequate buffers, and verify the quality of existing buffers. Communities may have an aerial mapping layer that shows buffer areas, but seldom know which specific areas are most suitable for reforestation or improved management. The IB form is a useful tool to identify candidate regeneration or active reforestation sites that should be targeted for more detailed riparian restoration surveys.

Figure 24: Types of Stream Buffers to Expect
Wide, naturally vegetated buffers provide many benefits to streams. Panel A shows optimal buffer conditions rare in urban systems. Panel B shows an impacted buffer often seen in parks and residential settings. Panel C shows an example of the paved buffer frequently observed in more highly urban settings.

Questions to ask when assessing the stream buffer:

Why is this buffer considered inadequate?

What is the adjacent land use and how does it impact the buffer?

What is the density and diversity of vegetative cover (grass, shrub, woody)?

Are invasive plant species present?

What kinds of reforestation opportunities exist?

- *Vegetative condition of buffer*: The regulatory status of stream buffers varies tremendously throughout the country. While many local ordinances require a certain width (25 to 100 feet or more), specific guidelines for vegetative diversity or density, use of native species, and overall maintenance planning are not always addressed. Understanding the diversity and density of existing buffer vegetation can help identify locations to control invasive plant species and to craft better buffer management practices.

- *Watershed Treatment Model:* Quantitative values for riparian continuity can be inserted into various water quality models, such as the Watershed Treatment Model (WTM). The WTM estimates pollutant load reductions for reforested buffers.

5.2 Introduction to the IB Form

This section introduces you to the impacted buffer form (IB), which evaluates riparian buffers encountered during your stream walk. You are asked to record basic information on the location and quality of buffers, along with adjacent wetland restoration and reforestation opportunities at each site. This section describes each part of the IB form, and presents guidance on how to complete it. Appendix A provides the full version of the IB form. A completed example IB form is included at the end of this chapter in Section 5.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

The first part of the IB form contains general header information.

You should modify the header to reflect your reach and site labeling system, and whether you are using GPS units to fix locations. If you use GPS units, record the beginning and end coordinates for each buffer segment, the **GPS unit ID #,** and an **LMK** number. If you are not using a GPS unit, then measure the buffer length using calibrated paces or a tape measure.

The next part of the IB form asks which side of the stream lacks a buffer and the reason(s) you consider it inadequate.

You should decide in advance what criteria you will use to define the adequacy of buffers. **Buffer adequacy** can be defined based on your local buffer protection criteria. For example, if your local ordinance requires a minimum buffer width of 25 feet, then this may be a benchmark to judge whether a buffer is too narrow. Adjacent land ownership is also a useful criterion since parks and public lands are often the best places for buffer restoration. Buffer expansion on public land can sometimes be accomplished by changing mowing practices used by local maintenance crews. The IB form also asks you to estimate the extent of **invasive plant** coverage, as well as the amount of **stream shading** provided by the overhead tree canopy. You should also note if wetlands are present in unbuffered segments that may be suitable for potential enhancement or restoration projects. Table 16 illustrates what many buffer features can look like in the field.

The last part of the IB form asks you to recommend any potential management practices you feel may be appropriate for the impacted buffer.

Buffer management practices to consider include natural regeneration, active reforestation, greenway design, and control of invasive species. **Active reforestation** involves planting native tree species to eventually produce a streamside forest. **Natural regeneration** is a more hands-off approach that allows nature to take the area back on its own. This is done in areas where mowing is stopped and existing plants and seed banks are allowed to propagate after invasives are removed (Figure 25). In some cases, unbuffered segments may be associated with **greenways**, trail systems, or other open space areas. Integrating appropriate management practices in these buffer segments may be a restoration opportunity (Figure 26). Watershed groups can be a great source of support for active reforestation planting and invasive species control projects (Figure 27). Riparian management practices are described in more detail in Manual 5.

Table 16: Buffer Characteristics to Note During Site Assessment

Aerial photography showing wide, forested buffer between residential area (top left) and stream.	Lack of buffer on one side of stream; impacted buffer should be at least 100 ft long to record.	Example of inadequate buffer on both sides of stream; potential site for active reforestation.
Turf grass mowed to stream edge in public open space should be targeted for bufferscaping projects.	Buffer management at golf courses should integrate course requirements with bank stability and in-stream goals.	If forest cover is not practical, buffers should, at a minimum, contain shrubs or tall grass.
Sometimes impacted buffers may have been recently planted. This should be noted on your field form.	The extensive presence of invasive plant species can threaten an otherwise healthy buffer system.	Note the width of the restorable area. Structural encroachment may limit the available restorable width.

Figure 25: Active Reforestation and Natural Revegetation Locations
Active reforestation can be done even in utility corridors (Panel A). These activities can serve as highly visible educational opportunities, particularly if appropriate signage is used (Panel B). Some areas can regenerate vegetation themselves, if access is limited and invasive plants are controlled (Panel C).

Figure 26: Riparian Management in Open Space
Panel A shows an area identified as a community greenway where buffer enhancement should be part of the master planning process. Panel B shows poor backyard landscaping practices where vegetation is mowed frequently, and chemical sprays are used to remove vegetation from the stream edge.

Figure 27: Using Local Volunteers for Buffer Restoration
Watershed groups can generate volunteer support for removing invasive species (Panel A) or active planting (Panel B).

To evaluate reforestation potential, first estimate the available area or length suitable for reforestation, and then assign a **reforestation potential** score based on adjacent land use, access, and site constraints. The reforestation score is based on a five-point scale, where five is the most suitable. You should look for any potential conflicts that might hinder successful reforestation (e.g., lack of adjacent water, or presence of beaver, utilities, or invasive plants). Feasibility factors are used later to rank the most promising riparian management sites in the subwatershed.

5.3 Which Impacted Buffers Should I Record?

The IB form is designed to help you find the total length of buffered/unbuffered stream miles in a subwatershed, even if full reforestation is impractical. You may want to set criteria based on minimum widths cited in local buffer ordinances, or based on protection goals (e.g., 100 feet). At a minimum, field crews should evaluate buffers that extend outward at least 25 feet from the stream, as measured from the top of each bank.

To avoid repetitive starts and stops, field crews should only record impacted buffer areas greater than 100 feet in length. In some cases, a wide vegetated buffer may be considered inadequate if its health is compromised by invasive species or diseased vegetation.

Not all impacted buffer sites can be successfully reforested due to physical site or land use constraints. In commercial settings, for example, roads, buildings, or other encroachments may often constrain buffer width. While it is important to record these areas, they may not be considered prime candidates for reforestation, although options for riparian management should be explored.

5.4 Field Assessment Tips

Keeping track of inadequate buffer sites can become a field nightmare if crews are sloppy in recording data. Some tips to guide your buffer assessments are provided below:

- If you have access to good aerial photos, analyze survey reaches based on the presence or absence of buffer vegetation.
- If vegetative conditions in the buffer change significantly, fill out a new IB form. This generally occurs when you switch from one to both banks, or vice versa, or if there is a shift in land cover or other features.
- Remember to only record inadequate buffer segments longer than 100 feet, otherwise you'll find yourself completing too many forms. Fragmented buffer conditions are best reported on the RCH form.
- Take some clippers with you, since many urban buffers contain dense thickets with invasive vines and shrubs such as multiflora rose (ouch!).
- Watch out for poison ivy! You should also consult a local plant guide to learn the common invasive and poisonous plants you may encounter on your streamwalk.
- Look closely at your map beforehand and try to determine if multiple buffer sites exist within your survey reach.
- Start a new IB form if you cross over to a new survey reach. Alternatively, consider redefining the boundaries of the survey reaches to accommodate the full extent of the inadequate buffer.
- Reforestation on public lands or large parcels such as schools or golf courses will generally take a higher priority than small, privately-owned parcels.

Table 17: How IB Data Can Be Used	
Problem Assessed	Encroachment in the stream corridor Vegetative condition of existing buffer
Potential Restoration Practice *(Manual Profile sheets)*	Active reforestation (F-1) Greenway design (F-2) Natural regeneration (F-3) Related site preparation (SP-1 to SP-4) Bufferscaping (N-20)
Stream Corridor Metric	Riparian forest continuity (buffer miles/stream miles) Miles of invasives
Output for Planning	Map of reforestation sites Map of invasive removal locations
**The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series.* • *F- and SP-sheets can be found in Manual 5: Riparian Management Practices* • *N- sheets can be found in Manual 8: Pollution Source Control Practices*	

5.5 Using IB Data in Subwatershed Restoration

Impacted buffer data serves many restoration planning purposes. For example, IB data can help define buffer lengths, generate a list of potential riparian management practices, develop stream buffer metrics, and generate planning maps (Table 17). These products can help you decide if inadequate buffers are a significant problem in your subwatershed, and how integral riparian management will be to the overall restoration plan.

5.6 Example IB Form

The IB form evaluates riparian buffers encountered during your stream walk. You are asked to record basic information on the location and quality of buffers, along with adjacent wetland restoration and reforestation opportunities at each site. A detailed explanation of how the field crew filled out each section of this example form is included on the next page.

Impacted Buffer **IB**

A.

WATERSHED/SUBSHED: Smiley Run | DATE: 3/10/03 | ASSESSED BY: AZK, EW
SURVEY REACH: T02-1 | TIME: ___:___ AM/PM | PHOTO ID: (Camera-Pic #) A #07
SITE ID: (Condition-#) IB-1 | START LAT ___° ___' ___" LONG ___° ___' ___" LMK ___ | GPS: (Unit ID)
END LAT ___° ___' ___" LONG ___° ___' ___" LMK ___

B.

IMPACTED BANK: ☑ LT ☐ RT ☐ Both
REASON INADEQUATE: ☑ Lack of vegetation ☑ Too narrow ☐ Widespread invasive plants ☐ Recently planted ☐ Other: BEAVER PRESENT

LAND USE: (Facing downstream)	Private	Institutional	Golf Course	Park	Other Public :
LT Bank	☑	☐	☐	☐	☐ :
RT Bank	☐	☐	☐	☐	☐ :

DOMINANT LAND COVER:	Paved	Bare ground	Turf/lawn	Tall grass	Shrub/scrub	Trees	Other
LT Bank	☐	☐	☑	☐	☐	☐	☐ : SOME SCATTERED PINE TREES
RT Bank	☐	☐	☐	☐	☐	☐	☐ :

INVASIVE PLANTS: ☒ None ☐ Rare ☐ Partial coverage ☐ Extensive coverage ☐ unknown
STREAM SHADE PROVIDED? ☒ None ☐ Partial ☐ Full | WETLANDS PRESENT? ☒ No ☐ Yes ☐ Unknown

C.

POTENTIAL RESTORATION CANDIDATE: ☑ Active reforestation ☐ Greenway design ☐ Natural regeneration ☐ Bufferscaping ☐ no ☐ Other:

RESTORABLE AREA

	LT BANK	RT
Length (ft):	≥600ft	
Width (ft):	>100ft	

REFORESTATION POTENTIAL: (Circle #)

Impacted area on public land where the riparian area does not appear to be used for any specific purpose; plenty of area available for planting	Impacted area on either public or private land that is presently used for a specific purpose; available area for planting adequate	Impacted area on private land where road; building encroachment or other feature significantly limits available area for planting
5	(4) PRIVATE 3	2 1

POTENTIAL CONFLICTS WITH REFORESTATION: ☐ Widespread invasive plants ☐ Potential contamination ☐ Lack of sun ☐ Poor/unsafe access to site ☐ Existing impervious cover ☐ Severe animal impacts (deer, beaver) ☐ Other:

NOTES:

THIS IS A PERFECT PLACE TO REPLANT BUFFER - NOW ITS JUST A MOWED AREA. IF ACTIVE USE OF OPEN AREA, THEN MAYBE ENCOURAGE IMMEDIATE BUFFER PLANTING NEXT TO STREAM... LOOKS LIKE THERE IS A BEAVER IN THE AREA

SEE REACH SKETCH SKETCH

How the Example IB Form Was Completed

Part A

Field crews assessed an unbuffered segment in the Smiley Run subwatershed in survey reach 102-1. They took a photo (#7) at this location, which also happened to be the first impacted buffer segment they came across.

Part B

The buffer in this example was located on the left bank (facing downstream), and was considered inadequate because it was too narrow and primarily vegetated with turf grass. The buffer area was located in a homeowner's back yard, and all of the trees that once shaded the stream were cleared.

Part C

The impacted buffer was identified as a candidate for active reforestation, and had more than 6,000 square feet available for planting. Beaver signs were noted in the vicinity, which could pose a threat to tree planting efforts (i.e., may have to either remove the beaver or use sturdy tree shelters). The biggest drawback to this site was that it was located on private property, which will require landowner permission.

Chapter 6: Utilities in the Stream Corridor (UT)

The USA assesses all locations where utilities cross the stream corridor and can cause water quality, stream habitat, or channel stability problems. Utilities may include leaking or exposed sewer pipes, sewer overflows at manhole stacks, and overhead power line crossings. You will specifically be looking for locations where stream repairs or discharge investigations may be needed.

6.1 About Utilities

Utility pipes and rights-of-way are frequently located within urban stream corridors, often parallel to or underneath the stream itself. When sewer lines leak or overflow, they can be a direct discharge source of raw sewage into the stream. Leaking water pipes can increase dry weather stream flows. Pipe infrastructure may physically impact the stream, particularly at crossings that cause bank destabilization or stream scouring, or create fish barriers. Exposed pipes in the channel are also susceptible to damage from floating debris, especially during large storm events. Vegetative maintenance under power line crossings can also impact stream buffers, through removal of native cover, spread of invasive plant species, and regular herbicide spraying. On the other hand, sewer, water, and power utilities have a strong interest in protecting their infrastructure, and can become good partners in subwatershed restoration. Figure 28 illustrates various impacts that utilities can cause along the stream corridor.

Utility impacts are included in the USA for several reasons:

- *Sanitary sewer overflows*: Sanitary sewer lines can overflow and leak untreated sewage to the stream due to blockages or lack of capacity. Sewage overflows may be a chronic problem in some subwatersheds that local authorities need to address. The UT form can help identify locations where overflows have recently occurred and refer these for immediate correction or add them to a "watch list" for the future. Additionally, the UT form quickly inspects the outside condition of manholes to identify whether structural repairs and discharge prevention investigation are needed.

- *Leaking sewer pipes and manholes:* Field crews can report location coordinates directly to the utility for a faster response when active leaks are detected or suspected.

Figure 28: Types of Utility Impacts to Expect
Common utility-related impacts include sewer overflows (Panel A), damaged and leaking pipe crossings (Panel B), or power line rights-of-way interrupting the stream buffer (Panel C).

Questions to ask when assessing utility impacts:

How is the utility impacting the stream corridor?

Are there any maintenance issues that should be reported?

Is there evidence of any sewer leaks or recent overflows?

What kind of utility repair would I suggest here?

- *Sewers crossing streams:* Stream sewer crossings can be a serious problem. The UT can evaluate the potential risk of sewage leaks in the stream corridor, and also locate where existing utility infrastructure is threatened by erosion or floodwater. These crossings are also good candidate sites for subsequent pipe testing and dry weather sampling investigations to confirm whether they are a sewage source (Manual 6).

6.2 Introduction to the UT Form

This section introduces the utility impacts (UT) form that evaluates the impact of utilities on the stream corridor. At each manhole or crossing, you are asked to collect basic information on its location, structural features, evidence of discharge, and potential repair opportunities. This section describes each part of the UT form and provides guidance on how to complete them. Appendix A offers a full version of the UT form. A completed example UT form is included at the end of this chapter in Section 6.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

As with other USA forms, the first part of the UT form contains general header information. As always, the header should be modified to reflect your reach and site labeling system, and whether you are using a GPS unit. If you are using GPS, record the coordinates for each site, the **GPS unit ID #,** and an **LMK** number.

The next part of the UT form asks you to describe the type, location, and structural condition of the utility feature.

Manhole stacks should always be checked for signs of external **deterioration** or recent **overflows**. Sewer lines that cross stream channels should be evaluated for their potential to act as **fish barriers** or whether they might be subject to damage from channel erosion or flooding. If a pipe crosses the stream and creates at least a six-inch vertical water drop, you should classify it as a potential fish barrier. In many cases, sewer pipes are located on the stream bottom and are encased in a layer of protective concrete. Note any damaged exposed sewers or coverings in the **Condition** box. If there is any evidence of sewer **discharge**, you should note colors, odors, or types of deposit observed. Table 18 illustrates what many of these utility features look like in the field.

In the last part of the UT form, you are asked to recommend any potential restoration practices you feel may be appropriate for the utility.

You may want to consider practices such as **structural repairs**, **pipe testing**, **citizen hotlines**, or dry weather **water quality sampling** to fix the utility problem. More detail on discharge prevention practices can be found in Manual 6. If the pipe is a potential barrier to fish migration, record the height of the water drop (Figure 29).

The UT form asks you to assign a **utility impact severity** score based on the extent and potential for discharge on a scale of one to five, where five is the most severe condition. If a sewage discharge is detected, the site automatically scores a five and should be immediately referred to local authorities. Guidance on how to estimate discharge severity and access scores are provided on the UT form, and are used later to identify the most severe utility impacts in the subwatershed.

6.3 What Utility Data Should I Record?

All leaking or exposed sewer infrastructure in the stream corridor that causes (or threatens to cause) water quality, aquatic habitat, or channel stability problems should be recorded. This can include manhole stacks, sewer or water lines, or rights-of-way. Exposed pipes along the stream bottom, in the stream bank, along the stream corridor, or crossing the stream should always be assessed. Particular attention should be paid to utilities that are vulnerable to damage due to lack of maintenance or floating debris. Overhead utility crossings such as major power lines should be recorded as well.

Table 18: Utility Characteristics to Note During Site Assessment

Utilities crossing above the stream can be susceptible to floating debris during storm events. You should note the length and condition of exposed pipes.	The structural condition of manhole stacks in-stream due to bank erosion should be examined. This site may rank highly for restoration to prevent future degradation.	Manholes are typically spaced 200-400 feet apart. You should examine the condition of each
Look for any colored discharges or structural problems with manholes sitting in flood plain wetlands.	The presecence of toilet paper and solid waste are evidence of overflows.	Powdered agents spread over sewer overflows in the flood plain are a sign of clean-up efforts.
Popped manhole covers and toilet paper in branches are good evidence of past discharge.	Check condition of concrete or brick manhole stacks. Open or missing manhole cover may indicate recent overflow.	Pipes crossing the stream can be at risk from floating debris or contribute to debris jams, as shown here.

6.4 Field Assessment Tips

Some quick tips for assessing utility impacts are provided below:

- Manhole stacks typically occur every 200 to 400 feet along the stream corridor.
- To be safe, perform an external inspection of utility pipes only. Do not open manhole covers or climb into open sewer pipes.
- If you smell something, take extra time to look for visual evidence of a leak or spills.
- Visual cues of recent sewer overflows may include open manholes, toilet paper and other sanitary deposits, obvious staining or dried residues, lime, or "stay out" signage.
- Report any spills or leaks to appropriate authority on your emergency contact list.
- Record any phone numbers or identification information written on utility poles or manhole covers to help response crews find the "address" of the problem.

6.5 Using UT Data in Subwatershed Restoration

Utility impact data can be useful for restoration planning in several ways. UT data can identify major sewage discharges, generate a map of discharge detection properties, and screen subwatersheds for priority investigations to identify illicit discharges (Table 19). The UT assessment can help determine whether sewage leaks or overflows are a major problem in your subwatershed and whether they should be addressed in your overall restoration plan.

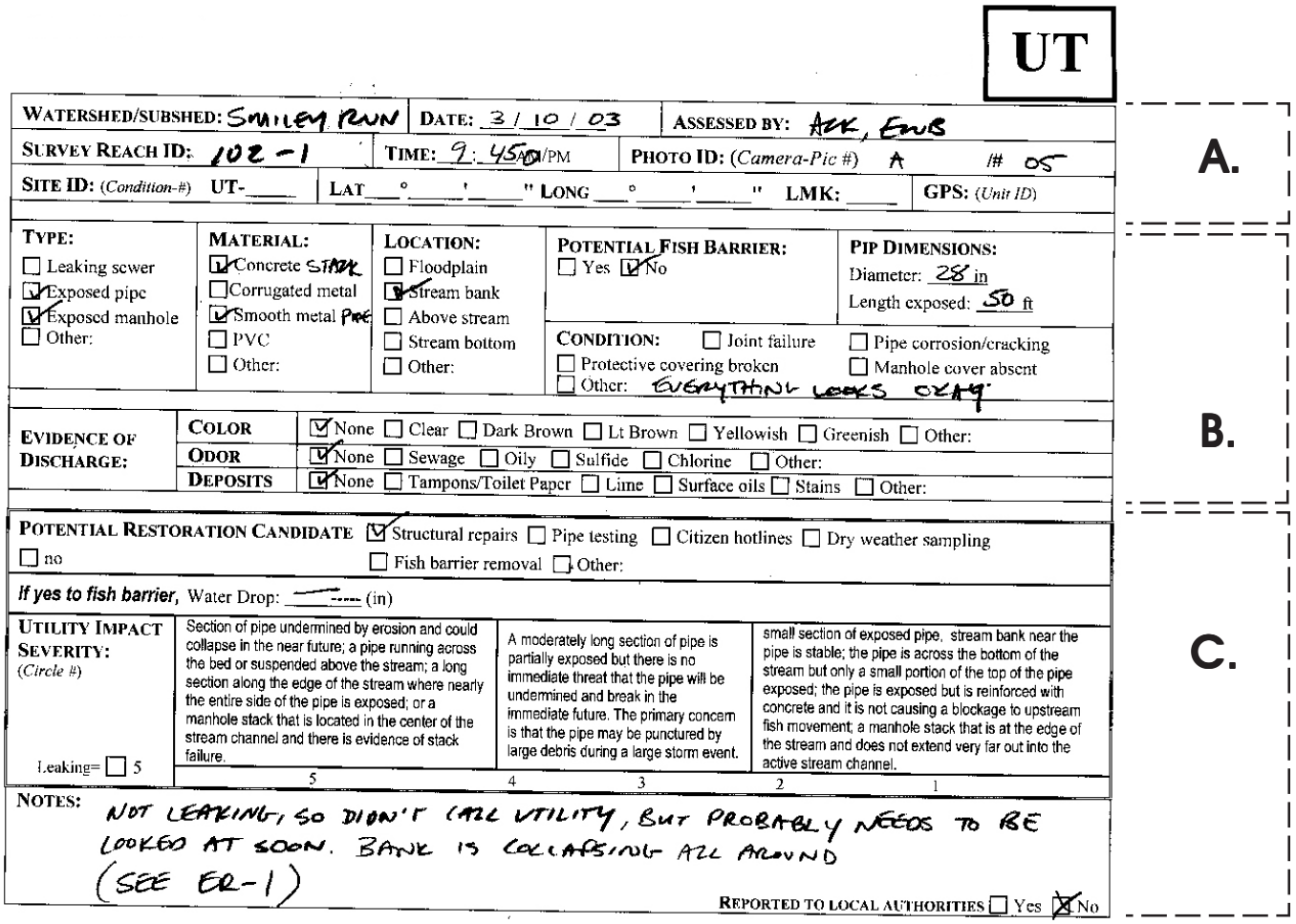
Figure 29: Structural Repair and Fish Barrier Removal at Utilities
Structural repair or relocation of sewer lines may be necessary to stop leaking pipes as shown here (Panel A), or to restore fish passage at potential fish barriers like the one shown here (Panel B).

Table 19: How UT Data Can Be Used	
Problem Assessed	Sanitary sewer overflows Leaking sewer pipes and manholes Sewers crossing streams Powerline rights-of-way impacting buffers or stream banks
Potential Restoration Practice *(Manual Profile sheets)*	Structural repairs (D-10) Pipe testing (D-6) Citizen hotlines (D-5) Dry weather stream sampling (D-3) Reforestation (F-1)
Stream Corridor Metric	# of sanitary sewer overflows # of leaking sewer pipes and manholes Sewers crossings/stream mile
Output for Planning	Map of problem areas Additional discharge investigations

**The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series:*
- *D- sheets can be found in Manual 6: Discharge Prevention Practices*
- *F- sheets can be found in Manual 5: Riparian Management Practices*

6.6 Example UT Form

The UT form evaluates the impact of utilities on the stream corridor. At each manhole or crossing, you are asked to collect basic information on its location, structural features, evidence of discharge, and potential repair opportunities. A detailed explanation of how the field crew filled out each section of this example form is included on the next page.



UT

WATERSHED/SUBSHED: Smiley Run | DATE: 3/10/03 | ASSESSED BY: AZK, EWB

SURVEY REACH ID: 102-1 | TIME: 9:45 AM/PM | PHOTO ID: (Camera-Pic #) A /# 05

SITE ID: (Condition-#) UT-____ | LAT ___° ____' ____" LONG ___° ____' ____" LMK: ____ | GPS: (Unit ID)

A.

TYPE:
- ☐ Leaking sewer
- ☑ Exposed pipe
- ☑ Exposed manhole
- ☐ Other:

MATERIAL:
- ☑ Concrete STACK
- ☐ Corrugated metal
- ☑ Smooth metal PIPE
- ☐ PVC
- ☐ Other:

LOCATION:
- ☐ Floodplain
- ☑ Stream bank
- ☐ Above stream
- ☐ Stream bottom
- ☐ Other:

POTENTIAL FISH BARRIER: ☐ Yes ☑ No

PIP DIMENSIONS: Diameter: 28 in; Length exposed: 50 ft

CONDITION: ☐ Joint failure ☐ Pipe corrosion/cracking ☐ Protective covering broken ☐ Manhole cover absent ☐ Other: EVERYTHING LOOKS OKAY

B.

EVIDENCE OF DISCHARGE:
- COLOR: ☑ None ☐ Clear ☐ Dark Brown ☐ Lt Brown ☐ Yellowish ☐ Greenish ☐ Other:
- ODOR: ☑ None ☐ Sewage ☐ Oily ☐ Sulfide ☐ Chlorine ☐ Other:
- DEPOSITS: ☑ None ☐ Tampons/Toilet Paper ☐ Lime ☐ Surface oils ☐ Stains ☐ Other:

C.

POTENTIAL RESTORATION CANDIDATE ☑ Structural repairs ☐ Pipe testing ☐ Citizen hotlines ☐ Dry weather sampling ☐ no ☐ Fish barrier removal ☐ Other:

If yes to fish barrier, Water Drop: ____ (in)

UTILITY IMPACT SEVERITY: (Circle #)

5	4	3	2	1
Section of pipe undermined by erosion and could collapse in the near future; a pipe running across the bed or suspended above the stream; a long section along the edge of the stream where nearly the entire side of the pipe is exposed; or a manhole stack that is located in the center of the stream channel and there is evidence of stack failure.	A moderately long section of pipe is partially exposed but there is no immediate threat that the pipe will be undermined and break in the immediate future. The primary concern is that the pipe may be punctured by large debris during a large storm event.		small section of exposed pipe, stream bank near the pipe is stable; the pipe is across the bottom of the stream but only a small portion of the top of the pipe exposed; the pipe is exposed but is reinforced with concrete and it is not causing a blockage to upstream fish movement; a manhole stack that is at the edge of the stream and does not extend very far out into the active stream channel.	

Leaking= ☐ 5

NOTES: NOT LEAKING, SO DIDN'T CALL UTILITY, BUT PROBABLY NEEDS TO BE LOOKED AT SOON. BANK IS COLLAPSING ALL AROUND (SEE ER-1)

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☒ No

How the Example UT Form Was Completed

Part A

In this example, field crews performed a UT assessment at a sewer manhole stack in the Smiley Run subwatershed in survey reach 102-1. The crew took one photo at this location, which also happened to be the first utility impact assessed.

Part B

Bank erosion exposed a manhole stack and about 50 feet of exposed pipe in this example. While the pipe appeared to be in good structural condition, and no visible evidence of sewage overflow or leaks was found, the field crew still recorded it because of its potential vulnerability to future erosion.

Part C

The site was identified as a strong candidate for structural repairs, in combination with a local bank stabilization project. Because no discharge was detected, the utility was not immediately contacted. Given the nature of the problem, however, the utility may eventually be contacted as a follow-up or be invited to participate in the subwatershed restoration plan.

Chapter 7: Trash and Debris (TR)

The USA evaluates the stream corridor to find locations where trash and debris (TR) are dumped or have accumulated. TR data help target stream reaches for routine stream cleanups, adoption, or major removal of dumped materials (bulk or hazardous).

7.1 About Trash and Debris

Nothing is more unsightly than the accumulation of bags, cans, bottles, and other trash and debris along the stream corridor. Despite decades of anti-litter campaigns, trash still finds its way into streams and flood plains either from direct dumping or through transport through the storm drain system. Since the stream corridor is the low point of the urban landscape, considerable quantities of trash and debris build up over time. Yard wastes such as grass clippings, leaves, and trees are often dumped from the backyard to the stream. In more urban subwatersheds, fill material, construction debris, and rubble are frequently dumped in remaining flood plains, since they are perceived as vacant land. The presence of trash and debris can degrade resident perceptions about stream quality, reduce community amenities, contribute pollutants (e.g., nutrients, oil, bacteria), and create blockages at outfalls or other locations in the stream. Examples of trash conditions you may observe during the USA survey are shown in Figure 30.

Trash and debris are documented in the USA for several reasons:

- *Trash/debris in the stream*: Stream cleanups are a terrific way of getting the community involved in subwatershed restoration. The TR form can help identify sites for trash pick-up events or adopt-a-stream segments (Manual 4). The TR form allows you to quantify the relative "trashiness" between subwatersheds and help devise upland education campaigns (e.g., storm drain stenciling, public trash cans, and signage).

- *Dumping in the stream corridor:* The TR form can also be used to identify locations in the stream corridor where chronic dumping is a problem. Preventative measures such as limited access, signage, and more aggressive enforcement can then be used to address dumping problems. Additionally, the TR form

Figure 30: Types of Trash Impacts to Expect

Floating trash can accumulate at debris jams (Panel A) or along the banks, or be deposited in the flood plain during storm events. Of course, no urban stream is complete without its signature trash item: the shopping cart (Panel B). Outfalls often convey trash into the stream corridor (Panel C).

Questions to ask when assessing trash and debris:

Is this area trashier than the rest of the survey reach?

What kind of trash is it, and is it hazardous?

Is there an illegal dump, or other obvious source?

What level of effort will it take to clean this up?

indicates whether access is available for heavy equipment needed to remove bulk items (e.g. cars, mattresses, refrigerators).

Locating hazardous materials: The TR form is used to report medical waste, chemical drums, or unknown hazardous materials that the field crew should NOT remove. These sites should be immediately referred to the appropriate hazardous waste response agency for cleanup and response.

7.2 Introduction to the TR Form

This section introduces you to the trash and debris assessment form (TR) to report problems in the stream corridor. You are asked to collect basic information on the location, type, and amount of trash at each site, and estimate the level of effort needed to clean it up. Each part of the TR form is described in this section, followed by guidance on how to complete each part. Appendix A includes a full version of the TR form. A completed example TR form is included at the end of this chapter in Section 7.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

The first part of the TR form contains general header information. The header information should be modified to reflect your reach and labeling system, and whether you are using GPS. If you are using GPS units, record the coordinates for each site, and provide the **GPS unit ID #** and an **LMK** number.

The next section of the TR form asks you to describe the type, location, and likely source of the trash or debris. **Industrial** trash refers to large drums, construction debris and rubble, while **commercial** trash may include fast food items, plastic bags, grocery carts, car parts, or other items generated from commercial areas. **Residential** trash may include yard waste, toys, and household items that originate from backyard dumping. You should assess the dominant type of trash (e.g., is it mostly plastic bags or lumber from a nearby construction site?), and try to find the likely source. If you find **hazardous materials**, record it as "other," describe it as best as you can, and report it to the appropriate authorities listed on your emergency contact list.

While you may not always be able to tell where the trash came from, you can usually guess how it was delivered—either by stream flooding, dumping, or from the nearest storm water outfall. Delivery information can help determine the best cleanup or prevention option to explore. Lastly, try to estimate the quantity of trash at the site by envisioning the number of pickup **truck loads** it would take to remove it (Figure 31).

In the last part of the TR form, you are asked to recommend potential **cleanup** or **prevention practices** that are appropriate for the site. Practices to consider include routine stream

Figure 31: Estimating Truck Loads of Trash

Quantify the volume of trash in the area by estimating the number of pickup truck loads it would take to haul it away.

cleanups, stream adoption, municipal removal, upstream source control, and enforcement. **Stream cleanups** organized by watershed groups can be great outreach tools to involve citizens in restoration (Figure 32). If a storm water outfall is thought to be a chronic source of trash, upstream **catch basin clean-outs**, storm drain stenciling, or retrofitting to reduce floatables may be an option. If dumping appears to be associated with easy vehicle access, restricting or eliminating access may also solve the problem (Figure 33).

If trash needs to be removed from the site, estimate the type of equipment and personnel most suitable for the job. Also, look around for the best location to store the collected trash (ideally, a nearby dumpster). The TR form asks you to assign a **cleanup potential score** based on the trash volume and site access (on a scale of one to five, where five is the best). The TR form provides descriptive scoring criteria to help make this determination.

Figure 32: Stream Cleanup Events
Identify target locations for organized stream cleanup events.

Figure 33: Deploying a Trash Boom
Prevention and enforcement practices for addressing trash in highly urban watersheds may include inserting a trash boom downstream of a storm water outfall to catch floatables (Panel A), or removing vehicle access and posting "no dumping" signs.

7.3 What Trash/Debris Impacts Should I Record?

You don't need to record every bottle, beer can, or plastic bag you find along the stream corridor. As a general rule, only note areas where trash and debris have accumulated well above the average level observed for the survey reach, or where potentially hazardous or unknown chemical containers are found.

7.4 Field Assessment Tips

Some quick field tips for assessing trash and debris impacts are offered below:

- If trash is a known or potential hazard, contact appropriate authorities immediately.
- Trash tends to accumulate around debris jams and may be mobile during storm flows.
- Try to note the presence of poison ivy or other hazards (e.g., traffic or deep, fast-flowing water) that may limit volunteer cleanups to older teens and adults.
- Look around for a nearby dumpster, and think about accessibility and available parking for cleanup volunteers.
- Do your part and take a plastic bag along to pick up some trash during the USA survey.

7.5 Using TR Data in Subwatershed Restoration

Trash and debris data can guide restoration planning in a number of ways. For example, it can be used to map stream cleanup sites, prioritize stream segments for adoption, and develop trash metrics to compare different subwatersheds (Table 20). TR data can help you decide if trash and dumping are a major problem in your subwatershed and help select the mix of prevention and enforcement practices to address the problem.

Table 20: How TR Data Can Be Used

Problem Assessed	Trash or debris in stream or flood plain Dumping in the stream corridor
Potential Restoration Practice *(Manual Profile sheets)*	Stream clean-up sites (C-1) Stream adoption segments (C-2) Removal of trash/debris (SP-1) Storm drain stenciling (N-21)
Stream Corridor Metric	General index of trashiness
Output for Planning	Map of clean-up sites Mapping of stream adoption segments

The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series.

- *C- sheets can be found in Manual 4: Stream Repair Practices*
- *SP- sheets can be found in Manual 5: Riparian Management Practices*
- *N- sheets can be found in Manual 8: Pollution Source Control Practices*

7.6 Example TR Form

The TR form is used to report problems in the stream corridor. You are asked to collect basic information on the location, type, and amount of trash at each site, and estimate the level of effort needed to clean it up. A detailed explanation of how the field crew filled out each section of this example form is included below.

Trash and Debris **TR**

WATERSHED/SUBSHED: SMILEY RUN | DATE: 3/10/03 | ASSESSED BY: ADK, EMS

SURVEY REACH ID: 102-1 | TIME: 9:30 AM/PM | PHOTO ID: (Camera-Pic #) A # 02

SITE ID: (Condition-#) TR-1 | LAT ___°___'___" LONG ___°___'___" LMK ___ | GPS: (Unit ID)

A.

TYPE: ☐ Industrial ☑ Commercial ☐ Residential

MATERIAL: ☑ Plastic ☐ Paper ☐ Metal ☐ Tires ☐ Construction ☐ Medical ☐ Appliances ☐ Yard Waste ☐ Automotive ☐ Other: BEER CANS/GROCERY CARTS

SOURCE: ☐ Unknown ☐ Flooding ☑ Illegal dump ☐ Local outfall

LOCATION: ☑ Stream ☐ Riparian Area ☐ Lt bank ☑ Rt bank

LAND OWNERSHIP: ☐ Public ☐ Unknown ☑ Private BEHIND STORE

AMOUNT (# Pickup truck loads): 1 – 1.5

B.

POTENTIAL RESTORATION CANDIDATE ☑ Stream cleanup ☐ Stream adoption segment ☐ Removal/prevention of dumping ☐ no ☐ Other:

If yes for trash or debris removal

EQUIPMENT NEEDED: ☐ Heavy equipment ☑ Trash bags ☐ Unknown

WHO CAN DO IT: ☑ Volunteers ☐ Local Gov ☐ Hazmat Team ☐ Other

DUMPSTER WITHIN 100 FT: ☑ Yes ☐ No ☐ Unknown

CLEAN-UP POTENTIAL: (Circle #)

5	4	3	2	1
A small amount of trash (i.e., less than two pickup truck loads) located inside a park with easy access		A large amount of trash, or bulk items, in a small area with easy access. Trash may have been dumped over a long period of time but it could be cleaned up in a few days, possibly with a small backhoe.		A large amount of trash or debris scattered over a large area, where access is very difficult. Or presence of drums or indications of hazardous materials

C.

NOTES: JUST GENERAL TRASH FROM STORE – CARTS, BAGS, ETC
2-3 VOLUNTEERS COULD KNOCK IT OUT IN 3 HRS; BUT MAY BE A RECURRING EFFORT... UNLESS WE CAN RESTRICT ALLEYS. DUMPSTER BEHIND STORE

REPORTED TO AUTHORITIES ☐ YES ☑ NO

How the Example TR Form Was Completed

Part A

In this example, field crews assessed a trash dump site in the Smiley Run stream corridor at survey reach 102-1. They took a photo at this location, which also happened to be the first dump site they encountered.

Part B

The trash site had approximately one to two pickup truck loads of trash, which were thought to come from the adjacent grocery store (on the right bank). The crew could not tell if the trash was due to littering, or if it came from an overloaded dumpster located behind the store.

Part C

The trash site in this example was deemed appropriate for routine cleanup by volunteers. The crew estimated that a few volunteers could clean the area up in two or three hours, so a large organized stream cleanup day was probably not needed.

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Chapter 8: Stream Crossings (SC)

This part of the USA examines each structured crossing that occurs within the stream corridor, which can include bridges, culverts, railways, and dams. Note that sewer and water line crossings are evaluated on the UT form. You will be looking for potential fish barriers, culverts in need of repair or replacement, opportunities for upstream storage retrofits, or associated stream repair projects at each crossing.

8.1 About Stream Crossings

As subwatersheds urbanize and transportation networks expand, the number of stream crossings increases. Stream crossings interrupt the stream corridor, alter local stream hydrology, impact bank stability, and prevent fish migration. Stream crossings are generally designed based on the width of the road and the stream, the slope of the flood plain, and runoff volumes generated by extreme storms. In many cases, crossings enclose the stream for an extended distance. Known as culverts, these involve a long pipe or box-like structure installed to safely convey storm water through or under a structure (e.g. roadway or driveway). When culverts are poorly designed, they can degrade habitat, create fish barriers, and contribute to local flooding and erosion problems (i.e., if they are clogged, misaligned, or under capacity). Both man-made and beaver dams are considered to be stream crossings. Figure 34 illustrates various types of stream crossings you may encounter in the field.

Stream crossings are important to assess during the USA survey for several reasons:

- *Stream Impacts:* While maps can provide a general sense of how many crossings occur in your subwatershed, they do not show all crossings, nor do they indicate whether the crossings are a barrier to fish migration or a local grade control feature.

- *Flooding Models*: Detailed information on crossings, such as capacity and flow alignment, is essential for analyzing flooding risk using hydraulic simulation models.

- *Potential repair retrofits.* Undersized culverts may be prime candidates for repair or replacement, which can improve natural stream flow (Manual 4), or may be ideal sites for an upstream storage retrofit (Manual 3).

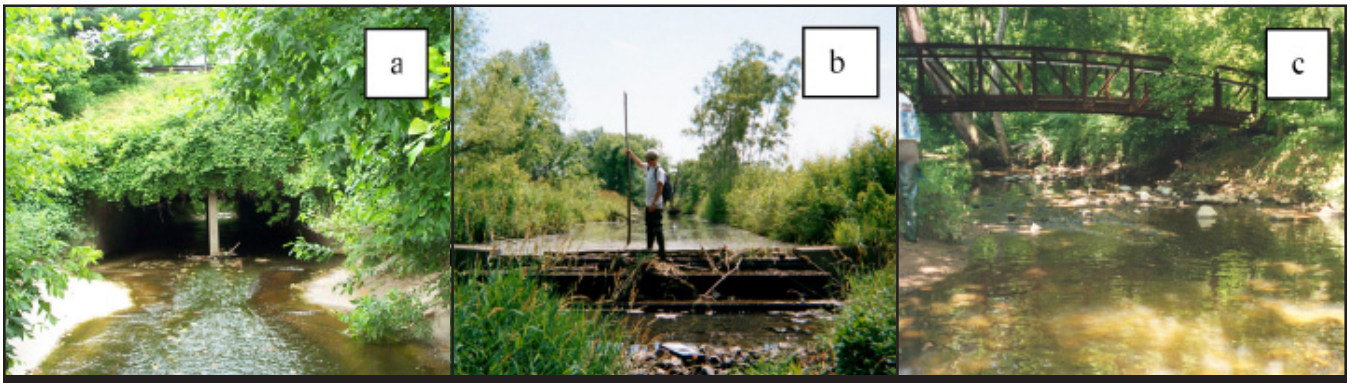


Figure 34: Types of Stream Crossings You May Encounter

Roadways (Panel A), dams (Panel B), and pedestrian bridges (Panel C) are structured crossings that you may observe during the USA. You should assess all crossings that have a direct impact on the stream. Structures like the one shown in Panel C that do not have a significant impact should not be assessed.

Questions to ask when assessing stream crossings:

What impact is the crossing having on the stream?

Is this a potential fish barrier?

Is there any maintenance or flooding concerns related to this crossing?

Is this crossing a candidate for removal or retrofitting?

8.2 Introduction to the SC Form

This section introduces you to the stream crossing (SC) assessment form. The SC form asks you to record basic information on the location, dimensions, condition, and restoration potential of each stream crossing. This section describes each part of the SC form, and provides guidance on how to complete it in the field. A full version of the SC form can be found in Appendix A. A completed example SC form is included at the end of this chapter in Section 8.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

The first part of the SC form contains general header information that locates the subwatershed, survey reach, crossing identifier, and GPS coordinates for the crossing.

The next part of the SC form asks you to describe the type and general features of each stream crossing. Structured crossings can be quite diverse in urban subwatersheds. Table 21 shows examples of some of the different crossings you may find in the field. If the crossing is not related to a road or a culvert, you can skip to the next section. If it is a culvert, record some basic information describing its shape and condition. In particular, note whether the culvert is **bottomless** (has a natural stream bottom) and what, if any, impact it may be exerting on the stream. For example, does the culvert cause a **scour hole**, promote upstream sediment deposition (occurs when floodwaters back up behind the crossing), or threaten adjacent embankments (often caused by misdirected flow)?

If you want to perform flooding analysis, measure the general barrel dimensions, as well as roadway elevation, alignment, and slope. **Roadway elevation** is measured from the stream bed to the road surface. **Alignment** refers to the direction of the culvert in relation to stream flow (does the upstream culvert line up with the direction of stream flow, or does it angle away?). Try to gauge the relative **slope of** the culvert by looking upstream through the culvert. Keep in mind that a 2% slope represents a rise of two feet over a run of 100 feet.

In the last part of the SC form, you are asked to recommend any restoration projects that are suitable for the crossing, and determine whether it is a potential fish barrier.

Potential practices to consider at crossings include fish barrier removal, culvert repair/ replacement (Figure 35), and local stream repair. These **stream repair** techniques are discussed in more detail in Manual 4. Additionally, you should check out the potential to have an upstream **storage retrofit** at the stream crossing (Figure 36).

It is a good idea to consult with a local fishery biologist to determine the criteria to define fish blockages before sending crews out in the field. In the mid-Atlantic region, **fish barriers** are defined as crossings that create at least a six-inch water drop and/or have an average depth of flow less than one-half inch deep during normal conditions. If you consider the crossing a potential fish barrier, describe the extent of the blockage (spatially); classify it as total, temporary, or partial; and note your rationale for your decision. Note that some fish barriers can also be created by steep culverts slopes or extended culvert lengths (100 feet or

Table 21: Stream Crossing Characteristics to Note During Site Assessment

Elliptical, concrete, single-barrel roadway culvert, with an associated outfall.	Round, metal culvert. Estimate culvert length by walking above ground.	This arched, corrugated metal culvert is bottomless (or is it? Be sure to check!).
Single box culvert not well-aligned with flow path.	Replacing existing culverts with ones like this provides a natural channel bottom.	Double-barrel, concrete road culvert with significant sediment deposition.
Double box culvert with in-stream sediment deposits forming on the left side and a distinct vegetated bar forming on the right.	Culverts or dams that result in at least a six-inch water drop should be considered potential fish barriers.	Culverts with a significant slope or over a certain length (100 feet or more) may prevent fish passage.
Dams should also be recorded as stream crossing features. Measure dam heights, if you can.	Culvert being blocked by large vegetation established on in-stream bar formations.	While tempting, we do not encourage field crews to walk through long, dark culverts.

more). You should assign a **blockage severity** score for the crossings (one to five, where five is the most severe blockage). The SC form contains criteria to help you rate the severity of the potential blockage.

The SC form also asks you to determine whether the culvert serves as **grade control**, meaning that the bottom of the culvert controls the invert or bottom elevation of the stream. A grade control often acts to prevent upstream channel incision, and stops the upward migration of nick points. If you see a vertical drop in water elevation at the downstream end of the culvert (a little waterfall), this often signals that the culvert could be acting as grade control for stream erosion (Figure 37). It is helpful to understand grade control in stream restoration and fish passage design to predict what might happen to stream channel dynamics if a culvert is repaired or replaced.

Figure 35: Minor Culvert Repair
Example of where culvert repair may be needed in combination with buffer planting and storm water control.

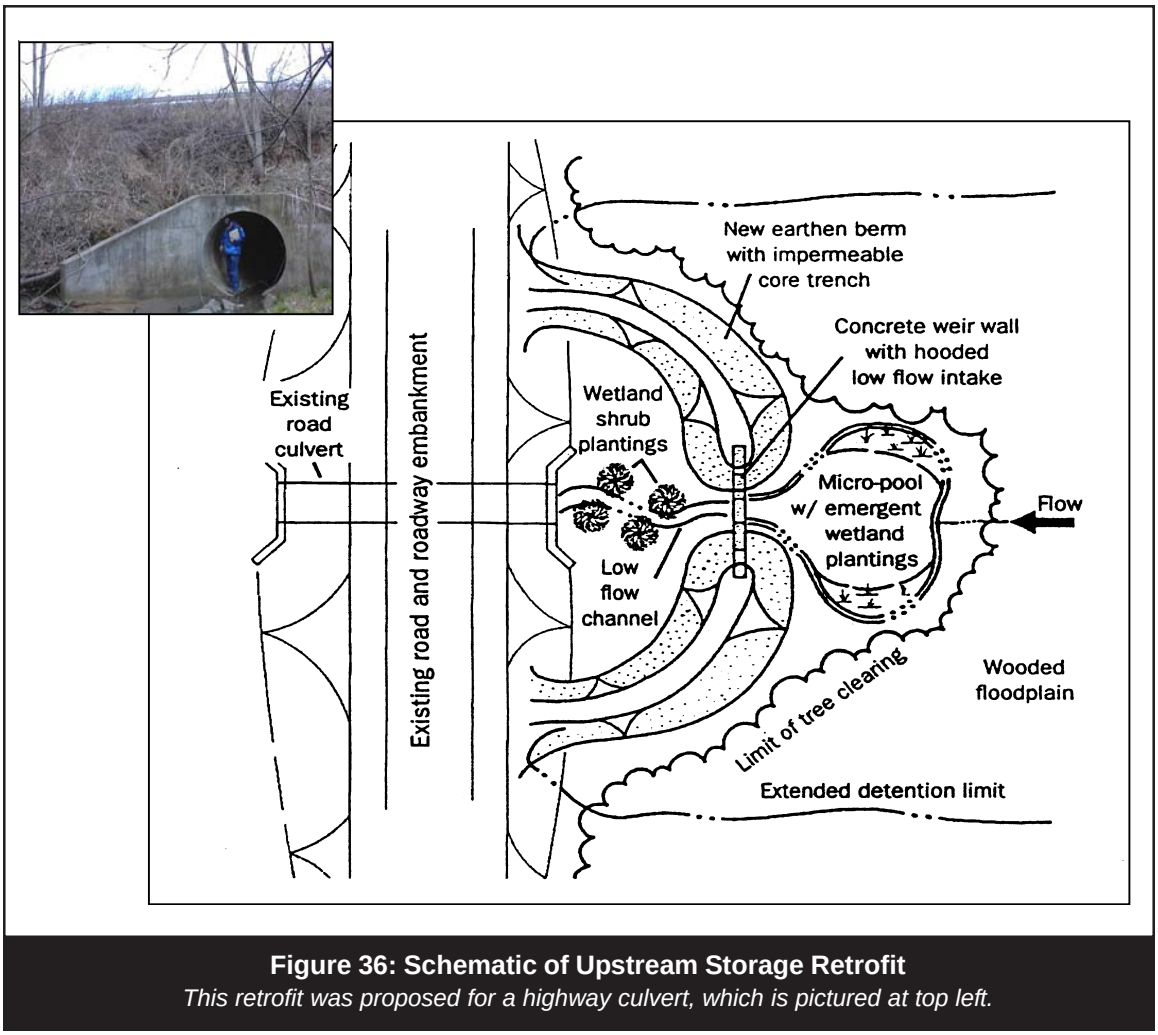


Figure 36: Schematic of Upstream Storage Retrofit
This retrofit was proposed for a highway culvert, which is pictured at top left.

8.3 What Stream Crossings Should I Record?

You should try to assess all man-made or natural structures that cross the stream, such as road culverts, railroad crossings, dams, or natural falls that create a change in grade or elevation in the stream. Exceptions include sewers or other utility crossings, which are evaluated using the UT field form (see Chapter 6), and channelized stream sections longer than 100 feet, which are separately assessed by the Channel Modification (CM) field form (see Chapter 9). Overhead crossings that appear to have minimal impact on the stream corridor can be skipped.

8.4 Field Assessment Tips

Some tips for assessing stream crossings in the field are offered below:

- Be careful investigating culverts. Do not enter them unless you can clearly see through to the other side AND enough light is available for walking.
- Be on the look out for outfalls inside culverts.
- Many culverts and other crossings lack enough capacity to pass floodwaters; you can often observe this if you see a lot of sediment deposition, debris jams, or slack or standing water upstream of the culvert.
- Since road crossings may often be your end/start points for survey reaches, make sure to track them on the downstream reach level assessment form (RCH).

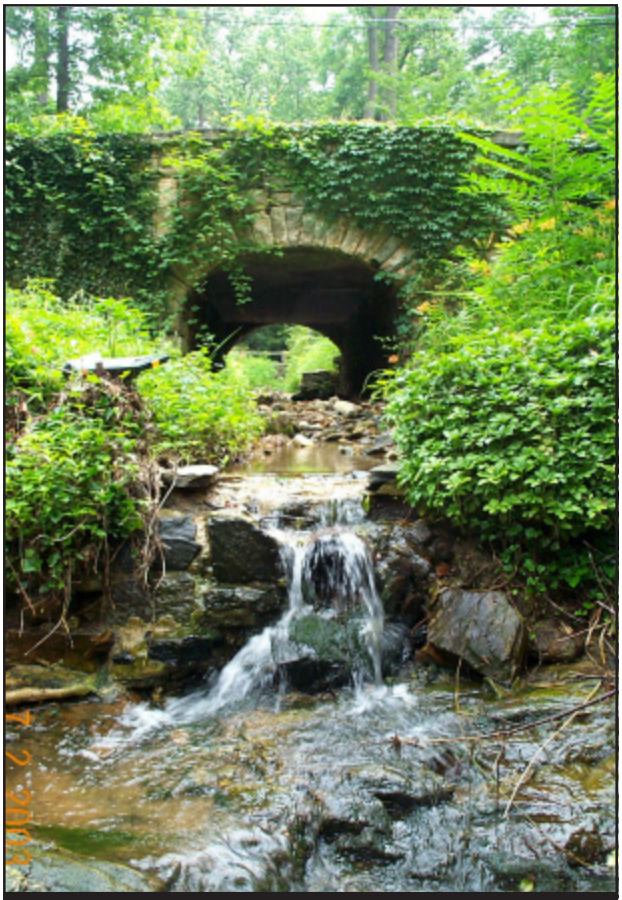


Figure 37: Grade Control and Potential Fish Barrier
This vertical drop indicates that the structural crossing may serve as a grade control feature along this reach.

Table 22: How SC Data Can Be Used	
Problem Assessed	Fish barriers Stream interruption Potential upstream storage retrofit Scour/erosion below crossing Lack of capacity to pass floodwaters
Potential Restoration Practice *(Manual Profile sheets)*	Fish barrier removal projects (R-30) Culvert repair/replacement sites (R-28/29) Upstream storage retrofit sites (SR-1/2) Local stream repair (R-3 to R-21)
Stream Corridor Metric	Stream interruption (crossings/mile) # of potential retrofit crossings
Output for Planning	Map of potential fish barriers Map of upstream storage retrofits Map of grade control structures Culvert dimensions for flooding analysis
The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series. • *SR- sheets can be found in Manual 3: Storm Water Retrofit Practices* • *R- sheets can be found in Manual 4: Stream Repair Practices*	

8.5 Using SC Data in Subwatershed Restoration

Stream crossing (SC) data can support restoration planning by identifying problem crossings, generating a candidate list of culvert retrofit practices, developing metrics of stream interruption, and generating fish barrier maps (Table 21). SC data can help you decide how stream crossings impact your subwatershed and how they can be managed to better promote the passage of fish and floodwaters.

8.6 Example SC Form

The SC form asks you to record basic information on the location, dimensions, condition, and restoration potential of each stream crossing. A detailed explanation of how the field crew filled out each section of this example form is included on the next page.

Stream Crossing **SC**

WATERSHED/SUBSHED: Smiley Run | DATE: 3/10/03 | ASSESSED BY: AK, EWB
SURVEY REACH ID: 102-1 | TIME: 10:15 AM/PM | PHOTO ID: (Camera-Pic #) A #09
SITE ID: (Condition-#) SC-2 | LAT ___°___'___" LONG ___°___'___" LMK ___ | GPS (Unit ID)

A.

TYPE*: ☑ Road Crossing ☐ Railroad Crossing ☐ Manmade Dam ☐ Beaver Dam ☐ Geological Formation ☐ Other:

B.

FOR ROAD/RAILROAD CROSSINGS ONLY

SHAPE: ☐ Arch ☐ Bottomless ☑ Box ☐ Elliptical ☐ Circular ☐ Other:

BARRELS: ☑ Single ☐ Double ☐ Triple ☐ Other:

MATERIAL: ☑ Concrete ☐ Metal ☐ Other:

ALIGNMENT: ☑ Flow-aligned ☐ Not flow-aligned ☐ Do not know

DIMENSIONS: (*if variable, sketch*)
Barrel diameter: 12 (ft)
Height: 12 (ft)
Culvert length: 48 (ft)
Width: 12 (ft)
Roadway elevation: 24 (ft)

CONDITION: (*Evidence of...*)
☐ Cracking/chipping/corrosion ☐ Downstream scour hole
☐ Sediment deposition ☐ Failing embankment
☐ Other (*describe*): NO PROBLEMS

CULVERT SLOPE: ☐ Flat ☐ Slight (2° – 5°) ☐ Obvious (>5°)

C.

POTENTIAL RESTORATION CANDIDATE: ☑ Fish barrier removal ☐ Culvert repair/replacement ☐ Upstream storage retrofit ☐ no ☐ Local stream repair ☐ Other:

IS SC ACTING AS GRADE CONTROL: ☐ No ☐ Yes ☑ Unknown

If yes for fish barrier

EXTENT OF PHYSICAL BLOCKAGE: ☑ Total ☐ Partial ☐ Temporary ☐ Unknown

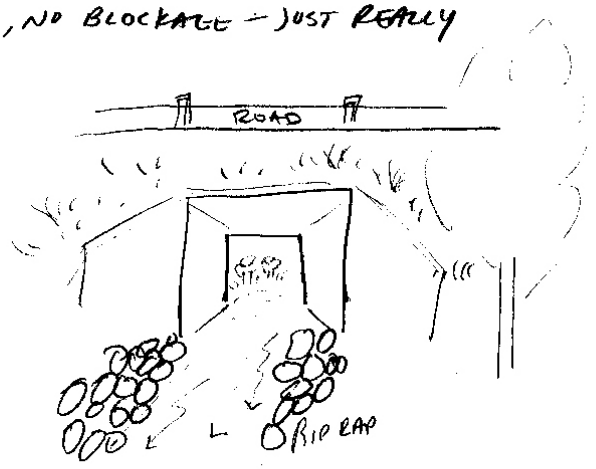
CAUSE: ☐ Drop too high Water Drop: ___ (in) ☑ Flow too shallow Water Depth: <2 (in) ☐ Other:

BLOCKAGE SEVERITY: (*circle #*)

5	4	3	2	1
A structure such as a dam or road culvert on a 3rd order or greater stream blocking the upstream movement of anadromous fish; no fish passage device present.		A total fish blockage on a tributary that would isolate a significant reach of stream, or partial blockage that may interfere with the migration of anadromous fish.		A temporary barrier such as a beaver dam or a blockage at the very head of a stream with very little viable fish habitat above it; natural barriers such as waterfalls.

NOTES/SKETCH:

NO MAINTENANCE PROBLEMS, NO BLOCKAGE – JUST REALLY SHALLOW, FAST FLOW



REPORTED TO AUTHORITIES ☐ YES ☐ NO

How the Example SC Form Was Completed

Part A

Field crews in this example assessed a stream crossing in the Smiley Run subwatershed at survey reach 102-1. They took a single photo of the crossing, which happened to be the second crossing they encountered during the stream walk.

Part B

In this part of the form, the field crew classified the road crossing as a single box culvert that was flow-aligned and showed no signs of sediment deposition or bank erosion. The crew did not observe a downstream scour pool at this location.

Part C

The field crew considered the crossing to be a potential fish barrier because flow depths were extremely shallow (less than two inches). The crew rated the blockage severity as moderate, given that the culvert was located on a small stream. No maintenance problems were observed.

Chapter 9: Channel Modification (CM)

This part of the USA examines the extent to which stream channels are modified within the urban stream corridor. Examples of channel modifications include channelization, bank armoring, channel lining, and flood plain encroachment. During the channel modification (CM) assessment, you will be specifically looking for channel segments that may need structural repair or present opportunities for a more natural stream channel design.

9.1 About Channel Modification

Many urban stream segments have been historically modified to safely convey floodwaters, maintain a stable channel, restrict channel migration, or realign channels around property or infrastructure. The basic engineering approach is to "design" a new channel or flood plain with less roughness (e.g., boulders, vegetation, large woody debris, meander bends), greater slope, and expanded cross-sectional area to pass floodwaters more quickly and efficiently. As a consequence, some urban streams are converted into straight channels that are often lined with concrete to reduce roughness. In other streams with little room for channel migration, banks are often fixed in place by armoring them with rip-rap and rock. In other situations, the capacity of the flood plain to accommodate floodwaters has been structurally altered by filling, dikes, or other measures.

In the most extreme instances, streams are entirely enclosed in underground pipes or extended culverts (note: this category of channel modification is already assessed in the USA by the SC form). Both stream and riparian habitat can be degraded or eliminated by channel modifications, and in some cases, fish passage may also be prevented. Newer, more environmentally-sensitive channel design may be a viable option to restore some natural features within modified channels. Figure 38 illustrates some of the typical channel modifications you may encounter during the USA.

Channel modifications are included in the USA survey for several reasons:

- *Stream Interruption:* An understanding of channel modification gives you a sense of the degree of stream interruption in your subwatershed. This factor is extremely

Figure 38: Types of Channel Modifications You May Encounter
Various types of modified streams include a concrete channel and flood plain (Panel A), a concrete-lined channel (Panel B), and a straightened, armored stream segment (Panel C).

Questions to ask when assessing channel modifications:

How severely is this modification affecting stream corridor habitat?

What is the length and purpose of the modification?

Can softer bank stabilization methods be used?

Can more natural channel design be employed?

important to determine where stream restoration projects make sense across the entire stream corridor.

- *Channelization:* In some instances, channelized segments of the stream network are candidates for restoration using techniques such as de-channelization, natural channel design, and baseflow channel creation. Also, if the CM form suggests armoring or other stabilization techniques are failing, it may be a good opportunity to replace them with bioengineering techniques (Manual 4).

- *Habitat Degradation*: The CM form quickly identifies the portion of the urban stream network where stream or riparian habitat has been degraded or eliminated by channel modification.

- *Tracking Stream Bank Armoring*: While some communities have been stabilizing banks for decades, institutional knowledge of these project locations may have been lost. The CM form can help generate a map of these repair/ restoration locations.

9.2 Introduction to the CM Form

This section introduces you to the channel modification (CM) assessment form. The form asks you to record basic data on the length and nature of the channel modification, and determine whether it might be a candidate for possible restoration. This section describes the four parts of the CM form, and provides guidance on how to complete each one. Appendix A provides a blank version of the CM form. A completed example CM form is included at the end of this chapter in Section 9.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

The first part of the CM form contains general header information that locates where the modified channel section is in the survey reach.

As always, the header should be modified to reflect your reach and site labeling system. If you are using a GPS unit, record the beginning and ending coordinates for each channel segment, and remember to note the **GPS unit ID #** and an **LMK** number. If the modified section is shorter than 50 feet long, GPS units cannot calculate an accurate length. Instead, measure these sections by pacing or with a tape measure. Depending on how extensively channels have been modified in the subwatershed, you may want to skip these short sections altogether.

The next part of the CM form asks you to describe the type of channel modification and the dominant material that comprises it.

Four basic options are available. **Channelization** refers to a channel that has been excavated and straightened to eliminate natural meanders and bends. **Bank armoring** consists of an extended length of bank protected by hard stabilization measures, such as rip-rap, gabions, rock, or retaining walls. Armoring can occur on one or both banks and should only be recorded if it extends more than 50 feet. **Concrete channels** should be checked on the CM form if the natural stream or banks have been replaced with concrete lining that extends more than 50 feet. Lastly, **flood plain encroachment** should be checked if you see obvious signs of earth fill, levees, or dikes in

the flood plain or stream corridor. Note that more than one type of channel modification can occur in each segment. If only one bank is affected by the modification, indicate this in the notes section on the CM form. Table 23 illustrates a number of common channel modifications you may encounter in the field.

Next, assess the condition of the channel, and note any perennial flow, sediment deposition, vegetative growth, or apparent connection with the flood plain. Each of these conditions provides useful clues about sediment and flow dynamics through the modified channel. You should also measure the basic dimensions of the channel modification, take a photo, and draw a rough sketch.

The next part of the CM form asks you to assess the nature of the stream corridor adjacent to the channel modification and the current baseflow channel segment. Both factors are crucial to determine if natural channel design may be suitable for the channel segment.

You should estimate the "**available**" width of the adjacent stream corridor on both sides of the channel. Available means open ground, with no obvious structures or utilities present.

Table 23: Channel Modifications to Note During Site Assessment

At crossings, only record on CM form if modification extends at least 100 feet up or downstream.	Measure the width of the channel bottom. If there is perennial flow, measure the water depth.	Channelized and concrete-lined segment that maintains good connectivity with the flood plain.
Sediment deposits and algal growth on bottom of a concrete-lined channel.	Rock revetments should be recorded as bank armoring.	Imbricated rip-rap used for bank stabilization; Record if 50 feet or longer.
Gabion baskets used to stabilize a stream bank.	Highly urban subwatersheds frequently have most of their surface streams piped.	Exposed portion of an enclosed stream in a commercial area.

Also, note if any earthen fill, dikes, or levees occur in the adjacent stream corridor, which could constrain flood plain capacity. Lastly, you should examine the **baseflow channel**, noting the average depth of flow, and the fraction of the channel bottom over which it flows. Check to see if there is a defined low-flow channel, and record its average depth of flow.

The last part of the CM form asks you to recommend whether the modified channel might be a candidate for structural repair, more natural channel design, or fish barrier removal. Consult profile sheets R-5 to R-15, R-25, R-30, S-32, and S-33 in Manual 4 to familiarize yourself with these stream restoration techniques. If you don't feel comfortable making a restoration recommendation, simply check the "Can't tell**"** box. The CM form provides some guidance on how to score the overall **severity** of channel modification on a scale of one to five (five being the most severe). Figure 39 illustrates modified channel segments that should be considered restoration candidates.

9.3 Which Modified Channels Should I Record?

Most urban streams are extensively modified over much of their length, so only record "hard" channel modifications longer than 50 feet. Do not record channel modifications that are immediately associated with structured stream crossings unless they extend 100 feet above or below the crossing. "Soft" bank stabilization practices should not be counted.

9.4 Field Assessment Tips

Some quick tips for evaluating channel modifications in the field are provided below:

- To reduce the number of forms you will need to complete, only record channel modifications that are at least 50 feet long.
- Also, you only need to record channel modifications associated with stream crossings if they extend at least 100 feet upstream or downstream of the crossing.
- Keep in mind that channel modifications can occur on the bed, banks, and flood plain of the stream corridor.
- If a channel modification extends on both sides of a road crossing that is used as a survey reach boundary, make sure to extend the survey reach to include the entire modified channel.
- Enclosed sections or extended culverts are picked up on the SC form and should not be recorded on the CM form.

Figure 39: Restoration of Channelized Stream Segments
Candidate site for structural repair (Panel A) and natural channel restoration (Panel B).

Table 24: How CM Data Can Be Used	
Problem Assessed	Stream interruption Channelization Habitat degradation
Potential Restoration Practice *(Manual Profile sheets)*	Baseflow channel creation (R-25) Natural channel design (S-32) De-channelization (S-33)
Stream Corridor Metric	Channelized length Channelized length per stream mile
Output for Planning	Map of potential fish barriers Map of channelized sections Map of potential de-channelization projects Map of grade control structures
**The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series. R- and S- sheets can be found in Manual 4: Stream Repair Practices*	

9.5 Using CM Data in Subwatershed Restoration

Channel modification (CM) data can be used in several ways for restoration planning. CM data can be used to measure stream interruption, generate a list of stream restoration practices, develop stream channelization and habitat metrics, and generate planning maps (Table 24). CM data can help you decide whether channel modifications are a significant problem in the subwatershed and how important channel restoration should be in the overall restoration plan.

9.6 Example CM Form

The CM form asks you to record basic data on the length and nature of the channel modification, and determine whether it might be a candidate for possible restoration. A detailed explanation of how the field crew filled out each section of this example form is included on the next page.

Channel Modification **CM**

A.

WATERSHED/SUBSHED: SMILEY RUN | DATE: 3/10/03 | ASSESSED BY: ACK, EMR

SURVEY REACH ID: 102-1 | TIME: 10:25 (AM)/PM | PHOTO ID: (Camera-Pic #) A /# 08

SITE ID: (Condition-#) CM-1

START LAT ___° ___' ___" LONG ___° ___' ___" LMK ____

END LAT ___° ___' ___" LONG ___° ___' ___" LMK ____

GPS: (Unit ID)

B.

TYPE: ☒ Channelization ☒ Bank armoring ☐ concrete channel ☐ Floodplain encroachment ☐ Other:

MATERIAL:
☐ Concrete ☐ Gabion
☒ Rip Rap ☐ Earthen
☐ Metal
☐ Other:

Does channel have perennial flow?	☒ Yes	☐ No
Is there evidence of sediment deposition?	☐ Yes	☒ No
Is vegetation growing in channel?	☐ Yes	☒ No
Is channel connected to floodplain?	☐ Yes	☒ No

DIMENSIONS:
Height 6.5 (ft)
Bottom Width 8.0 (ft)
Top Width: 15.0 (ft)
Length: 150 (ft)

C.

BASE FLOW CHANNEL
Depth of flow 10 (in)
Defined low flow channel? ☒ Yes ☐ No
% of channel bottom 70 %

ADJACENT STREAM CORRIDOR
Available width LT 50 (ft) RT 100 (ft)
Utilities Present? ☒ Yes ☐ No
Fill in floodplain? ☐ Yes ☒ No

D.

POTENTIAL RESTORATION CANDIDATE ☐ Structural repair ☐ Base flow channel creation ☐ Natural channel design ☐ Can't tell
☒ no ☐ De-channelization ☐ Fish barrier removal ☐ Bioengineering

CHANNELIZATION SEVERITY: (Circle #)	A long section of concrete stream (>500') channel where water is very shallow (<1" deep) with no natural sediments present in the channel.	A moderate length (> 200') ,but channel stabilized and beginning to function as a natural stream channel. Vegetated bars may have formed in channel.	An earthen channel less than 100 ft with good water depth, a natural sediment bottom, and size and shape similar to the unchannelized stream reaches above and below impacted area.
	5	4 3	(2) 1

NOTES: BOTTOM OF CHANNEL IS NATURAL – JUST BANKS HAVE BEEN STRAIGHTENED AND ARMORED DOWNSTREAM OF ROAD CROSSING – SEEMS A BIT EXCESSIVE – NOT MUCH REST. POTENTIAL

How the Example CM Form Was Completed

Part A

In this example, the field crew assessed an armored stream section in the Smiley Run subwatershed in survey reach 102-1, and took a single photo at this location.

Part B

The field crew evaluated a channel segment armored with 150 feet of rip-rap on both banks as part of a past bank stabilization project. The channel had perennial flow, but showed no signs of deposition or vegetative growth in the channel, which also did not appear to be connected to the flood plain.

Part C

In this part of the form, the field crew observed a defined low flow channel. Flow was approximately 10 inches deep and took up most of the width of the channel. Exploring the adjacent flood plain area, the field crew observed no fill or excavation activities, though utilities did interrupt the stream corridor on the left bank.

Part D

The field crew assigned this segment a low severity rating due to its natural channel bottom and relatively short distance of modification. They were unable to envision a particular type of restoration at the site.

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Chapter 10: Miscellaneous Features (MI)

The miscellaneous features (MI) form is used to track any unusual impact or notable feature encountered during the stream walk that cannot be assessed using any of the other impact forms. Specifically, the MI form is used to record high quality habitats or rare biota in the stream corridor, grade controls that could influence stream restoration, disturbances in the stream corridor, or in-stream water quality problems that may warrant further investigation.

10.1 About Miscellaneous Features

When walking a stream, you inevitably encounter features that may be important for restoration planning but do not conveniently fit into the other seven impact forms. You can either choose to note these features on the overall RCH form, or you can track them on the MI form to ensure that they are included in restoration planning. For example, you may want to track the locations of high quality habitats such as emergent wetlands, or disturbances to the stream corridor due to construction, excavation, and livestock access. You may also want to record in-stream water quality problems not visibly associated with storm water outfalls, or any other features you feel are important. Miscellaneous features should be considered in the context of stream corridor restoration potential and how they might relate to discharge prevention, riparian management, stream restoration, and storm water retrofit strategies. Table 25 illustrates some miscellaneous features worth tracking during the USA.

Miscellaneous features are included in the USA for several reasons:

- The protection or restoration of **high quality habitats** or rare species found in the stream corridor can be an important element of a subwatershed restoration plan. Presence of vernal pools, wetlands, rookeries, rare or threatened mussel or plant communities, or specimen trees should be noted.
- **Construction activities** within the stream corridor that lack proper erosion and sediment controls, violate tree clearing regulations, or fail to meet flood plain standards should be referred for immediate enforcement.
- Natural **grade controls** such as rock outcrops, bedrock, or waterfalls help fix the elevation of the streambed, and can control stream channel processes.
- Algal blooms, fish kills, turbid water, oil sheens, and other **water quality** problems should be noted, particularly if they are not associated with a leaking pipe or outfall. If water quality problems are severe, you may want to follow up with monitoring investigations at all upstream outfalls.
- If you encounter any **stream gauges** or **sampling stations**, you should record their location on the MI form and remind yourself to track down the data when you get back to the office. Current or historic monitoring stations should always be considered when picking locations for future sentinel monitoring stations.
- **Cattle access** or other livestock crossings can cause water quality problems and damage both stream habitat and riparian buffers. If livestock are causing severe problems, bank stabilization, exclusionary fencing, or alternative water sources may be worth exploring.

Table 25: Examples of Miscellaneous Stream Corridor Features		
Excavation, dumping, or construction activities in the stream corridor may require enforcement.	Unstructured crossings such as culvertless roads, ATV trails, or gravel livestock crossings.	Failed erosion and control practices causing sediment loading into stream.
Cattle in the stream can contribute to water quality, stream habitat, and riparian degradation.	Stream gauges or other features denoting repeat sampling or monitoring locations.	Water quality problems like excessive algae, fish kills, or sediment plumes.
Unusual deposits not associated with an immediate source.	Special natural areas, such as wetlands, heron rookeries, and vernal pools.	Specimen trees or rare plant or animal species found within stream corridor.
Log jams that may create flooding or erosion problems.	Grade control features such as exposed bedrock, rock outcroppings, or water falls.	Stream sinks or sources, particularly in karst areas where caves and sinkholes are common.

10.2 Introduction to the MI Form

The miscellaneous feature form (MI) is used to track stream and flood plain features that don't fit into one of the other seven impact forms or the overall RCH assessment. Simply note basic data on the location of your feature on the MI form, and a brief description of any potential restoration recommendations. Appendix A provides a blank version of the form. A completed example MI form is included at the end of this chapter in Section 10.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

10.3 What Features Should I Record?

This is the catch-all form for recording unusual features that you want to track, but aren't sure where to record them. Include any features you want on the MI form, but make sure that the feature relates to your overall restoration goals.

10.4 Field Assessment Tips

The following tips should help you use the MI form:

- If you end up reporting a lot of the same kinds of features on your MI form (such as livestock crossings), consider developing a new impact form to specifically evaluate that feature.
- Waterfalls or other hard features that provide a fixed location for change in vertical elevation (at least two feet) should be recorded (excluding pipes, stream crossings, or modified channels).
- Nickpoints, where softer substrates are actively eroding, should be recorded on the ER form.
- If you see water quality impairments, look around for outfalls, pipes, or other potential sources.
- Construction activity associated with a known stream restoration project need not be recorded.
- Note the presence of log and debris jams, particularly if they could clog or block downstream road crossings.
- Document as much information as possible about suspicious activities, and take photos, which are extremely helpful to support local enforcement measures.
- Write down whatever information you can ascertain from stream gauges or monitoring station markers.
- Don't forget about these miscellaneous features during data analysis and review.

10.5 Using MI Data in Subwatershed Restoration

Miscellaneous stream data can be used in a number of ways. Depending on the feature, you can identify locations for natural area protection, or generate a list of potential enforcement actions or upstream discharge investigations. MI data can also be used to develop stream corridor metrics and generate planning maps (Table 26). This information can supplement data collected during the impact and overall RCH assessment and can provide additional perspective on restoration opportunities within the stream corridor.

Table 26: How MI Data Can Be Used	
Problem Assessed	Wetlands and natural area remnants Land disturbance and erosion Livestock access/hobby farms Fish kills, water quality problems
Potential Restoration Practice *(Manual Profile sheets)*	Riparian wetland restoration (F-8) Enforcement (E-1) Exclusionary fencing, alternative water source Discharge prevention (D1-D12) Grade controls (R-18 to R-21)
Stream Corridor Metric	# of natural area remnants # livestock access points per stream mile # of log jams, grade controls, etc
Output for Planning	Map of potential natural area remnants Map of grade controls, log jams, etc Water quality problem map Monitoring station location map
**The code in parentheses refers to the appropriate restoration profile sheet in the Restoration Manual Series.* • *R- sheets can be found in Manual 4: Stream Repair Practices* • *F- sheets can be found in Manual 5: Riparian Management Practices* • *E- sheets can be found in Manual 9: Municipal Practices and Programs*	

10.6 Example MI Form

The MI form is used to track stream and flood plain features that don't fit into one of the other seven impact forms or the overall RCH assessment. A detailed explanation of how the field crew filled out each section of this example form is included.

A.

Miscellaneous **MI**

WATERSHED/SUBSHED: Big Rock | DATE: 7/15/02 | ASSESSED BY: AK, DES

SURVEY REACH ID: UBC-2 | TIME: 10:30 AM/PM | PHOTO ID: (Camera-Pic #) #6 /# 002

SITE ID: (Condition-#) MI-2 | LAT ___°___'___" LONG ___°___'___" LMK: ___ | GPS: (Unit ID)

POTENTIAL RESTORATION CANDIDATE ☐ no ☐ Storm water retrofit ☒ Stream restoration ☒ Riparian Management ☐ Discharge Prevention ☐ Other:

DESCRIBE: COW IN STREAM

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

How the Example MI Form Was Completed

Part A

The field crew came across a cattle access point in this example. Cows in the stream can contribute to water quality impacts, as well as damage to in-stream habitat and riparian conditions. Field crews took a picture of the culprit and suggested the location as a potential riparian and stream restoration candidate.

Chapter 11: Overall Conditions in the Survey Reach (RCH)

The reach assessment form (RCH) collects overall information about each channel and corridor conditions in the survey reach. The RCH form evaluates overall conditions such as average bank stability, in-stream and riparian habitat, and flood plain connectivity across the survey reach. In addition, the RCH form is used to track and locate any of the eight individual impacts encountered along the survey reach. RCH data can be used to compare stream quality in reaches within a subwatershed, and is an important ingredient in stream and riparian restoration design.

11.1 About the Survey Reach

While it is important to track individual problem sites, you also want to gain an understanding of the overall physical conditions along the entire stream corridor. The physical condition and restoration potential of survey reaches varies along the stream corridor, as shown in Figure 40. The RCH assessment helps identify the highest quality, most impacted, or most restorable stream reaches in your subwatershed. It can also be used to screen reaches for potential restoration.

Much of the RCH assessment draws heavily from the EPA's Rapid Bioassessment Protocol for Habitat (Barbour *et al*., 1999).

The RCH assessment is designed to track individual problem sites along the stream corridor, and to rapidly measure habitat conditions over discrete segments of the stream corridor, termed **survey reaches**. Field crews should sketch each survey reach, record average channel dimensions, and assess the general stream channel, water column, and flood plain characteristics. Numeric scores are assigned to each survey reach based on the quality of habitat, bank stability, and flood plain conditions. Total scores are then used to compare survey reaches across the subwatershed.

Since field crews must assign an "average" value, try to ensure that each survey reach is fairly uniform in character. Survey reaches are initially delineated before going out into the field, but field crews can and should modify delineations to reflect on-the-ground conditions. Desktop procedures for delineating and naming survey reaches are detailed in Chapter 2.

Figure 40: Range of Survey Reach Conditions
Narrow, forested stream corridors, with few discharge or erosion problems may offer sufficient in-stream habitat and little restoration potential (Panel A). Impacted reaches on institutional or public lands may be great opportunities for restoration and education (Panel B). Restoration in highly impacted reaches with significant infrastructure can be very expensive (Panel C).

11.2 Introduction to the RCH Form

This section introduces the reach assessment form (RCH) used to evaluate the average condition of each survey reach in your subwatershed. The RCH form has three parts:

A. General header
B. Average physical condition
C. Quantitative evaluation of eight stream corridor habitat parameters

This section describes each part of the RCH form, and presents guidance on how to complete it. Appendix A includes a full version of the RCH form. A completed example RCH form is included at the end of this chapter in Section 11.6, along with detailed explanations to help clarify how the field crew filled out each section of the form.

The first part of the RCH form contains general header information. The header should be modified to reflect your reach labeling system. If the reach starts or ends at a road crossing or other notable landmark, include a general **description** of it (e.g., at the HWY 21 bridge, the Piggly Wiggly, or behind Linglestown elementary school). You are also asked to document past and current **weather conditions**, since recent storm events can influence stream flow conditions, sediment scouring and deposition, and water clarity. In addition, record the most prevalent land use(s) adjacent to your survey reach. If you take a photo of the reach, record the photo number in the notes section of your RCH form.

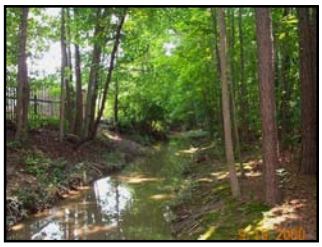
The next part of the RCH form has two columns. The first column asks you to record the physical features of the channel and water column, and evaluate access to the stream corridor for potential restoration projects. The second column asks you to draw a sketch of the survey reach, which includes major structures affecting the stream or flood plain, as well as the locations of each problem or impact site evaluated in the survey reach. This sketch also serves as a quick visual reference to help you track the location of impact forms.

The physical condition of the stream reach is defined by nine parameters. **Baseflow percentage** refers to the fraction of the stream bottom width covered by the baseflow channel, sometimes known as the wetted width. The **dominant substrate** reflects the predominant inorganic particle size found on the streambed observed throughout the channel (sand, gravel, cobble, etc). Field crews should also note the general **clarity** of the water column before they enter the stream. **Stained** generally refers to a reddish or brownish color often associated with tannic acids (think of iced tea). **Turbid** refers to cloudy water containing suspended silt or organic particles. Algae, suspended solids, dyes, or chemical discharges may also cause poor water clarity.

Excessive nutrient loading can often cause excessive growth of **aquatic plants** and algae, and field crews should note the presence of attached and floating plants in the streambed. As an example, the presence of stringy or clumps of floating algae can be a sign of an unhealthy stream. Look for evidence of **wildlife** in the stream corridor, such as beaver and deer that could harm potential riparian restoration projects. The percentage of **stream shading** by overhead tree canopy is an important factor, since it influences large woody debris and stream temperature. Crews are also asked to determine overall **channel processes** (e.g., aggradation, degradation) and record average channel dimensions (bank heights, channel widths) observed within the survey reach. Consult Chapter 4 for a review of channel processes and guidance on how to measure stream channel dimensions. Many of these stream features are illustrated in Table 27.

The third part of the RCH form asks you to evaluate eight parameters that rate the quality of stream and riparian habitat.

Habitat parameters are classified as optimal, suboptimal, marginal, or poor condition, and are assigned a score ranging from zero to 20 (with 20 being the most pristine stream corridor condition observed in your region). The RCH form combines habitat and streambank parameters from Barbour *et al.* (1999) with additional questions on flood plain

Table 27: Characterizing the Survey Reach		
Base flow width taking up less than 50% of the channel width	Baseflow width taking up 100% of the channel width	Sand as the dominant surface substrate
Gravel (0.1-2.5") as the dominant substrate	Cobble (2.5-10") as the dominant channel substrate	Opaque water clarity
Rooted aquatic vegetation	Attached algae	Floating aquatic plants
Evidence of beaver activity	Visual evidence of fish in stream	An unshaded (<25%) stream reach
 A mostly shaded (>75%) stream reach	Field crew assessing channel dynamics in reach	Field crew measuring top width of stream channel

features, to characterize overall stream corridor conditions. The first four habitat parameters focus on stream channel conditions, and the next four relate to riparian areas outside the channel. Together, the maximum score for all eight habitat parameters is 160 points (which represents the highest quality stream conditions for your region). Few urban streams will score this well. The composite habitat score for a survey reach should always be evaluated relative to the other survey reaches in your subwatershed.

General criteria for scoring habitat parameters are included on the RCH form. Barbour *et al.* (1999) also provides more illustrations on how to evaluate habitat parameters in the field.

To determine **in-stream habitat quality**, think like a bug or a fish. Habitat structure includes riffles, boulders, large woody debris, undercut banks, and deep, stable pools, and provides locations to hide, eat, or breed. The more abundant and diverse habitat structures are, the better the habitat quality will be for aquatic insects and fish. Stream habitat criteria should be adopted to reflect the gradient of streams in the subwatershed. The criteria provided on the RCH form are geared towards high gradient streams that tend to have a wider diversity of substrate and available cover. Barbour *et al.* (1999) recommends reducing the habitat cover percentage thresholds in **lower gradient** streams to 50%, 30%, and 10% to define optimal, suboptimal, and marginal habitat conditions, respectively.

Vegetative protection should not be confused with vegetated buffer width. This habitat factor explicitly deals with the diversity and abundance of vegetation found on the face and top of stream banks. The roots and shoots of vegetation hold bank sediments together and can protect the bank from erosion. Each bank should be evaluated separately. Survey reaches with dense and diverse bank vegetation receive the highest score. **Vegetative buffer width**, on the other hand, measures the average width of the naturally-vegetated buffer on each side of the stream, and accounts for any impacts. You may choose to modify the buffer criteria to suit your local needs; generally, lawns and row crops are not counted as natural cover. Reaches with a continuous, naturally-vegetated buffer at least 50 feet wide receive the highest score.

Average channel stability is determined by simultaneously assessing vegetative protection, bank erosion and flood plain connection. Field crews are asked to assess the general level of **bank erosion** occurring throughout the reach. Bank erosion is a natural process; however, hydrologic changes associated with urbanization often cause excessive erosion. Natural stream banks have gentle slopes, whereas many urban streams have steep, exposed banks and may exhibit signs of collapse and active scouring. Reaches exhibiting minimal erosion receive the highest score. Illustrations of actively eroding streams can be found in Chapter 4.

Flood plain connection examines the degree to which the steam and flood plain are hydrologically connected. Flood waters often spill into the flood plain in undeveloped streams. When this occurs, the energy of the flood water is effectively dissipated as it spreads over a wider area. Many urban streams become separated from their flood plain by downcutting or channel alteration. You can evaluate flood plain connection by checking to see if the stream has incised to the point that moderate flood events can no longer escape the channel. A connected system usually has short stream banks, which allow flood waters to move from the channel out into the flood plain. Look for signs of fresh sediment, water marks, and debris jams in the flood plain to confirm if the flood plain is connected. Streams where moderate flood flows can reach the flood plain receive the highest scores.

The next habitat parameters focus on flood plain vegetation, habitat, and encroachment. **Flood plain vegetation** helps to slow flood waters and promote sediment deposition, and is classified based on the dominant vegetative cover found on both sides of the stream corridor. Forest cover receives the highest score because bottomland forests slow flood waters to the greatest degree, and are valuable habitats for plant and wildlife species. Flood plains consisting of turf or crops have less

ability to slow flood waters and receive lower scores. A high scoring **flood plain habitat** consists of a diversity of wetland and non-wetland habitat types. Also look for standing/ ponded water in the flood plain, which provides valuable habitat for amphibians and other animals. **Flood plain encroachment** asks you to determine the extent of encroachment in the flood plain by filling, land development, and/or man made structures. Try to assess encroachment from the perspective of how it alters the flood plain ability to pass extreme flood events. Higher scores are assigned to flood plains with a low percentage of encroachment over their length. Table 28 shows examples of how field crews can assess various types of survey reaches using the habitat parameters. Overall scores are totaled at the bottom of the form.

Table 28: Diversity of Reach Conditions in Urban Subwatersheds

	Stream Condition This survey reach has optimal in-stream habitat (large woody debris, undercut banks, deep pools); 100% vegetative protection on stream banks; no evidence of bank erosion; and is completely connected to its flood plain. Riparian/Flood plain Condition Both stream banks have wide, natural buffers; flood plain vegetation is bottomland forest and wetland meadow; no encroachment Total Score 150-160 points
	Stream Condition Marginal in-stream habitat (very little stable structure); no vegetative protection on stream banks (due to removal of bank vegetation with chemical spray); no evidence of bank erosion (very little flow in these headwaters) and reach remains connected to its flood plain. Riparian/Flood plain Condition No natural buffer on either bank and has been highly impacted by landscaping practices. Dominant flood plain vegetation is turf grass; no evidence of standing water or wetland habitat. Because of small stream size, buildings and berms have probably not encroached significantly on flood plain function Total Score 60-70 points
	Stream Condition Poor in-stream habitat (no structure); no vegetative protection on one side of stream (due to rip-rap); no evidence of bank erosion; and reach has been disconnected from its flood plain (road on one side, parking lot on other). Riparian/Flood plain Condition No natural buffer on either bank. Dominant flood plain vegetation is turf grass (where vegetated); no evidence of standing water or wetland habitat. Encroachment has significantly impacted flood plain function. Total Score 30-40 points

11.3 What Survey Reaches Should I Assess?

An RCH assessment form should be completed for every survey reach in the subwatershed. The initial desktop delineation of survey reaches should be modified by field crews to reflect conditions on the ground. For example, field crews may extend the length of a survey reach to accommodate an entire modified channel or impacted stream buffer, eliminate a survey reach that has been piped, or combine two similar reaches together.

11.4 Field Assessment Tips

Some field tips to keep in mind when performing an RCH assessment include the following:

- Use the tips for assessing erosion and inadequate buffers provided in Chapters 4 and 5, respectively.
- Determine left and right bank by facing downstream.
- One person on the field crew should be responsible for assessing flood plain parameters, while the other assesses the stream channel. Field crews should communicate frequently in order to quickly complete the RCH form.
- Don't waste your energy trying to agree on the exact numeric score for the eight stream corridor parameters, but focus instead on being consistent with respect to the general category into which the survey reach condition falls (e.g., optimal, suboptimal, marginal, poor).
- Don't waste time adding up the numbers in the field, you should do the math later, preferably during the debriefing meeting at the end of the day.
- Walk the entire survey reach before completing the assessment parts of the RCH form, although you should sketch the reach as you go.
- If you notice significant changes in reach conditions or an obvious break point, feel free to split your survey reach in two, but make sure to note these modifications on your field map.

Table 29: How RCH Data Can Be Used in Restoration Planning	
Problem Assessed	Poor stream corridor habitat Average stream bank erosion Flood plain connectivity Flood plain encroachment Feasibility factors
Potential Restoration Practice	Tracking of all potential corridor restoration practices, with special emphasis on stream restoration and riparian management concepts
Stream Corridor Metric	Stream density (miles/sq. mi) # of problems/survey reach Stream corridor habitat index Stream bank erosion severity index Access and other feasibility factors
Output for Planning	Average reach erosion map Sediment loading estimates from bank erosion Reach quality/prioritization map Subwatershed screening

11.5 Using RCH Data in Subwatershed Restoration

Reach assessment data can support restoration planning in several ways. Total habitat scores can be used to identify stream reaches of optimal or poor condition. Component indices of in-stream habitat condition can also be generated (Table 29). In addition, tracking access by survey reach allows you to examine the feasibility of restoration. RCH data is particularly useful to analyze possible options for stream restoration and riparian management across the survey reach, and scoping more detailed restoration investigations in the stream corridor.

11.6 Example RCH Form

The RCH form is used to evaluate the average condition of each survey reach in your subwatershed. A detailed explanation of how the field crew filled out each section of this example form is included on the next page.

Reach Assessment **RCH**

A.

SURVEY REACH ID: 102-1	WTRSHD/SUBSHD: SMILEY RUN	DATE: 3/10/03	ASSESSED BY: ACK, EWB
START TIME: 9:00 AM/PM LMK: ____ LAT ___°____'____" LONG ___°____'____" DESCRIPTION:		END TIME: 10:30 AM/PM LMK: ____ LAT ___°____'____" LONG ___°____'____" DESCRIPTION:	GPS ID:

RAIN IN LAST 24 HOURS: ☐ Heavy rain ☐ Steady rain ☑ None ☐ Intermittent ☐ Trace

PRESENT CONDITIONS: ☐ Heavy rain ☐ Steady rain ☐ Intermittent ☐ Clear ☐ Trace ☐ Overcast ☑ Partly cloudy

SURROUNDING LAND USE: ☐ Industrial ☑ Commercial ☑ Urban/Residential ☐ Suburban/Res ☐ Forested ☐ Institutional ☐ Golf course ☐ Park ☐ Crop ☐ Pasture ☐ Other:

B.

AVERAGE CONDITIONS *(check applicable)*

BASE FLOW AS % CHANNEL WIDTH: ☐ 0-25% ☐ 25-50 % ☐ 50%-75% ☑ 75-100%

DOMINANT SUBSTRATE: ☐ Silt/clay (fine or slick) ☐ Sand (gritty) ☑ Gravel (0.1-2.5") ☐ Cobble (2.5 –10") ☐ Boulder (>10") ☐ Bed rock

WATER CLARITY: ☑ Clear ☐ Turbid *(suspended matter)* ☐ Stained *(clear, naturally colored)* ☐ Opaque *(milky)* ☐ Other *(chemicals, dyes)*

AQUATIC PLANTS IN STREAM: Attached: ☐ none ☑ some ☐ lots; Floating: ☑ none ☐ some ☐ lots

WILDLIFE IN OR AROUND STREAM: (Evidence of) ☑ Fish ☑ Beaver ☐ Deer ☐ Snails ☐ Other:

STREAM SHADING (water surface): ☐ Mostly shaded (≥75% coverage) ☑ Halfway (≥50%) ☐ Partially shaded (≥25%) ☐ Unshaded (< 25%)

CHANNEL DYNAMICS: ☐ Downcutting ☐ Widening ☐ Headcutting ☐ Aggrading ☐ Sed. deposition ☐ Bed scour ☐ Bank failure ☐ Bank scour ☐ Slope failure ☐ Channelized ☐ Unknown

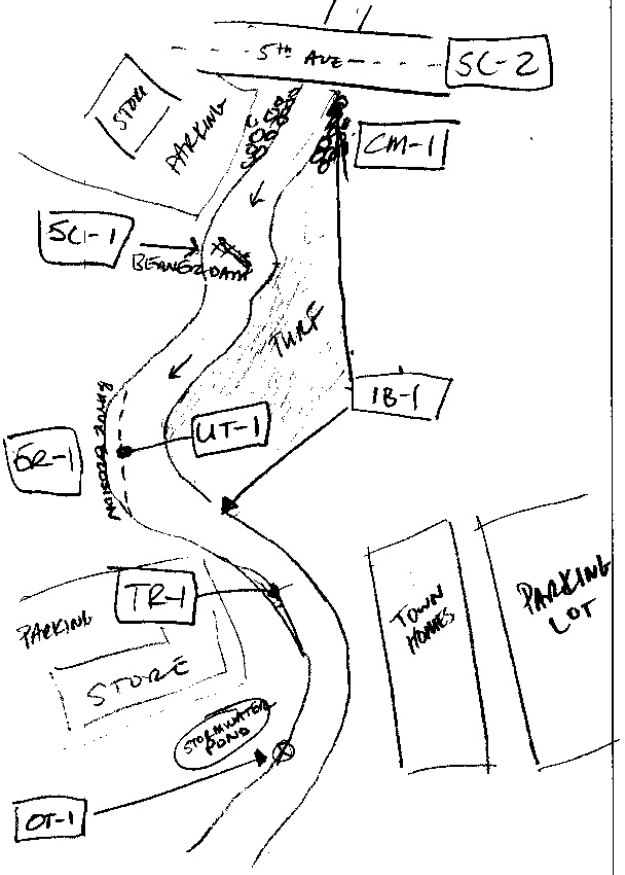
CHANNEL DIMENSIONS *(FACING DOWNSTREAM)*: Height: LT bank 3 (ft); RT bank 3.5 (ft); Width: Bottom 7.5 (ft); Top 10 (ft)

REACH ACCESSIBILITY

5	4	3	2	1
Good: Open area in public ownership, sufficient room to stockpile materials, easy stream channel access for heavy equipment using existing roads or trails.		**Fair:** Forested or developed area adjacent to stream. Access requires tree removal or impact to landscaped areas. Stockpile areas small or distant from stream.		**Difficult.** Must cross wetland, steep slope, or sensitive areas to get to stream. Few areas to stockpile available and/or located a great distance from stream. Specialized heavy equipment required.

REACH SKETCH AND SITE LEVEL ASSESSMENT TRACKING

Simple planar sketch of survey reach. Track locations and IDs for all site level assessments within the survey reach (OT, ER, IB,SC, UT, TR, MI) as well as any additional features deemed appropriate. Indicate direction of flow



NOTES: *(biggest problem you see in survey reach)*

REPORTED TO AUTHORITIES ☐ YES ☐ NO

C.

OVERALL STREAM CONDITION				
	Optimal	**Suboptimal**	**Marginal**	**Poor**
IN-STREAM HABITAT *(May modify criteria based on appropriate habitat regime)*	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0
VEGETATIVE PROTECTION *(score each bank, determine sides by facing downstream)*	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0
BANK EROSION (facing downstream)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Grade and width stable; isolated areas of bank failure/erosion; likely caused by a pipe outfall, local scour, impaired riparian vegetation or adjacent use.	Past downcutting evident, active stream widening, banks actively eroding at a moderate rate; no threat to property or infrastructure	Active downcutting; tall banks on both sides of the stream eroding at a fast rate; erosion contributing significant amount of sediment to stream; obvious threat to property or infrastructure.
	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0
FLOODPLAIN CONNECTION	High flows (greater than bankfull) able to enter floodplain. Stream not deeply entrenched.	High flows (greater than bankfull) able to enter floodplain. Stream not deeply entrenched.	High flows (greater than bankfull) **not** able to enter floodplain. Stream deeply entrenched.	High flows (greater than bankfull) **not** able to enter floodplain. Stream deeply entrenched.
	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
OVERALL BUFFER AND FLOODPLAIN CONDITION				
	Optimal	**Suboptimal**	**Marginal**	**Poor**
VEGETATED BUFFER WIDTH	Width of buffer zone >50 feet; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, crops) have not impacted zone.	Width of buffer zone 25-50 feet; human activities have impacted zone only minimally.	Width of buffer zone 10-25 feet; human activities have impacted zone a great deal.	Width of buffer zone <10 feet: little or no riparian vegetation due to human activities.
	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0
FLOODPLAIN VEGETATION	Predominant floodplain vegetation type is mature forest	Predominant floodplain vegetation type is young forest	Predominant floodplain vegetation type is shrub or old field	Predominant floodplain vegetation type is turf or crop land
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
FLOODPLAIN HABITAT	Even mix of wetland and non-wetland habitats, evidence of standing/ponded water	Even mix of wetland and non-wetland habitats, no evidence of standing/ponded water	Either all wetland or all non-wetland habitat, evidence of standing/ponded water	Either all wetland or all non-wetland habitat, no evidence of standing/ponded water
	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
FLOODPLAIN ENCROACH-MENT	No evidence of floodplain encroachment in the form of fill material, land development, or manmade structures	Minor floodplain encroachment in the form of fill material, land development, or manmade structures, but not effecting floodplain function	Moderate floodplain encroachment in the form of filling, land development, or manmade structures, some effect on floodplain function	Significant floodplain encroachment (i.e. fill material, land development, or man-made structures). Significant effect on floodplain function
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0

Sub Total In-stream: 43 /80 + Buffer/Floodplain: 27 /80 = **Total** Survey Reach 70 /160

How the Example RCH Form Was Completed

Part A

In this example, field crews performed an RCH assessment for reach 102-1 in the Smiley Run subwatershed. The survey reach started just downstream of the stormwater pond and ended at the 5th Avenue road crossing. It was partly cloudy during the assessment and no rain showers had occurred over the past 24 hours. Land use along this survey reach was predominantly commercial (right side) and high density residential (left side).

Part B

The field crew indicated on this part of the form that base flow was clear and took up most of the eight-foot wide channel bottom. The most prevalent surface substrate was gravel, and attached algae were observed in the reach, but were not considered excessive. Field crews noted signs of deer and beaver along the reach, and indicated that trees along the banks shaded about half its length. The dominant channel process affecting the survey reach was unknown, and banks were less than four feet high. From the sketch, you can see that eight impact forms were completed in the survey reach (a stormwater outfall, bank erosion, impacted buffer, trash dump, two stream crossings with a modified channel, and an exposed utility). The field crew indicated that the top priority for restoration in this survey reach was stabilization of the eroding bank (ER-1) at the point where the utility line and manhole stack were exposed.

Part C

Field crews determined that overall conditions for survey reach 102-1 were marginal, with flood plain conditions bringing the total score down (total score of 70).

Chapter 12: Interpreting and Using USA Data in Subwatershed Restoration Plans

The USA generates a wealth of information to help define an initial stream corridor restoration strategy for your subwatershed. This chapter presents a series of methods to compile, organize and interpret your USA data. Six different methods can be used to translate USA data into effective upland restoration projects:

1. Basic Data Management and Quality Control
2. Simple Stream Corridor Project Counts
3. Mapping USA Data
4. Devising USA Metrics
5. Subwatershed and Reach Screening
6. Additional Stream Corridor Investigations

The choice of which method(s) to use depends on your local resources, restoration goals, and the actual problems and opportunities discovered in the stream corridor. In general, the most common stream corridor problems and opportunities will shape your initial subwatershed restoration strategy. This initial strategy outlines which candidate sites or reaches should be targeted for more detailed investigations for future restoration project design.

12.1 Basic Data Management and Quality Control

The USA produces an enormous amount of raw data to characterize stream corridor conditions. It is not uncommon to compile dozens and even hundreds of individual forms for a single subwatershed. The real trick is to devise a system to organize, process, and translate this data into simpler outputs and formats that can guide subwatershed restoration efforts. The system starts with effective quality control procedures in the field.

To start, organize field forms in a three-ring binder instead of the traditional clipboard, at least for the eight impact forms. A small **field binder** lets you quickly flip back and forth between the various forms you will be using during your stream walk. RCH sheets and photo tracking forms can be kept in one section and the impact assessment forms in another. Authorization letters and emergency contact lists can be tucked into the binder's front pocket.

Carry enough blank forms for the day's work; this will depend on the density and types of problem areas you expect to encounter. For example, if you anticipate having a lot of storm water outfalls and sewer lines in your subwatershed, take a lot of OT and UT forms with you. Blank USA field forms are provided in Appendix A. Feel free to double-side forms to minimize the number of copies you will need to make. Also, copying field sheets onto hole-punched paper saves time. If you use handheld computer devices (such as personal data assistants or PDAs) to record and store field data, you can save a lot of time and tedious data entry when you get back in the office.

At the end of each day, field crews should regroup at a predetermined location to compare notes. The crew leader should confirm that all survey reaches have been surveyed, discuss initial findings, and deal with any logistical problems. It is also a good time to check whether field crews are measuring and evaluating impact data in the same way, and are consistent in what they are (or are not) recording. Crew leaders should also use this time to review field forms for accuracy and thoroughness. Illegible handwriting should be neatened and details added to notes and sketches. Also, make sure that RCH sketches include all site impacts, and that reach IDs, GPS waypoints, and photo numbers are properly cross-referenced.

The crew leader should also organize the forms together into a single **master binder** for future analysis. This binder should be divided into nine sections, one for RCH forms, and eight for the impact forms. If you are using photo tracking forms, then you will need an additional section in the master binder. Blank field sheets should be added to the field binders at this time.

Once you return from the field, data should be entered into a spreadsheet or directly into GIS. Spreadsheets are probably the easiest method to sort USA data. Appendix B provides a specially-modified Microsoft Access database, which can be used to input and organize your USA data. Access allows you to enter data into forms that look like the field sheet and can link databases by survey reaches (Figure 41).

Spreadsheet data can also easily be imported into GIS for mapping purposes. The GIS system will create its own database table that allows you to create subwatershed maps showing reach quality, problem areas, and candidate restoration sites.

Once data entry is completed, you should be sure to check the quality of USA data by randomly spot-checking 10% of entered data. For example, if you had 100 field forms, check 10 of the spreadsheet entries. Once data can be transferred into GIS, **quality control maps** should be created that display labeled problem sites and survey reaches color coded by total habitat score. Each member of the field crew should review the accuracy of quality control maps.

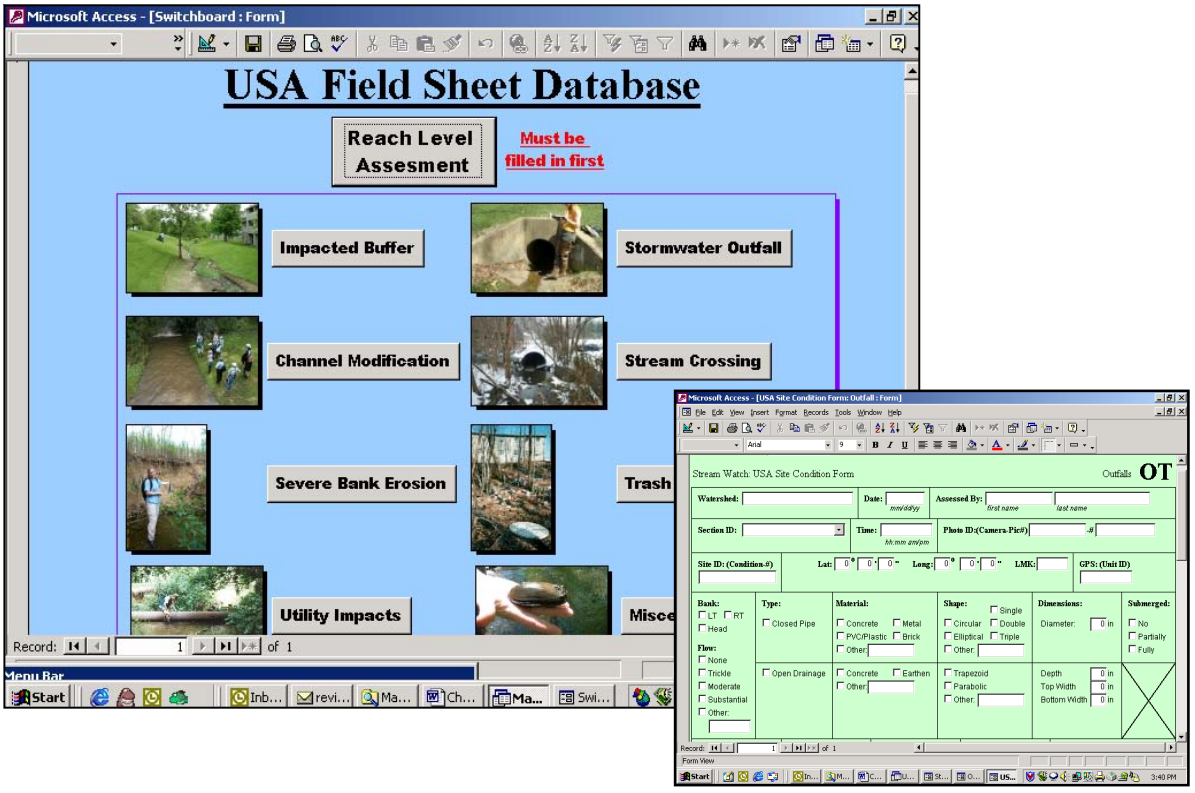


Figure 41: Example Screens from USA Access Database

12.2 Simple Stream Corridor Project Counts

An initial screening analysis counts the major outputs of the USA that appear to have the greatest stream corridor restoration potential. Often, the sheer number, length or area of stream corridor problems will give you a strong sense of what practices to consider in the restoration plan. For example, you may want to compile the number and distribution of the following:

- Suspect outfalls or sewage discharges
- Storage retrofit candidate sites
- Stream daylighting opportunities
- Severe bank erosion sites
- Inadequate buffers
- Suspected fish barriers
- Channelized segments
- Livestock access points
- Threatened infrastructure
- RCH habitat score
- Reach erosion severity score

At this stage, you simply count the number of sites, or express them as a fraction of total stream corridor or survey reach length. For example, counts may include the length of inadequate buffers as a fraction of total stream length, the number of suspected outfalls, potential storage retrofit sites, or severe bank erosion sites.

Based on your counts, you may discover that a particular stream corridor restoration strategy may not apply to the subwatershed. For example, if no suspect outfalls or sewer overflows are found in the survey, you won't want to make discharge investigations a big part of the initial restoration strategy. On the other hand, if the USA counts reveal that dozens of impacted buffer sites exist along the stream corridor, you may want to immediately pursue more detailed reforestation investigations. The key point is to avoid getting lost in the raw data, but look instead to find patterns that can shape the development of the initial restoration strategy.

12.3 Mapping USA Data

Maps are always an excellent way to portray stream corridor data. If your GIS system is linked to the USA database, many different kinds of stream corridor maps can be created to show the spatial distribution of stream problems, potential restoration projects, and overall reach conditions. What you choose to map depends on your initial findings, restoration goals, available software, and GIS capability. Many different kinds of USA data can be effectively portrayed on maps:

- Suspect storm water outfalls
- Potential storage retrofit sites
- Potential daylighting locations
- Threatened infrastructure
- Potential riparian reforestation sites
- Buffers needing invasive species control
- Dumping and trash clean-up sites
- Stream adoption segments
- Channelized segments and associated de-channelization projects
- Potential fish barriers
- Grade control structures
- Natural area remnants along the steam corridor
- Current and future monitoring stations
- Reach habitat quality scores
- Reach bank erosion scores
- Severe erosion sites for stream repair or bank stabilization

Subwatershed maps that depict reach quality and the locations of all potential stream corridor restoration projects are especially useful in restoration planning (Figure 42). Maps that overlay the locations of restoration projects on aerial photos are quite effective for showing stakeholders exactly where restoration sites are located in the subwatershed (Figure 43). These maps can also help identify adjacent stakeholders that should be consulted about proposed restoration projects.

Where possible, USA data should be integrated with USSR data to better understand the relationship between upland areas and the stream corridor. For example, you may want to examine the relationship between upland retrofits and downstream stream repair

projects, as shown in Figure 44. When USSR and USA data are combined on a single map, you often discover connections between subwatershed pollution sources and stream corridor impacts (e.g., suspect outfalls, dumping sites, bank erosion, etc.). Combined maps can also powerfully illustrate the link between upland residential behaviors and stream quality conditions.

The key point to remember is that maps are only a tool of restoration and not a final end point. Try to map with a purpose in mind. A large number of cluttered subwatershed maps

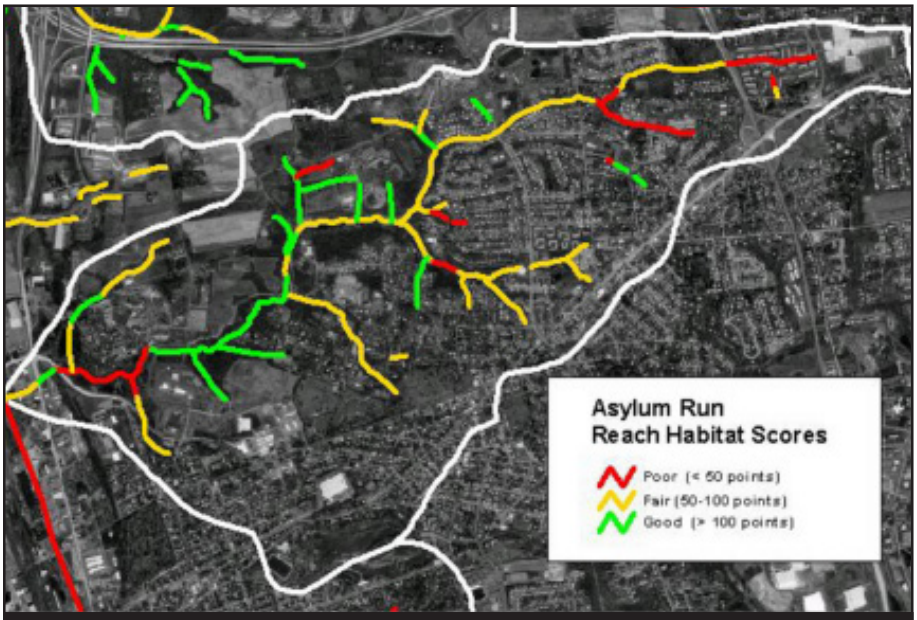


Figure 42: Reach Habitat Quality Map
USA stream corridor map showing locations of poor, fair, and good quality reaches based on total habitat scores from the RCH assessment.

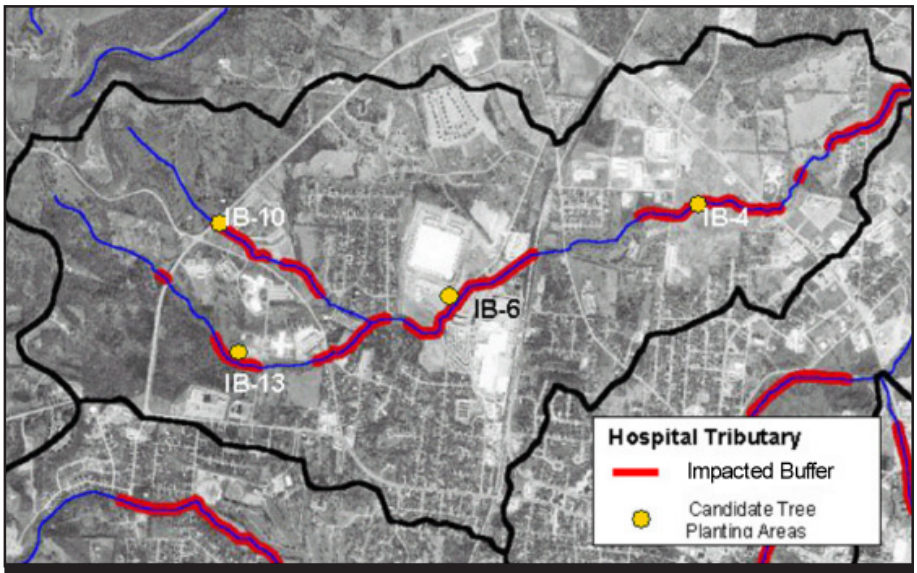


Figure 43: Location of Impacted Buffers and Potential Restoration Sites
USA stream corridor map showing locations of impacted stream buffers and four prime locations for active riparian reforestation projects.

may only confuse stakeholders, whereas a smaller number of well-designed maps may stimulate ideas for the initial restoration strategy.

12.4 Deriving Stream Corridor Metrics

"Stream corridor metrics" is a term used to describe the process of aggregating data from individual USA forms to get a clearer picture of what is happening at the survey reach or stream corridor level. Metrics are expressed as the frequency of a problem or restoration opportunity over a defined stream length or stream corridor area. One example of a stream corridor metric is the number of suspect storm water outfalls per stream mile (i.e., the storm water outfalls with dry weather flows and signs of possible sewage contamination recorded on the OT field form). Stream corridors with a high density of suspect outfalls are obviously a high priority for additional pipe discharge investigations to find and fix illicit discharges. Consequently, communities with NPDES Phase I or II storm water permits may want to use this metric to decide where to look for illicit discharges. The ability to trace illicit discharges is further enhanced when the metric is coupled with other upland metrics, such as the density of confirmed storm water hotspots and pollutant-generating land uses.

Other stream corridor metrics examine the quality of riparian buffers. Two different metrics can be derived, depending on your needs. The first looks at riparian forest continuity, measured as the length of inadequate buffers as a fraction of total stream length. This metric can help distinguish survey reaches based on the continuity of stream buffer cover. Alternately, you may want to derive a metric that looks at the percent of the stream corridor that can feasibly be reforested. This metric is computed by comparing the total length (or area) of reforestation sites ranked highly on the IB form to the total length (or area) of the entire stream corridor.

The RCH assessment form can be used to derive several metrics that give a good picture of the overall quality of the stream corridor, and the feasibility of restoration. For example, the back of the RCH form contains an overall index of stream habitat quality, which can be subdivided into stream and flood plain components. Other metrics can be computed from the RCH form that relates to the overall feasibility of restoration, such as reach accessibility, land ownership and wildlife utilization. Additional ideas on other stream corridor metrics that can help guide restoration plans are provided in Table 30.

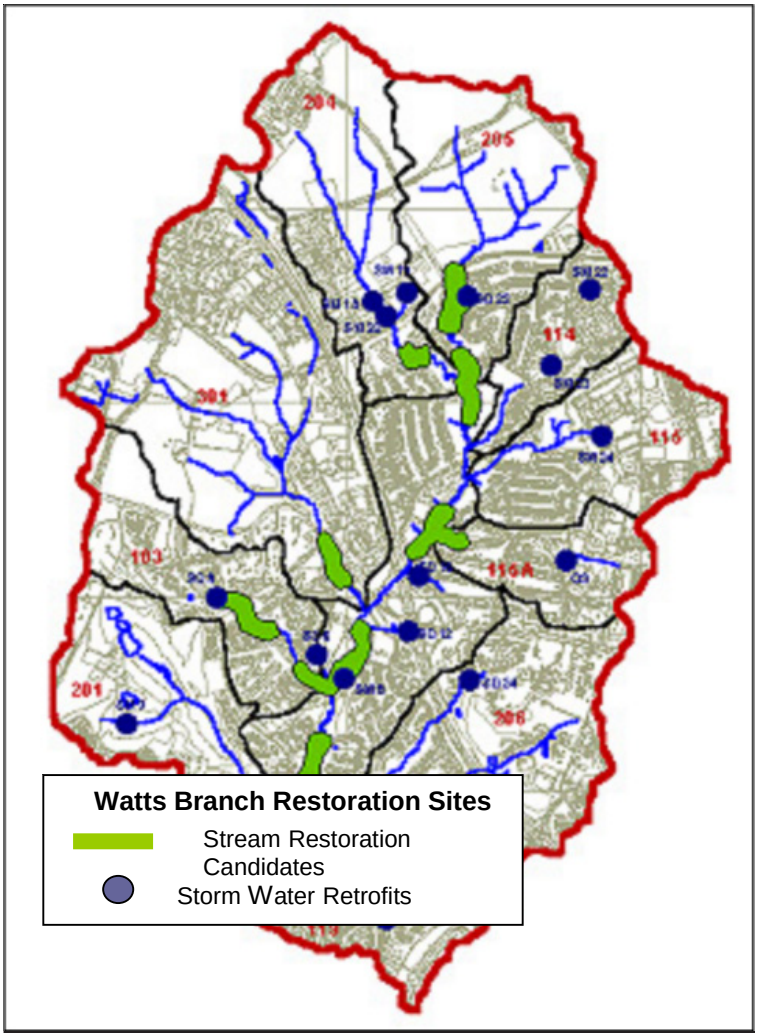


Figure 44: Combining Stream Corridor and Upland Restoration Projects

This example shows stream restoration sites and potential storage retrofits identified during the USA and USSR surveys. Priority stream restoration projects should often be combined with an upland retrofit to control the volume of upstream storm flows.

Table 30: Metrics Generated Using USA Data	
Assessment	**Stream Corridor Metric**
OT	Outfall density Density of suspect outfalls (#/stream mile) Number of outfalls discharging uncontrolled storm water Treatable outfalls Length of potential daylighting
ER	# of severe bank erosion sites Estimated bank erosion sediment load
IB	Riparian forest continuity (buffer miles/stream miles) % of stream corridor that can be reforested % of buffer length needing invasive species control
UT	# of sanitary sewer overflows # of leaking sewer pipes and manholes Sewers crossings/stream mile
TR	General index of trashiness
SC	Stream interruption (crossings/mile) # of potential retrofit crossings
CM	Channel density (miles/sq. mile) Channelized length Channelized length per stream mile
MI	# of natural area remnants and wetlands # of livestock access points per stream mile # of log jams
RCH	Stream density (miles/sq. mile) # of problems/survey reach Stream corridor habitat index Streambank erosion severity index Access and other feasibility factors

12.5 Subwatershed and Reach Screening

Stream corridor metrics are particularly valuable to screen or rank restoration potential among groups of subwatersheds and streams. The basic approach is simple: select the metrics you feel are most important to your watershed planning goals, and then see how individual subwatersheds or reaches rank in the process. A simple example of this screening process is provided in Table 31. In this hypothetical example, the goal was to find the best stream reach to restore aquatic diversity. The design team derived four reach metrics that they felt would contribute most to success: riparian forest continuity, the absence of fish barriers, overall reach habitat score, and the presence of upstream retrofits. Based on this screening process, stream reach 102 was considered to have the greatest overall stream restoration potential for three of the four metrics, and was therefore selected for subsequent stream reach investigations.

The same basic approach can be used to compare subwatersheds as part of a larger watershed restoration strategy. In this case, this screening process determines which subwatersheds will be priorities for initial implementation. An example of subwatershed severity is provided in Table 32. The goal for the watershed was to stabilize streambanks and reduce channel erosion in the stream corridor. The design team chose four reach metrics to screen three subwatersheds. The four metrics

that defined the severity of the erosion problem and project feasibility were the number of severe erosion sites, threatened infrastructure, the bank erosion, and reach accessibility. Based on these screening criteria, the design team selected subwatershed X as the focus of the next phase of detailed field investigation.

The last example of how USA metrics can be used for screening involves the selection of priority reaches for riparian reforestation (Table 33). In this instance, the goal was to select the stream reach that would result in the most reforestation with the highest degree of survival. The local watershed group selected four USA reach metrics they felt would contribute to most to this goal: the percent of stream corridor that could be reforested (i.e., sites rated good or better on the IB form), the percentage of stream corridor in public ownership, the overall riparian habitat score and the amount of deer/beaver activity (the last three derived from the RCH form). Based on the screening process, the group concluded that reforestation in reach 203 would have the greatest impact and survival, and targeted it for a riparian reforestation inventory.

Table 31: An Example of Using USA Data to Compare Reaches

	Riparian Forest Continuity	Suspected Fish Barriers	Overall RCH Habitat Score	Upstream Retrofit?
Reach 101	20%	8	68	No
Reach 102	60%	0	127	Yes
Reach 103	65%	2	104	No

Table 32: An Example of Using USA Data to Compare Across Subwatersheds

	# of Severe Bank Erosion Sites	Threatened Infrastructure Sites	RCH Bank Erosion Severity Score	Reach Accessibility
Subwatershed X	12	3	23	Good
Subwatershed Y	7	4	40	Difficult
Subwatershed Z	3	0	61	Fair

Table 33: An Example of Using USA Data to Select Priorities

	% of Stream Corridor that can be Reforested	Publicly-Owned Stream Corridor	Overall RCH Riparian Score	Deer/Beaver Activity
Reach 201	10	0%	31	Moderate
Reach 202	22	25%	42	Low
Reach 203	35	25%	53	Low

12.6 Additional Stream Corridor Project Investigations

By now, USA data analyses will help focus on the initial priorities for your stream corridor restoration strategy. The next step is to undertake more detailed follow-up investigations to assess the feasibility of candidate project sites and begin restoration design. Follow-up investigations create an inventory of stream corridor restoration projects for subsequent review by subwatershed stakeholders.

Table 34 describes the range of additional stream corridor investigations that may be triggered by your USA data analysis. The basic investigation techniques are summarized in Manual 2, with expanded descriptions for each technique found in Manuals 3, 4, 5, and 7. You should carefully choose the ones that are right for your subwatershed. Good hunting!

Table 34: How to Use USA Metrics to Develop an Initial Restoration Strategy

Restoration Practice	Follow-up Project Investigations	Corresponding Manual
Storage Retrofit	Retrofit Reconnaissance Inventory	Manual 3
Stream Restoration	Stream Reach Investigation	Manual 4
Riparian Restoration	Natural Area Remnant Investigations Riparian Reforestation Inventory	Manual 7 Manual 5
Discharge Prevention	Discharge Prevention Investigations	Manual 6
Other	Enforcement Actions	Manual 9

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Appendix A: USA Field Forms

013125

Storm Water Outfalls **OT**

WATERSHED/SUBSHED:		**DATE:** ___/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**____:____AM/PM	**PHOTO ID:** (*Camera-Pic #*)	/#
SITE ID (*Condition-#*): **OT-**_____	**LAT** ___°_____'_____" **LONG** ___°_____'_____"	**LMK**_____	**GPS:** (*Unit ID*)

BANK: ☐LT ☐RT ☐ Head

FLOW: ☐ None ☐ Trickle ☐ Moderate ☐ Substantial ☐ Other:

TYPE: ☐ Closed pipe

MATERIAL: ☐ Concrete ☐ Metal ☐ PVC/Plastic ☐ Brick ☐ Other:

SHAPE: ☐ Single ☐ Circular ☐ Double ☐ Elliptical ☐ Triple ☐ Other:

DIMENSIONS: Diameter:_____(in)

SUBMERGED: ☐ No ☐ Partially ☐ Fully

☐ Open channel

☐ Concrete ☐ Earthen ☐ Other:

☐ Trapezoid ☐ Parabolic ☐ Other:

Depth: _____(in)
Width (Top):_____(in)
" (Bottom):_____(in)

NOT APPLICABLE

CONDITION: ☐ None ☐ Chip/Cracked ☐ Peeling Paint ☐ Corrosion ☐ Other:

ODOR: ☐ No ☐ Gas ☐ Sewage ☐ Rancid/Sour ☐ Sulfide ☐ Other:

DEPOSITS/STAINS: ☐ None ☐ Oily ☐ Flow Line ☐ Paint ☐ Other:

VEGGIE DENSITY: ☐ None ☐ Normal ☐ Inhibited ☐ Excessive ☐ Other:

PIPE BENTHIC GROWTH: ☐ None ☐ Brown ☐ Orange ☐ Green ☐ Other:

POOL QUALITY: ☐ No pool ☐ Good ☐ Odors ☐ Colors ☐ Oils ☐ Suds ☐ Algae ☐ Floatables ☐ Other:

FOR FLOWING ONLY	**COLOR:**	☐ Clear ☐ Brown ☐ Grey ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:
	TURBIDITY:	☐ None ☐ Slight Cloudiness ☐ Cloudy ☐ Opaque
	FLOATABLES:	☐ None ☐ Sewage (toilet paper, etc.) ☐ Petroleum (oil sheen) ☐ Other:

OTHER CONCERNS: ☐ Excess Trash (paper/plastic bags) ☐ Dumping (bulk) ☐ Excessive Sedimentation ☐ Needs Regular Maintenance ☐ Bank Erosion ☐ Other:

POTENTIAL RESTORATION CANDIDATE ☐ Discharge investigation ☐ Stream daylighting ☐ Local stream repair/outfall stabilization ☐ no ☐ Storm water retrofit ☐ Other:

If yes for daylighting:

Length of vegetative cover from outfall: _____ft Type of existing vegetation:_____ Slope: _____°

If yes for stormwater:

Is stormwater currently controlled? ☐ Yes ☐ No ☐ Not investigated

Land Use description:_____

Area available:

OUTFALL SEVERITY: *(circle #)*	Heavy discharge with a distinct color and/or a strong smell. The amount of discharge is significant compared to the amount of normal flow in receiving stream; discharge appears to be having a significant impact downstream.	Small discharge; flow mostly clear and odorless. If the discharge has a color and/or odor, the amount of discharge is very small compared to the stream's base flow and any impact appears to be minor / localized.	Outfall does not have dry weather discharge; staining; or appearance of causing any erosion problems.
	5	4 3	2 1

SKETCH/NOTES:

REPORTED TO AUTHORITIES: ☐ YES ☐ NO

013127

Severe Bank Erosion **ER**

WATERSHED/SUBSHED:		**DATE:** ___/_____/___	**ASSESSED BY:**
SURVEY REACH:	**TIME:**___:___AM/PM	**PHOTO ID** (CAMERA-PIC #):	/#
SITE ID: (*Condition-#*) **ER-**_____	*START* **LAT** ___°___'___" **LONG** ___°___'___" **LMK** _____		**GPS:** (*Unit ID*)
	END **LAT** ___°___'___" **LONG** ___°___'___" **LMK** _____		

PROCESS: ☐ Currently unknown

☐ Downcutting ☐ Widening ☐ Headcutting ☐ Aggrading ☐ Sed. deposition

☐ Bed scour ☐ Bank failure ☐ Bank scour ☐ Slope failure ☐ Channelized

BANK OF CONCERN: ☐ LT ☐ RT ☐ Both (*looking downstream)*

LOCATION: ☐ Meander bend ☐ Straight section ☐ Steep slope/valley wall ☐ Other:

DIMENSIONS:

Length *(if no GPS)*	LT_____ft	and/or RT_____ft	Bottom width _____ft
Bank Ht	LT_____ft	and/or RT_____ft	Top width _____ft
Bank Angle	LT_____°	and/or RT_____°	Wetted Width _____ft

LAND OWNERSHIP: ☐ Private ☐ Public ☐ Unknown

LAND COVER: ☐ Forest ☐ Field/Ag ☐ Developed:

POTENTIAL RESTORATION CANDIDATE: ☐ Grade control ☐ Bank stabilization ☐ No ☐ Other:

THREAT TO PROPERTY/INFRASTRUCTURE: ☐ No ☐ Yes (Describe):

EXISTING RIPARIAN WIDTH: ☐ ≤25 ft ☐ 25 - 50 ft ☐ 50-75ft ☐ 75-100ft ☐ >100ft

EROSION SEVERITY (*circle#*) Channelized= ☐ 1	Active downcutting; tall banks on both sides of the stream eroding at a fast rate; erosion contributing significant amount of sediment to stream; obvious threat to property or infrastructure.	Pat downcutting evident, active stream widening, banks actively eroding at a moderate rate; no threat to property or infrastructure		Grade and width stable; isolated areas of bank failure/erosion; likely caused by a pipe outfall, local scour, impaired riparian vegetation or adjacent use.
	5	4	3	2 1
ACCESS:	**Good access:** Open area in public ownership, sufficient room to stockpile materials, easy stream channel access for heavy equipment using existing roads or trails.	**Fair access**: Forested or developed area adjacent to stream. Access requires tree removal or impact to landscaped areas. Stockpile areas small or distant from stream.		**Difficult access.** Must cross wetland, steep slope or other sensitive areas to access stream. Minimal stockpile areas available and/or located a great distance from stream section. Specialized heavy equipment required.
	5	4	3	2 1

NOTES/CROSS SECTION SKETCH:

REPORTED TO AUTHORITIES ☐ YES ☐ NO

013129

Impacted Buffer **IB**

WATERSHED/SUBSHED:	**DATE:** ___/_____/___	**ASSESSED BY:**
SURVEY REACH:	**TIME:**___:____AM/PM	**PHOTO ID:** (*Camera-Pic #*) /#

SITE ID: (*Condition-#*) **IB-**_____	*START* **LAT** ____º____'____" **LONG** ____º____'____" **LMK** _____	**GPS:** (*Unit ID*)
	END **LAT** ____º____'____" **LONG** ____º____'____" **LMK** _____	

IMPACTED BANK: ☐ LT ☐ RT ☐ Both

REASON INADEQUATE: ☐ Lack of vegetation ☐ Too narrow ☐ Widespread invasive plants ☐ Recently planted ☐ Other:

LAND USE:	Private	Institutional	Golf Course	Park	Other Public
(Facing downstream) LT Bank	☐	☐	☐	☐	☐ :
RT Bank	☐	☐	☐	☐	☐ :

DOMINANT LAND COVER:	Paved	Bare ground	Turf/lawn	Tall grass	Shrub/scrub	Trees	Other
LT Bank	☐	☐	☐	☐	☐	☐	☐:
RT Bank	☐	☐	☐	☐	☐	☐	☐:

INVASIVE PLANTS: ☐ None ☐ Rare ☐ Partial coverage ☐ Extensive coverage ☐ unknown

STREAM SHADE PROVIDED? ☐ None ☐ Partial ☐ Full

WETLANDS PRESENT? ☐ No ☐ Yes ☐ Unknown

POTENTIAL RESTORATION CANDIDATE ☐ Active reforestation ☐ Greenway design ☐ Natural regeneration ☐ Invasives removal ☐ no ☐ Other:

RESTORABLE AREA

	LT BANK	RT
Length (ft):	_____	_____
Width (ft):	_____	_____

REFORESTATION POTENTIAL: (*Circle #*)

Impacted area on public land where the riparian area does not appear to be used for any specific purpose; plenty of area available for planting		Impacted area on either public or private land that is presently used for a specific purpose; available area for planting adequate		Impacted area on private land where road; building encroachment or other feature significantly limits available area for planting
5	4	3	2	1

POTENTIAL CONFLICTS WITH REFORESTATION ☐ Widespread invasive plants ☐ Potential contamination ☐ Lack of sun ☐ Poor/unsafe access to site ☐ Existing impervious cover ☐ Severe animal impacts (deer, beaver) ☐ Other:

NOTES:

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Stream Crossing **SC**

WATERSHED/SUBSHED:		**DATE:** ___/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**____:____AM/PM	**PHOTO ID:** (*Camera-Pic #*)	/#
SITE ID: (*Condition-#*) **SC-**_____	**LAT** ___°_____'_____" **LONG** ___°_____'_____"	**LMK**_____	**GPS** (*Unit ID*)

TYPE: ☐ Road Crossing ☐ Railroad Crossing ☐ Manmade Dam ☐ Beaver Dam ☐ Geological Formation ☐ Other:

FOR ROAD/ RAILROAD CROSSINGS ONLY

SHAPE:
☐ Arch ☐ Bottomless
☐ Box ☐ Elliptical
☐ Circular
☐ Other:

 # BARRELS:
☐ Single
☐ Double
☐ Triple
☐ Other:

MATERIAL:
☐ Concrete
☐ Metal
☐ Other:

ALIGNMENT:
☐ Flow-aligned
☐ Not flow-aligned
☐ Do not know

DIMENSIONS: (*if variable, sketch)*
Barrel diameter: _____(ft)
Height: _____(ft)
Culvert length: _____(ft)
Width: _____(ft)
Roadway elevation:_____(ft)

CONDITION: (*Evidence of…*)
☐ Cracking/chipping/corrosion ☐ Downstream scour hole
☐ Sediment deposition ☐ Failing embankment
☐ Other (*describe*):

CULVERT SLOPE:
☐ Flat
☐ Slight ($2^o - 5^0$)
☐ Obvious ($>5^o$)

POTENTIAL RESTORATION CANDIDATE ☐ Fish barrier removal ☐ Culvert repair/replacement ☐ Upstream storage retrofit
☐ no ☐ Local stream repair ☐ Other:

IS SC ACTING AS GRADE CONTROL ☐ No ☐ Yes ☐ Unknown

If yes for fish barrier

EXTENT OF PHYSICAL BLOCKAGE:
☐ Total ☐ Partial
☐ Temporary ☐ Unknown

CAUSE:
☐ Drop too high Water Drop: _____ (in)
☐ Flow too shallow Water Depth:_____ (in)
☐ Other:

BLOCKAGE SEVERITY: *(circle #)*

5	4	3	2	1
A structure such as a dam or road culvert on a 3rd order or greater stream blocking the upstream movement of anadromous fish; no fish passage device present.		A total fish blockage on a tributary that would isolate a significant reach of stream, or partial blockage that may interfere with the migration of anadromous fish.		A temporary barrier such as a beaver dam or ablockage at the very head of a stream with very little viable fish habitat above it; natural barriers such as waterfalls.

NOTES/SKETCH:

REPORTED TO AUTHORITIES ☐ YES ☐ NO

013133

Channel Modification **CM**

WATERSHED/SUBSHED:	**DATE:** ___/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**___:_____AM/PM	**PHOTO ID:** (*Camera -Pic #*) #

SITE ID: (*Condition-#*) **CM-**_____

START **LAT** ____°____'____" **LONG** ____°____'____" **LMK** _____

END **LAT** ____°____'____" **LONG** ____°____'____" **LMK** _____

GPS: (*Unit ID*)

TYPE: ☐ Channelization ☐ Bank armoring ☐ concrete channel ☐ Floodplain encroachment ☐ Other:

MATERIAL:
☐ Concrete ☐ Gabion
☐ Rip Rap ☐ Earthen
☐ Metal
☐ Other:

Does channel have perennial flow?	☐ Yes ☐ No
Is there evidence of sediment deposition?	☐ Yes ☐ No
Is vegetation growing in channel?	☐ Yes ☐ No
Is channel connected to floodplain?	☐ Yes ☐ No

DIMENSIONS:
Height _____(ft)
Bottom Width _____(ft)
Top Width: _____(ft)
Length: _____(ft)

BASE FLOW CHANNEL
Depth of flow _____(in)
Defined low flow channel? ☐ Yes ☐ No
% of channel bottom _____%

ADJACENT STREAM CORRIDOR
Available width LT_____(ft) RT_____(ft)
Utilities Present? ☐ Yes ☐ No
Fill in floodplain? ☐ Yes ☐ No

POTENTIAL RESTORATION CANDIDATE ☐ Structural repair ☐ Base flow channel creation ☐ Natural channel design ☐ Can't tell ☐ no ☐ De-channelization ☐ Fish barrier removal ☐ Bioengineering

CHANNEL-IZATION SEVERITY: (*Circle #*)			
	A long section of concrete stream (>500') channel where water is very shallow (<1" deep) with no natural sediments present in the channel.	A moderate length (> 200') ,but channel stabilized and beginning to function as a natural stream channel. Vegetated bars may have formed in channel.	An earthen channel less than 100 ft with good water depth, a natural sediment bottom, and size and shape similar to the unchannelized stream reaches above and below impacted area.
	5 4 3 2 1		

NOTES:

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Trash and Debris **TR**

WATERSHED/SUBSHED:		**DATE:** ___/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**____:____AM/PM	**PHOTO ID:** (*Camera -Pic #*)	/#
SITE ID: (*Condition-#*) **TR-**_____	**LAT** ___°_____'_____" **LONG** ___°_____'_____" **LMK** _____		**GPS:** (*Unit ID*)

TYPE:
- ☐ Industrial
- ☐ Commercial
- ☐ Residential

MATERIAL:
- ☐ Plastic
- ☐ Paper
- ☐ Metal
- ☐ Tires
- ☐ Construction
- ☐ Medical
- ☐ Appliances
- ☐ Yard Waste
- ☐ Automotive
- ☐ Other:

SOURCE:
- ☐ Unknown
- ☐ Flooding
- ☐ Illegal dump
- ☐ Local outfall

LOCATION:
- ☐ Stream
- ☐ Riparian Area
  - ☐ Lt bank
  - ☐ Rt bank

LAND OWNERSHIP:
- ☐ Public
- ☐ Unknown
- ☐ Private

AMOUNT (*# Pickup truck loads*):

POTENTIAL RESTORATION CANDIDATE ☐ Stream cleanup ☐ Stream adoption segment ☐ Removal/prevention of dumping ☐ no ☐ Other:

If yes for trash or debris removal

EQUIPMENT NEEDED: ☐ Heavy equipment ☐ Trash bags ☐ Unknown

WHO CAN DO IT: ☐ Volunteers ☐ Local Gov ☐ Hazmat Team ☐ Other

DUMPSTER WITHIN 100 FT: ☐ Yes ☐ No ☐ Unknown

CLEAN-UP POTENTIAL: (*Circle #*)

5	4	3	2	1
A small amount of trash (i.e., less than two pickup truck loads) located inside a park with easy access		A large amount of trash, or bulk items, in a small area with easy access. Trash may have been dumped over a long period of time but it could be cleaned up in a few days, possibly with a small backhoe.		A large amount of trash or debris scattered over a large area, where access is very difficult. Or presence of drums or indications of hazardous materials

NOTES:

REPORTED TO AUTHORITIES ☐ YES ☐ NO

Utility Impacts **UT**

WATERSHED/SUBSHED:	**DATE:** ___/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**____:____AM/PM	**PHOTO ID:** (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) **UT-**_____	**LAT**___°_____'_____" **LONG** ___°_____'_____" **LMK:** _____	**GPS:** (*Unit ID*)

TYPE:
- ☐ Leaking sewer
- ☐ Exposed pipe
- ☐ Exposed manhole
- ☐ Other:

MATERIAL:
- ☐ Concrete
- ☐ Corrugated metal
- ☐ Smooth metal
- ☐ PVC
- ☐ Other:

LOCATION:
- ☐ Floodplain
- ☐ Stream bank
- ☐ Above stream
- ☐ Stream bottom
- ☐ Other:

POTENTIAL FISH BARRIER: ☐ Yes ☐ No

PIPE DIMENSIONS:
Diameter: _____in
Length exposed: _____ft

CONDITION: ☐ Joint failure ☐ Pipe corrosion/cracking ☐ Protective covering broken ☐ Manhole cover absent ☐ Other:

EVIDENCE OF DISCHARGE:		
	COLOR	☐ None ☐ Clear ☐ Dark Brown ☐ Lt Brown ☐ Yellowish ☐ Greenish ☐ Other:
	ODOR	☐ None ☐ Sewage ☐ Oily ☐ Sulfide ☐ Chlorine ☐ Other:
	DEPOSITS	☐ None ☐ Tampons/Toilet Paper ☐ Lime ☐ Surface oils ☐ Stains ☐ Other:

POTENTIAL RESTORATION CANDIDATE ☐ Structural repairs ☐ Pipe testing ☐ Citizen hotlines ☐ Dry weather sampling ☐ no ☐ Fish barrier removal ☐ Other:

If yes to fish barrier, Water Drop: _____ (in)

UTILITY IMPACT SEVERITY: (*Circle #*)					
Leaking= ☐ 5	Section of pipe undermined by erosion and could collapse in the near future; a pipe running across the bed or suspended above the stream; a long section along the edge of the stream where nearly the entire side of the pipe is exposed; or a manhole stack that is located in the center of the stream channel and there is evidence of stack failure.	A moderately long section of pipe is partially exposed but there is no immediate threat that the pipe will be undermined and break in the immediate future. The primary concern is that the pipe may be punctured by large debris during a large storm event.	Small section of exposed pipe, stream bank near the pipe is stable; the pipe is across the bottom of the stream but only a small portion of the top of the pipe exposed; the pipe is exposed but is reinforced with concrete and it is not causing a blockage to upstream fish movement; a manhole stack that is at the edge of the stream and does not extend very far out into the active stream channel.		
	5	4	3	2	1

NOTES:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

Miscellaneous **MI**

WATERSHED/SUBSHED:	**DATE:** ____/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**____:____AM/PM	**PHOTO ID:** (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) **MI-**_____	**LAT**___°_____'_____" **LONG** ___°_____'_____" **LMK:** _____	**GPS:** (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

WATERSHED/SUBSHED:	**DATE:** ____/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**____:____AM/PM	**PHOTO ID:** (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) **MI-**_____	**LAT**___°_____'_____" **LONG** ___°_____'_____" **LMK:** _____	**GPS:** (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

WATERSHED/SUBSHED:	**DATE:** ____/_____/___	**ASSESSED BY:**
SURVEY REACH ID:	**TIME:**____:____AM/PM	**PHOTO ID:** (*Camera-Pic #*) /#
SITE ID: (*Condition-#*) **MI-**_____	**LAT**___°_____'_____" **LONG** ___°_____'_____" **LMK:** _____	**GPS:** (*Unit ID*)

POTENTIAL RESTORATION CANDIDATE ☐ Storm water retrofit ☐ Stream restoration ☐ Riparian Management
☐ no ☐ Discharge Prevention ☐ Other:

DESCRIBE:

REPORTED TO LOCAL AUTHORITIES ☐ Yes ☐ No

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Reach Level Assessment **RCH**

SURVEY REACH ID: _____	**WTRSHD/SUBSHD:**	**DATE:** ___/____/___	**ASSESSED BY:**

START **TIME:**____:____AM/PM **LMK:** _____	*END* **TIME:**____:____AM/PM **LMK:** _____	**GPS ID:**
LAT___°_____'_____" **LONG** ___°_____'_____"	**LAT**___°_____'_____" **LONG** ___°_____'_____"	
DESCRIPTION:	**DESCRIPTION:**	

RAIN IN LAST 24 HOURS ☐ Heavy rain ☐ Steady rain ☐ None ☐ Intermittent ☐ Trace

PRESENT CONDITIONS ☐ Heavy rain ☐ Steady rain ☐ Intermittent ☐ Clear ☐ Trace ☐ Overcast ☐ Partly cloudy

SURROUNDING LAND USE: ☐ Industrial ☐ Commercial ☐ Urban/Residential ☐ Suburban/Res ☐ Forested ☐ Institutional ☐ Golf course ☐ Park ☐ Crop ☐ Pasture ☐ Other:

AVERAGE CONDITIONS *(check applicable)*

BASE FLOW AS % CHANNEL WIDTH ☐ 0-25% ☐ 50%-75% ☐25-50 % ☐ 75-100%

DOMINANT SUBSTRATE
☐ Silt/clay (fine or slick) ☐ Cobble (2.5 –10")
☐ Sand (gritty) ☐ Boulder (>10")
☐ Gravel (0.1-2.5") ☐ Bed rock

WATER CLARITY ☐ Clear ☐Turbid *(suspended matter)*
☐ Stained *(clear, naturally colored)* ☐ Opaque *(milky)*
☐ Other *(chemicals, dyes)*

AQUATIC PLANTS IN STREAM
Attached: ☐ none ☐ some ☐ lots
Floating: ☐ none ☐ some ☐ lots

WILDLIFE IN OR AROUND STREAM (Evidence of)
☐ Fish ☐ Beaver ☐ Deer ☐ Snails ☐ Other:

STREAM SHADING (water surface)
☐ Mostly shaded (≥75% coverage)
☐ Halfway (≥50%)
☐ Partially shaded (≥25%)
☐ Unshaded (< 25%)

CHANNEL DYNAMICS

☐ Unknown	☐ Downcutting	☐ Bed scour
	☐ Widening	☐ Bank failure
	☐ Headcutting	☐ Bank scour
	☐ Aggrading	☐ Slope failure
	☐ Sed. deposition	☐ Channelized

CHANNEL DIMENSIONS *(FACING DOWNSTREAM)*
Height: LT bank _____(ft)
RT bank _____(ft)
Width: Bottom _____(ft)
Top _____(ft)

REACH ACCESSIBILITY

5	4	3	2	1
Good: Open area in public ownership, sufficient room to stockpile materials, easy stream channel access for heavy equipment using existing roads or trails.	**Fair**: Forested or developed area adjacent to stream. Access requires tree removal or impact to landscaped areas. Stockpile areas small or distant from stream.		**Difficult.** Must cross wetland, steep slope, or sensitive areas to get to stream. Few areas to stockpile available and/or located a great distance from stream. Specialized heavy equipment required.	

REACH SKETCH AND SITE IMPACT TRACKING

Simple planar sketch of survey reach. Track locations and IDs for all site impacts within the survey reach (OT, ER, IB,SC, UT, TR, MI) as well as any additional features deemed appropriate. Indicate direction of flow

NOTES: *(biggest problem you see in survey reach)*

REPORTED TO AUTHORITIES ☐ YES ☐ NO

OVERALL STREAM CONDITION				
	Optimal	**Suboptimal**	**Marginal**	**Poor**
IN-STREAM HABITAT *(May modify criteria based on appropriate habitat regime)*	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
VEGETATIVE PROTECTION *(score each bank, determine sides by facing downstream)*	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0
BANK EROSION (facing downstream)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Grade and width stable; isolated areas of bank failure/erosion; likely caused by a pipe outfall, local scour, impaired riparian vegetation or adjacent use.	Past downcutting evident, active stream widening, banks actively eroding at a moderate rate; no threat to property or infrastructure	Active downcutting; tall banks on both sides of the stream eroding at a fast rate; erosion contributing significant amount of sediment to stream; obvious threat to property or infrastructure.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0
FLOODPLAIN CONNECTION	High flows (greater than bankfull) able to enter floodplain. Stream not deeply entrenched.	High flows (greater than bankfull) able to enter floodplain. Stream not deeply entrenched.	High flows (greater than bankfull) **not** able to enter floodplain. Stream deeply entrenched.	High flows (greater than bankfull) **not** able to enter floodplain. Stream deeply entrenched.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
OVERALL BUFFER AND FLOODPLAIN CONDITION				
	Optimal	**Suboptimal**	**Marginal**	**Poor**
VEGETATED BUFFER WIDTH	Width of buffer zone >50 feet; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, crops) have not impacted zone.	Width of buffer zone 25-50 feet; human activities have impacted zone only minimally.	Width of buffer zone 10-25 feet; human activities have impacted zone a great deal.	Width of buffer zone <10 feet: little or no riparian vegetation due to human activities.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0
FLOODPLAIN VEGETATION	Predominant floodplain vegetation type is mature forest	Predominant floodplain vegetation type is young forest	Predominant floodplain vegetation type is shrub or old field	Predominant floodplain vegetation type is turf or crop land
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
FLOODPLAIN HABITAT	Even mix of wetland and non-wetland habitats, evidence of standing/ponded water	Even mix of wetland and non-wetland habitats, no evidence of standing/ponded water	Either all wetland or all non-wetland habitat, evidence of standing/ponded water	Either all wetland or all non-wetland habitat, no evidence of standing/ponded water
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
FLOODPLAIN ENCROACH-MENT	No evidence of floodplain encroachment in the form of fill material, land development, or manmade structures	Minor floodplain encroachment in the form of fill material, land development, or manmade structures, but not effecting floodplain function	Moderate floodplain encroachment in the form of filling, land development, or manmade structures, some effect on floodplain function	Significant floodplain encroachment (i.e. fill material, land development, or man-made structures). Significant effect on floodplain function
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Sub Total In-stream: _____ **/80** + Buffer/Floodplain: _____ **/80** = **Total** Survey Reach _____ **/160**

Photo Inventory

(By Camera)

Project: _____

Group: _____

Camera: _____

This field sheet is to be completed AS photos are taken in the field. The intent is to force us to organize pictures taken on a camera basis. Fill out one sheet per camera (add sheets as needed). Only fill in Date/Reach/Location ID when you start in a new spatial or temporal location.

Date	Stream/ Reach	Location ID	Photo #	Description

Date	Stream/ Reach	Location ID	Photo #	Description

Comments:

(BACK)

Appendix B: USA Data Entry Database

The USA Data Entry Database is an Access software application designed for use as part of the Unified Stream Assessment. An electronic version of the database is included with your copy of this manual.

013146

013147

United States Environmental Protection Agency
Office of Wastewater Management Washington DC 20460
EPA/833B-99/002 August 1999

Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants

013148

EPA/833B-99/002
August 1999

Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants

Office of Wastewater Management
U.S. Environmental Protection Agency
Washington, D.C. 20460

Notice and Disclaimer

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Foreword

This document is intended to provide guidance to permittees, permit writers, and consultants on the general approach and procedures for conducting toxicity reduction evaluations (TREs) at municipal wastewater treatment plants. TREs are important tools for Publicly Owned Treatment Works (POTWs) to use to identify and reduce or eliminate toxicity in a wastewater discharge. TREs may be required by the discharger's National Pollutant Discharge Elimination System (NPDES) permit or through state or federal enforcement actions. Dischargers can use the guidance to evaluate the nature and sources of effluent toxicity before a TRE becomes a regulatory requirement. Whether the TRE is voluntary or mandated, this guidance can be helpful in preparing and executing a plan to address effluent toxicity.

This guidance describes the general approaches that have been successfully used in municipal TREs. Each TRE will be different; therefore, the strategy for conducting TREs should be tailored to address site-specific conditions. The components of a TRE may include the collection and review of pertinent data; an evaluation of the treatment facility to identify conditions that may contribute to effluent toxicity; identification of effluent toxicants using toxicity identification evaluation (TIE) procedures (USEPA 1991a, 1992a, 1993a, 1993b, 1996); location of the sources of toxicants and/or toxicity using chemical analysis or refractory toxicity assessment (RTA) procedures; and the evaluation, selection, and implementation of toxicity control measures. Dischargers are encouraged to develop a TRE plan that describes the initial components to perform in the TRE. Following initial testing, the results can be used to provide direction for further testing to identify the cause(s) and source(s) of toxicity and evaluate and select methods for toxicity control.

This document is an update of the municipal TRE protocol that was published in 1989 (USEPA, 1989a). Much experience has been gained since 1989, including the use of a number of freshwater and estuarine/marine species in acute and chronic TRE studies and the development of additional procedures for TIE and RTA studies. In most cases, the approaches and methods described in the municipal TRE protocol have been validated through TRE studies and other municipal TREs (Amato et al., 1992; Bailey et al., 1995; Botts et al., 1990, 1992, 1993, 1994; Collins et al., 1991; Fillmore et al., 1990; Lankford and Eckenfelder, 1990; Morris et al., 1990, 1992). Important lessons have been learned and this information has been incorporated in this guidance where possible. Additions to this guidance include considerations in evaluating the operation and performance of current publicly owned treatment works (POTW) technology, descriptions of current TIE procedures for acute and short-term chronic toxicity (USEPA 1991a, 1992a, 1993a, 1993b, 1996), updated methods for tracking sources of acute and chronic toxicity in POTW sewer collection systems, and additional recent case studies on acute and chronic TREs using freshwater and estuarine/marine species. Information is also provided on sampling requirements, equipment and facilities, quality assurance/quality control, and health and safety.

The updated TIE guidance procedures are important tools for conducting TREs including *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I* (USEPA, 1992a), *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures, Second Edition* (USEPA, 1991a), *Marine Toxicity Identification Evaluation (TIE) Guidance Document, Phase I* (USEPA, 1996), *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (USEPA, 1993a), and *Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (USEPA, 1993b). The acute and chronic whole effluent toxicity testing manuals should also be reviewed during the TRE process (USEPA 1993c, 1994a, 1994b, 1995). These manuals describe procedures for the toxicity tests that are the core of the TREs.

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Acronyms, Abbreviations, and Symbols

AA	Atomic absorption
ACO	Administrative consent order
Ag	Silver
Alum	Aluminum sulfate
A/O®	Patented biological nutrient removal process
AQUIRE	Aquatic Information Retrieval Toxicity Data Base
APE	Alkylphenol ethoxylates
ASCE	American Society of Civil Engineers
ASM	American Society for Microbiology
ASTM	American Society for Testing and Materials
ATP	Adenosine triphosphate
BNR	Biological nutrient removal
BOD	Biochemical oxygen demand
BOD_5	Five-day biochemical oxygen demand
BOD_{20}	Twenty-day biochemical oxygen demand
°C	Degrees centigrade
$CaCO_3$	Calcium carbonate
CADPR	California Department of Pesticide Registration
Cb	Concentration of specified analyte in filtrate of return activated sludge biomass
CCCSD	Central Contra Costa Sanitary District
C. dubia	*Ceriodaphnia dubia*, cladoceran
Cd	Cadmium
Ce	Effluent concentration of the specified analyte
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
ChV	Chronic value, geometric mean of the no observed effect concentration (NOEC) and lowest observed effect concentration (LOEC)
Ci	Influent concentration of the specified analyte
CO_2	Carbon dioxide
COC	Chain-of-custody
COD	Chemical oxygen demand
Cpe	Concentration of specified analyte in primary effluent
Cr	Chromium
CSO	Combined sewer overflow
CTAS	Cobalt thiocyanate active substances
Cu	Copper
$CuSO_4$	Copper sulfate
cu ft/lb	Cubic feet per pound
CV	Coefficient of variation
CVP	Chlorfenvinphos
Cw	Concentration of specified analyte in sewer wastewater
CWA	Clean Water Act
C18	Carbon-based resin used in solid phase extraction (SPE) columns to evaluate for the presence of nonpolar organic toxicants
D. excentricus	*Dendraster excentricus*, sand dollar
D. magna	*Daphnia magna*, cladoceran
D. pulex	*Daphnia pulex*, cladoceran
DMR	Discharge monitoring report

Acronyms, Abbreviations, and Symbols (continued)

DO	Dissolved oxygen
EC50	Effective concentration causing a 50% effect in the test species
ECOTOX	Ecotoxicology Database Retrieval System
EDTA	Ethylenediaminetetraacetate
ELISA	Enzyme-linked immunosorbent assay
EXTOXNET	Extension Toxicology Network
F/M	Food to microorganism ratio
F/Mb	Food to microorganism ratio
Fw	Flow concentration factor for RTA testing
g/L	Grams per liter
gpd/sq ft	Gallons per day per square foot
gpm/sf	Gallons per minute per square foot
GAC	Granular activated carbon
GC	Gas chromatography
GC/MS	Gas chromatograph/mass spectrophotometer
H&S	Health and safety
Hg	Mercury
HNO_3	Nitric acid
H_2O_2	Hydrogen peroxide
HPLC	High-performance liquid chromatography
HRT	Hydraulic retention time
ICP	Inductively coupled plasma spectrometry
ICp	Inhibition concentration causing a percent effect (p) in the test species (e.g., IC25, IC50)
IWC	Instream waste concentration
IWS	Industrial waste survey
L	Liter
LC50	Lethal concentration causing a 50% mortality in exposed test organisms
LRSA	Linden Roselle Sewerage Authority
LOEC	Lowest observed effect concentration
$m^3/m^2/day$	Cubic meters per square meter per day
MBAS	Methylene blue active substances
MCRT	Mean cell residence time
MCWTP	Michigan City Wastewater Treatment Plant
mg/L	Milligram per liter
mg O_2/hr/g	Milligram dissolved oxygen per hour per gram
mg O_2/L/ gMLVSS/min	Milligram dissolved oxygen per liter per gram mixed liquor volatile suspended solids per minute
M. bahia	*Mysidopsis bahia*, mysid shrimp
mL	Milliliter
MLSS	Mixed liquor suspended solids
MLVSS	Mixed liquor volatile suspended solids
MS	Mass spectrometry
MSDS	Material safety data sheet
mgd	million gallons per day
NaCl	Sodium chloride
Na_2HPO_4	Disodium phosphate
NaH_2PO_4	Monosodium phosphate
NCDEM	North Carolina Division of Environmental Management

Acronyms, Abbreviations, and Symbols (continued)

NETAC	USEPA's National Effluent Toxicity Assessment Center
NH_3	Un-ionized ammonia
NH_4^+	Ammonium ion
NH_3-N	Total ammonia as nitrogen
Ni	Nickel
NIOSH	National Institute of Occupational Safety and Health
NJDEP	New Jersey Department of Environmental Protection
NOEC	No observed effect concentration
NO_3-N	Nitrate as nitrogen
NJPDES	New Jersey Pollutant Discharge Elimination System
NPDES	National Pollutant Discharge Elimination System
NPO	Non-polar organic
NTIS	National Technical Information Service
O_2	Oxygen
O. mykiss	*Oncorhynchus mykiss*, trout
OSHA	Occupational Safety and Health Administration
OUR	Oxygen uptake rate, a measure of the activity of activated sludge biomass
P	Phosphorus
PAC	Powdered activated carbon
Pb	Lead
PBO	Piperonyl butoxide, a metabolic blocking agent used to detect for the presence of organophosphate insecticides
pH	Logarithm of the reciprocal of the hydrogen ion concentration
PO_4-P	Orthophosphate as phosphorus
POTW	Publicly owned treatment works
P. promelas	*Pimephales promelas*, fathead minnow
PPCR	Pretreatment program chemical review
Qi	POTW influent flow rate
Qw	Sewer wastewater flow rate
QA/QC	Quality assurance/quality control
r value	Correlation coefficient
RAS	Return activated sludge
RBC	Rotating biological contactor
RCRA	Resource Conservation and Recovery Act
RREL	Risk Reduction Engineering Laboratory
RTA	Refractory toxicity assessment
RWQCP	Regional Water Quality Control Plant
SARA	Superfund Amendments and Reauthorization Act
$SBOD_5$	Five-day soluble biochemical oxygen demand
SCOD	Soluble chemical oxygen demand
sf	square foot
SIC	Standard industrial classification
SNAP	Sewer network analysis program
SNH_3-N	Soluble ammonia – nitrogen
SO_2	Sulfur dioxide
SOP	Standard operating procedures
SOR	Surface overflow rate
SOUR	Specific oxygen uptake rate

Acronyms, Abbreviations, and Symbols (continued)

S. purpurtus	*Strongylocentrotus purpurtus*
SP	Soluble phosphorus
SPI	Simulated plant influent
SPE	Solid phase extraction
SRT	Sludge retention time
SS	Suspended solids
SSO	Sanitary sewer overflow
SSUR	Specific substrate utilization rate
SVI	Sludge volume index
$TBOD_5$	Total five-day biochemical oxygen demand
TCIP	Toxics control implementation plan
TCLP	Toxicity characteristic leaching procedure
TDS	Total dissolved solids
TIE	Toxicity identification evaluation
TKN	Total Kjeldahl nitrogen
TMP	Toxicity management program
TOC	Total organic carbon
TP	Total phosphorus
TRC	Total residual chlorine
TRE	Toxicity reduction evaluation
TSD	Technical Support Document
TSDF	Treatment, storage, and disposal facility
TSS	Total suspended solids
TU	Toxic unit
TUa	Acute toxic unit
TUc	Chronic toxic unit
µg/L	Microgram per liter
µm	Micron
UMVUE	Uniformly Minimum Variance Unbiased Estimator
USD	Union Sanitary District
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
UV-VIS	Ultraviolet – visible spectrophotometer
Vb	Volume of biomass for RTA testing
Vr	Reactor volume for RTA testing
Vnb	Volume of non-toxic biomass for RTA testing
Vpe	Volume of primary effluent for RTA testing
Vsw	Volume of synthetic wastewater for RTA testing
Vw	Volume of sewer wastewater for RTA testing
VSS	Volatile suspended solids
WEF	Water Environment Federation
WPCF	Water Pollution Control Federation (currently Water Environment Federation)
WWTP	Wastewater treatment plant
xg	Times gravity
Zn	Zinc
ZSV	Zone setting velocity

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Section 1
Introduction

Background

The Clean Water Act (CWA) (United States Federal Water Pollution Control Act Amendments, Public Law 92-500 of 1972) prohibits the discharge of "toxic pollutants in toxic amounts." In the CWA, the mechanism for regulating discharges to the Nation's waterways is the National Pollutant Discharge Elimination System (NPDES). Permits issued under NPDES may contain effluent limits and other requirements based on ambient water quality standards for the protection of aquatic life and human health. The water quality-based approach applies criteria for both chemical specific parameters and whole effluent toxicity to ensure that toxic pollutants are controlled and water quality standards are maintained (*Federal Register* 23868, 1989). This integrated approach to water quality protection is described in detail in USEPA's *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD, 1991b).

"Whole effluent toxicity" refers to the results of acute and chronic aquatic toxicity tests used to monitor discharges to surface waters. Acute toxicity is a measure of primarily lethal effects that occur over a short period of time (i.e., 96 hours or less). Chronic toxicity refers to sublethal effects, such as inhibition of fertilization, growth, and reproduction that occur over a longer exposure period (e.g., 7 days). Acute and chronic effects to aquatic species are measured using standard procedures (40 CFR 136.3) as specified in NPDES permits. USEPA has published manuals that describe the toxicity test methods for freshwater and estuarine/marine organisms (USEPA 1993c, 1994a, 1994b, 1995). On October 26, 1995, USEPA promulgated a final rule under the CWA that adds whole effluent toxicity testing methods to the list of nationally applicable methods in 40 Code of Federal Regulations (CFR) Part 136. These methods can be accessed electronically along with all other approved analytical methods on CD-ROM (USEPA, 1997).

Effluents from permitted facilities are monitored, and where a reasonable potential exists to exceed numeric toxicity criteria, NPDES permit limits for whole effluent toxicity are established (40 CFR 122.44(d)(1)(iv)). Whole effluent toxicity limits may also be established where there is reasonable potential to exceed a narrative toxicity criterion in the receiving water (40 CFR 122.44(a)(1)(v)). A toxicity reduction evaluation (TRE) may be used to identify and reduce or eliminate sources of effluent toxicity whether or not there are whole effluent toxicity limits in the NPDES permits. For example, where a permittee has no whole effluent toxicity limits in its current permit but discovers a toxicity problem, it may use a TRE to reduce or eliminate effluent toxicity, ensure that there is no reasonable potential that its discharge will exceed toxicity criteria and possibly obviate the need for whole effluent toxicity limits in a subsequent permit. On the other hand, if a permit contains whole effluent toxicity monitoring requirements or limits and unacceptable toxicity is observed, the permitting authority may require the permittee to perform a TRE through special conditions in the permit or an enforcement action.

The TSD defines a TRE as "a site specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity" (USEPA, 1991b). USEPA has developed procedures that can be used to conduct TREs (USEPA 1989a, 1989b, 1991a, 1992a, 1993a, 1993b, 1996).

This document represents the first update of USEPA's *Toxicity Reduction Evaluation Protocol for Municipal*

Wastewater Treatment Plants (1989a). This guidance provides a general framework for conducting TREs at publicly owned treatment works (POTWs) and describes the available methods and procedures that experience to date has shown to be most useful. It is designed for POTW staff, consultants, and regulatory agency staff who are implementing TREs to identify and reduce or eliminate sources of effluent toxicity. Where possible, POTW staff are encouraged to use the guidance before the discharge of whole effluent toxicity is subject to regulatory review and action.

This guidance presents methods and procedures that are useful to:

- Develop and implement a TRE plan.
- Evaluate the results and data generated during the TRE.
- Develop a sound scientific and engineering basis for the selection and implementation of toxicity control methods.

This guidance supports the strategy desribed in the TSD (USEPA, 1991b) for integrated toxics control using whole effluent toxicity and pollutant specific limits. It is well recognized that while POTWs may achieve effluent limits for conventional pollutants, the discharge of effluent toxicity, volatilization of toxic materials, and contamination of sewage sludges can still occur. The focus of this guidance is the reduction of whole effluent toxicity at municipal wastewater treatment plants.

The methods and decision points that comprise a TRE are described in the context of an overall generalized approach. Each municipality must address regulatory issues and treatment operations that are unique to each POTW; therefore, not all components of this guidance will apply in every case. POTW staff may also select components to address specific questions about the causes and sources of effluent toxicity; however, the decision to choose a particular step should be based on technically sound information. Given the site-specific nature of TREs, POTW staff will need to develop a TRE plan that describes the overall approach and components of the guidance to be implemented.

In most cases, the approaches and methods described in the TRE protocol (USEPA, 1989a) have been validated by USEPA TRE research studies and other municipal TREs (Amato et al., 1992; Bailey et al., 1995; Botts et al., 1990, 1992, 1993, 1994; Collins et al., 1991; Fillmore et al., 1990; Lankford and Eckenfelder, 1990; Morris et al., 1990, 1992). Appendix A provides the original case studies from the municipal TRE protocol (USEPA, 1989a). Additional examples of successful TREs are presented in Appendices B through H of this guidance. The TRE guidance includes information learned from these studies. Major changes include:

- Information on toxicants commonly found in POTW effluents and the conditions that influence their toxicity (Section 2).
- Considerations in evaluating the operation and performance of POTWs with respect to conditions that may contribute to effluent toxicity. Additional information is provided on operations review of biological nutrient removal (BNR) processes (Section 3).
- A brief description of the use of updated toxicity identification evaluation (TIE) procedures for acute and short-term chronic toxicity (Section 4). The reader is referred to USEPA's guidance on TIE procedures for further details (USEPA 1991a, 1992a, 1993a, 1993b, 1996).
- Refined step-by-step guidance for tracking sources of acute and chronic toxicity in POTW collection systems (Section 5).
- Additional recent TRE case studies that describe approaches for identifying the causes and sources of acute and chronic effluent toxicity and practical methods for toxicity reduction (Appendices B through H).

The methods and procedures described herein will continue to be updated and refined based on the results of further studies.

Professional judgment is required in selecting the appropriate steps for identifying toxicants and for evaluating options for controlling effluent toxicity. USEPA has developed TIE procedures to use as tools for TRE studies. These TIE manuals (USEPA 1991a, 1992a, 1993a, 1993b, 1996) describe procedures for characterization, identification, and confirmation of effluent toxicants. TIE procedures are a basic component of the municipal TRE and the USEPA guidance manuals should be obtained and reviewed prior to implementing a TRE. USEPA also has developed a generalized protocol for conducting industrial TREs (USEPA, 1989b).

TRE Goals and Objectives

It is the responsibility of POTW staff to conduct a TRE to identify and reduce or eliminate sources of effluent toxicity and to fully comply with applicable toxicity-based NPDES permit limits. The goal of the TRE may be to achieve compliance with a whole effluent toxicity limit; however, POTW staff are encouraged to use the guidance to evaluate effluent toxicity before it becomes a regulatory issue. The TRE goal and implementation schedule should be clearly defined with the regulatory authority as part of the preparation of the TRE plan. The regulatory authority will review the TRE plan and carefully monitor the progress of the TRE, providing direction as needed.

The following objectives may be defined to accomplish the TRE goal:

- Evaluate the operation and performance of the POTW to identify and correct treatment deficiencies contributing to effluent toxicity (e.g., operations problems, chemical additives, or incomplete treatment).
- Identify the compounds causing effluent toxicity.
- Trace the effluent toxicants and/or toxicity to their sources (e.g., industrial, commercial, or domestic).
- Evaluate, select, and implement toxicity reduction methods or technologies to control effluent toxicity (i.e., in-plant or pretreatment control options).

These objectives are applied to meet the TRE goal of compliance with regulatory requirements.

Components of the Municipal TRE

A generalized flow diagram for a TRE program is illustrated in Figure 1-1. A brief description of each major TRE component is presented below along with the section number in the guidance in which additional information is provided.

Information and Data Acquisition (Section 2)

The first step in a TRE is the collection of information and analytical data pertaining to effluent toxicity. This information includes data on the operation and performance of the POTW, such as plant design criteria and discharge monitoring reports (DMRs), and data from the POTW's pretreatment program, such as industrial waste survey (IWS) information, permit applications, and industrial user compliance reports. The POTW performance data and pretreatment program information are used in the second stage of the TRE, as described below.

Facility Performance Evaluation (Section 3)

Operations and performance data can be reviewed in a POTW performance evaluation to indicate possible in-plant sources of toxicity or operational deficiencies that may be contributing to the effluent toxicity. If a treatment deficiency is causing noncompliance with conventional pollutant permit limits, studies should be conducted to evaluate treatment modifications before proceeding further in the TRE. These studies should evaluate the toxicity reduction that can be achieved by correcting treatment deficiencies. If plant performance is not a principal cause of toxicity or treatment modifications do not reduce effluent toxicity, a logical next step is to identify the cause(s) of toxicity using TIE procedures.

Pretreatment program data also can be gathered to prepare a data base on the wastewaters discharged to the POTW collection system. These data can be used in the latter stages of the TRE to assist in tracking the sources of toxicity and/or toxicants that are contributing to POTW effluent toxicity.

Toxicity Identification Evaluation (Section 4)

This section provides a brief overview of the TIE procedures. TIE procedures are available to evaluate the causes of acute and short-term chronic toxicity. When implementing a TIE, the reader is advised to consult USEPA's TIE procedures for freshwater species (1991a, 1992a, 1993a, 1993b) or estuarine/marine species (1996). The generic TIE protocol is performed in three phases: toxicity characterization (Phase I), toxicant identification (Phase II), and toxicant confirmation (Phase III). Phase I characterizes the types of effluent toxicants by testing the toxicity of aliquots of effluent samples that have undergone bench-top manipulation (e.g., pH adjustment, filtration). An evaluation of common POTW effluent toxicants such as ammonia, chlorine, and organophosphate insecticides may be included in Phase I. Phases II and III involve further treatments in conjunction with chemical analyses to identify and confirm the compounds causing effluent toxicity. USEPA's Phase II and III procedures (1993a, 1993b) for freshwater species are generally applicable for estuarine/marine species.

Toxicity Source Evaluation (Section 5)

A toxicity source evaluation involves the sampling and analysis of wastewaters discharged from sewer lines

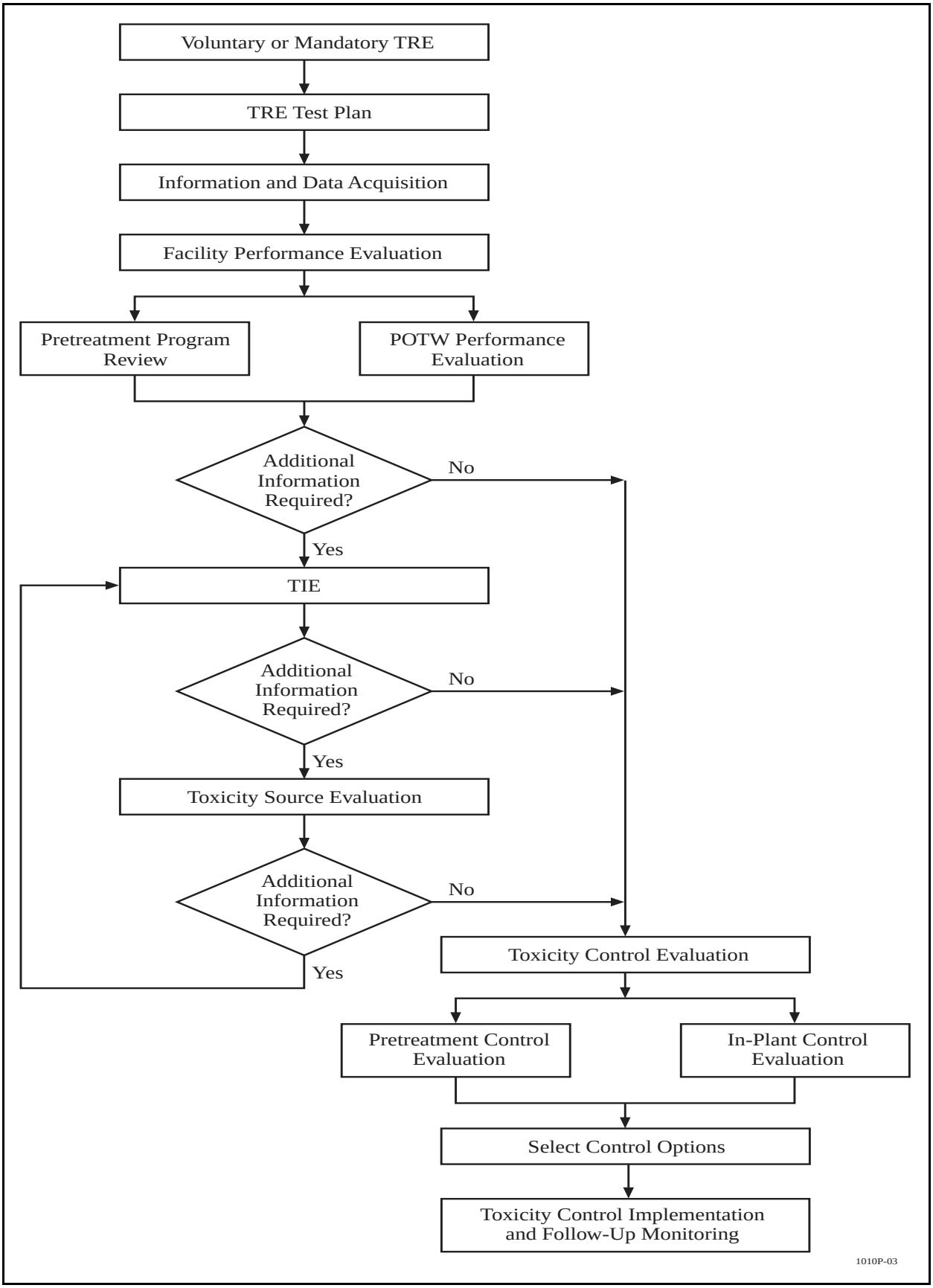

Figure 1-1. TRE flow diagram for municipal wastewater treatment plants.

and indirect dischargers such as industrial users and commercial facilities. Two types of source evaluation studies may be performed: chemical tracking or toxicity-based tracking.

Chemical-specific tracking is recommended when the POTW effluent toxicants have been identified and confirmed in the TIE, and can be readily traced to the responsible sewer dischargers. Toxicity tracking is used when TIE data indicate the type of effluent toxicant, but the specific toxicant(s) is not identified. Toxicity tracking involves treating the sewer samples in a bench-scale treatment simulation prior to toxicity measurements to account for the toxicity removal that is provided by the POTW.

The sampling strategy for toxicity source evaluations involves two tiers. Tier I focuses on sampling and analysis of the main sewer lines in the collection system. Tier II involves testing sewer lines and indirect dischargers upstream of the main lines identified as being toxic in Tier I. This tiered approach can be used to identify the contributors of toxicity and/or toxicants by eliminating segments of the collection system that do not contribute toxicity/ toxicants.

Toxicity Control Evaluation (Section 6)

Using the results of each of the above TRE elements, alternatives for effluent toxicity reduction are evaluated and the most feasible option(s) is selected for implementation. Effluent toxicity may be controlled either through pretreatment regulations or in-plant treatment modifications or additions. In some cases, several control methods may be required to achieve the desired toxicity reduction. Selection of control options is usually based on technical and cost criteria.

If the toxicity source evaluation is successful in locating the sources that are contributing the POTW effluent toxicants, local limits can be developed and implemented. If in-plant control appears to be a feasible approach, treatability testing may be used to evaluate methods for optimizing existing treatment processes and to assess options for additional treatment.

Toxicity Control Implementation (Section 7)

The toxicity control method or technology is implemented and follow-up monitoring is conducted to ensure that the control method achieves the TRE objectives and meets permit limits.

Limitations of the TRE Guidance

This guidance describes procedures for evaluating and implementing controls for reduction of whole effluent toxicity. Procedures for the reduction of toxic pollutants in residuals, biosolids, and air emissions at POTWs are not discussed. The reader may consult the *Standards for the Use or Disposal of Sewage Sludge* (40 CFR Part 503) regarding the control of toxic materials in biosolids.

The municipal TRE guidance was developed based on the results and findings of TRE and TIE studies. The following limitations have been identified in these studies:

- Intermittent or ephemeral toxicity may be challenging to characterize using TIE/TRE procedures. In these cases, modifications to TRE procedures may be needed to achieve the best possible results (see Sections 4 and 5). Discussions with the regulatory authority also may help to identify the most appropriate approach for complying with effluent toxicity requirements.
- As described in this guidance, alternative procedures are available if traditional methods such as TIE testing are not successful. Additional TRE procedures, especially tools for toxicity source evaluations, have not been widely used, but may be helpful if careful consideration is given to their design and application.
- As more TRE studies are completed, more information is available on the feasibility and effectiveness of in-plant and pretreatment toxicity control options. Examples of TREs in which toxicity controls have been successfully implemented are provided in Appendices B, C, D, E, G, and H.
- The TRE guidance is designed to help public works managers select appropriate toxicity control approaches. As such, it does not discuss regulatory procedures that may be useful for assessing the need for, or compliance with, toxicity requirements, such as the determination of reasonable potential, dilution factors, and permit limits. The importance of these procedures in the evaluation of whole effluent toxicity is mentioned in Section 2 and is discussed more fully in USEPA's TSD (1991b).

Organization of the TRE Guidance

This guidance is organized according to the components of the TRE flow diagram shown in Figure 1-1.

Sections 1 through 7 describe the primary TRE elements noted above. Changes to the municipal TRE protocol (USEPA, 1989a) include more information on toxicants commonly identified in POTW effluents, suggestions for evaluating the effect of POTW operations on effluent toxicity, an overview of updated TIE procedures for acute and short-term chronic toxicity, and refined step-by-step procedures for tracking sources of acute and chronic toxicity in POTW collection systems.

Sections 8 through 11 provide information on the TRE requirements for quality assurance/quality control, health and safety, facilities and equipment, and sample collection and handling.

Sections 12 and 13 list the references and bibliography cited in this guidance.

Appendix A presents the original case histories (given in the municipal TRE protocol, USEPA, 1989a) along with commentary on how the TIE/TRE procedures have been updated to better address toxicity observed in future studies.

Appendices B through G provide new in-depth case examples of municipal TREs. These new examples include summaries of four chronic TRE studies and two acute TRE studies.

Appendix H is a new appendix that describes approaches for addressing effluent toxicity caused by organophosphate insecticides.

Appendix I describes a chemical-specific approach for TREs that may be applied in limited circumstances.

Appendix J is referenced in Section 5 (toxicity source evaluation) and presents an updated step-by-step procedure for tracking sources of toxicity in POTW collection systems.

Section 2
Information and Data Acquisition

Introduction

The first step in a TRE is to gather all information and data that may relate to effluent toxicity and that might prove useful in planning and conducting the TRE. This information can be categorized as POTW treatment plant data and pretreatment program data. The pertinent POTW information includes historical effluent toxicity data as well as information on the treatment plant's design capabilities, treatment performance, and operation and maintenance practices. Appropriate pretreatment program information consists of IWS data, industrial user permits, pretreatment inspection reports, and monitoring and compliance reports. If a pretreatment program is not in place, POTW staff may need to collect monitoring data on the POTW industrial users and, where necessary, appropriate controls should be considered to ensure good effluent quality.

Background information may provide insight into the nature of effluent toxicity and can be used to select the initial steps to take in the TRE. However, it is important *not* to draw conclusions about the causes and sources of toxicity in the beginning of the TRE unless corroborative testing is performed. A summary of information recommended for a TRE is provided in the following subsections.

Review of Effluent Toxicity Data

Information and data acquisition should include a careful review of recent effluent toxicity data. This review should be used to confirm the effluent toxicity results and the potential to cause adverse instream effects. The data also can be used to evaluate general toxicity characteristics, such as temporal variability, species sensitivity, and whether the toxicant(s) is fast or slow acting.

In some states, laboratories are required to be certified to perform toxicity tests. Toxicity test data reports also may be reviewed by regulatory staff to confirm that the tests meet basic quality assurance/quality control (QA/QC) requirements. However, this is usually the exception; most state and regional regulatory agencies do not have certification programs for toxicity testing and reports may not be formally reviewed. As an initial step in the TRE, POTW staff should conduct an independent review of the toxicity test reports to verify the quality of the reported data, especially results that have triggered TRE requirements.

It often is beneficial to develop a profile on the characteristics of effluent toxicity using the available historical data. Information on toxicity variability, the relative sensitivity of various test species to the effluent, and effluent characteristics [e.g., pH, alkalinity, hardness, conductivity, total residual chlorine (TRC), and dissolved oxygen (DO)] can provide important clues about the nature of the toxicity. These characteristics can be compared to POTW and pretreatment information to help determine if effluent toxicity may be related to operational practices or sewer discharges. This information also can be used as part of the TIE (Section 4) to help identify the causes of effluent toxicity.

The data review may show that some test conditions such as pH may artificially change during testing. Typically, the pH of toxicity test solutions tends to drift upward over time, which can cause pH sensitive compounds such as ammonia and metals to exhibit toxicity. With the consent of the regulatory authority, it may be possible to modify the test procedures to control pH drift (USEPA 1993c and T. Davies, USEPA, Office of Water, *Memorandum on Clarifications Regarding Flexibility in 40 CFR Part 136 Whole Effluent Test Methods*, April 10, 1996). Modifications may also be allowed to better reflect the range of temperatures and hardness observed in the receiving water. Depending on the temperatures to be

considered, it is recommended to use a different test species rather than modify the recommended temperature range for a given test species.

Prior to a TRE, POTW staff or the regulatory agency may evaluate the "reasonable potential" for exceeding a toxicity-based water quality standard to determine if a permit limit is required. If there is reasonable potential to cause instream toxicity or contribute to an excursion above a narrative criterion, a statistical approach may be used to calculate a toxicity-based permit limit. This approach may also be applied during the course of a TRE to assess compliance with a permit limit or a water quality standard. For example, improvements in effluent quality resulting from the TRE could lower effluent toxicity to a point where there is no longer a reasonable potential to exceed the permit limit. Or, these improvements may reduce effluent variability. The reduced variability could result in a smaller coefficient of variation (CV), which would lessen the potential for excursions above the TRE goal. The reader is referred to USEPA's TSD for details on these procedures (USEPA, 1991b).

The TSD also discusses the use of dilution, and particularly the use of high-rate diffusers, in achieving compliance with toxicity-based water quality standards. The dilution determination, if allowed by applicable regulations, is one of the first steps in characterizing the effluent for toxicity-based permitting (USEPA, 1991b). Public works managers, who are initiating a TRE, may choose to evaluate the application of appropriate mixing zone allowances to eliminate the potential for instream effects. A shoreline outfall, for instance, may not qualify for any dilution when determining an acute toxicity requirement. Use of a diffuser constructed in deeper water may allow the effluent to achieve sufficient dilution in the rapid-mixing, near-field area to meet permit requirements. Similar results may be obtained by moving an outfall from a small or intermittent stream, where no dilution is available under low flow conditions, to a larger permanent stream, with greater dilution. It should be noted, however, that less costly toxicity control approaches than outfall relocation may be identified during the course of the TRE. The process of selecting the most feasible and practical control option(s) is described in Section 6 of this guidance.

Toxicants Identified in POTW Effluents

As noted, the occurrence of toxicity and the treatment process operations are unique to each POTW; therefore, the causes of effluent toxicity are likely to be different for each case. Nonetheless, some toxicants have been identified at many POTWs. A list of toxicants commonly found in POTW effluents, the levels of concern, and potential sources is presented in Table 2-1. The levels of concern are to be used as a general guide, *not as absolute values*. Due to the site-specific nature of effluent toxicity, these data are intended only as background information to consider in the process of conducting a TRE. It is important to stress that a direct comparison of chemical concentrations to toxicity data reported in the literature often provides misleading information. The toxicity of effluent constituents is affected by many factors including the effluent matrix and toxicity test conditions. The most effective way to identify causes of effluent toxicity is by applying the TIE procedures, which are described in Section 4 of this guidance.

Some of the information that can be collected to help evaluate the contribution of the toxicants to effluent toxicity is provided in Table 2-1. Toxicity information on specific parameters can be obtained from USEPA's *Aquatic Information Retrieval Toxicity Data Base* (AQUIRE, 1992), TIE manuals (USEPA 1991a, 1992a, 1993a, 1993b, 1996), EXtension TOXicology NETwork (EXTOXNET, 1998), peer-reviewed journal articles, and other sources. AQUIRE information can be obtained through the National Technical Information Service (NTIS) in Springfield, Virginia, or through several commercial vendors. USEPA's Mid-Continent Ecology Division (Duluth, Minnesota) will be offering Internet access to AQUIRE data in early 1999 through its Ecotoxicology Database Retrieval System (ECOTOX). The EXtension TOXicology NETwork is currently available on the Internet at http://ace.orst.edu/info/extoxnet/. When reviewing toxicological data, it is important to ensure that the references for the data have been peer-reviewed and the values given are considered to be accurate.

In some cases, toxicological data may be presented in toxic units (TUs) instead of in lethal concentrations causing a 50% mortality in exposed test organisms (LC50) or no observed effect concentrations (NOEC). TUs are the inverse of the percent concentration

Table 2-1. Toxicants Identified in POTW Effluents

Toxicant Type	Level of Concern*	Potential Source	Information Needed to Assess Toxicity
Chlorine	0.05 to 1 milligram per liter (mg/L)	POTW disinfection process	TRC, temperature, and pH upon receipt of effluent sample and during toxicity test Toxicity degradation tests TIE Phase I tests†
Ammonia	5 mg/L as NH_3-N	Domestic and industrial sources POTW sludge processing sidestreams	Ammonia-nitrogen upon receipt of effluent sample pH, temperature, and salinity during toxicity test TIE Phase I tests†
Non-polar organics, such as organophosphate insecticides (e.g., diazinon, malathion, chlorpyrifos, and chlorfenvinphos)	Diazinon: 0.12–0.58 microgram per liter (µg/L) Chlorpyrifos: 0.03 µg/L	Homeowners, apartments, veterinarians, pest control, lawn care, and commercial businesses	High resolution analysis of organophosphate insecticides TIE Phase I tests†
Metals [e.g., cadmium (Cd), copper (Cu), chromium (Cr), lead (Pb), nickel (Ni), zinc (Zn)]	Varies	Treatment additives in POTW Industrial users	Dissolved metals, effluent hardness (mg/L as $CaCO_3$), and alkalinity upon receipt of sample TIE Phase I tests†
Other treatment chemical additives such as dechlorination chemicals and polymers	Varies	Disinfection, dechlorination, sludge processing, and solids clarification in the POTW	Vendor information on toxicity of products Dosage rates Effluent characteristics that affect toxicity (e.g., pH) TIE Phase I tests†
Surfactants	Varies	Industrial users	Methylene blue active substances (MBAS) and cobalt thiocyanate active substances (CTAS) TIE Phase I tests†
Total dissolved solids (TDS)	1,000–6,000 µhmos/cm depending on endpoint, species tested, and TDS constituents	Industrial users Sludge processing sidestreams	TDS, ion analysis, and anion/cation balance TIE Phase I tests†

* As referenced by USEPA (1992a) and D. Mount (personal communication, AScI Corp, Duluth, Minnesota, 1991) for chlorine; USEPA (1992a) for ammonia; TRAC Laboratories (1992), Bailey et al. (1997) for diazinon and chlorpyrifos; and USEPA (1992a) for TDS.

† The contribution of effluent constituents such as chlorine, ammonia, organic compounds, metals, and TDS to effluent toxicity can be most effectively evaluated using the TIE Phase I procedures described in Sections 3 and 4 of this guidance and the USEPA manuals (1991a, 1992a, 1996).

values and are calculated by dividing 100% by acute or chronic percent effluent values or chemical concentration data. For example, a chronic TU (TUc) of 2 is equivalent to an NOEC value of 50% effluent (i.e., 100%/50%). Likewise, if the LC50 of a compound is 20 µg/L, an effluent sample with 100 µg/L contains 5 acute TU (TUa) of the compound (i.e., 100 µg/L/20 µg/L). TU values are helpful in understanding the relative contribution of toxicants to effluent toxicity and are often used in interpreting TIE data (Section 4). For example, if one of two compounds is contributing to effluent toxicity (e.g., 4 TUc of compound A and 1.5 TUc of compound B), it may be possible to focus on controlling the major toxicant if compliance with the permit limit (e.g., 3 TUc) can be achieved. However, consideration should be given to possible antagonistic effects between the toxicants such that removal of one toxicant may cause the other toxicant to exhibit greater toxicity. An overview of this is provided in Section 4 and the TIE manuals (USEPA 1991a, 1992a, 1993a, 1993b, 1996) provide thorough guidance.

POTW Design and Operations Data

POTW design and operations information can indicate possible in-plant sources of toxicity or operational problems that might be contributing to treatment interferences and the pass through of toxicity. In the beginning of the TRE, it is often helpful to briefly review the operations and performance of the major unit treatment processes. Notes can be added to POTW data base about initial impressions and potential problem areas that should be investigated further in the POTW Performance Evaluation (see Section 3).

The types of POTW data to be gathered include:

- Background information on treatment plant design and operation.
- Data routinely collected for NPDES DMRs and treatment process control.
- Existing data on potential effluent toxicants, including chlorine, ammonia, organophosphate insecticides, surfactants, metals, and treatment additives (e.g., polymers, chlorine, dechlorination chemicals).

A list of useful POTW data is provided in Table 2-2.

The POTW data can be compared to the profile on effluent toxicity characteristics to determine if toxicity may be related to operation and performance. Several questions can be posed, including:

- Is toxicity apparent during certain operational events, such as when treatment upsets are observed, when treatment units are taken offline for maintenance, or as a result of other operating practices (e.g., excess chlorine addition)?
- Does toxicity exhibit a weekly, monthly, or seasonal pattern? For example, if the POTW is operated to achieve seasonal ammonia removal, is toxicity present in the period when ammonia removal is not practiced? What process control parameters may be related to toxicity? Is toxicity apparent with changes in hydraulic and pollutant loadings to the primary sedimentation process, changes in biological treatment parameters [e.g., mixed liquor suspended solids (MLSS) concentration, DO concentration, sludge volume index (SVI), mean cell residence time (MCRT)], changes in filtration rates in filters, or changes in application rates of chlorine and dechlorinating agents?
- Is toxicity apparent when the type and dose of treatment additives change? For example, did toxicity occur when a different polymer or other coagulant/flocculent aid was used?

In the beginning of the TRE, emphasis should be placed on effluent concentrations of ammonia and chlorine, which are common toxicants in POTW effluents (USEPA 1991a, 1992a, 1993a, and 1993b). The toxicity of ammonia is dependent on effluent characteristics such as the pH, temperature, and salinity of the sample, as well as the sensitivity of the species being tested. Therefore, it will be difficult to determine the toxicity of ammonia based solely on a comparison of literature values to effluent concentrations. Likewise, the toxicity of chlorine will depend on the form of chlorine, which may be in the free form as chlorine, hypochlorous acid, or hypochlorite ion, or in the combined form as chloroamines or nitrogen trichloride. The sum of the free and combined chlorine, termed total residual chlorine or TRC, is matrix dependent. Chloramines, which are formed by chlorine combining with ammonia, can be more toxic than free chlorine (AQUIRE, 1992).

Assessments of the contribution of ammonia, chlorine, and other compounds to effluent toxicity can be made using Table 2-1 as a guide. As stated in Table 2-1, if

Table 2-2. Example POTW Design and Operation Data

1. NPDES permit requirements
   a. Effluent limitations
   b. Special conditions
   c. Monitoring data and compliance history
   d. Dilution studies or modeling results
2. POTW design criteria
   a. Hydraulic loading capacities
   b. Pollutant loading capacities
   c. Biodegradation kinetics calculations and assumptions
3. Influent and effluent pollutant data
   a. Ammonia
   b. Residual chlorine
   b. Other pollutants of concern such as non-polar organic compounds (e.g., organophosphate insecticides), metals, and TDS (see Table 2-1)
   c. Conventional pollutant data, including five-day biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), total organic carbon (TOC), total suspended solids (TSS), volatile suspended solids (VSS), total Kjeldahl nitrogen (TKN), ammonia-nitrogen (NH_3-N), total phosphorus (TP), orthophosphate (PO_4-P), and nitrate-nitrogen (NO_3-N),to evaluate treatment performance
   d. Parameters, including pH, hardness, and alkalinity, to evaluate the toxicity of suspect compounds (see Table 2-1)
4. Process control data
   a. Chemical usage for each treatment process (e.g., coagulants for primary sedimentation, lime for biological treatment, polymers for tertiary clarification; see Table 2-1)
   b. Process control data for primary sedimentation (i.e., hydraulic loading capacity and BOD_5 and TSS removal)
   c. Process control data for activated sludge [e.g., food to microorganism (F/M) ratio, MCRT, MLSS, sludge yield, removal efficiency of BOD_5, COD, TKN, NH_3-N, TP, PO_4-P, NO_3-N, and other pollutants specified in the permit].
   d. Process control data for secondary and tertiary clarification [e.g., hydraulic and solids loading capacity, SVI, sludge blanket depth]
   e. Number of process units online and number offline for maintenance
5. Operations Information
   a. Reports on previous operation and maintenance evaluations, including engineering studies and USEPA and state compliance inspections
   b. Operating logs
   c. Standard operating procedures
   d. Operation and maintenance practices (e.g., filter backwash procedures)
6. Process sidestream characterization data
   a. Chemical usage for sludge processing, including thickener, digester, and dewatering processes
   b. Pollutant data for sludge processing sidestreams, including ammonia, metals, organophosphate insecticides, and TDS (see Table 2-1)
   c. Incinerator scrubber waste stream, including data on possible formation of cyanide (see discussion in Section 3)
   d. Tertiary filter backwash
   e. Cooling water
7. Wastewater bypass, combined sewer overflow (CSO), and sanitary sewer overflow (SSO) for bypasses or overflows that are discharged to the POTW effluent
   a. Frequency
   b. Volume

chlorine is suspected of contributing to toxicity, TRC should be measured when the sample arrives and when toxicity tests are initiated because chlorine usually dissipates rapidly. If ammonia is a concern, conditions that affect its toxicity, including sample pH, should be carefully monitored during toxicity tests. This information is necessary to determine the concentration of the toxic un-ionized form of ammonia (NH_3) in the toxicity test. In addition to toxicity data, USEPA's AQUIRE data base (1992) includes information on the conditions of the toxicity test that may have influenced the reported toxicity of chemicals of concern. However, not all conditions may be recognized or reported, which may limit the utility for TIE tests.

Surfactants also have been identified as toxicants in POTW effluents (Diehl and Moore, 1987; Ankley and Burkhard, 1992; Botts et al., 1994). These studies focused on characterizing the type or source of surfactants rather than trying to identify the toxic surfactant compound because analytical methods are not readily available to detect and quantify surfactant compounds in complex effluents. Municipal effluents contain numerous substances that interfere with surfactant analysis. Also, surfactants are actually mixtures of many homologues and oligomers; therefore, the composition and toxicity of surfactants is complex and often variable (USEPA, 1993a). One exception is a class of surfactants, referred to as alkyl phenol ethoxylates (APEs), that can be analyzed by a gas chomatograph/mass spectrometer (GC/MS) (Giger et al., 1981). Also, it may be helpful to characterize surfactants by the nature of their polar segment; surfactants may be classified as nonionic, anionic, cationic, and amphoteric. Many surfactants tend to sorb to C18 resin and analyses of the methanol extracts from solid phase extraction (SPE) columns can help to indicate the type of surfactant causing toxicity (USEPA, 1993a). The American Public Health Association (1995) describes methods for determining anionic surfactants as MBAS and nonionic surfactants as CTAS.

The contribution of effluent constituents such as ammonia and chlorine to effluent toxicity can be most effectively evaluated using the TIE procedures described in Sections 3 and 4. Non-polar organic compounds (such as organophosphate insecticides), metals, surfactants, and TDS also can be effectively evaluated using these procedures. In Phase I of the TIE, various sample manipulations and toxicity tests are performed to determine how toxicity is affected by removing or isolating a particular group of toxicants. These procedures establish a cause and effect relationship between toxicants and whole effluent toxicity. If a toxicant is indicated through Phase I testing, additional TIE procedures can be applied to identify (Phase II) and confirm (Phase III) the toxicant (see Section 4).

Treatment additives can be screened by obtaining toxicity data from product vendors or by performing toxicity tests on samples that have been treated using typical chemical dosages. If toxicity tests are performed, it is important to simulate the conditions occurring in the treatment process where additives are being used because some portion of the additives is usually removed in the treatment process. For example, polymers are largely bound with suspended solids in the wastewater being treated and only minor amounts may pass through in the final effluent (Hall and Mirenda, 1991).

Once the toxicants are identified, the POTW data will be useful in evaluating and selecting in-plant toxicity control options (see Section 6).

Pretreatment Program Data

Pretreatment program information may provide evidence that can be used to identify sources of toxicants or toxicity in the wastewater collection system. For this reason, pretreatment data should be briefly reviewed in the beginning of the TRE. As an initial step, pretreatment data can be compared to the profile on POTW effluent toxicity characteristics to determine if toxicity may be related to a particular type of discharge. This review may attempt to answer several questions, including:

- What changes in POTW influent characteristics may be observed during toxic periods (e.g., pH, alkalinity, suspended solids, hardness, conductivity, DO, color)? Also, does toxicity occur during changes in hydraulic and pollutant loadings to the POTW? Can these characteristics be related to certain types of discharges?
- Does toxicity occur when treatment upsets are observed at the POTW? Can the upsets be related to a particular discharge(s)?
- Does toxicity exhibit a weekly, monthly, or seasonal pattern that may be related to production schedules of certain industries? For example, is

toxicity observed when an industry is manufacturing a particular type of product? Also, does toxicity abate when the industry is shutdown for maintenance or holidays?

- If the POTW accepts hauled wastes, is toxicity apparent when a particular hauler delivers wastes?

Appropriate pretreatment program information to review includes the data on the industrial users of the POTW [e.g., industrial manufacturers, Resource Conservation and Recovery Act (RCRA) waste disposers, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) dischargers] and the toxic pollutant data on the POTW waste streams. A list of suggested pretreatment data is shown in Table 2-3.

The POTW pretreatment program data can be reviewed as part of a Pretreatment Program Review (described in Section 3). The summarized data may be useful in locating the sources of toxicants identified in the TIE (see Section 4). In cases in which effluent toxicants are not identified, the pretreatment program data can be used to develop a sampling and analysis program to track sources of toxicity in the collection system (see Section 5).

Table 2-3. Example Pretreatment Program Data

1. POTW influent and effluent characterization data
   a. Toxicity
   b. Priority pollutants
   c. Hazardous pollutants
   d. Pollutants listed in Superfund Amendments and Reauthorization Act (SARA) Title 313
   e. Other chemical-specific monitoring results (e.g., industry raw materials and products)
2. Sewage residuals characterization data (e.g., raw, digested, thickened, and dewatered sludge, composted biosolids, and incinerator ash)
   a. Toxicity characteristic leaching procedure (TCLP)
   b. Chemical data
3. IWS
   a. Information on industrial users with categorical standards or local limits and other significant non-categorical industrial users
      – number of industrial users
      – discharge flow
      – chemical usage
   b. Standard Industrial Classification (SIC) code
   c. Wastewater flow
   d. Types and concentrations of pollutants in the discharge
   e. Products manufactured
   f. Description of pretreatment facilities and operating practices
4. Industrial User Permits
   a. Pretreatment standards
      – categorical standards
      – local limits
      – prohibited discharge standards
   b. Monitoring requirements
5. Annual pretreatment program report
   a. Schematic of sewer collection system
   b. Industrial user monitoring and inspection data collected by POTW staff
      – discharge characterization data
      – spill prevention and control procedures
      – hazardous waste generation
   c. Industrial user self-monitoring data
      – discharge characterization data
      – flow measurements
      – description of operations
      – compliance schedule (if out of compliance; e.g., notice of slug loading)
6. Headworks analysis for local limits
7. Industrial user compliance reports
8. Waste hauler monitoring data and manifests
9. RCRA reports [if the POTW is considered a hazardous waste treatment, storage, and disposal facility (TSDF)]
   a. Hazardous waste manifests
   b. Operating record
   c. Biennial report
   d. Unmanifested waste report
10. CERCLA reports (if the POTW accepts wastes from a superfund site)
    a. Preliminary site assessment
    b. Site investigations
    c. Remedial investigations
    d. Feasibility studies
    e. CERCLA decision documents
11. Information on POTW treatment interferences (e.g., biological process inhibition); example data include:
    a. Evidence of slug loadings
    b. Decreased pollutant removal
    c. Decreased oxygen uptake rates (OURs), SVI, and sludge yield in biological treatment process
    d. Increased requirement for chemical usage (e.g., chlorine, coagulants, flocculents)
    e. Decreased filtration rate and increased backwash frequency for filtration treatment

Section 3
Facility Performance Evaluation

Introduction

POTW treatment deficiencies that cause poor conventional pollutant removal can have an adverse effect on toxicity reduction as well. As an initial step in the TRE, effluent toxicity data (Table 2-1) and POTW operations and performance data (Table 2-2) should be evaluated to indicate potential toxicants of concern and to identify treatment deficiencies or in-plant sources of toxicity that may be responsible for all or part of the effluent toxicity. POTW pretreatment program data (Table 2-3) should also be reviewed to indicate possible sources of toxicity and summarized for use in later steps of the TRE such as the toxicity source evaluation (Section 5).

POTW Performance Evaluation

A POTW performance evaluation can be conducted to indicate conventional pollutant treatment deficiencies or in-plant sources of toxicity that may be contributing to effluent toxicity. Conventional pollutant treatment deficiencies include the inability to meet permit limits for BOD, TSS, and nutrients. These deficiencies should be corrected before initiating a full TRE because improved treatment also may reduce effluent toxicity. In-plant sources of toxicity may be present even if the POTW is meeting permit limits for pollutants other than toxicity. An example of an in-plant source of toxicity includes inadequate solids separation in the final clarifier, which may result in the discharge of toxic material bound to suspended solids. Also, incomplete biological treatment may cause the pass-through of biodegradable toxicants. Other in-plant sources of toxicity may include treatment additives used in toxic amounts or additives that contain toxic impurities. If deficiencies are found in the POTW performance evaluation, improvements can be implemented to eliminate the causes of toxicity. Several examples of operating conditions that have contributed to effluent toxicity at POTWs and the steps taken to correct the problem are included in the following discussion of the POTW performance evaluation process.

A flowchart for conducting a POTW performance evaluation is presented in Figure 3-1. The POTW performance evaluation involves a review of the major treatment unit processes (e.g., primary sedimentation, activated sludge, and secondary clarification) using wastewater characterization data and process operations information. A TIE Phase I analysis (as described below and in Section 4) also can be performed to indicate the presence of effluent toxicants caused by incomplete treatment (e.g., ammonia), routine operating practices (e.g., chlorine), or the discharge of organophosphate pesticides in the POTW collection system. Ammonia and chlorine are commonly found to cause toxicity in POTW effluents and should be evaluated at this stage of the POTW performance evaluation. As noted in Section 2, ammonia and chlorine may be of concern at concentrations greater than 5 mg/L and 0.01 mg/L, respectively, depending on the effluent matrix and the species being tested. Levels of concern for other relatively common effluent toxicants are listed in Table 2-1. Special consideration also should be given to chemicals used in the treatment process such as used or reused waste materials and coagulants, which may contribute to toxicity due to pass-through of residual concentrations or impurities in the product.

Based on the process review results and TIE characterization data, options for improving operations and performance may be selected and evaluated in treatability studies. If treatability tests are successful in identifying options for improving conventional pollutant treatment and toxicity reduction, the TRE proceeds to the selection and implementation of those options (Section 6). If no treatment deficiencies or in-plant sources of toxicity are observed, or the treatment alternatives do not reduce effluent toxicity to

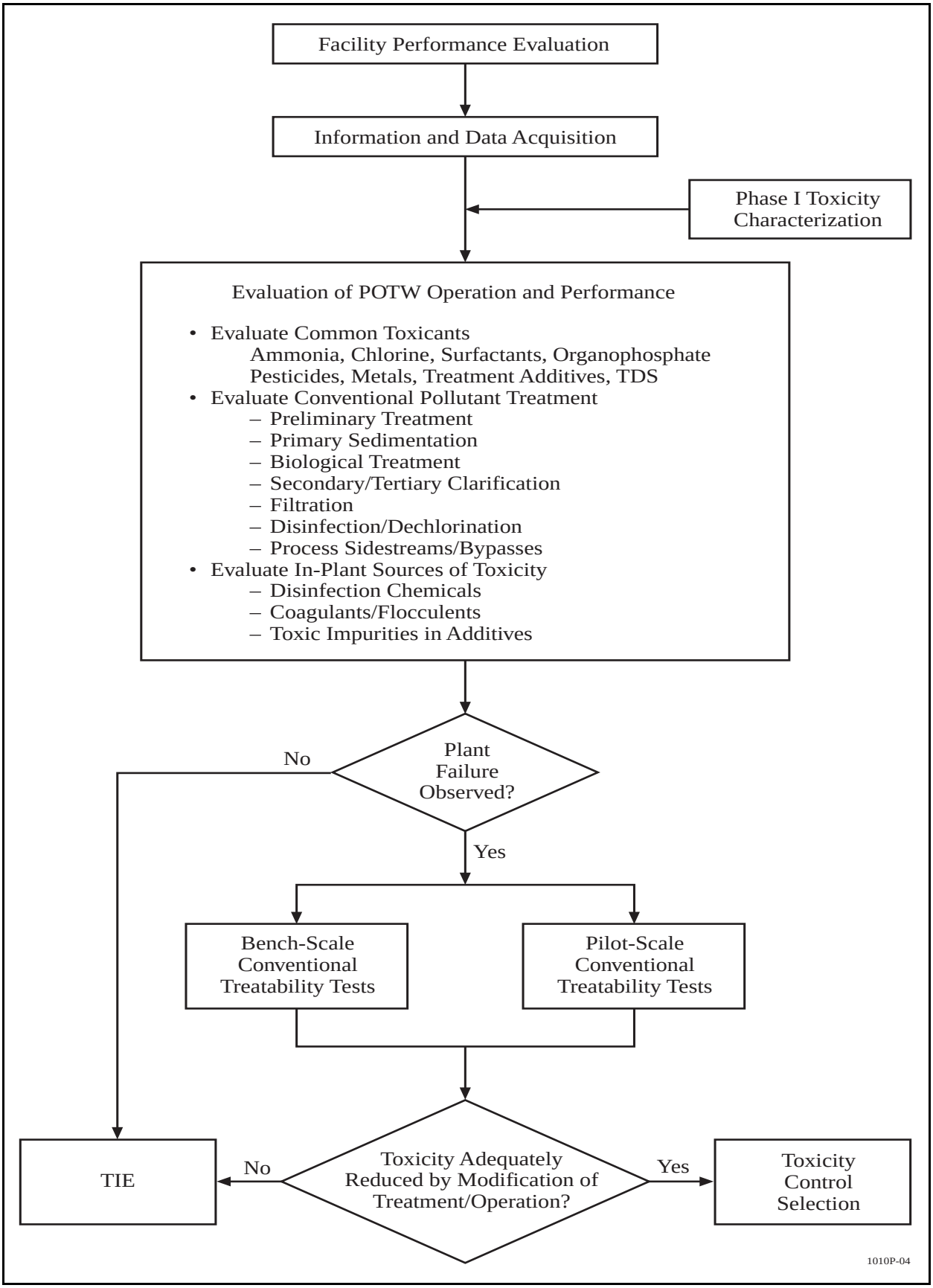

Figure 3-1. Flow diagram for a facility performance evaluation.

acceptable levels, a complete effluent toxicity characterization should be performed using the TIE procedures described in Section 4.

POTWs are subject to both variable influent characteristics and changing operating conditions that may have a significant effect of effluent toxicity. The POTW performance evaluation should be conducted during a period when the influent loadings and facility operations are representative of average conditions. If effluent toxicity varies seasonally or as a result of a specific operational condition, the POTW performance evaluation should be scheduled to coincide with the expected toxic event. Due to the variability inherent in POTW operations, it may be necessary to conduct additional POTW performance evaluation investigations during the course of the TRE. For example, POTW performance evaluations may be useful when performed before and after implementation of facility modifications, changes in industrial user activities, or variations in effluent toxicity.

Operations and Performance Review

The operations and performance review involves the evaluation of the major POTW unit processes using the information described in Table 2-2. This review focuses on the secondary treatment system because secondary treatment is responsible for removing the majority of the conventional and toxic pollutants from municipal wastewater. Deficiencies in this system are more likely to result in incomplete treatment of wastewater toxicity. For example, problems with nitrification treatment may cause toxic concentrations of ammonia to pass through in the effluent. Other unit processes to be evaluated include primary sedimentation, disinfection, and advanced treatment processes such as filtration.

Procedures for evaluating and improving POTW operations and performance are described in USEPA's *Handbook on Retrofitting POTWs* (USEPA, 1989c). This handbook describes a two-step process to improve POTW performance: comprehensive performance evaluation and a composite correction program approach. The comprehensive performance evaluation involves a thorough review of the POTW design and operating conditions to identify problem areas. The composite correction program involves the systematic identification and implementation of improvements with an emphasis on low-cost solutions. Other useful sources of information include a joint publication by Water Environment Federation and American Society of Civil Engineers entitled *Design of Municipal Wastewater Treatment Plants* (WEF/ASCE, 1992a, 1992b) and Metcalf and Eddy's *Wastewater Engineering Treatment, Disposal, and Reuse* (1991). Computer software programs, including USEPA's *POTW Expert* (1990), have also been developed to "troubleshoot" operations and performance problems. In addition, USEPA (1993d) has a data base on pollutant removal efficiencies (RREL Treatability Data Base, Version 5) for various treatment processes. Although this guidance does not specifically address toxicity, correcting conventional pollutant treatment problems and controlling in-plant toxicants may improve toxicity reduction. In addition to the noted guidance, public works managers are advised to use the services of a professional engineer who has experience with the POTW treatment system.

Preliminary Treatment

Preliminary treatment processes that may be used to enhance toxicity control include equalization/storage and oil and grease removal. Equalization basins can be effective in dampening the effect of slug loads of toxicity or to equalize flow and organic loadings to achieve consistent subsequent treatment of the influent wastewater. Oil and grease removal can assist in removing toxicants associated with oil and grease and to minimize the impact of oil and grease on the POTW.

TRE Example

A municipality in Texas experienced effluent toxicity that was related to a volatile organic compound entering the POTW. A pre-aeration system was to be added to the influent headworks or the grit removal system; however, before construction was started, a city employee noticed a strong odor in a sewer line that was related to the volatile toxicant. The source of the volatile compound was identified and controlled. As a result, effluent toxicity was eliminated (S. Bainter, personal communication, USEPA, Dallas, TX, 1998).

Primary Sedimentation

Primary treatment processes are designed to reduce the loading of TSS, BOD_5, and COD on the secondary treatment system. Toxic pollutant removal also can occur by sedimentation of insoluble or particulate wastewater constituents. Optimal removal of both toxic and conventional pollutants in primary

sedimentation ultimately reduces the amount of material to be treated in the biological treatment process.

Primary clarifier performance can be evaluated by comparing BOD_5 removal to the surface overflow rate (SOR), which is the average daily flow divided by the clarifier surface area. A clarifier operating at an SOR of less than 24 cubic meters per square meter per day ($m^3/m^2/day$) [600 gallons pre day per square foot (gpd/sq ft)] should remove 35 to 45% of the influent BOD_5. A clarifier operating at an SOR of 24 to 40 $m^3/m^2/day$ (600–1,000 gpd/sq ft) should remove 25 to 35% of the influent BOD_5 (USEPA, 1989c). In most cases, COD removal performance is comparable to the BOD_5 removal performance. If the primary clarifiers do not achieve the expected BOD_5 or COD removal, engineering studies should be initiated to determine the need for additional clarifier capacity.

Removal of toxicity associated with TSS may be enhanced by addition of coagulants to the primary clarifiers. The optimum conditions for coagulation and flocculation of toxicants can be determined by jar tests. These tests are used to establish the optimum type and dosage of coagulant, the proper mixing conditions, and the flocculent settling rates for enhanced toxicant removal (Adams et al., 1981).

A key operating parameter for controlling clarifier performance is sludge removal. Primary clarifiers generally function best with a minimum sludge blanket. Sludge withdrawal should be adjusted to maintain the primary sludge concentration in the range of 3 to 6% total solids (USEPA, 1989c).

Biological Treatment

Biological treatment is a critical process at most POTWs because it is the process that converts organic matter and nutrients to settleable microorganisms. Toxic pollutant removal during biological treatment can occur by biodegradation, oxidation, volatilization, and adsorption onto the biological floc. Key factors affecting the removal of toxic pollutants are the rates of biodegradation, tendency to volatilize, oxidize, or sorb onto solids, and the degree to which the pollutants may inhibit the treatment process.

Ammonia is a common cause of effluent toxicity at POTWs that do not include nitrification treatment. As noted by USEPA (1991a), ammonia is often present in effluents in concentrations varying from 5 to 40 mg/L. These concentrations can cause toxicity depending on several factors that affect the toxicity of ammonia, including pH, temperature, DO, and TDS. A simple TIE procedure for checking whether effluent toxicity may be related to ammonia is described below (see "TIE Phase I Tests"). Literature data on ammonia toxicity (USEPA, 1985a) should only be used as a general guide because ammonia toxicity is significantly affected by slight pH changes.

The most commonly used biological treatment systems can be defined as either suspended growth processes, such as conventional activated sludge, contact stabilization, and extended aeration; or fixed film processes, such as trickling filters, denitrification filters, and rotating biological contactors (RBC). To simplify the discussion of biological treatment, the following subsections focus on evaluating the performance of conventional activated sludge processes and related BNR processes, which are the systems most widely used in POTWs.

Conventional activated sludge treatment is an aerobic process that can be accomplished in one stage or zone. BNR processes integrate carbon oxidation, as achieved in conventional activated sludge treatment, with treatment stages designed for nitrification, denitrification, and enhanced biological phosphorus removal. These stages require specific treatment conditions, including anaerobic, anoxic, and aerobic zones in the mixed liquors. The stages may be separated by physical divisions, non-discrete zones, or by operating cycle (WEF/ASCE, 1992b). The sequence and sizing of the BNR stages depend on the effluent nitrogen and phosphorus concentrations that must be achieved.

Conventional activated sludge processes remove phosphorus and nitrogen in the course of converting organic matter to new biomass. The typical phosphorus content of microbial cells is 1.5 to 2% on a dry-weight basis (WEF/ASCE, 1992b). BNR processes enhance phosphorus removal by utilizing the sequence of an anaerobic stage followed by an aerobic stage, which results in the selection of a biomass population capable of concentrating phosphorus from 4 to 12% of the microbial cell mass. Enhanced nitrogen removal in BNR processes is a two stage process: nitrification oxidizes ammonia to nitrite and then to nitrate, and denitrification reduces the nitrate to nitrogen gas. The nitrogen and phosphorus removal processes can be used independently (e.g., oxidation

ditches and A/O® process, respectively) or can be integrated into a combined nutrient removal process (e.g., A^2O® and Bardenpho® processes). A wide variety of BNR systems are in operation, some of which are proprietary; therefore, specific information on the process being studied may be obtained by consultation with the system vendors.

TRE Example

A United States east coast municipality implemented nitrification to achieve a seasonal NH_3-N limit of 1 mg/L (Engineering Science, Inc., 1994). The POTW typically achieved less than 1 mg/L NH_3-N. As a result, the POTW effluent eliminated chronic toxicity to fathead minnows (*Pimephales promelas*) from May 1 through September 31 each year; however, the effluent continued to be toxic during the remainder of the year. In an effort to comply with the permit limit for chronic toxicity, nitrification was extended for the full year. This modification eliminated chronic toxicity to fathead minnows throughout the year.

The parameters that are typically used to evaluate the operational capability of an activated sludge system include organic loading, oxygen requirement, and MCRT. Additional important operating conditions include the alkalinity requirement for nitrification, and the BOD_5 requirement for phosphorus removal and denitrification. Operating values for these parameters can be compared to design specifications or recommended criteria to determine how well the processes are being operated.

Organic Loading

Organic loading affects the organic removal efficiency, oxygen requirement, and sludge production of activated sludge processes. The most common measure of organic loading in suspended growth processes is the F/M ratio, which is the organic load removed per unit of mixed liquor volatile suspended solids (MLVSS) in the aeration basin per unit time. High F/M ratios (i.e., high organic loading to MLVSS) will result in a low organic removal efficiency, low oxygen requirement, and high sludge production. Low F/M ratios (i.e., low organic loading to MLVSS) will lead to high organic removal efficiencies and low sludge production, but high oxygen requirements.

If the suspected toxicants are biodegradable or partition to activated sludge, the MLVSS of the treatment process should be increased to the maximum levels that can be maintained at the POTW. The maximum MLVSS often will be limited by the available secondary clarifier capacity. It is important to consider the effect of increased MLVSS on secondary solids separation and the TSS concentrations of the clarifier effluent. The Patapsco Wastewater Treatment Plant (WWTP) in Baltimore, Maryland, was operated at an F/M ratio of 0.40 lb BOD_5/lb MLVSS-day instead of the design F/M ratio of 0.55 lb BOD_5/lb MLVSS-day, because the POTW could not achieve consistent wastewater treatment at the higher organic loading. The increased MLVSS levels were thought to be necessary because of the toxic effect that industrial wastewaters were having on the activated sludge biomass (Slattery, 1987). For optimal treatment, it may be necessary to maintain F/M ratios that are on the low end of the range typically observed for biological treatment processes. The F/M ratio in an activated sludge system is generally maintained in the range of 0.2 to 0.4 lb BOD_5/lb MLVSS-day for conventional activated sludge, 0.05 to 0.15 lb BOD_5/lb MLVSS-day for extended aeration, and 0.2 to 0.6 lb BOD_5/lb MLVSS-day for contact stabilization (Metcalf and Eddy, 1991). The recommended F/M ratio for integrated BNR processes is generally in the range of 0.1 to 0.25 lb BOD_5/lb MLVSS-day (Metcalf and Eddy, 1991).

Influent BOD_5 concentrations should be high relative to phosphorus levels to ensure optimal phosphorus uptake and removal in BNR processes. Although optimum conditions vary according to the system design, the ratio of total influent BOD_5 ($TBOD_5$) to influent TP should be 20:1 to 25:1 to meet an effluent TP level of 1.0 mg/L or less. More importantly, the ratio of influent soluble BOD_5 ($SBOD_5$) to influent soluble phosphorus (SP) should be 15:1 (WEF/ASCE, 1992b).

The presence of biodegradable material also is necessary for denitrification in the first anoxic stage of BNR processes. For example, the Water Research Commission (1984) found that the TKN to COD ratio should be less than 0.08 to accomplish complete denitrification with the Bardenpho® process. In most cases, carbon must be added to the anoxic stage either by internal recycling of BOD_5 in process streams (e.g., nitrified effluent) or by chemical addition (e.g., methanol or acetate).

Oxygen Requirement

Microorganisms in the activated sludge system require oxygen to metabolize organic material and nutrients and breakdown biodegradable toxicants. Oxygen in diffused air or pure oxygen systems also may oxidize toxicants. Oxygen deficient conditions can result in lower treatment efficiency and, as a result, a greater potential for pass-through of toxic material. To ensure an adequate supply of oxygen, the DO level for conventional activated sludge (carbon oxidation) should be at least 2 mg/L during average loading conditions and 0.5 mg/L under peak loadings (WEF/ASCE, 1992a). Typical air requirements are 1,500 cu ft/lb BOD_5 load for conventional activated sludge and contact stabilization, and 2,000 cu ft/lb BOD_5 load for extended aeration (USEPA, 1989c). Air requirements for nitrification are higher because 4.2 to 4.6 mg of oxygen are required per mg of NH_3-N oxidized as compared to 0.6 to 1.1 mg of oxygen needed per mg of BOD_5 oxidized (WEF/ASCE, 1992b). DO concentrations of 2 to 2.5 mg/L are needed for nitrification in activated sludge processes with short retention times. In integrated activated sludge/nutrient removal processes, sufficient oxygen should be provided to achieve carbon oxidation and complete nitrification at the maximum daily loading rate.

Some of the oxygen consumed in the aerobic stage is in the form of NO_3-N. This oxygen source can be recovered in the denitrification process, which is generally located in an anoxic stage at the head of the BNR system. Approximately 2.86 mg of oxygen is recovered for each mg of NO_3-N reduced by biological denitrification. Internal recycling from the aerobic stage to the anoxic stage can decrease the oxygen required for nitrification by 50 to 60%. Carryover of molecular oxygen from the aerobic stage to the anoxic stage should be minimized by regulating the internal recycle rate. Generally, the recycle rate should be no more than three to four times the influent flow rate for these systems (WEF/ASCE, 1992b).

The transfer of oxygen from the gas phase to the liquid phase is a function of the aeration equipment and the basin mixing conditions. USEPA (*Handbook for Retrofitting POTWs*, 1989c) describes a procedure for estimating the oxygen transfer capacity in aeration basins based on equipment specifications. Another estimate of oxygen transfer capacity involves comparing OUR of the biomass to the calculated theoretical oxygen demand for the aeration system (USEPA, 1989c). If the OUR results indicate an oxygen demand that is greater than the calculated oxygen demand, the oxygen supply may be inadequate. The opposite case (i.e., higher theoretical oxygen demand than actual oxygen demand) is preferred; however, a substantial difference may indicate inhibition of biomass activity.

TRE Example

OUR measurements were used to document the start-up performance of the activated sludge treatment process at the Patapsco Wastewater Treatment Plant (Botts et al., 1987). During the start-up, the OUR of the biomass averaged 20 milligrams O_2 per liter per hour per gram MLSS (mg O_2/L/hr/g MLSS), and the POTW frequently exceeded its conventional pollutant permit limits. As the biological system became acclimated to the wastewater, the effluent quality improved and the biomass OUR increased to an average of 50 mg O_2/L/hr/g MLSS.

Oxygen is not desirable in denitrification processes and the initial (anaerobic) stage of biological phosphorus removal processes. Molecular oxygen must be absent for denitrifying organisms to reduce NO_3-N to nitrogen gas. Phosphorus removing organisms require anaerobic conditions to accomplish the initial phosphorus release step (resynthesis occurs in the subsequent aerobic zone). NO_3-N and DO concentrations in the anaerobic zone should be kept below 1 mg/L (WEF/ASCE, 1992b). Although mixing is usually required in anaerobic and anoxic basins, it is minimized to prevent oxygen transfer to the mixed liquors. Also, DO carry over from the aerobic zone to the anoxic (denitrification) zone should be regulated through independent control of aeration equipment at the end of the aerobic zone.

Mean Cell Residence Time

In the course of biological treatment, activated sludge microorganisms convert some of the organic matter and nutrients in the wastewater to new cell mass. Toxic constituents may also be degraded or adsorbed onto the biomass. To achieve optimal treatment, the biomass concentration in the aeration tank is held at a constant level by routinely wasting the excess sludge. Sludge mass control can be practiced by maintaining a consistent average age of activated sludge (i.e., MCRT) in the system. The MCRT is calculated by dividing the total sludge mass in the system by the

amount of sludge that is wasted each day (i.e., lb/lb per day).

The optimal MCRT for toxicity reduction will depend on the type of toxicant(s) in the wastewater. Some compounds may be more efficiently removed by a younger biomass (low MCRT) and other toxicants are treated better with an older biomass (high MCRT) (Metcalf and Eddy, 1991). In general, biodegradable toxicants are more efficiently removed using a relatively long MCRT (WEF/ASCE, 1992a); therefore, the MCRT may be set at the high end of the range of values typically used for biological treatment. Hagelstein and Dauge (1984) also found improved toxicity reduction of a petroleum waste at MCRTs greater than 10 days. Typical MCRTs for aeration processes are 6 to 12 days for conventional activated sludge, 10 to 30 days for contact stabilization, and 20 to 40 days for extended aeration (USEPA, 1989c). System MCRTs for nitrification and BNR processes are generally long (20 to 40 days) because the growth rates of nitrifying organisms are slower compared to those for heterotrophic organisms found in conventional activated sludge systems (WEF/ASCE, 1992b). Overly long MCRTs should be avoided because subsequent denitrification treatment may be adversely affected if essential carbon has been depleted in the nitrification/carbon oxidation stage.

TRE Example

In 1992, Novartis Crop Protection, Inc., in cooperation with Makhteshim-Agan of North America, Inc., the two principal manufacturers of organophosphate insecticides in North America, evaluated the removal of diazinon and chlorpyrifos by various treatment methods (Novartis, 1997). Anecdotal evidence from other studies (Fillmore et al., 1990) and treatability studies by Novartis suggested that adsorption onto solids was the dominant mechanism for removal of organophosphate insecticides. The treatability tests performed in the 1997 study showed that about 30% of the diazinon and 85 to 90% of the chlorpyrifos present in POTW primary influent samples is adsorbed onto primary influent solids and approximately 65 to 75% of the diazinon added to the mixed liquor is adsorbed onto the biomass. Diazinon adsorption was greater for a 30-day MCRT biomass than for a 15-day biomass. Chlorpyrifos strongly adsorbed to the biomass; none remained after biological treatment. These results suggest that longer MCRTs may improve removal of organophosphate insecticides.

Additional Considerations for BNR Process Control

Additional considerations for BNR process control include maintaining sufficient alkalinity, proper management of sludge processing sidestreams, and achieving efficient solids separation in the secondary clarifier. Nitrification reduces the wastewater alkalinity by 7.2 mg/L as $CaCO_3$ for each mg of NH_3-N oxidized. However, about 40 to 50% of the alkalinity destroyed by nitrification can be restored in the denitrification process. The carbonate/CO_2 equilibrium in the mixed liquor determines the pH. As a general rule, alkalinity should be maintained above 50 mg/L in the nitrification process in order to keep the pH high enough for optimal treatment.

Secondary Clarification

In order for activated sludge and BNR processes to operate efficiently, the secondary clarifier must effectively separate solids from the liquid phase and concentrate the solids for subsequent return to the aeration basin. In addition to clarifier design, solids-liquid separation is influenced to a large degree by the aeration basin operating conditions such as DO levels, F/M ratio, and MCRT. If the MLVSS and MCRT of the aeration basin is to be maximized for toxicity control, it is important to consider the impact of this change on secondary solids separation and effluent TSS concentrations. Sludge settling characteristics are affected by how the aeration basin is operated. Low or high DO levels in the aeration basin can result in the growth of filamentous bacteria (e.g., *Norcardia* spp. and *Sphaerotilus natans*, respectively) that can hinder solids settling, whereas DO levels of 2 to 4 mg/L promote the growth of "zoogleal-type" bacteria, which aggregate into fast settling flocs. At very high organic loadings (high F/M), the activated sludge can be dispersed and will not settle well. This condition was observed at the East Side Sewage Treatment Plant in Oswego, New York, which experienced sludge bulking due to high effluent organic loadings (USEPA, 1984a). Sludge settleability was improved by increasing the MCRT and the sludge return rate.

The performance of secondary clarifiers in solids-liquid separation is dependent on a variety of factors including clarifier configuration, SOR, clarifier depth at the weirs, the type of sludge removal mechanism, and the return sludge flow rate. USEPA's *Handbook on Retrofitting POTWs* (1989c) describes a system for scoring secondary clarifier performance based on these factors. Design clarifier SORs for conventional

activated sludge processes are typically in the range of 400 to 800 gpd/sq ft (Metcalf and Eddy, 1991). In general, integrated BNR processes require larger clarifier capacity than conventional activated sludge processes, particularly where effluent quality must be high.

Clarifier capacity is important for phosphorus removal, because phosphorus is associated with the biomass, which can be carried over into the final effluent as residual solids. At peak sustained flow, a clarifier SOR of 800 gpd/sq ft is recommended to achieve a final effluent TP concentration of 2 mg/L. Lower effluent TP limits may require chemical treatment using a metal salt of iron, aluminum, or calcium, and, perhaps, a follow-on filtration process. For example, effluent phosphorus levels at the Jerry Sellers POTW in Cocoa, Florida, were reduced from an average of 2.9 mg/L to less than 0.2 mg/L with the addition of aluminum sulfate, commonly referred to as alum (WEF/ASCE, 1992b). In general, effluent TP levels of 0.2 to 0.5 mg/L can be met through chemical addition with a clarifier capacity of 500 gpd/sq ft (WEF/ASCE, 1992b).

Process Sidestreams and Wastewater Bypasses

Some wastewater and sludge treatment processes can produce sidestream wastes that may have a deleterious effect on the wastewater treatment system or might contribute to effluent toxicity. In addition, raw or partially treated wastewater that bypasses part or all of the treatment system can add substantial toxicity to POTW discharges (Mosure et al., 1987).

Examples of POTW sidestreams include sludge processing wastewaters (from thickening, digestion, and dewatering of sludges), cooling water blowdown, incinerator scrubber blowdown, and backwash from tertiary filters. Sidestreams from anaerobic digestion and sludge dewatering can contain high concentrations of BOD_5, COD, nitrogen, and phosphorus that can represent a significant loading to the aeration basin. Nitrogen and phosphorus in sidestreams are a concern for BNR processes, which can be compromised unless the loadings are removed, equalized, or separately treated. Also, some sidestreams may contain toxic materials such as metals and cyanide that may pass through the POTW. For example, cyanide may be formed during incineration of biosolids. Once formed, the cyanide may be captured in the incinerator scrubbers and introduced into the treatment system via the scrubber waste stream. If the treatment process does not degrade the cyanide, toxic concentrations may be discharged in the POTW effluent. Also, sufficient amounts of cyanide may be present to cause inhibition of the biological treatment process, which leads to the release of more cyanide in the POTW effluent.

In some municipalities, storm water and sewage are still collected in the same sewer system. When a large storm event occurs, the CSO is often diverted away from all or part of the treatment system to prevent hydraulic over loading. In some cases, untreated overflows or bypasses may be directed into the POTW effluent, which can cause the discharge of relatively high concentrations of toxic and conventional pollutants.

The POTW performance evaluation should include a review of data on process sidestreams, wastewater bypasses, and overflows that are discharged into all or part of the POTW or into the final effluent. Additional analytical and toxicity data may be needed to characterize the levels of toxic pollutants and toxicity in these waste streams. Information on the frequency, volume, and toxicity of sidestream discharges, bypasses, and overflows also can be compared to historical effluent toxicity data to evaluate possible trends or relationships. This information can be used to determine if the discharges are a significant source of pollutants or toxicity, and whether current treatment practices are sufficient to remove toxicity. If necessary, consideration may be given to enhanced treatment of process sidestreams to remove toxicants such as metals. Enhanced treatment may involve changing the dosage of currently used coagulants applied for solids separation or adding new coagulant and flocculent aids. Bench-scale jar tests can be performed to determine the optimum type and dosage of coagulant and the appropriate treatment conditions.

Advanced Treatment Processes

Advanced treatment processes may be included in some POTWs to achieve pollutant removal beyond what is provided by biological treatment. These processes may include filtration, adsorption, chemical treatment, air stripping, and breakpoint chlorination. Of these processes, chemical treatment and filtration are most commonly used in POTWs, particularly for enhanced phosphorus removal.

Chemical Treatment

Chemical treatment can contribute to toxicity where toxic residual concentrations or contaminants in the product are present in the final effluent. Chemicals used in the latter stages of wastewater treatment are of particular concern because final treatment processes (e.g., tertiary clarification, chlorination) are less likely to remove residual concentrations (Note: potentially toxic disinfection byproducts, including residual chlorine, are discussed in a following subsection). When used wisely, treatment additives such as coagulants, flocculent aids, and hydrogen peroxide (H_2O_2) can also improve toxicity treatment.

Chemicals of concern in POTWs include chemicals formerly classified as hazardous waste. Under RCRA, a hazardous waste sold to a POTW is no longer considered a hazardous waste. According to 40 CFR Part 261.21(c)(5)(ii):

> "A material is 'used' or 'reused' if it is... employed in a particular function or application as an effective substitute for a commercial product (for example, spent pickle liquor used as phosphorus precipitant and sludge conditioner in wastewater treatment)."

TRE Example

An example of the potential problems that may occur with process chemicals was the use of a dechlorination agent at several City of Houston wastewater treatment plants (S. Bainter, personal communication, USEPA, Dallas, TX, 1998). The City had routinely passed effluent toxicity tests until a dechlorination chemical was obtained from a new vendor. When the chemical was applied, effluent toxicity was observed at each of the POTWs. At the time, the City did not know the chemical may be a problem and proceeded to retain consultants to conduct TREs at the facilities. In the meantime, the supply of the dechlorination chemical was depleted and the city turned to a new source of the chemical. When the new chemical was applied, the POTWs started to pass the effluent toxicity tests. POTW staff can avoid similar problems if vendors are queried about potential contaminants in the waste chemicals or toxicity tests are performed on product samples to verify their suitability.

Chemical treatment is often practiced for phosphorus removal at POTWs. Typical coagulant aids include lime, alum, sodium aluminate, ferric chloride, and ferrous sulfate. These coagulants have generally not been found to be toxic at the concentrations typically used for phosphorus removal. For example, alum dosages as high as 20 mg/L did not cause chronic effluent toxicity in treatability tests conducted at the City of Durham, North Carolina (Appendix D). Nonetheless, steps should be taken to prevent excessive and inadvertent chemical use. Also, each chemical additive used for treatment should be evaluated as a potential source of toxicity, not just suspect chemicals.

If toxicity is associated with suspended solids, chemical treatment conditions may be modified to enhance toxicity removal. The optimum conditions for coagulation can be determined by conducting jar tests. These tests can be used to establish the optimum type and dosage of coagulant, the proper mixing conditions, and the flocculent settling rates for improved phosphorus and/or toxicity removal (Adams et al., 1981).

TRE Examples

Studies have been performed to evaluate the reduction of organophosphate insecticides by chemical treatment (Novartis, 1997). Chemical precipitation using ferric chloride and polymer was found to only slightly reduce diazinon levels. No major change in diazinon concentrations was observed whether the coagulants were added to primary wastewater or secondary treated wastewater prior to clarification. Chlorination treatment was effective in reducing diazinon from secondary clarifier effluent; however, chronic toxicity was unchanged. Qualitative results suggest that the chlorine oxidized diazinon to diazoxon, a byproduct that exhibits similar toxic effects as diazinon. The results of additional treatments for diazinon are given in Appendix H.

A study conducted for San Francisco Bay area POTWs also evaluated the effect of chlorine on organophosphate insecticide concentrations (AQUA-Science, 1995). This study evaluated the use of household bleach as a measure that residential customers could use to degrade diazinon in spray container rinsate and chlorpyrifos from pet flea washes prior to disposal into the sewer. Samples of tap water were spiked with diazinon (60.0 µg/L) and chlorpyrifos (10.0 µg/L) and treated with either 0.005 or 5% solutions of household bleach for 24 hours. Results showed that both bleach concentrations

reduced concentrations of the insecticides by 86 to 92%. The study suggested that household bleach may be an effective pretreatment for waste solutions of the two insecticides prior to disposal. Additional studies are planned to further define bleach exposure times and concentrations under actual use conditions and to characterize the chemical oxidation products produced by the chlorine treatment. Additional information on this study is presented in Appendix F.

H_2O_2 has been used by a North Carolina municipality to control toxicity associated with non-polar organic toxicants (Aquatic Sciences Consulting, 1997). Although the specific toxic compounds were not identified; jar tests with H_2O_2 showed a substantial reduction in chronic toxicity to *Ceriodaphnia dubia* (*C. dubia*) at dosages ranging from 1 to 10 mg/L H_2O_2. Since the City began adding H_2O_2 to the POTW effluent (final concentration of 5 to 7 mg/L), results of a single *C. dubia* test show that the effluent NOEC was reduced from <15 to 90%.

Granular Media Filtration

Granular media filtration is usually applied after biological treatment to remove residual suspended solids, particulate BOD_5, or insoluble phosphorus. Filter influent is often chemically pretreated to enhance removal of suspended solids and phosphorus. In addition to the metal salts noted above, polyelectrolytes may be added to improve coagulation and flocculation of chemically treated influents. Typical polymer dosages are 0.5 to 1.5 mg/L for settling of flocculent suspensions before filtration and 0.05 to 0.15 mg/L when added directly to the filter influent. Some polymers can be toxic to aquatic life (Hall and Mirenda, 1991); therefore, polymers used in the filtration process should be evaluated for the potential to contribute to effluent toxicity.

Poor filter performance should be investigated, especially the pass-through of potentially toxic material. Loss of suspended solids and other pollutants may result from high hydraulic and solids loadings, excessively long filtration cycles, and incomplete backwashing and cleaning of the filter.

Disinfection

Disinfection is generally achieved by treating the secondary effluent with chlorine and allowing a sufficient contact period prior to discharge. Alternative disinfection practices such as ultraviolet (UV) radiation are becoming more popular because of concerns about the effects of chlorine on aquatic life and human health.

The chlorine disinfection process should be carefully evaluated because residual chlorine and other by-products of chlorination (i.e., mono- and dichloro-amines, nitrogen trichloride) are toxic to aquatic life (Brungs, 1973). Chlorine dosages are usually based on the level of residual chlorine to be maintained in the final effluent as specified in the NPDES permit. The POTW performance evaluation should focus on the minimum amount of chlorine that can be applied to achieve the required residual chlorine concentration. In some cases, the TRC level specified in the NPDES permit may be sufficient to cause effluent toxicity. In general, TRC concentrations above 0.05 mg/L are a concern (D. Mount personal communication, AScI Corp, Duluth, Minnesota, 1991), although its toxicity will depend on the effluent matrix and the species used for effluent monitoring. Residual chlorine levels can be compared to toxicity data reported in the literature (USEPA, 1984b) to determine if chlorine may be a *potential* cause of effluent toxicity. If dechlorination is practiced following chlorination, information on the type and amount of oxidant-reducing material also should be obtained.

A chlorination process that is not continuously adjusted to varying flow and chlorine demand may cause effluent toxicity. Fortunately, this problem can be corrected easily by more frequent monitoring of the chlorine residual in effluent samples and more frequent adjustments in the addition of chlorine and dechlorination chemical. Flow-proportional feed equipment for chlorine and dechlorinating agents should be used to minimize the potential for excess chemical addition.

TIE Phase I Tests

TIE Phase I tests (USEPA 1991a, 1992a) can be conducted in parallel with the above operations and performance review to obtain information on the types of compounds causing effluent toxicity. An overview of the Phase I procedure is described in Section 4 of this guidance.

TIE Phase I testing in the POTW performance evaluation focuses on characterizing toxicants that may be present in the effluent because of inadequate treatment performance or routine operating practices. Phase I results, when taken together with the POTW performance evaluation data, may provide important

clues about possible in-plant toxicants. Based on this information, treatability tests may be designed to evaluate methods for removing the suspected effluent toxicants.

TIE Phase I testing includes several characterization steps that can be used to indicate the presence of "in-plant toxicants" such as ammonia and chlorine. One step involves pH adjustment of the effluent sample to three distinct pHs, such as pH 6, 7, and 8 prior to toxicity testing to indicate the effect of pH changes on effluent toxicity. The pH adjustment will shift the equilibrium concentration of ammonia between its toxic form (NH_3) and its essentially nontoxic form (NH_4). As pH increases, the percentage of total ammonia (NH_3 and NH_4) present as NH_3 increases. If adjusting the effluent sample pH to 8 increases the toxicity and if lowering the effluent sample pH to 6 decreases the toxicity, the identity of the effluent toxicant would be consistent with ammonia (Section 4). Another Phase I step is designed to indicate whether wastewater oxidants, such as TRC (i.e., free chlorine and mono- and dichloroamines), are causing toxicity. Sodium thiosulfate, a reducing agent, is added to eliminate TRC and other oxidants. The thiosulfate is added to serial dilutions of the effluent sample with 1 or 2 levels added across the dilutions. Toxicity tests on samples with and without thiosulfate treatment are used to indicate if oxidants such as TRC may be causing effluent toxicity.

It is important to note that each of the TIE Phase I characterization steps described above addresses a broad class of toxicants rather than specific effluent constituents, such as ammonia and TRC (USEPA, 1991a). For example, the toxicant affected by pH adjustment may be a pH sensitive compound that behaves in the same manner as ammonia. Also, the oxidants that are neutralized in the thiosulfate treatment step include bromine, iodine, and manganous ions in addition to TRC. Also, some cations, including selected heavy metals, are complexed by thiosulfate and may be rendered nontoxic (Hockett and Mount, 1996). Therefore, the Phase I results should be compared with information from the POTW operations and performance review to substantiate the evidence for a particular toxicant. Using the previous example, the assumption that TRC is causing oxidant toxicity would be corroborated if operations data show that toxic concentrations of chlorine are maintained in the final effluent (see Table 2-1 for levels of concern).

Organophosphate insecticides also have been identified as causes of effluent toxicity at POTWs (Ankley et al., 1992; Amato et al., 1992; Bailey et al., 1997; Botts et al., 1990; Burkhard and Jenson, 1993). TIE Phase I procedures that affect organophosphate insecticides include C18 SPE and treatment with a metabolic blocker, piperonyl butoxide (PBO). PBO can be added to effluent samples or methanol eluates from C18 SPE columns to block the toxicity of metabolically activated toxicants like organophosphate insecticides. PBO has been shown to block the acute toxicity of diazinon, parathion, methyl parathion, and malathion to cladocerans, but does not decrease the acute effects of dichlorvos, chlorfenvinphos, and mevinphos (Ankley et al., 1996). A reduction in toxicity by PBO treatment together with toxicity removal by the C18 SPE column, recovery from the C18 SPE column, and effluent concentration data can provide strong evidence for the presence of organophosphate insecticides. An exception is chlorpyrifos, which is not recovered well from C18 SPE columns (see Appendix F).

Conventional Wastewater Treatability Testing

The operations and performance information may identify areas in the POTW where improvements in conventional pollutant treatment may reduce the pass-through of toxicity. This information and the optional TIE Phase I data also may indicate in-plant sources of toxicants such as process sidestreams or over chlorination. Using these data, a wastewater treatability program may be devised and implemented to assess in-plant options for improving conventional treatment and eliminating in-plant sources of toxicity.

Treatability studies are recommended prior to comprehensive TIE testing (Section 4) in situations where improvements in treatment operations and performance are needed to attain acceptable conventional pollutant treatment. Otherwise, TIE testing of poor quality effluents could lead to erroneous conclusions about the nature of effluent toxicity. For example, inadequate conventional pollutant treatment could cause toxic materials to pass through the POTW that would otherwise be removed. In the POTW performance evaluation, treatability studies should focus on conventional pollutant treatment deficiencies that are suspected of contributing to effluent toxicity. The scope of the treatability studies program should be based on clear evidence of a consistent treatment deficiency causing toxicity over time. If sufficient

information is not available to develop a straightforward treatability program, additional data must be gathered in the subsequent stages of the TRE before in-plant toxicity control (Section 6) can be evaluated.

Treatability studies can vary from a simple evaluation such as testing the effect of TRC reduction on effluent toxicity to an extensive effort involving long-term bench- and pilot-scale work. Prior to beginning these studies, the POTW operations and performance data and the optional TIE Phase I results should be carefully reviewed and an appropriate treatability test program should be developed using best professional judgment. The nature and variability of effluent toxicity must be completely assessed (Section 4) prior to implementing an extensive treatability effort.

A treatability program can be devised to evaluate modifications in existing treatment processes. Evaluating new or additional treatment units should be attempted only after further effluent characterization studies (i.e., TIE) have been performed. POTW performance evaluation treatability testing may involve physical/chemical treatment approaches, such as coagulation and precipitation, solids sedimentation, granular media filtration, powdered activated carbon adsorption, or biological treatment approaches, such as activated sludge or sludge digestion.

Toxicity control is the ultimate goal of the TRE; therefore, toxicity tests should be performed in addition to the conventional pollutant analyses normally conducted in treatability studies. Toxicity tests are used to assess the capability of the treatment modifications for toxicity reduction. In some cases, the waste streams to be tested may exert a high oxygen demand and aeration may be needed to maintain a minimum DO level of 4 mg/L in the toxicity test. Aeration may affect toxicant characteristics; therefore, it may be necessary to use an alternative test method, such as Microtox®, that is not affected by low DO. Side-by-side testing with alternative methods or species and the definitive test can be used to select a procedure that correlates well with the definitive test. This initial testing will help to ensure that the alternative test method or species is sensitive to the effluent toxicants of concern.

The following subsections briefly describe some of the treatability tests that can be used to determine if improvements in existing conventional pollutant treatment will reduce effluent toxicity. If bench-scale tests suggest that toxicity can be reduced, follow-up pilot-scale or full-scale testing is recommended to confirm the initial results. As shown in Figure 3-1, if this testing is successful in identifying improvements in conventional pollutant treatment that will achieve acceptable levels of effluent toxicity, the TRE proceeds to the selection and implementation of those options (Sections 6 and 7). If, however, the treatability data indicate that improved in-plant treatment will not reduce effluent toxicity to acceptable levels, other approaches must be investigated, including TIE testing (Section 4).

Chemical Treatment

Chemical treatment may be applied in primary sedimentation, secondary clarification, filtration, and sidestream treatment processes. As noted above, jar tests can be used to determine the optimum type and dosage of chemical, the proper mixing conditions, and the flocculent settling rates for improved conventional pollutant and toxicity removal (Adams et al., 1981). As noted, some chemical additives, including polymers (Hall and Mirenda, 1991), can be toxic; therefore, the toxicity of the chemicals should be evaluated as part of treatability testing.

Sedimentation

Sedimentation processes remove suspended solids or flocculent suspensions from the wastewater. In general, sedimentation in POTWs is characterized by flocculent settling for wastewater (i.e., primary clarification) and zone settling for mixed liquors (i.e., secondary clarification) and sewage sludges (sludge thickening).

Flocculent settling rates can be converted to a clarifier SOR by measuring the flocculent percent removal with time in a settling column test (Adams et al., 1981). If coagulants are needed, the optimum conditions for flocculation can be determined from jar tests, as noted above. A series of settling column tests can then be performed to compare particle settling profiles for various coagulant doses and mixing conditions.

Zone settling also can be evaluated in settling column tests. The settling velocity of mixed liquor or sludge is determined by measuring the subsidence of the liquid-solids interface over time (Adams et al., 1981). A series of tests are performed using the anticipated

range of suspended solids loadings to the clarifier. Test results are used to calculate a solids flux curve that can be used for clarifier design.

Activated Sludge

Continuous flow and batch biological reactor tests can be used to assess pollutant and toxicity treatability, and to predict the process kinetics of an activated sludge system. A series of bioreactors are generally operated under a range of MCRT values to determine optimum operating conditions (Adams et al., 1981).

The operational performance of bioreactors can be evaluated by measuring pollutant removals, OUR, MLVSS, and the zone settling velocity (ZSV) of the sludge. These measurements are used to determine the biodegradation kinetics of the wastewater, the potential for treatment inhibition, and the preferred sludge settling conditions. Samples of the influent, intermediate treatment stages, and effluent of the bioreactors can also be tested for toxicity to evaluate the system's toxicity reduction capability. Appendix D provides an example of the use of batch treatability tests to evaluate toxicity reduction in a BNR process.

If results of bench-scale treatability tests suggest that full-scale treatment will reduce effluent toxicity, follow-up pilot-scale or full-scale tests are recommended to confirm the results.

Granular Media Filtration

Toxicity removal by filtration can be evaluated in bench-scale tests or in full-scale tests of existing processes. The main parameters to be evaluated in filtration testing include hydraulic loading rate, media type and configuration, and, if necessary, type and dose of chemical coagulant (Adams et al., 1981). Filtration testing results can be used to correlate removal of suspended solids and toxic compounds with loss of toxicity. These results are ultimately used to establish the optimum design and operational conditions for conventional pollutant and toxicity removal, including filter type and loading rates, media characteristics, backwashing, and headloss development. Examples of the use of filtration in toxicity treatability studies are presented in Appendices C and D.

Activated Carbon Adsorption

Activated carbon may be applied in powdered form to the activated sludge process or may be used in granular form in a post treatment process (e.g., columns). The capability of carbon adsorption for treatment of organic wastewater constituents or toxicity is determined by conducting batch isotherm tests and continuous-flow tests (Adams et al., 1981).

The effectiveness of carbon in removing BOD_5, selected organic contaminants (e.g., phenols), or toxicity is predicted by adding varying amounts of powdered activated carbon (PAC) to wastewater samples and measuring removal of the organic constituents or toxicity. The equilibrium relationship between a wastewater and carbon usually can be described either by a Langmier or Freundlich isotherm. A plot of equilibrium concentration versus carbon capacity is used to select the required PAC concentration to add to activated sludge processes.

Continuous-flow tests are required to confirm the batch isotherm results. PAC tests involve adding PAC to bench- or pilot-scale biological reactors and monitoring the removal of the organic wastewater constituents or toxicity.

TRE Example

Activated carbon was investigated as a toxicity control option in the TRE at the Linden Roselle Sewerage Authority's (LRSA) POTW in New Jersey (Appendix G). Both PAC and granular activated carbon (GAC) were expected to remove non-polar organic toxicity in the effluent; however, the costs were determined to be prohibitive. It was also anticipated that carbon would concentrate the toxicants in the mixed liquor and cause unacceptable sludge quality.

Pretreatment Program Review

POTW pretreatment program data (Table 2-3) may provide information that can be used in subsequent steps of the TRE such as the toxicity source evaluation (Section 5). Information on the main trunk lines and the types of indirect dischargers in the sewer collection system can be used to devise a sampling strategy for tracking the sources of toxicants or toxicity. In some cases, the pretreatment program data may be sufficient to identify the sources of effluent toxicants identified in the TIE. In most cases, however, additional data, such as wastewater flow and toxicant concentrations in indirect discharges, will be needed to track the sources of toxicants or toxicity.

The information needed to conduct a toxicity source evaluation is presented in Section 5. In a USEPA TRE

research study conducted in Linden, New Jersey, pretreatment program data on wastewater characteristics of the main sewer lines and industrial dischargers were used to develop a comprehensive toxicity tracking program (see Appendix G). Sources of toxicity were successfully identified by devising a sampling schedule that accounted for periods of normal industry activity and periods of temporary shut-down for industry maintenance. The level of toxicity from the industries was found to vary with the industry production schedules.

It may be possible, in a few cases, to identify the toxic sources by comparing chemical-specific data on the POTW effluent to information on suspected sources of the toxic pollutants. This pretreatment program chemical review (PPCR) approach is recommended *only* in situations where the POTW has only a few indirect dischargers that have relatively non-complex wastewaters.

PPCR methods are described in Appendix I. These methods involve a direct comparison of industry chemical data to POTW effluent toxicity. It is important to emphasize that drawing preliminary conclusions based on PPCR results can be misleading because pretreatment monitoring information could be incomplete, analytical techniques may not be sensitive to low levels of effluent toxicants, and the estimated toxicity of individual compounds may not reflect the whole effluent toxicity. Domestic sources of toxicants such as organophosphate insecticides also may be responsible for effluent toxicity (see Appendices A and F). In summary, comparisons of toxic pollutant concentrations to effluent toxicity may yield false correlations. Whenever possible, results of TIE testing should be used in lieu of PPCR results because the TIE establishes a cause and effect relationship between toxicants and effluent toxicity.

TRE Example

The PPCR approach was applied at the Mt. Airy POTW in North Carolina that receives industrial wastewater from only a few sources, all of which are textile industries (Diehl and Moore, 1987). Detailed information on the manufacturing processes and wastewater discharges of the industries was gathered, including data on the toxicity and biodegradability of raw and manufactured chemicals as provided in material safety data sheets (MSDS) and the scientific literature. This information was used to identify industrial chemicals with a relatively high potential to cause toxicity. Subsequent chemical analysis of the POTW effluent was performed to evaluate the presence of the suspected industrial toxicants. Effluent results were then compared to literature toxicity values for individual compounds. Using this approach, APE surfactants, largely attributed to textile industries, were identified as the primary causes of POTW effluent toxicity.

Section 4
Toxicity Identification Evaluation

Introduction

The TIE is an integral tool in the TRE process and is applied to evaluate the acute and short-term chronic toxicity of effluents and other samples. Toxicity is the trigger for TREs; therefore, the toxicity test is used in the TIE as the detector for chemicals causing effluent toxicity. Many types of test species and test conditions, including lethal (acute) and sublethal (chronic) measures for both freshwater and saltwater, can be adapted for use in the TIE. The use of modified effluent monitoring procedures, which incorporate the permit test species or a suitable surrogate, will help to ensure that the toxicants identified are the ones that specifically affect the species of concern. In the TIE, the toxicity test is used to track changes in the presence and magnitude of toxicity as the effluent is manipulated to isolate, remove, or render biologically unavailable specific types of constituents (e.g., volatile, filterable, oxidizable). These procedures relate toxicity to the wastewater's physical/chemical characteristics to determine the compound(s) causing effluent toxicity.

This section of the guidance is intended to be a general guide for TIEs. For specific guidance on how to conduct TIEs, the reader should consult USEPA's TIE manuals (USEPA 1991a, 1992a, 1993a, 1993b, 1996). The TIE procedures consist of three phases: Phase I involves characterization of the toxic wastewater components, Phase II is designed to specifically identify the toxicants of concern, and Phase III is conducted to confirm the causes of toxicity. Figure 4-1 presents the logical progression of these three phases within the framework of a municipal TRE. USEPA has published guidance documents for performing each phase of the TIE procedures. Phase I procedures are available to characterize acute (USEPA 1991a, 1996) and short-term chronic toxicity (USEPA 1992a, 1996). Phase II procedures (USEPA, 1993a) and Phase III procedures (USEPA, 1993b) are used to identify and confirm the causes of acute or chronic toxicity, respectively. Each TIE is unique and a strategy should be developed for each study that accounts for site-specific conditions and allows flexibility in the study design, including the use of alternative tools and techniques noted in the TIE documents.

Several effluent samples should be tested to characterize the magnitude and variability of effluent toxicity over time. Failure to understand the variability in whole effluent toxicity and individual toxicants could lead to the selection of controls that do not consistently reduce toxicity to compliance levels. Sampling requirements for TIEs are described in Section 11. In addition to effluent testing, the TIE procedures can be applied in toxicity source evaluations (Section 5) to obtain information about the causes of toxicity in sewer wastewater or industrial discharges.

Toxicity Tests

The choice of acute or short-term chronic tests in the TIE should be determined based on discharge permit requirements and the toxicity exhibited by the effluent. Modifications to the whole effluent toxicity test procedures specified in the permit (USEPA 1993c, 1994a, 1994b, 1995) have been made to streamline the TIE process. These modifications are described in the respective TIE characterization, identification, and confirmation manuals and include smaller test volumes, shorter test duration, smaller number of replicates, reduced number of test concentrations, and reduced frequency of sample renewal (USEPA 1991a, 1992a, 1996). In addition, it is often more useful to evaluate only one effluent sample in chronic TIEs instead of multiple samples (e.g., two, three, or seven) as is typically used for chronic toxicity monitoring. Reducing the scale of the toxicity tests improves the efficiency of processing the large number of subsamples usually generated in the TIE. During the

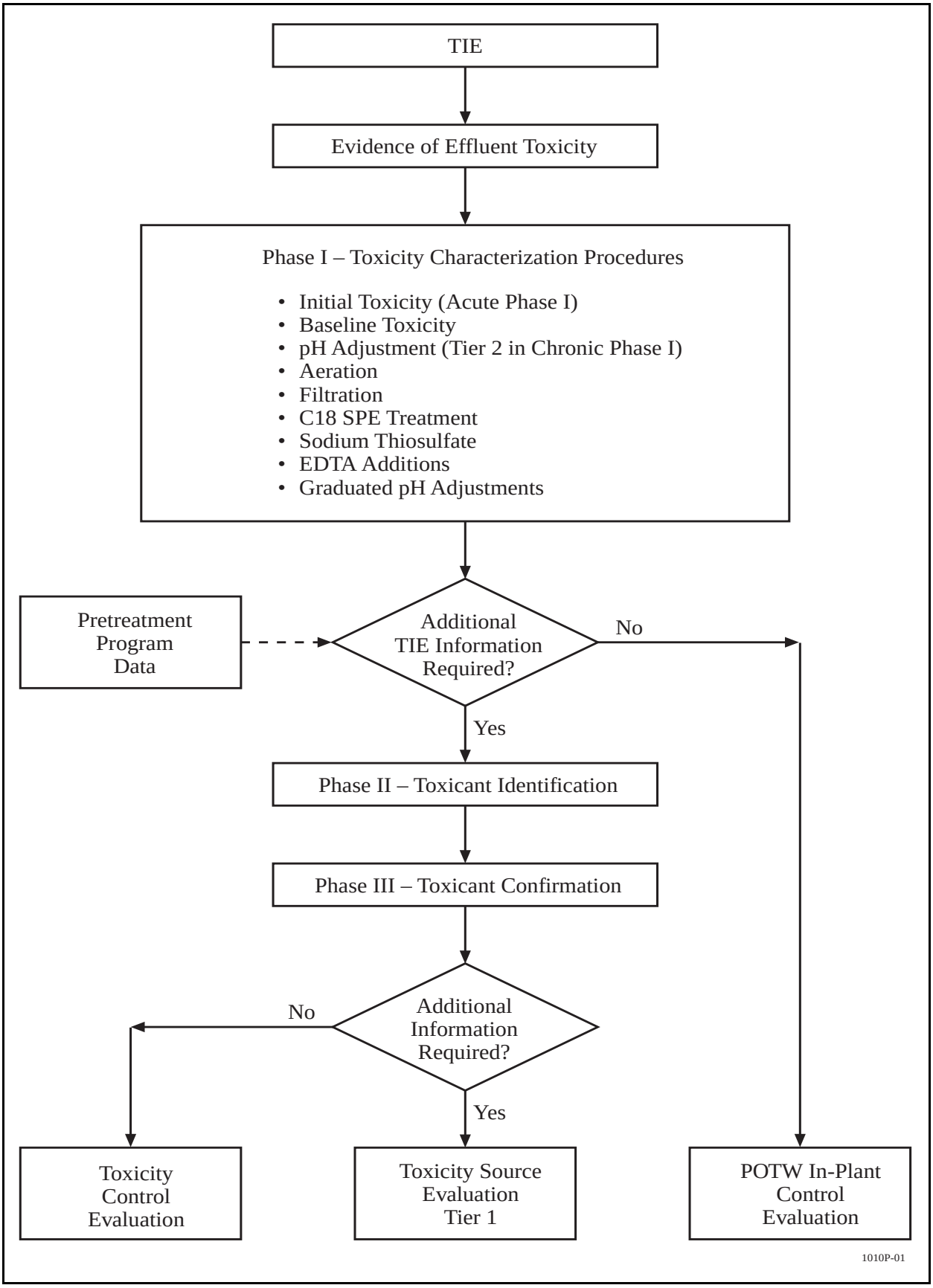

Figure 4-1. Flow diagram of a toxicity identification evaluation.

confirmation stage of the TIE (Phase III), whole effluent toxicity test methods are applied to confirm that the toxicant(s) identified in Phases I and II is the cause of the observed effluent toxicity.

TIE procedures have been designed to utilize both freshwater and estuarine/marine species in acute and short-term chronic tests (USEPA 1991a, 1993a, 1993b, 1996). Most POTW discharges to freshwater are monitored with the cladoceran, *C. dubia*, and/or *P. promelas* or, less commonly, the cladocerans, *Daphnia magna* or *Daphnia pulex*, and the trout, *Oncorhynchus mykiss*. *C. dubia* and *P. promelas* were used in the development of the TIE procedures and many subsequent TIEs have been performed successfully with these species (USEPA 1991a, 1992a, 1993a, 1993b), including the case studies presented in Appendices A, E, and F. TIEs also have been performed with trout (Goodfellow et al., 1994) and the green alga, *Selenastrum capricornutum* (Walsh and Garnas, 1983).

In addition, USEPA has provided guidance for the use of Atlantic, Pacific, and Gulf coast estuarine/marine species in TIEs (USEPA, 1996). A compilation of marine TIE studies has been prepared (Burgess, personal communication, USEPA, Narragansett, Rhode Island, August, 1998). TIEs have been performed using mysid shrimp, *Mysidopsis bahia* (Morris et al., 1990; Collins, et al., 1994; Burgess et al., 1995; Douglas et al., 1996), the grass shrimp, *Paleomonetes pugio* (Goodfellow and McCulloch, 1993), the mussels, *Mytilus edulis* (Edile et al., 1995) and *Mytilus californianus* (Higashi et al., 1992), the sheephead minnow, *Cyprinodon variegatus* (Goodfellow and McCulloch, 1993; Burgess et al., 1995; Douglas et al., 1996), the inland silverside, *Menida beryllina* (Burgess et al., 1995), the purple urchin, *Strongylocentrotus purpurtus* (Bailey et al. 1995; Jirik et al., 1998), the urchin, *Arbacia punctulata* (Burgess et al., 1995), the sand dollar, *Dendraster excentricus* (Bailey et al. 1995), the red abalone, *Haliotis rufenscens* (Griffin et al., 1993), the alga, *Champia parvula* (Burgess et al., 1995), the giant kelp, *Macrocystis pyrifera* (Higashi et al., 1992; Griffin et al., 1993), and other estuarine/marine species (Higashi et al., 1992; Weis et al., 1992). Case studies that utilized the echinoderms, *S. purpuratus* and *D. excentricus*, and the mysid shrimp, *M. bahia*, are presented in Appendices B and G, respectively. Although many species can be used in TIEs, the use of the species that is specified in the NPDES permit or that triggered the TRE is encouraged to ensure that the toxicants identified are the ones that affect the species of concern. Also, NPDES permit species are more widely used in TIEs; therefore, extensive published data are generally available to help characterize and identify the toxicants affecting these species.

The TIE should incorporate modifications in toxicity test procedures that are specified in the permit, to the extent practicable. If pH control in the toxicity tests is allowed (T. Davies, USEPA, Office of Water, *Memorandum on Clarifications Regarding Flexibility in 40 CFR Part 136 Whole Effluent Test Methods*, April 10, 1996), the effects of pH should be addressed when evaluating effluent toxicants. However, procedural modifications should be limited to steps that are easy and practical to implement.

Effluents with intermittent and ephemeral toxicity may be challenging to characterize using TIE procedures. Intermittent toxicity may require adjustments in the TIE such as performing frequent toxicity screening tests over time to ensure that toxic samples are collected. Some effluents also may exhibit toxicity that dissipates after the samples are received and the initial and baseline toxicity tests are performed. If possible, this ephemeral toxicity may be characterized by conducting both the baseline test and TIE treatments immediately upon sample receipt. Also, it may be possible to shorten the time between sample collection and testing (i.e., <36 hours) or use grab samples in addition to composite samples. Depending on the level of effluent toxicity, it also may be challenging to discern differences in toxicity following the various TIE treatments. Steps that may improve characterization of these samples include adding more replicates and/or effluent concentrations in toxicity tests used in the TIE and testing more samples to evaluate trends in the toxicity characteristics. Additional information on this topic is given in USEPA's TIE manuals (1991a, 1992a, 1996).

Effluent monitoring data often includes information on the relative sensitivity of test organisms. It is generally recommended that initial TIE testing be performed using the test species that has been shown to be most sensitive to the effluent. In cases where equal sensitivity is observed, the organism that is easiest to use in the TIE should be selected. Phase III confirmation tests should utilize each of the species required by the discharge permit to ensure that all toxicants of concern have been determined.

A brief description of the TIE procedures is provided below. Examples of TIE applications in municipal TREs are presented in Appendices A through G.

TIE Procedures

Acute Toxicity Characterization (Phase I)

The first step in the TIE is to characterize effluent toxicity using the Phase I approach (USEPA, 1991a). This procedure involves several bench-top treatment steps to indicate the general types of compounds that are causing effluent toxicity. An initial toxicity test is performed to determine if the sample is acutely toxic. Simple manipulations for removal or alteration of effluent toxicity are then performed and the resulting treated samples and the original sample are tested for toxicity. The physical/chemical characteristics of the toxicants are indicated by the treatment steps that reduced toxicity relative to the baseline test.

The Phase I characterization includes the following tests:

- Initial toxicity (unaltered effluent)
- Baseline toxicity(unaltered effluent)
- pH adjustment (pH 3 and 11)
- Filtration/pH adjustment (pH 3 and 11)
- Aeration/pH adjustment (pH 3 and 11)
- C18 SPE/pH adjustment (pH 3 and 11)
- Sodium thiosulfate additions
- Ethylenediaminetetraacetate (EDTA) additions
- Graduated pH adjustments.

USEPA recommends performing the full suite of Phase I procedures on initial effluent samples (USEPA 1991a, 1996). As information is obtained on the nature and variability of toxicity, additional Phase I tests may focus on the steps that are successful in affecting toxicity. The aeration procedure is used to determine if toxicity is associated with volatile or oxidizable compounds. The filtration procedure is designed to evaluate whether toxicity is in the suspended particulate phase or in the soluble fraction. Aeration and filtration, in conjunction with pH adjustments, are used to evaluate the volatility and solubility of toxicants such as ammonia, hydrogen sulfide, and metals. The toxicity of oxidants and certain metals is evaluated by adding sodium thiosulfate. Cationic metal toxicity is determined by ethylenediaminetetraacetate EDTA additions and, possibly, by the graduated pH procedure. The graduated pH step is used to evaluate for the presence of pH sensitive compounds such as ammonia. An aliquot of the effluent sample also is used to evaluate the presence of pH sensitive compounds such as ammonia. In addition, an aliquot of the effluent sample is passed through a C18 SPE column that selectively removes non-polar organic compounds (USEPA, 1991a).

In general, the TIE procedures used for marine species are similar to those used for freshwater species, except that samples used in marine TIEs must be adjusted to the salinity appropriate to the species being tested (USEPA, 1996). As part of the development of the marine TIE procedures, USEPA found that marine species can tolerate EDTA and sodium thiosulfate additions at concentrations that can affect toxicants of concern. Marine species can also tolerate methanol at concentrations that are necessary to evaluate non-polar organic compounds with the C18 SPE column. However, there are exceptions to the methods used for freshwater species for TIE steps. Due to the strong carbonate buffering capacity of seawater, it is difficult to characterize pH dependent toxicants using acids, bases, and organic buffers. The only efficient method for maintaining pH in the pH manipulation procedures is to use controlled atmospheric chambers. Also, a higher range of pH values is used in the graduated pH procedure because of the sensitivity of some marine species to lower pH.

When characterizing toxicity to marine species, USEPA recommends adjusting the salinity of samples before performing Phase I manipulations (USEPA, 1996; Ho et al., 1995). However, if a Phase I TIE is being conducted to help identify potential treatment options for the POTW, the salinity of the samples may be adjusted after the TIE manipulations are performed. This approach is necessary to ensure that toxicity removal in the TIE reflects the conditions that would occur in the POTW (i.e., mimics treatment before discharge to saline waters).

Subsequent tests are recommended to further characterize effluent toxicity. These tests are described in the acute Phase I document (USEPA, 1991a) in the "Interpretation of Results/Subsequent Tests" sections for each procedure. Some of these procedures include elution of the C18 SPE column with methanol to retain possible toxicants for further testing. If Phase I does not adequately characterize the toxicants, other techniques can be used, such as ion exchange resins for anions and cations; XAD (a commercially available ion exchange resin) and activated carbon for various

inorganic and organic compounds; and molecular sieves, such as Sephadex resins that separate compounds by molecular weight (Walsh and Garnas, 1983; Lankford and Eckenfelder, 1990; Burgess et al., 1997). TDS is an example of a toxicant that may not be well characterized in the TIE. Methods for characterizing and identifying TDS toxicity are presented below.

The characterization procedures are relatively broad and can indicate more than one class of toxicant. Additional tests are needed to delineate the nature of the toxicity if significant toxicity changes occur following the Phase I tests. For example, the C18 SPE column procedure, which is designed to determine if non-polar organic compounds contribute to toxicity, also can remove other compounds such as metals. USEPA (1991a, 1992a) reports that aluminum, nickel, and zinc concentrations may be adsorbed onto the C18 SPE resin. Confirmation that the C18 SPE column removed non-polar organic compounds is obtained by eluting the column with methanol to try to recover the toxicity. If toxicity can be recovered in the methanol eluate, then a non-polar organic toxicant is likely causing toxicity because metals do not elute with methanol. If toxicity adsorbed by the C18 SPE column is *not* recovered by the methanol elution, the column may have removed toxicants other than non-polar organic compounds, such as metals, or the non-polar organic compounds may have a higher affinity for the SPE column resin than methanol. Appendix E provides a case example in which toxicity due to metals was removed by the C18 SPE procedure.

When the primary toxicant is present in high concentrations, it may mask other potential toxicants, making it difficult to detect changes in toxicity following the TIE treatments. Modified procedures can be designed to control or account for the toxicity of the primary toxicant. Ammonia is a common example of a toxicant that may need to be controlled in the TIE (e.g., pH control) in order to evaluate secondary toxicants (see Appendix G).

Pretreatment program data and chemical-specific effluent data may provide useful information to assist in the Phase I characterization. By reviewing available information, compounds that are known to be problematic can be compared to the Phase I results to assist in indicating the effluent toxicants. This data comparison should not, however, replace the Phase II and III analyses.

After successful completion of Phase I, it may not be necessary to proceed to Phases II and III. If the effluent toxicity can be isolated to a class of compounds, POTW staff may opt to evaluate the treatment of effluent toxicity. These studies may involve bench-scale or pilot-scale testing procedures described in Section 6. However, if toxicity remains following implementation of toxicity control methods, the TIE should begin again with Phase I. In most cases, a complete TIE using all three phases will provide results that will lead to a more cost-effective evaluation of toxicity control approaches.

Chronic Toxicity Characterization (Phase I)

The chronic TIE Phase I procedures (USEPA 1992a, 1996) are similar to the acute Phase I procedures and include aeration, filtration, C18 SPE treatment, chelation with EDTA, oxidant reduction and/or precipitation with sodium thiosulfate, and graduated pH testing. The chronic test measures sublethal effects, such as reproduction, fertilization, cyst development, and/or growth. These measurements may be affected by the TIE manipulations. Adjustments have been made in the TIE procedures to limit toxicity artifacts. As in acute TIEs, additional steps are recommended to evaluate potential toxicity artifacts, including use of system blanks and replicate tests.

The same freshwater species typically used in acute TIEs (i.e., *C. dubia*, *P. promelas*, and, less commonly, *D. magna* or *D. pulex*) can be applied in chronic TIEs. Species that have been used in chronic marine TIEs include those noted above in the section titled "Toxicity Tests."

Two tiers of the Phase I characterization are recommended for the chronic TIE. Tier 1 is performed without major pH adjustments. Consistent, representative blank tests with reconstituted water are not readily obtained at higher pHs; therefore, the pH adjustment procedures used in the acute TIE are separated into Tier 2. Tier 2 is performed only when Tier 1 does not provide sufficient information about the types of compounds causing toxicity, and includes adjusting the effluent sample to pH 3 and 10 as part of the filtration and aeration steps and pH 9 for C18 SPE treatment.

Tier I of the chronic Phase I characterization consists of the following:

- Baseline toxicity
- Aeration
- Filtration
- C18 SPE treatment (including tests on post C18 SPE treatment and methanol eluate)
- Sodium thiosulfate additions
- EDTA additions
- Graduated pH adjustments.

The Tier 2 tests are to be conducted when Tier 1 does not provide sufficient information and consists of filtration, aeration, and the C18 treatment technique of Tier 1 with an effluent sample adjusted to both pH 3 and 10. Tier 2 of the chronic Phase I characterization consists of the following:

- pH adjustment
- Aeration and pH adjustment
- Filtration and pH adjustment
- C18 SPE treatment and pH adjustment (including tests on post C18 SPE treatment and methanol eluate).

Additional Characterization Procedures for Evaluating the Effect of Ion Composition

Although toxicity caused by ion composition is more commonly found in industrial effluents, ion-based toxicity has been reported at POTWs (Rodgers 1989a, 1989b; Douglas and Horne, 1997; Dawson et al., 1997). Ion composition can cause toxicity in two ways: relatively high levels of TDS can inhibit osmotic regulation in freshwater species, and an imbalance in ion composition, particularly calcium carbonate levels, can adversely affect marine crustaceans (Ward, 1989; MacGregor et al., 1996; Mickley et al., 1996). The later mechanism primarily affects crustaceans such as the mysid shrimp, *M. bahia*, which require minimum concentrations of calcium carbonate for survival, growth, and reproduction.

Procedures for evaluating toxicity caused by ion composition are available (USEPA 1991a, 1992a; Goodfellow et al., 1998). The following summary is intended to provide an overview of procedures that can be used to evaluate ion-based toxicity.

TDS Toxicity

As a general guide, TDS may contribute to acute toxicity when conductivity exceeds 3,000 and 6,000 µhmos/cm at the LC50 for *C. dubia* and fathead minnows, respectively (USEPA, 1991a). For chronic toxicity, TDS may be a concern when conductivity exceeds 1,000 and 3,000 µhmos/cm at the lowest observed effect concentration (LOEC) for *C. dubia* and *P. promelas*, respectively (USEPA, 1992a). The conductivity of 100% effluent is not the relevant reading, but rather the conductivity at the concentrations bracketing the effluent LC50 and NOEC.

C. dubia's higher sensitivity to TDS as compared to *P. promelas* can provide additional evidence for TDS toxicity. Also, the cladoceran, *D. magna*, exhibits less sensitivity to TDS than the cladocerans, *C. dubia* and *D. pulex* (API, 1998). These species generally show similar sensitivities to most toxicants (Mount and Gulley, 1992); therefore, the difference in sensitivity to TDS can be useful in characterizing TDS toxicity. It is the toxicity of the individual ions that actually constitutes TDS toxicity; therefore, it is important to review the literature for toxicity data on specific ions. A thorough review of the toxicity of common ions to freshwater and marine organisms was recently published by the American Petroleum Institute (API, 1998).

An approach for evaluating TDS toxicity may consist of the following steps:

1. Monitor the effluent for TDS and if the conductivity exceeds the levels given above, measure the major cations (calcium, magnesium, sodium, potassium) and anions (carbonate, bicarbonate, sulfate, chloride). A cation/anion balance should be performed to ensure that all major ions have been accounted for.
2. For freshwater effluents, conduct toxicity tests using *D. magna*, *C. dubia*, and *D. pulex*. A greater sensitivity by *C. dubia* and *D. pulex* compared to *D. magna*, together with high conductivity readings, provides a weight of evidence for TDS toxicity.
3. If TDS toxicity is suspected, review the ion analysis data gathered above and prepare a stock solution of the ions in proportion to the amounts typically observed in toxic effluent samples. Collect an effluent sample and immediately measure the constituent cations and anions. Prepare a mock effluent by adding the solution to deionized water to yield the same cation/anion concentrations observed in the effluent sample. Measure the toxicity of the effluent sample and mock effluent. If the toxicity is similar, additional evidence is provided for TDS toxicity.

4. If TDS toxicity is indicated, additional procedures can be used to determine the extent to which TDS contributes to effluent toxicity. A sample of the effluent can be prepared for toxicity testing by setting up an appropriate dilution series and then adjusting the TDS levels in each dilution to the same TDS level as the 100% effluent using the stock solution (prepared above). Each effluent dilution is then tested individually for toxicity. Comparable results for each effluent dilution provides additional evidence for TDS toxicity.
5. Additional testing can be performed to identify the TDS constituent(s) that are causing toxicity. The toxicity of various cations and anions is well known and a review of the literature (e.g., ENSR, 1998) can be helpful in indicating potential ions of concern. The ions of concern can be evaluated by spiking the ions into dilution water and measuring the resulting toxicity. It should be noted that toxicity may be caused by a combination of many ions that exert their influence together. Therefore, a single salt may not be solely responsible for the observed toxicity.

TRE Example

Some of these procedures were used in a TIE at a POTW in Georgia (Dawson et al., 1997) where chronic effluent toxicity to *C. dubia* was observed. TIE characterization tests conducted on the effluent did not show a reduction in toxicity as a result of the Phase I manipulations. Independent analyses of the effluent indicated elevated chloride concentrations. A mock effluent was prepared as described in step 3, above, and the ion mixture was found to be as toxic to *C. dubia* as the POTW effluent. Laboratory toxicity data for sodium chloride (NaCl) were used to confirm that the effluent chloride levels would impair reproduction in *C. dubia* at the effect concentration.

Additional TIE studies were performed on the Georgia POTW effluent using calcium addition and species sensitivity tests. Calcium has been found to reduce chloride toxicity in waters with similar ion composition as the effluent and addition of calcium to effluent samples reduced toxicity. Toxicity tests using *D. magna*, which has been shown to be less sensitive to chloride than *C. dubia*, also provided evidence for chloride toxicity. Overall, the TIE results identified chloride as a major contributor to effluent toxicity.

Ion Imbalance

Calcium and carbonate, in proper balance, with other natural ions, are essential for the formation of new exoskeleton for mysid shrimp and other crustaceans. At low calcium carbonate levels (i.e., 15 mg/L $CaCO_3$), Ward (1989) observed 60% mortality in mysids between the 48-hour and 72-hour exposure periods, which corresponds well with the mysid molting cycle. Low $CaCO_3$ concentrations also appear to enhance mysid sensitivity to other toxicants. Ward (1989) observed a significant increase in the toxicity of Cd to mysids when calcium carbonate levels were reduced.

The investigator should consider the potential effect of ion balance as part of the TIE. Ion imbalance can contribute to apparent toxicity in some marine crustaceans when $CaCO_3$ concentrations are 15 mg/L or less.

Interpretation of Phase I Characterization Results

The following information on the interpretation of Phase I characterization results is paraphrased from the TIE manuals. The Phase I characterization provides information on the types of toxicants in the POTW effluent. In reviewing the Phase I data, whether for acute or chronic toxicity characterization, caution is needed to avoid making inaccurate conclusions about the results. For example, as noted above, toxicity removal by C18 SPE treatment does not necessarily mean that non-polar organic toxicants are present. Toxicity must be recovered in the methanol eluate test to provide evidence for non-polar organic toxicants.

The following guidance is given by USEPA (1992a) for interpreting Phase I data on various types of toxicants. Note that the reduction or elimination of toxicity is determined by comparing toxicity before treatment, as measured by the baseline test, with toxicity after treatment.

Non-Polar Organic Toxicants

Non-polar organic toxicants may be indicated if:

- Toxicity in the *post C18 SPE column test* was absent or reduced.
- Toxicity is recovered in the *methanol eluate test*. However, in those instances where methanol does not recover toxicity from the C18 SPE column, other solvents may be needed to elute the toxicants (USEPA, 1993a).

- Toxicity is reduced by adding PBO to effluent samples or methanol from the *methanol eluate test*. PBO blocks the toxicity of metabolically activated toxicants like organophosphate insecticides (USEPA, 1992a).

Cationic Metals

Cationic metals may be indicated if:

- Toxicity is removed or reduced in the *EDTA addition test.*
- Toxicity is removed or reduced in *the post C18 SPE column test.*
- Toxicity is removed or reduced in the *filtration test*, especially when *pH adjustments* are coupled with filtration.
- Toxicity is removed or reduced in *the sodium thiosulfate addition test.*
- Erratic dose response curves are observed.

None of these characteristics is definitive, with the possible exception of EDTA. In addition, toxicity may be pH sensitive in the range at which the graduated pH test is performed, but may become more or less toxic at lower or higher pH depending on the particular metal involved. This characteristic has not been demonstrated for chronic toxicity to the extent it has for the acute toxicity of several metals (USEPA, 1991a).

Surfactants

Surfactants may be indicated if:

- Toxicity is reduced or removed in the *filtration test.*
- Toxicity is reduced or removed by the *aeration test*. In some cases, toxicity may be recovered from the walls of the aeration vessel using a dilution water or methanol rinse.
- Toxicity is reduced or removed in the *post C18 SPE column test.* The toxicity may or may not be recovered in the *methanol eluate test*. If a series of methanol concentrations (e.g., 25, 50, 75, 80, 85, 90, 95, and 100% in water) is used to elute the column, toxicity may be observed in multiple fractions.
- Toxicity is reduced or removed in the post C18 SPE column test using unfiltered effluent. Toxicity reduction/removal is similar to that observed in the *filtration test* and toxicity may or may not be recovered in the *methanol eluate test* or by extraction from the glass fiber filter used in the *filtration test.*
- Toxicity degrades over time as the effluent sample is held in cold storage (4°C). Degradation is slower when the effluent sample is stored in glass containers instead of plastic containers.

Ammonia

Ammonia may be indicated if:

- Toxicity increases in the *graduated pH test* at higher pH.
- The effluent is more toxic to *P. promelas* than to *C. dubia*.
- Note: If the concentration of total ammonia (as nitrogen) is 5 mg/L or more and chronic toxicity is a concern, the potential for ammonia toxicity should be evaluated.

Drawing conclusions about ammonia toxicity based solely on observed concentrations can be misleading, especially where chronic toxicity is a concern because of the uncertainty about the chronic effects of ammonia. Ammonia is an example of a toxicant that acts independently of other toxicants in effluents. Even though ammonia concentrations may appear to be sufficient to cause all of the effluent toxicity, other toxicants may be present and may contribute to toxicity when ammonia is removed.

Oxidants

Oxidants may be indicated if:

- Toxicity is removed or reduced in the *sodium thiosulfate addition test.*
- Toxicity is removed or reduced in the *aeration test.*
- The sample is less toxic over time when held at 4°C (and the type of container does not affect toxicity).
- *C. dubia* are more sensitive to the effluent than *P. promelas*.

The presence of TRC in the effluent is not enough to conclude that toxicity is due to an oxidant. However, TRC concentrations of 0.05–0.1 mg/L or more in 100% effluent provides strong evidence for oxidant

toxicity. Further evidence would be provided, if dechlorination with sulfur dioxide (SO_2) or another dechlorinating agent removes or reduces toxicity (USEPA, 1992a).

TDS

TDS may be indicated if:

- pH adjustments do not remove or reduce toxicity and a precipitate is not visible in the *pH adjustment test*, *pH adjustment and filtration test*, or *pH adjustment and aeration test.*
- There is no loss of toxicity in the *post C18 SPE column tests*, or a partial loss of toxicity, but no change inconductivity measurements.
- There is no change in toxicity with the *EDTA addition test*, *sodium thiosulfate addition test*, or the *graduated pH test.*
- There is a greater sensitivity by *C. dubia* and *D. pulex* compared to *D. magna*, together with high conductivity readings.
- A mock effluent prepared with the same ions as the effluent exhibits similar toxicity as the effluent.
- Toxicity is removed or reduced by ion exchange resin.
- Toxicity is not removed or reduced by passing the effluent over activated carbon.

Appendices A, B, E, F, and G provide example Phase I data and describe how results are used to select additional TIE procedures for testing. The Phase II and Phase III procedures (USEPA 1993a and 1993b) are applicable to both acutely and chronically toxic samples.

Acute and Chronic Toxicity Identification (Phase II)

The Phase II guidance manual (USEPA, 1993a) describes procedures that can be used to identify specific toxicants such as non-polar organic compounds, ammonia, cationic metals, chlorine, or toxicants removed by filtration. The Phase II procedures are applicable to both acute and chronic toxicant identification. Phase II uses treatment and toxicity testing techniques similar to Phase I and incorporates chemical-specific analyses to identify the toxicants. Examples of TIE Phase II studies are provided in Appendices A, B, E, F, and G. Appendices A, F, and G describe the use of Phase II techniques for non-polar organic compounds, including high-performance liquid chromatography (HPLC) for the isolating toxicants. Appendices B and E describe the application of Phase II procedures for identifying toxic metals. Appendix G describes how Phase II procedures were used to identify ammonia toxicity.

Acute and Chronic Toxicity Confirmation (Phase III)

The toxicants identified in Phase II may be confirmed by a series of Phase III steps, including correlating toxicity and toxicant concentration from multiple samples, observing test organism symptoms, evaluating species sensitivity, spiking effluent samples with suspected toxicants, and performing a mass balance to account for all of the effluent toxicity. In many cases, it will be appropriate for the Phase I, II, and III evaluations to overlap because confirmation information can be obtained during Phases I and II. Examples of TIE confirmation testing are provided in Appendices A, B, E, F, and G.

Section 5
Toxicity Source Evaluation

Introduction

Once the effluent toxicants have been identified, a follow-up evaluation can be conducted to locate the sources of the toxicants. This evaluation may involve a review of existing pretreatment program data or data from the collection and analysis of additional samples from industrial users. In some cases, the TIE may not identify the specific compounds causing effluent toxicity and, in the absence of data on toxicants, the sources of toxicity must be tracked. Examples of compounds that are not easily identified in the TIE include surfactants and some non-polar organic compounds (other than organophosphate insecticides). Although the class of compounds may be indicated in the TIE, it may not be possible to locate the sources without information on the specific toxic compounds. In these cases, a guidance is available to track the sources of toxicity.

A toxicity source evaluation is conducted to locate the sources of influent toxicity or toxicants that are contributing to the POTW effluent toxicity. This evaluation is performed in two tiers whether chemical-specific or toxicity tracking is to be performed:

- Tier I—generally involves sampling and analysis of wastewater samples collected from the main POTW sewer lines.
- Tier II—is performed using samples collected from tributary sewer lines or point sources on the main sewer lines found to be toxic in Tier I.

This tiered tracking approach can be used to identify the sources of toxicity and/or toxicants through a process of eliminating segments of the collection system that prove to be non-toxic.

The flow diagram for the toxicity source evaluation is presented in Figure 5-1. The choice of chemical-specific analyses or toxicity tests for source tracking will depend on the TIE data on the POTW effluent toxicants. A chemical-specific investigation is recommended in cases where the effluent toxicants have been confirmed and can be traced to the responsible sewer dischargers. If the sources of toxicants are located, the TRE can then proceed to the evaluation of local pretreatment limits as described in Section 6. Toxicity tracking, using the refractory toxicity assessment (RTA) approach described herein, is required in situations where the TIE does not provide conclusive data on the effluent toxicants. Prior to toxicity analysis, sewer samples are subjected to the same type of treatment as is provided by the POTW for its influent wastewaters. This treatment step allows a measurement of "refractory" wastewater toxicity, which is the toxicity that passes through the POTW and causes effluent toxicity. If toxicity tracking is successful in locating the sources of toxicity, pretreatment requirements can be set to reduce the refractory toxicity contributed to the POTW.

In some cases, industrial users may modify or cease the discharge of toxicity before specific sources are identified. The abatement of effluent toxicity during the course of TREs is not uncommon; however, efforts to ensure ongoing compliance can be difficult when the original sources of toxicity are not located. These situations dramatize the importance of collecting information on industrial pretreatment activities and POTW operations in the early stages of the TRE. As part of the toxicity source evaluation, POTW staff can request industrial users to submit weekly or daily reports of production and waste discharge activities that can be used to indicate potential sources of toxicity. This information also is helpful in subsequent pretreatment control studies, if an industrial user is identified as a source of toxicity (Botts et al., 1994).

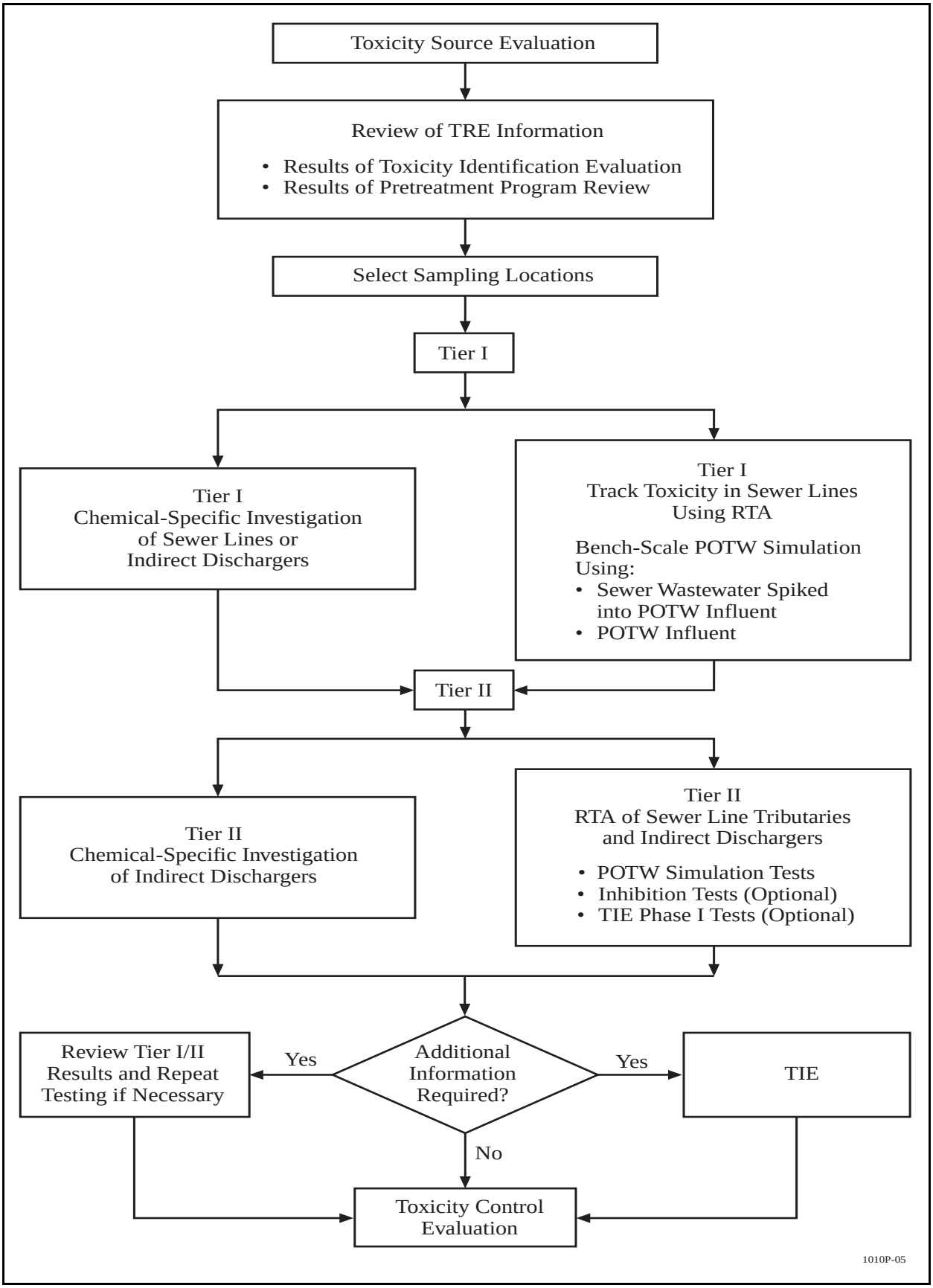

Figure 5-1. Flow diagram for a toxicity source evaluation.

Sampling Approach

The "Tier I" and "Tier II" designations refer to the sampling approach to be taken in tracking the sources of toxicity and/or toxicants.

Tier I – Toxicity Source Evaluation

Sampling locations for Tier I testing are established by reviewing the pretreatment program data (Section 3) and selecting appropriate sampling points on the main sewer lines. In some cases, industrial users or tributary sewer lines may be selected when substantial evidence is available on potential sources of toxicity or toxicants.

If the toxicants have been identified and chemical-specific tracking is to be performed in Tier I, sampling locations can include industrial users who have manufacturing processes or use raw materials that are known or suspected of containing the toxicants (e.g., metals from metal finishers). If the toxicant is contributed by a large number of dischargers, sewer line sampling is recommended in Tier I. For example, sewer line sampling was conducted to determine the sources of organophosphate insecticides in the City of Fayetteville, North Carolina, sewer system and several sewer systems in the San Francisco Bay Area in California (see Appendix F). These studies indicated that two insecticides, diazinon and chlorpyrifos, are widely distributed in POTW collection systems.

If toxicity tracking is to be performed in Tier I, each major sewer line should be sampled to ensure that all possible sources in the collection system are considered. Indirect discharger sampling is not recommended in Tier I because of the large number of sources that may need to be evaluated. Sewer line testing may ultimately reduce the number of sampling points by eliminating segments of the collection system where toxicity is not observed (USEPA, 1983a).

In the RTA study conducted at Fayetteville, North Carolina (Fillmore et al., 1990), sewer wastewater samples were initially collected from manholes throughout the collection system because of the large number of potential sources of toxicity. Sources of toxicity were subsequently identified by testing the indirect dischargers located on the toxic sewer lines.

Tier II – Toxicity Source Evaluation

Results of Tier I are used to establish the sampling locations for Tier II. The toxic sewer lines identified by toxicity or toxicant tracking in Tier I can be further evaluated in Tier II by sampling indirect dischargers or tributary sewers on the toxic sewer lines.

Information on classes of toxicants such as surfactants can be obtained by coupling the RTA protocol with selected TIE procedures. For example, in the TRE at the LRSA, New Jersey, sources of non-polar organic toxicants were identified by passing RTA test samples through C18 SPE columns (see Appendix G). Sources of toxicity were indicated if toxicity was observed in methanol eluates from the columns.

Sampling Conditions

Whether sampling of sewer lines or indirect dischargers is conducted, 24-hour flow proportional composite samples are recommended to characterize daily variations in toxicant concentrations or toxicity. In some cases, samples may be collected over less than 24 hours to observe the contribution of potential intermittent sources of toxicants or toxicity.

Flow data must be gathered in order to determine the relative contributions of toxicants or toxicity from the sewer lines or indirect dischargers. Flow data can be used to calculate the toxicant loadings, which will be needed to develop local pretreatment limitations (Section 6). Flow data also will be needed to conduct RTA testing, as described later in this section.

The sampling period for both sewer lines and indirect dischargers should account for:

- Discharge schedules for indirect dischargers (i.e., intermittent versus continuous).
- Temporary shut-down schedules for industry maintenance.
- Coordination with routine pretreatment program monitoring, if possible.

For example, in the LRSA TRE (Appendix G), sources of refractory toxicity were identified by sampling during periods of normal industry activity and during a period of temporary industry shut-down.

Other considerations for sampling are described in Section 11. QA/QC sampling requirements are discussed in Section 8.

Chemical-Specific Investigation

A chemical-specific approach can be used to trace the influent sources of toxicants if definitive TIE data on the causes of POTW effluent toxicity are available.

This approach is not recommended in cases in which the TIE data only indicate a broad class of compounds (e.g., polar organic compounds), because the toxicants may be contributed by a variety of sources that will be difficult to pinpoint by chemical tracking. Chemical-specific tracking should be conducted after the effluent toxicants have been identified and confirmed in TIE Phase II and III tests (USEPA 1993a and 1993b).

The chemical-specific approach involves testing indirect dischargers or sewer line samples for toxicants using chemical analysis techniques. In some cases, existing pretreatment program data may be adequate to identify the indirect dischargers that are contributing the toxicants. It is likely, however, that further sampling and analysis will be necessary, because pretreatment program data generally do not include information on toxicants typically identified in TIE tests (e.g., compounds other than regulated pollutants). Existing pretreatment program data may be used to reduce the amount of sampling and analysis by indicating which sources contribute toxic pollutants that are similar to the effluent toxicants.

Chemical analysis methods for potential toxicants such as ammonia, metals, and organic compounds are described in several USEPA documents (USEPA 1979b, 1983b, 1985b) and *Standard Methods for the Examination of Water and Wastewater* (APHA, 1995). USEPA (1997) provides all of USEPA's methods for analysis of water on a CD-ROM. USEPA's Phase II TIE manual (1993a) also provides guidance for the analysis of organophosphate insecticides, surfactants, and metals. Analytical methods for organophosphate insecticides have been improved to achieve the lower detection limits necessary to assess insecticide toxicity (USEPA, 1993a; Durhan et al., 1990). Enzyme-linked immunosorbent assay (ELISA) procedures also are available for selected organophosphate insecticides, metals, and other compounds. ELISA methods offer the advantage of low cost, rapid sample processing, and field portability; however, these methods may not be specifically approved by USEPA. Additional analytical techniques can be found in American Society for Testing and Materials (ASTM) manuals and peer-reviewed journals such as the *Analytical Chemistry Journal*. A qualified chemist should verify the selected analytical method in the laboratory prior to sampling and analysis.

A literature search also can be made to determine if the toxicant could be a biodegradation product resulting from POTW treatment. Where clear evidence is available to show that the toxicant is a treatment by-product, the sewer sample should be analyzed for the precursor form(s) of the toxicant as well as the toxicant itself.

In cases where chemical tracking is successful in locating the sources of the POTW effluent toxicants, the TRE can proceed to the selection and development of toxicity control options such as local pretreatment regulations (Section 6). Information on toxicant distribution can be used in developing pretreatment control options. For example, although a primary contributor of ammonia was identified in the LRSA TRE (Appendix G), system-wide pretreatment limitations were adopted to address all non-domestic sources of ammonia. In other situations, control methods other than pretreatment limitations, such as public education, may be needed to control the discharge of a widely used toxicant. Public education has been successfully used at a number of POTWs (Appendix H) to control the use of organophosphate insecticides, which can be contributed from many domestic and commercial areas of the collection system.

If the responsible indirect dischargers are not located, the TIE results should be reviewed to confirm previous conclusions. The chemical analysis results also should be carefully reviewed to determine if errors or wastewater matrix effects may have caused inaccurate results. In cases where the chemical-specific approach is ultimately not successful, the source evaluation testing should be repeated using toxicity tests in lieu of chemical analyses, as described below.

Refractory Toxicity Assessment

Toxicity tracking may be required when the TIE characterizes the toxicity as broad classes of toxicants or identified toxicants cannot be confirmed. Toxicity tracking also may be useful in situations in which there are multiple effluent toxicants and the occurrence of these toxicants in the POTW effluent is highly variable. In such cases, toxicity testing may be more cost-effective than chemical tracking.

The toxicity found in influent wastewaters is not necessarily the same toxicity that is observed in the

POTW effluent because the POTW is capable of removing some toxic wastewater constituents. The amount of sewer wastewater toxicity that could potentially pass through the POTW must be estimated by treating sewer samples in a simulation of the POTW prior to toxicity analysis. This treatment step accounts for the toxicity removal provided by the POTW.

A protocol has been developed for predicting the potential for a sewer discharge to contribute to acute or chronic toxicity in POTW effluents. This protocol, referred to as the RTA procedure, has been successfully used to track sources of acute and chronic toxicity using both freshwater and estuarine/marine species (Morris et al., 1990; Botts et al., 1992, 1993, 1994). Examples of RTA studies are presented in Appendices C, D, and G.

The RTA protocol has been designed to simulate conventional activated sludge processes, although it has also been adapted to other POTW treatment processes including single and two-stage nitrification systems (Collins, et al. 1991), BNR processes (Appendix D), and filtration treatment systems (Appendices C and D). The RTA procedure described herein involves treating sewer samples in a bench-scale, batch simulation of a conventional activated sludge process and measuring the resulting toxicity. Batch simulations are appropriate for plug-flow biological systems because batch processes behave over time as plug-flow processes do with flow time. Batch biological reactors have been used by several researchers to screen wastewaters for activated sludge inhibition (Grady, 1985; Adams et al., 1981; Philbrook and Grady, 1985; and Kang et al., 1983) and non-biodegradable aquatic toxicity (Hagelstein and Dauge, 1984; Lankford et al., 1987; and Sullivan et al., 1987). Hagelstein and Dauge (1984) and Lankford et al. (1987) have found that toxicity measurements coupled with bioreactor tests can be a pragmatic way to evaluate refractory wastewater toxicity.

The RTA protocol was developed in the USEPA TRE research study at the City of Baltimore's Patapsco POTW (Botts et al., 1987) to evaluate the potential for indirect dischargers to contribute refractory toxicity. Additional USEPA TRE research studies in Linden, New Jersey; High Point, North Carolina; Fayetteville, North Carolina; and Bergen County, New Jersey were conducted to improve the RTA approach (Morris et al., 1990; DiGiano, 1988; Fillmore et al., 1990; Collins et al., 1991). The RTA procedure described herein is a refined version of the method given in the municipal TRE protocol (USEPA, 1989a).

The batch reactor used in RTA testing is designed to simulate, as close as possible, the operating characteristics of the POTW's activated sludge process (e.g., MLSS concentration, DO level, and F/M ratio). Two types of batch reactors are used, as shown in Figure 5-2. One reactor serves as the control and consists of the POTW influent and return activated

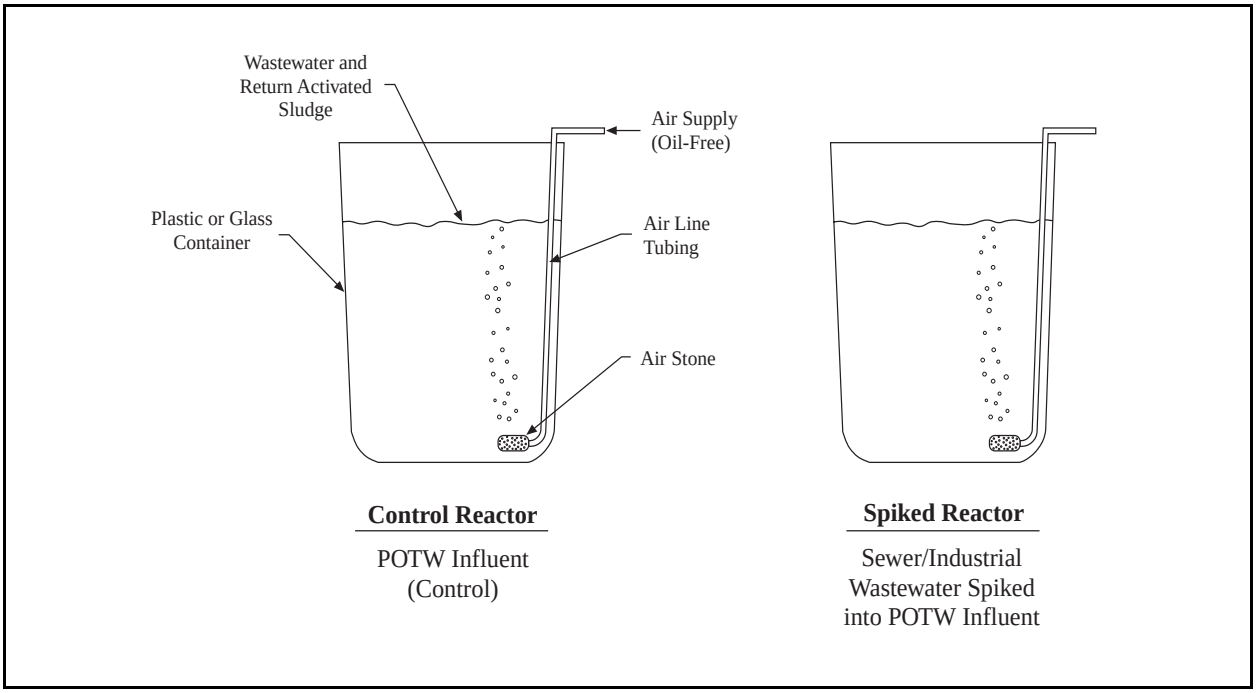

Figure 5-2. Schematic of a refractory toxicity assessment test.

sludge (RAS). The other reactor consists of sewer wastewater spiked into the mixture of POTW influent and RAS. If the effluent toxicity of the reactor spiked with sewer wastewater is increased relative to the unspiked reactor, the sewer wastewater would be considered a source of refractory toxicity. In the spiked reactor, sewer wastewater is tested together with the POTW influent in order to observe possible interactive effects (e.g., additivity, antagonism) that can occur when the wastewater and the total POTW influent are combined and treated in the POTW.

A general description of the RTA procedure is presented below. A step-by-step protocol for RTA testing is provided in Appendix J. The basic steps in the RTA approach are:

- Conduct conventional pollutant analyses to develop a profile for each wastewater to be tested in the RTA.
- Perform toxicity tests on the POTW's RAS (filtrate) to determine its potential to cause an interference in RTA testing.
- Collect, characterize, and prepare wastewater samples for RTA tests.
- Calibrate the RTA batch reactors to achieve a treatment level comparable to that of the POTW's activated sludge process.
- Calculate wastewater volumes to be used in RTA tests.
- Set-up and operate the RTA batch reactors.
- Analyze batch effluent toxicity.
- Evaluate the potential for the sewer wastewaters to inhibit activated sludge treatment (optional).
- Conduct TIE Phase I tests to indicate the types of refractory toxicants in the sewer wastewater (optional).
- Interpret the results.

It is important to emphasize that the RTA protocol should be modified to address site-specific conditions. For example, Appendix C describes an RTA study that simulated a filtration treatment process in addition to a nitrification treatment process. The following summary of the RTA protocol is intended to be a general guide to evaluating sources of toxicity using simulations of suspended biological growth processes. Best professional judgment is important in adapting the procedures to treatment processes and conditions that are unique to each facility.

POTW Wastewater Profile

The first step in the RTA is to characterize the POTW influent (primary effluent), sewer wastewaters, and RAS to be used in RTA testing. The POTW influent wastewater should be collected from the effluent of the POTW primary treatment process because primary effluent is treated by the activated sludge process, which is the main process to be simulated in the RTA. RAS is recommended for use in batch testing because it is in a concentrated form that can be easily diluted to the target MLSS concentration. Mixed liquor from the POTW's aeration basins can be used in lieu of RAS; however, the activated sludge will need to be thickened to the same suspended solids concentration as the RAS before use.

Table 5-1 presents the analyses and information that are needed to characterize the wastewaters to be used in RTA testing. This information will be useful for determining the following operating conditions for the RTA batch reactors, including:

- Determining the volume of sewer wastewater to use in testing based on sewer line and indirect discharger flow-rate data.
- Determining whether nutrient addition is necessary using information on the ratio of organic content (BOD_5 or COD) to nutrient concentrations (TKN and TP).
- Selecting a test period for the RTA reactors that is based on the organic content of the sewer wastewater. Some sewer wastewaters may have substantially higher COD concentrations, which will increase the initial COD level in the RTA reactor. A longer treatment time may be needed to ensure that the wastewater is treated to the same level as the POTW influent.

Biomass Toxicity Measurement

Sometimes the RAS used in testing can cause an interference in the measurement of refractory toxicity. In the Patapsco TRE, filtered samples of RAS were found to be acutely toxic to *C. dubia* (Botts et al., 1987). This toxicity was related to residual biosolids that passed through the filter [10-micron (µm) pore size]. The toxic biosolids caused the batch reactor effluents in RTA tests to be acutely toxic and masked the refractory toxicity of the wastewaters being tested. This biomass interference reduced the effectiveness of the RTA test for determining the sources of refractory

Table 5-1. POTW Wastewater Profile Analyses for a Refractory Toxicity Assessment

Waste Stream	Information Required
RAS	TSS VSS NH_3-N pH
Primary effluent	BOD_5 COD TSS TP TKN NH_3-N pH
Sewer line or indirect discharger wastewater	Location in collection system Number/type of indirect dischargers Flow, million gallons per day (mgd) BOD_5 COD TSS TKN NH_3-N TP pH
Other indirect discharger data	Type of discharger Wastewater pretreatment system Operations/production schedule

toxicity at the Patapsco WWTP. Additional tests demonstrated that RAS toxicity could be removed by filtration of the coarse filtrate through a 0.2 µm pore-size filter or by centrifugation of the coarse filtrate at 10,000 times gravity (xg) for 20 minutes (Botts et al., 1987).

Additional information obtained in the Linden Roselle, New Jersey; Fayetteville, North Carolina; and Bergen County, New Jersey USEPA TRE research studies indicated that the POTW RAS filtrate was not acutely toxic, and therefore did not cause an interference in RTA testing (Morris et al., 1990; Fillmore et al., 1990; Collins et al., 1991). The existing data on the toxicity of sewage sludges are not sufficient, however, to evaluate the occurrence of biomass toxicity at POTWs. The following discussion provides information on how to proceed, if POTW biomass toxicity is observed. Prior to conducting the RTA, toxicity tests of the POTW activated sludge should be performed to determine if the biomass is toxic. This testing involves toxicity measurement of two aliquots of RAS: coarse RAS filtrate and coarse RAS filtrate subjected to centrifugation to remove colloidal particles. The RAS should first be filtered through a coarse glass fiber filter (e.g., 10 µm pore size), which is the same type of filter used for suspended solids analysis (APHA, 1995). Following coarse filtration, an aliquot of the RAS filtrate should be further treated by centrifugation at 10,000 xg for 10 to 15 minutes. Alternatively, the coarse filtrate could be filtered through a 0.2 µm membrane filter. However, tests should be conducted to confirm that soluble toxicity is not removed by sorption onto the filter.

Both the RAS filtrate and centrate should be tested for acute or chronic toxicity using limited-scale tests (USEPA 1993c, 1994a, 1994b). If results show that centrifugation does not reduce biomass toxicity relative to the coarse filtrate, then the RAS is not likely to cause an interference in RTA testing. In this case, the POTW biomass can be used directly in RTA testing

and centrifugation of the RTA batch effluents will not be required. Samples of RAS should be periodically analyzed for toxicity during RTA testing to monitor for possible biomass toxicity.

If the biomass coarse filtrate is observed to be more toxic than the RAS centrate, the biomass toxicity may interfere with RTA testing. Two options are available in this case: removal of the toxic biosolids by fine particle filtration (or centrifugation) of batch test effluents, and use of an alternate biomass.

Biomass toxicity may be removed by applying the fine particle filtration or centrifugation treatment steps to the batch test effluents. In this case, the resulting RTA effluent toxicity will only indicate *soluble* refractory toxicity, not the *total* refractory toxicity (i.e., soluble and particulate).

Another approach to remove biomass toxicity is to use a non-toxic biomass such as another POTW biomass or a commercially available (freeze-dried) preparation. A surrogate biomass will not be acclimated to the influent wastewaters of the POTW being evaluated; therefore, it may not treat the wastewaters as well as the POTW's biomass. Nonetheless, an alternate biomass can provide a level of treatment that will approximate the refractory toxicity of the sewer wastewater. It may be helpful to conduct a parallel series of RTA tests using the toxic POTW biomass. The use of toxic POTW biomass is suggested because it is acclimated to the POTW influent wastewaters and will therefore provide a level of batch treatment that is more similar to the POTW treatment than that provided by the unacclimated alternate biomass. In this case, fine particle filtration or centrifugation is required to remove the interfering biomass particles prior to toxicity analysis. By performing RTA tests with POTW biomass in parallel with RTA tests with alternate biomass, both the soluble and total refractory toxicity of the wastewater may be estimated.

An alternate biomass may be useful in cases where it is necessary to simulate future modifications or additions to the POTW activated sludge treatment process (e.g., conversion from conventional activated sludge to nitrification). In these cases, a biomass that is indicative of the future activated sludge, may not be directly available at the POTW. An alternate biomass can be obtained from another POTW that has a biological treatment process similar to the treatment process planned for the POTW. A TRE conducted by the City of Durham, North Carolina, used this approach to evaluate the toxicity reduction capability of planned nutrient removal treatment systems (Appendix D).

RTA Reactor Calibration Testing

Generally, ideal plug-flow conditions do not occur in activated sludge processes; therefore, it will be necessary to adjust the RTA batch treatment conditions to account for the actual level of treatment achieved in the POTW. One method of controlling the treatment efficiency of activated sludge processes is to adjust the biomass concentration, measured as MLVSS concentration. Batch calibration tests can be performed using a series of MLVSS concentrations and the MLVSS concentration that most closely simulates the POTW treatment efficiency can be selected for RTA testing.

Prior to calibration testing, a target MLVSS concentration can be estimated using mathematic models. In the Fayetteville TRE, a steady state, completely mixed, multi-stage model (Grady and Lim, 1980) was used to determine biokinetic coefficients that best modeled the POTW treatment performance (Fillmore et al., 1990). The biokinetic coefficients were then used in a steady state plug-flow model (Kornegay, 1970) to calculate a batch MLVSS concentration that would theoretically simulate the POTW treatment efficiency. The model results were confirmed in bench-scale, batch reactor tests using a range of MLVSS concentrations, including the theoretical MLVSS concentration and several MLVSS concentrations that bracketed the theoretical value. In this case, the MLVSS concentration determined from the calibration tests matched the theoretical MLVSS value (Fillmore et al., 1990).

POTW primary effluent is typically used in RTA calibration testing. The treatment efficiency of the batch reactors can be evaluated by periodically collecting and analyzing samples for COD and toxicity. TKN, NH_3-N, and TP may also be monitored if the batch reactors are simulating BNR treatment systems. Results of the batch reactor tests are then compared to COD, nutrient, and toxicity data for the POTW final effluent to indicate which batch reactor achieved treatment comparable to the POTW. If there are large differences between batch effluent results and POTW effluent results, it may be necessary to evaluate

different MLVSS concentrations in additional calibration tests. In the Durham TRE, calibration tests were used to define batch operating conditions for a five-stage BNR process (Appendix D).

The RTA calibration study can also be used to establish an appropriate test dilution series for the toxicity tests of batch effluents. Where possible, the dilution series for toxicity tests should bracket the acute or chronic toxicity value (i.e., LC50 or ICp) as closely as possible in order to reduce the span of the 95% confidence limits. Increased confidence in the data is important because sources of refractory toxicity are indicated based on a comparison between effluent toxicity results for the sewer wastewater-spiked reactor and the POTW influent (control) reactor (Figure 5-2). The following example illustrates this point.

A wastewater from an industrial user is spiked into POTW influent sample and tested using the RTA procedure. The acute toxicity of the RTA effluent is measured using two different dilution series: one test series encompasses a wide range of sample concentrations and the other series more closely brackets the expected LC50. The dilution series and resulting survival and LC50 values are shown in Table 5-2.

Using dilution series #1, the LC50 for the industrial wastewater test would be 35% sample with confidence limits (95%) of 25% to 50% (based on binomial model). Using series #2, the LC50 would also be 35% sample, but the confidence limits (95%) would be much tighter at 31 to 39% (based on probit method).

The results for the RTA control test together with the industrial wastewater spiked test are shown in Table 5-3.

In this example, if the control reactor LC50 had been 50% with confidence limits of 42 to 62%, the industrial wastewater would have been indicated as a possible source of toxicity based on the results of series #2, because the 95% confidence limits do not overlap (i.e., 31 to 39% versus 42 to 62%). However, if dilution series #1 had been used, the industrial wastewater may not have been judged to be a toxic source because the confidence limits overlap (25 to 50% versus 42 to 62%). The partial mortality in the 35% concentration in series #2 (Table 5-3) helps to more precisely define the LC50. The narrow confidence limits in series #2 support the conclusion that the refractory toxicity of the wastewater is significantly greater than the POTW influent control (i.e., confidence limits do not overlap).

In the Reidsville and LRSA TREs (Appendices C and G), the results of preliminary toxicity analyses were used to adjust the dilution series to closely bracket the expected IC25 and LC50 value of the batch effluent samples. This approach allowed the identification of sources of refractory toxicity that would not have been indicated using a standard toxicity test dilution series.

Sample Collection

Wastewater and activated sludge samples should be collected according to the procedures described in Section 11. Sample volumes will be based on the subsample volumes needed for periodic reactor measurements and batch effluent toxicity testing.

Table 5-2. Example of Bracketing the LC50 Concentration in the RTA Sewer Wastewater Test

Test	Percent Survival in Sample Concentration					
Series #1	100	50	25	12.5	6.25	0
	0	0	100	100	100	100
Series #2	100	50	35	25	12.5	0
	0	0	50	100	100	100

Source: Fillmore et al., 1990.

Table 5-3. Comparison of Control Test and Industrial Wastewater Spiked Test Results

Test	Control Test LC50 (CI)*	Industry Spiked Test LC50 (CI)	Potential Source of Toxicity?
Series #1	50% (42–62)	35% (25–50)	No
Series #2	50% (42–62)	35% (31-39)	Yes

* Confidence intervals (95%) shown in parentheses.

The volumes of wastewater and RAS to be used in RTA testing will depend, in part, on whether acute or chronic toxicity will be measured. Generally, a batch reactor volume of 3 liters (L) is sufficient when standard freshwater and marine/estuarine species (i.e., *C. dubia*, *Daphnia* sp., *P. promelas*, *M. bahia*) are to be used for testing the acute toxicity of batch effluents. A batch reactor volume of 10 L is adequate to measure chronic batch effluent toxicity using the 7-day *C. dubia* test.

Sample Characterization

Average characteristics of the sewer wastewater and POTW primary effluent can be determined using the wastewater profile data (Table 5-1). These data should include historical results of BOD_5, COD, TKN, TP, TSS, NH_3-N, and pH analyses. Analyses should also be performed on the samples collected for RTA tests to ensure that the wastewater characteristics are consistent with historical data.

Preparation of RTA Test Mixtures

Two batch influent solutions are prepared for each test of a sewer wastewater sample: sewer sample spiked into POTW primary effluent, and primary effluent alone. The sewer sample may be collected from a sewer line or an industrial discharge. The amount of sewer sample to be used in testing should reflect the percent volume of sewer wastewater in the POTW influent. In some cases, the wastewater toxicity from small contributors may not be readily observed when the wastewater is mixed by percent volume with POTW influent. In these cases, it may be necessary to use a greater volume of sewer wastewater than is typically contributed to the POTW.

The volume of sewer wastewater (Vw) sample to be added to the batch reactor is calculated as follows:

$$\mathrm{Vw\,(L)} = \frac{\mathrm{Qw}}{\mathrm{Qi}} \times (\mathrm{Vr} - \mathrm{Vb}) \times \mathrm{Fw},$$

where: Qw is the sewer wastewater flow rate (mgd).
Qi is the average POTW influent flow rate (mgd).
Vr is the total reactor volume (gal or L).
Vb is the volume of RAS biomass (gal or L).
Fw is the sewer wastewater flow concentration factor (e.g., 1, 2, 10 times the sewer wastewater flow).

The selection of a flow concentration factor (Fw) will depend on the percent flow of the sewer wastewater in the POTW influent. A conservative, yet realistic, approach would be to use a Fw that is based on the maximum daily wastewater flow from the sewer discharge in the past year. The Fw should not cause the sewer wastewater to be 100% of the reactor wastewater volume. For example, if the sewer wastewater flow is greater than 20% of the POTW influent flow, a Fw of less than 5 should be used. It is necessary to test the mixture of sewer wastewater and POTW primary effluent in order to evaluate the interactive effects (e.g., additive or antagonistic) that can realistically occur when these wastewaters are combined at the POTW. All sewer samples should be tested using the same Fw to allow a comparison of batch effluent toxicity between the various sewer wastewaters.

After determining the Vw, the volume of primary effluent (Vpe) to be added to the batch reactors can be calculated as:

$$\mathrm{Vpe} = (\mathrm{Vr} - \mathrm{Vb} - \mathrm{Vw}).$$

The batch reactor influents are prepared by mixing the Vw and Vpe for the sewer wastewater spiked reactor and measuring Vpe for the control reactor. In some cases, it may be necessary to adjust the nutrient levels or pH of the batch influents prior to testing as described below.

The BOD_5/TKN/TP ratio of the batch reactor influents should be compared to the average BOD_5/TKN/TP ratio of the POTW influent, as determined from historical or profile data. The sewer wastewater added in the batch reactor influent may be deficient in nutrients, especially if industrial wastewaters are used. If necessary, nitrogen and/or phosphorus should be added so that the BOD_5/TKN/TP ratios of the batch reactor influent and POTW influent are similar. Unless the BOD_5 to nutrient ratios for the batch reactor influent and POTW influent are clearly dissimilar, nutrient addition is not recommended because of the potential for added nutrient salts to change the sample's toxicity.

Using the profile data, BOD_5 and nutrient (TKN, TP) concentrations (C) in the batch reactor influent (spiked) are calculated as follows:

$$C\,(mg/L) = \frac{(Vpe \times Cpe) + (Vw \times Cw)}{(Vpe + Vw)},$$

where: Vpe is the volume of primary effluent in reactor (L).
Cpe is the BOD_5 or nutrient concentration in primary effluent (mg/L).
Vw is the volume of sewer wastewater in reactor (L).
Cw is the BOD_5 or nutrient concentration in sewer wastewater (mg/L).

The typical BOD_5/TKN/TP ratio for municipal sewage is 100:5:1 (WEF/ASCE, 1992a). This ratio will ensure that sufficient nutrients are available for consistent batch treatment of the sewer wastewaters. If necessary, phosphorus should be added in the form of three parts monosodium phosphate (NaH_2PO_4) to four parts disodium phosphate (Na_2HPO_4). Nitrogen should be added as urea nitrogen, except in cases where ammonia is suspected as a cause of effluent toxicity, because urea nitrogen can be converted to ammonia during biological treatment.

Following nutrient addition, the pH of the batch influents may need to be adjusted to within the average range of pH for the POTW influent. Typically, the range of POTW influent pH values will be pH 6 to 9. Hydrochloric acid and sodium hydroxide can be used for pH adjustment.

Following nutrient addition and pH adjustment, the batch influent toxicity should be measured to determine if the added nutrients or pH adjustment cause a change in sample toxicity. Substantial differences between the initial toxicity and the adjusted sample toxicity may indicate the presence of specific types of toxicants. Use of pH adjustment for toxicity characterization is discussed in the USEPA TIE Phase I manuals (USEPA 1991a and 1992a).

The volume of RAS biomass (Vb) to be used in batch testing should yield a batch MLVSS concentration that is equal to the target MLVSS concentration determined in calibration testing (see above). The amount of RAS to be added to the total reactor volume (Vr) is calculated as follows:

$$Vb\,(L) = \frac{\text{Target MLVSS}\,(mg/L)}{\text{RAS VSS}\,(mg/L)} \times Vr\,(L).$$

This equation also is used to determine the alternate (non-toxic) biomass volume (Vnb), if required.

Synthetic Wastewater Testing (Optional)

In some cases it may be important to determine the amount of refractory toxicity of the sewer wastewater excluding the effects of other influent wastewaters. A batch influent solution containing sewer sample spiked into a synthetic wastewater can be used to determine the individual refractory toxicity of the sewer sample. The synthetic wastewater will provide a standard substrate that will allow consistent treatment of the sewer wastewaters.

A synthetic wastewater should be prepared that has a COD concentration that is equal to the average COD concentration of the POTW primary effluent. The volume of synthetic wastewater (Vsw) to be added to the batch reactor is calculated using the same equation that is used to calculate the volume of POTW primary effluent. A synthetic wastewater has not been developed that is consistently non-toxic (DiGiano, 1988). Prior to use in RTA testing, the synthetic wastewater should be tested for toxicity to ensure that it will not interfere with the measurement of refractory toxicity.

Performance of RTA Tests

RTA testing is initiated when the batch influent solutions are mixed with RAS and diffused air is applied to the mixture. The aeration rate should be adjusted to maintain a DO concentration equal to the DO level observed in the POTW activated sludge treatment process. Mechanical mixing using a magnetic stirrer and teflon-coated stir bars may be required to ensure complete mixing in the reactor. The RTA tests must be performed in appropriate laboratory fume hoods to prevent exposure of laboratory staff to any toxic vapors stripped from the wastewater samples (Section 9).

The organic loading to the batch reactors can vary substantially depending on the type of sewer wastewater being tested. For example, a wastewater with a high COD concentration (e.g., >5,000 mg/L) is likely to increase the COD loading to the RTA reactor. The effect of this variation on batch treatment can be minimized by adjusting the reactor treatment time to achieve a constant “food-to-microorganism ratio” in the batch reactor (F/Mb). F/Mb should be similar to

the F/M of the POTW biological treatment process. This adjustment will allow the biodegradable material in the batch influent to be reduced to approximately equal levels in all RTA tests. The required batch test period (d) can be calculated as follows:

$$d = \frac{\text{Batch Influent COD (mg/L)}}{\text{MLVSS (mg/L)} \times \text{F/Mb}},$$

where: F/Mb is equal to the calculated F/M of the primary effluent reactor (i.e., COD/MLVSS × treatment period in days).

Both acute and chronic refractory toxicity can be measured in RTA testing. In order to obtain comparable toxicity results, RTA testing should utilize the same species that was used for TIE tests or routine compliance monitoring. Use of toxicity screening tests such as bacterial bioluminescence tests (e.g., Microtox®) in conjunction with the preferred test species may provide additional information. These screening tests are recommended when the waste streams to be tested exert a high oxygen demand (i.e., high BOD concentration) which would otherwise require aeration during testing and a possible loss of toxicants. Standard procedures for toxicity measurement are not practical due to the large number of samples that will need to be processed in the RTA. Instead, simplified acute toxicity test procedures, like those presented in the USEPA TIE Phase I manuals (USEPA 1991a, 1992a, 1996) are recommended. Likewise, simplified procedures for short-term measurement of chronic toxicity (USEPA 1992a, 1996) are recommended for chronic refractory toxicity assessments. Oris et al. (1991) and Masters et al. (1991) describe the use of an abbreviated version of the 7-day chronic *C. dubia* test, referred to as the 4-day test. However, the 7-day test has been the method of choice for most RTA studies because the use of younger test animals provides more consistent results. Therefore, 7-day test data are better for discerning differences between toxic and nontoxic sources.

The batch test mixtures are prepared for toxicity analysis by allowing the mixed liquors to settle, decanting the clarified supernatant, and filtering the supernatant through a coarse glass fiber filter. The coarse filtration step is used to more closely simulate the POTW clarification process because solids settling in bench-scale containers is not as efficient as the POTW settling process. Note that this step may not be required if the RTA includes a simulation of effluent filtration processes at the POTW (see Appendix C). If toxic biomass is used in the RTA tests, further particulate removal is required to measure the soluble refractory toxicity in the sewer wastewater. In this case, the coarse filtrate can be filtered through a 0.2 µm pore-size glass filter or centrifuged at 10,000 xg for 10 to 15 minutes (American Society for Microbiology, 1981) to remove colloidal size particles from the wastewater. Membrane filters such as cellulose nitrate filters may not be appropriate because some soluble organic constituents may absorb onto the filter. Prior to sample filtration, all filters should be washed and filter blanks should be prepared using the steps described in Section 8 and Appendix J.

Data Evaluation

Results of RTA testing are used to locate the sources that are contributing refractory toxicity to the POTW. A discussion of the evaluation of RTA results is provided as follows.

Results of RTA Tests if POTW Biomass is Non-toxic

Results for each sample analysis will consist of data on two types of batch tests: tests of sewer sample spiked into primary effluent, and a control test using primary effluent alone. The batch test of the sewer sample/ primary effluent will indicate the toxicity that would realistically occur upon mixture of the sewer wastewater with POTW influent. Results of this test are compared to results of the primary effluent control test to determine if the addition of sewer wastewater decreases the refractory toxicity (e.g., dilution or antagonistic effect) or increases the refractory toxicity (e.g., additive effect) of the primary effluent.

If the effluent toxicity of the sewer sample/primary effluent test is greater than the effluent toxicity of the primary effluent control test, the sewer wastewater source may be a contributor of refractory toxicity. POTW influent and sewer wastewater toxicity is known to vary significantly over time; therefore, each wastewater source should be tested several times over an extended period (e.g., three times during both cold and warm weather months) to determine the overall potential for the discharge to cause POTW effluent toxicity. Results of Tier I sewer line tracking can be used to prepare a list of the toxic sewer lines. This list can be compared to a sewer collection system map to indicate tributary sewer lines or indirect dischargers to be tested in Tier II.

The TRE case study summaries in Appendices C and G describe how RTA results were used to indicate sources of refractory toxicity in the Reidsville and LRSA TREs, respectively. These studies illustrate the need to test several samples from each wastewater source in order to account for the variability in refractory toxicity over time.

Results of RTA Tests if POTW Biomass is Toxic

In situations where the RAS coarse filtrate is found to be more toxic than the RAS centrate, RTA tests may use alternate (non-toxic) biomass in addition to tests with the POTW biomass. The data for each sewer sample analysis will consist of results of two batch tests using alternate biomass (i.e., one test of sample/ primary effluent, and one test of primary effluent) and results of two batch tests using toxic POTW biomass. The results of tests that use alternate biomass will provide an estimate of the total refractory wastewater toxicity. The disadvantage of these tests is that the alternate biomass is not acclimated to the POTW influent wastewaters; therefore, it may not provide the same level of treatment as the POTW acclimated biomass.

Batch tests using toxic POTW biomass better reflect the treatment efficiency of the activated sludge process; however, manipulation of the batch effluent (i.e., centrifugation or small particle filtering) removes particles that normally are present in the POTW effluent. Batch effluent treatment is necessary to remove the interfering toxic biomass, but this treatment may artificially change batch effluent toxicity. The advantage of toxic biomass tests is that the soluble refractory toxicity of source wastewaters can be determined. The non-toxic biomass tests cannot provide as good an estimate of soluble toxicity, because alternate biomass is not acclimated to the POTW influent wastewaters. If both toxic biomass and alternate nontoxic biomass are used in testing, results are obtained on both the soluble and total refractory toxicity of the sewer wastewater.

Inhibition Testing (Optional)

Inhibitory wastewater may upset the normal operation of the POTW biological treatment process to the extent that it causes toxicity pass-through. Biological treatment inhibition may occur by three primary mechanisms: competitive inhibition, non-competitive inhibition, and substrate inhibition. The effect of competitive inhibitors is most pronounced at low substrate concentrations. Inhibition by non-competitive inhibitors such as chromate or other heavy metals is observed over a range of substrate concentrations. The third mechanism of biological inhibition, substrate inhibition, occurs at high substrate concentrations.

Only substrate inhibition can be practically evaluated in batch treatment tests. An example of the effects of substrate inhibition on biological activity is shown in Figure 5-3. This figure shows that substrate utilization normally achieves a constant maximum rate as the wastewater concentration is increased. If inhibitory substances are present in the wastewater, the substrate uptake rate would decrease as the wastewater concentration is increased further.

Substrate inhibition can be assessed by monitoring removal of substrate (e.g., BOD_5, COD, TKN, and TP) and oxygen uptake rates in the RTA batch reactors. A series of dilutions of the sewer line or indirect discharger wastewater is tested with POTW biomass: one with 100% indirect discharger wastewater and at least three consisting of serial dilutions (e.g., 50%, 25%, and 12.5%) of sewer wastewater. A range of wastewater dilutions is necessary to compare organic, nutrient, and oxygen removal rates over a range of substrate concentrations. At high wastewater strengths [e.g., 1 mg/L soluble COD (SCOD) to 4 mg/L MLVSS], biomass activity will generally reach a maximum rate (Figure 5-3). When wastewater concentrations are increased, a decrease in COD, nutrient, and oxygen removal rates would indicate the presence of inhibitory materials.

SCOD, ammonia (SNH_3-N), and phosphorus (SP) removal can be used to calculate the specific substrate utilization rate (SSUR). The SSUR is reported in units of mg/L of soluble substrate per gram MLVSS per minute (g MLVSS/min), and is calculated using the equation:

$$SSUR = \frac{Ci\,(mg/L) - Ce\,(mg/L)}{MLVSS\,(g/L) \times Test\ Period\,(min)},$$

where: Ci is the influent substrate concentration as SCOD, SNH_3-N, or SP.
Ce is the substrate concentration in periodic samples collected from the batch reactor.

The POTW biomass used in batch testing contains residual SCOD, SNH_3-N and SP remaining from

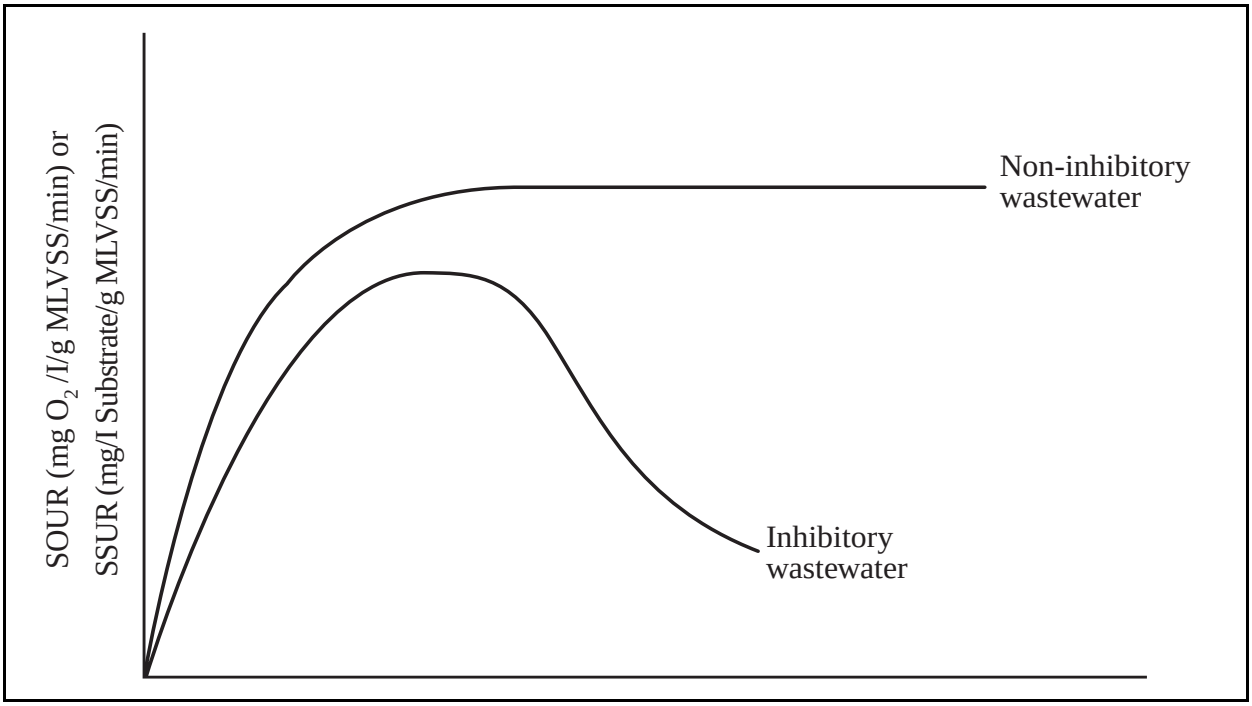

Figure 5-3. Theoretical results of inhibition testing.

biological treatment that must be accounted for when calculating batch effluent concentrations. The correction for biomass SCOD, SNH_3-N, and SP is calculated by the following equation:

$$SCOD = \frac{[(Vr) \times (Ce, mg/L)] - [(Vb) \times (Cb, mg/L)]}{Vr},$$

where: Cb is the concentration of SCOD, SNH_3-N, and SP in the RAS filtrate.
Vr is the total volume in the batch reactor (L).
Vb is the volume of RAS added to the reactor (L).

Oxygen utilization can be measured as a specific oxygen uptake rate (SOUR). SOUR is reported in units of mg O_2/L/g MLVSS/min and is calculated as follows:

$$SOUR = \frac{\text{Oxygen Consumed (mg/L)}}{\text{MLVSS (g/L)} \times \text{DO Measurement Period (min)}}.$$

The SSUR and SOUR data for the four wastewater concentrations can be plotted as shown in Figure 5-3. A reduction in the SSUR and SOUR rates for the full strength sample test relative to the SSUR and SOUR rates for the sample dilution tests would indicate the presence of inhibitory material in the sewer wastewater sample. The degree of inhibition can be inferred by the amount of deviation in biomass activity rates between the full strength sample test and the sample dilution tests.

Phase I Toxicity Characterization (Optional)

TIE Phase I tests can be applied to the batch effluent of the indirect discharger/primary effluent test to determine the types of toxicants causing refractory toxicity in the sewer wastewater. Results of the TIE Phase I testing can be compared to TIE results for the POTW effluent to determine if the sewer wastewater contains the same types of refractory toxicants that were observed in the POTW effluent. Sources that discharge the same types of toxicants as those found in the POTW effluent would be candidates for a pretreatment control evaluation (Section 6). The TIE Phase I procedure is described in Section 4.

Findings of the Toxicity Source Evaluation

The results of Tier I and Tier II testing should be sufficient to confirm the sources of POTW effluent toxicants or refractory toxicity. This information can be used to evaluate and select pretreatment control options (Section 6).

It is possible that the toxicity source evaluation results will suggest that no single sewer line or indirect discharger is a source of refractory toxicity. This case may occur if the sources of toxicants or toxicity are

widely dispersed throughout the collection system. Examples of dispersed toxicants include organo-phosphate insecticides (e.g., diazinon) and ammonia. The inability to locate the toxicant or toxicity sources may also indicate that the sewer sampling points did not include all possible sources of the toxicants or toxicity. In this case, it may be necessary to evaluate additional sewer lines in the collection system.

In situations where the toxicity source evaluation proves to be a prodigious task, the permittee may elect to evaluate alternatives for in-plant toxicity control (Section 6). The choice of pretreatment or in-plant controls may be determined by assessing the best use of the resources that are available for the TRE. In this regard, POTW staff have the option to recover costs associated with toxicity source evaluation through the process of local limits development.

Section 6
Toxicity Control Evaluation

Introduction

The goal of the TRE is to select and implement toxicity control methods and technologies that will achieve compliance with the permit limits for effluent toxicity. Toxicity control evaluation involves assessing the potential control options and selecting the best option(s) for toxicity reduction based on technical and cost considerations. Figure 6-1 illustrates the process of evaluation and selection of toxicity control options. Toxicity control may be accomplished either through the implementation of pretreatment requirements or POTW modifications. Examples of pretreatment controls include local limits development and waste minimization/pollution prevention requirements. POTW modifications may include changes in treatment chemical usage, enhanced operational strategies, or addition of treatment processes.

Criteria for the selection of the preferred toxicity control option(s) should be defined at the beginning of the toxicity control evaluation. Recommended criteria include:

- Compliance with effluent toxicity limits
- Compliance with other permits
- Capital, operational, and maintenance costs
- Ease of implementation
- Reliability
- Environmental impact.

Cost will be a primary selection criterion; however, the selected control option must offer the best potential for consistent, reliable toxicity reduction with the least impact on other permit requirements. The selection criteria should be used initially to screen all candidate control options to determine which alternatives merit further study. The preferred options can then undergo an in-depth review in a pretreatment control evaluation (e.g., local limits development) or in-plant control evaluation (e.g., treatability studies). Information from these evaluations will be used to select the most feasible option(s) based on a more thorough comparison of the criteria listed above. The final selection process may require a quantitative examination of the options using a scoring and ranking system. Table 6-1 presents a matrix of in-plant toxicity control options for the TRE case example provided in Appendix G. Further discussion of the final selection process is provided at the end of this section.

Identifying Toxicity Control Options

The TRE guidance is designed to identify possible methods for toxicity reduction at the earliest possible stage in the TRE process. As shown in the overall schematic of the TRE process (Figure 1-1), sufficient information may be available for toxicity control evaluation at the completion of the POTW performance evaluation conventional pollutant treatability tests, TIE tests, and toxicity/toxicant tracking. Control options must be identified based on ample data that clearly demonstrates the option's technical feasibility.

POTW Performance Evaluation Treatability Tests

Treatability testing in the POTW performance evaluation may identify options for improved conventional pollutant treatment that also reduce effluent toxicity to acceptable levels (Section 3). In addition, the optional TIE Phase I tests may provide information on the presence of in-plant toxicants such as suspended solids or chlorine that is corroborated in the operations and performance review. The treatment steps in TIE Phase I also may provide information on treatment options for control of the in-plant toxicants.

Potential control options may involve treatment modifications or additions that are necessary to improve conventional pollutant treatment and to reduce or eliminate in-plant sources of identified toxicants. Examples of these control options include dechlorin-

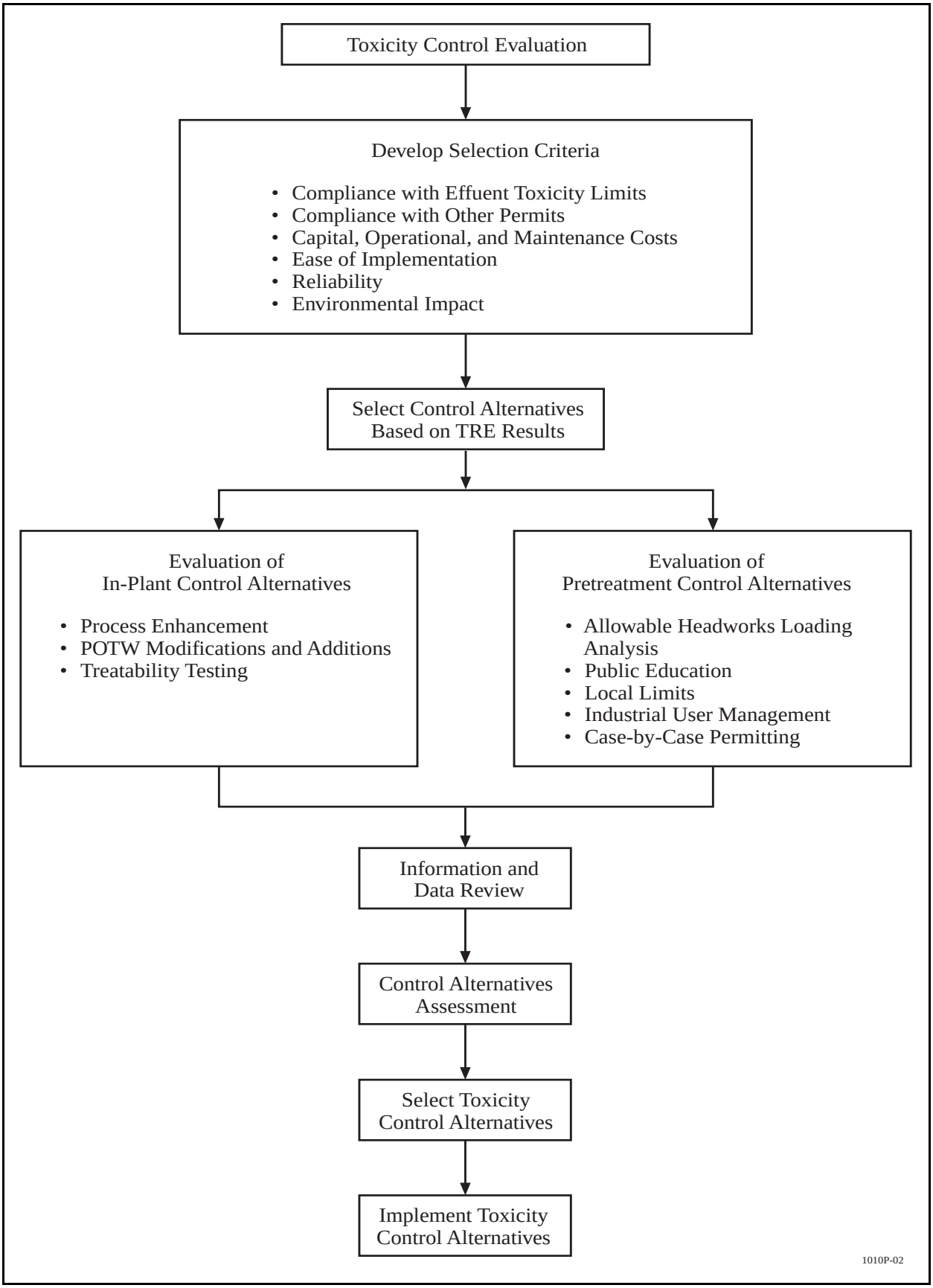

Figure 6-1. Flow diagram for a toxicity control evaluation.

Table 6-1. An Example of the Comparison of In-Plant Ammonia Treatment Alternatives (Ammonia Concentrations of 90 mg/L NH_3-N or Higher)

Treatment Technology	Capital Costs Millions*	O&M Costs Millions†	Equivalent Annual Cost Millions‡	Relative Practicality§	Relative Reliability#
1. Single-stage biological nitrification	9.1	1.5	3.4	Low	Low
2. Two-stage biological nitrification	11.5	2.4	5.0	Impractical	Low
3. Biological nutrient removal with nitrification	18.7	2.8	6.4	Low	Low
4. Ammonia air stripping	11.2	1.3	3.3	Very Low	Low
5. Selective ion exchange (including resin regeneration)	28.0	6.2	12.7	Very Low	Low
6. Breakpoint chlorination	7.5	6.8	11.5	Very Low	Low

* Approximate capital costs based in part on WPCF Nutrient Control Manual cost curves (WPCF, 1983). Values reflect conditions of 17 mgd and 90 mg/L NH_3-N. The values presented here have been modified from the cost curves to reflect engineering and contingency costs at 25% and contractor's overhead and profit at 15%.

† Approximate overhead costs based on WPCF Nutrient Control Manual cost curves. Values reflect conditions of 17 mgd and 90 mg/L NH_3-N.

‡ Approximate equivalent costs amortized over 20 years, assuming an annual 5.00% increase in operation and maintenance costs and an estimated annual interest rate of 8.86%.

§ Relative practicality based on typical technology applications, available land space, overall costs, and/or chemical usage requirements.

Relative reliability based on potential inhibition, temperature and pH sensitivity, and evidence that the technology is proven reliable at 17 mgd and 90 mg/L NH_3-N. Scores of "low" to "high" were used.

Source: LRSA (1991). Additional information on this TRE is presented in Appendix G. All costs shown are in 1991 dollars.

ation treatment to eliminate toxic levels of chlorine and biological treatment optimization (e.g., increased MCRT) to remove toxic ammonia concentrations.

TIE Tests

Results of TIE Phase I testing (Section 4) may indicate the types of treatment that can be used to remove broad classes of effluent toxicants (e.g., filterable material, metals, organic compounds). For example, filterable toxicants may be removed by granular media filtration. The feasibility of options for removing classes of toxicants can be evaluated in the POTW in-plant control evaluation.

Alternatively, results of TIE Phases II and III may help to identify and confirm the specific effluent toxicants (Section 4). If the pretreatment program data are adequate to determine the sources of the toxicants, local limits can be developed and evaluated in the pretreatment control evaluation. In this case, pretreatment control would be preferred over in-plant control because the costs of implementation are usually lower. If pretreatment program data on the toxicants are not available, chemical-specific testing will be necessary to track the sources of the toxicants before toxicity control selection can proceed.

Chemical-Specific Investigation

Chemical-specific tracking in the Tier I – toxicity source evaluation may locate the sources of the POTW effluent toxicants (Section 5). Once the sources have been identified, pretreatment control options such as local limits or waste minimization requirements can be developed and evaluated.

Refractory Toxicity Assessment

Results of the Tier II RTA testing may identify the indirect dischargers contributing refractory toxicity to the POTW. Based on these results, POTW staff can require the indirect discharger to limit the discharge of wastewater toxicity even though the toxic wastewater constituents have not been identified. In some cases,

POTW staff may elect to perform optional TIE Phase I analyses to provide information on the toxic constituents in the indirect discharger wastewater. This additional testing may be conducted so that numerical pretreatment limits can be set.

Toxicity Control Screening Process

Using appropriate selection criteria, the preferred toxicity control options are identified. Available options can be compared using a ranking system (e.g., on a scale of 1 to 10). This screening process may be relatively simple, although some estimate of costs (i.e., order of magnitude) will be useful in selecting the most practical options. The selected options are then studied in the pretreatment control evaluation and in-plant control evaluation, as described below.

The example matrix in Table 6-1 compares in-plant control options for ammonia toxicity. In this case, costs and qualitative measures were used to rank the various options. All of the in-plant control options were found to be impractical or costly; therefore, the sewerage authority investigated pretreatment controls. The source of a majority of the ammonia loading was an industry, which was considered to be controllable. As a result, the sewerage authority required the industry to implement ammonia control methods. The cost to the authority was relatively low and involved a headworks analysis for ammonia and reissuance of discharge permits. Additional information on this TRE is provided in Appendix G.

Pretreatment Control Evaluation

Pretreatment control options can be developed by public works managers to prevent the pass-through of toxicants, toxicity, and inhibitory material that have been traced to indirect dischargers. The primary advantages of pretreatment control of toxicity are that a smaller volume of waste can be managed by addressing individual sources and the costs are usually the responsibility of the industrial users. Pretreatment requirements may involve a public education effort or the implementation of narrative or numerical limitations for POTW users.

The toxicants to be controlled may not be the same parameters that are currently regulated under the pretreatment program. Examples of these types of toxicants include organophosphate insecticides, TDS, biocides, and specialty chemicals used by industries. In cases where current pretreatment regulations are inadequate to address sources of toxicants or toxicity, POTW staff should revise or adopt new permit regulations or ordinances, as appropriate. In these cases, it may be necessary to initiate the following steps to control toxicants or toxicity:

- Investigate public education approaches, if the toxicant is widely used in the service area (e.g., organophosphate insecticides).
- Perform an allowable headworks loading analysis.
- Decide whether to establish local limits or implement a more directed approach, such as industrial user management or case-by-case requirements.
- Develop a monitoring program to evaluate compliance with the requirements.

These steps are described below.

Public education has been successfully used to control toxicity at POTWs. Organophosphate insecticides such as diazinon and malathion have been identified as effluent toxicants at many POTWs, especially in the southeast and southwest United States (Norberg-King et al., 1989). Insecticides can be discharged by many users in the POTW service area, including pest control businesses, veterinarians, lawn care businesses, apartment complexes, restaurants, hotels/motels, office buildings, and homeowners. These users are usually not included under pretreatment programs and it may be impractical to control these sources by regulating each discharge. Studies at POTWs in California (Singhasemanon et al., 1997), Texas (City of Greenville, 1991), Oklahoma (Engineering-Science, Inc., 1992), and North Carolina (Fillmore et al., 1990) have determined that public education is a viable option for control of organophosphate insecticide toxicity attributed to multiple sources. Recommended steps in a successful public awareness program include identifying the significant users of insecticides, developing education materials targeted to users, and distributing the materials on an ongoing basis during periods of expected insecticide use. The City of Greenville also enacted an ordinance to encourage the environmentally sound use of insecticides and require merchants to display public education materials where insecticides are sold (City of Greenville, 1991). Additional information on the identification and control of organophosphate insecticides is presented in Appendices F and H. Public education efforts may be applied to control other effluent toxicants that are widely used in POTW service areas and are not

practical to regulate through local pretreatment limitations.

POTW staff have successfully used revised or new pretreatment regulations to reduce POTW effluent toxicity (Appendices C, E, and G). Local pretreatment limits can be developed to control sources of toxicants or toxicity identified in the toxicity source evaluation. USEPA's *Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program* (USEPA, 1987b) describes several approaches for developing local limits. These approaches include:

- Allowable Headworks Loading Method: Numerical limits are defined based on the maximum pollutant loadings that will allow compliance with receiving water quality criteria, sludge quality criteria, or protection against treatment interferences.
- Industrial User Management Method: Based on an in-depth review of indirect discharger practices, POTW staff can set narrative limits for chemical management practices (e.g., chemical substitution, spill prevention, and slug loading control).
- Case-by-Case Permitting: Technology-based limits are established based on levels that can be feasiblely and economically achieved by industries.

Some of the local limits approaches can be adapted to address effluent toxicants or toxicity. For example, the allowable headworks loading method is well-suited for developing limits to prevent the pass-through of toxicants identified in POTW effluent TIE tests and located by chemical-specific analyses in the toxicity source evaluation. This method can be used to establish the maximum level of the toxicant that can be safely received by the POTW without exceeding the effluent toxicity limit. The LRSA, New Jersey, conducted an allowable headworks loading analysis to address industrial sources of ammonia (see Appendix G). The results of the analysis were used to develop local limits for controllable sources in order to reduce effluent toxicity caused by ammonia.

The industrial user management method provides a framework for implementing chemical management practices including slug discharge control. In cases in which slug loadings contribute to POTW effluent toxicity, spill prevention or load equalization can be implemented at the industrial facility to moderate the slug loadings. USEPA's *Guidance Manual for Control of Slug Loadings to POTWs* (1988b and 1991c) describes methods for the development of slug loading control programs.

The case-by-case permitting method can be used when the POTW effluent toxicants cannot be identified, but TIE information on the general classes of toxicants is available or sources of toxicity have been located in the toxicity source evaluation. Using TIE data, an engineer may be able to select a pretreatment technology that can remove general types of toxicants (i.e., non-polar organic compounds). In cases where the sources of toxicity have been identified, POTW staff have the authority to require the indirect discharger to take steps to limit the discharge of refractory or inhibitory toxicity (USEPA, 1987b).

Although USEPA and the States with approved pretreatment programs have overview authority, the choice of which approach to use for local limits development is the municipal government's decision. The goal in developing local limits is to implement pretreatment regulations that are technically and legally defensible. Local limits can include provisions for equitable recovery of costs associated with the toxicity source evaluation and limits development.

In-Plant Control Evaluation

The objective of the in-plant control evaluation is to select and evaluate feasible treatment options for the reduction of effluent toxicity at the POTW. Treatability testing may be conducted to determine the toxicity removal effectiveness and operating characteristics of the candidate treatment options. These tests should use acute or chronic toxicity tests and chemical analyses to evaluate the removal of specific toxicants and/or toxicity. The resulting data provide a basis for the final selection and conceptual design of feasible POTW process modifications or additions.

It is important to consider that major changes in treatment plant facilities or operations may not be practical due to the cost of new facilities or the complexity of additional process operations. In these situations, pretreatment control of toxicity may be preferred over in-plant control. Wherever possible, the in-plant control evaluation should be performed in conjunction with the pretreatment control evaluation to identify the most technically feasible and cost-effective control option.

Review Existing Information

The first step in the in-plant control evaluation is to review the POTW performance evaluation data on the POTW design (Section 3) to establish the physical space available for new process additions and to determine the idle facilities and equipment that could be used for toxicity control. Operations and maintenance information also should be reviewed to determine if the POTW is capable of handling the increased operational control that may be required with process modifications or additions. In addition, POTW performance evaluation information should be reviewed to determine how the control options might be integrated into the overall treatment system design.

TIE results on identified effluent toxicants can be used to determine in-plant control options. Although information on specific toxicants is well suited for the application of pretreatment control limitations, POTW staff may choose to evaluate in-plant control of these toxicants. An example is the treatment of ammonia by optimizing the POTW activated sludge process (e.g., increase MCRT) to achieve nitrification. In some cases, TIE Phase I data on the classes of effluent toxicant can be used to select options to be examined. For example, if filterable material is the principal effluent toxicant, possible options would include improved solids clarification or granular media filtration.

In-plant toxicity control may be achieved by enhancement of the existing treatment system or by the implementation of additional treatment processes. In-plant control alternatives for different categories of toxicants are summarized in Table 6-2. A description of these control alternatives is provided as follows.

Process Enhancement

Biological Process Control

Biological process control is most easily applied to suspended growth systems (e.g., conventional activated sludge and BNR processes), although some modifications to fixed film processes (e.g., trickling filters and RBCs) may be feasible. The performance of activated sludge and BNR systems is generally controlled by adjusting several process parameters, including MCRT, MLSS, DO levels, recycle ratio, and F/M ratio. The treatment efficiency of the activated sludge system is optimized by varying these interrelated process parameters. A description of the use of operational parameters for toxicant control is provided as follows: "Removal of biodegradable toxic compounds in suspended growth systems may be improved by increasing the MCRT" (Adams et al., 1981). MCRT can be increased by lowering the excess sludge wasting rate. Longer MCRTs are necessary for nitrification and can be beneficial for the biodegradation of some types of organic compounds. An example of this approach was practiced at a POTW on the United States' east coast (Judkins and Anderson, 1992). The facility was retrofitted to achieve nitrification to reduce ammonia. Existing treatment capacity, including aeration basins and secondary clarification, was available to accommodate the longer MCRTs and detention times needed to accomplish nitrification and denitrification. The retrofits involved increasing the air supply, changing the air diffuser pattern, adding an anoxic zone in the aeration basins, increasing the MCRT, and modifying the return sludge flow. Usually, mixed liquor from the aerobic zone of the biological treatment process is recycled to the anoxic zone to accomplish denitrification. However, it was possible in this case to use the existing return sludge pumps to recycle the secondary clarifier underflow to the anoxic zone. The cost of the retrofit consisted of approximately $100,000 in capital costs and an increase in annual operating costs of about 25%.

High MLSS concentrations have been shown to minimize the effects of inhibitory pollutants on activated sludge treatment systems (WEF/ASCE,

Table 6-2. POTW In-Plant Control Technologies for Categories of Toxic Compounds

Biodegradable Organic Compounds and Ammonia*	Non-Biodegradable Organic Compounds	Volatile Organic Compounds	Heavy Metals and Cationic Compounds
Biological process control	Filtration	Biological process control	Filtration
Nutrient addition	Activated carbon	Aeration	Coagulation/precipitation
Coagulation/precipitation	Coagulation/precipitation		pH adjustment

* Air stripping, breakpoint chlorination, and ion exchange also may be considered for ammonia removal; however, the cost of these technologies and the use of toxic additives such as chlorine often preclude their use.

1992a). High MLSS concentrations increase the potential for biodegradation and sorption of toxic wastewater constituents and can help to protect the treatment process from shock loadings. The maximum MLVSS will often be limited by the available secondary clarifier capacity. It is important to consider the effect of increased MLVSS on secondary solids separation and the TSS concentrations of the clarifier effluent.

A decrease in F/M (based on BOD_5) effectively decreases the organic waste loading per unit of biomass, which may improve the biodegradation of some toxic compounds (Adams et al., 1981). The F/M ratio is inversely related to MCRT.

Biological process control is not as easily accomplished for fixed film processes, such as trickling filters or RBCs. Some adjustments can be made, however, such as varying the amount and point of wastewater recirculation in a trickling filter to potentially increase the removal of toxicants or toxicity. In addition, secondary clarifier effluent can be recirculated to dilute high-strength wastes prior to treatment in a trickling filter or RBC. In some cases, inhibitory pollutants may cause excessive sloughing of the fixed film biomass. This problem may be rectified by returning thickened secondary clarifier solids to the fixed film process to help maintain a proper biomass population.

Chemical Addition

The addition of chemicals or additives to waste streams in existing POTW treatment processes may improve toxicant or toxicity removal. Nutrients can be added to influent wastewaters that have low nutrient levels (relative to their organic strength) to improve biological treatment. Lime or caustic chemicals can be used to adjust wastewater pH for optimal biological treatment or for coagulation and precipitation treatment. Other chemical coagulants are used to aid in removal of insoluble toxicants and to improve sludge settling. Powdered activated carbon may be applied in activated sludge systems to remove toxic organic compounds. A description of each of these treatment additives is provided as follows.

Addition of phosphorus, nitrogen, or sulfur may in some cases improve biological treatment of industrial wastewaters with low nutrient concentrations. The optimal BOD_5/TKN/TP ratio for municipal activated sludge treatment is 100:5:1. Lime and caustic chemical addition may be used to increase influent wastewater pH prior to primary sedimentation in order to enhance the precipitation of heavy metals. Chemical addition may also be appropriate for removal of metals in sidestreams from sludge processing. Some metals, however, such as iron and chromium will go into solution rather than precipitate at alkaline pH. The optimum pH range for metals precipitation varies for each type of metal and the solubility/precipitation equilibrium can be affected by other factors such as dissolved solids concentrations in the wastewater. Lime and caustic chemicals also provide additional alkalinity, which is essential for biological treatment, especially nitrification treatment, processes.

Polymers and inorganic coagulants such as alum and ferric chloride can be introduced to POTW waste streams to help remove insoluble pollutants. Coagulants may be added to influent wastewater to increase the sedimentation of toxic constituents in primary treatment and thereby minimize the loading of toxicants on the biological treatment process. Coagulants also can be added after the activated sludge aeration basins to control sludge bulking or reduce effluent suspended solids, which may be associated with effluent toxicity. The optimum conditions for coagulation can be determined by conducting bench-scale jar tests. These tests are used to establish the optimum coagulant type and dose, the proper mixing requirements, and the flocculent settling rates for treatment (Adams et al., 1981).

Coagulants can adversely affect the characteristics of sewage sludges, which could affect the sludge disposal method. Coagulants may increase the toxicity of the sludge (as measured by a TCLP) as a result of the removal of toxic wastewater constituents or as a result of the toxicity of the coagulant itself (e.g., metal salts). Therefore, coagulants should be evaluated carefully prior to use.

The addition of PAC to an activated sludge unit may increase the removal of toxic organic chemicals. Organic pollutants that are not biodegraded can be removed by adsorption onto the surfaces of activated carbon particles. Activated carbon also improves sludge settleability by providing a substrate onto which sludge flocs can agglomerate. Although PAC processes have been used in municipal wastewater treatment, studies (Deeny et al., 1988) have shown that PAC regeneration by wet-air oxidation breaks down the activated carbon particles to carbon fines, which

carry over the secondary clarifier weirs. In some cases, periodic additions of PAC to an aeration basin can be used to minimize the effects of toxic slug loadings, thereby improving the stability of the activated sludge system.

POTW Modifications and Additions

Where process enhancement is not feasible or will not provide adequate toxicant removal, physical addition to or modification of the POTW can be undertaken. Additional treatment processes could include equalization prior to treatment, instrumentation control, BNR, and advanced wastewater treatment processes such as coagulation/flocculation, granular media filtration, and GAC treatment. Public works managers also may consider enhancing effluent dilution through the addition of an outfall diffuser or relocation of the outfall to a larger water body.

Equalization

Equalization can be used prior to the biological treatment process to dampen the effect of slug or diurnal loadings of high-strength industrial wastes. Equalization facilities can be provided to either equalize wastewater flows or wastewater concentrations. Flow equalization is partially provided by existing primary sedimentation tanks and can be enhanced by increasing the size of the primary tankage. Concentration equalization requires mixing of the wastewater to moderate intermittent pollutant loadings; therefore, separate facilities must be provided.

Instrumentation Control

Instrumentation/monitoring can be used to help control slug loadings of toxic constituents in the POTW influent wastewater. For example, transient metals loadings may be monitored by continuously measuring the pH and conductivity of the influent wastewater. A significant change in pH or an increase in conductivity may indicate a slug loading of toxic material, which can be manually or automatically diverted to a holding basin. After equalization, the diverted wastewater can be slowly added back to the influent waste stream to dilute the material prior to treatment.

Outfall Diffuser/Relocation

Public works managers may choose to evaluate the alternative of installing a diffuser or relocating the outfall to achieve better dilution. For example, the extension of a shoreline outfall to a submerged high-rate diffuser in deeper water may promote rapid mixing and achieve an acute dilution factor of 10 or more. If allowed by applicable state water quality standards, the effectiveness of outfall relocation or diffuser installation can be evaluated along with other control options. The reader is referred to USEPA's TSD (1991b) for a discussion of the role of dilution in permitting for whole effluent toxicity control and details on mixing zone analyses and high-rate diffusers.

Advanced Wastewater Treatment

POTWs that only utilize primary and secondary wastewater treatment may achieve toxicity reduction by the addition of advanced wastewater treatment processes such as coagulation/flocculation, sedimentation, granular media filtration, and granular activated carbon. Each of these processes can provide enhanced removal of some toxicants and toxicity. Treatability tests used to evaluate treatment process additions are described below.

Treatability Testing

Bench-scale and pilot-scale treatability tests are commonly used to evaluate treatment options that have been selected for testing. Bench-scale or pilot-scale tests offer several advantages compared to full-scale testing, including a more manageable test unit size and the ability to vary the operating conditions to evaluate toxicity reduction. Treatability methods can range from simple jar tests for testing coagulation/flocculation options to flow-through bioreactors for investigating the biodegradation kinetics of wastewater treatment.

During treatability testing, influent, effluent, and sidestream wastewaters of the treatment simulation are tested for acute or chronic toxicity. Toxicity testing is used to assess the effectiveness of the treatment option in reducing wastewater toxicity and to determine the fate of toxicity in the treatment process. Initial testing should use the simplified toxicity test methods described in the TIE manuals (USEPA 1991a, 1992a, 1996) because of the large number of samples that may need to be tested. Toxicity screening tests such as Microtox® also may be used in conjunction with the required test species to provide additional information. These tests are recommended for waste streams with a high oxygen demand (i.e., high BOD_5 concentration), which would otherwise require aeration when testing with permit species. Aeration should be avoided because it may remove volatile or oxidizable toxicants.

Definitive acute or chronic toxicity tests (USEPA 1993c, 1994a, 1994b, 1995) should be used at the

completion of treatability testing to verify the option's capability in meeting the NPDES permit limit. Optional TIE Phase I analyses also may be performed on treatability test samples to confirm toxicant removal by the treatment option.

Activated Sludge/BNR Treatment

The basic parameters of interest in the design of activated sludge/BNR systems include organic loading, oxygen requirements, nutrient requirements, sludge production, sludge settleability, and internal recycle rates. Continuous flow systems are most useful for evaluating activated sludge/BNR systems; however, batch systems may provide sufficient treatability information in some cases. An example of the use of batch treatment tests in a TRE is provided in Appendix D. This study determined that an upgrade of a conventional activated sludge process to a five-stage BNR process would achieve compliance with chronic toxicity limits. Follow-up monitoring upon completion of the upgrades confirmed the toxicity reduction.

Consideration should be given to evaluating design specifications and operating conditions that are expected to optimize the treatment of toxicants and toxicity. These parameters may include relatively long MCRTs and high MLVSS levels, which have been shown to improve toxic pollutant removal and protect the process from inhibitory wastes (Hagelstein and Dauge, 1984; WEF/ASCE, 1992a).

Coagulation/Flocculation

The evaluation of coagulation and flocculation treatment involves the use of bench-scale jar tests or zeta potential tests to provide information on the optimum coagulant type and dosage, mixing rates, and flocculent settling rates for removal of solids and flocculent suspensions (Adams et al., 1981). Results of these tests are used to devise treatability tests to evaluate the sedimentation of flocculent suspensions.

Sedimentation

Sedimentation involves the removal of suspended solids or flocculent suspensions by gravity settling. Sedimentation is evaluated by conducting a series of settling column tests that measure the settling rates of solids or flocculent suspensions (Adams et al., 1981). Test results are used to calculate a settling profile that can be used for clarifier design.

Granular Media Filtration

Filtration testing involves scaled-down models (usually pilot-scale) of full-sized filters. The choice of filter media and test-flow rates should correspond to the intended design and operating criteria. Although the process scale is reduced, the bed gradation and thickness should be equivalent to anticipated full-scale processes in order to predict actual treatment performance (Adams et al., 1981).

Granular Activated Carbon

The carbon adsorption isotherm test is used to determine the optimum type and dosage of activated carbon for wastewater treatment (Adams et al., 1981). Results of this test are used to prepare bench-scale or pilot-scale carbon columns that can be used to evaluate carbon exhaustion rates and the effect of carbon regeneration on toxicity removal performance.

Toxicity Control Selection

The final process of toxicity control selection involves an assessment of potential control options and selection of the best option(s) for toxicity reduction based on several criteria. In most cases, both a pretreatment control evaluation and an in-plant control evaluation will have been performed; therefore, the review information should include the data developed in both evaluations.

The choice of in-plant toxicity control or pretreatment toxicity control will depend largely on the technical and economic feasibility of POTW treatment modifications and pretreatment controls. Pretreatment control will be feasible in situations where the TIE data and the toxicity source evaluation data are sufficient to definitively identify the sources of toxicity. These data should provide an indication of the variability of toxicity and toxicants in the indirect discharge. If these conditions are satisfied, POTW staff can set local limits using the methods outlined above. In-plant control will be preferred in cases where the implementation of feasible treatment modifications or additions is more practical than pretreatment control. Data obtained in treatability studies should include information on the variability of toxicity treatment performance and the design criteria for implementing the treatment option. In-plant options provide POTW staff a direct method of controlling effluent toxicity; however, in-plant modifications or additions may substantially increase process operation requirements and maintenance costs.

Selection of Toxicity Control Options

Final selection of the preferred toxicity control option(s) involves a comparison of the options using appropriate criteria (see example in Table 6-1). It may be necessary to select and implement more than one control option to ensure compliance with effluent toxicity requirements. The preceding evaluations should provide sufficient information to document the technical and cost considerations for each option.

Compliance with Effluent Toxicity Limits or Requirements

Data gathered through the TRE should indicate that the selected option will consistently achieve compliance with the toxicity permit requirement. Sufficient information should be provided to show that the option will reduce effluent toxicity even during periods of maximum occurrence of toxicity. If this information includes bench and/or pilot-scale treatability data, scale-up factors must be incorporated into estimates of toxicity reduction to adjust for differences in treatment efficiency between laboratory and full-scale treatment systems. Likewise, safety factors should be included in the calculation of local limits to allow for variation in toxicant loadings to the POTW. It also may be necessary to conduct a sensitivity analysis to evaluate the effectiveness of the options under variable conditions (e.g., variable toxicant loadings or treatment performance).

A relative scoring system can be used to rate the overall potential for the options to achieve permit compliance. The scores can be entered into a matrix table like that shown in Table 6-1.

Compliance with Other Permits

Steps taken to reduce effluent toxicity may have a detrimental effect on other permitted activities such as sludge disposal or air emissions. If toxicants are expected to be transferred to sludge or air, the potential effects on limitations specified in residuals and air permits should be estimated. Each option should be rated for its potential to comply with related permits.

Capital, Operation, and Maintenance Costs

Sufficient detail on costs should be presented to allow a straight-forward comparison of the control options. Cost estimates should include the effort and materials required for planning, implementation, operation, and maintenance of the options. Cost information may be obtained from equipment vendors, engineering consultants, and existing data for comparable systems. Costs for requisite environmental and construction permits should be included.

In some cases, it may be possible to recover some of the costs of implementation from responsible dischargers. For example, municipalities may apply surcharges to local limits or request in-kind funding for POTW modifications or additions to recover the costs of toxicity control. Anticipated cash returns should be included in the final cost estimate.

Costs for all options can be ranked and a score can be assigned and entered into a matrix table. Weighting factors may be incorporated into the scoring if funding of some options is uncertain.

Ease of Implementation

Factors such as land availability, permits, operability, and maintenance will have a major influence on the selection of options involving POTW modifications or additions. Likewise, the economic impact and level of community cooperation anticipated from new pretreatment regulations will affect the selection of pretreatment control options. Public works managers should develop a list of all potential constraints as well as benefits of the candidate control methods. Benefits should address items other than effluent toxicity reduction such as improved treatment conditions or better cooperation among POTW users. Each constraint and benefit can be assigned a weighted score, the individual values can be summed for each option, and the total value entered into the matrix table.

Reliability

The selected option(s) must be dependable. Pretreatment approaches or treatment processes that tend to malfunction or fail because of difficulties in executing complicated operational plans should be avoided. Experience in implementing similar projects will be useful in defining the reliability of the options. Public works managers should consider each option's operational history, maintenance requirements, and longevity.

Environmental Impact

Some options may require the evaluation of environmental issues related to the protection of wetlands, rare and endangered species, and cultural resources. Although the costs of these evaluations are included under the above cost criteria, other factors will affect the decision-making process, including public perception, time period for permit approval (if

needed), and potential remediation issues. A score can be developed based on these factors and entered into the matrix table.

Comparison of the Toxicity Control Options

Scores developed in the criteria evaluation are summed for each option. These scores will incorporate all necessary weighting factors; therefore, the total scores for each option can be compared directly. The options can be ranked according to their scores and the highest ranked option(s) can be selected for implementation. In some cases, it may be necessary to select more than one toxicity control option to ensure that permit compliance will be achieved. This approach is highly recommended when the control options are relatively inexpensive to implement, operate, and maintain.

Section 7
Toxicity Control Implementation

Introduction

Once the evaluation and selection of toxicity control options has been completed, the final steps in the TRE are the implementation of the selected pretreatment and in-plant control options and follow-up monitoring to ensure permit compliance. The degree of effort in the implementation step will depend on the severity of the effluent toxicity and the complexity of the selected control approaches. Depending on the findings of the TRE, implementation may involve relatively minor changes such as modifying POTW operating procedures or more complex modifications such as expanding the POTW's pretreatment program or designing and constructing new treatment facilities.

Implementation

Using the results of the previous steps in the TRE, a Toxics Control Implementation Plan (TCIP) should be developed. The TCIP should summarize the results of the TRE, results of the screening and selection of toxicity control options, and justification for selecting the preferred toxicity control option(s). For in-plant control options, the TCIP should provide the basis of design for the selected control options, including capital and operating costs, and a schedule for design and construction. For pretreatment control options, the TCIP should specify the basis of selection and technical justification for local limits and discharger monitoring methods. In addition, the procedures for implementing revised pretreatment regulations also should be defined.

Follow-Up Monitoring

Once a control technology has been implemented, a follow-up monitoring program should be developed and implemented to ensure the effectiveness of the selected control option(s). In most cases, the conditions and frequency of monitoring will be set by the regulatory agency. If source controls are implemented, POTW staff should specify additional monitoring requirements for indirect dischargers under the pretreatment program. These requirements may include verification of statements from industries that the required reduction of toxicity has been made.

The POTW effluent monitoring program should be designed to provide data to ensure that toxicity has been reduced to acceptable levels and that the TRE objectives have been met. This program may involve more frequent monitoring than is required by the NPDES permit, including monitoring to evaluate daily, weekly, monthly, or seasonal variations in effluent toxicity that were observed during the TRE. Follow-up monitoring should utilize the test species and methods specified in the discharge permit. Additional tests, including surrogate methods applied in the TRE, may be included to re-evaluate correlations between test species that may have changed as a result of the effluent toxicity reduction.

Any effluent toxicants that were determined to be present prior to implementation of the control technology should be monitored to ensure that concentrations are below toxic levels. Approved analytical methods will generally be applied; however, screening methods such as ELISA tests or other field kits, which may not be specifically approved by USEPA, can be used to evaluate trends and identify potential problems for follow-up testing. As with toxicity monitoring, the analytical program should re-evaluate trends in toxicant concentrations observed during the TRE. A discussion of an ongoing POTW monitoring program for organophosphate pesticides is described in Appendix F.

Section 8
Quality Assurance/Quality Control

Introduction

A QA/QC program for the TRE should be developed and implemented to ensure the reliability of the collected data. The QA/QC program should include addressing the monitoring of field sampling and measurement activities, the review of laboratory analysis procedures, and the documentation and reporting of the analytical data. A QA/QC program should be designed so that corrective action can be quickly implemented to detect and eliminate erroneous or questionable data without undue expense to the project or major delays in the schedule.

The POTW laboratory manager should ensure that the specific QA/QC requirements for TRE activities are addressed by the facility's QA/QC plan. If a private consultant is to be used for all or part of the TRE testing, the POTW laboratory manager should request a QA/QC plan from the consultant and review the consultant's proposed QA/QC activities. Whether the TRE is to be performed by the POTW laboratory or by a consultant, it is essential that the project organization include competent chemists, toxicologists, and engineers who have adequate knowledge of TRE methods.

The QA/QC plan should be prepared prior to the initiation of the TRE and should contain the following elements:

- QA/QC objectives
- Sample collection and preservation techniques
- Chain of custody procedures
- Analytical QA/QC
- Laboratory equipment maintenance
- QA/QC training requirements
- Documentation and reporting procedures
- Corrective action protocols.

Sample Collection and Preservation

To ensure quality control in sample collection activities, the TRE sampling plan (Section 11) should be strictly followed. In addition, the QA/QC plan should state the minimum sample volumes, maximum sampling holding times, and sample preservation techniques for each analytical method. The sampling requirements for conventional and priority pollutant analyses are described in USEPA's *Methods for Chemical Analysis of Water and Wastes* (USEPA, 1983b) and *Standard Methods for the Examination of Water and Wastewater* (APHA, 1995). Sampling requirements for acute toxicity tests are provided in USEPA's *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms* (USEPA, 1993c) and *Methods for Aquatic Toxicity Identification Evaluations: Phase I, Toxicity Characterization Procedures* (USEPA, 1991a). Sampling requirements for chronic toxicity tests are provided in USEPA's *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (USEPA, 1994a), *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms* (USEPA, 1994b), *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (USEPA, 1995), *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I* (USEPA, 1992a), and *Marine Toxicity Identification Evaluation (TIE)* (USEPA, 1996).

It is important to routinely assess the effects of sample holding times on wastewater toxicity to predict how long samples can be kept before changes in toxicity occur. For example, the acute TIE Phase I manual (USEPA, 1991a) describes how testing the sample toxicity on the day of collection and comparing this initial toxicity to its baseline toxicity (tested 1 day

later) can provide information on appropriate sampling holding times for toxicity analysis. In chronic TIEs, effluent manipulations are performed on the day the sample is received so that the possible effects of any toxicity degradation are minimized (USEPA, 1992a).

Other QA/QC considerations for TRE sample collection include routine cleaning and inspection of automatic sampling equipment, cleaning sample containers according to the requirements for each analytical method, and collecting duplicate samples and field blanks. When preserving samples for chemical analysis, only analytical grade preservatives should be used to avoid contamination and overestimation of analyte concentrations. Unpreserved samples that are to be used for toxicity and chemical analyses require sample containers that are both toxicologically and analytically clean. Equipment and containers used for toxicity test samples require special cleaning procedures outlined in USEPA manuals (1993c, 1994a, 1994b).

Chain-of-Custody

A chain-of-custody (COC) form should accompany all samples to document the collection, preservation, and handling of samples. The COC form should indicate the sample identification number, sample type (i.e., composite or grab), date and time of collection, a brief description of the sample, number of samples taken, name of the person taking the sample and performing field measurements, and sample characteristics such as temperature, pH, total and free residual chlorine, and conductivity. A field book also should be used to record any field observations or conditions noted during sampling along with other pertinent information. Each laboratory should identify a sample custodian to log in and store samples collected during the TRE. The sample custodian should acknowledge receipt of samples by signing the COC form and noting the date and time of sample receipt, the sample identification number, the laboratory assession code, and sampling information such as temperature, pH, and TRC. Upon receipt of the sample, a sample tracking form should be used to record the date, time, and volume of aliquots of the sample removed for analysis, the analyst, and any changes in the nature of the sample, including its toxicity, over time. All COC and sample tracking forms should be maintained in a permanent file so that information on specific samples can be traced easily.

TRE Procedures

Analytical tests should provide data of an acceptable quality for characterizing wastewater toxicity and for evaluating methods and technologies for toxicity reduction. Several test methods described in this document are not standard procedures and require careful attention to unique QA/QC procedures. Special QA/QC procedures for each major TRE test are discussed below. Whenever possible, these procedures should be followed to ensure precise and accurate results.

Toxicity Identification Evaluation

Special precautions for TIE tests are discussed in the Phase I, II, and III manuals (USEPA 1991a, 1992a, 1993a, 1993b, 1996). In general, strict adherence to standard quality control practices is *not* required for conducting Phase I analyses due to the large number of toxicity tests to be performed and the tentative nature of the toxicant characterization. Nonetheless, system blanks and controls should be used whenever possible to indicate toxicity artifacts caused by the characterization procedures. In Phase II more attention should be paid to quality control in order to identify interferences in toxicant characterization and identification. Even greater attention to quality control is needed in Phase III. Sample manipulation should be minimized in Phase III to prevent analytical interferences and toxicity artifacts. Field replicates, system blanks, controls, and calibration standards should be used extensively to allow a precise and accurate determination of the sample toxicants and toxicity.

Specific precautions for characterization (Phase I) and toxicity testing in TIE analyses are provided below.

Aeration

For air stripping or aeration tests, only a high quality compressed air source should be used. Oil, water, and dirt are undesirable contaminants in compressed air; therefore, it is important to use equipment and filters that generate dry, oil-free air. Oil-sealed air compressors should not be used. Simple aeration devices, such as those sold for use with aquariums, are acceptable provided that the ambient laboratory air is uncontaminated (USEPA, 1991a). Recommendations for in-line filters for air exchange systems in laboratories are provided by USEPA (1993c).

Filtration

High purity water, which has been adjusted to a specified pH, should be used to rinse filters between filtration steps (USEPA 1991a, 1992a). Filtration equipment should be rinsed with 10% nitric acid (HNO_3), acetone, and high purity water between sample aliquots. Filtration equipment should be made of plastic to avoid leaching of metals or other toxicants during acid washes. Toxicity can be checked by testing filtered dilution water.

pH Adjustments

Concerns in the pH adjustment steps involve artificial toxicity caused by excessive ion concentrations from the addition of acid and base solutions, contamination from impure acid and base solutions, and silver contamination from some pH probes (USEPA 1991a, 1992a). The baseline toxicity test acts as a control for indicating whether addition of acid and base solutions increases effluent toxicity. Ultra-pure acids and bases should be used to minimize artificial toxicity. During pH measurement, toxic concentrations of silver can leach from refillable calomel electrodes; therefore, only solid state pH probes should be used.

Methanol/C18 SPE Column

HPLC grade methanol is required for C18 SPE column preparation and extraction steps. A blank toxicity test should be conducted for each methanol reagent lot. In addition, a toxicity blank should be performed on each C18 SPE column to check for resin-related toxicity (USEPA 1991a, 1992a).

Sodium Thiosulfate Addition

The TIE manuals (USEPA 1991a, 1992a, 1996) provide information on the toxicity of sodium thiosulfate to several freshwater and marine species. These manuals prescribe the amount of sodium thiosulfate to use in testing. If alternative species are to be used, the species tolerance should be evaluated by adding increasing quantities of sodium thiosulfate to aliquots of the sample, testing the resulting toxicity, and comparing the toxicity to the sample's baseline toxicity.

EDTA Addition

The TIE manuals (USEPA 1991a, 1992a, 1996) also prescribe the concentration of EDTA ligand to be added to samples. If alternative species are to be used in the TIE, the same test approach noted above for sodium thiosulfate can be applied.

Toxicity Tests

The organisms used to test the sample toxicity prior to and following each characterization step should not be subject to undue stresses such as contamination (USEPA, 1991a). The test organisms should have had no prior exposure to pollutants and their sensitivity should be constant over time. To assess changes in the sensitivity of the test organisms, a standard reference toxicant test should be performed on a regular basis and accompanying quality control charts should be developed (USEPA 1993c, 1994a, 1994b). Reference toxicant tests should be performed monthly. If test organism cultures are not maintained in the laboratory, reference toxicant tests should be performed with each group of test organisms received, unless such information is available from the vendor. Information on obtaining and culturing species for toxicity testing is provided in the acute and chronic toxicity test manuals (USEPA 1993c, 1994a, 1994b).

The quality of the dilution water used in toxicity tests will depend on the purpose of the TIE test and whether the test is being performed for toxicant characterization (Phase I), identification (Phase II), or confirmation (Phase III). Much of Phase I and parts of Phase II rely on relative toxicity measurement; therefore, water that is of consistent quality and will support the growth and reproduction of the test species is suitable for these phases of the TIE (USEPA 1991a, 1992a, 1996). The objective of Phase III, however, is to confirm the true cause of toxicity; therefore, artifacts are to be excluded and the choice of dilution water should follow Phase III guidance (USEPA, 1993b). Guidance for preparing the dilution waters is described by USEPA (1991a, 1992a, 1996).

USEPA (1991a) recommends feeding cladocerans (i.e., *C. dubia* and *Daphnia* sp.) in the TIE test solutions at the beginning of acute TIE toxicity tests. Daily feeding is required in the chronic TIE tests (USEPA, 1992a). Feeding requirements for selected species are described in the acute and chronic toxicity test manuals (USEPA 1993c, 1994a, 1994b, 1995).

Sample pH should be recorded at each sample renewal. Additional pH measurements may be needed during the test, especially if ammonia toxicity is a concern.

DO measurements may be made at sample renewal or at the end of the exposure period in the TIE. In cases where low DO is a problem, DO adjustment should be

performed at a rate that will not intentionally change the sample toxicity.

Refractory Toxicity Assessment and Treatability Tests

RTA and treatability tests are subject to a variety of potential interferences due to the large number of variables that must be accounted for and controlled during testing. When performing RTA and treatability analyses, it is important to hold all parameters potentially affecting toxicity constant so that sample toxicity is the sole variable. Important parameters to be controlled in RTA testing include the test solution temperature, DO level, and pH.

The QA/QC concerns for toxicity analysis in RTA and treatability tests are the same as those noted above for TIE tests. Selection and use of test species and dilution water should follow procedures given in the USEPA Phase I manual (USEPA 1991a, 1992a).

Potential sources of toxicity contamination should be identified through the use of system blanks. As in TIE testing, the filters used in RTA testing should be tested to determine if toxicity is added during filtration. Each of the solutions used in RTA testing, including activated sludge, should be checked for toxicity. In the Patapsco TRE, the RAS used in the RTA batch tests was found to be acutely toxic to *C. dubia* (Botts et al., 1987). Steps for addressing RAS toxicity are described in Section 5. Similarly, the reagents used in treatability testing such as chemical coagulants should be screened for toxicity.

Field replicates, calibration standards, and analytical replicates should be routinely performed during RTA and treatability testing. Results of these quality control analyses can be used to calculate the precision, accuracy, and the sensitivity of each physical/chemical analysis method used in these studies.

Chemical Analyses

Quality control for chemical analyses includes the use of calibration standards, replicate analyses, spiked sample analyses, and performance standards. The detection limits and the recommended reagents for method calibration and spiking are discussed in USEPA's *Methods for Chemical Analysis of Water and Wastes* (USEPA, 1983b) and *Standard Methods for Examination of Water and Wastewater* (APHA, 1995). General information on laboratory quality control for chemical analyses is provided in USEPA's *Handbook for Analytical Quality Control in Water and Wastewater Laboratories* (USEPA, 1979a).

Equipment Maintenance

All facilities and equipment such as pH, DO, and conductivity meters, spectrophotometers, GC/MS, and HPLC instruments should be inspected and maintained according to manufacturers' specifications. Standard operating procedures (SOP) should be followed for routine maintenance and calibration of each analytical instrument. A maintenance log book also should be kept for each major laboratory instrument.

The measurement of toxicity or trace compounds in wastewater samples requires the use of carefully cleaned instruments and glassware. Instruments that involve flow-through analysis such as automated spectrophotometers should be inspected to ensure that flow-through parts (i.e., tubing) are periodically replaced. New glassware may be contaminated with trace amounts of metals; therefore, any glassware being used in toxicity tests for the first time should be soaked for three days in 10% HNO_3 (USEPA, 1991a). For subsequent use in TIE and toxicity tests, the glassware should be washed with phosphate-free detergent, and sequentially rinsed with 10% HNO_3, acetone, and finally high-purity water (USEPA 1993c, 1994a, 1994b).

Documentation and Reporting of Data

Basic steps in a successful QA/QC program are the documentation of the analytical data in meaningful, exact terms, and reporting the analytical data in a proper form for future interpretation and use. To ensure the reliability of the data, its handling must be periodically monitored and reviewed. This review generally consists of three elements: an assessment of laboratory record-keeping procedures, a review of the data calculations, and a review of the final reported data. On the basis of these review steps and the QA/QC analyses for precision and accuracy, the data are accepted or rejected. This review process is essential because some or all records may have to be submitted for review by State or Federal regulatory agencies.

Corrective Action

Procedures should be established to ensure that QA/QC problems such as improper sampling techniques, inadequate COC records, and poor precision and accuracy results are promptly investigated and corrected. When a QA/QC deficiency is noted, the cause of the condition should be determined and corrective action should be taken to preclude repetition.

Section 9
Health and Safety

Introduction

A health and safety (H&S) plan may be necessary to establish policies and procedures to protect workers from hazards posed by TRE sampling and analytical activities. The general guidelines outlined in this section should be integrated into existing H&S programs even if a specific H&S plan is not required. Whether a specific H&S plan is necessary or not will depend on the conditions under which the TRE is being conducted. For example, if the POTW operates under an RCRA permit by rule, then H&S must be addressed when collecting and analyzing hazardous wastes.

Important considerations for H&S for TRE studies include:

- Identification of personnel responsible for H&S matters
- H&S information and training activities
- Protective equipment required for TRE activities
- Materials cleanup and disposal procedures
- Emergency response contingencies.

Detailed information on the preparation and scope of H&S plans is provided in the Occupational Safety and Health Administration's (OSHA's) *Safety and Health Standards, General Industry* (OSHA, 1976). The following subsections discuss specific H&S considerations for selected TRE activities.

Sample Collection and Handling

Working with waste streams of unknown composition is inherent to TREs. Samples of industrial sewer discharges, municipal wastewater, and sewage sludge can contain a variety of toxic and hazardous materials (e.g., pathogens, carcinogens) at concentrations that can be harmful to human health.

It is the responsibility of the laboratory sample custodian to ensure that TRE samples are properly stored, handled, and discarded after use (see Section 8). Upon sample storage, the sample custodian should indicate the H&S considerations for sample handling and disposal.

Exposure to toxic and hazardous sample constituents should be minimized during sampling handling. The principal routes of human exposure to toxics is via inhalation, dermal absorption, and/or accidental ingestion. Exposure can be minimized through the use of proper laboratory safety equipment such as gloves, laboratory aprons or coats, safety glasses, respirators, and laboratory hoods. Laboratory hoods are especially important when testing wastewaters containing toxic volatile substances such as volatile priority pollutant compounds, hydrogen sulfide, or hydrogen cyanide. Proper dermal protection such as using neoprene gloves for solvent-containing wastes also is important. Laboratory managers should consult the manufacturers' specifications in selecting appropriate clothing materials for protection against specific chemicals.

Residual wastewater samples and wastes generated during TRE studies should be disposed of properly. Residual municipal wastewater and other non-hazardous wastes can be disposed directly into the sink drain if the TRE is being conducted at the POTW. Residual industrial samples and other wastes that may contain hazardous materials should be decontaminated and/or disposed of in accordance with hazardous waste regulations (NIOSH, 1977).

TRE Methods

Specific precautions to be followed for selected TRE techniques are described below.

Toxicity Identification Procedures (TIE)

USEPA's TIE Phase I manuals (USEPA 1991a, 1992a, 1996) address the general H&S concerns involved in performing TIE testing. Ventilation is a specific concern when performing the Phase I aeration procedure. The aeration test should be performed in laboratory hoods to prevent exposure to toxic volatile compounds or pathogens resulting from aeration.

H&S considerations for aquatic toxicity testing are addressed in USEPA's toxicity test manuals (USEPA 1993c, 1994a, 1994b, 1995). Special precautions need to be taken for on-site mobile laboratories in the handling and transportation of chemicals, supply of adequate ventilation and safe electrical power, and disposal of waste materials.

Refractory Toxicity Assessment and Treatability Tests

Proper ventilation also is important when conducting RTAs and treatability tests in the laboratory. Hoods should be used to capture and vent potential volatile compounds that are stripped from the wastewater during biological treatment tests.

Physical/chemical treatability testing may involve the use of hazardous reagents such as acids or caustics. Caution should be taken in the handling and disposal of these chemicals.

Chemical Analyses

Several reagents used for chemical-specific analyses (e.g., priority pollutants, COD, etc.) are toxic or hazardous substances. Analysts should be familiar with safe handling procedures for all reagents used in testing, including the practice of proper chemical storage to avoid storing incompatible chemicals together (NIOSH, 1977; OSHA, 1976). After use, the waste chemicals should be converted into a less hazardous form in the laboratory before disposal or disposed of by a commercial disposal specialist.

General Precautions

USEPA (1977) and the American Chemistry Society (1979) describe additional laboratory safety procedures that can be used in TRE studies, including:

- Use of safety and protective equipment such as eye protection (safety goggles, eye wash), fire hazard protection (smoke and fire detectors, fire extinguishers), and electrical shock protection (ground-fault interrupters for wet laboratories).
- Protocols for emergency response and materials cleanup.
- Personnel training in H&S procedures.

Section 10
Facilities and Equipment

Introduction

Laboratories should be equipped with all the basic and specialized laboratory equipment required to conduct the TRE, and laboratory personnel should be skilled and experienced in operating this equipment. The facilities and equipment needed to perform a TRE will be different for each POTW and will depend on the type of testing to be performed in the TRE. In general, the minimum facilities and equipment for initiating a TRE will include the equipment needed for toxicity and TIE testing (USEPA 1991a, 1992a, 1993c, 1994a, 1994b, 1996). As additional information becomes necessary, facility and equipment needs will depend on the physical/chemical characteristics of the causative toxicants and the toxicity control approaches to be evaluated. For example, the selection of bench-scale equipment and/or pilot plant facilities for treatability studies will be dictated by the control options to be tested (e.g., physical/chemical processes such as filtration or biological processes).

The choice of whether to work on-site or off-site will depend on the stage of the TRE, the approach for tracking sources of toxicants or toxicity, and the requirements for treatability testing. In general, the equipment and time required for conducting TIE tests makes on-site testing less feasible. If the loss of sample toxicity over time is minimal, TIE samples can be shipped and tested off-site, usually at much less cost than on-site testing. If toxicity tracking using RTA tests is required, on-site testing is recommended for the treatment phase of the RTA, because fresh samples of the POTW RAS biomass must be used. Treatability tests that require continuous supplies of POTW influent or process wastewaters and/or activated sludge (i.e., flow-through bioreactor tests) also may be more efficiently conducted in on-site facilities. Some treatability evaluations require unique or sophisticated equipment (e.g., ultra-filtration apparatus) that is not readily available for on-site work. In these situations, the equipment vendor may be able to conduct the required tests at their facility.

The general equipment requirements for each of the main TRE methods are summarized below. H&S equipment is discussed in Section 9.

Toxicity Identification Evaluations

Laboratories should be equipped with the equipment and materials needed to conduct the TIE, including filtration and air-stripping equipment, pH and DO meters, C18 SPE columns, fluid metering pumps, required reagents for the TIE manipulations, and facilities for organism handling, water preparation, sample holding, and glassware cleaning. Equipment requirements for culturing standard test species are described in USEPA's acute and chronic toxicity test manuals (USEPA 1993c, 1994a, 1994b, 1995).

More sophisticated analytical equipment is required for the TIE Phase II toxicant identification and TIE Phase III toxicant confirmation procedures. The choice of analytical instruments for these procedures will depend on the compound to be measured. Equipment may include an analytical balance, a GC/MS, an HPLC, an atomic absorption (AA) spectrometer, an inductively coupled plasma (ICP) spectrometer, an ultraviolet-visible spectrophotometer (UV-VIS), an ion chromatograph, ion selective electrodes, a pH meter, a conductivity meter, and a refractometer. Use of inert materials such as perfluorocarbon plastics for TIE Phases II and III are recommended to protect against toxicity artifacts (USEPA, 1991a).

Refractory Toxicity Assessment and Treatability Tests

Laboratories should be equipped with the basic equipment for setting up and operating the RTA batch

reactors, including an air supply, electrical supply, and a laboratory hood. Instruments for monitoring the batch reactors include respirometer and/or oxygen meter, pH meter, ion selective electrode meter and probes, total TOC analyzer, spectrophotometer for COD and nutrient (e.g., ammonia and nitrate) analyses. A drying oven, muffle furnace, and analytical balance will be needed for TSS and VSS measurements.

The equipment for toxicity testing will depend on the choice of toxicity screening tests. Depending on the species to be used, it may be more economical to culture the test organisms than to purchase them. In some cases, rapid screening tests such as a bacterial bioluminescence test (e.g., Microtox®) may be used as a surrogate method for toxicity testing (see the Billerica, Massachusetts, case history in Appendix A).

General Analytical Laboratory Equipment

General laboratory equipment such as refrigerators, a water purification system, and commonly used reagents are needed to support the TIE and RTA analyses. The type of water purification system needed for testing is described by USEPA (1993c, 1994a, 1994b, 1995).

Section 11
Sample Collection and Handling

Introduction

The most important criterion in sampling is to obtain a sample that is representative of the discharge. Several samples will need to be collected to ensure that the samples represent the typical toxicological and chemical quality of the wastewater. Guidelines for sample collection and handling are presented in the acute and chronic toxicity test manuals (USEPA 1993c, 1994a, 1994b, 1995) and the Phase I TIE documents (USEPA 1991a, 1992a, 1996). The WEF also has published a useful guide to sampling at POTWs (WEF, 1996).

A sampling plan should be prepared to document the procedures to be followed in TRE sampling. This plan should include:

- A description of sampling locations
- Sampling equipment and methodology
- Sample delivery requirements.

These elements are discussed in the following subsections. QA/QC procedures for sampling are addressed in Section 8. Procedures include preparing COC forms, maintaining sampling equipment, and identifying the minimum volume requirements, holding times, and preservation techniques for samples.

Sampling Location

Sampling locations should be established where representative samples can be readily obtained. When sampling waste streams within the POTW, care should be taken to exclude unwanted waste streams and select a sampling point that is most representative of the discharge (e.g., the common discharge channel for secondary clarifiers). The sampling location for the POTW effluent should correspond with the biomonitoring sampling point stated in the NPDES permit. If the permit does not specify whether the effluent sample is to be collected prior to or following the chlorination/dechlorination treatment process, the choice of a sampling location will depend on the toxicants of concern. Generally, sampling at the point of final discharge is the best option; however, sampling both before and after chlorination/dechlorination may help to determine if toxicity is caused by chlorination (i.e., TRC) or dechlorination. If samples are collected following the chlorination process, free chlorine and TRC should be measured when sampling is completed and upon initiation of toxicity tests. These results will provide information on the potential for chlorine toxicity.

Wastewater sampling for toxicity source evaluations requires knowledge of sewer discharge locations. Sampling may be conducted at the point of sewer discharge or within the sewers in the municipal sewer collection system. The choice of sampling points for sewer line tracking may be based on existing pretreatment program data. If these data are not available, a sampling scheme can be devised to locate sources of toxicity by testing and eliminating segments of the collection system that prove to be non-toxic. In some cases, indirect dischargers may have multiple sewer discharges that need to be included when sampling.

RTA testing requires samples of the POTW influent (primary effluent) and activated sludge. Primary effluent samples should be collected at the overflow weirs of the primary sedimentation tanks. Activated sludge samples can be collected from the aeration basin effluent weirs or the RAS pipelines.

POTW Sampling

The choice of grab or composite samples of POTW waste streams (i.e., effluent and influent wastewater and process waste streams) will depend on the physical/chemical characteristics and variability of the

toxicants. Initial effluent toxicity characterization (TIE Phase I) should utilize 24-hour composite samples in order to ascertain the daily, weekly, or seasonal variability of the causative agents. If effluent toxicity is not easily observed in 24-hour time composites, flow proportional composite or grab samples may be used to observe possible flow-related peaks of toxicity. In the latter phases of the TIE, grab samples may be used to determine the variability in the type and concentration of effluent toxicants (USEPA 1991a, 1992a). A discussion of the use of grab versus composite sampling for toxicity tests is provided by USEPA (USEPA 1993c, 1994a, 1994b, 1995). The choice of sampling techniques for chemical-specific analyses is dependent on the type of compounds to be measured (e.g., grab sampling for volatile organic compounds).

When evaluating the treatment efficiency of the POTW or its unit processes, collection of the influent and effluent wastewaters should be lagged by the hydraulic retention time (HRT) of the treatment process in order to obtain comparable samples. For example, if the HRT of the treatment plant is 20 hours, the effluent sampler should be timed to start 20 hours after influent sampling is initiated. Likewise, sampling of wastewater from industries or sewers should account for the travel time in the collection system (i.e., POTW influent sample collection should lag industry sample collection).

Samples also should be collected during representative discharge periods. An evaluation of the POTW operations and performance at the time of sampling can be made by comparing the effluent sample concentrations of BOD_5, TSS, and other pollutants to long-term historical averages and/or permitted values for those parameters.

Effluent samples are often collected, shipped, and stored in plastic containers. However, some toxicants such as surfactants may adsorb to plastic. A simple way to check for this characteristic is to collect and ship samples in both glass and plastic containers, then test the samples for toxicity (USEPA, 1991a). A greater loss of toxicity in plastic containers as compared to glass containers may indicate the presence of toxic surfactants.

The sample volume requirements for TIE Phase I tests are provided by USEPA (1991a, 1992a, 1996). Volume requirements for POTW samples that are used in RTA tests are given in Section 5.

If TIE or physical/chemical treatability testing is being conducted off-site, samples should be shipped on ice to maintain the sample temperature at 4°C. RTA and some biological treatability tests require fresh or continuous samples of POTW waste streams, which requires testing to be conducted on-site. Samples of RAS and activated sludge should be delivered to the on-site laboratory and used immediately in testing to prevent changes in the biomass that can occur during long-term storage. Biomass samples should be vigorously aerated for a minimum of 15 minutes before use in the RTA or treatability tests. POTW influent and process wastewater samples required for on-site RTA or treatability studies should be used on the day of sample collection.

Sewer Discharge Sampling

The choice of grab or composite samples of indirect discharges will depend on the physical/chemical characteristics and variability of the toxicants. The sample type also will be dictated by the stage of the toxicity source evaluation. In Tier I testing, 24-hour flow proportional composite samples are recommended to characterize daily variability while accounting for variations in flow. Flow proportional sampling should be scheduled to coincide with production schedules for industrial discharges, the frequency of intermittent inputs for RCRA discharges, and the schedule of remedial activities for CERCLA discharges. This information is usually available in the POTW's pretreatment program reports.

Sampling techniques for flow proportional composites should account for the potential loss of volatile compounds. For samples collected for chemical analysis or refractory toxicity testing, zero headspace sampling methods can be used to minimize volatile losses. In some cases, grab sampling may be used in lieu of zero headspace methods to reduce sampling costs; however, care should be exercised in collecting samples that are representative of the discharge.

In Tier II, grab sampling can be used in addition to composite sampling to assess the variability of the toxicants. This type of sampling requires in-depth knowledge of the production schedules and the pretreatment operations of the discharger.

Section 12
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Section 13
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Sediment Toxicity Identification Evaluation (TIE)

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Sediment Toxicity Identification Evaluation (TIE) Phases I, II, and III Guidance Document

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The Office of Research and Development (ORD) has produced this document to provide guidance for the identification of toxicants in sediments. These methods may be useful as a complement to existing sediment assessment tools. This document should be cited as

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Abstract

Sediment contamination in the United States has been amply documented and, in order to comply with the 1972 Clean Water Act, the U.S. Environmental Protection Agency must address the issue of toxic sediments. Contaminated sediments from a number of freshwater and marine sites have demonstrated acute and/or chronic toxicity to a variety of test species, as well as adverse ecological effects such as population declines and changes in community structure. However, simply knowing that a sediment is toxic has limited use. This document provides guidance on the performance of sediment Toxicity Identification and Evaluation (TIE). TIE methods allow for the identification of toxic chemicals or chemical classes causing observed toxicity. The identification of pollutants responsible for toxicity of contaminated sediments has broad application in a number of EPA programs as the methods can be used within the total maximum daily load (TMDL) framework, to link sediment toxicity to specific dischargers, to design cost-effective remediation programs, and to identify environmentally protective options for dredged material disposal. In addition, the identification of specific problem contaminants in sediments could prove to be very useful to EPA programs involved in the development of water or sediment quality guidelines, and the registration of new products such as pesticides. Finally, knowledge of the causes of toxicity that influence ecological changes such as community structure would be useful in performing ecological risk assessments not only for the Agency but also for the scientific and regulated community as a whole.

This document provides guidance for both interstitial water and whole sediment TIEs and combines our current understanding of TIE methods for both marine and freshwater interstitial waters and whole sediments. This guidance does not include approaches for the implementation of sediment TIE in a regulatory context.

This document contains Phase I TIE (characterization) methods for interstitial waters and whole sediments, including guidance on when to use whole sediment or interstitial water methods, the collection of interstitial waters for testing, and test volume considerations. Interstitial water methods include the following manipulations: graduated pH, aeration, filtration, C_{18} reverse-phase chromatography extraction, EDTA addition, and cation exchange solid phase extraction. Whole sediment methods include general procedures and considerations for whole sediment testing and the following manipulations: *Ulva lactuca*, zeolite, cation exchange resin, anion exchange resin, acid volatile sulfide, Ambersorb, and powdered coconut charcoal additions and base metal substitution. Existing guidance for Phases II and III methods have been tailored for chemical classes normally found in sediments.

Sediment Toxicity Identification Evaluation (TIE) Phases I, II, and III Guidance Document Acknowledgements

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Abbreviations

AED	Atlantic Ecology Division, USEPA, Narragansett, RI
AET	apparent effects threshold
AVS	acid-volatile sulfide
DI	deionized (water)
DO	dissolved oxygen
EC	electron capture
EC_{50}	median effective concentration (concentration for which the endpoint is reached in 50% of the organisms)
EDTA	ethylene diamine tetraacetic acid
EqP	equilibrium partitioning
ERL	effects range low
ERM	effect range medium
ESB	equilibrium partitioning sediment benchmark
f_{OC}	fraction organic carbon (usually sediment dry weight)
GC	gas chromatography
HPLC	high performance liquid chromatography
ICP	inductively coupled plasma emission spectroscopy
IW	interstitial water (porewater)
K_{OC}	organic carbon normalized partition coefficient
K_{OW}	octanol water partition coefficient
K_{SPMD}	water SPMD partition coefficient
LC	liquid chromatography
LC_{50}	median lethal concentration (concentration that kills 50% of the organisms)
MED	Mid-Continent Ecology Division, USEPA, Duluth, MN
MEOH	HPLC grade methanol
MS	mass spectroscopy
NEC	no-effect concentration
NPDES	National Pollution Discharge Elimination System
PAH	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PEC	probable effects concentration
PEL	probable effects level
pH_i	initial pH
SPE	solid phase exchange
SPMD	semipermeable membrane device
SQG	sediment quality guidelines
TIE	toxicity identification evaluation
TEL	threshold effects level
TOC	total organic carbon

1 Introduction

Toxicity testing is an excellent tool for monitoring sediment contamination, as it can detect the presence of both known and unknown sediment contaminants if they are present at concentrations sufficient to cause toxicity to the test organisms. The existence of sediment contamination in the United States has been documented (Long et al. 2001; USEPA 2004). To comply with the Clean Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act, and other mandates, the U.S. Environmental Protection Agency (USEPA) must develop means to assess and manage ecological risks from contaminated sediments.

1.1 Background

Toxicity testing of sediments from many monitoring and assessment efforts has shown that sediments from a great number of freshwater and marine sites are acutely or chronically toxic to benthic organisms (Hyland et al. 1999; USEPA 2004). Toxicity of sediments has been shown to be associated with adverse ecological effects such as population declines and changes in community structure (Anderson et al. 1987; Bailey et al. 1995; Hartwell et al. 1997; Hatakeyama and Yokoyama 1997; Swartz et al. 1994; Swartz et al. 1982).

While the presence of sediment toxicity can be a strong indicator of potential ecological risk from sediment contamination, toxicity tests alone do not indicate the cause of toxicity. While the presence of toxicity alone may be sufficient for some environmental management decisions, the most effective and cost-efficient management decisions are possible when the exact cause(s) of sediment toxicity is known. Clearly, the selection of appropriate management alternatives could be altered if one knew that the cause of toxicity in a particular sediment was ammonia, as compared to DDT or zinc. As another example, in complex systems there may be a variety of sources for sediment contamination, both point (e.g., wastewater discharges) and non-point (e.g., stormwater runoff). While finding that sediments are toxic may suggest the need for better management of contamination sources, knowing the specific chemical(s) causing sediment toxicity enables more accurate definition of the source(s), and thereby focuses remedial actions on those sources contributing most directly to degradation of the sediments. For these reasons, the development of methods to link the existence of sediment toxicity to the specific cause(s) of that toxicity would be of great benefit to programs charged with managing sediment quality.

One approach to identifying potential causes of sediment toxicity is chemical screening, such as priority pollutant analyses, and either comparison of those results with numerical benchmarks for sediment contamination, or correlation of measured concentration with observed toxicity. These approaches are often unsuccessful for a number of reasons:

- **Presence of unmeasured chemicals** While common chemical screens may detect dozens or even hundreds of chemicals, there are literally thousands of chemicals released into waterways, leaving many potential toxicants unmeasured. To rely solely on standard chemical screens is like “looking for your car keys only under the lamppost.”
- **Co-correlation of sediment contaminants** Because most sources of sediment contamination do not release single chemicals but rather whole suites of chemicals, concentrations of many sediment contaminants are highly correlated with others. Accordingly, correlation of sediment toxicity with chemical concentration often identifies

many associations that are not causal and, therefore, may provide a poor basis for environmental management decisions.

- **Differences in bioavailability** Even if all possible contaminants of concern could be measured, the factors that control biological availability of those chemicals to sediment organisms are not known for all chemicals and/or all sediments, leading to difficulty in defining, *a priori*, the concentration of a chemical that would be expected to cause adverse effects.
- **Mixtures** Even if all of these issues could be resolved, predicting toxicity solely from chemical concentrations would require sufficient understanding to predict the interactive toxicity of the mixtures of chemicals present.

These same problems were encountered in the National Pollutant Discharge Elimination System (NPDES) permitting program when it focused on utilizing toxicity to aquatic organisms in effluent permit limits. In response, the USEPA Office of Research and Development, specifically the ecology divisions in Duluth, MN, and Narragansett, RI, developed a biologically-based rigorous fractionation approach to identify the cause of toxicity in aqueous samples such as effluents and receiving waters (USEPA 1989a; 1991a; 1991b; 1992b; 1993a; 1996). These procedures, called a Toxicity Identification Evaluation (TIE) relied on combinations of physical/chemical manipulations and toxicity tests to characterize, identify, and confirm the causes of measured toxicity. Application of these methods through the NPDES program and others have shown them to be highly effective in determining the cause of toxicity in effluents, and an invaluable tool in the cost-effective control of effluent toxicity.

This document presents TIE methods developed for application to toxic sediments. While similar in concept to the approaches developed previously for water column (e.g., effluent and receiving water) toxicity, these methods address the unique issues posed by identifying toxicants in a sediment matrix.

1.2 The TIE Concept

The basic concept in TIE or other biologically-directed fractionation approaches is to use physical/chemical manipulation of a sample to isolate or change the potency of different groups of toxicants potentially present in a sample. Rather than using a chemical detector to determine whether a change occurred, a biological test, in this case a toxicity test, is used as the "indicator" to determine whether the manipulation changed toxicity. For example, imagine taking a toxic water sample, splitting it into two aliquots, one of which is aerated and one not. If toxicity testing of these samples showed that the aerated sample was markedly less toxic than the unmanipulated sample, one might suspect that the causative toxicant is volatile or easily oxidized. By simultaneously conducting tests using multiple manipulations targeted at different physical/chemical properties, one can build a physical/chemical characterization of the toxicant(s), which in turn becomes the basis for additional studies to isolate and ultimately identify the specific chemicals causing toxicity. In developing TIE procedures for aquatic toxicity in effluents and other waters, USEPA divided the overall TIE process into three phases: characterization (Phase I), identification (Phase II), and confirmation (Phase III). While sharing many of the same concepts and general procedures, each Phase has a different goal.

- In Phase I, a suite of physical/chemical manipulations is used to build a general "profile" of the causative toxicant(s), with the goal of determining the general category or type of toxicant involved (e.g., metals, nonpolar organics, volatiles, ammonia).
- In Phase II, more refined procedures are used, to focus on the specific category of chemical implicated in Phase I, with the goal of isolating the causative toxicant(s) from other chemicals in the sample, thereby simplifying the sample for chemical analysis. This process generally culminates in the analytical identification of the suspected toxicant.
- In Phase III, the investigator collects the corroborating data to build a weight-of-evidence case that the suspect toxicant is in fact the cause of toxicity, an important step before initiating management actions to control the problem chemicals.

1.3 The TIE Approach for Sediments

This document describes TIE procedures that have been developed for identifying the cause(s) of toxicity in sediments. While our experience in developing TIE procedures for water column toxicity formed an important basis for sediment TIE, working with sediments presented some unique challenges that required the modification of some prior procedures as well as the development of new procedures.

The reader should be aware that this document was not prepared to be stand-alone guidance for conducting sediment TIEs. Because these procedures build on previous methods developed for toxicity in effluents and other water samples, we assume that the reader of this document already has a strong familiarity with those previously developed procedures. Much of the philosophy, procedures, design considerations, and interpretation issues already described are directly applicable to sediment TIE, and therefore not all repeated in this document. Investigators not already familiar with previous TIE guidance should read that previous guidance (USEPA 1989a; 1991a; 1991b; 1992b; 1993a; 1996). In keeping with previous guidance, sediment TIE has been structured around the same three elements: characterization (Phase I), identification (Phase II), and confirmation (Phase III). A complicating factor for sediments is that sediment toxicity can and has been assessed using more than one test matrix. Whole sediment exposures involve test chambers containing both a sediment layer and an overlying water layer, similar to the situation for a bedded sediment in the field. However, sediment toxicity can also be assessed using water column tests conducted on aqueous samples prepared from sediments; the most common of these is interstitial water (IW; sometimes called porewater) testing, in which water from the interstices of the sediments is isolated by centrifugation or other methods, then used in water column toxicity tests. Although IW tests are probably the most common water column tests conducted to assess sediment toxicity, there are other methods, such as the preparation of elutriates and solvent extracts. For clarity, this document refers to water column testing as IW testing since it is the most common approach, but we recognize that other water preparations might be used and expect that the guidance provided here is fully applicable in some but not all of these other instances (i.e., solvent extracts).

Another difference between this and previous TIE guidance is that procedures for both freshwater and marine TIEs have been combined into a single guidance document. We have found that the bulk of the approaches developed are equally applicable to both freshwater and marine sediments and organisms, though where differences exist we have tried to make those clear. In some cases this leads

to some redundancy, but we believe these are outweighed by the overall benefits of having one consolidated guidance document.

The procedures we describe are not the only ones that can be used to identify toxicants in sediments. Much of what we describe are methods that we have found to be effective, but the degree to which we have explored alternatives varies. For some methods, we have spent considerable time optimizing a particular method; for others, we have not conducted sufficient studies on all the alternatives to state that the suggested method is the only, or even the best, procedure that could be used. In some cases, we suggest possible procedures that we have not actually used because we haven't had the need, but we believe that they would work should the necessity arise. While this argues toward openness and flexibility in the procedures, we also recognize that guidance that is largely conceptual and does not contain specific procedures may be difficult to implement by laboratories new to these techniques. Toward this end, we have tried to do both: not only to provide suggested, or "default," procedures that we believe are robust, but also to include supplementary information on the rationale behind our suggestions and perhaps alternatives that we have tried that may not have been effective. To help in this communication we have tried to use words like must, should, can, may, and might in ways consistent with their ASTM usage (ASTM 2005).

It is very important to recognize that this manual represents guidance, not a strict protocol. TIEs are by nature unique investigations that may have many alternative paths that could be successfully followed to the same conclusion. The quality of a TIE lies only partially in the technical quality of the data; the more important element is the soundness of the reasoning and the creativity of the investigator. Treatment of this manual as an inviolable protocol is not recommended, and might actually be counterproductive to the overall goal of efficiently identifying toxicants.

1.4 Document Organization

The remainder of this document outlines procedures for conducting sediment TIEs. General information concerning Health and Safety; Quality Assurance; Equipment, Supplies, and Facilities; and Statistical Methods are described in Sections 2 through 5. Section 6 discusses overall issues involved in designing the TIE approach, including selecting the test matrix, and procedures and species to be used, and provides recommendations for how to collect and prepare samples for sediment TIE testing, including the collection of IW. Phase I, characterization methods for whole sediment and IW, are described separately in Sections 7 and 8, respectively. Because both whole sediment and IW approaches may be used in later phases of the TIE, they are described jointly for Phase II, identification (Section 9), and Phase III, confirmation (Section 10) studies. Published studies and existing guidance are cited throughout this document when possible. Original data developed for this document are also included with appropriate documentation of materials and methods.

2 Health and Safety

This section has been reprinted, with minor modifications, from *Methods for Aquatic Toxicity Identification Evaluations: Phase I. Toxicity Characterization Procedures*, Second edition (USEPA 1991b).

Sediments are repositories for a wide range of chemical and biological agents. Sediment TIEs involve, by definition, working with samples of unknown composition. Therefore, the safety measures must be adequate for a wide spectrum of hazardous materials. Exposure to sediment samples during collection and in the laboratory should be kept to a minimum. Inhalation and dermal absorption can be reduced by using laboratory hoods and wearing protective gloves, laboratory aprons or coats, safety glasses, and respirators. Further guidance on health and safety for toxicity testing is described in Walters and Jameson (1984).

In addition to the precautions taken with sediment samples, a number of the reagents that might be used during the tests described in this guidance are known or suspected to be toxic to people. Analysts need to be familiar with safe handling procedures for these chemicals (Occupational Safety and Health Administration 1976; U. S. Department of HEW 1977) as well as the manufacturer's Materials Safety Data Sheets (MSDS). Use of the compounds may also necessitate specific waste disposal practices. See USEPA (2000), sections 5.1.3, 5.1.4, 5.2, 5.3, 5.4 and 5.5 for more information.

3 Quality Assurance

The following section has been reprinted, with minor modifications, from *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures,* Second edition (USEPA 1991b).

Quality assurance comprises two aspects: quality verification and quality control. Quality verification entails a demonstration that the proposed study plan was followed as detailed and that work carried out was properly documented. Aspects of quality verification include chain-of-custody procedures, statements on the objective of the study and what is known about the problem at its outset, instrumental log books, and work assignments. This aspect of quality assurance ensures that documentation is created to prove that the work plan has been covered completely. The quality control aspect of quality assurance involves the procedures that take place, such as the number of samples to be taken and the mode of collection, standard operating procedures for analyses, and spiking protocols.

3.1 TIE Quality Control Plans

A successful TIE depends on a strong quality control program. Obtaining quality TIE data is complex because the constituents are unknown, in contrast to obtaining quality data from a standard analytical method for a specific chemical, where the characteristics of the analyte and the implications of the analytical procedure being used are known. Without knowledge of the physical and chemical characteristics of the analyte, however, the impact of various analytical procedures on the compound under study is not known. Further, quality control procedures are specific to each compound. Quality control procedures appropriate to one analyte might be completely inappropriate to another.

Because TIEs use both chemical and biological assays, the problem of quality control is further aggravated because quality control procedures for aquatic toxicity tests might be radically different from those required for individual chemical analyses. This additional dimension to quality control requires a unique framework of checks and controls to be successful. The impacts of chemical analytical procedures on sample toxicity must be included. Likewise, procedures used to insure quality toxicity test results should not affect chemical analyses. For example, in a standard aquatic toxicity test, samples with low dissolved oxygen (DO) are usually aerated. This practice might, however, result in a loss of toxicity if the toxicant is volatile or subject to oxidation. Given the multidisciplinary complexities of this work, it is recommended that quality control plans are supported by standard operating procedures (SOPs).

3.2 Cost Considerations and Concessions

The quality control practices required in any given experiment must be weighed against the importance of the data and decisions to be based on that data. The crucial nature of certain data demands stringent controls, while quality control can be lessened in other experiments having less impact on the overall outcome.

Sediment TIEs require a large number of toxicity tests and a good deal of interstitial water. In interstitial waters, the decision to use the standard toxicity test methods described in USEPA (1995; 2000; 2001; 2002a; 2002b) which involved a relatively high degree of quality control,

must be weighed against the degree of complexity involved, the time required, and number of tests performed. All of these contingencies affect the cost of testing.

In addition, obtaining large volumes of interstitial water can be labor intensive and time consuming. For this reason, replication and size of toxicity tests are both minimized.

3.3 Variability

In retesting sediments to confirm the quality of initial TIE results, possible sources of error need to be considered, including changes in the chemical and toxicological nature of the sediments over time in storage or in the field. Changing field conditions may alter salinity, pH, and redox potential of sediments, which, in turn, might influence the toxicity of metals, ammonia, and hydrogen sulfide. Also, patchiness in the field might limit the ability to obtain the same or similar sediments.

While studies vary in their recommendations (Beiras et al. 1998; Carr and Chapman 1995; DeFoe and Ankley 1998; Dillon et al. 1994; Ho and Quinn 1993; Malueg et al. 1986; Othoudt et al. 1991; Thompson et al. 1980), we have successfully used sediments stored up to three years to reconfirm initial findings of sediment TIEs. Caveats include being aware that certain volatile compounds such as ammonia and hydrogen sulfide may decrease in concentration, and changes in redox potential might affect the toxicity of metals and other ionizable compounds. If particularly volatile or unstable toxicants are suspected, it may be necessary to test freshly collected sediments.

3.4 Intralaboratory Communication

Quality control procedures can be quite different for chemistry and biology. For example, phthalates are a frequent analytical contaminant requiring special precautions that are not of toxicological concern. The toxicological problem presented by zinc levels typically associated with new glassware is of no concern to organic analysis. The difference in glassware cleanup procedures is an example of one of many differences that must be resolved when working among different disciplines in a laboratory. Cleaning procedures must be established to cover the requirements of all of the involved disciplines. Time schedules for analyses must be detailed in advance to avoid delays that may change toxicant concentrations and effects. Frequent, well documented, communication of a well designed experiment involving all concerned parties is one of the keys to performing successful TIEs.

3.5 Record Keeping

Throughout the TIE, record keeping is an important aspect of quality verification. All observations, including organism symptoms, should be documented. Details that seem unimportant during testing can be crucial in later stages of the evaluation. Investigators should record test results in such a manner that preconceived notions about the sediment toxicants are not unintentionally reflected in the data.

3.6 Phase I Considerations

Sediment toxicity is “tracked” through Phases I, II, and III using aquatic or benthic organisms. Such tracking is the only way to detect where the toxicants are until their identity is known. The organism’s response must be considered as the foundation. Therefore, the toxicity test results

must be dependable. System blanks (blank samples carried through procedures and analyses identical to those performed on effluent samples) are critical to the process and are used extensively throughout the TIE to detect toxic artifacts added during the sediment characterization manipulations. With the exception of tests intended to make the sample more toxic, or cases in which a known amount of toxicity has been intentionally added, TIE manipulation should not cause the sample toxicity to increase.

There are many sources of toxicity artifacts in Phase I. These include

- Excessive ionic strength resulting from the addition of acid and base during pH adjustment
- Formation of toxic products by acids and bases
- Contaminated air or carbon dioxide sources
- Inadequate mixing of test solutions
- Contaminants leached from filters
- pH probes
- Resins
- Solid phase extraction (SPE) columns
- Other substances used to alter toxicity
- Added reagents and their contaminants

The appropriate toxicity data for the reagent chemicals used in Phase I and common aquatic test organisms are provided as needed in subsequent sections of this document and in other documents (USEPA 1989a; 1991a; 1991b; 1992b; 1993a; 1996).

Frequently, toxic artifacts are unknowingly introduced. For example, some pH meters with refillable electrodes can act as a source of silver, which can reach toxic levels in the solutions being measured for pH—a problem especially when there is a need to carefully maintain or track solution pH. Using pH electrodes without membranes avoids the silver problem, which can be detected only by the profuse use of blanks.

Oil in air lines or from compressors is a source of contamination. Simple aeration devices, such as those sold for use with aquaria are preferable, as long as caution is taken to prevent contamination of the laboratory air that is taken in by the pump. Test chambers should be covered to prevent contamination by dust and to minimize evaporation. Because small volumes are often used, evaporation must be controlled.

Glassware used in various tests and analyses must be cleaned not only for the chemical analyses but so that toxicity is not introduced either by other contaminants or by residues of cleaning agents. Because organisms are sensitive to all chemicals at some concentrations, all toxic concentrations must be removed, not only those for which analyses are being made.

Randomization techniques, careful observance of organism exposure times, and the use of organisms of approximately the same age and size ensure quality data. Standard reference toxicant tests should be performed regularly with the test species and control charts should be developed (USEPA 2002a; 2002b). During Phase I it is not known how much the toxicity of the unknown toxicant varies over time compared to the reference toxicity. When the toxicants are known, the investigator may want to use them as the reference toxicant. Reference toxicant tests should be performed to coincide with the TIE testing schedule.

3.7 Phase II Considerations

In Phase II, a more detailed quality control program is required. Interferences in toxicant analysis are for the most part unknown initially, but as toxicant identifications are made, interferences can be determined. Many interferences are possible and include co-elution of compounds and analytical overlap of peaks. Likewise, instrumental response, degree of toxicant separation, and detector sensitivity can be determined as identifications proceed. Throughout Phase II, particularly as the manipulations become more sophisticated, the use of control blanks or performance blanks is critical to ensure that Phase II manipulations, such as separations via column chromatography, do not result in artifactual toxicity. As the sample is moved through an increasing number of manipulations, these blanks have an increasing importance.

3.8 Phase III Considerations

In Phase III of a TIE, the detail paid to quality control and verification is at the maximum. For this reason, confidence intervals for toxicity and chemical measurements should be calculated. These measurements allow the correlation between the concentration of the toxicants and sediment toxicity to be checked for significance based on test variability. Sample manipulations before chemical analyses and toxicity testing are minimized in this phase in an effort to decrease the chance of producing artifacts. Field replicates to validate the precision of the sampling techniques and laboratory replicates to validate the precision of analyses may be included in the Phase III quality control program. System blanks must be provided. Calibration standards and spiked samples must also be included in the laboratory quality control program. Because an attempt will be made to correlate sediment toxicity to toxicant concentration, spiking experiments are important in determining recovery of the toxicants. These procedures are feasible because the identities of the substances being measured are known.

The toxicants being analyzed can be tested for by using pure compounds, thereby alleviating the need for a general reference toxicant. Because the test organism also acts as an analytical detector in the correlation of sample toxicity with toxicant concentration, changes in the sensitivity of the test organism must be known. This can best be achieved by using reference toxicants.

4 Equipment, Supplies, and Facilities

Equipment necessary to perform each of the Phase I procedures is listed in Sections 7 and 8 under each manipulation. In addition, basic analytical laboratory equipment such as pH meters, pumps (vacuum and fluid), pipettors, and the capacity for maintaining compressed gas cylinders and regulators are required.

A reliable source for large numbers (hundreds) of test organisms is essential for TIE work. It is recommended that on-site culturing facilities be used to prevent TIE activity from being subject to seasonal availability of field collected organisms or delays in shipping from suppliers.

For TIEs of estuarine and marine sediments, a supply of clean, or fresh, saline water is necessary as a diluent (depending on the medium being used), a natural marine water control, a performance control for reference toxicant testing (USEPA 1994b); and as a source of hypersaline brine. Large supplies of brine solutions (100%) can be prepared, stored, diluted with deionized water to desired salinities, and used in batches to insure seawater consistency and to avoid seasonal fluctuations in water quality.

At AED, we prepared saline water from both natural marine water and GP2 synthetic marine water. In addition, water used for test organism culturing should come from the same source. USEPA (1995; 2002a) provides a discussion of acceptable source waters and their quality control.

5 Statistical Methods

The sediment TIE methods generate two types of data: interstitial water dilution series data and whole sediment data. The whole sediment data are generally based on a single concentration (i.e., 100% sediment) unless the whole sediment is diluted.

Test results from interstitial water dilution series data are used to calculate point estimates (e.g., LC_{50}s and EC_{50}s). EPA recommends Probit, Spearman-Karber, trimmed Spearman-Karber, and Inhibition Concentration (IC_p, where p is the percent effect—mortality, reduced growth, etc.) as means to calculate point estimates (USEPA 1993b; USEPA and U. S. Army Corps of Engineers 1994).

Conversion of point estimates to toxic units (e.g., TU = $100/LC_{50}$ or $100/IC_p$) eliminates the inverse relationship between toxicity and LC_{50} or EC_{50} values, making TIE interpretation easier. Furthermore, if the concentrations of toxicants are known for a given sample, the TUs for the individual toxicants can be compared to the total sample TUs. The sum of the TUs of the individual toxicants should be similar to the total TUs of the sample, assuming that they are all measured, bioavailable, and that their toxicities are additive.

In analyzing the results of a whole sediment TIE based on a single concentration (i.e., 100% sediment), hypothesis testing using analysis of variance (ANOVA) is recommended to determine whether statistical differences exist between any of the treatments (e.g., baseline, coconut charcoal addition, cation exchange resin addition). If the ANOVA indicates statistical differences do exist, a Dunnett's multiple comparison test should be used to determine whether differences occur between the baseline treatment and the other manipulations. This test indicates whether the TIE manipulations altered toxicity compared to the untreated baseline. To determine if statistical differences exist between treated manipulations (i.e., coconut charcoal addition versus cation exchange resin addition) a least significant difference (LSD) test can be used (USEPA 2002a).

6 Designing the TIE Approach

Because there is no one set of circumstances under which sediment TIEs may be performed, there is no one set of procedures that is applicable to all situations. Many combinations of matrices, test species, and procedures can and have been used to determine the cause of toxicity. However, a number of factors may make certain approaches more desirable for a given application. The purpose of this section is to discuss the relationship between the goals of TIE and the methods selected to reach those goals.

6.1 Defining the Question

TIE methods are often employed to determine the cause of toxicity in environmental samples about which little is known of the composition. Indeed, the strength of the TIE approach is that it requires no previous knowledge of what contaminants may be involved. In this sense, the question being asked by the TIE is "What is the cause of toxicity in this sample?" It is this question around which most of this document is designed.

In some cases, there may be some prior knowledge about the likely source of toxicity in a sample. However, we have encountered cases where an observed correlation between sediment toxicity and chemical concentration in sediment samples has led to a belief that the chemical is the cause of toxicity, a conclusion later found to be false. Sediment contaminants are often highly correlated with one another, and care must be taken not to confuse correlation alone with causation. For this reason, we strongly suggest that investigators consider conducting Phase I, II, and III studies even when they have reason to suspect a particular cause for toxicity at the outset. Forming conclusions too soon can blind investigators to alternative evidence or cause them to pursue shortcuts that prevent a thorough testing of the true cause–effect relationships. Keep an open mind, and, if the preliminary suspicion is correct, it will be quickly proved in a well-conducted TIE.

6.2 Whole Sediment Versus Interstitial Water Approaches

This document provides guidance for both whole sediment and interstitial water TIEs.[1] Both of these methods have advantages and disadvantages and the choice between them should result from considering the several issues presented in this guidance. The investigation may also use elements of both. Within this document, we present Phase I procedures separately for whole sediment (Section 7) and IW TIE (Section 8), but combine the approaches in discussions of Phases II and III (Sections 9 and 10).

Interstitial water TIEs use water column toxicity tests conducted on IW isolated from sediments (Ankley and Schubauer-Berigan 1995). These methods were the first sediment TIE methods developed, building from considerable previous experience with conducting water column TIEs on effluents and receiving waters (USEPA 1989a; 1991a; 1991b; 1992b; 1993a; 1996). IW TIE

[1] Interstitial water TIEs are TIEs conducted on an aqueous sample from sediments, rather than a solid-phase sample. While interstitial water prepared from sediment would be the most common form of aqueous sample used for TIE, other aqueous samples relevant to sediments, such as elutriates, could be evaluated. For the purposes of this document we will call these water column-based sediment TIEs, interstitial water (IW) TIEs, recognizing that other aqueous samples might also be used with the same procedure.

methods, though very similar to those previously developed for water column testing, incorporate some important changes in methodologies necessary to adapt to the differing chemistry of IWs, and the different characteristics of toxicants likely to be found in sediments. While similar in conceptual approach, most manipulations used in whole sediment studies are different from those used for aqueous samples, largely because of the need to influence two phases, water and sediment, instead of water only.

6.2.1 Comparison of Whole Sediment and IW Toxicity Tests

Both whole sediment and IW toxicity tests can be used to draw inferences about the potential toxicity of contaminated sediments, even though they have different features with respect to the logistics involved in conducting the tests, the type of information gained, and particular biases involved. The theoretical basis for IW testing stems from the hypothesis that the biological activity of toxicants in the IW is proportional to the biological potency of those chemicals in bulk sediment (Adams et al. 1985; Di Toro et al. 1991). IW toxicity testing is also relatively straightforward to conduct, and can draw on the strong experience base for water column toxicity testing. Nonetheless, direct comparison of whole sediment and interstitial water toxicity tests indicates that results are not always similar (Table 6–1).

Table 6–1 Comparison of Interstitial Water and Whole Sediment Tests (% Survival)*

	Percent Survival in Whole Sediment (100% unless otherwise noted)		**Percent Survival in Interstitial Water (100% unless otherwise noted)**	
	M. bahia	*A. abdita*	*M. bahia*	*A. abdita*
Westport, MA	100[1] (0) n=3	100[1] (0) n=3	0[2] (0) n=3	93[2] (11) n=3
New York Harbor	90 (14) n=2	27 (25) n=3	0 (0) n=3	10 (14) n=3
Fox Point, RI	40 (35) n=3	87 (15) n=3	0 (0) n=3	27 (31) n=3

*Values in parentheses are standard deviation of three replicates. Unless otherwise noted, each test was run for 96 h. Whole sediment tests were conducted static with aeration using 20 g of sediment, 60 mL overlying waters and 10 organisms per species (*A. abdita* and *M. bahia*). Interstitial water tests were conducted in 10 mL of interstitial water with 5 organisms per species (*A. abdita* and *M. bahia*) in separate exposure chambers. In both types of tests, *M. bahia* was fed daily with newly hatched *Artemia, A. abdita* was not fed during the test. Control survival was 100% for interstitial water and 90% for whole sediment tests.

[1]Tested at 75% whole sediment

[2]Tested at 50% interstitial water

Both theory and experience suggest reasons why toxicity tests conducted on IW may not always give results similar to whole sediment tests. These include:

- Oxidation-related changes in IW chemistry

IW toxicity testing requires that IW from anoxic samples be oxygenated to support test organisms. This can lead to a number of physical/chemical changes in the sample. For example, Fe^{2+} is soluble and stable under anoxic conditions, but upon exposure to oxygen is oxidized to Fe^{3+}, which is fairly insoluble and precipitates as $Fe(OH)_3$, a familiar orange precipitate. As a consequence of hydroxide sequestration by this reaction, IW samples rich in iron may turn quite acidic (e.g., pH 3), rendering them toxic to test organisms regardless of their level of contamination. The precipitation of iron may also encourage co-precipitation of other substances in the IW, potentially altering the toxicity measured by an IW toxicity test. Casual observations also suggest that some IW samples undergo flocculation of organic material following isolation from the sediment, changes that may also affect the measured toxicity.

- Adsorption of chemicals to test chambers and/or absorption by test organisms

Many sediment contaminants have large octanol water partition coefficients (K_{OW}) (e.g., log $K_{OW} > 5$) and are hydrophobic, properties that encourage their accumulation in sediment. These same properties are also often associated with chemicals that tend to sorb to the surfaces of test chambers, thereby reducing exposure of organisms in IW tests. The resulting change in exposure may be particularly dramatic for chemicals present in IW at very low concentrations. Also of concern for high K_{OW} compounds is depletion of chemical from the IW that occurs from uptake of chemical by the test organism, which is exacerbated by the low test volumes that are often used in IW toxicity tests, because of the logistical constraints on isolating larger volumes of IW. These phenomena can also occur in whole sediment tests, but the presence of large amounts of chemical on the sediment particles provides a larger reservoir of chemical to replenish losses that may occur from adsorption or absorption.

- Removal of the dietary exposure route

Ingestion of sediment by test organisms represents a route of chemical exposure that exists in whole sediment tests, but not always in IW toxicity tests. While arguments exist that the distinction between dietary and IW exposure has little impact on the ultimate accumulation and toxicity of sediment associated contaminants (e.g., Di Toro et al. 1991), the presence of dietary exposure can clearly increase the kinetics of chemical uptake by benthic organisms and can therefore influence time-dependent toxicity measures (e.g., 96-hour LC_{50}). Furthermore, the potential for chemical depletion from such a water column can further increase the difference in response observed because of the difference in dietary exposure between IW and whole sediment toxicity tests.

- Differences in degree of IW exposure

In whole sediment testing, behavioral orientation of test organisms influences their exposure; obligate benthic organisms may have intimate and consistent exposure to sediment and/or IW, while epibenthic organisms may have increased exposure to overlying water. In IW toxicity testing, exposure of all organisms is to 100% IW, which may affect organism response. For example, studies of ammonia toxicity to freshwater oligochaetes (*Lumbriculus variegatus*), midge larva (*Chironomus dilutus*, formerly known as *Chironomus tentans*), and

amphipods (*Hyallela azteca*) found that oligochaetes exposed to sediments suffused with waterborne ammonia showed the same LC_{50} based on IW ammonia concentration as oligochaetes exposed in water-only tests (Whiteman et al. 1996). However, the response of amphipods was much different between sediment and water-only exposures, suggesting that these organisms had lower exposure to IW, presumably through avoidance of the contaminated IW. Thus the forced exposure to IW created in IW toxicity tests may increase the apparent toxicity of sediments tested in this way.

- Constraints of obtaining IW

Obtaining adequate volumes of IW for testing may be a limitation for the simultaneous testing of many manipulations and replicates needed to conduct a thorough TIE. Sandy sediments pose the greatest challenge, but even in silty sediments one rarely extracts more than 40% of the total sediment volume in water. IW volume is also a major reason for limitations in test species. Many vertebrates, particularly fish, require larger IW volumes for testing then would be possible to obtain under normal laboratory conditions. See Sections 6.3 and 8 for further discussion of volume considerations.

In light of these issues, many believe that whole sediment toxicity tests provide a better representation of the expected toxicity from bedded sediments in the field (Adams et al. 2001; Ho et al. 2004), but this view must be tempered by the realization that even whole sediment tests do not fully represent exposures that occur in the field (Luoma and Ho 1993). For example, sediment disruption during collection, manipulation, and testing could affect whole sediment toxicity, as could differences in chemical distribution between sediment and overlying water. The significance of all the issues affecting the IW versus whole sediment toxicity test comparison also varies among sites, test organisms, and chemicals involved, so no one approach is intrinsically most accurate for indexing sediment toxicity in all cases.

6.2.2 Selecting Whole Sediment or IW Methods for Phase I TIE

The generic objective of a TIE is to determine the cause of a biological response measured in a biological test. For the purposes of this document about sediment TIE, we presume that response to be based on sediment toxicity measured in either a water column (for IW or elutriates) or a whole sediment toxicity test. This toxicity, as determined by the organism, exposure matrix, and test methodology used, is referred to as the index response for the TIE—the expression of toxicity for which the cause is sought.

Other endpoints, such as in situ toxicity tests or benthic community assessments may be used to indicate the potential for sediment toxicity. While these observations may spur a desire to know the cause of the observed degradation, application of the TIE methods described in this document is constrained to those measures that are compatible with the physical/chemical manipulations that are discussed, i.e., TIEs cannot be performed on whole communities. Because of this constraint, if endpoints such as a degraded benthic community serve as the impetus to perform a TIE, then these effects must be correlated to responses in sediment toxicity tests or some other endpoint suitable for use in a TIE. These sediment toxicity tests then become the index response for the TIE; demonstrating the connection between the index response and the observed degradation is an important component of many investigations (Long et al. 2001; Swartz et al. 1994), but it is beyond the scope of a TIE as described here. For example, an impaired benthic community was noted in several locations in an estuary. When the sediment

from the impaired communities was tested in an amphipod toxicity tests, the tests demonstrated significant mortality. The amphipod toxicity test could be considered an index response. The nature of the index response has a substantial influence on the decision to choose whole sediment or IW methods for Phase I of the TIE. As a general rule, our approach is to conduct the Phase I investigation using the exposure matrix that most closely matches the index response—often a whole sediment toxicity test—so we often begin the TIE using whole sediment methods for Phase I of the TIE. Differences between IW and whole sediment toxicity tests may yield different responses. Thus if we use IW TIE methods to investigate toxicity in whole sediment, then at some point the TIE must include an additional element, that being the development of evidence that the cause of toxicity identified in one matrix is also the cause of toxicity in the other (see Section 9.7).

Regardless of which matrix is associated with the index response, it can be very valuable to know the relative toxicity of a sediment sample in both IW and whole sediment toxicity tests, and we recommend that initial toxicity tests be conducted in both matrices at the beginning of a TIE. Even if it is already known which matrix will be used for Phase I, knowing the relative toxicity in both matrices makes the investigator aware of what TIE tools might potentially be employed to evaluate the cause of toxicity in later parts of the investigation and may provide insight into the actual cause of toxicity. It is quite likely that in identifying or confirming the cause of toxicity, some combination of IW and whole sediment techniques might be used to develop the required weight of evidence (see Sections 9 and 10).

Clearly, if toxicity is observed only in the whole sediment test, then whole sediment TIE methods are the only option, and the reverse if toxicity is observed only in IW. If measurable toxicity occurs in both matrices, then other factors can be considered in making the decision between whole sediment and IW TIE methods. Although we typically use whole sediment methods for Phase I unless the index response is in IW, there may be advantages to conducting TIEs with IW over whole sediment methods. Use of water column methods as in IW TIE brings to bear a much larger experience base than exists for whole sediment TIE and, as evidenced in Sections 9 and 10, a much larger range of TIE procedures and techniques is available for water column TIE. Use of IW testing allows a broader range of organisms to be used, since the organism need not necessarily be benthic or epibenthic to be exposed, and there is a broad range of pelagic species that are amenable to toxicity test procedures like those used in TIE.

Additionally, conducting tests in the water column facilitates daily biological observations, rather than only one measurement at the conclusion of the exposure, thus allowing computation of additional effects—endpoints, such as time-to-death analyses and effect of concentrations at intermediate times (e.g., 1-, 2-, 4-day LC_{50}s instead of only 4-day LC_{50}s). Finally, because TIEs generally require that large numbers of toxicity tests be conducted simultaneously, some laboratories may be better equipped to test at this scale using water column rather than whole sediment procedures.

In summary, our general recommendation is to conduct Phase I of a sediment TIE using the same matrix as defines the index response for the TIE, but this should not be viewed as a requirement. If compelling reasons exist for using alternative methods, there is no reason that the TIE cannot be completed successfully. The successful TIE correctly identifies the cause of toxicity no matter which matrix is chosen. However, conducting the TIE in an alternate matrix places the strict

requirement that sufficient studies be conducted to demonstrate that the conclusions reached using IW water methods are applicable to whole sediment tests, or vice versa.

6.3 Species Selection for Sediment TIE

Selection of test species brings up issues similar to those discussed above. As a general rule, it is desirable to conduct the TIE with the same test species whose response defined the need for the TIE, because this eliminates the need to conduct studies to demonstrate that the conclusions drawn with a surrogate species are relevant to the original species. This argument parallels that for conducting the TIE using the same matrix used to define the index response.

However, in some cases, the species used for the index response may not be as desirable for use in the TIE. This may be because the organism is not well adapted to the test methods or sediment manipulations used in sediment TIE, or perhaps, the species tolerance to various additives and manipulations is simply not known. Alternatively, the index species may not be readily available in the large numbers needed for TIE, or may be only seasonally available. In these cases, use of alternative species may be warranted. But again, when alternative species are used, the investigator must be careful to collect as part of the investigation sufficient evidence to demonstrate the applicability of the conclusions drawn using the TIE species to the index species.

Several test species have been used in freshwater and marine sediment toxicity assessments, with fewer species used in either interstitial water or whole sediment TIEs (Table 6–2). *H. azteca, C. dilutus,* and *L. variegatus* are the species that have been most widely used for toxicity testing of freshwater sediments, and all three are also amenable to use in sediment TIEs. Methods for culturing and testing these species in the laboratory have been developed and described elsewhere (USEPA 2000). Development of TIE procedures for marine/estuarine sediments has been conducted historically with the amphipod *Ampelisca abdita* and the mysid shrimp *Americamysis bahia.*

On the West Coast of the U. S., the amphipod *Eohaustorius estuarius* has successfully been used in both solid-phase and IW TIEs (Anderson et al. 2006a). Recently, we have been evaluating the use of the economically important hard shell clam *Mercenaria mercenaria* for use in both interstitial and whole sediment TIEs. A number of other marine species have been tested for their tolerance to TIE manipulations including the embryo-larval stages of the oyster *Crassostrea gigas;* mussels *Mytilus californianus* and *Mytilus galloprovincialis*; purple urchin *Strongylocentrotus purpuratus*; and the sand dollar, *Dendraster excentricus* (Anderson et al. 2006a). In Europe, the amphipod *Corophium volutator* has been used in TIE evaluations. Methods for collecting, holding, and testing many of these species are described elsewhere (ASTM 2000a; 2000b; 2000c; USEPA 2002a; 2002b). Additional species used for sediment toxicity testing should also be amenable to TIE testing with bulk sediments, but some obligate benthic organisms may not tolerate IW testing without substrate.

Table 6–2 Commonly Used Species in the Conduct of Interstitial and Whole Sediment Toxicity Identification Evaluations*

Test Medium	Species	Common Name	Cited Method	Species Used in			
				Water Column Toxicity Tests	Whole Sediment Toxicity Tests	Interstitial Water TIEs	Whole Sediment TIEs
Freshwater benthic	*Chironomus dilutus*	Chironomid, midge larvae	(1)	+	+	+	+
	Chironomus riparius	Chironomid, midge larvae	(2) (3)	+	+		
	Hyalella azteca	Amphipod, scud	(1) (4)	+	+	+	+
	Lumbriculus variegatus	Oligochaete, "worm"	(1)	+	+	+	+
	Gammarus pulex	Amphipod	(5)	+	+	+	+
	Hexagenia limbata	Ephemeroptera, mayfly	(2) (6)	+	+		
	Tubifex tubifex	Oligochaete	(7)		+		
	Diporeia sp	Amphipod, Great Lakes	(7)		+		
Marine Benthic	*Americamysis bahia***	Mysid shrimp	This report (8) (9) (10)	+	+	+	+
	Ampelisca abdita	Amphipod (Atlantic)	This report (8) (11) (12)	+	+	+	+
	Eohaustorius estuarius	Amphipod (Pacific)	(4) (11) (12)	+	+	+	+
	Leptocheirus plumulosus	Amphipod (Atlantic)	(11) (12 (13)	+	+	+	+
	Rhepoxynius abronius	Amphipod (Pacific)	(4) (11) (12)	+	+		
	Grandidierella japonica	Amphipod	(8) (9)		+		
	Arbacia punctulata	Echinoderm, sea urchin	(8) (9)	+		+	
	Dendraster excentricus	Echinoderm, sand dollar	(8)	+			
	Strongylocentrotus purpuratus	Echinoderm, purple urchin	(8)	+	+	+	
	Mytilus galloprovincialis	Mussel	14		+		+
	Crassostrea gigas	Bivalve, Portuguese oyster	(8)	+			
	Corophium volutator	Amphipod, mud shrimp	(4)	+	+	+	

Test Medium	Species	Common Name	Cited Method	Species Used in: Water Column Toxicity Tests	Whole Sediment Toxicity Tests	Interstitial Water TIEs	Whole Sediment TIEs
	Psammechinus miliaris	Shore urchin	(4)		+		
	Mercenaria mercenaria	Hard shell clam	(15)	+	+	+	
	Mulinia lateralis	Dwarf surf clam	(8)	+	+	+	
	Microtox (*Vibrio fischerii*)	Bacteria	(16) (17) (18) (19) (20)	+	+	+	
Freshwater Pelagic	*Ceriodaphnia dubia*	Cladoceran, water flea	(1)	+	+	+	+
	Daphnia magna	Cladoceran, water flea	(1)	+	+	+	+
	Daphnia pulex	Cladoceran, water flea	(1)	+	+	+	+
	Pimephales promelas	Fish, fathead minnow	(1)	+			
	Salvelinus fontinalis	Fish, brook trout	(1)	+			
	Oncorhynchus mykiss	Fish, rainbow trout	(1)	+			
Marine Pelagic	*Atherinops affinis*	Fish, topsmelt	(8)	+			
	Cyprinodon variegatus	Fish, sheepshead minnow	(8) (9)	+			
	Menidia beryllina	Fish, silverside	(8) (9)	+			

*The + sign indicates the species has been used in the specific type of tests. A blank box indicates no evidence of a species being used in the specific type of test.
**The genus name of this organism was formally changed to *Americamysis* (Price 1994)

1 USEPA (1991b)
2 ASTM (2000c)
3 Organisation for Economic Cooperation and Development (2004)
4 Maltby and Betton (1995)
5 Burton (2003)
6 USEPA and U. S. Army Corps of Engineers (1994)
7 USEPA (1996)
8 USEPA (2002a)
9 ASTM (2000a)
10 USEPA (1994a)
11 ASTM (2000b)
12 Anderson et al. (2006a)
13 USEPA (2001)
14 Phillips et al. (2003)
15 Ringwood and Keppler (1998)
16 Guzzella et al. (1996)
17 Gupta and Karuppiah (1996a)
18 Gupta and Karuppiah (1996b)
19 Karuppiah and Gupta (1996)
20 Hoke et al. (1992)

For TIEs conducted on IW, a variety of pelagic species (cladocerans, crustaceans, fishes) may be used in addition to the benthic organisms that are amenable to water column testing. The limitations are generally volume associated. For example, both the sheepshead minnow *Cyprinodon variegatus* and the silverside *Mendia beryllina* usually require 100 mL of IW/replicate. Considering the number of replicates and tests performed in a TIE, the volume of necessary IW quickly becomes unmanageable. The fathead minnow *Pimephales promelas* and the cladoceran *Ceriodaphnia dubia* have been used extensively for IW TIE in freshwater. For marine IW TIEs, we have also performed some work with the clam *Mercenaria mercenaria*, but we have used *A. abdita* and *A. bahia* more extensively, largely because of their small volume requirements. Some work has also been performed with IW using the purple sea urchin sperm cell test with *Arbacia punctulata* (Burgess et al. 1993), but researchers need to be certain that the IW is particle free to prevent particle interference in the test. The embryo-larval clam test with *Mulinia lateralis* has been performed in porewater (ASTM 1996) but has limitations because of the bivalve's sensitivity to pH. If species beyond these are used, it is important to verify that the manipulations used in IW TIE do not cause artifactual toxicity.

6.4 General Considerations for Testing

Regardless of whether whole sediment or interstitial water tests are planned, sample measurements taken at the beginning of each test should include interstitial water measurements of pH, salinity, hardness and ammonia. Dissolved oxygen (DO) should be measured in the interstitial water for interstitial water tests and in overlying water for whole sediment tests. Sulfide measurements may also be helpful in later interpretation. While we want to avoid being predisposed toward a particular class of compounds, these measurements can give valuable information about possible toxicants (such as ammonia or unusual ion toxicity) and prevent the oversight of what might be obvious toxicity. However, it should be noted that measured concentrations of a toxicant such as ammonia should not constitute the only line of evidence for toxicity. Ammonia concentrations need to be interpreted with respect to other water parameters such as pH (see Sections 7 and 8). Ammonia toxicity may also mask the toxicity of other toxicants. These toxicants may not be evident until the ammonia toxicity is removed via zeolite or *Ulva lactuca* manipulations, or the testing is performed at a different pH. Extreme changes in ion toxicity may be detected by measurements of hardness or salinity; however, small but significant changes in ion composition may not change salinity or hardness, yet may still be toxic. While the routine measures of pH, DO, salinity, hardness and ammonia are not conclusive evidence, they are still good insurance against obvious oversights of toxicity.

7 Phase I Overview and Methods: Whole Sediments

Whole sediment TIE methods were developed in part because of theoretical and observed differences in the results of toxicity tests conducted using interstitial water and whole sediment test methods. As explained in Section 6.2.1, direct comparison of whole sediment and interstitial water toxicity tests indicates that results are not always similar. This section outlines procedures and approaches for conducting whole sediment TIEs and is divided into two parts:

- General procedures and considerations when performing whole sediment TIEs
- Techniques used to perform specific TIE manipulations to characterize toxicity from three major classes of toxicants: ammonia, cationic or anionic metals, and organic chemicals

7.1 Toxicity Testing for Solid Phase TIE: General Procedures

TIE methods for whole sediments were developed using common sediment test organisms: *Chironomus dilutus*, *Hyalella azteca*, and *Lumbriculus variegatus* for freshwater sediments, and *Ampelisca abdita* and *Americamysis bahia* for estuarine/marine sediments. Test procedures used were generally patterned after those described elsewhere (ASTM 2001; Ho et al. 2000; USEPA 1994a; 2000). However, the logistical requirements of testing large numbers of sediments with different manipulations led us toward using "scaled down" versions of standard test procedures, with both freshwater and marine tests being conducted in 100-mL chambers rather than the 300-mL to 1-L chambers used in many published sediment toxicity test methods. Using smaller chambers reduces the requirements for sediment, bench space, and reagents; the smaller sediment volumes also speed recovery of the organisms at test termination. Comparative studies have suggested that responses observed in these smaller systems are comparable to (Norberg-King et al., unpublished) or indicative of (Ho et al. 2000) responses obtained in "full-scale" test systems.

A procedural difference in the development of whole sediment TIE methods for freshwater and marine sediments is that the freshwater tests were developed using flow-through methods (i.e., periodic renewal of overlying water), while marine methods were developed using static exposures. Neither method is intrinsically superior; both have advantages and disadvantages. Static tests are obviously easier to initiate where a water renewal system has not been constructed and/or there is not a sufficient source of clean water for renewal. However, once constructed, flow-through systems operate automatically and require little attention during testing. Static tests generally require aeration during testing to maintain acceptable DO concentrations.

Logistics aside, the most significant difference between static and renewal test methods lies in the nature of chemical exposure that may exist using the different methods. In static systems, concentrations of sediment-associated chemicals in the overlying water can be expected to be higher than in a renewal system, where incoming clean water dilutes and removes some of the chemical released from sediment. Whether this is positive or negative is case-specific. The equilibration between water and sediment that is likely to occur in a static system may increase the concentration of chemicals in the water column and therefore over-represent the exposure that would occur in nature, except in stagnant systems. Renewal methods will reduce water column concentrations of contaminants and exposure relative to static methods, but the

relationship of this reduced exposure to that which would occur in nature is often unknown. In most systems with histories of contamination, concentrations of sediment-associated chemicals in the water column will be much lower than those expected at equilibrium, because the system is at steady state rather than equilibrium, but the degree of this disequilibrium varies among systems. Matching renewal rates in sediment tests to exactly match what is found at a specific site would require extensive chemical monitoring and is not performed generally. In addition, the type of exposure the test organism has may affect the outcome of the test. Obligate sediment burrowers may have the same exposure no matter which test system is used, whereas facultative sediment dwellers may move from a contaminated sediment to the less contaminated overlying water in a renewal test and therefore decrease the exposure and possibly the outcome of the test. Similarly, tests performed with epibenthic organisms, which can be expected to have significant water column exposure, may have very different results depending upon whether a static or renewal system is used. Awareness of the different exposures in different test methods and how they affect organisms is critical to interpreting test results correctly.

Even in circumstances where static test methods exaggerate water column exposure over that occurring in nature, this greater water column exposure may be used to advantage. For marginally toxic sediments, the greater water column exposure may intensify the toxic response and make it easier to discern differences induced by TIE manipulations. It may also allow the use of more epibenthic, or even pelagic, organisms in TIE testing.

Other differences between the TIE development work in fresh and salt water relate to test durations and biological endpoints. Most whole sediment TIE work for marine organisms used 7-day tests with mortality as the biological endpoint; in contrast, the developed freshwater method primarily centered on 10-day tests measuring both survival and growth. As with the static versus renewal issue, no single test duration or biological endpoint is intrinsically better. Shorter test durations and mortality endpoints allow testing to be conducted more rapidly and therefore with more rapid iterations of rounds of TIE tests. On the other hand, longer test durations are more amenable to measurement of sublethal endpoints like growth, and may be necessary where the response in the index toxicity test is itself sublethal.

For initial TIE testing, test method selection among static or renewal, short- or longer-term, and lethal or sublethal is probably not as critical, provided that the selected procedure yields a measurable toxic response. More important is that there is confirmation later in the TIE that differences in test method are not leading to false conclusions relative to the exposure method used in the index test that indicated the need for a TIE. Where the exposure method differs between the index test and the TIE tests, confirmation should directly address the comparability of results between the two methods.

The specific manipulations and toxicity test methods described here are centered around those we used in developing TIE methods, namely 10-day renewal methods for freshwater sediments and 7-day static methods for estuarine/marine sediments. These described methods are not intended to limit the universe of test procedures that can be used, but to focus on those methods we have experience with and have confidence will perform as described. Others have performed successful TIEs using the West Coast species *Eohaustorius estuarius* (10 day static tests) (Anderson et al. 2006a) and *Mytilus galloprovincialis* (using a sediment–water interface exposure system) (Phillips et al. 2003). We fully expect that successful TIEs could be conducted with full-scale test procedures, or other "miniaturized" procedures (e.g., Ferretti et al. 2002), providing that appropriate developmental work is conducted and that the test methods are basically compatible with the test organisms.

7.1.1 Marine Test Methods

The test procedures for the development of marine TIEs use 20 g of sediment and 60 mL of reconstituted seawater (30 ppt) in a 120 mL glass chamber (95 mm x 45 mm diameter). Sediment is added to the chamber and the chamber then is tapped vigorously on the bench top until a smooth surface is obtained on the sediment. The smooth surface is necessary for good recovery of the mysids at the test termination. The 60 mL of reconstituted seawater is added carefully to avoid sediment resuspension. Gentle aeration (e.g., 80 to 100 bubbles/min) of the overlying water is introduced using short glass pipettes attached to an aeration system. The loaded test chambers are then allowed to equilibrate for 24 hours.

After 24 hours, 10 amphipods (*A. abdita*; 0.5 to 0.7 mm) are added first and allowed to burrow into the sediment, then 10 mysids (*A. bahia*) are added. The differing habits of amphipods (burrowing) and mysids (epibenthic) allow them to coexist in the same exposure chamber. Tests can be conducted from 4 to 10 days depending upon the intent of the test. Mysids are fed *Artemia* daily (2 drops (~ 100 µl)/test chamber of 1.4 g concentrated *Artemia* diluted into 10 mL of water); no supplemental food is added for the amphipods. Organisms are tested at 20 to 22°C under a 16h:8h light:dark photoperiod of ambient laboratory light (cool white fluorescent) at about 100 lux. Temperature is measured daily, and DO, pH, and salinity two to three times/test. Exceptions to these methods for the purpose of the TIE manipulations are discussed in Section 7.2.1.

To terminate the test, each exposure chamber is gently swirled by hand and the overlying water poured through a 0.5 mm Nitex sieve. The sediment surface is then gently rinsed twice with seawater and each time the overlying water is poured through the sieve. Theoretically, all mysids should be retained on the sieve at this point. Mysids present on the sieve are counted and assessed for condition (i.e., dead or alive). Amphipods are then recovered by pouring the remaining sediment into the sieve and rinsing with seawater until only amphipods and their tubes remain on the sieve. Tubes are then dissected to expose the amphipods so their condition can be assessed. Amphipod number and condition (dead or alive) are recorded. Missing test organisms are considered to have died during the exposure.

7.1.2 Freshwater Test Methods

Freshwater sediment TIE tests have been conducted in both 300-mL and 100-mL glass beakers, though we favor the 100-mL beakers for logistical reasons. Each beaker has two 1.6-cm holes drilled on opposite sides approximately 4 cm from the bottom of each beaker. These holes are covered with 60-mesh stainless steel fixed to the beakers with silicone adhesive. These beakers are held in glass aquaria in a system like that described by Benoit et al. (1993). The beakers are elevated in the glass aquaria such that the surrounding water level will be at about the 90-mL mark (allowing for 30 mL of sediment and 60 mL of overlying water). The Benoit system provides an inflow of clean water to each glass aquarium. Renewal of the overlying water in each beaker is accomplished by fitting the overflow standpipe of the aquarium with a self-starting siphon sleeve. The siphons cause the water level in each holding tank to fluctuate, thereby "pumping" water in and out of the test beakers. Water flow to the glass aquaria is regulated by a timing mechanism that provides flow for two periods each day (approximately 90 min.). The rate and timing of the water flow is calibrated to create two volume additions of overlying water in each beaker each day.

Zumwalt et al. (1994) describe another type of water renewal system for sediment tests that is also compatible with sediment TIE testing (e.g., Besser et al. 1998). Both Zumwalt and Benoit

systems have advantages and disadvantages. The Benoit system is easily retrofitted into common toxicity testing systems whereas the Zumwalt system requires more initial construction. However, the Zumwalt system provides complete separation of individual test beakers, while in the Benoit system, beakers within the same aquarium have the potential to exchange water among them. Because of the isolation of individual beakers, the Zumwalt system provides truer independence of replicates and more rigorous randomization of treatment positions compared to the Benoit system in which beakers of the same treatment must be co-located.

To initiate a sediment toxicity test, 30 mL of sediment is added to each beaker, either volumetrically or by mass, if the density of the sediment sample is known. These beakers are placed in the exposure system carefully, to minimize disruption of the sediment as the overlying water flows in through the screens. Test beakers are allowed to sit in the exposure system overnight. The next day, test organisms (typically *H. azteca* or *C. dilutus*) are added to each test beaker. Unlike the marine tests, these freshwater organisms are not generally tested in the same beakers; however, we commonly combine test beakers containing *H. azteca* together with those containing *C. dilutus* in the same aquaria within the test system. The *H. azteca* used for testing are typically 7- to14-day-old test organisms and the *C. dilutus* are typically 10-day-old, third instar organisms. *H. azteca* are fed 1.0 mL of yeast-cerophyll-trout chow (YCT; 1.8 g/L suspended (USEPA 2002a) suspension/beaker once a day. The midges are fed 1.5 ml of Tetrafin fish food slurry (4 g/L) per beaker daily. These organisms are tested at 23°C under a 16h:8h light:dark photoperiod of ambient laboratory light (cool white fluorescent) at about 100 lux. Temperature is measured daily; DO, pH, and conductivity three times per week; and ammonia, alkalinity, and hardness twice during the test.

Exposures are generally terminated after 10 days, consistent with standard test methods. For purposes of a TIE, shorter exposures are adequate if the toxic response can be measured in shorter periods, although 10 days is necessary to achieve much sensitivity for growth endpoints. To end the exposure, the organisms are sieved from the test sediments using a #40 (420 μm) standard sieve. *H. azteca* can also be removed by swirling the beaker and removing the overlying water to an observation tray, repeating this procedure several times. Efficient recovery of *H. azteca* using this method depends somewhat on technique, so it should not be used without first confirming that an individual researcher's technique is effective at recovering all organisms present. Sieving is always used to recover *C. dilutus*.

Organisms recovered alive are counted and recorded; missing organisms are presumed to have died. Dry weights are determined by pooling all living organisms by replicate, drying the samples at 60°C to a constant weight, and weighing to the nearest 0.01 mg to obtain a mean weight per surviving organism. For *C. dilutus*, measurement of ash-free dry weight (AFDW) is strongly recommended to reduce bias caused by gut contents (Sibley et al. 1997). AFDW is determined by ashing the initially dried organisms from each replicate at 500 EC for a minimum of two hours, then weighing again to determine the weight of the residual ash. AFDW is calculated as net dry weight minus net ash weight.

7.1.3 Replication

Common solid-phase sediment test methods suggest sediments be tested using 5 to 8 replicates. While this provides statistical power, in the context of a TIE it also imposes a substantial logistical load when simultaneously testing large numbers of different treatments. In general, we have found that testing three or four replicates per treatment provides a workable compromise between statistical power and practicality. However, for sediments with only small amounts of

toxicity, it may be necessary to increase replication in order to differentiate responses among treatments. In sediments with strong responses (e.g., 80 to 100% mortality), as few as two replicates have been used.

7.1.4 Controls and Procedural Blanks

In the context of sediment toxicity testing, both "control" and "reference" treatments are often incorporated into sediment toxicity testing. Control sediments generally refer to a well characterized source of uncontaminated sediment that is known to support the long-term survival (and growth where applicable) of the test organism. The purpose of a control treatment is generally to demonstrate that the test organisms were of sufficient quality to perform adequately in the absence of chemical stress. Reference sediments are often collected as part of field sampling programs in an effort to document the "background" response in a sample from the general study area but thought to be unaffected by the stressors being evaluated (e.g., a point source of sediment contamination). Depending on the research question being addressed, performance of the organisms in the test sediments may be compared to one or both of the control and reference sediments (in some cases multiple reference sediments may be evaluated). For further discussion on control and reference sediments see Environment Canada (1994)

In the context of a TIE, the primary measure of interest is the change in toxicity following different manipulations, rather than the absolute amount of toxicity. In this sense, testing a field reference sediment has comparatively little significance. However, it is very important to understand the effect of sediment manipulations themselves on the toxicity of sediment (referred to as "blank toxicity" in previous TIE guidance). To address this issue, procedural blanks are included as part of most manipulations. These procedural blanks consist of uncontaminated sediment subjected to the same manipulation as the toxic sediment. The preparation of procedural blanks for individual manipulations is discussed in conjunction with the overall discussion of that manipulation. Procedural blanks are often the only way to protect the TIE from false conclusions based on experimental artifacts: do not give in to the temptation to eliminate them as a logistical shortcut.

Several of the TIE manipulations involve the addition of relatively large amounts (e.g., 10 to 30% by volume) of additives, such as zeolite or cation exchange resin. While the primary influence of these additives on sediment toxicity is generally presumed to be changing the distribution or availability of chemical toxicants, adding these larger quantities of material also raises the potential for physical dilution of the sediment to change exposure. To assess this potential, another type of blank is commonly included, which we refer to as a "dilution blank." The dilution blank is created by adding a relatively inert material, such as clean quartz sand or muffled beach sand, in an amount comparable to the largest addition of TIE amendment.

7.2 Whole Sediment TIE Methods

As with effluent TIEs, sediment TIEs begin with initial toxicity tests to verify the presence of toxicity and determine the duration, endpoint, and degree of dilution appropriate for the TIE. If sufficient toxicity is detected, a whole sediment TIE is initiated. The whole sediment TIE consists of a baseline toxicity test and the manipulation tests described here. The baseline toxicity test serves as a point of comparison for the manipulation tests to determine whether or not a change in toxicity has occurred.

The suite of sediment manipulations we refer to as a Phase I includes three groups of manipulations targeted at three types of toxicants commonly found in sediments: ammonia, cationic metals, and organic chemicals (Figure 7–1). Specifically, these manipulations are:

For ammonia:

- Zeolite addition
- *Ulva lactuca* addition

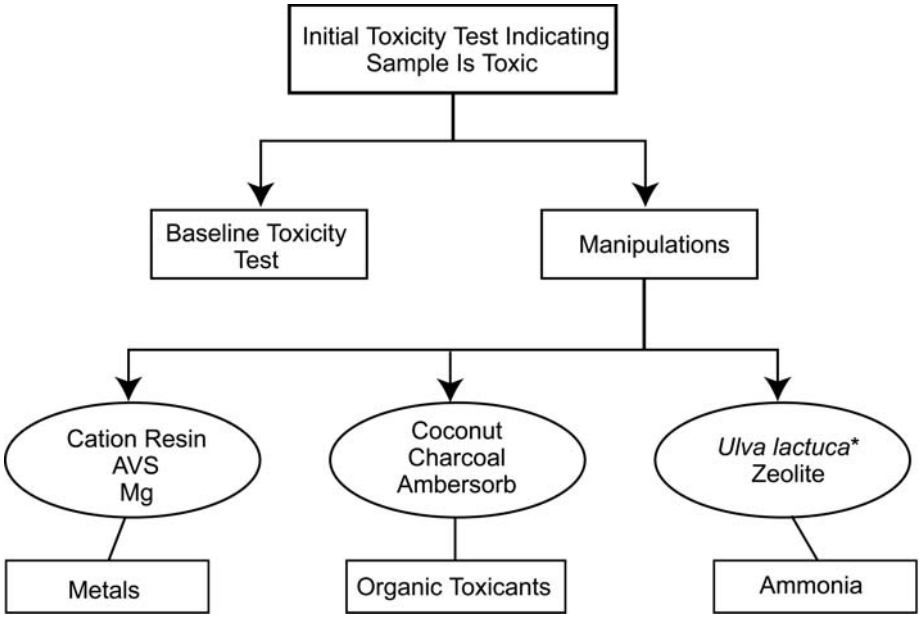
For cationic metals:

- Cation exchange resin addition
- AVS (sulfide) addition

For non-ionic organics:

- Coconut charcoal addition
- Ambersorb® addition

Figure 7-1 TIE Approach with Whole Sediments



*Marine only

Unlike the Phase I TIE guidance for effluents and other aqueous samples (USEPA 1991a;USEPA 1996), the Phase I structure proposed for whole sediments contains a fair degree of redundancy, with multiple manipulations targeted at the same group of toxicants. This redundancy can be important, as our experiences have shown that there is no one treatment that is always most effective or selective for a particular group of toxicants. Conducting multiple manipulations targeted for the same group of toxicants helps to not only insure against a false negative (believing that a group of toxicants is not involved when in fact it is) but also to reinforce conclusions about the involvement of a type of toxicant in producing toxicity. While stopping short of insisting that all manipulations be carried out on all sediments, we encourage the incorporation of as many of these manipulations in Phase I testing as is possible. While this

adds a logistical load, the benefits can be substantial, particularly when doing longer term tests, such as 10-day tests; if there are ambiguities in data interpretation, the investigation can be meaningfully delayed while steps are repeated.

The remainder of this chapter describes the individual manipulations and toxicity tests developed to initially characterize the source of sediment toxicity. Each method is described in three parts:

- *Overview* – The technical basis for the manipulation and considerations in its design and implementation
- *Method* – The physical procedures for the manipulation and associated testing
- *Interpretation* – Discussion of inferences that can be drawn from the test results

7.2.1 Initial Toxicity Tests

Overview

Initial toxicity tests are conducted to verify that the sediment is toxic and to determine whether diluting the sediment before Phase I testing is needed. To determine the latter, it is necessary to test the sample in a dilution series. We have had success in using a series of 100, 75, and 50% (plus dilution sediment control) for many sediments, although greater dilutions are necessary for sediments that are extremely toxic. Given that it is easier to add a couple of dilutions to the initial test than to re-conduct the test, it may be advisable to use an extended dilution series (e.g., 100, 75, 50, 25, and 12.5%) if it is likely that the sediment is highly toxic. Of course, if an undiluted sediment does not produce 100% mortality, then it should be tested at full strength.

Dilutions may be calculated and expressed on a wet weight basis, a dry weight basis, or a volume basis; the only importance is that the same method of expressing dilution be used throughout the TIE. We combine toxic sediment with the diluent sediment by weight, mix thoroughly, then allow to equilibrate at 4°C in the dark for a minimum of seven days.

As indicated, the purpose of the dilution series is to determine a "working concentration" of the sediment for use in initial TIE testing because some of the manipulations neutralize toxicity only within a range of toxicant concentrations. Manipulations applied to sediments with concentrations of toxicants beyond the range of the manipulation may lead to the incorrect conclusion that a manipulation is not effective and/or a particular class of chemical is not involved when it actually is. While there is not a definitive method of determining the sorptive capacity for each manipulation–toxic sediment combination the practice of working at the lowest concentration of toxic sediment to produce substantial (75 to 100%) mortality can help to prevent overwhelming the capacity of the manipulation while still allowing the largest practical range of detoxification that could occur from the manipulation.

In water column testing, toxicity is generally decreased proportionally to the volume dilution of the sample; in other words, a 50% dilution of a sample contains half as much toxicant and toxicity as the undiluted sample. However, as discussed in Section 6.2.1, this proportionality does not necessarily apply to dilutions of sediment. The bioavailability of sediment toxicants is controlled by several characteristics of sediments. As a result, a 50% dilution of a toxic sediment may have one-half the original toxicant concentration on a mass basis, but the toxicity of the sample may be decreased by more or less than a factor of two, depending on the composition of the toxic sediment and the diluent. For example, bioavailability of non-ionic organic toxicants is influenced heavily by organic carbon content of the sediment. As a result, if a toxic sediment with a high organic carbon content is diluted with a diluent sediment with low organic carbon content, the effect of the dilution on toxicity is much lower than predicted based solely on mass

dilution. For cationic metals, both AVS (Di Toro et al. 1990) and organic carbon (USEPA 2005) have substantial influence on bioavailability, and similar incongruities between mass dilution and dilution of toxicity can occur when there are differences in chemistry between the toxic sediment and the diluent.

This discussion then begs the obvious question: What is the appropriate diluent for sediment testing? The initial tendency may be toward "standard" materials such as quartz sand, or "reconstituted sediments" made from standard materials (Harrahy and Clements 1997; USEPA 2000; Anderson et al. 2006a). In reality, these materials are probably poor choices as diluents because they lack the chemical fractions that most affect the bioavailability of sediment contaminants, such as organic carbon and sulfide. Instead, we suggest that a natural sediment be used as the diluent, so these important components are present. It's worth noting that many formulated sediments, such as peat or alpha cellulose, contain a source of organic carbon, but these materials may not have the same partitioning characteristics as organic matter found in typical natural sediments. Gonzalez (1996) reported on a method to incorporate iron sulfide into formulated sediments, but without a bacterial population to maintain anoxic conditions, this method may not be sufficient to provide an effective diluent.

One might presume that the diluent sediment should be exactly matched to the characteristics of the toxic sediment in order to provide a linear dilution of sediment toxicants. However for purposes of a TIE, the most important issue is not that the change in toxicity is proportional to the mass dilution, but only that one can reliably and repeatably prepare dilutions of the toxic sediment that will have comparable toxicity. The percent dilution of sediment at which this occurs is not really important. It is generally desirable for the diluent sediment to have physical/chemical characteristics that are similar to the toxic sediment, but it is most important that it be free of substantive contamination and completely nontoxic to the test organisms. In developing sediment TIE methods we have used primarily sediments from a natural lake (freshwater) or relatively pristine coastal area (marine), but these exact locations have no special significance. The main issue is that the diluent sediment be well characterized, and in sufficient quantity to complete TIE testing with a single lot. Equilibration time must also be considered when diluting sediments. Unlike aqueous samples, which are assumed to achieve a stable state essentially immediately after mixing, sediments require longer times for re-equilibration. The time required varies with the type of toxicant and its specific chemical properties. Initial reactions of amorphous metal sulfides are generally thought to occur comparatively quickly (hours to days), while redistribution of high K_{OW} organic chemicals takes much longer (weeks to months). Since the range of toxicants potentially present in a toxic sediment is not typically known, there is no specific equilibration that is universally adequate, nor is there a way to directly monitor equilibration. As a practical compromise, we have made it a practice to allow mixtures of toxic and clean sediment to equilibrate at 4°C, in the dark, for at least seven days. Whatever equilibration period is used, it should be consistent throughout the entire TIE; therefore, if more sediment is needed, subsequent batches should be allowed to equilibrate for the same length of time as the first batch. Equilibrating at cold temperatures can be expected to slow equilibration, but it is generally necessary to avoid excessive microbial action and consequent changes, such as a buildup of ammonia.

Appropriate test duration may also be explored in the initial toxicity test. For example, if previous testing showed that a sample causes lethality in a 10-day test, it is possible that shorter exposure periods may also cause this lethality; if so, one could consider using a shorter exposure period in the TIE, at least in the initial part of the investigation. To assess this issue, additional

replicates may be added to the initial toxicity test at earlier timepoints (e.g., 48 and 96 hours). However, sediments that affect only growth or other sublethal endpoints may require the full exposure period for those effects to become measurable.

With regard to endpoints, there may be a tendency to think that conducting a sediment TIE using a sublethal endpoint is more difficult or uncertain than a TIE based on mortality. Most of the sublethal TIE work we have conducted has been with *C. dilutus*. At least in this case, we actually prefer the growth endpoint to the mortality endpoint because it seems less variable and the endpoint has a range larger than the 0 to 100% survival used in mortality tests.

Method

The procedures for the initial toxicity test are those described in Section 7.1. Test duration depends on the endpoint being measured, and may include more than one observation time.

Interpretation

Obviously, a TIE can be conducted only on a sediment causing measurable toxicity. There are no set minimums for the amount of toxicity that must be present to conduct a TIE, but the investigation becomes progressively more challenging as the amount of toxicity decreases. In general, we prefer that there be at least a 30 to 40% reduction in survival if survival is the endpoint. This is not to say that TIEs cannot be conducted when less toxicity is present, but all involved should recognize that the investigation will be more challenging, and will likely require extra effort in the form of additional replication and/or rounds of testing to achieve confidence in the results.

For the growth endpoint of *C. dilutus*, the same 30 to 40% reduction is desirable. For *C. dilutus*, it has been our experience that growth is impaired at toxicant concentrations well below those sufficient to cause direct mortality. For that reason, we have tended to emphasize the growth endpoint in TIE work with *C. dilutus* and would recommend using it even if the sediment causes mortality of *C. dilutus* at higher concentrations. In selecting the sediment dilution to be used in a TIE based on *C. dilutus* growth, we generally select a dilution that exerts a strong growth effect (e.g., 75% inhibition of growth) without causing substantial mortality. For *H. azteca*, growth effects are sometimes observed in sediments that do not cause substantial mortality. In contrast to *C. dilutus*, however, we often see comparatively small ranges in exposures between those affecting growth and those affecting mortality. We have found the growth endpoint of *H. azteca* to be slightly more variable and, as a result, greater reductions in growth (i.e., more toxicity in a sediment) would be preferable in order to be able to detect an effect. Unfortunately, the range of the growth response in *H. azteca* is much smaller than in *C. dilutus*, so larger reductions in growth may be uncommon. Because of this, and our experience that the growth endpoint for *H. azteca* is often more variable than for *C. dilutus*, we have tended toward emphasizing mortality in TIE work with *H. azteca*, though this is not to say that TIEs cannot be conducted on the basis of growth effects in *H. azteca*.

The other major purpose of the initial toxicity test is to determine a working concentration of the sediment for initial testing. As stated earlier, for tests where mortality is the primary endpoint, we generally conduct Phase I testing at the lowest sediment concentration that still causes substantial (e.g., 75 to 100%) mortality; if the undiluted sediment does not cause 100% mortality, then the TIE is performed on undiluted sediment. From the results of the initial toxicity test, the working sediment dilution for Phase I is selected based on these factors. If dilution is required, a

batch of diluted sediment sufficient to complete all Phase I tests should be prepared and equilibrated.

7.2.2 Baseline Toxicity Test

Overview

With each batch of TIE tests conducted, there must be a simultaneous test of unmanipulated sediment, referred to as the "baseline." As in effluent TIE methods, the purpose of this test is to determine the toxicity of unmanipulated sediment as a point of comparison for all other manipulations.

In effluent TIEs, baseline tests are performed in a dilution series. Because of the logistical demands of solid-phase TIEs, we generally conduct the baseline test and all other Phase I manipulations at a single concentration of toxic sediment, as determined from the initial toxicity test. Multiple dilutions of sediment could be tested in the baseline and other Phase I tests if there are compelling reasons.

Method

The method for a baseline test is straightforward. Unmanipulated sediment is tested as described in Section 7.1.

Interpretation

Again, the primary purpose of the baseline test is to document the toxicity of unmanipulated sediment as a point of comparison to other tests. Changes in toxicity from previous tests at the same sediment concentration should be noted as potential indicators of the stability of the sediment toxicity (e.g., potentially losing toxicity over time). If the baseline test does not show consistent, measurable toxicity, then one cannot perform a TIE, as the effect of the manipulations on toxicity cannot be assessed.

7.2.3 Manipulations Addressing Ammonia

Ammonia is a natural byproduct of microbial activity in sediment, and is often enhanced by anthropogenic pollution. In aqueous solution, ammonia exists in both ionized and un-ionized forms according to the reaction:

$$NH_3 + H_2 0 \leftrightarrow NH_4^+ + OH^-$$

where NH_3 is ammonia (un-ionized) and NH_4^+ is ammonium (ionized). The speciation of ammonia is a direct function of solution pH and to a lesser extent temperature and salinity (Hampson 1977a; 1977b).

Because of this pH dependence of toxicity, pH manipulation was the primary approach used to characterize ammonia toxicity in effluent TIE. In the case of solid-phase sediment TIE, early experimentation showed that manipulating the pH of sediments was difficult and had undesirable side effects. Amendments with either hard acid/base or with hydrogen ion buffers (e.g., MES) resulted in visible alteration of sediment structure and toxicity to sediment test organisms, and were therefore abandoned. Efforts to enhance removal of ammonia through nitrification were also unsuccessful.

Two alternative manipulations were developed that proved effective at reducing ammonia toxicity:

- Treatment with sea lettuce (*Ulva lactuca*)
- Addition of zeolite.

Both procedures have been found effective for marine sediments, but *U. lactuca* treatment is not used in freshwater TIE because *U. lactuca* is a marine organism.

7.2.3.1 Algae (*Ulva lactuca*) Addition

Overview

U. lactuca is an ephemeral cosmopolitan attached seaweed found along the Atlantic and Pacific coasts of temperate North America (Harlin et al. 1978). *U. lactuca* takes up aqueous NH_3, thus reducing the concentrations in the water. This uptake can be so dramatic that *U. lactuca* has been used to remove ammonia from water in many different situations including aquaculturing facilities (Cohen and Neori 1991; Neori et al. 1991). Treatment with *U. lactuca* has been shown to be effective in removing ammonia from marine interstitial waters in whole sediment exposures (Ho et al. 1999a; Pelletier et al. 2001). Additional research has indicated that the placement of *U. lactuca* in the overlying water of a solid-phase sediment test chamber did not significantly alter concentrations of selected organic contaminants, but can change the concentration and toxicity of metals (Pelletier et al. 2001).

Method

The *U. lactuca* addition is performed only in marine TIEs. *U. lactuca* should be collected from a clean location within four days of use. The plants should be brought back to the laboratory, cleaned of any epiphytic organisms, and sorted; yellowing or bleached pieces should be discarded. The plants should be held in clean, static, aerated marine water using a 16:8 light:dark cycle, at $\leq$ 15°C. When *U. lactuca* is held at temperatures above 15°C under static conditions for any length of time, it starts to decay.

To initiate the manipulation, add 5 g of cleaned, sorted, and pat dried (damp) *U. lactuca* to the overlying waters of the exposure chambers containing test sediments. Gently aerate and incubate for 24 hours at 15°C under continuous lighting (75 to 100 $\mu E/cm^2$ sec). After 24 hours, remove *U. lactuca*, add test organisms, and initiate the TIE.

A blank treatment is also prepared by treating test chambers containing control sediment using the same methods.

Interpretation

A decrease in toxicity after *U. lactuca* addition suggests ammonia toxicity, but may also suggest toxicity caused by some metals (Pelletier et al. 2001). The potential for metal toxicity can be evaluated by considering the *U. lactuca* addition test in conjunction with results from manipulations targeted specifically at metal toxicity (Sections 7.2.4, 8.3.4, and 9.2); this emphasizes the importance of conducting all TIE manipulations simultaneously, instead of in a piecemeal or selective fashion. Results of the zeolite manipulation also assist in distinguishing toxicity due to metals versus ammonia, as zeolite did not alter the toxicity of sediment contaminated with copper or cadmium (Besser et al. 1998).

Blank toxicity has rarely, if ever, been observed in the *U. lactuca* addition test. If blank toxicity is observed, consider repeating the test with a fresh batch of *U. lactuca* and ensure that the *U. lactuca* sediment incubation occurs at < 15°C.

Finally, we have chosen to work with the species *U. lactuca* to remove ammonia. Other macro-algae may be equally effective in removing ammonia, but should be tested to ensure they do not have toxic exudates, and to determine if they take up contaminants other than ammonia, which would complicate the interpretation of the results.

7.2.3.2 Zeolite Addition

Overview

Zeolite is a hydrated aluminosilicate mineral composed of symmetrically stacked alumina and silica tetrahedra forming an open and stable three dimensional structure with a negative charge (Rozic et al. 2000). There are approximately 30 known natural zeolites but only a few occur in sufficient quantities and acceptable purities to be of commercial use (e.g., clinoptilolite; Kesraoui-Ouki et al. 1994). The negative charge on zeolites allows for the adsorption of certain positively charged ions (Rozic et al. 2000). In aqueous solution, the negative charge is generally neutralized by Na^+, however, NH_4^+ is preferentially adsorbed to zeolite. The removal of NH_4^+ from solution results in a proportional reduction in NH_3 concentrations. The ability to remove NH_3 allows zeolite to be added directly to sediments as a manipulation to remove ammonia toxicity (Besser 2004; Besser et al. 1998; Burgess et al. 2003).

Method

Freshwater and marine methodologies are essentially the same and involve adding a known mass of zeolite to a prescribed amount of sediment.

Zeolite, a natural material, is available in several different commercially available forms. In general, a relatively fine-grained preparation is desirable so that the zeolite can be well distributed in the sediment and has a relatively high surface area:volume ratio. Two zeolites that have been used successfully in development work are

- SIR-600, a moist granular zeolite (ResinTech Inc., West Berlin, NJ, USA) that is rinsed with test water before use;
- Clinoptilolite (Aquatic Eco-Systems, Apopka, FL, USA) which needs to be ground (roughly 50% sand, 25% silt, 25% clay size fractions), and then slurried with clean water, allowed to settle, and decanted before use.

While these zeolite sources have been used successfully, others would probably be suitable. However, it is important to establish that a particular formulation is both nontoxic to test organisms and effectively adsorbs ammonia. For this reason, it is advisable for a laboratory to purchase an ample supply, characterize its performance, and then conduct all TIEs using this characterized supply.

The degree of reduction in ammonia concentration of interstitial water is proportional to the amount of zeolite added. Besser et al. evaluated additions of both 10% and 20% (v/v) and found that greater reductions in both ammonia concentration and toxicity were achieved with 20% zeolite addition compared with 10% (v/v) (Besser et al. 1998). Based on this result, a 20% zeolite addition (v/v or wwt/wwt) has been used predominately in our experimental work. This 20% addition results in a total of 24 g of sediment-zeolite tested.

To perform the zeolite addition test, the appropriate amount of zeolite is added to the test sediment and mixed thoroughly; an equivalent treatment of control sediment is also prepared as a blank. The mixed sediment is allowed to equilibrate for 24 to 96 hours before test organisms are added. We do not have any rigorous kinetic studies to demonstrate minimum equilibration times necessary for ammonia to be sorbed to the zeolite, but experience suggests that 24 hours is sufficient. Longer equilibration times have generally been used for logistic reasons, as some other manipulations (e.g., zero-valent magnesium addition) do have kinetic limitations and it can be convenient to prepare all sediment manipulations at the same time. After equilibration, toxicity of zeolite-amended sediments is tested using the general procedures described in Section 7.1.4.

Interpretation

Reduction in toxicity by zeolite addition is consistent with ammonia toxicity, but it is not singular proof that ammonia is the cause of toxicity. For marine TIEs, comparison with the results of the *U. lactuca* addition test can provide further confidence.

Burgess et al. (2003) compared the effectiveness of zeolite and *U. lactuca* for reducing ammonia toxicity to *A. abdita* and *A. bahia*. Both manipulations reduced ammonia concentrations in interstitial and overlying water, and both reduced toxicity of ammonia to *A. abdita*. It was suggested that *U. lactuca* addition might be more effective for *A. bahia*, perhaps because the adsorbent is placed in the overlying water, which is the exposure zone for the epibenthic mysids.

As a cation exchange material, zeolite is not highly selective for ammonia (NH_3) and has some affinity for several cationic metals including silver, cadmium, cesium, copper, nickel, lead and zinc (Kesraoui-Ouki et al. 1994; Ouki and Kavannagh 1999) and polar organic toxicants (Anderson 2000). However, zeolites do tend to have a greater affinity for ammonium (NH_4^+) than for metals (Kesraoui-Ouki et al. 1994). TIE experiments found that zeolite addition did not reduce the toxicity of copper or cadmium contaminated sediments (Besser et al. 1998). According to the manufacturer, the selective affinity order of SIR 600 is:

$$Cs^+ >> K^+ > NH_4^+ > Na^+ > Sr^{2+} >> Ca^{2+} > Mg^{2+}.$$

Nonetheless, results from zeolite addition tests should be considered in light of those from other manipulations, particularly those addressing metal toxicity and the sand dilution blank.

Experiments conducted with freshwater organisms suggest that the choice between static and renewal tests methods may have a large influence on the response to ammonia. Studies have shown that *H. azteca* tended to avoid ammonia present in sediment and were not affected by extremely high ammonia concentrations in sediment until ammonia concentrations in the overlying water increased to lethal levels (Whiteman et al. 1996). Because static test methods allow ammonia concentrations to increase in the overlying water much more than renewal methods, ammonia toxicity is much more likely to be expressed in static test procedures. This should be kept in mind when interpreting TIE results. For example, if static TIE procedures suggest ammonia toxicity, but the index test for the TIE is actually renewal, one must consider whether ammonia is really the cause of toxicity in a renewal test where ammonia concentrations in overlying water are likely to be lower. Comparative testing with static and renewal methods may be warranted, with careful measurement of ammonia concentrations in interstitial and overlying water.

7.2.4 Manipulations Addressing Cationic Metals

The most commonly encountered toxic cationic metals include cadmium, copper, nickel, lead, and zinc. (Methods to address the anionic metals—chromium and arsenic are presented in Section 9.6.) Assessment of metal toxicity can be complicated because their bioavailability is heavily influenced by the chemistry of the exposure matrix; in the water column, the bioavailability of these metals is thought to be represented best by dissolved concentration of their divalent ionic form (e.g., freely dissolved Cd^{2+} and Ni^{2+}). In sediments, the potency of these metals is thought to be related to their concentration in interstitial water (Di Toro et al. 1990), which is in turn controlled by components of sediment that sequester metals to the solid phase. In anoxic sediments, sulfide is thought to be a primary binding phase; metals such as cadmium, copper, nickel, lead, zinc, and silver form highly insoluble metal sulfide compounds that limit the partitioning of metal to interstitial water. The sulfide binding capacity of a sediment is measured as AVS (see Section 7.2.4.2 and Di Toro et al. 1990). Organic carbon is also capable of sequestering cationic metals in both oxic and anoxic sediments; in oxic sediments, iron and manganese hydroxides also play a prominent role (Tessier et al. 1993).

Because metal toxicity in sediment is thought to be associated with concentrations of metals in interstitial water, TIE methods for cationic metals seek to reduce the concentration of freely dissolved metal in the test matrix. In effluent and interstitial water TIE methods, this is accomplished primarily through chelation of metal by EDTA. However, early experimentation with solid-phase sediment TIE found that EDTA addition to solid-phase sediment was not consistently effective in reducing toxicity. Instead, solid-phase sediment TIE methods have been developed around two alternative means of reducing the concentration of toxic metals in interstitial waters:

- Addition of cation exchange resin, which adsorbs dissolved metal ions from interstitial water and
- Addition of sulfide, which precipitates metals into insoluble metal sulfides (for details of these procedures, see Sections 7.2.4.1 and 7.2.4.2)

The effectiveness of these manipulations appears to vary among metals, sediments, and organisms. For example, in marine waters, the cation exchange resin is generally effective for testing marine organisms with a variety of metals; however, our limited marine experience with sulfide addition indicates that it is effective with the amphipods, but not the mysids. Therefore, it is not essential that both manipulations reduce toxicity in order to conclude that metals are a likely toxicant. At the same time, there is no one method that is always effective. If either of these tests shows a substantive reduction in toxicity, it is probably worth exploring the possibility that cationic metals may be causative toxicants.

It's worth noting that these manipulations alters metal toxicity using a different mechanism, because each of the manipulations individually may be subject to certain interferences and/or may also reduce the toxicity of toxicants other than metals. Using these manipulations together greatly strengthens conclusions regarding the involvement of metals in sediment toxicity. For example, the cation exchange resin used may have some ability to sorb organic chemicals in addition to metals. Thus, if cation exchange resin addition reduces toxicity, metal toxicants are very plausibly the causative toxicant, but it is also possible that this reduction is an unintended artifact of sorption of an organic toxicant. If, however, toxicity is also reduced by the addition of sulfide, the case for metal toxicity is made much stronger, as it is unlikely that an organic

toxicant sorbed by SIR-300, a specific cation exchange resin (ResinTech Inc., Cherry Hill, NJ, USA), would also coincidentally be affected by the addition of sulfide.

7.2.4.1 Cation Exchange Resin Addition

Overview

Cation exchange resins generally consist of some type of silica or polymer structure coated with a specific functional group designed to form strong associations with divalent elements. Functional groups can include negatively charged carboxylic acids and imminodiacetate (Burgess et al. 1997). Binding of the dissolved positively charged metals to a cation exchange resin reduces the bioavailable concentration of metal. Addition of cation exchange resin to metal spiked sediment has been demonstrated to reduce metal toxicity in sediments (Burgess 2000); Mount et al., unpublished data).

The method described here has been developed using SIR-300. This resin was found most effective among a small group of resins evaluated by Burgess et al. (1997). Features of this resin that make it useful for this application include a relatively high affinity for metal cations of concern (e.g., copper, cadmium, zinc, nickel, lead) and low toxicity to sediment test organisms. This is not to say that SIR-300 is the only cation exchange resin that performs well for sediment TIEs; other commercially available resins may also be suitable.

Method

Freshwater and marine methodologies are very similar. We have found high purity SIR-300 to be an effective cation exchange resin. The resin should be rinsed before use by combining with deionized DI water (approximately 1:4 v/v) in a beaker, swirling the mixture to thoroughly mix and resuspend the resin, allowing the mixture to settle (e.g., 1 min.), then decanting the water. This procedure is repeated two times for a total of three DI rinses. Next, the decanted resin is combined with four volumes of saline water (e.g., 30% natural seawater or sodium chloride 30 g/L), mixed, and stored in this solution at 4°C in the dark. It is critical that the resin be stored in this solution for at least 24 hours before use; otherwise, pH anomalies may occur during the TIE.

Because the resin is stored in saline water, the freshwater and marine methods differ slightly in the method of preparing the actual test sediments. For marine sediments, the resin is removed from the storage container (taking care to allow any excess liquid to drain via gravity), measured into aliquots appropriate to bring the test sediment to 20% resin, then transferred to the test sediments, and mixed thoroughly. To ensure that the organisms are exposed to at least 20 g of the test sediment, the final weight of the sediment-resin mixture is 24 g for a 20% resin addition. Sediments are then equilibrated for at least 24 hours before organisms are added.

For freshwater sediments, the first step is to rinse the resin in DI water to remove excess salt. Previous research has suggested that the introduction of additional salt to test sediments can alter the performance of *H. azteca* and, to a lesser extent, *C. dilutus*. Once the resin has been rinsed with DI water, test sediments are prepared as described for marine sediments. Appropriate aliquots of resin are added to test sediments, mixed, and equilibrated for at least 24 hours.

Both the test sediment and a procedural blank (using control sediment) are prepared and tested.

Interpretation

Burgess et al. (2000) evaluated the comparative effectiveness of SIR-300 for reducing sediment toxicity caused by cationic metals, ammonia, and endosulfan (as an example of a nonpolar organic chemical). This research indicated that while the resin induced much greater reductions

in metal toxicity, there was some crossreactivity with both ammonia and endosulfan. Thus, reduction in toxicity by cation exchange resin addition should be viewed as consistent with the toxicity caused by metals, but not conclusive evidence by itself. As with most tests, conclusions from individual tests should be viewed in the context of the results from the entire Phase I TIE. For example, if the cation exchange test and the coconut charcoal tests both reduce toxicity but the sulfide test does not, the test might suggest that organic toxicants could be involved. If, however, the cation exchange and sulfide tests both reduce toxicity and neither the coconut charcoal or zeolite tests do, metals might be more strongly implicated. Since the cation exchange test involves a substantial physical dilution of the sediment, results of the sand dilution blank test should also be considered.

In addition to the use of cation exchange resin as a Phase I manipulation, the resin can also be sieved from the sediment at the end of the toxicity test using a 0.5 mm screen, and eluted with acid (e.g., HCl) to extract sorbed metals for chemical analysis. This is discussed at greater length in Phase II (Section 9.3).

7.2.4.2 Sulfide Addition

Overview

Reactive sulfides have been demonstrated to be a principal binding phase of toxic metals in anoxic sediments (Di Toro et al. 1990). These reactive sulfides include several different forms which are procedurally defined as AVS, which is that portion of sulfide that is liberated during an extraction with 1 N HCl at room temperature. Several common cationic metals, such as silver, cadmium, copper, nickel, lead, and zinc, react with AVS to form highly insoluble precipitates. Concentrations of these toxic metals in sediment are quantified in the same extraction used to measure AVS, and are referred to as "simultaneously extracted metal" (SEM). The relationship between concentrations of SEM and AVS and the presence of sediment toxicity has been studied extensively (Ankley et al. 1996). These studies have suggested that when the molar concentration of AVS exceeds that of SEM, these cationic metals are essentially all present as metal sulfide precipitates and do not cause sediment toxicity.

More recently, the effects of sediment organic carbon, along with AVS, has been incorporated into assessing the bioavailability and toxicity of metals in sediments. The USEPA equilibrium partitioning sediment benchmark (ESB) document for metal mixtures (USEPA 2005) discusses this topic in detail, and the reader is encouraged to review this document. By understanding the chemistry of AVS, organic carbon, and metals in a given sediment, it is possible to make an informed assessment of whether or not an adverse effect is expected. Interpretation of the ESB with respect to cadmium, copper, lead, nickel, silver, zinc, and chromium is driven by four assumptions:

- Any sediment with AVS > 0.0 will not cause adverse biological effects due to chromium or silver.
- Any sediment in which $(SEM–AVS)/f_{OC} < 130$:mol/g_{OC} should pose low risk of adverse biological effects due to cadmium, copper, lead, nickel, silver, and zinc.
- Any sediment in which 130 :mol/g_{OC} < $(SEM–AVS)/f_{OC} < 3{,}000$:mol/g_{OC} may have adverse biological effects due to cadmium, copper, lead, nickel, or zinc.
- In any sediment in which $(SEM–AVS)/f_{OC} > 3{,}000$:mol/g_{OC} adverse biological effects due to cadmium, copper, lead, nickel, or zinc may be expected.

Therefore, any sediment in which (SEM–AVS)/f_{OC} < 0.0 should have low risk of adverse biological effects due to chromium or silver, because AVS must be greater than 0.0 for this to be true. It should also have low risk of adverse biological effects due to cadmium, copper, lead, nickel, silver, and zinc. Sediments with (SEM–AVS)/f_{OC} > 3,000 :mol/g_{OC} in which AVS does not exceed 0.0 may have adverse biological effects due to chromium or silver, and adverse effects due to cadmium, copper, lead, nickel, silver, and zinc should be expected. Predictions of the adverse effects due to cadmium, copper, lead, nickel, silver, zinc, and chromium in sediments with other combinations of AVS and (SEM–AVS)/f_{OC} can be made by applying the four assumptions listed above. These interpretations and the science behind them are discussed in greater detail in USEPA (2005).

> **Note**: There is some controversy about the "bioavailability" of sulfide-bound metals for biological uptake (Lee et al. 2000), but there is little direct evidence that sulfide-bound metals cause sediment toxicity. However, when the molar concentration of SEM exceeds that of AVS, concentration of dissolved metal in interstitial water tends to increase, as does sediment toxicity. The purpose of the sulfide test is to increase the concentration of AVS in a sediment, thereby precipitating toxic (sulfide-reactive) metals and reducing their toxicity.

While the concept is simple, the execution is less straightforward. One of the most common pools of AVS in sediments is amorphous iron sulfide (FeS). While FeS is relatively insoluble, it is more soluble than sulfides of metals such as cadmium, copper, nickel, lead, zinc, and silver, which can replace iron in a reaction such as:

$$FeS_{(solid)} + Me^{++}_{(aq)} \Rightarrow MeS_{(solid)} + Fe^{++}_{(aq)}$$

Unfortunately, there are many geochemical forms of FeS, and not all are reactive. For example, commercially available FeS shows very low reactivity when exposed to copper in solution (E.N. Leonard, unpublished data). Reactive amorphous FeS can be created in the laboratory by reacting iron sulfate ($FeSO_4 \bullet 7H_2O$) with sodium sulfide ($Na_2S \bullet 9H_2O$); as both are highly soluble in water, each can be dissolved separately in a small amount of water and added to sediment (Gonzalez 1996; Leonard et al. 1999; Mahoney et al. 1996).

Because free sulfide is toxic to aquatic organisms, combining the sulfide with iron to produce FeS has the advantage of providing reactive sulfide in a form that is not toxic to test organisms. For this reason, this was the approach taken in initial development of a TIE procedure emphasizing sulfide binding of metals (Leonard et al. 1999) and allowed the addition of large amounts of supplemental AVS without causing blank toxicity. However, when large amounts of FeS are added to sediments containing an AVS-reactive metal such as copper, the resulting formation of CuS liberates large amounts of free Fe^{++}; this reduced iron is then oxidized to Fe^{+++} which then precipitates as $Fe(OH)_3$ forming a layer of orange flocculent material and also reduces pH. This raised the concern that adding AVS in the form of FeS might cloud the results of TIE tests by substituting one cause of toxicity for another.

Subsequent experiments were conducted in which only sulfide (as $Na_2S \bullet 9H_2O$) was added to sediment. These experiments showed that in the sediments tested, 10 to 20 µmol $S^{=}$/g dwt could be added without causing blank toxicity. In addition, this direct sulfide addition was successful in reducing the toxicity of several metals, including cadmium, copper, nickel, and zinc. We were somewhat surprised that the addition of substantial amounts of sulfide could be tolerated by the test organisms. We presume the sulfide addition did not cause toxicity because of the presence of excess iron or other substances that bound the added sulfide and reduced its toxicity. If this is the

mechanism, it can be expected that the ability of a sediment to accept additional sulfide without inducing sulfide toxicity will likely vary across sediments depending on their individual chemistry.

The amount of sulfide to be spiked is logically proportional to the amount of SEM to be bound. If SEM and AVS measurements are available for the toxic sediment, our experience suggests that spiking sulfide at 5 μmol higher than the difference between SEM and AVS is effective. For example, if SEM = 12 μmol Me^{++}/g dwt and AVS = 6 μmol S/g dwt, 11 μmol/g dwt would be the suggested sulfide spike. If SEM and AVS are not known, we suggest a default spiking level of 20 μmol S/g dwt unless the sediment is very sandy and/or has very low organic matter, which is often correlated with low concentrations of heavy metals. In those cases, a spike of 10 μmol S/g dwt may be more appropriate. When space allows and the degree of metal contamination is uncertain, we have also included an additional treatment at 30 μmol S/g dwt.

Method

Sulfide is added to sediment by dissolving $Na_2S•9H_2O$ crystals in water, then adding this solution to sediment. Because $Na_2S•9H_2O$ crystals oxidize on the outer surfaces, the crystals should be washed. This is performed by placing $Na_2S•9H_2O$ crystals in a beaker with enough DI water to cover the crystals, swirling the beaker, then decanting the water and blotting the crystals dry. The amount of sulfide to be weighed out is determined by the desired spiking level and grams (dwt) of sediment to be spiked. It may be calculated according to the formula where *x* is the desired spiking level and *y* is the g dwt of sediment to be spiked:

mg $Na_2S•9H_2O$ = *x* μmol S/g dry sediment × 0.240 mg $Na_2S•9H_2O$/μmol S × *y* g dry sediment

For a spiking level of 20 μmol S/g dwt, the calculation reduces to:

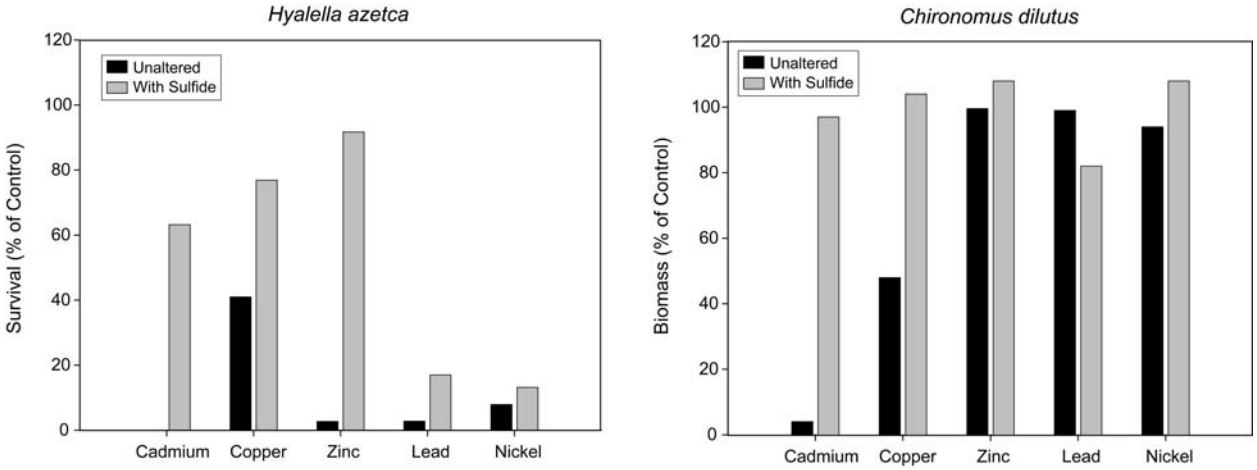
mg $Na_2S•9H_2O$ = 4.8 mg $Na_2S•9H_2O$/g dry sediment × *y* g dry sediment

The appropriate amount of sulfide is dissolved in a small amount of water (less than 10% of the sediment volume to be spiked) and stirred into the sediment. The mixed sediment is allowed to equilibrate for 24 to 96 hours before test organisms are added. Although equilibration time for sulfide spiking has not been extensively studied, our existing data suggest the reaction is rapid (hours). Longer equilibration times have generally been used for logistical reasons, as some other manipulations (e.g., zero-valent magnesium addition, Section 9.2.2) do have kinetic limitations and it can be convenient to prepare all sediment manipulations at the same time. After equilibration, toxicity of sulfide-spiked sediment is tested using the general procedures (Section 7.1). A control sediment spiked with sulfide is included as a blank.

Interpretation

The effectiveness of the sulfide test to remove metal toxicity depends in part on the amount of the sulfide spike relative to the excess of SEM present in the sediment; if this is not known, it is difficult to know whether a lack of toxicity reduction is because metals are not the cause of toxicity, or that insufficient sulfide was added to the sediment. We have generally found that a sulfide addition of 20 μmol S/g dwt is sufficient to reduce the toxicity of metals in sediments, provided that the toxicity is not extreme (Figure 7–2).

Figure 7–2 Effect of Sulfide Addition on the Toxicity of Metal-spiked Sediments to *H. azteca* and *C. dilutus*



The interpretation of blanks in the sulfide test can be very difficult. Unlike most TIE manipulations that add a material thought to be relatively harmless, the sulfide test adds a material known to be quite toxic to benthic organisms. Moreover, the resulting chemistry in test and control sediments may be very different. For example, if the control sediment does not have sufficient free iron to reduce sulfide concentrations in interstitial water, the sulfide addition may cause toxicity in the blank. However, if that same spiking level is added to a sediment with an excess of toxic metals, the sulfide may be consumed largely through precipitation of those toxic metals and a decrease in toxicity may be observed. The presence of blank toxicity is not necessarily indicative of a bad test; if a reduction in toxicity of the toxic sediment is observed, it can probably be interpreted as indicating the possibility of metal toxicity even if blank toxicity is observed.

If blank toxicity is observed and the toxicity of the sediment is not reduced, it is difficult to know whether it is because too much sulfide was added to both sediments, or because metals are not the cause of toxicity (or both). Theoretically, it is even possible that the control sediment could be toxic because of too much sulfide (causing sulfide toxicity) and the toxic sediment remains toxic because of too little sulfide (residual metal toxicity). In such cases, results of other manipulations targeting metals should be considered carefully to aid in the interpretation. One may also consider conducting an additional test with a different level of sulfide addition or, even better, multiple levels.

7.2.5 Organic Toxicants

There are two Phase I whole sediment TIE methods for characterizing toxicity caused by the very large group of chemicals categorized as nonpolar organic toxicants: the addition of coconut charcoal and the addition of carbonaceous resin. Both methods share the same theory of operation: by reduction of the activity of organic chemicals in the sediment through sorption.

Organic toxicants, particularly those that are comparatively nonpolar, are strongly sorbed to the organic carbon phase in sediments. Di Toro et al. (1991) argued that the toxicity of nonpolar organic chemicals in sediment can be predicted based on the distribution of chemical between organic carbon and interstitial water. Extending this theory, one would predict that changing the relative partitioning of chemical between organic carbon and interstitial water would also change the toxicity of the sediment. The partitioning described by DiToro et al. was based on naturally

occurring or diagenic organic carbon. However, there are other materials, such as coconut charcoal, that have much higher affinity for nonpolar organic toxicants than most naturally occurring organic carbon in sediments. Therefore, if one amends a contaminated sediment with a high-affinity carbon source, like coconut charcoal, one can expect a reduction in the concentration of nonpolar organic chemicals in the interstitial water and, consequently, a reduction in sediment toxicity. This prediction has been borne out in experiments (Anderson et al. 2006a; Ho et al. 2004; Kosian 1998; Kosian et al. 1999). The high-capacity resin and coconut charcoal addition methods reduce the bioavailability of organic toxicants by adding a nontoxic excess of organic carbon to the test sediment. This approach has been found to reduce the toxicity of fluoranthene and endosulfan in spiked sediments and PCB and PAHs in environmentally-contaminated sediments (Table 7–1; Ho et al. 2004; Kosian et al. 1999).

The two types of high-affinity carbon sources that have been used for whole sediment TIEs are coconut charcoals and carbonaceous resins, specifically, Ambersorb resins (Rohm & Haas, Philadelphia, PA, USA). Both coconut charcoal and Ambersorb resins come in different particle sizes/types and these differences affect their performance in TIEs tests. In general, powdered coconut charcoal appears to have greater influence on the toxicity of organic chemicals (per unit mass), although Ambersorb has shown a lesser degree of blank toxicity or decreased biomass in 10-day tests with freshwater organisms.

Table 7–1 Effectiveness of Powdered Coconut Charcoal and Ambersorb in Removing Toxicity from Spiked and Field Contaminated Sediments (% Survival)*

Sediment	**No Treatment**		**Coconut Charcoal Addition**		**Ambersorb Addition**	
	A. bahia	*A. abdita*	*A. bahia*	*A. abdita*	*A. bahia*	*A. abdita*
Endosulfan-spiked sediment	0	0	100 (0)	100 (0)	_	_
New Bedford Harbor Sediment (PCB contamination)	45 (7)	0 (0)	93 (6)	83 (6)	93 (6)	80 (10)

Source: Ho et al. 2004

*Values in parentheses represent standard deviation of three replicates; –, not tested

Coconut charcoal has not shown blank toxicity to marine organisms in tests as long as 10 days, nor has Ambersorb in 48-hour survival tests (longer tests have not been conducted).

Experiments with both coconut charcoal and Ambersorb resins have shown that the ability of these manipulations to reduce sediment toxicity is not only a function of what toxicants are involved, but also their relative concentration. For example, both coconut charcoal and Ambersorb were ineffective at reducing the toxicity of a field collected sediment heavily contaminated with DDT and metabolites. However, that sediment was extremely toxic, requiring more than a 100-fold dilution to eliminate most of its toxicity. While coconut charcoal and Ambersorb were not able to reduce toxicity of the undiluted sediment, both were effective at reducing toxicity of dilutions of that sediment (unpublished data, D. Mount, USEPA, Mid-Continent Ecology Division, Duluth, MN). This emphasizes the importance of understanding the degree of toxicity in the test sediment, and of working with an appropriate dilution of that

sediment during TIE studies. If the sediment is so toxic as to overwhelm the capacity of the charcoal or Ambersorb amendments, one may erroneously conclude that organic toxicants are not involved in sediment toxicity when in fact they are. This is particularly true for freshwater organisms, for which lower amounts of charcoal must be added to avoid creating blank toxicity. Conversely, when one dilutes a sediment, marginally toxic compounds may be diluted to below their toxic threshold, which may result in identifying only the most toxic components in a sediment.

7.2.5.1 Coconut Charcoal Addition

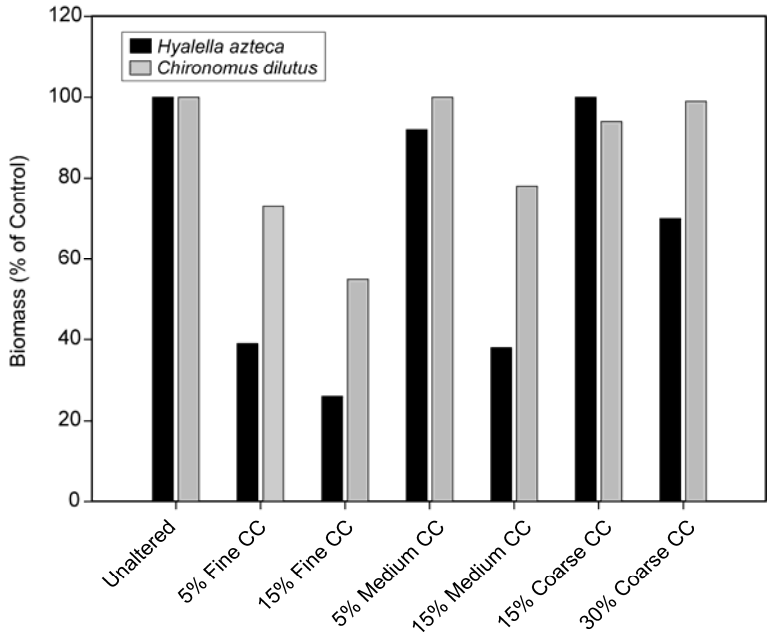
Overview

Coconut charcoal addition is believed to reduce toxicity of many organic toxicants by providing a high-affinity binding site and thereby reducing chemical activity/toxicity of those chemicals. In general, binding capacity of sorbents such as charcoal is proportional to surface area, and therefore small particle sizes should be more effective at sorbing organic chemicals in sediments. Initial development of this method was conducted using marine sediments and a "powdered" form of coconut charcoal (90 to 96% < 45 μm or capable of passing through a 325 screen (PCB, Carbon-G, Calgon Carbon Corporation, Pittsburg, PA, USA). This form of charcoal was not only effective at sorbing organic chemicals, but also appeared to be essentially nontoxic to *A. abdita* and *A. bahia* in 4- to 10-day survival tests. A 15% (wwt/wwt) addition has been used extensively for marine sediment TIE. This and other coconut charcoals we have evaluated have all been obtained from the Calgon Carbon Corporation. It is quite possible that other sources of charcoal may also be effective, but we have not experimented with them. If other sources are used, they should be tested for blank toxicity, as well as their effectiveness removing the toxicity of representative organic compounds in sediment.

When this technique was explored with freshwater organisms in 10-day tests (measuring survival and growth), some problems with reduced growth and/or survival occurred at higher levels of charcoal addition. This led to the evaluation of three different particle sizes of coconut charcoal, referred to as "fine" (the <45 μm size used for marine TIE), "medium" (44 to 177 μm; TOG-CA, and "coarse" (105-595 μm; PCB 30 to140). All three of these particle sizes have been successfully used in freshwater sediment TIE studies, but the ability of the test organisms to tolerate the charcoal additions varies. Figure 7–3 shows that reduced growth and/or survival decreases with decreasing addition rate within a particle size and with increasing particle size within a single addition rate.

For *C. dilutus*, larvae will survive large additions of any of the charcoal particle sizes, but suffer effects on growth with increasing carbon additions. For fine charcoal, a 2% addition allows growth comparable to a control, while 5% and 15% additions reduce growth to about 75% and 55% of the control, respectively. For medium particle size charcoal, growth at a 5% addition is close to control, but is reduced to about 80% of control by a 15% addition. Coarse carbon is tolerated by *C. dilutus* at both 15% and 30% additions. Sensitivity of *H. azteca* is similar, with additions of 5% fine, 5% medium, and 15% coarse supporting good survival. These relative concentrations of fine, medium, and coarse charcoal are similar in terms of total surface area added, which increases (per unit weight) with decreasing particle size.

Figure 7–3 Sublethal Response of *H. azteca* and *C. dilutus* to Different Particle Sizes and Addition Rates of Coconut Charcoal to an Uncontaminated Sediment



On the other hand, chemical sorption by coconut charcoal can be expected to increase with increasing surface area (decreasing particle size) and increasing amount of carbon added. Thus, selecting the appropriate charcoal additions for use in TIEs relies on balancing the opposing effects of blank toxicity and sorption ability. Generally, we have come to rely on additions of 2% fine and/or 5% medium coconut charcoal for freshwater TIE work. Exceeding those additions is very problematic for *H. azteca* because survival decreases rapidly above those values, rendering the data useless. For *C. dilutus*, organisms survive higher additions, but growth is reduced. Accordingly, higher additions can be used for *C. dilutus*, but one must expect that growth can only be improved to a degree, since the carbon itself has an impact on growth.

Method

Freshwater and marine methods are similar. The coconut charcoal must be hydrated before use by combining it with DI water (1:2, v/v) under vacuum for approximately 18 hours (overnight). The vacuum should be strong enough to remove air from the system so the water contacts the coconut charcoal without the interference of air bubbles. We have found our in-house vacuum (14-25 lbs psi) is adequate. A sealed vacuum flask containing a mixture of charcoal and DI water has been found to effectively hydrate the material. After the charcoal is hydrated, filtration (glass fiber) or centrifugation (220 to 230 x g for 30 min.) has been successfully used to remove excess water; residual moisture content is typically about 60%. Alternatively, we have also had success by simply combining charcoal and water in a ratio of 40% dry charcoal to 60% water (both by weight), mixing thoroughly, and placing under vacuum overnight. This approach seems to adequately wet the charcoal and avoids the filtration or centrifugation steps. The hydrated coconut charcoal has a paste-like consistency. Regardless of the preparation method used, the hydrated coconut charcoal is stored under refrigeration in the dark until use.

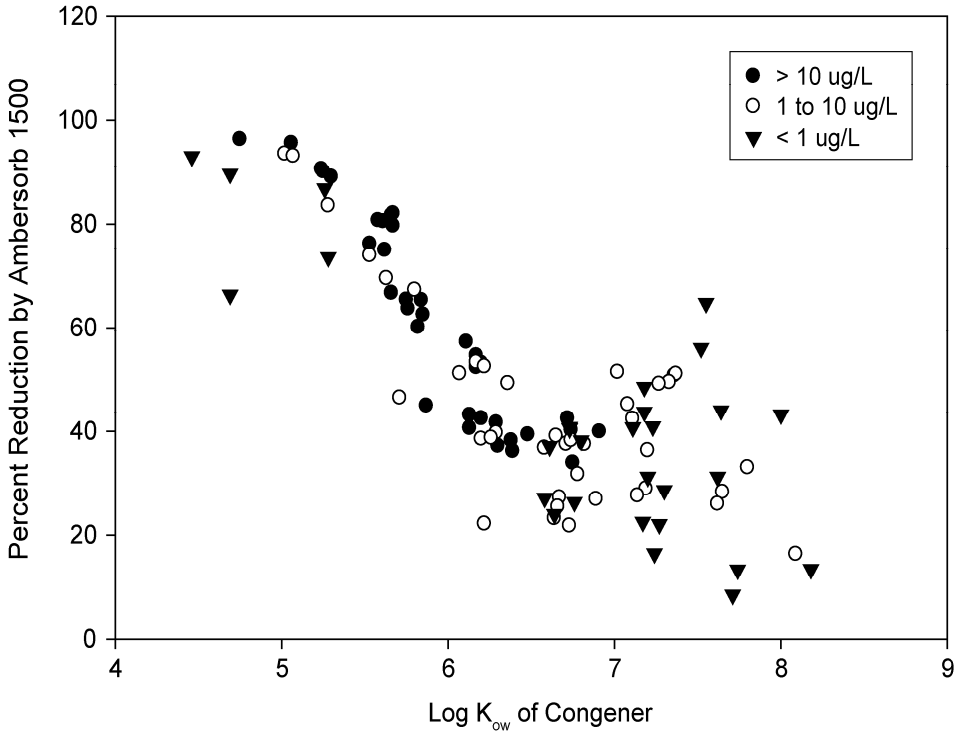
The marine test organisms evaluated have shown a higher tolerance for coconut charcoal. For that reason, we recommend using a 15% (wwt/wwt; for a total of 23 g sediment-charcoal

mixture) addition of fine coconut charcoal for marine TIE, to maximize the sorptive capacity of the addition. For 10-day freshwater tests with *H. azteca* and *C. dilutus*, we generally recommend an addition of either 2% fine or 5% medium (both wwt/wwt) coconut charcoal to avoid blank toxicity. Whatever the selected addition rate, the appropriate amount of wetted coconut charcoal is calculated, weighed, and mixed into the sediment sample. The water–coconut charcoal/sediment combination is allowed to equilibrate for at least 24 hours before organisms are added. Procedural blanks are also prepared using control sediment.

Interpretation

Addition of coconut charcoal has been shown to be highly effective in reducing the bioavailability and/or toxicity of several organic chemicals, including endosulfan, dieldrin, fluoranthene, nonylphenol, and tetrachlorobenzene in spiked sediments, and DDT, PCBs, and PAHs in field-collected sediments (Table 7-1; Figure 7-4; Anderson et al. 2006a).

Figure 7–4 Reduction in Concentration of Individual PCB Congeners in the Interstitial Water of a Field-collected Sediment Following Treatment with 4% Ambersorb 1500*

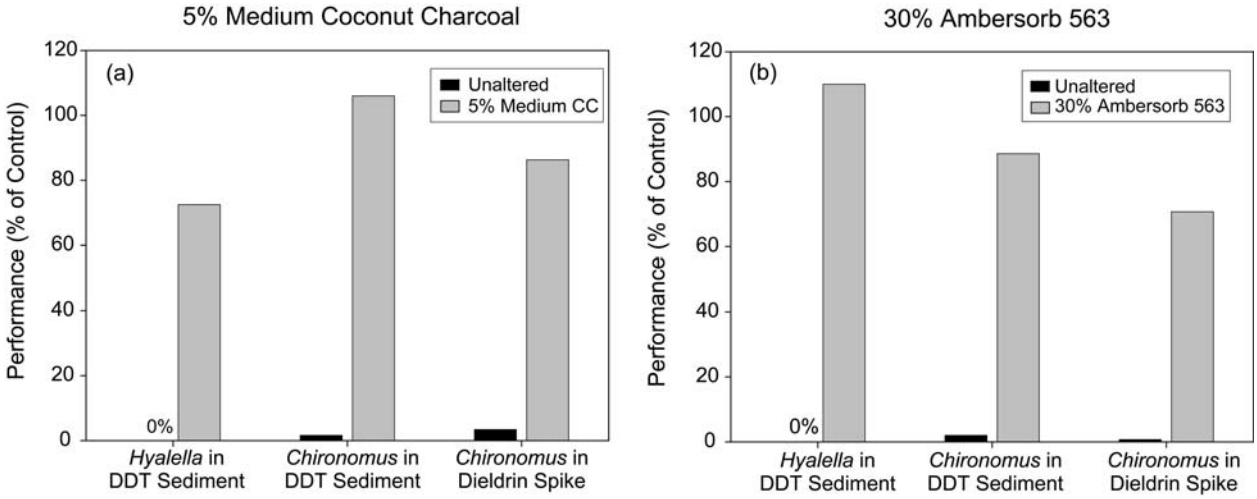


Source: D. Mount, unpublished data, USEPA, Duluth, MN

*Data coded by the measured concentration in untreated sediment because of greater analytical uncertainty for congeners present at low concentration

Figure 7-5 demonstrates how both coconut charcoal and Ambersorb decrease the toxicity of a dieldrin-spiked sediment and a DDT contaminated field sediment to *H. azteca* and *C. dilutus.*

Figure 7-5 Response of *H. azteca* and *C. dilutus* to a Field Sediment Contaminated with DDT and a Clean Sediment Spiked with Dieldrin



While coconut charcoal is effective for many organic chemicals, it must be recognized that other chemicals may also be affected by charcoal addition. For example, coconut charcoal is known to adsorb ammonia (NH_3) and some metals. For this reason, the results of coconut charcoal tests must be interpreted in conjunction with other Phase I tests to help determine whether other toxicants may be implicated. It is also possible to use coconut charcoal in combination with other manipulations, such as *U. lactuca* and/or zeolite addition.

For *H. azteca* and *C. dilutus*, the charcoal addition rates recommended here (2% for fine; 5% for medium) are very close to concentrations that cause blank toxicity to these organisms. In particular, we have occasionally seen some blank toxicity of the 2% fine addition to *H. azteca*. For this reason, it is especially important to include and evaluate procedural blanks to determine how much toxicity removal might be expected.

As indicated in Section 7.2.5, the detoxifying influence of coconut charcoal can be overwhelmed if the concentration of organic toxicants is higher than can be effectively sorbed. Therefore, it is important that the test sediment be diluted sufficiently such that it is not highly toxic. If the sediment is so toxic as to overwhelm the sorptive capacity of the charcoal, one may conclude that organic toxicants are not involved when in fact they are.

We have found some cases where sediments ostensibly contaminated with PAHs have shown toxicity that is not removed by coconut charcoal addition. This is contrary to expectation, since PAHs are known to sorb to coconut charcoal. Section 9.7 contains a broader discussion of this issue and should be consulted for further details.

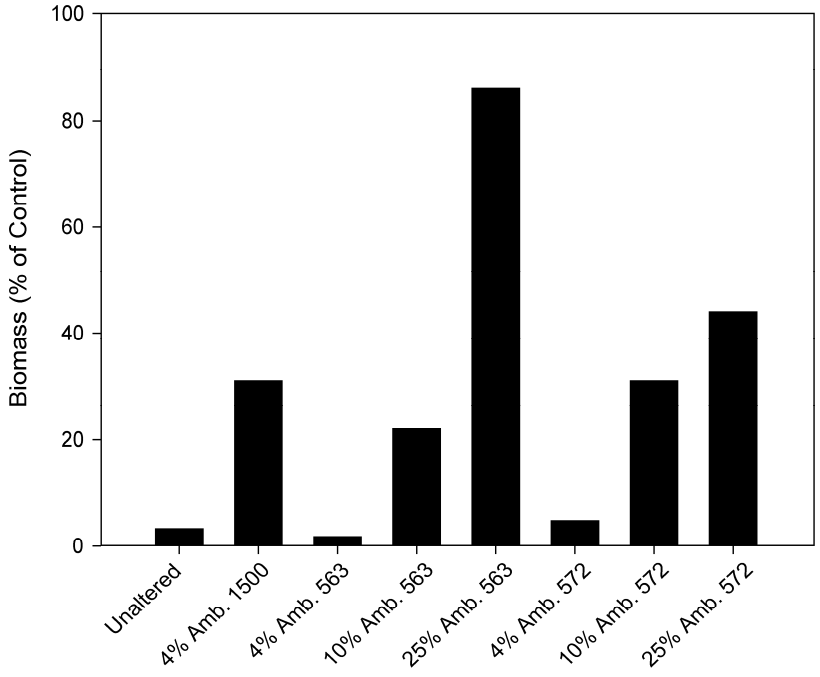
7.2.5.2 Carbonaceous Resin Addition

Overview

The addition of carbonaceous resin follows the same concept as coconut charcoal, using a high affinity sorbent to reduce bioavailability of organic toxicants. Initial development of this technique used Ambersorb 1500 as well as Ambersorb 563 and 572 (Rohm and Haas, Spring House, PA, USA), closely related resins that have somewhat larger particle size and somewhat lower sorptive capacity. Ambersorb 1500 was discontinued in the late 1990s while Ambersorb 563 was discontinued in 2006. While Ambersorb 563 and 572 have also been shown to be effective for TIEs, they have required that larger amounts of resin be added to achieve comparable reductions in toxicity, relative to Ambersorb 1500 (Figures 7–5 and 7–6). Because Ambersorb 563 was more effective than 572 in our trials, our ongoing work with Ambersorb resins has focused on 563. Other carbonaceous resins may also be effective for use in TIE, but we have only limited experience with other types of resin. Prior to using alternative resins in sediment TIE, the effectiveness and blank toxicity of those resins should be determined.

Ambersorb resins may be preconditioned with water using methods similar to those described for coconut charcoal, but experiments in freshwater have not indicated that this is necessary to achieve effectiveness. Although hydration has been used in Ambersorb experiments conducted in marine TIEs, Ambersorb resins have been added dry in freshwater experiments with comparable success.

Figure 7–6 Effectiveness of Different Ambersorb Resins and Addition Rates on the Response of *C. dilutus* Exposed to Dieldrin-spiked Sediment



Ambersorb resins appear to be equally nontoxic to test organisms relative to coconut charcoal. In freshwater tests, additions up to 30% have been tested without observing reduced growth and/or survival in the blank. For *A. abdita* and *A. bahia*, a 20% addition of Ambersorb 1500 did not cause reduced growth and/or survival (higher additions not tested). Because of the low rates of reduced growth and/or survival in the blanks, we recommend using Ambersorb resins at these

maximum addition rates. For a given percentage addition, Ambersorb 563 has a lesser ability to sorb contaminants than does fine coconut charcoal, reinforcing the need to use high addition rates.

Method

Ambersorb may be hydrated before adding it to sediment, but freshwater TIE studies have not indicated that this is necessary. The procedure for hydrating the resin is similar to that described for coconut charcoal. Resin is combined with DI water (1:2, v/v) under vacuum for approximately 18 hours. The slurry is then filtered (glass fiber filter) to remove excess water and stored at 4˚C in the dark until use.

We currently recommend a 20% Ambersorb addition (wwt hydrated resin to wwt sediment; 24 g total resin-sediment mixture) for *A. abdita* and *A. bahia*, and a 30% addition (dwt resin to wwt sediment; 26 g total resin sediment mixture) for *H. azteca* and *C. dilutus*. The appropriate amount of resin is added directly to sediment and mixed. The amended sediment may be added directly to test beakers and placed in the test system for 24 hours to equilibrate. Alternatively, the mixed sediment can be sealed with nitrogen and/or minimum headspace and held under refrigeration for 24 to72 hours before placement in test beakers. Procedural blanks should be prepared using control sediment and these same procedures.

Interpretation

If the addition of carbonaceous resins reduces the sediment toxicity, organic toxicant(s) can be suspected. As an example, Ambersorb 1500 addition reduced the toxicity of a PCB contaminated sediment from New Bedford Harbor, MA, USA (Table 7-1 and Figure 7–4). Figure 7–5b shows the effect of Ambersorb 563 on the toxicity of a DDT-contaminated field sediment and a dieldrin-spiked sediment. Additionally, other researchers have shown that Ambersorb 563 is effective in removing organic toxicity from marine and freshwater sediments spiked with fluoranthene, nonylphenol and tetrachlorobenzene, and from toxic marine and freshwater field sediments (Anderson et al. 2006a). Sediment toxicants affected by Ambersorb addition would generally be expected to be affected by coconut charcoal addition also. The reverse is less true, since coconut charcoal can be expected to address a larger range of toxicants than Ambersorb. Because the volume dilution of sediment by Ambersorb addition is high, results should also be compared to a sand dilution blank. Blank toxicity in Ambersorb tests has been observed only rarely.

As indicated in Section 7.2.5, the detoxifying influence of Ambersorb resin can be overwhelmed if the concentration of organic toxicants is higher than can be effectively sorbed. For that reason, it is important that the test sediment be diluted sufficiently that it is not highly toxic. If the sediment is so toxic as to overwhelm the sorptive capacity of the Ambersorb, one may conclude that organic toxicants are not involved when in fact they are. Furthermore, it appears that the sorptive capacity (in the context of toxicity removal) of coconut charcoal is larger than that of Ambersorb 563. Accordingly, it is possible that in highly toxic sediments, one might see removal of toxicity from organic toxicants by coconut charcoal in instances where the capacity of Ambersorb 563 is overwhelmed and toxicity is not reduced or removed. Both of these possibilities emphasize the importance of appropriately diluting highly toxic sediments.

As with coconut charcoal, we have found some cases in which sediments ostensibly contaminated with PAHs have shown toxicity that is not removed by Ambersorb addition. This

is contrary to expectation, since PAHs are known to sorb to Ambersorb. Section 9.7 contains a broader discussion of this issue and should be consulted for further details.

7.2.6 Whole Sediment Dilution Blank Test

Several of the Phase I tests involve a considerable volume dilution of the test sediment (e.g., zeolite test, cation exchange test, coconut charcoal test, carbonaceous resin test). Beyond the active chemical influence intended by these additions, it is unavoidable that they also affect the nature of the sediment by dilution alone. Therefore, we recommend that the Phase I characterization include a dilution blank of a relatively inert material such as quartz sand or clean muffled beach sand. The sand dilution blank differs from the sediment diluent (Section 7.2.1). The sediment dilution is performed to determine the working concentration of the toxic sediment and has the same physical characteristic (carbon content, grain size) as the test sediment, but has no toxic constituents. The sand diluent blank is performed to determine if volume alone would change the results of the toxicity test and is an inert substance.

Overview

The concept behind the sand dilution blank test is to add a relatively inert substance that provides a volume dilution of the test sediment without engaging in other types of sorption or exchange reactions. Interestingly, equilibrium partitioning theory (Di Toro et al. 1990;1991) would suggest that adding an inert material to sediment should have little effect on toxicity. If it is truly inert, adding the material should not alter the partitioning or chemical activity of chemicals in sediment. However, because we may not fully understand the ways in which organisms or chemicals interact with sediment, it is possible that a large volume dilution (e.g., 30%) of a sediment may alter the exposure of test organisms to sediment contaminants. Because of this uncertainty, we recommend including the sand blank dilution test in the Phase I test battery.

Method

Two materials have been used as the diluent in this test. Either is suitable:

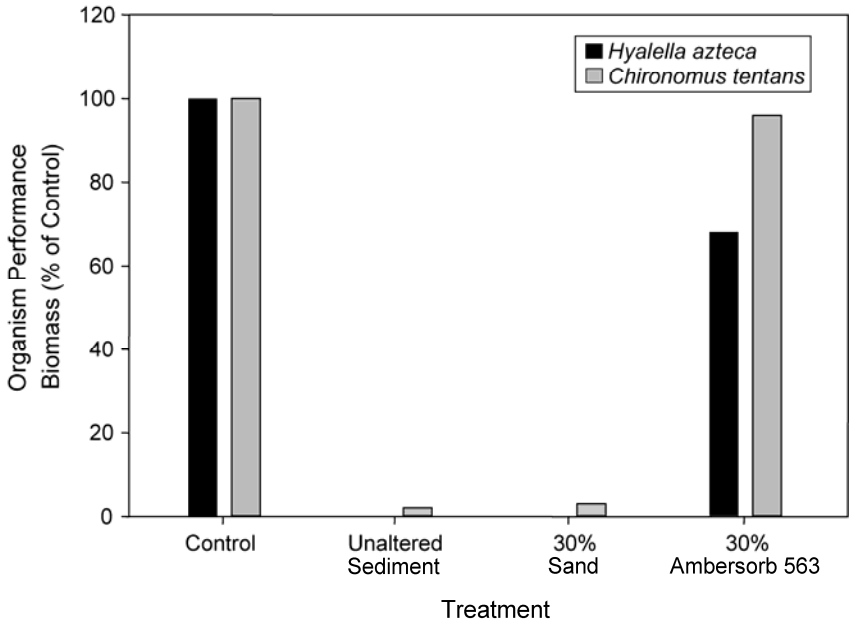
- Clean quartz sand
- Clean beach sand that has been muffled at 450°C for 6 hours

To conduct the test, simply weigh out the appropriate mass of dry sand. Because the density of sand and of various amendments used in Phase I differ, selecting the percentage addition for this test is somewhat arbitrary. We typically use a 30% (dwt/wwt) addition, which is close to or above the amendment addition rate for most Phase I tests. The dry sand is mixed directly into the test sediment and then either placed directly into test beakers and into the test system, or held under conditions paralleling those of other Phase I manipulations. If the source of sand is known to be nontoxic, it is not considered necessary that a control sediment be included as a procedural blank.

Interpretation

If the sand dilution blank test shows a reduction in toxicity, one must be cautious about the effect on other tests with large volume dilutions (e.g., zeolite test, cation exchange test, coconut charcoal test, carbonaceous resin test). In our experience, the sand dilution blank rarely shows a substantive change in toxicity from that in the test sediment, except in some sediments that are very marginally toxic (Figure 7–7).

Figure 7–7 Results of Sand Dilution Blank Test



7.2.7 Other Forms of Carbon Addition

Addition of other forms of carbon may prove useful for performing whole sediment TIEs. The addition of TENAX and XAD resins and silicon rubber have been used in Europe (personal communication, Werner Brack, UFZ Centre for Environmental Research Leipzig, Germany). For example, in The Netherlands, Rotteveel and Bakker (2005) reported on the development of TIE methods using TENAX resin and silicon rubber additions. These methods may prove useful in whole sediment TIE applications.

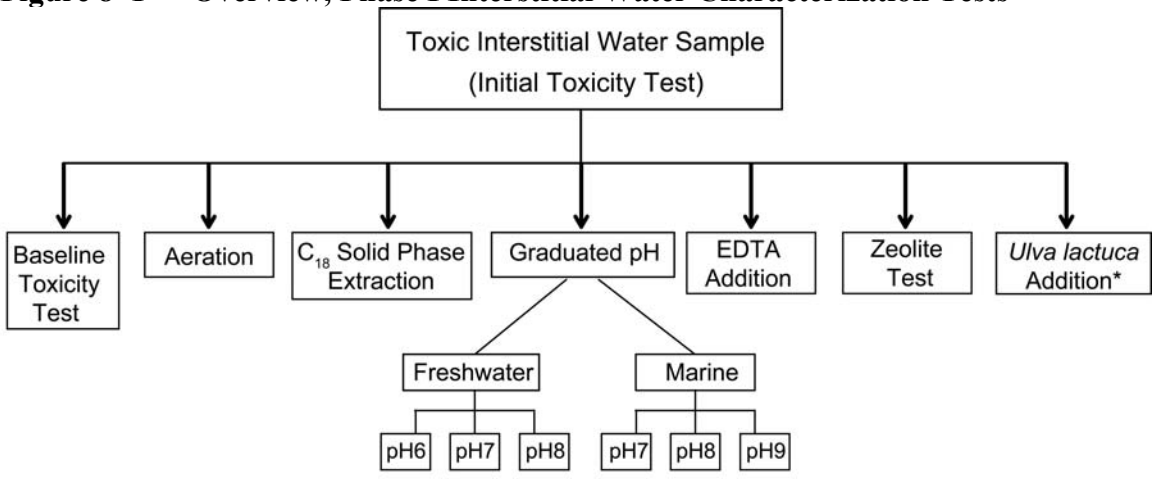
8 Phase I Overview and Methods: Interstitial Water

This section describes characterization (Phase I) procedures for interstitial water and other aqueous preparations from sediments. Following the guidance in Section 6, use of these procedures for sediment TIE presumes that the IW from the sediment is toxic, and that an appropriate test organism has been selected. Phase I procedures for IW are patterned closely after those used for other water column samples with some changes. When procedures do not deviate from those used for effluents and ambient waters, we do not describe them in detail. Therefore, in order to use this guidance, it is essential to be familiar with TIE manuals for effluents and ambient waters (USEPA 1989a; 1991a; 1991b; 1992b; 1993a; 1996)

Perhaps the greatest practical challenge in conducting TIE testing on IW is the difficulty in obtaining sufficient amounts of IW. With this in mind, the set of Phase I manipulations recommended for Phase I has been reduced from those recommended for effluent or ambient water TIE. As in previous guidance, we recommend the TIE begin with initial testing to determine the toxicity of the sample, which, among other things, aids in determining the dilution series to be used in the full Phase I. The Phase I itself consists of six procedures (Figure 8–1):

- Baseline Test – to determine the toxicity of unaltered IW; serves as a point of comparison for other manipulations
- Aeration Test – to evaluate volatile, sublatable (solid deposition onto a surface via the surface of air bubbles), or easily oxidized toxicants
- Solid-Phase Extraction (SPE) Test – targeted to remove nonpolar organic toxicants
- EDTA Addition Test – to address cationic metals
- *Ulva* Addition Test (marine only), or Zeolite Test – to remove ammonia
- Graduated pH – to evaluate the pH sensitivity of the toxicity

Figure 8–1 Overview, Phase I Interstitial Water Characterization Tests



*Not used in freshwater interstitial TIEs

Each of these manipulations has been divided into three sections: overview, method, and interpretation. Tests that have been eliminated from the original Phase I characterization for water column samples (USEPA 1991a; 1991b) are the oxidant reduction (thiosulfate addition) test, the filtration tests, and the pH adjustment tests, including filtration, aeration, and SPE at high and low pH. The oxidant reduction test was eliminated from Phase I because the conditions in natural sediments are such that oxidizing compounds potentially found in effluents (e.g., chlorine) are not likely to occur in sediments. Thiosulfate addition does affect the toxicity of some metals and can be useful in identifying specific metals (Hockett and Mount 1996; Schubauer-Berigan et al. 1993). However, given that EDTA is a fairly robust test for metals, we are recommending using thiosulfate addition as a Phase II procedure, rather than a routine part of Phase I.

Filtration through 1 μm glass fiber filters has been found to reduce the toxicity of many IW samples, but we are suggesting that it be dropped from Phase I as well because we believe that this removal is rather nonspecific, or at least it occurs by several mechanisms. Therefore it would not add a lot of diagnostic power to the Phase I, even if it does reduce toxicity. However, filtration has another important use in Phase I: its use as a pretreatment for the SPE manipulation, removing particulates so that the SPE column doesn't clog. For IW TIE, we suggest that double centrifugation be used to remove particulates, and that the SPE test be conducted without prefiltration. Section 8.3.5 contains a more detailed discussion of this change and its implications.

The pros and cons of performing the aeration, filtration, and SPE manipulations at high and low pH in Phase I have been debated since the issuance of the original TIE guidance in the late 1980s. On the positive side, pH sensitivity of these manipulations has been shown for many toxicants, such as precipitation/filtration of cationic metals at high pH, increased volatility of sulfide and cyanide at lower pH, and degradation of certain chemicals at extreme pH (e.g., malathion degradation at pH 3). All of these behaviors provide significant information to aid in either the identification or confirmation of the suspect toxicants. However, inclusion of these manipulations greatly increases the time required to perform the Phase I manipulations and, perhaps more importantly for IW TIE, the volume of sample required to complete Phase I. Based on our current experience, we believe reducing the volume of IW required is a significant benefit of eliminating these extra manipulations, and are therefore recommending that the manipulations at extreme pH be reserved as manipulations to be conducted during Phase II as required.

These and the other deletions are being done primarily for expediency, and there is no reason they couldn't be included in Phase I if the investigator feels they would be helpful. In general, we are making the presumption that IW TIEs will have lethality (LC_{50}) as the endpoint. While this is not a technical requirement, all the IW TIEs we have performed to date have used lethality as the endpoint; all sublethal endpoints for which we have conducted sediment TIEs have been performed using whole sediment tests in freshwaters.

8.1 Interstitial Water Toxicity Test Procedures

Because the procedural requirements for IW toxicity testing vary according to the species chosen for the TIE, specific definition of procedures that must be followed is not possible. Nonetheless, there are procedures we have found to work for many species, and several issues that should be considered before deviating from those methods.

8.1.1 Test Chambers

Because of the difficulty in obtaining large volumes of IW, our IW TIE work to date has focused largely on species that can be tested in very small chambers in very small amounts of water. Our standard approach is to use 30-mL beakers containing 10 mL of test solution. This combination has been used successfully with *Ceriodaphnia dubia, Daphnia pulex, Daphnia magna, Lumbriculus variegatus*, *Pimphlales promelas* (fathead minnow larva), *Americamysis bahia* mysid shrimp, and *Ampelisca abdita* at a density of five organisms per beaker. Other investigators have successfully performed TIEs using 10 mL of water in 20 mL scintillation vials with one *E. estuarius*/replicate or five *H. azteca*/replicate (Anderson et al. 2006a). Some organisms, such as *Hyalella azteca* and midge larva (*Chironomus* sp.) do not adapt well to water column exposure unless some form of substrate is included. We have used a very thin layer of clean quartz sand on the bottom of the beaker as a comparatively inert substrate for this purpose. For *H. azteca*, many researchers have used small pieces of nylon screen or webbing as a substrate during water column testing; however, there is evidence that this nylon material may serve as a significant sorbent for organic compounds and so we recommend the quartz sand instead, which seems to provide the required substrate with less tendency toward chemical sorption (unpublished data, C. Ingersoll, USGS, Columbia, MO, USA).

Previous TIE guidance has also suggested the use of plastic beakers for TIE testing (USEPA 1991b; 1992b). Plastic beakers have the advantage of being both inexpensive and disposable. While these were proven effective for most TIEs on effluents, sediments have a greater tendency to contain chemicals with high K_{OW} which may sorb excessively to plastic chambers. For this reason, we generally recommend that IW TIEs be conducted in glass beakers rather than plastic. If the investigator has a strong desire to use plastic beakers (i.e., metal contamination is suspected), the initial and baseline toxicity tests should contain at least one replicate conducted in glass beakers, so the effect of plastic versus glass can be determined.

8.1.2 Test Design

IW tests are generally run in dilution series, using a 0.5 x dilution ratio. Thus, an initial IW toxicity test might be run at 100, 50, 25, 12.5, and 6.25 % IW plus a dilution water control. For the Phase I tests, there is no specific number of dilutions that must be tested, and the dilution series may vary depending on the degree of toxicity in the sample. A typical dilution series for Phase I might be 100, 50, 25, and 12.5 % IW, plus the procedural blank. To prevent extreme levels of toxicity from "overpowering" the Phase I manipulations, the intention is generally to have the top concentration be no higher than 4 x the LC_{50}. Where the IW LC_{50} is less than 25%, the highest concentration in the test would be diluted to achieve approximately 4 x the IW LC_{50}, then a 0.5 dilution series would be prepared from there (e.g., 4 x, 2 x, 1 x, and 0.5 x).

> **Note**: In this case it may be advisable to dilute the IW down to the highest test concentration before performing the manipulations. In cases where the LC_{50} is greater than 50%, a dilution series that includes 100, 75, 50 and 25% may be used.

8.1.3 Volume Considerations

The actual sample volume needed to conduct the TIE tests depends on the 24-hour LC_{50} from the initial interstitial water test (Table 8–1). All volumes listed assume the initial LC_{50} is greater than 25%. If the initial LC_{50} is less than 25%, a smaller sample volume would be needed because of the necessity to dilute to 4 x the LC_{50} for subsequent testing and TIE work. If there are logistical

concerns, such as the often limited supply of IW, IW should be conserved throughout routine analyses and testing procedures by careful handling of the sample and keeping volumes of diluted sample to just above the minimum necessary to perform the manipulations. When calculating necessary volumes of diluted sample we usually add approximately 5 mL of additional volume (the volume of diluted sample necessary above the stated volume because of solution loss due to adherence to the walls of measuring and test vessels or tubing). If the manipulation does not require a lot of handling (e.g., EDTA manipulation) then 5 mL of additional volume is usually adequate. If the manipulation requires more handling (e.g., C_{18} manipulation) then the manipulation may require an additional 7 to 10 mL.

Table 8–1 Estimated Volumes for Phase I Interstitial Water TIE Tests*

Characterization Step	Volume Needed (mL)
Initial[1]	~ 45
Baseline[2]	~ 60
Aeration	~ 40
EDTA addition[3]	~ 40
C_{18} SPE	~ 40
Ulva lactuca or zeolite[4]	~ 40
pH 7	~ 40
pH 9	~ 40
Total for each species	~345

*Values are for three replicates for the baseline tests and two replicates in the initial test and the manipulations. Volumes should be multiplied by the number of species that need to be tested separately. In freshwater testing, all species are tested together; therefore a freshwater Phase I TIE would need approximately 425 mL. In marine systems, each species must be tested separately; therefore, for two marine species, the total for a marine Phase I TIE would be approximately 690 mL. Test volumes are assumed to be 10 mL/replicate. Values are directly applicable to Atlantic and Gulf Coast species. Pacific Coast or other species may require greater volumes.

[1]Assumes initial tests performed at 100, 50, 25, 12.5, and 6.25%.

[2]Assumes baseline and manipulations are performed at 100, 50, 25, 12.5, and 0%.

[3]In fresh waters, to perform a 3 x 3 matrix for EDTA additions (recommended due to varying water hardness) increase this volume to 120 mL.

[4]*Ulva lactuca* and zeolite volumes are approximate due to IW methodology questions. See section 8.3.6.

8.2 Test Conditions and Physical/Chemical Monitoring

Test conditions such as temperature, lighting, salinity, etc. must be tailored to the needs of the test organism. In general, the conditions used are not critical, as long as they are compatible with

the test organism, are kept the same for all tests, and don't conflict with the overall goals of the TIE (i.e., conflict with those in the original toxicity test).

Important chemical/physical endpoints to be monitored include temperature, dissolved oxygen (DO), pH, salinity/conductivity, ammonia, hardness, and alkalinity. For some manipulations, such as the pH manipulation, monitoring should be performed more often than during a standard toxicity test.

8.2.1 Temperature

Temperature should be monitored daily, with sufficient sampling across treatments, tests, and the spatial area in which the tests are conducted to ensure that temperature does not vary substantially across the system. The mean temperature is less important than the consistency of temperature across test chambers.

8.2.2 Dissolved Oxygen

DO should be measured in a subset of test chambers every day. Monitoring for DO is primarily to ensure that any toxicity observed is not the result of insufficient oxygen and, therefore, the intensity of DO monitoring should be designed to provide this assurance. Because 100% IW is typically the treatment with the highest oxygen demand, DO monitoring should be conducted with a heavy emphasis on these treatments. In addition, DO should be measured in any treatments showing marked biological effects, to ensure these effects are not related to DO.

8.2.3 pH

pH affects the toxicity of many chemicals, which makes it one of the more important measurements to make during TIE testing. In addition to ensuring that pH is within the physiological tolerances of the organisms, the purpose of pH monitoring is to determine whether differences in toxicity among treatments, or among dilutions within a test, are related to differences in pH. Accordingly, we recommend that pH is measured in the treatments with the highest IW concentration, in dilution water controls, and in test concentrations bracketing the threshold for any toxicity being observed.

Beyond these general recommendations, the graduated pH test should be closely monitored for pH. However, the ability to measure pH may be affected by the test methodology chosen for this test; recommendations are included in the description of these tests (see Section 8.3.5).

8.2.4 Salinity

For marine tests, salinity should be measured, and if necessary, adjusted daily. The small test volume and the need to allow for diffusion of air into the test sample all tend to increase evaporation, and therefore increase salinity. In order to maintain salinity within 1 to 2 ppt of the original salinity, it is often necessary to add a small aliquot of distilled water daily.

8.2.5 Conductivity, Hardness, Alkalinity

Measurement of these parameters is restricted primarily to the initial characterization of the sample being tested; in general, additional monitoring is not conducted during actual toxicity testing. Conductivity should be measured in freshwater samples as a check that the dissolved ion concentrations are not inordinately high (e.g., 2000 μS/cm). Hardness and alkalinity are useful additional parameters for characterizing freshwater IW samples but again, need to be

measuredonly on the IW sample itself. Hardness is often quite high in freshwater IW samples, which may affect metal and ammonia toxicity.

8.2.6 Dilutions, Dilution Water

Dilution of aqueous test samples is essential in order to track changes in toxicity by allowing the investigator to perform LC_{50} calculations for different manipulations. A clean, consistent source of dilution water is necessary to perform TIEs. For marine samples the dilution water should be the desired salinity of the test. Ho et al. (1995) concluded that there was no difference in TIE results whether the sample salinity was changed before or after the manipulations. For consistency, we recommended that all salinity adjustments be performed once at the beginning of the TIE. For freshwater samples, the dilution water is often matched into categories of hardness and alkalinity. While an exact match is not always necessary (or easily achieved), the dilution water should not be so different that the toxicity of metals or other toxicants would change dramatically.

8.2.7 Replication

In the past, EPA has released guidance in the TIE effluent manuals recommending that TIE manipulations be performed without replication. This recommendation evolved in part from the logistic constraints imposed by the large number of manipulations performed under the effluent TIE methodology. Because of the reduced number of Phase I manipulations recommended for Phase I IW TIE, there may be opportunity to increase replication. If at all possible, we advise testing two replicates, or even three, particularly for the baseline test against which other tests are compared. Replication is particularly important when the magnitude of toxicity is low (e.g., only partial mortality in 100% IW). There is, of course, a tradeoff between increased replication (and the associated interpretive power) and the logistical ease of conducting a TIE.

8.2.8 Observations

Careful and well annotated observations in IW TIEs may provide important information for toxicant identification and interpretation of test results. Observations can include, but are not limited to, formation of precipitate, time to death of organisms, unusual organism behavior, color or turbidity of IW, oily sheen, or any other aspects of IW appearance.

8.2.9 Feeding

Some test organisms, such as the marine mysid *A. bahia*, require feeding for survival. For organisms that don't need to be fed, but nevertheless may benefit or perform better when fed, we recommend feeding because it may reduce test variability in the long run. The major concern with feeding is that it may reduce the bioavailability of toxicants. While the possibility cannot be discounted, most interstitial waters contain comparatively high concentrations of dissolved organic carbon, which would be expected to reduce the effect of exogenous food on chemical bioavailability. A modified feeding regimen may also be used; in the case of the amphipod, *A. abdita*, if the test is performed for more than 96 hours we feed algae at 96 hours, then renew the IW after allowing 4 hours for organisms to feed.

8.2.10 Simultaneous Testing

Another useful tool for reducing the volume and effort required for TIE testing with interstitial water is the simultaneous testing of two species in the same test chamber. This method provides the additional advantage of minimizing differences in chemical test parameters, for example, pH,

during the testing of two species, and allows for easy comparison of species sensitivity. We have successfully tested *C. dubia* and fathead minnow in the same 10 mL volume throughout an entire Phase I evaluation. However, when *A. bahia* and *A. abdita* were tested in the same 10 mL volume, we noted increases in EC_{50}s probably due to sorption of toxicants to the organism biomass (Ho et al. 2000). While simultaneous testing has its advantages, we do not recommend simultaneous testing of species until it has been determined that the species are compatible, and that test conditions (e.g., adequate DO) can be maintained throughout the test.

8.3 Initial Tests

The purpose of the initial tests is to determine if the IW is toxic and, if so, how toxic (i.e., to generate an LC_{50}), in order to identify appropriate concentrations for the TIE manipulations. For the initial test, we recommend running at least duplicates and generally to test as many water column and benthic species as are currently collectable or available in our cultures. For each freshwater species (up to four), 45 mL of IW and 60 or more organisms of the same age are required. For marine species (we generally test two) we use 90 mL of water because our species must be tested separately and 60 organisms of the same age are required. A concentration series using 10 mL of 100, 50, 25, 12.5, and 6.25% IW should be prepared. If there is evidence that the toxicity of the sample is relatively low (i.e., EC_{50} = 75% IW), the dilution series may be adjusted upward to compensate and more IW (30 mL/species /replicate) may be needed. The concentration series also should have duplicate control cups (as a minimum) for each species tested. If after 24 hours the LC_{50} of the IW is at or below 6.25%, the test should be repeated using a lower dilution series (e.g., add 3.13% and 1.56%).

8.3.1 Baseline Test

Overview

If the initial toxicity test on the IW shows that it is acutely toxic (i.e., >50% mortality at a 100% sample dilution), Phase I TIE manipulations can be initiated. Samples with less than 50% mortality in 100% interstitial water can still be evaluated using IW TIE methods, but it can be more difficult to discern actual changes in toxicity relative to innate variability. Increased replication is very important when conducting TIEs on samples with minimal toxicity. Because the baseline test is used as the reference point to determine whether a manipulation has affected the toxicity of the sample, a baseline test should be included as part of every set of Phase I tests, even if tests are conducted on successive days. Temporal changes in the toxicity of IW are not uncommon, so a simultaneous comparison is critical.

Method

The test concentrations of the baseline test are determined by the initial toxicity test. Exposure concentrations should be at 4 x, 2 x, 1 x, and 0.5 x the 24-hour LC_{50} of the initial test if the LC_{50} was less than 25% whole sample concentration. If the LC_{50} was greater than 25%, exposure concentrations are typically 100, 50, 25, and 12.5%. More condensed dilution series (e.g., 100, 75, 50, and 35%) can be used with samples having very low levels of toxicity. Because the baseline test serves as the point of comparison for all other tests, replication is strongly recommended (minimum duplicate, triplicate preferred).

Interpretation

The baseline test provides the index response against which other tests are compared. Toxicity may be assessed in terms of overall LC_{50} or by the amount of mortality in specific dilutions. Another function of baseline tests is to track the stability of sample toxicity over time throughout the TIE. Changes in the baseline toxicity over time may indicate that volatile or unstable toxicants are present.

8.3.2 Volatile Compounds: Aeration

Overview

Aeration tests are designed to determine whether toxicity is attributable to volatile, oxidizable, or sublatable compounds. Samples are sparged with air for one hour, and tested for toxicity. If toxicity is reduced by air sparging, the presence of volatile or oxidizable compounds is suggested. To distinguish the volatile from the oxidizable compounds, further experiments are performed using nitrogen to sparge the samples rather than air. If toxicity remains the same as in the baseline toxicity test, oxidizable materials are implicated; if toxicity is again reduced, volatile compounds are suspected.

An additional mechanism through which toxicants can be removed from a sample by aeration is sublation, which is movement of the compound through the aqueous phase on the surface of the air bubbles, followed by deposition as a solid on the aeration glassware at the air–water interface. If sublation were the mechanism through which sample toxicants were removed, it might be possible to recover this toxicity by rinsing the aeration glassware (Ankley et al. 1990b). Compounds possessing both polar and nonpolar characteristics, such as surfactants or resin acids, are particularly prone to sublation from aqueous samples.

Method

The aeration tests and procedures remain identical to those described for effluent TIEs (USEPA 1991a; 1991b; 1996). Briefly, 40 mL of IW sample and a corresponding blank for each test species are placed into separate 100 mL graduated cylinders and aerated for one hour. The rate of aeration should be maintained at 500 mL/min. After one hour of aeration, the sample should be removed from the aeration vessel and transferred to a clean beaker using a siphon or pipette to prevent any re-solution of sublated compounds into the sample.

Interpretation

A change in toxicity after aeration indicates the presence of a volatile, oxidizable, or sublatable toxin. A notable volatile toxicant in IWs is hydrogen sulfide. If hydrogen sulfide toxicity is suspected, another manipulation to confirm the presence of hydrogen sulfide toxicity is the graduated pH manipulation (Section 8.3.5). While forms of ammonia are gaseous and may be considered volatile, ammonia concentrations appear to be stable in seawater during aeration for up to 96 hours at pH 8. In order to remove ammonia by aeration, the pH must be increased to 10 (Burgess et al. 2003).

Although this method is designed to remove volatile compounds, there may be circumstances when the toxicity may change due to the compounds' oxidation state and not volatility. To distinguish volatile from oxidizable compounds, further experiments are performed using nitrogen to sparge the samples rather than air. If toxicity remains the same as in the baseline

toxicity test, oxidizable materials are implicated; if toxicity is again reduced, volatile compounds are suspected.

8.3.3 Organic Compounds: Reverse-phase Solid-phase Chromatography

Overview

Reverse-phase solid-phase chromatography is designed to determine the extent of sample toxicity due to compounds that are relatively nonpolar. This test, in conjunction with associated Phase II analytical procedures, is an extremely powerful TIE tool. In this procedure, sample aliquots are passed through small columns packed with an octadecyl (C_{18}) sorbent. We have had the most experience with the C_{18} column, but other researchers have successfully used alternative packings such as Tenax (Cornelissen et al. 2001), C_8 (Bailey et al. 1996), and other columns with lower binding affinity such as the hydrophilic-lipophilic balance sorbent (Oasis®); (Anderson et al. 2006a) in order to isolate organic toxicants. The C_{18} solid phase extraction (SPE) column removes neutral nonpolar compounds including PAHs, PCBs and some pesticides. The C_{18} column may also sorb particle-active metals such as copper or lead; therefore, this manipulation, like all of the recommended manipulations, should be used in a suite of manipulations and not as a stand-alone procedure. The C_{18} blank may include some hydrocarbons eluted from the plastic housing (Junk 1988) and, therefore, manipulation blanks should be performed for this (and all other) manipulations.

The methods for the C_{18} SPE test are conceptually similar to those used for effluent TIE work (USEPA 1991b; 1992b; 1996) but there are differences in sample preparation, volumes, and the elution solvents. Because particulates in samples can plug the C_{18} column, samples must be pretreated to remove particulates before the SPE procedure. In effluent TIE, this is accomplished by prefiltering samples through glass fiber filter. In IW testing, we have observed a lot of seemingly nonspecific removal of toxicity by glass fiber filtration, and for this reason we recommend double centrifugation as an alternative. This involves an initial centrifugation of the sediment and decanting the IW, followed by a second centrifugation of only the IW to further remove residual particulates. The speed of these centrifugations depends on the equipment available in the laboratory. In general, centrifugation at 10,000 x g or more for at least 30 minutes is required in at least one of the steps to effectively remove fine particulates. After both centrifugations, great care should be given to preventing the transfer of particulates. Particularly after the second centrifugation, removal of IW by siphon or pipette is recommended (rather than simple decanting) to minimize the transfer of solids.

Another difference from effluent TIE procedures is the use of different solvents for elution. Because sediments commonly contain chemicals with high K_{OW} (e.g., $>10^5$) , methanol may not be sufficiently nonpolar to elute contaminants from the C_{18} column. For this reason, the elution solvents are modified to include less polar solvents, such as methylene chloride. Details are described in Section 9.3.2.

A decision point when planning Phase I SPE testing is the timing of testing the eluate fractions: whether to proceed immediately, or to perform an additional extraction and elution as part of Phase II studies if Phase I is to be limited to determining whether SPE reduced toxicity of the IW. The advantage of including elution as part of Phase I is that it requires only a single SPE extraction, and does not require the isolation of additional IW or the preparation of a new SPE column. The disadvantage of conducting solvent elution of the column as part of Phase I is that if the postcolumn effluent does not change in toxicity, then no useful information is gained from

the effort used to collect and test the eluates. This of course assumes that the column has not been overwhelmed by the amount of organic contaminants that has passed through and breakthrough has occurred (USEPA 1992a). In addition, there is some evidence to suggest that IWs high in dissolved organic material may allow hydrophobic compounds to pass through the column. This has been noted in IWs from field sediments contaminated with pyrethriod pesticides (personal communication, B. Phillips, Marine Pollution Laboratory, Monterey, CA, USA). A third, intermediate, option is to collect and test a smaller number of solvent eluates. Finally, one might store the loaded C_{18} columns until the results of the Phase 1 tests have been received, although it is difficult to determine if holding time would change the toxic constituents. The selection among these options is at the discretion of the investigator; if organic contaminants are thought to be likely, then proceeding with elution as part of Phase I may be advisable.

Method

The SPE test is generally conducted with a 3-mL (for up to 300 mL sample) or a 6-mL (for up to 1 L) C_{18} column, though larger columns (e.g., 12-mL) have been used. Whether or not the column is eluted as part of Phase I, the column must be first conditioned with methanol and water (USEPA 1991b). Next, the extraction blank is prepared by pumping dilution water over the column in a volume equal to the volume of IW to be extracted. The next step depends on which procedure option is pursued in Phase I.

If the approach is to test the postcolumn IW for toxicity (no solvent elution), then the next step is to pass the IW over the column, collect aliquots of the postcolumn sample, and test for toxicity.

If a complete solvent elution is conducted, then the methodology is the same as that described in Section 9. Briefly, the column is conditioned, followed by the dilution water blank and the full series of elution blanks. The column is then re-conditioned, followed by the interstitial water sample, and the solvent fraction series. Aliquots of the post-column interstitial water and the eluted fractions are tested as described in Section 9.3.2.

If the abbreviated elution is conducted, the procedure is similar to the full elution method, but with fewer solvent fractions. The column is first conditioned with methanol and water; then the dilution water blank is passed through the column. Next, extraction blanks are collected by passing three aliquots of 100% methanol, followed by three aliquots of methylene chloride. These six fractions (three from each solvent) can be combined, volume reduced (or exchanged) and tested as a single fraction. In addition to being more nonpolar than methanol, methylene chloride is miscible with methanol and has the additional quality of being more volatile than methanol. These two properties allow a solvent transfer of the methylene chloride fractions and blanks into methanol before toxicity testing. This step is essential because methylene chloride is more toxic to aquatic organisms than is methanol (e.g., the former has a 48-hour *C. dubia* LC_{50} of 0.46%, while that for methanol is 2.1%). The transfer is accomplished by partially evaporating the fractions and blanks containing methylene chloride with nitrogen (until the methylene chloride is removed) and subsequently restoring the initial volume with methanol (see Section 9.3.2 for more details on exchanging solvents). The blank fractions are treated similarly.

The 100% methanol fractions and their corresponding blanks then are tested as described elsewhere (USEPA 1991b; 1992b). Most freshwater organisms with which we have worked can tolerate 1.2 % methanol in water (e.g., 240 µL of methanol extract in 20 mL of dilution water). The methanol tolerance for several test organisms are given in Table 8–2 and in the effluent TIE guidance (USEPA 1991b; 1992b). *A. abdita* is particularly sensitive to methanol (*A. abdita* 96-

hour LC_{50} is 0.75%) and requires a lower methanol addition than the suggested 1.2%. In general, we recommend that methanol addition not exceed 25 to 50% of the LC_{50} for that species.

Table 8–2 Species Sensitivity to Phase I Additives

		LC_{50} (g/L unless otherwise noted)			
Additive	**Species**	**SW[1]**	**MHW2[b]**	**HW[3]**	**30 ppt**
EDTA	*H. azteca*	0.08	0.16	0.23	
	L. variegatus	7.0		7.4	
	M. lateralis[4]				0.288
	A. abdita				0.150
	M. bahia				0.315
Methanol	*H. azteca*			2.6%	
	L. variegatus			6.1%	
	M. lateralis[4]				2.2%
	A. abdita				0.75%
	M. bahia				2.3%
NaCl	*H. azteca*			3.9%	
	L. variegatus	7.0		7.4%	

[1]SW, soft water, natural or reconstituted
[2]MHW, moderately hard water, reconstituted
[3]HW, hard water, reconstituted
[4]Salinity, EC_{50} values for *M. lateralis* are for 48 hours; all other data are based on 96 hours

The concentration of toxicants in the fraction tests (relative to 100% IW) differs based on the volume of IW extracted, the volume of the extract, and the dilution of methanol used in the fraction test. The concentration factor is calculated based on the aggregate of the concentration or dilution factors at each step and assumes 100% recovery of toxicants. For example, if 300 mL of IW is reduced to 1 mL of methanol, the methanol fraction is at 300 x the IW. If this fraction is then tested by adding 240 µl of methanol to 20 mL of dilution water, the resulting dilution is dilution factor is 83.3-fold, and the final concentration in the fraction test is 300/83.3 = 3.6 x the concentration in the original IW. In order to account for possible procedural losses, the investigator should target the concentration in a eluation fraction test to be equivalent to at least twice the LC_{50} in the IW, and preferably higher. To achieve that concentration, it may be necessary to concentrate the methanol fractions additionally, particularly for methanol-sensitive species such as *A. abdita*.

Interpretation

Decreased toxicity in the post-C_{18} effluent and capture of the toxicity in the column eluate is a powerful indicator of organic toxicity. Further fractionation and identification of individual or groups of compounds can give insight into sources and stressors active in sediments. In our experience, organic compounds are a common source of toxicity in sediments, presumably because sediments are a common sink for persistent, hydrophobic compounds in the aquatic environment. However, the C_{18} column can also act as a filter, or as a nonspecific binding medium for cationic metals (e.g., copper, lead). For this reason, removal of toxicity by SPE alone

does not necessarily indicate toxicity from organic compounds; accompanying recovery of toxicity in the SPE fractions is an important confirmation. This need for recovery of toxicity is a major reason we suggest that investigators consider including column elution as part of the Phase I SPE test. On the other hand, while recovery of toxicity from the C_{18} column eluate is a strong indicator of organic toxicity, lack of toxicity in the eluate does not necessarily indicate that organics are not responsible. Many hydrophobic compounds may not be recoverable from C_{18} or other columns (Anderson et al. 2006a). It is important to consider the results of the SPE test in conjunction with other Phase I manipulations (e.g., EDTA) to provide context for interpreting SPE findings.

8.3.4 Cationic Metals: EDTA Test

Overview

The presence of toxicity due to cationic metals is tested through additions of ethylenediaminetetraacetic acid (EDTA), a strong chelating agent that produces nontoxic complexes with many metals. The specificity of the EDTA test for a class of ubiquitous toxicants makes it a powerful TIE tool. Cations chelated by EDTA include certain forms of aluminum, barium, cadmium, cobalt, copper, iron, lead, manganese, nickel, strontium, and zinc (Stumm and Morgan 1981). EDTA does not complex anionic forms of metals, and only weakly chelates certain cationic metals, for example, silver, chromium, and thallium (Stumm and Morgan 1981). EDTA appears to preferentially bind these transition metals over calcium and magnesium (hardness ions), and in-house studies suggest that the equilibration time for heavy metal chelation by EDTA is relatively brief. Despite the concern over water salinity, EDTA additions are effective in removing toxic cations in aqueous marine samples (Stumm and Morgan 1981; USEPA 1996). In addition, cation exchange resins have been demonstrated to be useful in removing toxic cations (see Phase II, Section 9; Burgess et al. 2000; Burgess et al. 1997; USEPA 1996).

A range of IW concentrations is used in conjunction with varying additions of EDTA to help determine the degree of toxicity associated with cationic metals in the IW sample. Because water hardness may affect the toxicity of EDTA as well as its ability to chelate toxic cationic metals, sample hardness should be considered when test concentrations of EDTA are set. To aid in identification of appropriate test concentrations for freshwater species, the toxicity of EDTA to the TIE test species must be ascertained for water with a hardness typical of that in the IW. Table 8–2 indicates these values for *H. azteca* and *L. variegatus*; data are also given for the marine species *A. abdita* and *A. bahia* at 30 ppt salinity. Comparable data for selection of appropriate EDTA concentrations for *C. dubia* and fathead minnow and other marine species are described elsewhere (USEPA 1991b; 1996; 2002a).

Method

For fresh water, we generally use and recommend the dilution option described in the effluent TIE document (USEPA 1991b). This consists of testing three dilution series of 100, 50, and 25% IW (or 4 x, 2 x, and 1 x the LC_{50} for highly toxic samples). To each of these dilution sets is added one of three decreasing concentrations of EDTA, thus forming a 3 x 3 matrix of EDTA level versus IW concentration. The three quantities of EDTA added should range from an amount approximating the LC_{50} of EDTA for the organism to a quantity that should not be toxic. Typical EDTA concentrations used are the EDTA LC_{50}, 0.5 x EDTA LC_{50}, and 0.25 x EDTA

LC_{50}, using an EDTA LC_{50} value appropriate for the sample hardness, which is often high in IW. In marine IW TIEs , we have generally tested at a single concentration of EDTA, 30 mg/L (USEPA 1996), which is tolerated by all marine organisms we have worked with. There is some evidence that this concentration of EDTA may decrease the test pH, and be too high for *M. galloprovincialis* (personal communication, D. Greenstein, Southern California Coastal Water Research Project, Costa Mesa, CA). Mortality in manipulation blanks would be a signal that EDTA concentrations are too high for the test organism. We recommend tolerance testing of species other than those listed in Table 8–2 in order to ensure that EDTA concentrations are not toxic. For both marine and freshwater EDTA testing, a three-hour interaction period is allowed after EDTA addition and before the animals are added to the IW. Blank tests of dilution water with EDTA added are included to ensure that the EDTA additions alone are not toxic.

Interpretation

Reductions in sample toxicity from EDTA addition are generally reasonably specific for toxicity caused by cationic metals. On occasion, high concentrations of EDTA may reduce pH of the sample, which can alter the toxicity of certain toxicants (e.g., ammonia, sulfide). Monitoring of pH and/or adjustment as necessary is recommended as a safeguard against such interferences.

8.3.5 Graduated pH Manipulation

Overview

Adjusting the interstial water pH can be a very powerful tool in sediment TIE. The bioavailability and toxicity of ammonia, hydrogen sulfide, and metals are highly pH dependent, even within the relatively narrow range of physiological tolerance for most pelagic, epibenthic, and benthic organisms (pH 6 to pH 9 for freshwater organisms and pH 7 to pH 9 for marine organisms). Because the graduated pH test is the only manipulation that targets toxicants with pH dependence, the results are often the first and only substantive clue to pH-dependent toxicants in the sample.

For IW TIEs, the power of pH adjustment as an investigative tool must be balanced against the practical constraints on obtaining large quantities of IW for testing. In the TIE guidance for effluents and ambient waters, pH manipulation is used in two ways:

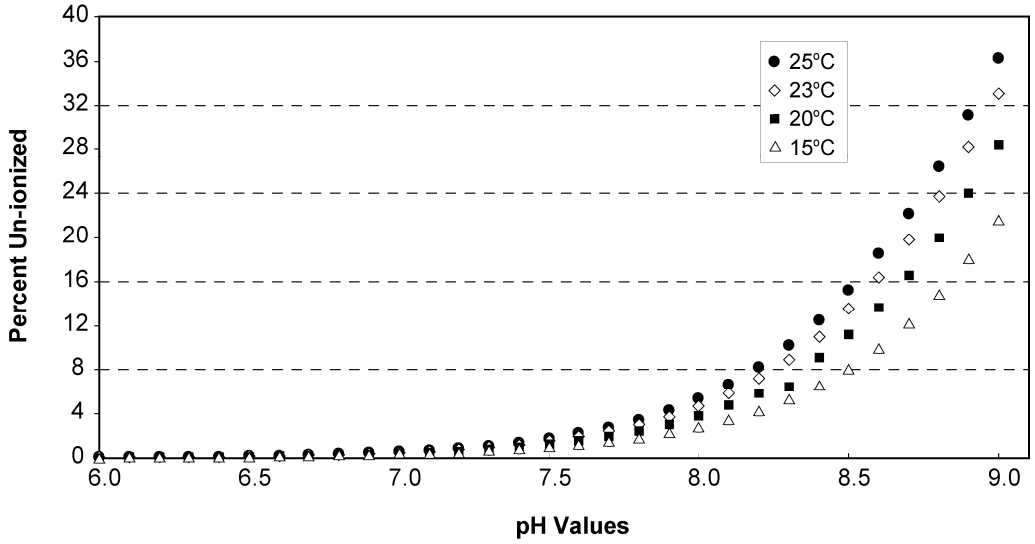
- A graduated pH test in which the sample is tested for toxicity at multiple pHs
- "pH adjustment" tests in which pH of the sample is adjusted to acidic or basic conditions, then returned to the original pH and tested for toxicity. These pH adjustment procedures are also used in concert with filtration, aeration, and solid-phase extraction to evaluate changes in toxicant behavior at extreme pHs.

Because of the limited sample volumes in IW TIE, we recommend that Phase I investigations begin with only the graduated pH test. The other pH adjustment tests can be performed in a tiered investigation if insufficient evidence is obtained during the initial Phase I without pH adjustment tests (see Section 9.7).

Ammonia is perhaps the most widely encountered toxicant that is pH sensitive and responds characteristically in the graduated pH test. Because ammonia is a common constituent of IW and because it is relatively easily measured (see Section 6), IW ammonia measurements should be taken at the beginning of each test. Figure 8–2 shows the change in relative ammonia and ammonium concentrations with change in pH. The exact roles of ammonia and ammonium in

aquatic toxicity have been debated, but it is accepted that un-ionized ammonia is the more toxic of the two forms for most species (Erickson 1985; Miller et al. 1990; Russo 1985). Therefore, the combined toxicity of a given total ammonia concentration generally increases with increasing pH, because of the relatively higher proportion of total ammonia present as un-ionized ammonia as pH increases. While pH is a dominant factor in determining the toxicity of ammonia to most aquatic species, ammonia toxicity to *H. azteca* appears more complex and has been found to depend on several factors (see Section 9.1; Ankley et al. 1995; Borgmann and Borgmann 1997).

Figure 8–2 Change in Relative Ammonia Concentrations with Change in pH for Selected Temperatures*



*Data calculated using the dissociation constants for ammonia (USEPA 1979). Under constant temperatures, as pH increases by one unit, there is 10-fold increase in the percent of un-ionized ammonia NH_3 present in aqueous solutions at pH 6.0 to 9.0. USEPA's ammonia water quality criteria document is an excellent source for the discussion of ammonia (USEPA 1985a).

The graduated pH test is another line of evidence for (or against) ammonia toxicity. With a dissociation constant (pk_a) slightly above pH 9, the speciation of ammonia changes dramatically relative to the range of pH 6 to 9 common to natural waters. The relative concentration of un-ionized ammonia increases as pH increases within this range. For example, in freshwater at 25°C the concentration of un-ionized ammonia (relative to ionized ammonia) is only about 0.05% at pH 6, but increases to about 5% at pH 8. In addition to the speciation change, it appears that the toxicity of the forms of ammonia may also change with pH (Miller et al. 1990; USEPA 1985a). However, the net result for most aquatic species is that the same total ammonia concentration is about three times more toxic at pH 8 than at pH 6 (Table 8-3). If ammonia is the sole sample toxicant, an IW that is toxic at pH 8 or 9 may be nontoxic at the lower pHs tested in the graduated pH test.

The toxicity of hydrogen sulfide is also highly pH dependent; the same concentration of total sulfide is approximately twelve times more toxic at pH 6.5 than at pH 8.7, even though molecular hydrogen sulfide appears more toxic at pH 8.7 than at lower pH (Broderius and Smith

1977). Often, in the graduated pH test, we have observed increased toxicity of IW at pH 6.5, which tends to disappear after storage of the interstitial water for more than 1 day. This behavior is consistent with hydrogen sulfide because of its high volatility and susceptibility to oxidation, which make it relatively unstable in isolated IW exposed to air.

Table 8–3 Relative Sensitivity (EC_{50}) of Benthic and Water Column Test Species to Different Toxicants

Species	Ammonia mg/L (95% CI)	$CuSO_4$ µg/L (95% CI)	SDS mg/L (95% CI)	H_2S (mg/L)[1]	Black Rock Harbor Sediment % sediment[2] (95% CI)
Ampelisca abdita	0.83[3] (0.76–0.92)				14 (8–22)
Eohaustorius estuarius	2.49[3] (2.26–3.38)			3.32	21 (16–28)
Rhepoxynius abronius	1.59[3] (1.46–1.72)			1.6	
Grandidierella japonica	3.35[3] (3.05–4.46)				
Leptocheirus plumulosus					11 (8–33)
Hyallela azteca	0.83[4] (0.62-1.22)	36[5] (21-61)			
Champia parvula		1.4[6] (0.8–1.9)	0.3[6] (0.2–0.4)		
Arbacia punctulata		33.2[6] (17.2–50.8)	3.2[6] (2.6–5.1)		
Mysidopsis bahia	2.98[7] (2.75–3.25)	169.3[6] (137.4–196.4)	9.3[6] (5.9–14.5)		
Strongylocentrotus purpuratus				0.19	
Mytilus edulis (embryo)				0.1	

[1]Knezovich et al. (1996)
[2]Calculated from Schlekat et al. (1995)
[3]Kohn et al. (1994)
[4]Ankley and Schubauer-Berigan (1995)
[5]Borgmann et al. (2005)
[6]Morrison et al. (1989)
[7]Miller et al. (1990)

Metals form another class of compounds whose toxicity and bioavailability depend on pH within the range of the graduated pH test. Work with both pelagic (*C.dubia*, fathead minnow) and epibenthic–benthic species (*H. azteca*, *L. variegatus*) indicates that zinc and nickel show increased toxicity at pH 8.5 relative to that at lower pHs (Table 8–4). Lead and copper show the opposite trend, and are more toxic at pH 6.5 than at pH 7.5 or pH 8.5. For fathead minnows,

Table 8–4 Trends in Metal and Ammonia Toxicity with Respect to Test pH*

Freshwater pH / Marine pH		6–6.5	7–7.5 / 6.5–7.5	8–8.5 / 7.5–8.5	8.5–9.2
Metal	**Species**	**LC_{50}**	**LC_{50}**	**LC_{50}**	**LC_{50}**
Zn	*C. dubia*	>530	360	95	
	H. azteca	1,200	1,500	289	
	P. promelas	830	333	502	
	C. dubia	>200	137	13	
	M. bahia		340	460	580
	A. abdita		2,860	4,470	1,970
Ni	*H. azteca*	1,960	1,940	890	
	P. promelas	>4,000	3,360	3,080	
	C. dubia	280	>2,700	>2,700	
	M. bahia		310	610	720
	A. abdita		7,660	>10,100	9,400
Pb	*H. azteca*	<90	>5,400	>5,400	
	Fathead minnow	1,410	>5,400	>5,400	
	C. dubia	10	28	201	
	M. bahia		17,860	6,090	>2,500
	A. abdita		12,300	11,300	>6,800
Cu	Fathead minnow	15	44	>200	
	H. azteca	17	—[1]	87	
	C. dubia	563	350	121	
	M. bahia		110	250	360
	A. abdita		160	90	30
Cd	Fathead minnow	54	74	<5	
	H. azteca	228	—	4–15	
	M. bahia	—	120	90	60
	A. abdita	—	1,780	1,260	1,540
Total NH_3	*H. azteca*	20[2] (9.0)	23[2] (14)	21[2] (12)	
Un-ionized NH_3	*L. variegatus*	>1,000	62	13	—
	M. bahia[3]	—	163	38	1.39
	A. abdita	—	—	—	1.49

*LC_{50}s (expressed as µg/L of metal or mg/L of ammonia) were determined at 48 hours for *C. dubia* and 96 hours for *P. promelas, H. azteca, L. variegates, A. bahia,* and *A. abdita*. Freshwater tests were performed in very hard reconstituted water.

[1]—Test not performed

[2]Value represents the mean of six LC_{50} values determined at that pH, with the standard deviation in parentheses

[3]Miller et al. (1990)

cadmium appears to be more toxic at pH 6.5 and pH 8.5 than at neutral pH. In marine waters, nickel and copper demonstrated increased toxicity at lower pHs for *M. bahia*. Lead and copper showed the opposite trend (increased toxicity with increased pH) for *M. bahia and A. abdita,* respectively. Interestingly, zinc and copper did not demonstrate pH-specific toxic responses for the two organisms tested (Ho et al. 1999b). Thus, the graduated pH test may serve additionally to

distinguish between toxic and nontoxic metals when several are present simultaneously in an IW sample.

The exact pHs tested in the graduated pH test are not particularly critical; the most important issues are achieving a range of pHs so that changes in toxicity may be observed, and staying within the physiological tolerance range of the test organisms. In work with freshwater sediments, we have found that after isolation and oxygenation, the IW often tend toward a pH of roughly 8.5. Accordingly, pHs of 6.5, 7.5, and 8.5 are often used. Marine organisms are less tolerant of pH below 7, so pHs of 7, 8, and 9 have been used more typically for marine TIE.

While the concept of the graduated pH test is simple, there are a great many variations on it. Several different methods have been developed, each with its own advantages and disadvantages. In the sections below, we describe three of the most common methods:

- Carbon dioxide method – The concentration of CO_2 in the headspace above the interstitial water is altered, which in turn alters the solution pH.
- Zero-headspace method – Hydrochloric acid or sodium hydroxide are used to adjust the pH of the sample; then the chamber is sealed without headspace, which helps maintain the adjusted pH of the sample.
- Buffer method – Relatively nontoxic hydrogen ion buffers are added to the interstitial water to maintain different pH levels.

8.3.5.1 Carbon Dioxide Method

Overview

The pH of freshwater and marine waters is controlled in large part by equilibria within the carbonate system:

$$CO_2 + H_2O = H_2CO_3 = H^+ + HCO^-_3 = 2H^+ + CO_3 =$$

As such, increasing the partial pressure of CO_2 creates carbonic acid (H_2CO_3); carbonic acid dissociates into bicarbonate (HCO_3^-) and a proton, and bicarbonate may further dissociate into carbonate (CO_3^{2-}) and another proton. Thus, increasing CO_2 yields protons and therefore reduces pH. The reverse is also true: decreasing carbon dioxide consumes protons and increases pH. This relationship is exploited by the CO_2 method for the graduated pH test. Samples of IW are tested under conditions of higher or lower CO_2 (relative to ambient air) to produce test solutions with differing pH.

Method

A variety of test systems can be used for the CO_2 methods; the general requirement is that the test beakers be placed within a sealed chamber constructed of glass or another substance that is relatively impermeable to CO_2. For purposes of discussion, we refer to the enclosure within which the CO_2 concentration is manipulated as the "CO_2 chamber," as contrasted with the "test chamber," which refers to the beaker containing the IW and test organisms. The CO_2 concentration in the headspace of the CO_2 chamber is altered by either flushing it with gas of a specific CO_2 concentration, or a measured volume of 100% CO_2 can be added to the ambient air to produce the desired CO_2 concentration in the headspace. CO_2 chambers may have headspaces that are either flow-through or static; flow-through systems require cylinders of premixed gas to provide continuous flow at a fixed CO_2 concentration, but have the advantage of continuously maintaining the desired concentration of CO_2 in the headspace. Static headspace chambers are

susceptible to changes in CO_2 concentrations as a result of exchange with the test solutions and/or production of CO_2 by biological respiration, though they have the advantage of greater simplicity.

Another issue that requires consideration in selecting a test apparatus is the potential for volatilization of toxicants and subsequent transfer of toxicant to adjacent test beakers. As an example, ammonia becomes volatile when present in the un-ionized form, which predominates at higher pH. If tests are conducted such that all test concentrations of IW are housed in the same chamber, then the higher ammonia concentrations present in the IW concentrations may volatilize ammonia that may be taken up by lower concentrations such as the controls. This can be avoided by housing different IW concentrations separately, but this in turn increases the number of CO_2 chambers required. The same considerations apply to hydrogen sulfide, except that volatilization is highest at low pH. If all IW concentrations are housed together, systems using flow-through gas mixtures may be advisable as they flush some of the volatilized toxicant out of the chamber headspace. Separation of test beakers by concentration may be more easily achieved using static headspaces, for which the management of multiple CO_2 chambers is much easier.

An important point of reference for the CO_2 test is the pH toward which the IW tends when equilibrated with ambient air (about 0.04% CO_2); this can be determined from the pH measured in the 100% IW concentration of the baseline toxicity test. The air-equilibrated pH of IW varies depending on its source and composition. Marine IWs tend to be more consistent in pH, typically about 7.8 to 8.2 after air equilibration (they are often slightly more acidic immediately after isolation but tend upward after air equilibration). IWs from freshwater sediments are more variable; while many equilibrate in the range of 8.3 to 8.5, some may be more acidic, particularly those with high concentrations of iron.

Because marine IWs often tend toward pH 8 after equilibration, and marine organisms are not very tolerant of low (<7) pH, we have typically conducted graduated pH tests with marine organisms at target pHs of 7, 8 (ambient), and 9; pH 7 is typically achieved using 2% CO_2, while pH 9 is achieved using CO_2-free air.

Freshwater organisms are generally more tolerant of pH in the range of pH 6 to 7, and we have often used target pHs of 6.5, 7.5, and 8.5 in the graduated pH test. However, the selection of specific pHs is somewhat arbitrary; all that is really needed is a reasonable range of pH so that changes in toxicity may be observed. Because the chemistry of IW from freshwater sediments can vary among sediments, some trial and error may be required to determine the CO_2 concentrations necessary to achieve the desired pHs. For IWs that air-equilibrate in the range of pH 8.0 to 8.5, appropriately lower pHs can generally be achieved using 8 to 10% CO_2 for the lowest pH (e.g., 6.5) and 2 to 5% for a middle pH (e.g., 7.5). Again, the exact pH is not that important, rather that a range of pH is achieved. Concentrations of CO_2 much above 10% may cause toxicity to some test organisms. The pH of dilution water may respond differently to CO_2 from that of IW, so controls and/or dilutions may end up with different pH at the same CO_2 concentration. Premixed gases with defined CO_2 content can be obtained from most specialty gas suppliers.

Safety Note: Elevated concentrations of CO_2 are a potential health risk to people. While small volume releases of gases with low percentages of CO_2 are generally diluted by large volumes of room air, even 10-minute exposures of a person to CO_2 concentrations of 1 to 3% may be dangerous and must be avoided. All uses of CO_2-enriched gases must be conducted with appropriate ventilation. Effluent air from chambers with continuous headspace renewal must be vented so as to avoid worker exposure.

Any number of different vessels may be used as the CO_2 chambers. Large systems designed to contain entire tests may be constructed from sheet glass, but the lids must be affixed with some kind of gasket to limit leakage of the headspace gas. If the system is flow-through, plastic chambers may be used; for static headspace chambers, plastic is less desirable, as many plastics are CO_2-permeable. Influent and effluent ports are required for introducing and venting the headspace, particularly for flow-through chambers.

Alternatively, smaller chambers that hold only a small number of test chambers may be used. Wide-mouth, screw-top jars (e.g., canning jars) can be useful in this regard. Such chambers may be more effective for tests with static headspace (the headspace is flushed initially with gas, then sealed) and when different test concentrations of IW are separated from one another to prevent cross-contamination via volatilization. Another option is to combine the test chamber and CO_2 chamber into a single vessel, such as by using 60-mL BOD (biological oxygen demand) bottles with ground-glass stoppers; test solution may be added directly to the bottle, and then the headspace flushed with gas and sealed.

The CO_2 method is generally performed with three separate dilution series of IW, one for each pH, with duplicate test chambers at each pH. For marine IWs, the relatively high buffering capacity generally requires that the pH of samples be adjusted with acid/base before being placed in the CO_2 chambers. This is done by adding small amounts of 1 N HCl or 1 N NaOH to adjust pH to 7 and to 9, respectively. Typically about 25 µL is needed, but this depends on the amount of buffering material in the IW. This is best done in a stepwise fashion, being careful not to overshoot the target pH. If the target pH is passed and it is necessary to add either acid or base to return to the target pH, check the salinity of the sample to ensure that it has not increased significantly. Generally, it is necessary to add more acid or base for the higher IW concentrations to overcome the additional buffering capacity of organic matter. In general, this preliminary pH adjustment has not been necessary for freshwater IWs, but it could be used for samples with particularly high buffering capacity, where CO_2 enrichment alone is insufficient to adjust pH.

After pH adjustment with acid or base (if necessary), test chambers are placed into the CO_2 chambers, the headspace is flushed with the appropriate gas mixture, and the system is allowed to equilibrate. The time for equilibration has not been carefully tested, and can be expected to vary with aspects of the chamber geometry, etc. In practice, for freshwater TIE we have typically allowed about two hours and then opened the chambers and checked pH of the test solutions; if sufficient adjustment of pH is not obtained, adjustment of the CO_2 concentrations and/or acid/base addition may be necessary. For marine work we have generally allowed chambers to sit in the CO_2 chambers overnight and then rechecked the pH and readjusted as necessary.

For flow-through CO_2 chambers, the rate of gas flow necessary to maintain pH depends on aspects of the chamber geometry and other factors. In our marine tests, we have used a CO_2 chamber with roughly 12 L capacity and have found that a flow rate of 100 mL/min of 2% CO_2 gas maintains a pH around 7. A flow rate of 150 to 300 mL/min of CO_2-free air (sometimes

called “zero grade”) maintains a pH of about 9. Placing the highest concentrations of IW near the inlet to the CO_2 chamber has sometimes resulted in better pH control across the test, but consideration should be given to the potential for contamination of other concentrations via volatilization.

Following equilibration and any subsequent adjustments that are necessary, test organisms are added to all test chambers, the test chambers are returned to the CO_2 chamber, and the headspace is flushed with the appropriate gas. For mysids, which require feeding during the test, we add a minimum number of *Artemia* necessary for the survival of the mysids (20 to 40 *Artemia*/mysid) every 24 hours.

One of the most important aspects of all of the graduate pH methods is intensive monitoring of test pH. Measuring pH twice per day in at least one replicate test chamber of each concentration is desirable. If it is necessary to adjust the test conditions (i.e., CO_2 concentration or flow or addition of HCl or NaOH) all replicate test chambers should be checked. It is important that relatively constant pH be maintained throughout the test in order to adequately test the effect of pH on sample toxicity. Some pH-sensitive toxicants, including ammonia and hydrogen sulfide, are relatively quick-acting toxicants, so unstable test conditions may lead to misleading or uninterpretable results.

Interpretation

With respect to changes in toxicity as a result of pH manipulation itself, interpretation of the graduated pH test is similar regardless of methodology and is discussed in the overview to Section 8.3.5. Ammonia toxicity generally decreases with decreasing pH, while sulfide toxicity increases with decreasing pH. Individual metals can go either way (see Table 8–4). While we do not have much experience with ionic organic chemicals in sediment TIEs, effluent TIEs have found pH-related shifts in toxicity from organic compounds as well, presumably related to differences in polarity stemming from changes in protonation/deprotonation of ionic sites on the molecule. A change in toxicity with pH is not by itself singularly indicative of any particular toxicant, but it can provide both some initial leads, and serves as a powerful tool for confirming a suspected toxicant, by showing it has the same behavior.

Although ammonia is generally a pH-sensitive toxicant and responsive to the graduated pH test, *H. azteca* represent an important exception. Sensitivity of *H. azteca* appears to be linked closely to sodium concentration, with comparatively little variation with regard to pH (Ankley et al. 1995; Borgmann and Borgmann 1997).

Beyond this general interpretation, each of the graduated pH test methodologies has specific interpretation issues that arise from the methodology. For the CO_2 method, the investigator must be concerned about toxicant transfer via volatilization when multiple IW concentrations are tested in the same CO_2 chamber—observed most frequently in the low pH treatments in samples from sediments with high sulfide concentrations, which may be severe enough to cause toxicity in blank (control) treatments housed in the same chamber. Measurements of sulfide concentrations may be useful in monitoring for this, and isolation of test concentrations may be necessary if it becomes problematic. A second issue involves direct toxicity of CO_2, which should be addressed in preliminary testing and/or by simultaneous controls.

8.3.5.2 Closed-cup Method

Overview

In the closed cup method, additions of HCl or NaOH are used to adjust the pH of the samples; pH adjusted samples are immediately sealed without headspace to better maintain pH during testing. Eliminating the headspace limits gas exchange, which in turn limits the re-establishment of equilibrium with ambient CO_2. In this way, it is similar to the CO_2 method. Compared to the CO_2 method, the closed cup method has the advantage of avoiding issues with toxicant volatilization and cross-contamination. It also doesn't require significant additional equipment or facilities. The disadvantage of the closed cup method is, that by limiting gas exchange, re-oxygenation of the sample from the atmosphere is also limited and is therefore not very compatible with samples and/or larger organisms that have high oxygen demand. Experiments with the marine organisms *A. bahia* and *A. abdita* have found that their oxygen demand is sufficiently high that the closed cup method is not useful with those marine organisms.

Method

As in the CO_2 method, many types of chambers might be used to achieve zero headspace. The simplest might be to completely fill the test beaker with solution, then place laboratory film (e.g., Parafilm™) over the chamber so that all air is excluded. Such laboratory film is somewhat gas permeable so gas exchange, although not completely eliminated, is slowed to a degree that is sufficient for many samples. A more complete prevention of gas exchange can be achieved with vessels constructed with a sealing lid or stopper. Sixty-mL BOD bottles with ground-glass stoppers, designed specifically to exclude air, can be purchased. In addition, there are commercially available culture dishes (e.g., Corning® 35 mm/Tissue Culture Dish 35mm x 10 mm style) that have small volume and a lid that allows exclusion of air.

The volume used in the closed-cup method often differs from the 10 mL volume often used in other IW tests. The volume used depends upon the capacity of the chamber used, and is often 30 to 60 mL. While this increases the amount of IW that must be prepared, it also helps to some degree with the oxygen demand issue by reducing the relative organism loading.

The test is usually conducted in a full dilution series (100, 50, and 25%) at each of three pHs, with duplicate chambers for each treatment. If the highest test concentration is 100% IW, the volume requirement for IW is approximately 360 mL (if using 30 mL chambers). Using the 30-mL chamber example, prepare three (one for each pH) 60-mL aliquots of test solution for each concentration to be tested and the dilution water control.

When all dilutions have been made, label a dilution series for each of the three desired test pHs. Typically, one of the test pHs selected is the ambient pH of the IW; the other two are selected so as to provide a good spread of pH (e.g., 6.5, 7.5, 8.5). Using 1.0, 0.1, and 0.01 N HCl or NaOH, as appropriate, adjust each solution in two of the dilution series to the desired pHs. Due in part to the high alkalinity of most IWs, the pH has a tendency to drift away from its adjustment point (e.g., pH 6, pH 7) rather quickly. Therefore, pH control procedures (i.e., adding solution and sealing the cup) should be initiated within one hour of pH adjustment. After all of the pHs have been adjusted, the solutions should be dispensed into the test chambers and the test organisms added (including food, if necessary). Ensuring that all test organisms are well below the surface of the solutions, place the cover (lid, stopper, or laboratory film) on the solution surface and press it into place so that a seal is formed between cup, solution, and lid. Care must be taken to

eliminate any air trapped between the lid and pH adjusted solutions, but also to not crack or rupture the test cup. The cups at the ambient pH value do not require a lid to maintain their pH; in fact, we have found that placing a lid on the higher pH solution tends to reduce pH over the course of the test.

Some of the primary difficulties with the closed cup method are the potential for DO depletion, the inability to monitor the pH of the sample throughout the test, and the relatively large volume for each replicate. The closed cup manipulation has not been successful with *A. bahia* and *A. abdita* because their relatively large size decreases DO to below biologically acceptable levels. Because most chambers are difficult to reseal after opening, monitoring of pH and DO are generally limited to a single measurement when the chamber is unsealed. Measurement of both parameters is critical for proper interpretation of test results: determining both the degree of pH control achieved and whether adequate DO was maintained to support the organisms absent the effects of toxicants in the sample. Whenever complete or near complete mortality is observed in a chamber, it should be opened immediately and pH and DO measured. In some cases it may be advantageous to use the duplicate chambers to sample the system at more than one time period (i.e., taking one set of replicates down in the middle of the exposure and running the other set until all Phase I tests are terminated). If tests lasting more than 24 to 48 hours are required, it may be necessary to prepare new test solutions and transfer the organisms every 1 to 2 days to maintain DO.

Interpretation

General interpretation of the closed cup method is as for the carbon dioxide method. The primary difference is in making sure that observed toxicity is due to sample toxicants and not DO depletion. If DO depletion is a problem, it may be necessary to use one of the other graduated pH test methods.

8.3.5.3 Buffer Method

Overview

In freshwater testing, we have successfully used minimally toxic hydrogen ion buffers (MES-pH 6, MOPS-pH 7, POPSO-pH 8) to maintain sample pH in the graduated pH test. These chemicals introduce a relatively high buffering capacity to the sample to maintain pH, without the need for headspace control. Major advantages of this approach include excellent pH control, low maintenance (e.g., no need for continual CO_2 flushing), adequate DO, rapid test setup time, and small sample volume requirements. The primary limitation of this approach is the possibility that the buffers might interfere with sample toxicants, which is difficult to predict when the sample toxicants are unknown. This issue is discussed here under *Interpretation*.

Method

Because of possible buffer toxicity artifacts or interactions with toxicants in the sample, it is desirable to use the lowest molar concentration of buffer to maintain the desired pH. In interstitial waters from freshwater sediments, we have generally found that 10 to 25 mM concentrations of buffer maintain pH while being nontoxic to the test organism (Table 8–5; (USEPA 1991b). Initially, a 100% sample with a corresponding dilution water blank should be tested at several buffer concentrations (e.g., 10, 15, 20, and 25 mM). We have found that the

Table 8–5 Sensitivities of *C. dubia*, *P. promelas*, *H. azteca*, and *L. variegatus* to the pH-Control Buffers, MES, MOPS, and POPSO

		LC_{50} (mM)		
Species	**Water Type**	**MES**	**MOPS**	**POPSO**
C. dubia	SW[1]	38	62	19
	HW[2]	62	57	23
P. promelas	SW	71	77	77
	HW	>100	>100	100
H. azteca	HW	46	29	13
L. variegatus	HW	>100	>100	100

[1]Soft water, natural or reconstituted [2]Hard water, reconstituted

lowest buffer concentration that maintains pH in the 100% sample also generally maintains pH in the sample dilutions, and therefore should be used for subsequent tests. Because there is not a headspace limitation with use of the buffers, 10 mL sample volumes can be used. The buffers must be added to sample and dilution water separately. The weight of buffer (in g) needed to attain the desired molar concentration of buffer is calculated by multiplying the volume of sample (in L) by the formula weight (FW) of the buffer (195.2 g/mol for MES, 209.3 g/mol for MOPS, 362.4 g/mol for POPSO) by the molar concentration of buffer desired, (e.g., volume x FW x M). Generally, additions of the crystalline MES and MOPS buffers to freshwater IW or dilution water will adjust the sample to the desired pH (i.e., pH 6 and pH 7, respectively). Using a magnetic stir plate and stir bar, stir the buffers into the sample and dilution water.

If the buffer addition fails to adjust the sample to the correct pH, the desired pH can be achieved initially with the use of 1.0, 0.1, 0.01 N HCl or NaOH. After this pH adjustment, the buffer should maintain pH. Results of tests to determine the efficacy of the buffers and three metals (USEPA 1991a) indicated that the MES buffer may interfere slightly with the toxicity of some metals (Table 8–6). For instance, the LC_{50}s of lead and copper increased by 2 for *C. dubia* when pH was controlled with MES buffer, yet the buffers did not impede the ability of EDTA (Table 8–6) or sodium thiosulfate to chelate metals.

In our experience, the pH 8 buffer (POPSO) is usually not needed because most freshwater IWs air-equilibrate to pH 8 or above. Additionally, the POPSO buffer requires large quantities of NaOH to adjust the samples and dilution waters to pH 8 after addition of the buffer. Such large amounts of NaOH may consequently increase the conductivity of the sample or dilution water and may thereby cause artifactual toxicity.

After making pH adjustments with the buffers, organisms can be added to the samples and tests performed using normal protocols. As with any version of the graduated pH test, pH should be closely monitored both during and at the termination of the test.

Table 8–6 Sensitivity of *C. dubia* to Lead, Copper, and Zinc*

Compound	pH Control Technique	LC_{50} (µg/L) 24h	pH	48h	pH
Pb	CO_2 adjustment	480	6.3	430	5.8
	MES buffer >1000	6.3	580	6.3	
Cu	Closed cup 31	6.2	12	6.3	
	MES buffer 41	6.3	22	6.3	
Zn	Closed cup 534	6.7	328	6.7	
	MES buffer 820	6.2	616	6.2	
	Closed cup 253	7.2	205	7.2	
	MOPS buffer 339	7.3	252	7.3	
	Closed cup 78	8.2	70	8.2	
	POPSO buffer	136	8.2	78	8.2

*While the LC_{50}s of lead and copper increased by a factor of two for *C. dubia* when pH was controlled with MES buffer, the buffers did not impede the ability of EDTA or sodium thiosulfate to chelate metals. EDTA additions chelated metal toxicity in the presence and absence of pH-control buffers at EDTA additions of <51.3 mg/L EDTA – Table III-6 in USEPA (1991a)

In marine IWs, we have performed more limited testing with buffers. The MOPS buffer (at 750 mg/L) was able to hold seawater pH between 6.5 and 7 for 48 hours without causing toxicity to *A. abdita* (amphipods) or *A. bahia* (mysids). We tested a number of other buffers and found them not to be effective because of high toxicity and poor efficacy. The buffers we tested that were not effective include HEPES, glycine, TRIZMA base, and piperazine dihydrochloride.

Interpretation

One of the primary interpretation issues for the buffer method is the possibility for interaction between the buffer and the causative toxicant(s). One way to address this possibility is to conduct some limited testing using one of the other graduated pH test methods to determine if similar results are obtained. In addition, once a causative toxicant has been initially identified, testing with buffers and solutions spiked with the causative toxicant can be used retrospectively to determine whether interactions exist.

8.3.6 Ammonia Manipulations: *Ulva lactuca* and Zeolite

The previous section on pH manipulations is designed to characterize pH-dependent toxicants including ammonia. Two additional manipulations also address ammonia toxicity: addition of the green macro-algae *U. lactuca* for marine sediments, and the alumina-silicate mineral, zeolite, for both freshwater and marine sediments. These manipulations are described in detail for whole sediments in sections 7.2.3.1 and 7.2.3.2, and in the literature (Anderson et al. 2006a; Besser et al. 1998; Ho et al.1999a; Pelletier et al. 2001; USEPA 1992b). Ammonia concentrations should be measured before and after both of these manipulations.

8.3.6.1 *Ulva lactuca*

As stated in section 7.2.3.1, *U. lactuca* is an ephemeral cosmopolitan attached seaweed found along the Atlantic and Pacific coasts of temperate North America (Harlin et al. 1978). *U. lactuca*

takes up aqueous NH_3, reducing the concentrations in the water. The theory for using *U. lactuca* is consistent in effluents, interstitial waters and whole sediments. While we believe this manipulation would be effective in interstitial waters, we don't have practical experience with the use of *U. lactuca* in interstitial waters. A key question that needs to be addressed before the manipulation is performed is "What quantity of *U. lactuca* should be added to 10 mL interstitial water replicates, or 40 mL of a pooled sample?" An additional concern would be the relatively higher concentration of organic toxicants in interstitial waters relative to effluents or even overlying waters in whole sediment tests. Because of these higher concentrations, one may want to ensure that the *U. lactuca* is not sorbing organic contaminants as well as ammonia from the interstitial water. One method to accomplish this would be to perform a sequential manipulation by first performing SPE with a C_{18} column, testing the effluent for toxicity and then subjecting the interstitial water to *U. lactuca* addition.

8.3.6.2 Zeolite Column

Overview

As stated in Section 7.2.3.2, zeolite is a hydrated aluminosilicate mineral composed of symmetrically stacked alumina and silica tetrahedra forming an open and stable three-dimensional structure with a negative charge (Rozic et al. 2000). It functions as a cation exchange material and has comparatively high affinity for ammonia. In interstitial water TIE, zeolite has been used in a column form similar to the SPE procedure (USEPA 1992b).

Method

Detailed information on the use of zeolite treatment of aqueous samples may be found in the Phase II effluent TIE document (USEPA 1992b); application to interstitial water follows the same general procedure, which is only summarized here. Particle size is important for column treatments; particles must be small enough to provide good contact with reactive surfaces, but not so small as to cause plugging of the column. We have found that screening to a particle size range of 32-95 µm works well; laboratory sieves can be used to sort zeolite particles to this size range. The column must be sized appropriately to the volume of material to be treated. Thirty g of zeolite has been used to effectively treat aqueous samples of 200 mL containing as much as 50 mg/L ammonia. This can be scaled for higher or lower volumes and/or concentrations of ammonia. Slurry the zeolite with high-purity water, pour into the column, and allow to settle. Pass a volume of dilution water through the column and reserve it as the procedural blank, followed by the intersititat water sample. Measure the ammonia in the post-column interstitial water and test both sample and blank for toxicity.

Interpretation

A decrease in the measured ammonia concentration along with a concomitant decrease in the toxicity is good evidence that ammonia contributes to the toxicity in the sediments. If ammonia concentration in the interstitial water is high enough to be expected to cause toxicity but zeolite treatment does not reduce toxicity, consider the possibility that additional toxicants are present. Zeolite treatment may be used in combination with other manipulations to address multiple toxicants. Example applications of zeolite treatment in sediment TIE are described by Anderson et al. (2006a; Ankley et al. (1990c); Science Applications International Corporation (2003).

9 Phase II Sediment TIE Methods for Interstitial Water and Whole Sediments

Phase I manipulations are intended to steer the TIE toward general classes of possible toxicants; the role of Phase II procedures is to identify specific toxicants within the different classes of compounds characterized in Phase I. In Sections 7 and 8, we described Phase I methods for solid phase sediments and interstitial waters separately. However, in this section describing Phase II, we elected to combine methods for solid phase and interstitial water methods. One of the compelling reasons for this is that, regardless of what methods were used in Phase I, tests using the alternate approach (e.g., solid phase if you have been using interstitial water methods or vice-versa) may prove very useful in identifying toxicants characterized in Phase I.

The general concept of Phase II is to build on Phase I data, collecting additional information that culminates in the identification of the toxicant(s) thought to be causing the observed toxicity. This generally entails sufficient additional investigation to identify/quantify concentrations of the causative toxicant(s) by analytical chemistry, as well as develop a suite of responses in specific tests that are consistent with the putative toxicant(s).

The sufficiency of evidence that constitutes an identification may vary depending upon the objective of the study and potential uses of the information. For example, the need for certainty of the identification of a toxicant that may be responsible for a multimillion dollar dredging project is higher than for developing a list of contaminants of concern (COC) for a monitoring program. Simply put, the weight of the evidence should be proportional to the weight of the decision. Furthermore, specific toxicants are never really "proved" to be the causative toxicants, at least not in the traditional sense of scientific proof. Instead, one aggregates evidence consistent with the candidate toxicant until alternative explanations seem sufficiently unlikely. As a loose rule of thumb, two separate manipulations pointing toward the same toxicant and a lack of evidence to the contrary, combined with chemical analysis showing that the chemical is present in toxic concentrations, is reasonable evidence for a toxicant identification.

Because of the many combinations of Phase I results that may lead into Phase II, it is difficult to organize this presentation in a manner that applies to all cases. That said, many of the Phase I methods are targeted toward one of three major sediment toxicants (ammonia, metals, organic compounds), so we have grouped discussion of Phase II procedures pertaining to these toxicants. Following those are sections that discuss other toxicants and techniques, and suggestions for approaches when Phase I results do not fall into easily interpreted patterns.

9.1 Ammonia

The potential for ammonia to be a causative toxicant may be indicated by several different Phase I manipulations. In whole sediment testing, decreased toxicity observed in the zeolite and/or *Ulva* tests would be expected. Because coconut charcoal has some capacity to sorb ammonia, some toxicity reduction may also be observed in that test. Among the Phase I tests

for interstitial water, the graduated pH test is the primary indicator of ammonia toxicity, which increases with increasing pH.

Because ammonia is easily measured using an ion selective probe, and its toxicity is fairly well understood, the first response to suspicion of ammonia toxicity is to measure the concentration in interstitial water and compare the values to toxicity benchmarks (Table 9–1). Care must be given to base this comparison on appropriate corrections for pH, salinity, alkalinity, and temperature. We have found that comparison of the un-ionized concentrations of ammonia give a better picture of the true toxicity. For freshwater organisms other than *H. azteca*, ammonia toxicity is not greatly influenced by most water quality parameters outside of pH. For *H. azteca*, the toxicity of ammonia depends heavily on sodium concentration (Borgmann and Borgmann 1997). For commonly tested marine species, the sensitivity of ammonia toxicity changes foremost with pH, but salinity and temperature also play a role (Kohn et al. 1994; Miller et al. 1990).

Table 9–1 Summary of Analytical Methods Currently Used or Proposed for Phase II TIEs

Compound Class	Analytical Methods
Nonpolar organics	High Performance Liquid Chromatography (HPLC)
	Gas Chromatography (GC)-Mass Spectroscopy (MS)
	Gas Chromatography(GC)-Electron Capture (EC)
	Mass Spectroscopy– Mass Spectroscopy
Metals	Inductively coupled plasma emission spectroscopy (ICP)
	Atomic Absorption Spectroscopy (AAS)
Polar organics	LC–MS
Ammonia, hydrogen sulfide	Colorimetric methods
	Specific ion electrodes

If the measured concentrations of ammonia are high enough to support the hypothesis that ammonia is a causative toxicant, further evidence can be gathered by conducting additional manipulations beyond those used in Phase I. For interstitial water, Phase II methods (USEPA 1992b) can be applied. These include treatment of interstitial water with zeolite to reduce ammonia concentrations, with commensurate reductions in toxicity. As further confirmation, one can spike zeolite-treated interstitial water with ammonia to restore the original ammonia concentrations, then demonstrate that this spiked sample has the same magnitude and pH-dependence of toxicity as did the original sample.

If whole sediment methods have been used, switching to interstitial water TIE manipulations (e.g., graduated pH test) may be used to further evaluate ammonia toxicity. However, this brings up an important issue in assessing ammonia toxicity in different sediment matrices. Particularly if flow-through methods are used for whole sediment toxicity testing, interstitial water tests may exaggerate the effect of ammonia toxicity for some organisms. As a demonstration of this, Whiteman et al. (1996) exposed three freshwater organisms, *C. dilutus*, *H. azteca*, and the oligochaete *L. variegatus* to elevated ammonia in sediment, using

a system that perfused the sediment substrate with ammonia-enriched water, but had a high rate of replacement of the overlying water, maintaining comparatively lower ammonia concentrations in the overlying water. The three organisms were exposed to a series of ammonia concentrations in this system, and the results were compared to LC_{50} concentrations observed in water-only exposures to ammonia. The results showed that *L. variegatus*, which depends largely on burrowing in sediment, died in ammonia-enriched sediment when the concentration of ammonia in the interstitial water reached concentrations comparable to the water-only LC_{50}, even though ammonia in the overlying water was low. For *C. dilutus*, the LC_{50} in sediment tests was reached when the interstitial water reached about three times the water-only LC_{50}. Visual observations suggested that this higher tolerance may have resulted, at least partially, from the midges building their cases up the sides of the test chambers in ways that maximized exposure to overlying water (lower in ammonia) and minimized exposure to interstitial water. In the case of *H. azteca*, mortality in sediment tests was not observed until the ammonia concentrations in the sediment were exorbitantly high in the sediment and the overlying water reached concentrations comparable to the water-only LC_{50}. This suggested that the comparatively epibenthic *H. azteca* was able to detect and avoid the elevated ammonia in the sediment, and was not affected until the overlying water no longer provided a refuge from ammonia exposure.

There is a large potential for misinterpretation of TIE information. Assume that a sediment toxic to *H. azteca* in a flow-through whole sediment toxicity test has an ammonia concentration of 40 mg/L in the interstitial water. Based on water column toxicity data for *H. azteca*, one might suspect that this is a sufficient concentration to explain the observed whole sediment toxicity. Further, if one performed toxicity tests on the interstitial water from this sediment, ammonia would likely be sufficient to cause toxicity. However, in our experience, the cause of whole sediment toxicity to *H. azteca* in this sediment is probably not ammonia, because the flow-through exposure reduces the overlying water exposure to concentrations far below those in the interstitial water.

This disconnect between causes of toxicity in interstitial water and whole sediment tests must be kept in the forefront of the logic used to identify causative toxicants. In addition, it makes clear the importance of monitoring ammonia in the overlying water (in addition to interstitial water) of a whole sediment toxicity test when ammonia toxicity is of concern. The type of whole sediment test is equally important. Because marine tests are normally performed static (compared to freshwater flow-through tests), concentrations of ammonia in the interstitial and overlying waters come to equilibrium within about 48 hours (Burgess et al. 2003; Ho et al. 1999a). Therefore, the marine mysid *A. bahia* and the marine amphipod *A. abdita* have similar exposures to ammonia concentrations throughout the whole sediment test. If the tests were performed flow-through, the tube building *A. abdita* might still be able to avoid high concentrations of ammonia by ventilating its tubes with overlying water. Other free burrowing marine amphipods, such as *E. estuarius* or *R. abronius*, may not be able to protect themselves in the same manner.

Another interesting consequence of this issue is that the relative species sensitivity for ammonia may be very different in whole sediment and interstitial water testing. Looking at freshwater test species as the specific example, in water-only exposures, *L. variegatus* is the least sensitive organism, followed by *C. dilutus* and *H. azteca* (most sensitive). However, in

flow-through whole sediment tests, this order is exactly reversed, with *L. variegatus* being most sensitive and *H. azteca* the least. The higher exposure of *L. variegatus* in whole sediment tests overcomes its innately lower toxicological sensitivity. In our marine studies, when mysids and amphipods are exposed to ammonia concentrations in the same test jars, we have found that the mysid *A. bahia* (un-ionized ammonia EC_{50} = 0.7) is consistently slightly more sensitive to ammonia than the amphipod *A. abdita* (un-ionized ammonia EC_{50} = 1.54) (Burgess et al. 2003; Ho et al. 1999a). Other researchers have found that *A. abdita* may be more sensitive (un-ionized ammonia EC_{50} = 0.83, Kohn et al. 1994) and *A. bahia* to be less sensitive (un-ionized ammonia EC_{50} = 2.49, Miller et al. 1990). Given the variability in measuring total ammonia and pH, the differences between the labs is not surprising.

9.2 Cationic Metals

For interstitial water TIEs, reduced toxicity in the EDTA test will be the primary indicator of metal toxicity. Because the toxicity of many metals is pH dependent, pH-related changes in toxicity may be observed in the graduated pH test, though the direction and magnitude of these changes is metal and organism dependent (Section 8.3.4). In the Phase I methods for effluent TIE (USEPA 1991b) reduced toxicity following filtration at pH 11 is associated with several common cationic metals. However, because the extreme pH manipulations are generally not conducted as part of Phase I for interstitial waters, this tendency may not be known at the outset of Phase II.

Two manipulations for the whole sediments in Phase I are designed to reduce toxicity associated with cationic metals: the cation exchange resin and the sulfide addition. The effectiveness of these individual manipulations appears to vary among metals, sediments, and organisms. As such, it is not essential that both manipulations reduce toxicity in order to conclude that metals are the likely toxicants. At the same time, there is no one method that is always effective. If either of these tests shows a substantive reduction in toxicity, it is probably worth exploring the possibility that cationic metals may be causative toxicants.

Techniques that can be used to further explore the potential for metal toxicity are described in the following subsections.

9.2.1 Direct Chemical Analysis

Because the list of cationic metals commonly associated with sediment toxicity is relatively small, direct chemical analysis is one of the most logical follow-ups to evaluate cationic metal toxicity. Metals typically analyzed for include copper, cadmium, zinc, nickel, lead, and silver. The matrices that can be analyzed are the sediment itself or the interstitial water.

In sediments, metals exist in a wide variety of chemical forms, the bioavailability of which varies greatly. As a result, a measurement of "total" metal in sediments will generally include measurement of mineral and other forms of metals that have essentially no bioavailability or toxicity. For this reason, several other extraction and measurement techniques have been developed to assess the more bioavailable forms of metal in sediment. In fine-grained anoxic sediments, reactive sulfides, quantified as acid-volatile sulfide (AVS) are thought to be the dominant binding phase for cationic metals. For this reason, comparing the concentration of AVS to the concurrent concentrations of reactive cationic metals provides a means to assess whether there is sufficient metal present to cause toxicity (Ankley et al. 1996; Di Toro et al.

1990). AVS is quantified using a sediment extraction method with 1 N HCl at room temperature. The concentrations of copper, cadmium, zinc, nickel, lead, and silver are quantified in this same extract and are referred to as "simultaneously extracted metals" (SEM). If the summed molar concentrations of SEM is less than AVS, then the metals should have low bioavailability and should not be causing toxicity of the sediment or interstitial water. If the concentration of SEM is greater than AVS, metal toxicity is possible, but not certain.

Binding of metals to AVS, organic carbon, or other sediment phases acts to maintain low concentrations of metals in interstitial waters. Several researchers have found that the toxicity of metals in sediment is proportional to the concentrations of metals in interstitial water (Berry et al. 1996; Di Toro et al. 1990). For that reason, analysis of cationic metals in interstitial water can be an effective means of evaluating metals as a potential cause of toxicity. For interstitial water TIE, metals should be measured in whatever preparation is used for TIE testing. For whole sediment TIE, we recommend isolating interstitial water by double centrifugation, or by using dialysis membrane samplers, sometimes called "peepers" (Berry et al. 1996; Serbst et al. 2003). Peepers are small dialysis samplers; several designs have been proposed by various researchers. All are some kind of cavity that can be filled with DI water, covered with a dialysis membrane and sealed. The peepers are placed into bedded sediment and allowed to come to equilibrium with the sediment. They are then removed and a sample of the DI water is removed and analyzed for metal. The presumption is that the concentration of metals inside the peeper is comparable to the freely dissolved concentration of metal in the surrounding interstitial water. It is important to realize that the amount of metal bound to solids in sediment is much greater than that dissolved in interstitial water. As a result, in any interstitial water analysis, it is essential that samples are kept scrupulously clear of any solids to avoid contaminating the sample and measuring falsely high metal concentrations in interstitial water.

For sediment TIE, we have generally favored measurement of metal in interstitial water over measurement in bulk sediment. This is in part because the SEM-AVS comparison may be subject to more false positives than comparisons based on interstitial water. While an excess of AVS over SEM appears to reliably predict low concentrations of metals in interstitial water and concurrently low sediment toxicity, there are binding phases in sediment, such as organic carbon, that may sequester metal into the solid phase even when sulfide binding capacity has been exceeded. The result is a sediment where SEM exceeds AVS, but metals in interstitial water are low and so is toxicity. Thus, interstitial water measurement can identify not only situations where AVS exceeds SEM, but also those cases where SEM exceeds AVS but there is sufficient binding elsewhere in the sediment to maintain low concentrations of metals in the interstitial water.

Metal concentrations measured in interstitial water may be compared with toxic metals concentrations determined in water-column exposures; metal toxicity data for several organisms commonly used in sediment testing or TIE are listed in Table 8–4. While these data are a helpful guide, one must be cautious when comparing these values with metal concentrations in interstitial water. Metal toxicity can be heavily influenced by a number of water chemistry parameters, such as pH, DOC and TOC, alkalinity, and concentrations of several ions such as sodium, calcium, and magnesium. For that reason, water column toxicity

data should be used only as a general guide, and attention should be given to matching the water column toxicity data to the chemistry of the interstitial water as closely as possible (e.g., similar pH, hardness, etc.). For example, if the measured concentration of a metal in interstitial water is 90 µg/L and the water column LC_{50} for the same metal and organism is 60 µg/L, that alone is not proof that the metal is the cause of toxicity, as water chemistry and other factors may reduce the toxicity of that metal in the interstitial water matrix. Likewise, if the concentration of the metal in the interstitial water is only 30 µg/L, it is certainly less likely that the metal is a cause of toxicity, but not out of the question. Professional judgment is needed to weigh this evidence and combine it with the strength of other evidence indicating or contraindicating metal toxicity.

Another approach investigators may consider in evaluating metal analysis in sediments is comparing measured concentrations of metals in whole sediments to "sediment quality guidelines" (SQGs). SQGs are specific concentrations of metals or other chemicals that have been associated with a frequency or severity of toxicity in sediments. Several of the published SQGs are based on empirical associations observed in testing of field collected sediments; examples include the ERL and ERM (Long and Morgan 1991); TEL and PEL (McDonald et al. 1996); AET (Becker et al. 1990); and logistic regression-based T20, T50, and T80 (Field et al. 1999). Because these SQG are based on field samples that contain a variety of chemical mixtures, they do not account for aspects of bioavailability that may be important in specific sediments, and are derived in ways that do not address causal relationships between specific metal concentrations and toxicity, they have very little value within the context of a TIE where the goal is to ascribe toxicity to specific metals. While "minimal effect" values such as the ERL, TEL, and T20 may in fact represent metal concentrations that are rarely associated with effects, it is possible that these concentrations could cause toxicity in sediments where binding capacity for metals was very low. Conversely, we have worked with many sediments in which metal concentrations greatly exceeded these values (or median effect values), but no toxicity was observed that could be ascribed to metals. This is not to say empirical SQGs do not have utility in sediment assessment as a whole, but that their qualities to not lend themselves to TIE work.

9.2.2 Zero Valent Magnesium Test

The zero valent magnesium (Mg^0) test was developed under the concept that reduction/oxidation reactions could be used to "exchange" a toxic metal ion for a relatively nontoxic metal ion by reducing the toxic metal ion and oxidizing the less toxic metal. For example,

$$Cu^{++} + Mg^0(solid) \Longrightarrow Cu^0(solid) + Mg^{++}$$

In this example, reduction is caused by a reaction releasing two electrons from the zero valent form of magnesium, Mg^0 (solid). The thermodynamic favorability of such reactions is determined by the relative strength of the half reactions, but the oxidation of zero valent magnesium is positioned such that it favors reduction of many common toxic metals (e.g., copper, cadmium, zinc, lead, nickel). From a toxicological standpoint, such reactions are favorable because the aquatic toxicity of Mg^{++} is far less than that of the common toxic metals. In this respect, zero valent iron and manganese are also theoretically viable reducing agents, but initial experimentation indicated neither were effective; manganese reactions were too vigorous and iron reactions too slow (Leonard et al., unpublished data).

Note: The exact reactions occurring in sediments following addition of Mg^0 have not been verified; the primary endpoints measured have been decreases in toxic metal concentrations in interstitial water and improvements in organism survival. It is possible that reactions other than reduction to zero valent metal are responsible for these changes; for example, zero valent magnesium treatment also tends to raise the pH of the sediment, which may induce precipitation of some metals as metal hydroxides.

In developmental work, several different levels of Mg^0 addition have been tested, and the values currently recommended represent a balance of several factors. If too little magnesium is added, the reduction of metal concentrations in interstitial water is either too little or too slow or both. At the other end of the spectrum, adding too much magnesium metal results in very vigorous reactions, generating large amounts of gas (presumably hydrogen) and disrupting the sediment structure. Magnesium metal is available from commercial chemical suppliers and is available in several different particle sizes. We have used a fairly small particle size (20 mesh) to better distribute the metal in the sediment and provide greater surface area. Calculate the amount of magnesium metal to be added based on the desired spiking level and the mass of sediment to be spiked. For freshwater TIE we recommend an addition of 114 μmol Mg/g dwt (2.77 mg/g dwt) and for marine tests, about 329 μmol Mg/g dwt (about 8 mg/g dwt).

Stir the magnesium metal into the sediment and equilibrate for 48 to 96 hours. The kinetics of the reactions in the Mg^0 test are not fast (i.e., requiring longer than 24 hours). This test requires longer than 24 hours to take effect, which is why an equilibration period of 48 to 96 hours is specified. Different methods have been used for this equilibration. In development work for freshwater TIE, amended sediments were held in a sealed jar under refrigeration until 24 hours before testing, when this and all other sediments are added to test beakers and placed into the exposure system with overlying water. Incubation jars should have either minimal headspace or have the headspace suffused with nitrogen before sealing. In the case of marine TIE studies, amended sediments were equilibrated in the test system (20 to 22°C), rather than under refrigeration. After the zero valent magnesium was mixed in, the sediment was placed in the test beaker and into the exposure system, but was allowed to equilibrate for 48 hours rather than the 24 hours typically allowed for other manipulations. Both methods appear to work satisfactorily. Blanks are prepared using the same method as the test sediment, except using a control sediment. All sediments are evaluated for toxicity using standard procedures

Treatment of sediment with Mg^0 has been observed to produce gas in some instances. If magnesium-amended sediments are equilibrated in a closed vessel, then any trapped gas will be released when the sediments are stirred before distribution to test chambers. If amended sediments were equilibrated in the test system, then gentle probing with a glass rod can be used to liberate trapped gas.

Warning: Gas liberated by this treatment may contain hydrogen. While the amount of hydrogen liberated is expected to be small, hydrogen is flammable and potentially explosive. Equilibration of sediments should be conducted under conditions with good air circulation, or in an explosion-proof refrigerator.

Zero valent magnesium treatment has been most effective for reducing metal toxicity in marine sediments, where it has been shown to reduce toxicity in sediment spiked with the single metals cadmium, nickel, or copper (Table 9–2). However, toxicity was not reduced in a marine sediment spiked with a mixture of all three metals. It was not determined whether this ineffectiveness was linked to higher total metal concentrations or an interactive effect of the metal mixture. Formation of excessive gas bubbles appeared to be associated with poor survival in controls or other treatments.

Table 9–2 Results of Toxicity Tests from Sediments with and Without the Base Metal Magnesium Added (% Survivial)[*+]

Treatment	*A. bahia*	*A. abdita*
Long Island Sound Control	83 (6)	97 (6)
Long Island Sound Control + Base Metal	63 (28)	97 (6)
Ni Spiked Sediment	0 (0)	57 (15)
Ni Spiked Sediment + Base Metal	90 (0)	93 (6)
Cd Spiked Sediment	0 (0)	0 (0)
Cd Spiked Sediment + Base Metal	93 (11)	80 (17)
Cu Spiked Sediment	0 (0)	11 (19)
Cu Spiked Sediment + Base Metal	80 (26)	72 (25)
Mixed Metal Spiked Sediment	0 (0)	11 (19)
Mixed Metal Spiked Sediment + Base Metal	0 (0)	36 (28)

[*]Values in parentheses are the standard deviation of three replicates.

[+]Cadmium and metal mixture were spiked at higher concentrations for *A. abdita* than *A. bahia*. Mixed metal spiked sediment contains copper, cadmium, and nickel. Metal concentrations were the lowest concentrations available to achieve 100% mortality without magnesium treatment compared to the same contaminant concentration with magnesium.

In fresh water, Mg^0 treatment has been shown to reduce toxicity of sediments spiked with copper, cadmium, lead, nickel, and zinc, but not consistently, and not always for both *H. azteca* and *C. dilutus*. In addition, Mg^0 treatments have often shown blank toxicity to *H. azteca* when the treatment was applied to a nontoxic sediment. The higher efficacy of this treatment in marine studies may be related to the shorter duration (48 to 96 hours) typically used for those studies, compared to the 10-day studies generally used for freshwater experiments. While treatment with Mg^0 has been shown to improve survival in freshwater metal-spiked sediments, this improvement does not often bring survival in treated spiked sediment to the level of control survival. In this respect, moderate improvements in survival in magnesium-treated sediment should be considered a positive response, even if absolute survival is not 90 to 100%.

Blank toxicity is sometimes observed in Mg^0-treated control sediment, even in cases where the concurrently tested toxic sediment shows improvement in survival. For this reason, the occurrence of blank toxicity should not be considered as evidence that the test is invalid,

especially if there was improved response in treated test sediment. However, if both control and test sediments show poor performance after Mg^0 treatment, one must keep in mind the possibility that the test was compromised.

9.2.3 Species Sensitivity

Relative species sensitivity is not a definitive indicator of metal toxicity in general, but can be useful as supplementary evidence, in part because the sensitivities of common sediment test organisms to common metals are well known (Table 8–4). In whole sediment testing, we have found that lethality to *H. azteca* and growth effects on *C. dilutus* seem to occur at comparable concentrations for copper, but *H. azteca* lethality appears to be somewhat more sensitive for cadmium, and substantially more sensitive for zinc, nickel, and lead. The mysid *A. bahia* appears to be relatively more sensitive to metals than the amphipod *A. abdita* with a notable exception of copper. The amphipod is an order of magnitude more sensitive to copper than is the mysid.

9.2.4 Complementary Phase I Manipulations

Part of developing a case for a particular causative toxicant is amassing several lines of evidence that all indicate its involvement. In the case of metals, one may create additional lines of evidence by conducting Phase I manipulations targeting metals that were part of the original Phase I testing. For example, if Phase I testing focused on interstitial water TIE, then conducting the cation exchange, sulfide, and Mg^0 tests in whole sediment tests (Sections 7.2.4.1, 7.2.4.2, and 9.2.6) can provide additional evidence of metal toxicity in addition to the EDTA test conducted as part of Phase I. The reverse is true if the Phase I testing was conducted using whole sediment methods. That is, conducting an EDTA test on interstitial water may provide additional confirmation that metals are involved.

9.2.5 Sodium Thiosulfate Test

While originally included in water column TIE methods as an indicator of oxidants such as chlorine, sodium thiosulfate can also act as a ligand for cationic metals, thereby reducing their toxicity. Because the relative affinity of thiosulfate for different metals varies from that for EDTA, the results of both tests can be used to categorize metal toxicants into smaller groups (Hockett and Mount 1996). This use of sodium thiosulfate has been tested only in fresh, and not marine, waters. While there is no empirical evidence to indicate that sodium thiosulfate may have different affinities for metals in marine waters, testing needs to be performed to confirm the efficacy of this approach in saltwater. In freshwater column experiments with *C. dubia*, toxicity of copper and cadmium was strongly reduced by both EDTA and thiosulfate treatment, while toxicity of zinc, lead, and nickel was strongly reduced by EDTA but only weakly by thiosulfate.

In the context of sediment TIE, the thiosulfate test is applied to interstitial water. The thiosulfate test is procedurally similar to the EDTA addition test (Section 8.3.4 and USEPA 1991b). For general methods, refer to the EDTA test and follow an identical format. As with the EDTA test, we generally recommend a matrix design, testing multiple concentrations of thiosulfate versus multiple concentrations of interstitial water. This matrix method allows for better quantitation of changes in sample toxicity relative to thiosulfate additions, especially when mixtures of toxicants are present. In our experience, 0.2, 0.1, and 0.05 mL additions of a 20.5 g/L $Na_2S_2O_3$ stock solution to the 10 mL test volumes results in an acceptable range of

concentrations needed to chelate or oxidize most sample toxicants. These concentrations range from lethal or near lethal concentrations of $Na_2S_2O_3$ for a number of test species (at the 0.2 mL addition), to a concentration well below toxic levels (see Table 8–2 and USEPA 1991b).

In some instances we have found that thiosulfate addition did not remove toxicity of a metal as expected. Further investigation showed that this was apparently due to thiosulfate reacting with oxidizable substances in the sample, chemically reducing the thiosulfate and rendering it ineffective as a metal ligand. In these instances, the metal binding ability of thiosulfate was restored when the sample was pretreated with another reducing agent, sulfur dioxide (SO_2) (Schubauer-Berigan et al. 1993; USEPA 1993a). For this reason, we recommend conducting the thiosulfate test in duplicate, one set with SO_2 and one set without SO_2.

For a 10-mL test volume, two 80-mL aliquots of interstitial water are needed (assuming the highest concentration is 100% interstitial water). A saturated solution of SO_2 is prepared by bubbling SO_2 gas through a small volume of DI water for 15 minutes.

> **Warning!** SO_2 is a highly toxic gas and must be handled in a fume hood!

One of the 80-mL aliquots is then treated by adding 10 µL of the saturated SO_2 solution, then both aliquots are used for thiosulfate tests. This typically involves three interstitial water concentrations (e.g., 100, 50, and 25%) and four levels of thiosulfate addition, 0, 0.2 mL, 0.1 mL, and 0.05 mL of a 20.5 g $Na_2S_2O_3$/L solution (based on 10 mL of test solution). This design also provides a reference treatment for SO_2 treatment alone, which is important in determining the relative roles of oxidation and metal chelation in reducing toxicity.

9.2.6 Cation Exchange Treatment of Interstitial Water

Cation exchange treatment of interstitial water can be another means of evaluating metal toxicity. The objective of cation exchange treatment is to remove cationic toxicants (see Section 7.2.4.1). This manipulation can be used with elution to verify potential metal toxicity and in addition to the EDTA manipulation as another line of evidence for cationic metals.

Test solutions (i.e., samples and controls) are passed through a disposable cation exchange column and the post-column sample is tested for toxicity. Reduced toxicity in the post-column sample suggests that cationic toxicants are active (Burgess et al. 1997). For details about the cation procedure, see USEPA (1996).

> **Note**: Because of the use of acids and bases in this manipulation, it is critical to measure the sample pH as frequently as possible but especially at the beginning (initial pH) and end (final pH) of the procedure to insure the samples are always exposed to the test organism at environmentally realistic pHs.

In general, a pump is connected to the sample reservoir and 10 mL of 1 M HCl followed by 25 mL of DI water is pumped through all tubing and connections to remove any contamination. Throughout column preparation, a flow of 7 to 10 mL/min is used. The cation exchange column (e.g., Supelco LC-WCX, Bellefonte, PA, USA; 3 mL/500 mg) is prepared by passing 2 mL of methanol and then 6 mL of DI water through the column. To avoid drying the column, leave a small volume of DI water in the tubing. For other column types, check manufacturer recommendations. An appropriate operational blank must be prepared by passing enough control water through the wet prepared column to conduct toxicity tests. The pH should be checked to ensure that residual acid, from the preliminary tubing rinsing, is not

contaminating the sample. After the blank water has passed through the column, pass the sample through the wet prepared column without letting the column dry out between the blank and sample. Collect enough post-column sample to perform toxicity tests (30 mL/species). The column can now go dry. Again, check the pH to ensure that residual acid is not contaminating the sample. If the pH has decreased below original levels, the sample can be adjusted using NaOH. Post-column sample and post-column reconstituted water samples should be tested.

Not all interferences with the cation exchange SPE procedure have been identified. Therefore, it is important to perform the acid elution to verify metal toxicity.

9.2.7 Cation Resin Elution

For interstitial waters, if the sample is nontoxic following the Phase II cation exchange SPE procedure or a Phase I EDTA addition, extraction from a loaded cation exchange SPE is recommended. Operationally, this is much like the C_{18} solid phase extraction (SPE) methodology. Like the C_{18} SPE technique, this method has the advantage of recovering the toxicant (cationic metals such as cadmium, copper, nickel, lead, and zinc) for further testing and analysis. The tubing is prepared for this manipulation in the same way as for performing the cation exchange column chromatography (Section 7.2.4.1). Next, a loaded column (i.e., a column suspected of containing metals removed from an IW sample) is attached to the tubing and 6 mL of 1 M HCl passed through the column at a flow rate of 0.5 mL/min. Collect the HCl in a container. At this point the sample can be chemically analyzed, prepared for further toxicity testing, or split for both purposes. For further toxicity testing, return the sample to its original volume with control water. After bringing the sample to its original volume, check the pH and adjust to the original pH with NaOH. The sample can now be tested for toxicity (USEPA 1996).

For whole sediments, metals may be recovered from the cationic resin mixed directly into whole sediments to bind toxic metals (Section 7.2.4.1). To recover metals at the conclusion of the test, retain the resin on a 1 mm sieve (same sieve used to retain organisms), rinse with control test water, and extract with 20% nitric acid in a microwave (open vessel) sample preparation apparatus (CEM Corporation, Matthews, NC, USA). Filter (#42 Whatman, Maidstone, England) resin samples immediately following microwaving (Burgess 2000; Burgess et al. 2000). Metals in the filtrate may be quantified by either graphite furnace atomic absorption (GFAA) spectroscopy or inductively coupled plasma (ICP) emission spectrometry. Some investigators have reported that using this method with formulated marine sediments spiked with high concentrations of copper has given inconsistent results with the amphipod *E. estuarius* (Anderson et al. 2006a).

9.3 Organic Compounds

In whole sediment testing, the presence of toxic non-ionic organic compounds is generally indicated by reduced toxicity after coconut charcoal and/or carbonaceous resin is added. For interstitial water TIE, reduced toxicity after the SPE manipulation would be the key indicator. As all of these manipulations can affect toxicity of chemicals other than nonpolar organic compounds, these tests are not definitive, but are probably sufficient that follow-up in Phase II is warranted.

For interstitial waters treated with SPE, the follow-up is to elute the SPE column to recover toxicants from the column, then reintroduce them to a water-only toxicity test. By eluting the column with solvents of differing polarity, fractionation of the sample is also achieved. This procedure is completely parallel to that used in effluent TIE, with a few procedural modifications that help address the potential for higher K_{OW} chemicals that are often present in sediments.

Isolation and fractionation of nonpolar organic toxicants from solid-phase sediment is more complicated, because at least two phases are involved, waterborne chemical and sediment-bound chemical. Partitioning between these phases is thought to control bioavailability of chemicals. Solvent-based extraction procedures can be used to isolate nonpolar organic chemicals from sediments into solvent, but doing so removes the partitioning phases that control chemical bioavailability in intact sediment. This greatly complicates the iterative fractionation and toxicity testing process used in effluent and interstitial water TIE.

The importance of this issue can be demonstrated through a theoretical example (Heinis et al. 2004). Imagine a sediment contaminated with two pesticides, diazinon and DDE. Imagine further that the primary toxicant in the intact sediment is diazinon, with 100-fold greater toxicity than DDE (sediment toxic units in Table 9–3).

Table 9–3 Thought Experiment Demonstrating Changes in Toxic Potency Associated with Direct Testing of Sediment Extracts*

Parameter	Diazinon	DDE
Log K_{OW}	3.30	6.76
Log K_{OC}[1]	3.24	6.65
Water column LC_{50} (µg/L)	10.7	1.39
Sediment LC_{50} (µg/g OC)	18.8	6140
Sediment Concentration (µg/g OC)	188	614
Toxic Units[2] in Sediment	10	0.1
Concentration in Extract (µg/L)	18800	61400
Concentration in SPMD (µg/g SPMD)[3]	188	614
Log K_{SPMD} (L/kg SPMD)[4]	3.30	6.76
Concentration in water equilibrated with SPMD (µg/L)	94.2	0.107
Concentration in Diluted Extract (µg/L)	3.75	12.3
Toxic Units in Diluted Extract	0.35	8.84
Toxic Units in SPMD preparation[5]	8.8	0.08

*Assumes 100 g sediment at 1% OC extracted into 10 mL, then diluted by 5000x

[1]Di Toro et al. (1991)

[2]Toxic units = concentration/LC_{50}

[3]SPMD prepared such that µg/g OC = µg/g SPMD

[4]Assumes $K_{SPMD} = K_{OW}$

[5]Concentration in water equilibrated with SPMD divided by LC_{50} in water

Assume that we then prepare a solvent extracted from this sediment, and then tested the extract for toxicity by adding a small amount to clean water. Because DDE has a higher (sediment organic carbon) K_{OC}, the concentration ratio of DDE to diazinon in the sediment extract (and therefore in the water spiked with this extract) would be much higher than in the interstitial water. This change in relative concentration would then change the relative toxicity of the two chemicals in the fraction test; in fact, the fraction test would show toxicity due to DDE, with 25-fold greater potency than diazinon (extract toxic units in Table 9–3).

The exact opposite situation existed in the intact sediment. So if one conducted a TIE on the extract spiked back into water, the conclusion would be that DDE was the primary toxicant in the sediment, which is wrong. To avoid this problem, one needs a method for testing sediment extract that preserves the differential partitioning behavior that controls bioavailability in the intact sediment. Such a method has been proposed by Heinis et al. (2004), wherein sediment extracts or fractions thereof are tested using a semipermeable membrane device (SPMD). SPMDs were originally developed for use as passive sampling devices for monitoring water column concentrations of bioaccumulative chemicals in the environment (Huckins et al. 1993). An SPMD is a length of polyethylene tubing containing triolein. In its deployment as a sampling device, chemicals from the water column partition into the SPMD in a ratio that is similar to the octanol-water partition coefficient (K_{OW}). However, one can also drive this partitioning in reverse, by placing chemicals into the SPMD, then allowing those chemicals to partition out into the surrounding water.

Because K_{OW} is very similar to typical partition coefficients between water and sediment organic carbon (K_{OC}), this partitioning is very similar to the partitioning that governs bioavailability in sediments. As shown by Heinis et al., one can therefore use the SPMD for sediment TIE by loading a sediment extract into an SPMD and placing it in water to equilibrate. In doing so, one essentially creates an exposure and bioavailability similar to that expected in sediment, and thereby overcomes the bioavailability problem. Table 9–3 shows how the same example would play out using an SPMD to expose organisms to the extract, and how it preserves the relative potency found in the intact sediment. The details for the SPMD method are provided in subsequent sections and by Heinis et al. (2004).

9.3.1 SPMD Method for Solid-Phase Sediments

The SPMD method should be considered more as a general approach than a strictly defined method; it is likely that there are many variations of this approach that would yield useful results. To facilitate the implementation of this procedure in laboratories new to the method, the following sections give some specific parameters (e.g., SPMD size, etc.), but these should only be considered as methods that have been shown to work, not as the only methods that will work.

The first step in the method is to prepare a solvent extract from the test sediment. Because in the context of a TIE the analytes of interest are not known and vary from sediment to sediment, it is not possible to have a single extraction procedure that is highly effective for every sediment and toxicant. In order to cover a variety of chemicals with a range in properties, we have used a mixed solvent system of hexane:acetone:dichloromethane in a 60:20:20 (v/v/v) mixture (referred to as “solvent mix” from now on). We have extracted sediment in batches of 40 to 100 g (air dry). The specific amount of sediment needed depends on the organic carbon content and the study design. It is best to consider the entire

procedure and back-calculate the amount of sediment that should be extracted. When larger amounts are needed, multiple aliquots of sediment are extracted and the extracts combined.

Air-dried sediment is ground to a powder using a mortar and pestle, combined with an equal mass of anhydrous sodium sulfate, and extracted three times with 75 mL of solvent mix in a sonicating bath at 35°C. The combined extract is then dried by passing it through a funnel containing a plug of glass wool covered with a layer of anhydrous sodium sulfate. The extract is concentrated to a final volume of 40 mL in a 50°C water bath with a stream of dry nitrogen.

SPMDs can be prepared in any length desired. In our work, we found that SPMDs as short as 10 cm long containing 0.1 g of triolein were effective; smaller SPMDs require less sediment extract, so we have adopted this size. Experiments conducted with different configurations suggested that maintaining a ratio of 0.1 g triolein for each 10 cm of polyethylene tubing yields partitioning behavior that best emulates K_{OW} for the chemicals we have examined (Heinis et al. 2004).

The next step is to solvent-exchange an aliquot of the extract into an aliquot of triolein, to be loaded into the polyethylene tubing. The calculation of how much extract to place in each SPMD depends on the characteristics of the sediment and the desired exposure. Different exposure concentrations can be achieved by loading the SPMDs with differing amounts of extract. Experimentally, we have found for several non-ionic organic chemicals that the partition coefficient between water and SPMDs (K_{SPMD}) approximates K_{OW}, a finding that is consistent with other literature data. Since the partition coefficient between organic carbon and water is also approximately equal to K_{OW}, it follows that K_{SPMD} is approximately equal to K_{OC}. On that basis, the expected chemical exposure in sediment and in an SPMD preparation can be expressed relative to the mass of organic carbon in the sediment and the mass of the SPMD.

For example, assume a test sediment with 1% organic carbon. Extracting 100 g of this sediment is the equivalent of extracting 1 g of sediment organic carbon. If one transfers this extract into an SPMD weighing 1 g (total, triolein + tubing), then the expected exposure in both preparations is the same (assuming $K_{OC} = K_{SPMD}$ and 100% extraction efficiency from the sediment). We refer to this as a 1 x SPMD treatment. Placing the extract from 200 g of this sediment is equivalent to 2 g organic carbon (e.g., 200 g of sediment with 1% organic carbon); placing this extract in a 1 g SPMD would represent a 2 x SPMD treatment, or an exposure twice that expected in intact sediment. Using a volume of extract equivalent to 50 g sediment (0.5 g organic carbon into a 1 g SPMD would yield a treatment of 0.5 x SPMD (0.5 g organic carbon/1.0 g SPMD).

The specific concentration to test depends in part on how toxic the test sediment is. If it is only marginally toxic, then it might be wise to test it at 2 x or more, to insure that it is still toxic even if there are some procedural losses. Alternatively, if a sediment is very highly toxic, it may be desirable to test it at lower concentrations. Since lower concentrations require increasingly small amounts of extract, conducting a series of decreasing concentrations of highly toxic sediments may be useful. One advantage of the SPMD method is that it allows the calculation of toxic units like those calculated for effluent TIE, because the organism response should be directly proportional to the concentration of chemical in the

SPMD. This is not necessarily the case for the dilution of contaminated sediment with clean sediment.

To solvent-exchange the desired aliquot of sediment extract into triolein, combine the desired mass of triolein (e.g., 0.1 g for a 10 cm SPMD) with the appropriate aliquot of sediment extract, then reducing the mixture to a constant mass in a 50°C water bath under a stream of dry nitrogen. Determine the final mass of the triolein/extract mixture.

Low-density polyethylene (LDPE) tubing, 2.5 cm wide with 100 µm thick walls (CIA Labs, St. Joseph, MO, USA), is initially cleaned by soaking it in a solution of hexane:dichloromethane (80:20, v/v) for 3 hours, air drying, and then drying under vacuum at room temperature for 18 hours.

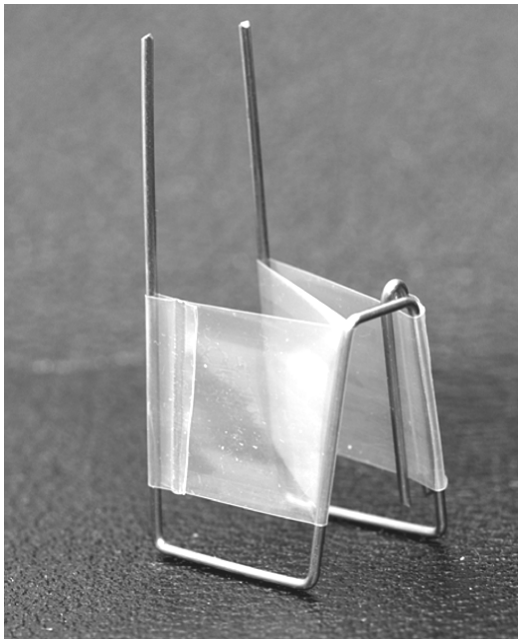
The exact procedure for loading and sealing the SPMD can vary, depending on the techniques and prior experience of the analyst. What follows is the method we have used successfully, but other methods that achieve the same end product could be used. The appropriate length of tubing (e.g., 10 cm) is cut off, flattened, then one end is heat sealed about 1 cm from the end (previous experimentation is required to determine the appropriate conditions for heat sealing such that a complete seal is achieved without burning a hole in the tubing). To provide a point of attachment to a support structure, we create loops of tubing at the ends of the tubing. This is done by doubling the 1 cm "tail" back on itself and heat sealing the end to form a loop. Any excess material can be trimmed off.

The next step is to transfer a quantified mass of triolein/extract mixture into the SPMD. We accomplish this using a clean, empty beaker as a holder. Tare the beaker, then place the tubing in the beaker such that the open end of the tubing faces upward and about 1 cm above the beaker's lip. Weigh the beaker and tubing to obtain the mass of the tubing. Open the end of the tubing by squeezing the sides together; the goal is to form an open, vertical column with the end of the tubing. Using a clean pipette or syringe, transfer the appropriate aliquot of triolein/extract mixture into the tubing, placing it as far down into the tubing as possible. It is important to keep the last 1.5 cm or so of the tubing clean and free of extract so that it can be heat sealed without loss. After the extract is transferred, weigh the beaker again to determine the exact mass of extract added.

Remove the SPMD from the beaker and place it flat on clean aluminum foil. Using a glass rod, move the triolein/extract around in the tubing to obtain a reasonably uniform layer along the length of the tubing, being careful to exclude air and to keep extract away from the open end of the tubing. Heat seal the tubing about 1 cm from the end, then double it over and heat seal that end into another loop.

The SPMDs are then placed in the test beaker. In our experiments, we have used a 600-mL beaker containing 300 mL clean water of a chemistry appropriate for the test organisms to be used. The SPMDs need to be situated in the test beaker to maximize the contact between the test water and the SPMD. We have accomplished this by creating a small rack out of stainless steel wire onto which the SPMD is placed in a zig-zag pattern (Figure 9–1a). The ends of the wire are left long enough to serve as handles for placing and removing the SPMD easily. For marine tests, bent glass tubing in approximately the same configuration is used to suspend the SPMD in the water column (Figure 9–1b).

Figure 9–1 Racks for Working with SPMDs. (a) Freshwater Stainless Steel Rack, and (b) Marine Glass Rack



a

b

The test beakers containing the SPMDs are then placed into a test system capable of maintaining the appropriate test temperature. In addition to treatments containing sediment extracts, control treatments should include a negative control with no SPMD, and a procedural control with an SPMD loaded with triolein only. The SPMD test is a water-column exposure; if the test organism requires a substrate, place a layer of clean, non-sorptive material such as clean silica sand on the bottom of the beaker. For *H. azteca* and *C. dilutus*, a 1 mm layer is sufficient; no substrate is necessary for *L. variegatus*. Commonly tested marine organisms *(A. abdita, A. bahia*, *M. mercenaria*, and *C. volutar*) require no substrate. We do, however, put a piece of black plastic under the test beakers to encourage *A. abdita* to stay at the test beaker bottom and not swim to the surface where they can be trapped by the water surface tension. To speed equilibration, each test chamber should have a small amount of aeration to very gently move the test solution in the beaker. We use a fritted glass dispersion tube, or small-bore tapered glass pipette delivering a very low flow of clean filtered air (e.g., 70 mL/min). The goal is to provide some movement of the water column without creating currents that would unnecessarily disturb the test organisms. Covers are placed over the chambers to reduce evaporation. Small water losses to evaporation or sampling can be replaced with clean water as needed during the exposure. Time required for equilibration depends on the chemical and the specifics of the chamber geometry and mixing. In most cases we have found that 24 to 48 hours of equilibration is sufficient to obtain at least 50% of the steady-state concentration, and typically much higher (Heinis et al. 2004). Unless the target analyte is known, there is no way to verify the degree of equilibration.

After equilibration, test organisms are added and testing and observation proceeds according to standard procedures. Food can be added for those organisms and/or test durations

requiring it. Because the SPMD is a partitioning-driven system, chemical losses to volatilization, sorption, or uptake by test organisms are compensated for by additional chemical release from the SPMD. To date, we have successfully used *H. azteca*, *C. dilutus*, *L. variegatus*, fathead minnows, Japanese medaka, *A. abdita, A. bahia,* and *M. mercenaria* in this test system. *Daphnia magna* have also been used, but we have encountered sporadic difficulties with blank toxicity. These include longer-term (7- to 10-day) exposures sufficient to measure sublethal endpoints (growth) as well as survival (Heinis et al. 2004)

When applying the SPMD method to evaluate nonpolar organic chemicals, a typical first step would be simply to extract the whole sediment and test the unfractionated extract at an appropriate concentration to verify that the toxicity can be removed from the extract and reintroduced via the SPMD. If so, this is strong evidence that the nonpolar organic toxicants are present at toxic concentrations in the sediment. However, because most sediments contain a very complex mixture of organic chemicals, gas chromatography-mass spectroscopy (GC/MS) analysis of an unfractionated extract is likely to produce an enormous number of chromatographic peaks, many of which overlap to a degree that confident identifications and quantifications are not possible. To address this problem, the initial extract can be fractionated, and the resulting fractions tested just as described.

Because the analytes of interest are unknown, it is difficult to derive one specific fractionation procedure that is appropriate for all samples, and we do not yet have sufficient experience to recommend anything specific. In effluent fractionation, the fractions themselves are diluted into water for toxicity testing, which requires that the solvents used must be compatible with the test organisms. In the SPMD approach, the fractionation solvents are removed, so it is not necessary to restrict the range of solvents used for fractionation. As a first step, a separation based on polarity is a logical approach, such as an alumina column eluted with hexane, then a hexane-methylene chloride mixture (e.g., 50:50), then a methylene chloride-acetone mixture. This is only a suggestion; any number of other fractionations proposed in the literature could be used. We suggest that the initial fractionation consist of a relatively small number of fractions (e.g., 3 to 6) to help insure that the toxicants are not diluted beyond detection in the fractionation. In addition, the fractionation procedure should be amenable to processing the relatively large amounts of extract involved. Several procedures for fractionating sediment extracts can be found in the literature (Beg et al. 2001; Brack 2003; Maltby and Betton 1995; Marvin et al. 1999). Regardless of the procedure used, SPMD tests conducted on fractions should probably use relatively high concentrations to avoid losing detectable toxicity due to procedural losses and/or splitting of toxicants among multiple fractions. It is also essential to test procedural blanks for toxicity to insure that toxic artifacts are not being introduced.

9.3.2 Alternate Phase II Solid-phase Methods for Organic Compounds

Large mesh resins such as Ambersorb 563 can be sieved from the sediments and eluted with organic solvents. Anderson et al. (2006a) reported using this method with field sediments and successfully recovering the toxicity in acetone fractions tested as indicated by both marine and freshwater amphipods. Chemical analyzes of those fractions showed the eluates to contain hydrophobic constituents including pyrethroid pesticides.

9.3.3 C_{18} Solid Phase Chromatography and Fractionation for Interstitial Water

The solid phase extraction and elution procedures for interstitial water are parallel to those developed for effluent samples. In that method, the C_{18} SPE column is used to remove nonpolar organic toxicants from the effluent sample, which then is eluted with a series of methanol:water solutions with increasing polarity. This series culminates in a 100% methanol solution, which is the most nonpolar solution used. While this approach proved effective for effluent samples, sediments tend to accumulate even more nonpolar chemicals, such that 100% methanol is not sufficient to elute these chemicals from the SPE column. As a result, the major change in adapting the effluent SPE procedure for interstitial water TIE is to amend the elution sequence to include additional solutions that are less polar. Specifically, the 100% methanol fraction is replaced by 50% methanol/50% methylene chloride, and three additional 100% methylene chloride fractions follow. In addition, we removed some of the more polar solvent mixtures. This modified method generates a total of nine fractions (Table 9–4). While we have chosen this particular scheme, other combinations of solvent mixtures and columns may perform equally well (Anderson et al. 2006a). When choosing solvent mixtures, biological compatibility and/or the ability to exchange solvent mixtures for biologically compatible solvents should be kept in mind. Section 9.8.2 presents further considerations for choosing solvent mixtures and extraction schemes.

Table 9–4 Composition of Nine Recommended Solvents and Water Combinations for Eluting the C_{18} Column in Phase II Sediment TIE

	Composition of Eluting Solutions (% by volume)		
Fraction	**Water**	**Methanol**	**Methylene Chloride**
1	50	50	0
2	20	80	0
3	10	90	0
4	0	100	0
5	0	100	0
6	0	50	50
7	0	0	100
8	0	0	100
9	0	0	100

In order to recover sufficient masses of chemical for fractionation, testing, and chemical analysis, it is best to process a large volume (i.e., 1 L) of interstitial water. While this may be logistically daunting, it is better to invest the effort to obtain a sufficient volume of water than to not have enough water and fail late in the extraction process.

In effluent TIEs, the SPE procedure is performed on a filtered sample. However for interstitial water TIEs, we don't recommend the filtration of the interstitial water, because we have often found that this results in a nonspecific reduction in toxicity. The original purpose of filtration was to prevent plugging of the SPE column by particles. However, this same objective can be met through double centrifugation of interstitial water (Section 8), avoiding any effects of filtration on toxicity.

As in the original effluent procedure, we recommend that one 6 mL high-capacity C_{18} column be used for every 1000 mL of sample fractionated. Throughout this procedure we recommend a flow rate of 7 to 10 mL/min. The column is preconditioned by pumping 25 mL of 100% methanol through the column, followed by 25 mL of high-purity distilled water. At this point, 25 mL of dilution water is passed over the column, the last 10 mL of which is collected for a column blank toxicity test. Special care must be taken not to allow the column to become dry at any time during the conditioning procedure. One solvent must be added after another in such a way that precludes air passing through the column.

After the column is conditioned, the elution blanks are collected (Table 9–4). Three mL (in two 1.5 mL aliquots) of fractions 1 through 9 (i.e., 50% methanol:water to 100% methylene chloride) is passed over the column and each fraction collected in separate analytically clean labeled vials.

Each eluting solution is allowed to pass completely through the column before the next solution is added to the column. The column may go to dryness during this procedure. After the elution blanks have been collected, the column should be reconditioned with methanol and water; again, it is important not to allow the column to become dry during reconditioning.

To extract the IW, 1000 mL of double centrifuged interstitial water is pumped through the column at a rate of 5 mL/min. Three 20 mL samples of the post-SPE column effluent are collected after 25 mL, 500 mL, and 950 mL of the sample pass through the column. These aliquots can be tested to monitor for the breakthrough of toxicity in the post C_{18} sample (USEPA 1991a; 1992b). After the entire sample has passed the column, it is allowed to go to dryness. If the column plugs and the entire 1000 mL cannot be processed, collect a 20-mL sample of the last interstitial water to pass the column and record the total amount passed through the column. If needed, the remainder of the sample can be processed using another column, prepared and blanked.

The loaded column is now ready for elution. The column is eluted exactly as described for the collection of elution blanks. If more than 1000 mL of sample is being fractionated, and therefore more than one column is being used (or if more than one column was needed to process 1000 mL), then the complete procedure from preconditioning, collection of the elution blanks, reconditioning, and column elution is repeated for each column. Corresponding fractions from several columns may be combined at this stage, but dilution water blanks should be kept separate. The vials containing the fractions are sealed with perfluorocarbon or foil-lined caps and stored under refrigeration.

Because methylene chloride has higher toxicity than methanol, the methylene chloride must be eliminated from fractions before toxicity testing of the fractions can take place. Because concentrations of the high log K_{OW} toxicants may be diluted over several fractions, it is best to combine those fractions that contain 100% methylene chloride (fractions 7 through 9). Then, one can eliminate methylene chloride from this one combined fraction, and reduce the volume to 3 mL, as would be the case if a toxicant had eluted in only a single fraction (i.e., in an ideal situation).

Eliminating methylene chloride from methanol or exchanging it into methanol is relatively easy because methylene chloride is more volatile than methanol and can therefore be removed from a mixture of these two solvents by evaporation under a stream of nitrogen. We

have found that this step is readily accomplished by combining fractions 7 through 9 for a total of 12 mL in a 50 mL glass centrifuge tube. To this is added another 12 mL of methanol and a perfluorocarbon-coated magnetic micro stir bar. The centrifuge tube is placed in a water bath at 50°C and stirred magnetically with a stream of nitrogen gently flowing over the surface of the solution. Alternatively, the sample can be placed in a Turbo-Vap™ evaporator (Zymark Corp., Hopkinton, MA, USA) set at 50°C. The Turbo-Vap system automatically blows a gentle stream of nitrogen over the surface of the sample, resulting in both evaporation and mixing, until it reaches a specified volume. After the volume of the solution is reduced to 3 mL, the sides of the tube are carefully rinsed with 3 additional mL of methanol and the volume is again reduced by evaporation to 3 mL. These repeated evaporations and additions of methanol ensure that the methylene chloride is eliminated from the fraction. If only a single fraction containing methylene chloride is to be tested for toxicity, then exchange into methanol can be easily achieved by using this procedure. In this case, however, 3 mL of methanol are added to the fraction, the volume is reduced to 3 mL, and sides of tube rinsed with another 3 mL methanol followed by a final volume reduction to 3 mL.

Because organic toxicants in sediments tend to be more nonpolar than those in effluents, sediment nonpolar compounds may not be very miscible in methanol or aqueous solutions. Sometimes, if we try to force a high concentration of nonpolar compounds into a polar solvent, a biphasic solution or undissolvable material in the test fraction has resulted. One way to counteract this is not to bring the test solution down to a small volume; however, this may decrease the ability to concentrate the test extract. Another method is to choose a biologically compatible, yet more nonpolar, solvent. Both acetone and DMSO have been used in this way. Any procedure that involves combining fractions or exchanging methylene chloride with methanol or other carriers also must be performed with the corresponding elution blanks. In that way, any artifactual toxicity that is inadvertently introduced by these procedures can be detected in the blank.

Toxicity testing of SPE fractions is performed as described in the general Phase II effluent method (USEPA 1992b). When concentrating toxic fractions for further chemical analysis by GC-MS, samples need to be transferred to a nonpolar solvent such as hexane or heptane. Samples to be analyzed by GC-MS will need to be dried with sodium sulfate to remove water before analysis. Fractions to be analyzed by HPLC need to be solvent exchanged to a polar solvent such as methanol, acetonitrile, or water. The above methods used for solvent exchange for toxicity testing can also be used here.

Further reverse phase fractionation of SPE fractions by HPLC, including fractions 8 through 11 (combined or individually), can be carried out exactly as described in the general method (USEPA 1992a). Compounds that require methylene chloride for elution from C_{18} SPE columns can often be fractionated by HPLC using a water:methanol solvent gradient. We have found that high log K_{OW} compounds elute in the 90 to 100% methanol portion of such an HPLC gradient and therefore would be found in the 90 to 100% methanol HPLC fractions. The 100% fractions, therefore, can be concentrated for GC-MS analysis by evaporative volume reduction. However, we have been unable to determine whether useful separations of high log K_{OW} compounds can be achieved by reverse-phase HPLC fractionation.

GC-MS analysis of concentrated SPE and HPLC fractions is performed in the same manner as described elsewhere (USEPA 1992b).

9.3.4 C_{18} Fractionation Considerations

As discussed in the previous section, many types of nonpolar organic compounds that accumulate in sediments are less polar than those typically found to be toxic in effluents. For example, we have identified toxic C_{18} SPE fractions containing benzenes, PCBs, PAHs, and long-chain aliphatic hydrocarbons from sediment interstitial water samples from the Illinois and Saginaw Rivers (Ankley et al. 1991; Schubauer-Berigan and Ankley 1991; Schubauer-Berigan et al. 1990). The recovery of these more nonpolar compounds is often not predictable from the C_{18} column. At times, these nonpolar compounds (e.g., PCBs) can be eluted in the 90:10 and 95:5 methanol:water solvent mixtures and further elution of the column with 100% methanol, 100% methylene chloride, and 100% acetone did not produce any additional toxicity (Ho et al. 1997). In other studies, we were unsuccessful in recovering nonpolar organics from the C_{18} SPE column using the methanol:water scheme recommended in the Phase II TIE manual (USEPA 1992b). Instead, we used an increasingly nonpolar methylene chloride:methanol elution series to extract the more nonpolar compounds that appeared to be causing the sample toxicity.

A series of experiments performed with standards containing compounds with log K_{OW} values ranging from 3 to 8 confirmed that C_{18} SPE fractionation techniques do not provide predictable recoveries or separations for more nonpolar compounds. We have observed that for compounds with log K_{OW} values of greater than 5, the same chemicals may be recovered in both the 100% methanol fractions, and in the more nonpolar methylene chloride:methanol fractions. However, the same standard fractionated by HPLC shows that increasingly nonpolar compounds are sequentially recovered, and more predictably, in the more nonpolar fractions. HPLC methods have far greater separation ability than simple column chromatography. Differences in column packing and elution conditions most likely also influence the elution of nonpolar compounds.

Alternatively, a normal-phase silica gel column fractionation may be used. Normal-phase packings generally do not sorb organic compounds to the same degree as reverse-phase packings. However, normal-phase fractionation generally requires elutions with solvents that are not biologically compatible (e.g., hexane, methylene chloride). These nonpolar solvents need to be exchanged into carriers that are more biologically compatible (e.g., methanol) before testing. Scrupulous use of operational blanks is critical for work with less biologically compatible solvents in order to detect any toxicity resulting from the use of these solvents.

9.4 Sulfide

Sulfide is produced naturally in anoxic sediments by sulfate-reducing bacteria, but the amount of sulfide produced may be increased by anthropogenic additions that enhance microbial activity (e.g., nutrients). Sulfide is present in anoxic sediments in many forms, both dissolved forms in interstitial water and mineral forms such as sulfides of iron and other metals. While solid forms such as metal sulfides are not thought to be toxic to benthic organisms, free sulfide in the water column is quite toxic to many aquatic organisms (Broderius et al. 1977). Most benthic organisms used for sediment toxicity testing are naturally adapted to living in the oxic layer overlying anoxic sediments, or actually within

the anoxic layer using adaptations such as irrigated burrows to obtain the oxygen necessary to sustain life. In whole sediment flow-thorough test systems, sulfide toxicity is likely to be minimized due to volatilization and dilution. However, we have documented sulfide toxicity in whole sediment static, aerated test systems. Although some sulfide is dissipated through the mixing and handling of sediments during test preparation, enough can remain to cause toxicity if initial concentrations are high.

Sulfide toxicity is also quite possible in interstitial water tests, where the interstitial water is isolated from previously anoxic sediment and the nature of the subsequent exposure does not allow test organisms to avoid exposure by the normal mechanisms (e.g., irrigation of a burrow with overlying water with low sulfide concentrations). While sulfide is typically oxidized over time when oxygen is available, it can persist for some time in isolated interstitial water even after it is oxygenated enough to allow toxicity testing.

Sulfide toxicity in the water column increases with decreasing pH, and sulfide itself is fairly volatile, increasingly so at lower pH. If a graduated pH test has not already been conducted, it should be, with the expectation of increased toxicity with decreased pH and/or reduced toxicity with increasing pH. However, many of the conditions that produce high sulfide concentrations in interstitial water (anoxic sediments) may also lead to increased ammonia; therefore, it is also important measure ammonia and factor its concentration into the interpretation of the graduated pH test. It would be theoretically possible for the graduated pH test to show relatively little change in toxicity if toxicity were caused primarily by ammonia at higher pH and by sulfide at lower pH.

Chemical analysis to confirm the presence and concentration of dissolved sulfide is both straightforward and an important piece of evidence for sulfide toxicity. Hydrogen sulfide can be measured using either a modified colorimetric method (American Public Health Association (APHA) 1992; Knezovich et al. 1996), which has a detection limit of 3 µg/L for total sulfides, or an ion selective probe (Orion Research, Cambridge, MA, USA) which has a detection limit of 20 µg/L. It is obviously important that the analytical method have sufficient sensitivity to detect concentrations of sulfide toxic to the test species.

Although some toxicity data for sulfide are available in the literature, the ease with which sulfide is lost from test solutions can make sulfide toxicity specific not only to the organism, but also to the specific test system used to (e.g., beaker size and geometry, temperature, airflow). For this reason, when sulfide is suspected it is prudent to conduct a toxicity test with sulfide-spiked dilution water to confirm the concentrations of sulfide that are associated with toxicity. Sodium sulfide (Na_2S) is an appropriate form of sulfide for spiking experiments. Sulfide concentrations should be measured at the start of the exposure and at relevant times during the exposure to document the rate of sulfide loss.

The volatility of sulfide at reduced pH can also be used effectively to implicate sulfide as a causative toxicant in interstitial waters. As sulfide becomes more volatile with decreasing pH, toxicity caused by sulfide should be readily lost under aeration at low pH (see USEPA 1991b for detail on pH-adjusted aeration tests). One can also use high pH aeration tests to show that volatility is retarded at high pH. If high pH aeration is used, it is important that nitrogen be used as the sparging gas instead of air. Sparging with air can induce sulfide loss by both oxidation and volatilization. If reduction in toxicity is intended, then it doesn't really matter the degree to which loss occurs by either mechanism. However, if retardation of

volatilization is the goal, then it is important that oxidation be minimized so that toxicity is not lost by that mechanism, with misleading results.

While loss of toxicity with low pH aeration is consistent with sulfide toxicity, more definitive evidence can be obtained by using a toxicant transfer or "purge and trap" approach. This is described in detail in previous TIE documentation (USEPA 1991b). In brief, the interstitial water sample is acidified to pH 3 and then sparged with nitrogen. Again, it is important to use nitrogen for this procedure to avoid oxidation of sulfide. Gas from the sparging vessel is then passed through a liquid trap of dilution water adjusted to pH 9. Sulfide liberated from the interstitial water at low pH should be retained in solution with higher pH. Volumes of the sample purged should be established so that there is no dilution of the toxicity to below toxic levels even after accounting for the possibility of less than 100% recovery. Following sparging, the pH of the trapping solution is readjusted to the initial pH of the sample and tested for toxicity. Even better, a graduated pH test can be conducted on the trapping solution to demonstrate that the recovered toxicant has the same pH dependence as in the original sample. Sulfide concentrations should be measured in both the sample purged and in the trapping solution. A procedural blank should also be included.

Because sulfide is both volatile and easily oxidized, it is also common for sulfide toxicity in interstitial waters to be transient (e.g., toxic when tested immediately after isolation, but not toxic when tested again one or two days later). In whole sediments where pH adjustments are difficult, the volatility of sulfide from test systems can be used as an additional line of evidence to identify the toxicant. We have found that with normal aeration (approximately 2 bubbles/sec) for 72 hours in our whole sediment small volume static tests, total sulfide levels decreased from about 10 mg/L to about 0.4 mg/L. The total sulfide LC_{50} for two amphipod species, *R. abronius* and *E. estuarius* are 1.60 and 3.32 mg/L, respectively (Knezovich et al. 1996). The benthic burrowing shrimp, *C. crangon,* has a total sulfide LC_{50} of 0.6 mg/L (Vismann 1996). Fish and epibenthic organisms tend to be more sensitive to sulfides; the mussel *M. edulis* and the sea urchin *S. purpuratus* have total sulfide EC_{50} of 0.1 and 0.19 mg/L (Knezovich et al. 1996). While this simple aeration method may remove sulfides to a level at which they do not cause toxicity to benthic organisms, the sensitivity of the specific test organisms should be confirmed.

9.5 Toxicity Caused by Major Cations and Anions

In one instance, we studied a sediment that contained unusually high concentrations of calcium, sufficient to cause toxicity to mysids. Although this was a marine sediment, it is possible that something similar could occur in freshwater sediments as well, and in either case it could involve other common cations and anions such as sodium, potassium, magnesium, and chloride. Toxicity of freshwater effluents caused by high concentrations of cations and anions is not uncommon (Tietge et al. 1997). Although marine organisms are naturally adapted to saline waters, they too are sensitive to waters with cations and/or anions in ratios sufficiently different from those in natural seawater (Douglas and Horne 1997; Pillard et al. 2000).

None of the solid phase sediment manipulations should be expected to remove cation imbalance toxicity. While it seems logical that cation exchange resin might affect major cations, the resin recommended for use in bulk sediment TIE procedures for metals was

specifically selected for having higher affinity for common heavy metal cationic metals as compared to major ions like calcium and magnesium. Moreover, the much greater concentrations required to cause toxicity from major cations are such that they would likely overwhelm the capacity of the cation exchange resin. And finally, cation exchange resin does not only remove cations; it exchanges them, so any sorption of one cation must be countered by release of another (sodium in the case of SIR-300 used as described in Section 7.2.4.1), which may cause problems of its own.

In effluent or interstitial water TIE, toxicity due to major cations or anions will result in none of the typical Phase I manipulations reducing toxicity. The next step is generally to measure the concentrations of sodium, potassium, calcium, magnesium, chloride, sulfate, and alkalinity in the sample. For freshwater samples, conductivity alone may give some indication of elevated concentrations of major cations and anions, but this is not very diagnostic, as the toxicity of these ions is determined by the specific concentrations of individual ions, not by the more general property measured by conductivity (Mount et al. 1997). As an example, *H. azteca* can easily tolerate seawater at 20% salinity, but is still sensitive to toxicity from major ions in waters with different ion ratios (Ingersoll et al. 1992). In marine waters, ionic imbalance toxicity may or may not be accompanied by changes in salinity. If the imbalance is due to an excess of an ion, the salinity may change; if toxicity results from a change in the ion balance, no salinity change may be noted.

If major ion analysis indicates something suspicious, the most straightforward approach is to create a mock sample by spiking dilution water (or DI water if necessary) with common salts (e.g., NaCl, Na_2SO_4, $CaCl_2$) to create a sample with major ion chemistry matching that in the interstitial water under study. This sample is then tested for toxicity using parallel methods. In addition to a baseline test with interstitial water and the usual negative (dilution water) controls, one might also consider a treatment using another mock sample that has had any unusual characteristics adjusted. For example, in testing a marine sample with excessive calcium, create another spiked sample of comparable composition except for a more proportional calcium concentration. This provides some assurance that artifactual toxicity is not introduced in the process of creating the mock sample itself, which is a concern for marine organisms in particular.

9.6 Manipulations Addressing Selected Anionic Metals: Chromium and Arsenic

Chromium and arsenic are two metals/metalloids that can be of concern in sediments and occur (or can occur) as oxyanions. These metals are known to contaminate sediments around the United States (Becker and Long 2006; USEPA 2004) and world (Aboul Dahab and Al-Madfa 1997; Becker and Long 2006; Mirlean et al. 2003; Neff 1997; Stronkhorst and van Hattum 2003). Although chromium and arsenic are known sediment contaminants, the frequency with which they cause toxicity to benthic organisms is not well understood. In the aquatic environment, arsenic and chromium assume anionic form resulting from oxidation/reduction and pH conditions (Bodek 1988). Arsenic has four oxidation states (-III, 0, III, V) and occurs in water as anionic arsenates V ($H_2AsO_4^-$ and $HAsO_4^{-2}$) and arsenites III ($H_3AsO_3^0$ and $H_2AsO_3^-$) (Bodek 1988). Chromium has three oxidation states (II, III, VI) and occurs as anionic chromates VI (CrO_4^{-2}, $HCrO_4$, and $Cr_2O_7^{-2}$) and in trivalent forms

($Cr(OH)_3^0$ and $Cr(OH)_4^-$) (Bodek 1988). Among these different forms, the trivalent (III) forms of arsenic and hexavalent (VI) form of chromium are considered to be the most toxic (Berry et al. 2004; Neff 1997). For example, LC_{50}s for hexavalent chromium for the marine amphipod *A. abdita* are reported to be 1,980 µg/L, and the LC_{50} to the mysid *A. bahia* is 2,030 µg/L (Berry et al. 2004; USEPA 1985b), while LC_{50} values for trivalent chromium are generally an order of magnitude greater (Berry et al. 2004; USEPA 1985b). For aquatic organisms, LC_{50}s for arsenic do not demonstrate the large differences between forms as observed between chromium III and VI (Neff 1997). The LC_{50} for arsenite (III) is reported as 1,740 and 8,000 µg/L for the mysid and amphipod, respectively (USEPA 1985c) while the LC_{50} for arsenate (V) is 2,319 and 4,160 µg/L for mysids and amphipods, respectively.

In sediments, because of changes in oxidation/reduction conditions, arsenic and chromium shift oxidation states and therefore toxicity. Under reduced sedimentary conditions, arsenic is present primarily in the III form (Neff 1997) and may be expected to demonstrate greater toxicity. However, arsenic will react with sulfur to form relatively insoluble and (possibly) nonbioavailable compounds (e.g., AsS, FeAsS, As_2S_3) (Neff 1997). Recently, Berry et al. (2004) and Besser (2004) reported on the environmental factors controlling chromium bioavailability and toxicity. Under reduced sedimentary conditions, chromium assumes the III oxidation state and correspondingly demonstrates less toxicity (Berry et al. 2004). For both arsenic and chromium, it is likely that at sufficiently elevated concentrations, and despite changes in oxidation state and presence of binding phases, toxicity to benthic organisms will occur.

Because anionic metal toxicity in sediment is thought to be associated with concentrations of metals dissolved in the interstitial waters, TIE methods for these metals seek to reduce these concentrations. In an effluent TIE, Mount and Hockett (2000) used anion exchange resin columns (Amberlite IRA410, Continental Water System, Denver, CO, USA) to identify chromium as the cause of observed toxicity to freshwater species. Exchange columns can be prepared by placing 40 mL of resin in a 60-mL syringe. The resin packed column should be rinsed with 1 L of control water and then 1 L of test water at a rate of 25 mL/min. Ion exchange would also be likely to remove ions essential for freshwater test organism survival, so blank and effluent samples should be spiked with 10% (v/v) of mineral water (Perrier®) after ion exchange. Detailed procedures are described (Mount and Hockett 2000). Interstitial water TIEs involving chromium or arsenic have not been reported.

For whole sediment TIEs, Burgess et al. (2007) recently reported on the use of anion exchange resins added directly to sediment as an approach for conducting TIEs for chromium and arsenic. Although these methods were developed for saltwaters and marine species (i.e., *A. abdita* and *A. bahia*), it is likely they will function in freshwater systems once tolerance data has been generated for freshwater species. Additions of anion exchange resins to whole sediments have been effective in reducing toxicity and dissolved concentrations of anionic chromium and arsenic. These resins consist of some type of silica or polymer structure coated with a specific functional group including positively charged dimethyl-, trimethyl- and proprietary amines (Burgess et al. 2007). Binding of the dissolved negatively charged metals to an anion exchange resin reduces the bioavailable concentration of metal.

We have used SIR-700 for chromium and ASM-10-HP for arsenic (ResinTech, West Berlin, NJ, USA). These resins were found most effective among a small group of resins evaluated

by Burgess et al. (2007) including weak base (WBMP-HP) and strong base (SBMP1-TR) resins. Features of the resins that make them useful for this application include a very high affinity for metal anions of concern (e.g., chromium or arsenic) and low toxicity to sediment test organisms. Other resins, not yet evaluated, may also be effective for use in whole sediment TIEs.

As noted above, the following method was developed for saltwater systems, however, the resins should also function in freshwater systems. Both resins, SIR-700 and ASM-10-HP, should be rinsed before use by combining resin with deionized DI water (approximately 1:4 v/v) in a beaker, swirling the mixture to thoroughly mix and resuspend the resin, allowing the mixture to settle (e.g., 1 min.), then decanting the water. This procedure is repeated two times for a total of three DI rinses. Next, the decanted resin is combined with four volumes of saline water (e.g., 30‰ natural seawater or 30‰ reconstituted natural seawater prepared from brine), and mixed as above two more times for a total of three saline rinses. We store the resin in saline solution from the last rinse for 24 hours at 4ºC in the dark before use.

Prior to use, each resin is removed from the storage container (taking care to allow any excess liquid to drain via gravity), measured into aliquots appropriate to bring the test sediment to 20% resin (24 g resin-sediment mix/replicate), then transferred to the test sediments, and mixed thoroughly. This can be performed in batch mode by treatment or on each individual replicate. We prepare the sediment-resin mixture in batches and then add aliquots of the mixture to the individual replicates followed by overlying water. Sediments are then equilibrated for at least 24 hours before organisms are added. Both the test sediment and a procedural blank (using control sediment) are prepared and tested.

The resins described by Burgess et al. (2007), SIR-700 for chromium and ASM-10-HP for arsenic, were shown to significantly reduce the overlying and interstitial water concentrations of arsenic and chromium, as well as several cationic metals including cadmium, lead and zinc and to a lesser degree, ammonia. Concentrations of a representative organic pesticide, endosulfan, were not significantly affected by the presence of the two anionic resins. Together, these results reinforce the need to conduct structured TIEs involving the different manipulations performed simultaneously. Using this structure reduces the possibility of misinterpreting results caused by a manipulation unexpectedly altering the bioavailability of an unintended sediment contaminant.

Thus, reduction in toxicity by the anion exchange resin additions should be viewed as consistent with toxicity caused by either chromium or arsenic, but not conclusive evidence by itself. As with most tests, conclusions from individual tests should be viewed in the context of the results from the entire Phase I TIE. Like the cation exchange resin addition, the anion exchange addition involves a substantial physical dilution of the sediment; therefore, results of a sand dilution blank test should be considered.

Although recovery of the sorbed metal from the resin has not been evaluated, it may be possible to sieve the resin(s) from the sediment at the end of the TIE using a 0.5 mm screen and then elute the resin with a strong basic solution to extract sorbed metals for later chemical analysis and testing. As noted, this aspect of the manipulation has not been evaluated but would be similar to the approach taken in Phase II with cationic metals (Section 9.2.7).

9.7 Phase II Approaches When No Phase I Manipulations Affect Toxicity

As was found in effluent TIE, there are instances when no Phase I manipulations alter toxicity of the interstitial water or bulk sediment. Although initially frustrating, there are options for pursuing toxicant identification in such situations.

In general, there are three primary reasons why toxicity might not be affected by any Phase I manipulations:

- The concentration of toxicant is too great and overwhelms the toxicity reduction capacity of the otherwise applicable manipulations.
- The properties of the toxicant are such that no Phase I manipulations are effective.
- There are multiple toxicants at work, such that reduction of one toxicant by a manipulation is masked by the presence of another toxicant.

Although which of these (or others) is responsible may not be known until after the toxicant(s) is ultimately identified, it is useful to keep these possibilities in mind while evaluating data and designing next steps. The order in which the suggestions are discussed does not reflect a particular priority for implementation, which would be sample specific. Instead, we encourage investigators to consider all of the suggestions and implement those that make the most sense in light of the particular circumstances.

If high toxicant concentrations overwhelm a manipulation, this might sometimes be avoided by insuring that the sample being tested is close to its threshold for toxicity. Section 7 describes the pros and cons of sediment dilution; however, regardless of the disadvantages one often needs to dilute very toxic sediments in order to make any progress in identifying sediment toxicants.

If no Phase I manipulations affect toxicity, the investigator might consider further diluting the sample and trying again. Of course, there is no point in conducting Phase I testing on a sample that is so marginally toxic that typical variations from random variability alone are sufficient to obscure a characterization pattern.

Another possibility is to change the matrix of the test used in Phase I. Even though the Phase I methods for both bulk sediment and interstitial water contain manipulations targeting similar groups of toxicants, they are based on different approaches and use different amendments. As such, it is possible that a more interpretable characterization pattern might be obtained by using the approach not used initially (e.g., if whole sediment testing was used initially for Phase I, try an interstitial water Phase I, assuming the interstitial water is toxic).

Some toxicants are such that no Phase I manipulation would be expected to affect their toxicity. Examples include toxicity from major ions and hexavalent chromium. While it can be nonproductive to begin chasing after isolated possibilities without a specific reason to suspect a particular toxicant, directly measuring concentrations of such toxicants may be warranted if there is reason to believe they may be present.

It should also be kept in mind that some toxicants targeted by Phase I manipulations may not respond to those manipulations because of a matrix interference or other difficulty. Accordingly, it may be worth verifying that such toxicants are not the culprits. Examples that come immediately to mind are ammonia and common cationic metals (e.g., zinc, cadmium, lead, nickel, copper). Ammonia should be measured in interstitial water (see Section 8).

Cationic metals can be measured in bulk sediment, interstitial water, or via peepers (Berry et al. 1996; Serbst et al. 2003). If measured in bulk sediment, analysis should include AVS, and metals should be quantified as part of that extraction as "simultaneously extracted metals" (Di Toro et al. 1990; Hansen et al. 1996). Measuring sulfide may be warranted, particularly if the sediment sample or isolated interstitial water has a sulfide odor. Ruling out many of these "common" toxicants can narrow the universe of possible toxicants.

There is some circumstantial evidence for polar organic compounds causing toxicity of field-collected sediments; however, no Phase I manipulations are targeted toward such compounds. Research with various column sorbents may be useful to remove and to isolate polar organics (la Farre et al. 2001). Effluent TIE work has identified various surfactants as suspected toxicants in water samples (Ankley and Burkhard 1992; Ankley et al. 1990a; la Farre et al. 2001). The behavior of surfactants or other polar organic compounds in sediment TIE has not been studied, but one might suspect that the toxicity of surface active compounds would be ameliorated considerably by sediment particles.

We have conducted several bulk sediment TIEs on harbor sediments that are generally thought to be primarily contaminated with PAHs from petroleum, coal tar, or other oily wastes. In these studies, we have often observed that the coconut charcoal and carbonaceous resin treatments did not appreciably reduce or remove toxicity as might be expected for a nonpolar organic contamination such as PAHs. Our investigations into this phenomenon are ongoing, but we have strong circumstantial evidence that the reason may be that toxicity to *H. azteca* and *C. dilutus* was caused by the presence of a non-aqueous phase (an "oil") rather than from direct toxicity caused by specific components, such as PAHs. One piece of evidence is that, when such sediments are treated with coconut charcoal, concentrations of PAHs in IW are greatly reduced, as are concentrations of PAHs in tissues of exposed organisms. These measurements indicate that PAH exposure is in fact being reduced by the manipulation, but it is just not reducing toxicity as one would expect. In separate experiments, we have spiked mineral oil (a refined oil containing alkane hydrocarbons, but not PAHs, and generally thought to be non-toxic) into sediments and have shown toxicity to *H. azteca* and *C. dilutus* at concentrations similar to the concentrations of solvent-extractable material ("oil and grease") found in the harbor sediments. At the time of this writing, we are working on, but have not yet developed, a TIE manipulation to address the toxicity of non-aqueous phases, so we cannot offer specific guidance about how to demonstrate experimentally that non-aqueous phases are a cause of toxicity. In general, it appears that sediments with two or more grams of solvent extractable material per liter of sediment tend to have toxicity to *H. azteca* and *C. dilutus* with the characteristics described above. Note that we are normalizing the solvent extractable material to sediment volume rather than sediment weight, because we have found that this normalization correlates better with observed toxicity. As indicated above, we are continuing to work on this problem and will publish our findings as they become available.

The majority of the solid-phase TIE manipulations have been developed using the premise that reducing chemical activity (concentration) in the interstitial water will reduce toxicity. While toxicity via sediment particles is indirectly addressed because chemical sorption to particles is influenced by chemical concentration in interstitial water, toxicity due to particle ingestion (of either metals or organics) is not overtly addressed by the solid-phase TIE

methods presented here. Therefore, it is conceivable that organisms susceptible to toxicity via ingestion of sediment might not be addressed by these methods. The extent of this potential shortcoming is not clear, as one of the organisms used successfully with these methods (*C. dilutus*) feeds by ingesting sediment, particularly in fine grained sediments (Sibley et al. 1998).

An approach that we have not yet explored may be to increase the equilibration time of the sorbent used in whole sediment exposures. While this may have limited success for cation resins designed to sorb metals due to relatively fast equilibration times, it may increase the effectiveness for organic sorbents such as PCC and carbon-based resins which have slower equilibration times with organic toxicants.

Another approach to identify toxicants when traditional methods have not succeeded may be to conduct interstitial water manipulations in conjunction with pH adjustments. The original Phase I TIE methods for effluents included several manipulations using pH-adjusted (acidic and basic) samples. With the exception of the graduated pH test, these pH-adjusted manipulations were not included in the initial Phase I methods for either chronic TIE on aqueous samples or the interstitial water methods described in this document. This change was based on two factors:

- Experience gained since the original development of the aqueous Phase 1 methods, which suggested than many toxicants could be characterized without the additional pH-adjusted tests; and
- The logistical constraints of conducting additional tests with chronic test methods or, in the case of sediments, the substantial effort required to isolate sufficient additional interstitial water to perform the additional tests

While we stand by this reasoning in general, there are toxicants that respond to altered pH alone or in combination with aeration, filtration, or SPE manipulations, suggesting that these might be considered when the manipulations conducted at ambient pH do not yield sufficient information. The methods for these pH adjusted manipulations are described Section 9.8.

The presence of multiple toxicants can confound attempts to characterize toxicity, particularly if the toxicants have different physical or chemical properties and therefore respond differently to Phase I manipulations. For example, consider a hypothetical interstitial water with 10 toxic units of zinc and 2 toxic units of ammonia. In this scenario, an EDTA test performed at a 100% or 50% interstitial water concentration would not be expected to remove sample toxicity because even with the zinc chelated and detoxified, there would still be a toxic amount of ammonia present. If, however, this sample were diluted sufficiently to reduce the ammonia concentration below its toxicity threshold (e.g., 25%), the remaining toxicity would be attributable to zinc only, and would be removed by EDTA treatment. This is another reason why diluting the sample to near its threshold for toxicity can be important in identifying the causes of toxicity (or one of them, in this case).

It's worth noting that diluting a sample to eliminate the effect of one toxicant does not solve the entire problem. That is, even though one of the sediment toxicants is identified, there is another toxicant that remains unknown. However, it is generally far easier to identify a second toxicant once the first is known. For example, in our hypothetical case, once zinc was

identified, we might be able to do a Phase I characterization on a sample that had EDTA added (to eliminate the zinc toxicity) in order to characterize the second source of toxicity.

If the multiple toxicants are present at a more equal potency, then dilution will not solve the problem. In this instance, use of multiple and/or sequential manipulations may be useful (Ho et al. 1999a; Phillips et al. 2003; Science Applications International Corporation 2003). For example, if both ammonia and nonpolar organic toxicants were present at roughly equal potency, it is likely that no one manipulation would remove toxicity. However, testing SPE-treated interstitial water in a graduated pH test might reveal the roles of both toxicants. Sequential manipulations can also be useful when the manipulations are not entirely toxicant specific; for example, *U. lactuca* in aqueous solutions removes both ammonia and some nonpolar organic chemicals. To distinguish between the two and determine the contribution of each of these to overall toxicity, we passed the sample through a C_{18} column and divided the treated sample into two aliquots. One of these was tested for toxicity without further manipulation, while the other was treated using *U. lactuca* and then tested. Any difference between the baseline and the post-C_{18} toxicity is most likely due to organics, while the difference between the post-C_{18} and the *Ulva* treatment toxicity is likely due to ammonia (Ho et al. 1999a).

Another example is discrimination between the effects of lead, zinc, copper, and ammonia by comparing the results of the graduated pH, sodium thiosulfate, and EDTA tests (Schubauer-Berigan et al. 1990). Such distinctions are possible because these compounds behave uniquely when exposed to combinations of these tests. These responses are summarized in Table 9–5.

Table 9–5 The Effect of Graduated pH, Sodium Thiosulfate, and EDTA on Ammonia, Copper, Lead, and Zinc Toxicity

Toxicant	Toxicity Response Under		
	Reduced pH	**EDTA Addition**	**Thiosulfate Addition**
Ammonia	Decreases	No change	No change
Copper	Increases	Decreases	Decreases
Lead	Increases	Decreases	Little/no change
Zinc	Decreases	Decreases	Little/no change

9.8 Manipulations Under Acidic and Basic Conditions

We recommend that, for interstitial water TIE, initial Phase I testing omit the pH-adjusted manipulations that are included in the acute TIE methods for aqueous samples. While we believe these additional tests are often unnecessary, they may provide important clues in cases where the initial Phase I characterization does not yield a clear pattern. Some toxicants undergo irreversible changes under acidic or basic conditions. For example, malathion degrades under basic conditions and its toxicity is therefore reduced or removed simply by temporary adjustment of the sample to basic pH. In addition, some toxicants undergo reversible changes that alter their response to aeration or SPE. Examples here include sulfide

(more volatile at reduced pH) or an ionizable organic chemical that becomes more nonpolar (and therefore amenable to SPE) under acidic or basic conditions.

Extreme pH manipulations are applicable only to interstitial water TIE; attempts to dramatically change the pH of whole sediments cause dramatic changes in sediment properties and associated artifactual toxicity. Acidifying sediments will likely mobilize large amounts of metals from otherwise nontoxic mineral forms, reactions that will not be reversed when the sediment is neutralized. Even within interstitial water TIEs, extreme pH manipulations are generally used for freshwater samples, as comparable manipulation of seawater can lead to precipitation of native ions and subsequent artifactual toxicity.

Even if pH-adjusted manipulations do not directly lead to the identification of the causative toxicant(s), they can be very useful in ruling out toxicants and/or identifying characteristics that can be used in later confirmation studies. For example, if aeration at low pH does not affect toxicity, then it is unlikely that sulfide is a cause. On the other hand, if low pH aeration does reduce toxicity of the interstitial water, then one can expect that the true toxicant will show the same behavior when spiked into clean water and subjected to this manipulation.

In freshwater samples, pH 3 and pH 11 adjustments are made by adding either 1.0, 0.1, or 0.01 N concentrations of HCl and NaOH to the interstitial water or elutriate sample. Follow the procedures and precautions noted elsewhere (USEPA 1991a). In general, it is desirable to use the most concentrated acid or base that one can while still maintaining control of the pH adjustment so as to minimize dilution of the sample. Table 8-2 gives the sodium chloride tolerances of *H. azteca* and *L. variegatus*, which may be used to determine whether the amount of sodium chloride resulting from the acid/base adjustments is sufficient to cause toxicity. Comparable tolerance values for *C. dubia* and fathead minnows are given (USEPA 1991a).

As described for effluent TIE, when performing manipulations under acidic and basic conditions, it is important that there be an aliquot of sample that is pH-adjusted but not manipulated further in order to understand the effect of pH alone. If this is not done, one cannot know whether it was the pH adjustment alone, or the combination of pH adjustment with additional manipulation that affected toxicity. Accordingly, after the pH adjustments have been made, aliquots of pH-adjusted solutions are set aside for testing that involves pH adjustment alone, pH adjustment plus SPE, and pH adjustment plus aeration.

9.8.1 Aeration

After pH adjustment, the aeration test is performed as described in Section 8.3.2 and in the effluent TIE guidance (USEPA 1996). Briefly, 30 mL of pH-adjusted sample and the corresponding blank are placed into separate 100 mL graduated cylinders and aerated for one hour. The rate of aeration should be vigorous (e.g., 500 mL/min) and equal among all treatments. The pH of each cylinder should be checked and readjusted with 0.01 to 1 N HCl or NaOH to the desired pH midway through the aeration procedure. After one hour of aeration, the sample should be removed from the aeration vessel and transferred to a clean beaker using a siphon or pipette to prevent any dissolving of sublated compounds into the sample. The different pHs not only affect the ionization state of polar toxicants, thus making them more-or-less volatile, but also affect the redox potential of the system. If toxicity is reduced by air sparging at any of the pHs, the presence of volatile, sublatable, or oxidizable

compounds is suggested. The role of oxidation can be evaluated by conducting an aeration test using nitrogen instead of air.

9.8.2 C_{18} Reverse-phase Solid-phase Chromatography

By shifting ionization equilibria at the low and high pHs, the SPE column also can be used to extract organic acids and bases that are too polar to be extracted at the initial pH (pH*i)*. The procedures for the pH-adjusted C_{18} extractions are identical to those for the pH*i* C_{18} manipulation described in Section 8. The C_{18} column packing is not stable at pH 11, so the pH 11 sample and its corresponding blank should be adjusted to a pH of 9 before passage through the SPE column. Some columns are designed to be stable at pHs up to 12 (Agilent Zorbax Extend-C_{18}, Agilent Technologies) but we have not evaluated these columns for their efficacy or compatibility with biological testing. After conditioning and blanking the column, the pH adjusted samples are extracted as described previously. The post-column samples and blanks are then tested for toxicity as described in Section 8.3.3.

If SPE removes toxicity, the resulting fractions and corresponding blanks are tested for toxicity. Fractions can be screened for toxicity initially by testing at a high concentration only; subsequent tests can evaluate dilutions of toxic fractions to quantify toxicity as necessary. If SPE removes toxicity under acidic or basic conditions, but not at pH*i*, involvement of an ionizable organic toxicant may be suspected. Since ionizable toxicants often show pH-dependent toxicity, it is important to keep this behavior in mind when conducting TIE testing. For example, if the pH of the dilution water is very different from the unaltered interstitial water, it is very possible that the toxicity of the causative toxicants may be different. Accordingly, be certain that the pH is carefully monitored and controlled to the extent possible when assessing ionizable toxicants. It is common for the pH of samples previously subject to pH manipulation to drift during testing in a manner different from the unaltered interstitial water. Again, great care must be taken to monitor these changes so their potential effects can be factored into data interpretation.

9.9 Phase II Summary

The overall objective of Phase II is to develop enough evidence to be confident in identification of a toxicant (or group of toxicants). Certainly, methods other than those covered here can be used to develop that evidence. These may include manipulations for specific toxicants such as

- Methods that enhance or decrease the toxicity of pesticides such as temperature manipulation, addition of piperonyl butoxide and addition of esterases (Amweg et al. 2006; Ankley et al. 1991; Bailey et al. 1996; Phillips et al. 2004; Wheelock et al. 2004; Wheelock et al. 2006)
- Other sorbents that may separate toxicants using different properties (Anderson et al. 2006a; Cornelissen et al. 2001; la Farre et al. 2001; Petrovic et al. 2003; Phillips et al. 2004; Thomas et al. 1999; Waller et al. 2005)
- Novel extraction methods (Campbell et al. 1992; Deacon et al. 1991; Dumont and Fritz 1995; Hennion and Pichon 1994; Pichon et al. 1996; Waller et al. 2005)
- Enzymatic or protein assays for specific compounds (Moshe and Auslander 2005)

- Use of novel experimental protocols for distinguishing between toxic stressors (Anderson et al. 2006b)

Other references containing examples of TIEs include the Water Research Federation Report (Anderson et al. 2006a), the Naval Facilities Engineering Service Center guide (Science Applications International Corporation 2003), and the summary of the workshop held by the Society of Environmental Toxicology and Chemistry (Norberg-King et al. 2005). After completion of Phase II and if the objectives of the research require further confirmation, the investigator should feel confident with information from Phase II to move to Phase III confirmation.

10 Phase III Sediment TIE Methods

As in effluent TIE, the purpose of sediment Phase III testing is to confirm that the suspected toxicant(s) identified in Phase II is(are) in fact the causative toxicant(s), and that all of the toxicity is accounted for. In addition, Phase III methods for sediment TIE may also involve demonstrating that the causative toxicant identified using interstitial water TIE is in fact the causative toxicant in bulk sediment tests. Failure to conduct adequate confirmation could be potentially disastrous, particularly if important decisions concerning remediation are to be made based on TIE results.

Phase III is not a cookbook exercise wherein a standard set of tests is conducted and the results interpreted in a routine manner. Rather, it is a weight-of-evidence analysis, the extent of which depends on the consistency of the information obtained, and its sufficiency to support follow-on actions. In cases where important environmental and social decisions are contingent solely on TIE results (e.g., extensive remediation), evidence approaching certainty should be achieved. If, however, TIE results are themselves only one line of evidence in a larger risk assessment, then a lower degree of certainty may be appropriate. It is important to reiterate a point made in the Phase II discussion (Section 9), that the nature of TIE is such that one cannot "prove" that a particular toxicant is in fact the true toxicant. Instead, one simply collects enough supporting evidence (and, presumably, a lack of contrary evidence) sufficient to support the decisions to be made.

Many of the approaches and issues involved in toxicant confirmation are already discussed in Phase III documents for effluent TIE (USEPA 1993a). Analysts conducting Phase III for sediments should already be familiar with those discussions. The text that follows focuses primarily on special considerations for conducting Phase III on sediments.

10.1 Defining the Objectives of Phase III

Confirming the identity of a causative toxicant can be thought of as having two elements:

- Was the identification of the causative toxicant in the study sediment itself correct?
- If so, is it appropriate to extrapolate that finding to a larger body of samples, either spatially or temporally variable?

The first of these is always important, while the importance of the second is situation-specific. As described throughout this document, sediment TIE may be performed using either solid-phase or interstitial water techniques. Because there are known differences in how toxicants and/or organisms may react in solid-phase versus interstitial water testing, it is important to insure that the TIE results are applicable to the actual management question. In most assessment situations, management of contaminated sediments will be based on the expected effects of bedded sediments. And, in general, an investigator might presume that solid-phase sediment toxicity tests might correspond better with the expected toxicity in situ, since the nature of the exposure is more comparable to field conditions. Thus, particularly when sediment toxicants were identified using interstitial water methods, it can be very important to verify that those same toxicants are responsible for the toxicity measured in solid-phase tests. This will not always be the case; for example, ammonia is apparently much

more toxic to *Hyalella* in water column tests (as in interstitial water) than in solid phase tests due to differences in exposure (Whiteman et al. 1996).

In effluent TIE, an important component of Phase III is to determine whether the cause of toxicity identified in one sample is the ongoing source of toxicity in samples collected over time. There are cases in which sediment toxicants might be temporally variable, such as pesticide contamination associated with episodic applications or runoff events, or seasonal variation in sulfide or ammonia production from changes in microbial activity. However, most sediment contamination problems are the result of historical or ongoing pollution events, and tend not to be temporally variable. Nonetheless, a question of interest in sediment TIE might be whether the same toxicant is causing toxicity over a broader assessment area—particularly true in complex settings such as industrialized harbors, where there may be many different sources of contamination that vary in spatial intensity.

While Phase III is distinct from other phases in concept, it may not be as distinct in terms of data collection and/or temporal sequencing of experiments. For example, in Phase II, we discuss many different approaches and manipulations that might be used to evaluate different types of toxicants. Depending on the path chosen, the amount of data generated in Phase II may vary. However, the body of data collected is part of the evidence that will inform Phase III in regard to the likelihood that the candidate toxicant is in fact the true toxicant. Moreover, it may be appropriate in Phase III to conduct additional Phase II manipulations relevant to the suspected toxicant in order to bolster the evidence for a particular toxicant.

10.2 Solid-Phase Versus Interstitial Water Testing

Understanding the relationship between toxicity in solid-phase and interstitial water tests can be an important part of confirmation. As discussed in Section 6 on TIE study design, if the methods used in the toxicity test that determines the need for the TIE are different from those used in the actual TIE (e.g., solid-phase versus elutriate, or use of different test species), it is important that confirmation studies be conducted to connect the TIE findings with the endpoints of interest to the assessment issue at hand. As an example, if an interstitial water TIE implicated cadmium as a causative toxicant, then it might be prudent to conduct solid-phase manipulations using sulfide addition and cation exchange resin addition, to demonstrate a consistency of the solid-phase response with the interstitial water response.

Even if the endpoint of interest is solid-phase toxicity and the TIE was conducted using solid-phase methods, conducting experiments with interstitial water can provide valuable information and the additional weight of evidence necessary to support confirmation.

Using the example in the previous paragraph, where sulfide addition and cation-exchange resin removed toxicity, we might conduct an EDTA test on interstitial water to help reinforce a diagnosis of metal toxicity. The results of such experiments must be considered carefully. In this example, if EDTA also removed toxicity, it reinforces (but does not prove) that metals are the cause of toxicity. If EDTA does not remove toxicity, it could mean that metals are not the cause of toxicity, though not necessarily. Suppose this sediment had both ammonia and cadmium contamination and was toxic to *H. azteca* in the solid phase, and toxicity was removed by sulfide addition and cation-exchange resin. If we tested the interstitial water using the EDTA procedure, we might find that toxicity was not removed, not because cadmium was not the toxicant in the solid phase, but because the ammonia had greater effect

on the amphipods in the interstitial water test. These odd outcomes may not be the rule, but the investigator must keep them in mind as data are interpreted. For this example with cadmium and ammonia, additional TIE manipulations could quickly establish the role of ammonia in producing the seemingly anomalous result. This also emphasizes the importance of always measuring ammonia in interstitial water, because it is commonly elevated in anthropogenically influenced sediments, and because it is known to cause differing toxicity to some species in solid-phase versus interstitial water tests.

10.3 Predicting Chemical Toxicity in Sediments

Somewhere in the process of toxicant identification or confirmation, it is generally necessary to estimate the toxicity of a candidate toxicant in sediment. This is an element of both determining whether a particular toxicant is a plausible cause of toxicity, as well as forming the basis for toxicity correlations as described later on (see Section 10.4). In effluent TIE, the potency of candidate toxicants is usually determined via literature data for water column toxicity tests, or by direct toxicity testing in dilution water and/or the effluent matrix. For sediments, the prediction of chemical concentrations that cause toxicity is more complicated.

For interstitial water studies, the same general approach as is used for other water samples can be used. The primary concern is that the composition of interstitial waters is often very different from typical surface waters; specifically, dissolved organic matter tends to be much greater, as does water hardness (for freshwater sediments). These differences in the test matrix can have significant effects on the toxicity of both organic and inorganic toxicants. Ideally, we prefer to test candidate toxicants in the same matrix, less the native chemical. For nonpolar organic chemicals, this can be approximated by testing SPE-treated samples (i.e., spike neat chemical back into interstitial water after treatment with SPE). For metal toxicants, this approach has greater uncertainties, as ion-exchange columns might alter the general ionic composition of a sample, which would in turn alter the toxicity of the spiked metals. Another possibility is to spike chemical into interstitial water extracted from a site sediment with similar characteristics, but with much lower concentrations of the candidate toxicant and no intrinsic toxicity.

Several sources have published sediment quality guidelines, giving chemical concentrations that are correlated to the presence of biological effects (Becker et al. 1990; Long et al. 1995; Swartz 1999; Wenning et al. 2005). Many of these, such as the ERL/ERM, TEL/PEL, PEC/NEC, AET, and others are developed from empirical correlations between measured concentrations of chemicals in sediments and observed toxic effects. While these guidelines have utility in sediment assessment, they are not based on cause-effect relationships between individual chemicals and should not be used in TIEs as a basis for predicting toxicity or calculating toxic units.

For nonionic organic chemicals, the equilibrium partitioning (EqP) theory offers an approach for estimating the concentration of chemicals in sediment that would cause toxicity. This approach assumes that organic carbon in the sediment is the primary phase controlling bioavailability of nonionic organic chemicals to benthic organisms, and that the potency of sediment exposure is proportional to the concentration of chemical in the interstitial water.

Note: This does not mean that interstitial water is the only route of exposure, only that the aggregate toxicity of exposure to the sediment is indicated by the chemical concentration in interstitial water.

The concentration in interstitial water can be predicted from the organic carbon partition coefficient (K_{OC}). Although specific characteristics of a sediment can cause K_{OC} to vary, the default assumption is that K_{OC} will be very close to the octanol-water partition coefficient (K_{OW}). A general relationship of K_{OC} to K_{OW} has been proposed (Di Toro et al. 1991):

$$\log (K_{OC}) = 0.00028 + 0.983 \log (K_{OW})$$

The units of K_{OC} and K_{OW} are L/kg. The relationship between chemical concentration in the solid phase and interstitial water (at equilibrium) is

$$C_{sed\ dwt} / f_{OC} = C_{iw} * K_{OC}$$

where $C_{sed\ dwt}$ is the dry-weight normalized chemical concentration, f_{OC} is the fraction of the sediment dry weight composed of carbon (e.g., 5% organic carbon is $f_{OC} = 0.05$), and C_{iw} is the chemical concentration in interstitial water. By setting C_{iw} equal to the concentration that causes toxicity in a water column test, we can calculate the sediment concentration that would be predicted to cause equivalent toxicity to the same species in a sediment exposure. For example, assume we are evaluating the potency of DDE, with a log K_{OC} of 6.65 and an LC_{50} for *H. azteca* of 1.66 µg/L (Holm-Hansen and Booth 1967). Inserting these values into equation 11-2 yields a sediment concentration of about 7400 µg/g organic carbon, or 74 µg/g dwt at an organic carbon content of 1%, as the sediment concentration expected to cause 50% mortality for *H. azteca*. While this calculation makes a number of assumptions, it can serve as a starting point for addressing the likelihood that a given chemical concentration could be responsible for toxicity in a given sediment. The partitioning part of this calculation can be spot checked by measuring chemical concentration in both bulk sediment and interstitial water in the sample of interest. The applicability of EqP for predicting toxicological response for a given species and chemical can be evaluated by conducting tests with spiked sediments in the same test system as is used for the TIE.

For cationic metals such as cadmium, zinc, copper, lead, nickel, and silver, it is believed that partitioning is also a significant influence on toxicity, but the primary partitioning phase in anoxic sediments is acid-volatile sulfide (AVS) with additional influence exerted by organic carbon (see Section 9 and (USEPA 2005) for additional details). We would generally not expect to find acute metal toxicity exerted in sediments where either the summed concentrations of simultaneously extracted metal do not exceed that of AVS, or the concentrations of metals measured in interstitial water are below toxic concentrations. Because AVS and total organic carbon (TOC) vary widely in sediments, and because total metal concentrations can be influenced by relatively non-labile mineral forms, the dry weight metal concentrations that would be associated with toxicity can vary widely, and are therefore a poor basis for deciding whether a particular metal is a causative toxicant.

10.4 Correlation

Correlation is one of the most commonly used confirmation approaches, wherein observed toxicity in a series of samples is regressed against expected toxicity due to measured concentrations of the suspect toxicants. Correlation is a very powerful Phase III procedure;

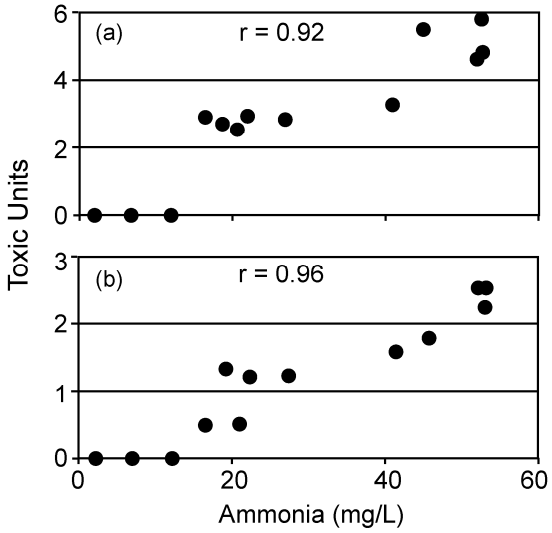
however, for this approach to be successful, there must be a range of samples with sufficiently different toxicities to develop a meaningful relationship among them. With effluents, correlation is often achieved by sampling over time; for sediments, temporal sampling will probably not give the variability desired, except in certain cases where seasonal variation in contamination occurs—e.g., seasonal agricultural runoff of relatively nonpersistent pesticides (Chandler and Scott 1991), biologically generated ammonia, or sulfide. For the majority of sediment assessments, the best strategy for maximizing variability is not by sampling over time, but by collecting sediment samples over a gradient of contamination. We have usually used horizontal distribution to generate such a gradient, but it is possible that vertical gradients in contamination might also be used.

Depending on the characteristics of the study site, covariation of sediment contaminants may be an important influence on correlation analyses. For example, in some cases sediment contamination is the result of contaminant release from a single discharge or activity, decreasing in intensity with distance from that source. While this can provide a concentration gradient with respect to the candidate toxicant, it is often the case that many contaminants associated with that source follow the same gradient. As such, a correlation between the candidate toxicant and actual measured toxicity may occur, even if the identified toxicant is not the true cause of toxicity. On the other hand, complex sites with many sources of contamination can create the opposite problem. If a harbor contains many sources of contamination at levels sufficient to cause toxicity, then a gradient in concentration of the candidate toxicant may overlap with areas having toxicity caused by other chemicals. This could result in a poor correlation between observed and predicted toxicity across the gradient, even if the initial identification was correct. This is not intended to discourage investigators from using correlation approaches, but to emphasize that the interpretation of such correlations (or lack thereof) can be complex. The existence of a correlation does not, by itself, imply a correct identification, nor does a poor correlation necessarily imply an incorrect one.

The general application of the correlation approach to interstitial water or elutriate samples is essentially the same as described for effluents; several examples are available in the literature (Figure 10–1; Amato et al. 1992; Ankley et al. 1990c; USEPA 1989b).

Applying correlation to whole sediments has the additional wrinkle that the testing of sample dilutions to determine toxic units in the sample is not straightforward. While sediments can be diluted to reduce toxicity in general, the rate at which toxicity is diluted is not necessarily proportional to the mass or volumetric dilution; in other words, combining a toxic sediment with an equal volume of a control sediment does not necessarily (or even typically) yield a sediment with half the toxicity of the original. Alternatively, one may have two sediments with equal toxicity from the same chemical, but have different toxicity when each is diluted by 50% by the same sediment.

Figure 10–1 Correlation of Concentrations of Ammonia in Sediment Interstitial Waters from the Lower Fox River/Green Bay Watershed, with Toxicity of the Samples to Fathead Minnows and *C. dubia**



Source: (Ankley et al. 1990c)

*Toxicity expressed as TU (100/LC50 or 100/EC50) for (a) 96-hour fathead minnow mortality, and (b) 48-hour *C. dubia* mortality. When no mortality was observed, a value of 0 toxic units was assigned. In the two instances in the *C. dubia* test in which less than 50% mortality occurred at an interstitial water concentration of 100, a value of 0.5 TU was assigned.

For this reason, toxicity correlation plots are generally restricted to plotting survival on the *y*-axis (instead of toxic units, which are normally used in effluents). This greatly limits the dynamic range of contamination that can be effectively evaluated, since once 100% effect is reached, all samples with higher contamination are expected to yield the same result. Another complication lies in the *x*-axis of the correlation plot, which typically displays either toxic units or chemical concentration. Because bioavailability of chemicals can vary among sediment samples, the expression of contamination used for the *x*-axis must reflect contaminant bioavailability, not only concentration. For this reason, the *x*-axis should generally be expressed as organic-carbon normalized concentration for nonpolar organic chemicals, SEM-AVS for cationic metals (with a possible additional correction for organic carbon). See USEPA (2005) for chemical concentration in interstitial water–applicable to both organic and inorganic toxicants.

For both sediment and effluent TIE, the degree of correlation that constitutes confirming evidence is debatable. Typical statistical expressions such as correlation coefficients are often calculated, but they are of limited use in defining adequacy, because their values are determined not only by the relative agreement between predicted and observed toxicity, but also by the magnitude of the contamination gradient studied. In addition, linear models of correlation may not be appropriate for graphs of contamination versus biological effect (e.g., survival), which can be expected to assume a sigmoidal shape and may require nonlinear regression techniques. Also important to consider is the weight of supplementary evidence.

For example, if there is a comparatively poor toxicity correlation over a limited contamination gradient, but there is other strong evidence from other experimental approaches that the identification is correct, then we might still conclude that the toxicant has been confirmed. No simple rules can substitute for appropriate professional judgment and sound scientific argument in evaluating the adequacy of confirmation data.

10.5 Spiking

Confirmatory evidence can also be obtained through a number of approaches involving spiking samples with the suspect toxicant(s). In general, if the investigator notes an increase in the toxicity of a sample in the same proportion as the increase in concentration of the suspected causative toxicant, the candidate toxicant can be confirmed as the true toxicant. To get a proportional increase in toxicity from the addition of a suspect toxicant when in fact it is not the true toxicant, both the true and the suspect toxicants would need to have very similar toxicity levels and would presumably have to be additive. Like correlation, this can be a powerful approach, but must be conducted and interpreted carefully, with consideration of possible interferences and confounding factors.

While spiking studies in interstitial water and in solid-phase sediment tests have some similarities, there are important differences as well, and are therefore discussed separately. For interstitial waters, one approach is to double (or increase by some other multiple) the concentration of the suspect toxicant in the sample, and then test both spiked and unspiked solutions in a dilution series. This is similar to a method of standard additions as is sometimes employed in analytical chemistry. If the correct toxicant was identified, there should be a corresponding doubling in toxicity (USEPA 1989b), but there are some potential complications such as interference or sorption by carbon in a solid matrix, or solubility problems in interstitial waters.

Another use of spiking in the confirmation phase is to spike the suspect toxicant into a sample with a matrix similar to that of the test sample (e.g., nontoxic interstitial water from a nearby site). If the suspect toxicant was correctly identified, spiking similar concentrations as those observed in the test sample should result in similar toxicity.

To help account for matrix effects on toxicity, a useful confirmation technique is spiking a sample from which the suspect toxicant has been removed (e.g., via aeration, SPE, cation exchange resin, zeolite, etc.) with similar concentrations of the suspect toxicant. The effectiveness of this approach depends on the degree to which the manipulation used to remove the suspect toxicant alters the matrix of the text sample (e.g., pH, ion composition, organic carbon content, etc.), thereby potentially altering the toxicity of the spiked toxicant. Also, there exists the potential for manipulations to remove multiple classes of toxicants (e.g., SPE removes nonpolar organic compounds and metals; zeolite removes both ammonia and some metals). Accordingly this, like most confirmation approaches, is not definitive, but a piece of a larger body of evidence.

Another issue that must be considered when using spiking as a confirmation tool is one that is more or less pervasive throughout Phase III of the TIE. In our experience, when multiple toxicants that don't share a common mode of action (e.g., ammonia and zinc, copper and diazinon, diazinon and ammonia) (Bailey et al. 2000) are present in a sample, their toxic effects are independent (or at least less than additive); that is, the toxicity of the mixture is

determined by the toxicity of the toxicant present in greatest potency. Thus, when a sample in a dilution series is tested, the compound with the greatest number of TUs in the sample determines the toxicity of the mixture, and there may be no indication that another toxicant is present.

If the suspect toxicant at the highest concentration is removed from the sample, the sample will still be toxic (albeit at a higher sample concentration) due to the second toxicant. If the two toxicants are not affected by the same manipulations, this situation can be spotted through differing behavior in different manipulations in Phases I and II (see Section 9.7 on multiple toxicants).

This is more difficult to detect in cases where both toxicants are affected by the same manipulation (e.g., SPE removing both metals and nonpolar organic chemicals). There is no comprehensively effective means to determine if this problem of a "masked" second toxicant exists.

The best chance is probably through using as many manipulations as possible that are effective for the suspect toxicant in hopes that the second toxicant will not be affected by one of them and thereby open to detection. The second toxicant may also be detected through testing a range of samples with differing concentrations of the suspect toxicant; if the suspect toxicant and the secondary toxicant do not always vary in the same proportion, the issue may be revealed by a sample in which the suspect toxicant is at a lower toxicity than the second. From a practical perspective, if both toxicants co-vary closely, then attempting to separate them may be of limited practical significance in determining appropriate risk management strategies.

When working with solid-phase toxicity tests, several additional considerations come into play. The first involves the greater technical challenges in spiking a solid-phase sediment compared to an aqueous sample, in which an aliquot of toxicant can just be added directly and tested. Because the bioavailability of toxicants in solid-phase sediment tests is governed by the interaction of the toxicant with the solid and aqueous phases of a sediment, chemicals must be added in a way that does not inappropriately change the physical/chemical characteristics of the sediment and, even more importantly, must be given time to interact with various chemical compartments within the sediment to reach a distribution similar to that for the chemicals in bedded sediment. Relatively little consensus guidance exists for the spiking or equilibration of sediments. What is provided here is our best judgment based on our experience.

Metals can be spiked into sediments by dissolving metal salts into a minimum of water and adding them directly into sediment. Sediment should be thoroughly mixed. We often do this by hand and then place the well-capped jar (Teflon tape on the internal threads and electrical tape on the exterior) on a roller (4°C in the dark). Mixing may be performed by hand, by using a power mixer, and/or by placing the sediments in jars on a roller mill at a slow speed (e.g., <5 rpm). Continuous rolling of sediment for long periods of time can lead to a loss of sediment structure (sediments become "soupy"). Accordingly, we don't generally roll sediments for longer than four days. Rates of equilibration for spiked metals have not been broadly determined to our knowledge, but are thought to be relatively short. We recommend a week as a minimum equilibration time. Refrigeration of sediment during equilibration is generally necessary to prevent excessive microbial activity.

A problem with spiking of many metals is that the metal ions scavenge hydroxide ions in the sediment and cause it to become acidic. This can not only change bioavailability of metals in the sediment, but also can cause toxicity via reduced pH. This phenomenon may occur in marine waters, but it is more common in fresh waters where there is less buffering capacity in the sediment and overlying water. The intensity of this problem increases with the concentration of metal spiked. The only solution we are aware of is direct neutralization using a strong base, such as NaOH. We have neutralized metal spikes by neutralizing the spiking solution before adding it to the sediment. This generally precipitates the metal in the spiking solution (as a metal hydroxide), but we believe the metal is resolubilized after it is mixed into the sediment. Simpson et al. (2004) have published an alternate approach in which the base is added to the sediment after spiking.

Most nonpolar organic toxicants common to sediments are too insoluble to spike using this same approach. As for metals, there are no standard approaches and we have used several methods to spike nonpolar compounds into sediments.

One approach involves coating chemical onto silica sand, then mixing this sand into the sediment. Specifically, the chemical of interest is dissolved into an appropriate, volatile solvent. In a jar of appropriate size for the amount of sediment to be spiked, we add a small amount of clean quartz (e.g., 2 to 5% of the dry mass of the sediment to be spiked). The chemical/solvent mixture is then poured onto the sand, mixed with a glass rod to wet the sand, then placed on a jar roller. The cap of the jar is fitted with a swivel fitting to which a vacuum hose is attached, which is connected in turn to an appropriate (solvent-safe) vacuum pump. The jar is then rotated under vacuum until all solvent has been removed, at which time the spiked chemical is crystallized on the sand particles and to some degree on the side of the jar. The sediment to be spiked is then added to the jar and mixed well, insuring that the sand is well distributed in the sediment. The jar is then placed on a roller mill, rolled for 48 hours, then stored upright under refrigeration. Once or twice a week, the jars are manually stirred. The sand increases the surface area over which chemical dissolution takes place and better distributes chemical throughout the sediment. Alternatively, we have used a jar coating technique (Ditsworth et al. 1990). The desired amount of chemical is added to the wall of a clean glass jar in acetone. The acetone is allowed to evaporate while slowly rotating the jar to provide a coating of contaminant on the jar's internal surface. Sediment is then added. The jar is capped with Teflon tape on the internal threads and electrical tape on the exterior. The jar is then slowly rolled (~5 rpm) on a roller mill for 96 hours at 4°C in the dark.

Either method prevents residual solvent from being introduced to the sediment as there would be if the chemical/solvent mixture was added directly.

Time required to equilibrate the sediments varies according to the properties of the compound (e.g., water solubility and K_{OW}) and the concentration of chemical spiked. We have found that a comparatively low concentration spike of phenanthrene (log K_{OW} = 4.5) took only 7 to 10 days to reach an apparent steady state, while a higher concentration of DDT (log K_{OW} about 6.5) took on the order of a month (USEPA, unpublished). Equilibration of a spiked sediment can be monitored by measuring chemical concentration in the interstitial water; a stable value over time suggests that equilibration has been achieved. In lieu of actual monitoring, an equilibration period of 28 days at 4°C in the dark should be sufficient for most cases.

In most cases, it is desirable to spike test chemicals over a range of concentrations to understand the toxicity of the chemical in relation to the concentration in the test sediment. In general, we believe spiking different aliquots of sediment at different concentrations is probably more desirable than creating one spike at high concentration, then diluting aliquots of that high spike with differing amounts of clean sediment. If the latter method is used, it is important to wait to make the dilutions until the chemical is uniformly distributed in the initial spiked sediment, then allow additional time for re-equilibration after dilutions are made.

In effluent or interstitial water TIE, samples that have had the suspect toxicant removed (e.g., by SPE) can be spiked. Because there aren't solid phase manipulations that actually remove toxicants from the sediment (they may be sequestered, but not removed) without destroying the sediment matrix, the matrix spiking approach is not straightforward for solid-phase TIE. However, an approach that can be used for organic toxicants is to spike a reference sediment with a sediment extract from the toxic sediment and compare its toxicity with another aliquot of reference sediment spiked only with the suspect toxicant at the same concentration. Although the bioavailability of the spiked chemicals in the extract may not be exactly what would have been in the original sediment, this approach should allow the toxicity of the sediment extract and candidate toxicant alone to be compared on an equal basis. If one can produce equivalent toxicity by spiking only the candidate toxicant (as compared to the sediment extract), then this is strong evidence that the candidate toxicant is sufficient to explain the observed toxicity.

> **Note**: This conclusion is not quite the same as saying that the suspected toxicant is the only causative toxicant, as there could be other chemicals with lesser toxicity that are "hidden" by the effects of the suspect toxicant (if the other toxicant is acting independently and therefore does not increase the potency of the suspect toxicant). The amount of toxicity represented by both the sediment extract and the spiked toxicant can be quantified by spiking each over a range of concentration as already discussed.

A related experiment can be conducted using the SPMD approach described in Section 9.3.1. This approach is conceptually similar to the one just described, except that the sediment extract and the spiked toxicant are prepared in SPMDs for toxicity testing, rather than being spiked into sediments. An example of this approach has been provided (Heinis et al. 2004).

One of the important assumptions of both of these spiking approaches is that the relative bioavailability of chemicals extracted from the sediment is comparable between the intact sediment and the spiked preparation, be it sediment or SPMD. This could be of concern, since sediment contaminants can exist in less bioavailable forms, such as PAHs associated with soot particles; these PAHs can be extracted with solvent, but appear to have a relatively low bioavailability in the original sediment. As such, spiking the extract into clean sediment may artificially increase the bioavailability of soot-associated PAHs relative to other chemicals that are not associated with soot. The most direct way to evaluate this issue is to analyze the concentration of known toxicants in the interstitial water of both the intact sediment and the spiked sediment or SPMD. If the concentration of the chemical measured in the spiked preparation is much larger than that in the intact sediment (after normalizing to organic carbon content), it may raise concerns about artifacts stemming from chemical extraction of sediment compartments with low bioavailability.

10.6 Species Sensitivity

The relative sensitivity of different test species can be used to provide weight of evidence for suspect toxicants. If two or more species exhibit markedly different sensitivities to a suspect toxicant in pure chemical toxicity tests, and the same patterns in sensitivity are seen with the test sample, there is additional weight of evidence that the suspect is the true toxicant.

The main prerequisite for using the species sensitivity approach as a confirmation tool is, of course, the ability to identify test species with differing sensitivities to the suspect toxicants. Differences in sensitivity among test organisms should be determined in single chemical tests performed under conditions similar to the TIE tests, bearing in mind that relative toxicant sensitivity may vary between solid-phase and interstitial water exposures (Section 9).

Generalizations about the relative sensitivity of different species cannot easily be made without actually performing the appropriate tests. For example, although oligochaetes have traditionally been considered to be relatively insensitive to toxic compounds, we have found *L. variegatus* to be among the most sensitive of our test species to ammonia at pH 8 to 8.5 (Table 8–4). For example, if ammonia and some metal more toxic at high pH (e.g., zinc for freshwater species) are both present in a sample at potentially toxic concentrations, it would be prudent to test, in tandem, several species possessing differing responses to these types of contaminants. Fathead minnows, for instance, are more sensitive to ammonia and hydrogen sulfide than is *C. dubia* and are comparatively insensitive to some metals (Table 8–4). *L. variegatus* is another species very sensitive to ammonia, but not to metals or certain nonpolar organic compounds, while *H. azteca* is sensitive to both ammonia and metals. On the marine side, *A. bahia* and *A. abdita* have the same general ammonia sensitivity (within a factor of two), but *A. bahia* is generally more sensitive to metals than is *A. abdita* except to copper (Burgess et al. 2000 and Table 8–4). We have also noted that *A. bahia* is much more sensitive to hydrogen sulfide than *A. abdita*. *A. bahia* has a much shorter time to death (minutes) than does *A. abdita* when exposed to hydrogen sulfide concentrations. These types of comparisons may be useful throughout all stages of the TIE to determine whether more than one toxicant may be present in an interstitial water sample, or to ascertain whether a manipulation designed to remove one toxicant, for example, zeolite removal of ammonia, actually removed another toxicant (zinc). The use of relative species sensitivity as a confirmation test with the lower Fox River/Green Bay interstitial water samples has been demonstrated (Table 10–1). Fathead minnows were the most sensitive test organisms, followed by *C. dubia* and then a bacterial species (*P. phosphoreum*), both to the interstitial water samples and to the suspect toxicant, ammonia, providing confirmatory evidence for its role in sample toxicity.

Table 10–1 Comparison of the Sensitivities of *C. dubia*, *P. promelas*, and *P. phosphoreum* to Interstitial Water at Green Bay/Fox River*

Site	*P. promelas* 96-hour LC_{50}	*C. dubia* 48-hour LC_{50}	*P. phosphoreum* 15-min EC_{20}[1]
1	40.6 (34.1-48.4)	>100	>100
2	30.9 (25.3-37.8)	63.0 (51.0-77.8)	>100
3	35.4 (NC)[2]	>100	>100
4	35.4 (NC)	84.1 (NC)	>100
5	18.0 (NC)	56.1 (43.0-73.3)	>100
6	21.8 (17.8-26.6)	39.7 (32.1-49.0)	>100
7	35.4 (NC)	84.1 (NC)	>100
8	37.9 (30.4-47.2)	75.8 (NC)	>100
9	17.4 (NC)	44.5 (34.1-58.2)	>100
10	21.1 (16.8-26.5)	39.7 (32.1-49.0)	>100
11	NM[3]	NM	>100
12	NM	NM	>100
13	NM	NM	>100

Source: Ankley et al. (1990a)

*The LC_{50} and EC_{20} values are expressed in percent interstitial water. The 95% confidence intervals are indicated in parentheses.

[1]Concentration resulting in 20% inhibition of light production

[2]NC, reliable confidence limits could not be calculated due to lack of partial mortality

[3]NM, no mortality

A second example of the use of relative species sensitivity is from a TIE on sediment interstitial water from Turkey Creek, MO (Table 10–2).

Table 10–2 Comparison of the Sensitivities of *C. dubia*, *P. promelas*, and *H. azteca* to Sediment Interstitial Water from Five Sites Along Turkey Creek, Joplin, MO*

	Percent LC_{50}s		
Site	***C. dubia***	***P. promelas***	***H. azteca***
1	35 (NC[1])	>100	>100
2	<3 (NC)	47 (34-63)	4.5 (NC)
3[2]	>100	89 (NC)	84 (47-100)
4[2]	>100	71 (NC)	>100 (NC)
5	3 (NC)	77 (NC)	13 (10-18)

*LC_{50} expressed in percent interstitial water. Test lengths were 48 hours for *C. dubia* and 96 hours for fathead minnows and *H. azteca*. The 95% confidence intervals are indicated in parentheses.

[1]NC, confidence intervals not calculable due to lack of partial mortality in test concentrations

[2]Toxicity at these sites determined to be due to ammonia

In this case, the suspect toxicant in the sediment sample was zinc; the sample was most toxic to *C. dubia*, followed *by H. azteca*, and finally fathead minnow. This trend closely paralleled the sensitivity of the three species to zinc in single chemical tests (Table 8–4), thereby lending support to the identification of zinc as responsible for sample toxicity.

10.7 Symptoms

Another Phase III procedure is observation of symptoms in test animals. This is most easily applied in interstitial water testing, because organism behavior and time to death can be more directly observed. Although this approach does not necessarily provide support for a given suspect, it can be used to provide evidence against a suspect toxicant. If the symptoms observed in a pure chemical toxicity test with a suspect toxicant are much different from those observed with the test sample (which contains similar concentrations of the suspect toxicant), there is strong evidence for a misidentification.

This approach was proposed as a useful confirmation technique for effluent TIE work (Ankley et al. 1990a), and this approach should be of equal usefulness in sediment TIE. Examples of symptoms include agitated behavior, or time to mortality. In particular, time to mortality is a quantifiable symptom that can be monitored relatively easily in toxicity tests. It has been noted that *A. bahia* has a relatively fast time to death compared to *A. abdita* when both are exposed to toxic hydrogen sulfide concentrations.

10.8 Matrix Changes

There are two types of matrix changes that can be useful Phase III evidence:

- Concurrence in identification between interstitial water and whole sediment matrices, and
- Toxicant behavior in response to specific environmental changes in the matrix

Changing the sample matrix in a manner designed to alter the toxicity of specific compounds can be a very useful confirmation technique. The most obvious matrix change is moving from a whole sediment TIE to an interstitial water TIE. Identification of the same toxicant in both the interstitial water and the bulk sediments using different sets of TIE manipulations is strong evidence that the suspect toxicant is the correct one. Section 6 discusses some of the similarities and differences one can expect between whole sediment and interstitial water testing.

Changing the environmental matrix of the test organism is another piece of evidence that can be used for confirmation. The pH of a matrix may be altered in the TIE confirmation step with interstitial water or elutriate samples. Because of the common occurrence of pH-dependent toxicants, such as ammonia, hydrogen sulfide, or metals in sediments, the graduated pH test can be an invaluable tool (Section 8.3.5). In order to use alterations in pH as a confirmation technique, it is essential that the behavior of the suspect compounds has been well defined at the various test pHs. A positive result in the test (i.e., sample toxicity behaves as predicted) can be a powerful piece of evidence for the confirmation. Any deviation from expected behavior, over time or among samples, can help provide evidence that either the wrong toxicants, or not all toxicants, were identified. Some caution should be taken, however, when extrapolating the effects of pH on toxicants tested in clean laboratory

water to the potential effects of pH on suspect toxicants in a complex matrix such as interstitial water or elutriate. The pH-dependent behavior of a toxicant in one matrix may not exactly mirror behavior observed in a very different matrix.

10.9 Phase III Summary

After Phase III, the investigator should have a preponderance of evidence that confirms or denies that the identified compound is truly the compound responsible for sediment toxicity. If the information is contrary to the suspect toxicant, further Phase I and II research must be performed. Future research with diagnostic tools, such as specific enzymatic assays, diagnostic biomarkers, and other assays identified in Phase II that can be used to identify specific compounds, may be useful as evidence in confirming the identity of a toxicant.

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The State of California's

Surface Water Ambient Monitoring Program

Quality Assurance Program Plan

Version 1.0

Originated by:

The Surface Water Ambient Monitoring Program Quality Assurance Team
Quality Assurance Research Group
Moss Landing Marine Laboratories
San José State University Research Foundation

(September 1, 2008)

Introduction

This quality assurance program plan (QAPrP) serves as an umbrella document for use by each of the Surface Water Ambient Monitoring Program's (SWAMP's) contributing projects. It describes the program's quality system in terms of organizational structure; the functional responsibilities of management and staff; the lines of authority; and the interfaces for those planning, implementing, and assessing all activities conducted.

Purpose

This QAPrP identifies the quality assurance (QA) and quality control (QC) procedures of SWAMP. Its primary purpose is to:

- Ensure that SWAMP activities adhere to the QA policies in the State Water Resources Control Board's (State Board's) draft quality management plan (QMP);
- Specify the quality systems of SWAMP; and
- Serve as a guidance document for projects that are required to be or desire to be SWAMP-comparable

This document applies to the collection of surface water ambient monitoring data, and addresses neither ambient groundwater data, nor effluent data collected as part of National Pollution Discharge Elimination System (NPDES) permitting or waste discharge requirements. Instead, use of this QAPrP is:

- Required for SWAMP-funded projects
- Required for state programs with a SWAMP-comparability mandate
- Encouraged for projects external to SWAMP

Comparability

The U.S. Environmental Protection Agency (EPA) defines comparability as the measure of confidence with which one data set, element, or method can be considered as similar to another. Comparability is an especially important consideration with SWAMP data, which represents a wide variety of objectives, organizations, and procedures over many years. To minimize the effect of this variability, SWAMP has established certain universal guidelines that must be adopted by those seeking or requiring SWAMP comparability.

Functionally, SWAMP comparability is defined as adherence to two key programmatic documents: this QAPrP, and the *Surface Water Ambient Monitoring Program Information Management Plan*. The latter document addresses the database component of SWAMP comparability. It is independent of this QAPrP, and is maintained and implemented by the Data Management Team (DMT) at the Moss Landing Marine Laboratories (MLML).

Additional information on QA and data management comparability is available online or through the SWAMP Help Desk (see Appendix G: *Online Resources*).

Waiver System

While certain universal requirements are the foundation of SWAMP comparability, such requirements may conflict with the unique objectives of each project contributor. At the discretion of the SWAMP Coordinator, a waiver may be obtained for project-relevant adjustments to programmatic requirements. Waiver applications must be submitted in writing to the SWAMP QA Team (QAT), and must detail why the specified requirement is not applicable to the project's quality objectives. The SWAMP Coordinator, in conjunction with the QAT, determines whether or not each waiver will be granted. All associated correspondences are archived by the SWAMP QAT for a period of five years. The standard operating procedure (SOP): *Waiver System for the Surface Water Ambient Monitoring Program Quality Assurance Program Plan* is currently under development.

Group A: Program Management

Element A1: Title and Approval Sheet

Program Title State of California's Surface Water Ambient Monitoring Program

Lead Organization California State Water Resources Control Board
Office of Information Management and Analysis
Surface Water Ambient Monitoring Program Unit
1001 "I" St, 15th Floor
Sacramento, CA 95814

Primary Contact Emilie Reyes, Surface Water Ambient Monitoring Program Coordinator
Phone Number: 916-341-5556
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Effective Date September 1, 2008

Approvals

The approvals below were submitted separately, preventing their inclusion in this signature block. Instead, they appear in Appendix H: *Approval Signatures* of this document. Originals are kept on file by the Surface Water Ambient Monitoring (SWAMP) Quality Assurance Team (QAT) according to Element A9: *Documents and Records*.

Emilie Reyes, State Water Resources Control Board, Surface Water Ambient Monitoring Program Coordinator, Office of Information Management and Analysis, Surface Water Ambient Monitoring Program Unit

_____On File_____ _____July 15, 2008_____
Signature Date

William Ray, State Water Resources Control Board, Quality Assurance Office Manager, Office of Information Management and Analysis

_____On File_____ _____July 14, 2008_____
Signature Date

Beverly H. van Buuren, Moss Landing Marine Laboratories, Surface Water Ambient Monitoring Program Quality Assurance Officer, Quality Assurance Research Group

_____On File_____ _____July 21, 2008_____
Signature Date

**Rich Fadness, Quality Assurance Officer (or Designee),
Regional Water Quality Control Board 1 (North Coast Region)**

_____On File_____ _____July 10, 2008_____
Signature Date

**Wil Bruhns, Quality Assurance Officer (or Designee),
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**Karen Worcester, Quality Assurance Officer (or Designee),
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Element A3: Distribution List

While this quality assurance program plan (QAPrP) will be publicly available online, it will be officially distributed to Surface Water Ambient Monitoring (SWAMP) representatives from the State Water Resources Control Board (State Board) and Regional Water Quality Control Boards (Regional Boards), contractors under state master contracts, and other organizations. Associated contact information follows in Table 1: *Primary Contact Information for Surface Water Ambient Monitoring Program Representatives.*

Table 1: Primary Contact Information for Surface Water Ambient Monitoring Program Representatives

State Water Resources Control Board	
Contact Information	**Organization's Mailing Address**
Main Contact: Emilie Reyes Position: SWAMP Coordinator Phone: 916-341-5556 Email: ereyes@waterboards.ca.gov	State Water Resources Control Board Office of Information Management and Analysis 1001 "I" Street, 15th Floor Sacramento, CA 95814
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Regional Water Quality Control Boards	
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Element A4: Program/Task Organization

Program Management

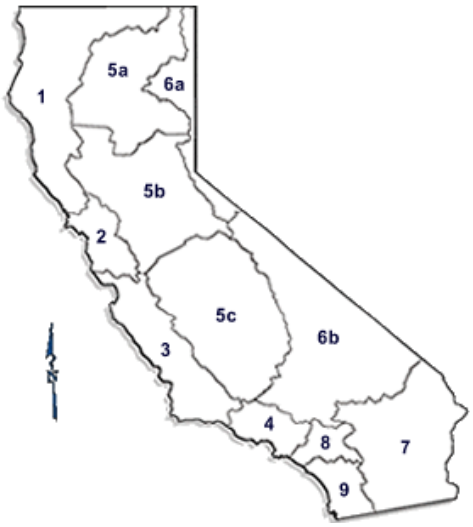
The Surface Water Ambient Monitoring Program (SWAMP) is administered by the State Water Resources Control Board (State Board). However, responsibility for implementation of regional monitoring activities often resides with the nine Regional Water Quality Control Boards (Regional Boards) that have jurisdiction over specific geographical areas of the state (See Figure 1: *Regional Water Quality Control Board Jurisdictions*). Statewide monitoring programs are implemented at the state level in coordination with the regions. SWAMP monitoring is conducted through State Board master contracts and Regional Board monitoring contracts.

Figure 1: Regional Water Quality Control Board Jurisdictions

Regional Board 1: North Coast Region
Regional Board 2: San Francisco Bay Region
Regional Board 3: Central Coast Region
Regional Board 4: Los Angeles Region
Regional Board 5: Central Valley Region
- **(5a): Redding Office**
- **(5b): Sacramento Office**
- **(5c): Fresno Office**

Regional Board 6: Lahontan Region
- **(6a): South Lake Tahoe Office**
- **(6b): Victorville Office**

Regional Board 7: Colorado River Basin Region
Regional Board 8: Santa Ana Region
Regional Board 9: San Diego Region



Coordination of SWAMP is achieved through monthly meetings of the SWAMP Roundtable, which consists of State and Regional Board representatives, as well as representatives from other agencies and organizations. Roundtable members provide programmatic, technical, and logistical support, as well as guidance on SWAMP's implementation. The Roundtable also makes recommendations to the State Board regarding annual SWAMP budget allocations. This is done through a majority vote or, lacking a majority, the approval of the SWAMP Coordinator. An organizational chart of SWAMP is provided in Figure 2 below.

Quality Assurance

In December 2002, the SWAMP Quality Assurance (QA) Program was formalized to develop and implement the quality systems specified in the *Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program* (2002). The program consists of quality

assurance representatives from the State and Regional Boards, as well as contractors from the Moss Landing Marine Laboratories (MLML).

State Water Resources Control Board

Ultimately, SWAMP's quality system is overseen by the State Board's QA Program. As part of its SWAMP oversight, this program:

- Creates, implements, and maintains the State Board's draft quality management plan (QMP);
- Ensures that SWAMP operates in a manner consistent with the State Board's QMP;
- Formally reviews SWAMP's quality system every three years (see Element C2: *Reports to Management*);
- Ensures that SWAMP operates in a manner consistent with Scientific Panel and Review Committee (SPARC) reports (see Element C2: *Reports to Management*);
- Coordinates with the U.S. Environmental Protection Agency (EPA) and CalEPA as necessary; and
- Reviews and approves this quality assurance program plan (QAPrP)

Regional Water Quality Control Boards

Some components of SWAMP's QA system are implemented at the Regional Board level. Each of these tasks is managed by the Regional Board's QA representative to SWAMP - a role often assumed by the region's primary SWAMP contact (see Element A3: *Distribution List*). As part of its SWAMP involvement, this program:

- Creates, implements, and maintains regional QA documents, as necessary;
- Provides general and SWAMP-specific QA guidance;
- Monitors the effectiveness of project- and region-specific QA activities;
- Monitors and participates in QA and technical training; and
- Reviews and approves this QAPrP

Moss Landing Marine Laboratories

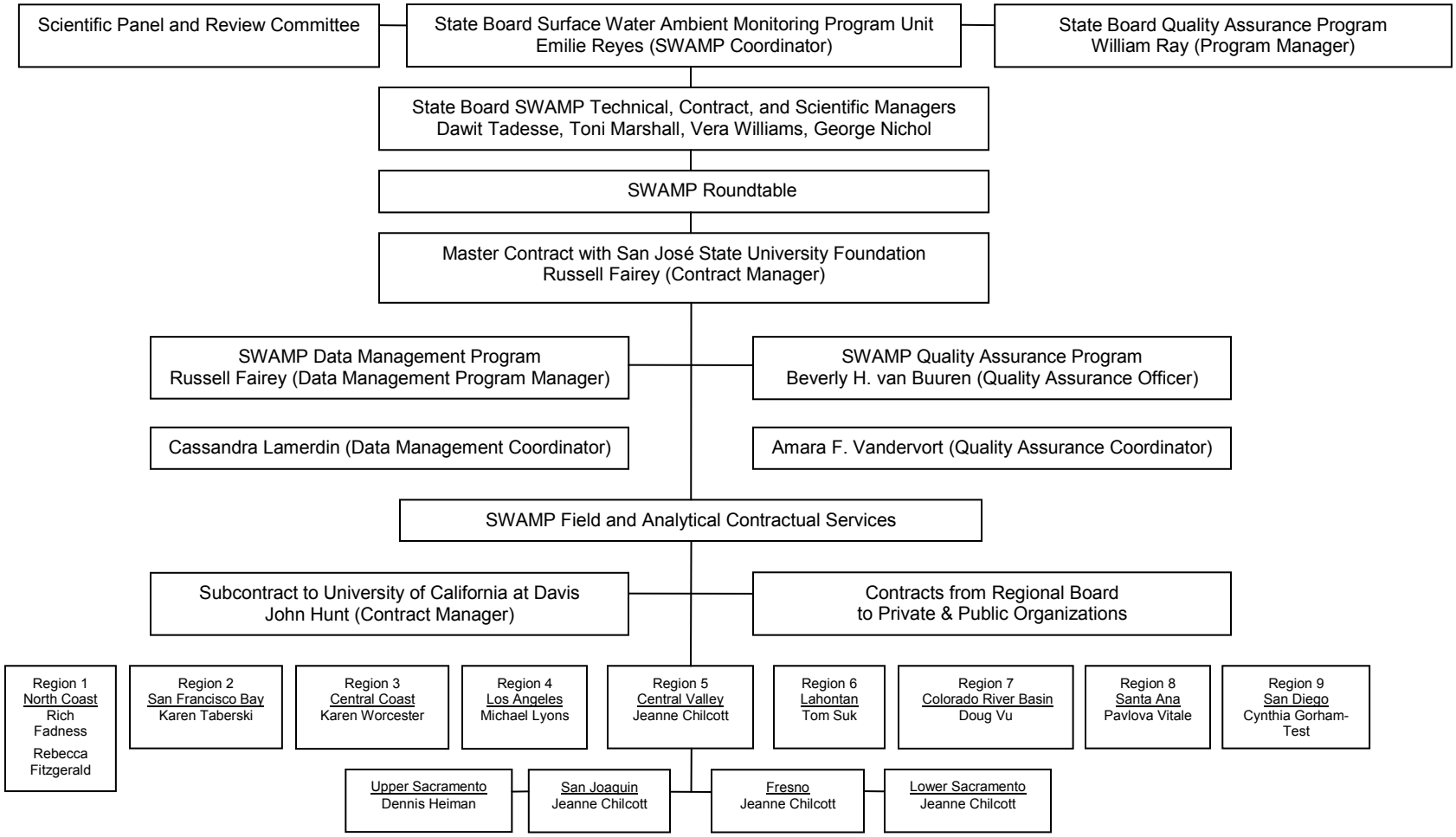
SWAMP's QA Program is implemented primarily by its QA Team (QAT), which is staffed by the QA Research Group at MLML. This group consists of a QA Officer, QA Coordinator, and QA Specialists. The QA Officer leads, while the QA Coordinator manages QA Specialists in completing

required tasks. These include, but are not limited to:

- Quality document creation, implementation, and maintenance;
- State and Regional Board consultation;
- SWAMP Roundtable representation;
- Regional and laboratory audits; and
- Quality system training

The SWAMP QAT operates at the programmatic level, and is therefore completely independent of data production. This relationship is shown in Figure 2: *Organizational Chart of the Surface Water Ambient Monitoring Program*.

Figure 2: Organizational Chart of the Surface Water Ambient Monitoring Program



Element A5: Problem Definition/Background

In 1999, the Surface Water Ambient Monitoring Program (SWAMP) was proposed in California Assembly Bill (AB) 982 to integrate existing water quality monitoring activities of the State Water Resources Control Board (State Board) and its nine Regional Water Quality Control Boards (Regional Boards).

Monitoring conducted under SWAMP was initially proposed to include a combination of statewide monitoring and site-specific monitoring. Statewide monitoring examines the status and trends in water quality. Site-specific monitoring employs a more targeted monitoring approach to better characterize clean and problem locations. Currently, only the site-specific monitoring portion of this program is being implemented.

Element A6: Program/Task Description

The Surface Water Ambient Monitoring Program (SWAMP) is a statewide monitoring effort designed to assess the conditions of surface waters throughout the State of California. Ambient monitoring refers to any activity in which information about the status of the physical, chemical, and biological characteristics of the environment is collected to answer specific questions about the status and trends in those characteristics. For the purposes of SWAMP, ambient monitoring refers to these activities as they relate to the characteristics of water quality.

SWAMP also hopes to capture monitoring information collected under other programs of the State Water Resources Control Board (State Board) and Regional Water Quality Control Boards (Regional Boards). This includes, but is not limited to Board programs such as the State's Total Maximum Daily Load (TMDL), Nonpoint Source (NPS), and Watershed Project support programs. SWAMP does not conduct effluent or discharge monitoring, which is covered under National Pollutant Discharge Elimination System (NPDES) permits and waste discharge requirements.

SWAMP is administered by the State Board. Responsibility for implementation of monitoring activities resides with the nine Regional Water Quality Control Boards that have jurisdiction over their specific geographical areas of the state (see Element A4: *Program/Task Organization*).

Element A7: Quality Objectives and Criteria for Measurement Data

In coordination with the State Water Resources Control Board (State Board), each Regional Water Quality Control Board (Regional Board) establishes monitoring priorities for the water bodies within its jurisdiction. The Surface Water Ambient Monitoring Program (SWAMP) compiles data from California's nine Regional Boards. This monitoring is performed in accordance with protocols and methodologies laid out in this quality assurance program plan (QAPrP). SWAMP seeks to meet the following four objectives:

- Create an ambient monitoring program that addresses all of California's hydrologic units using consistent and objective monitoring, sampling, and analytical methods; consistent data quality assurance (QA) protocols; and centralized data management.
- Document ambient water quality conditions in potentially clean and polluted areas. The scale for these assessments ranges from site-specific to statewide.
- Identify specific water quality problems preventing the State Board, the Regional Boards, and the public from realizing beneficial uses of water in targeted watersheds.
- Provide data to evaluate the overall effectiveness of regulatory water quality programs in protecting beneficial uses of California's waters.

Three of these SWAMP objectives relate to documenting water quality conditions and identifying problem areas where beneficial uses are not being attained. In as much as state standards provide the benchmark for such assessments, the analytical methods employed should be sufficient to allow the evaluation of SWAMP against state standards (e.g., the California Toxic Rule, Regional Board Basin Plans, and the California Ocean Plan).

The remaining objective, consistency in SWAMP monitoring, is achieved through the application of universal measurement quality objectives (MQOs – see Appendix A: *Measurement Quality Objectives*). As defined by the U.S Environmental Protection Agency (EPA), these are acceptance criteria for the quality attributes such as precision, accuracy, and sensitivity. Adherence to SWAMP MQOs ensures that data generated by the program will be of known and documented quality. SWAMP offers a waiver system for instances where mandated MQOs conflict with a project's objectives (see *Introduction*).

Element A8: Special Training and Certification

Training

Organizations and individuals involved in the Surface Water Ambient Monitoring Program (SWAMP) are expected to have familiarity with the quality documents described in this quality assurance program plan (QAPrP). SWAMP has also developed training tools to ensure data comparability among program participants. Information about tool availability is published on the SWAMP web site (see Appendix G: *Online Resources*).

Projects operating under their own QAPP must describe personnel training and its documentation in Element A8: *Special Training and Certifications.* Such training may apply to technical or administrative protocols, and should be provided prior to the initiation of any procedure. Training strategies and documentation will be evaluated during SWAMP regional and laboratory audits.

Permits

All SWAMP participants must obtain appropriate permission for their field activities. *California Scientific Collecting Permits* from the Department of Fish and Game (DFG) must be obtained for all biological collections. These permits must be in possession during all collection activities. Additional permits for collecting threatened or endangered species may also be required. During the planning stages of any project, SWAMP participants are to request permission from landowners to access sites on private property. Keys may be needed to access certain locations on government property.

Element A9: Documents and Records

The Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance (QA) Program utilizes quality documents and records at the state, regional, programmatic, and project levels, as well as the laboratory and field levels. This element describes the creation, maintenance, and archival of each of these documents. Per the Government Paperwork Elimination Act of 1998, SWAMP encourages the use of electronic signatures, maintenance, and submission when practical.

As appropriate, updates to SWAMP QA documents are communicated to program participants using the following process:

1. The interested party issues a memo to the SWAMP QA Team (QAT) describing and justifying the proposed update.
2. Once finalized, the memo is officially approved by the SWAMP Coordinator.
3. Approved updates are presented publicly online at the Moss Landing Marine Laboratories' SWAMP website (see Appendix G: *Online Resources*).
4. Approved updates are presented to the SWAMP Roundtable by the SWAMP QAT.
5. As requested, approved updates are presented via email by the SWAMP QAT.

SWAMP participants interested in these email updates must register for the "SWAMP Water Quality Monitoring" portion of the State Water Resources Control Board (State Board's) online mailing list (see Appendix G: *Online Resources*).

State Water Resources Control Board Documents and Records

State Water Resources Control Board Quality Management Plan

The State Board's draft quality management plan (QMP) proposes five policies that are pertinent to SWAMP and incorporated by reference:

- All State Board and Regional Water Quality Control Board (Regional Board) programs generating, using, or receiving environmental data will adhere to the policies outlined in the State Board's draft QMP.
- All data generated by or for the State Board and the Regional Boards will be of known and documented quality.

- Environmental data submitted to the State Board and the Regional Boards by other agencies, contractors, grant recipients, and regulated parties will be of known and documented quality.
- The intended use of environmental data and the level of data quality necessary to support decisions will be established by State Board and Regional Board staff prior to the design and initiation of all data collection activities.
- Adequate resources and staff will be provided by the State Board and the Regional Boards to meet the QA and quality control (QC) requirements of the State Board's draft QMP.

SWAMP Documents and Records

The SWAMP Quality Assurance Program Plan

This Quality Assurance Program Plan (QAPrP) was created and is maintained by the SWAMP QAT. Updates to this plan must be approved and signed by the SWAMP Coordinator, the State Board QA Officer, The SWAMP QA Officer, and the QA Officer or designee of each Regional Board. It is to be revised every five years, or when major changes to SWAMP's mission or organization occur. The document is publicly available online (See Appendix G: *Online Resources*), and replaces the *Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program* (Puckett 2002).

Currently, this document's scope retains the chemistry focus seen in the original plan. However, bioassessment and toxicity testing will receive full coverage in future iterations of this QAPrP. In the meantime, toxicity testing is addressed in Appendix A: *Measurement Quality Objectives*, while bioassessment is addressed in the standard operating procedure (SOP): *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*, and on the State Board's SWAMP website (see Appendix G: *Online Resources*).

SWAMP Regional Reports

The SWAMP Data Management Team (DMT) and QAT have created templates for the QA section of each annual *SWAMP Regional Report* (see Appendix G: *Online Resources*). These templates include a narrative and table to ensure consistent presentation and reporting of QA information. Both templates should be incorporated into the report, but each region may determine their location. They may be included in the body of the report or as an appendix.

Regions requiring assistance with their annual report may contact the DMT or QAT. They should

submit a list of datasets (by fiscal year) to be incorporated in the report and an estimated completion date for the narrative. The availability of assistance is dependent on the workload at the time of request.

Standard Operating Procedures

SWAMP creates a variety of scientific, technical, and administrative standard operating procedures (SOPs) for use by program staff and data contributors. SWAMP SOPs are based on the recommendations of U.S. Environmental Protection Agency (EPA) Quality System document QA/G-6: *Guidance for Preparing Standard Operating Procedures* (EPA 2001b - see Appendix G: *Online Resources*).

Signature approval by the SWAMP QA Officer indicates that a program SOP has been both reviewed and approved by the SWAMP Coordinator. Whenever procedures are changed, SWAMP SOPs are updated and re-approved. SOPs are also systematically reviewed on a periodic basis to ensure that policies and procedures remain current and appropriate. Current SOPs are publicly available online (see Appendix G: *Online Resources*). These include:

- *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California (February 2007)*
- *Conducting Field Measurements and Field Collections of Water and Bed Sediment Samples in the Surface Water Ambient Monitoring Program (October 15, 2007)*
- *Data Loading And Verification Of The Surface Water Ambient Monitoring Program Database (March 3, 2005)*
- *Field Data Verification Of The Surface Water Ambient Monitoring Program Database (January 1, 2005)*
- *Surface Water Ambient Monitoring Program Quality Assurance Program Contract Laboratory Data Verification And Validation (March 11, 2005)*
- *Surface Water Ambient Monitoring Program Quality Assurance Program On-Site Systems Assessment for Contract Laboratories (March 3, 2005)*
- *Toxicity Data Verification Of The Surface Water Ambient Monitoring Program Database (March 3, 2005)*

The following SOPs are in the draft stage, and will be officially released upon completion:

- *Division of Financial Assistance Quality Assurance Project Plan Review*

- *Surface Water Ambient Monitoring Program Quality Assurance Program* Corrective Action
- *Surface Water Ambient Monitoring Program Quality Assurance Program Data Classification System*
- *Surface Water Ambient Monitoring Program Quality Assurance Program On-Site Systems Assessment For Regional Boards*
- *Surface Water Ambient Monitoring Program Review and Approval Procedure for Monitoring Plans and Research Proposals*
- *Waiver System for the Surface Water Ambient Monitoring Program Quality Assurance Program Plan*

Retired SOPs are removed from circulation and electronically archived by the SWAMP QAT for a minimum of five years.

Project Documents and Records

Quality Assurance Project Plans

Applicable components of the above programmatic documents may then be incorporated into a quality assurance project plan (QAPP). A QAPP is a document that describes the intended technical activities and project procedures that will be implemented to ensure that the results will satisfy the stated performance or acceptance criteria.

A QAPP is required for certain large, ongoing, or special projects conducted by the Regional Boards or contractors under SWAMP. Each must reference this QAPrP in their generation of a project-specific QAPP. To streamline this process, SWAMP encourages the use of EPA Quality System document QA/G-5: *Guidance for Quality Assurance Project Plans* (EPA 2001c), as well as its own standardized review checklist, online QAPP template, and *SWAMP Advisor* Expert System (see Appendix G: *Online Resources*).

Prior to sample collection or field measurements, The SWAMP QAT evaluates each QAPP against a program-specific checklist and related EPA guidance. The products of this review include the completed checklist, a related narrative, and consultation pertaining to necessary corrective actions. Regardless of their scope, QAPPs completing this standardized review process may then be applied to SWAMP's common end use. Each QAPP is to be distributed according to its own Element A3: *Distribution List*. Project management must remove retired QAPPs from circulation before physically or electronically storing them for a minimum of five years.

Other Project Documents and Records

Prior to sample collection or field measurements, project contributors may reference this QAPrP in their generation of a project-specific field sampling plan, and sampling and analysis plan. These documents are then evaluated using the peer-review process described in the SWAMP SOP: *Review and Approval Procedure for Monitoring Plans and Research Proposals* (see Appendix G: *Online Resources*). In this process, the SWAMP Coordinator selects a pair of independent reviewers with expertise reflecting the submitted document. The document is then accepted, or re-reviewed following the resolution of outstanding issues.

Laboratory and Field Documents and Records

Standard Operating Procedures

Each SWAMP data producer is required to use an established method, or create and maintain SOPs that detail their own technical and administrative protocols. While no specific SOP content or format is mandated by SWAMP, assistance is available in the form of EPA Quality System document QA/G-6: *Guidance for Preparing Standard Operating Procedures* (EPA 2001b - see Appendix G: *Online Resources*).

Laboratory and field SOPs must follow the approval and maintenance processes of the programmatic SOPs described above.

Group B: Data Generation and Acquisition

Element B1: Sampling Process Design

Given the number and variety of projects contributing to the Surface Water Ambient Monitoring Program (SWAMP), it is not appropriate to mandate a specific sampling design at the programmatic level. Instead, Regional Water Quality Control Board (Regional Board) SWAMP Work Plans outline each region's overall goals for the program. These include:

- Details of specific monitoring objectives for the year
- A summary of existing information regarding water bodies to be sampled during the year
- Site-specific lists of all planned monitoring locations
- Planned measurement parameters for monitoring
- A site-specific summary of planned sampling frequencies for the year

Annual SWAMP Work Plans are available on the State Water Resources Control Board's (State Board's) SWAMP web page (see Appendix G: *Online Resources*). For projects operating under a quality assurance project plan (QAPP), project-specific sampling design information may be found in Element B1: *Sampling Process Design*.

Element B2: Sampling Methods

The Surface Water Ambient Monitoring Program (SWAMP) involves the collection of samples for a variety of analytes in water, sediment, tissue, and biota. Collections are conducted by multiple organizations using a variety of sampling protocols.

In the interest of programmatic comparability, SWAMP participants may reference the California Department of Fish and Game - Marine Pollution Studies Laboratory (DFG-MPSL) standard operating procedure (SOP), *Conducting Field Measurements and Field Collections of Water and Bed Sediment Samples in the Surface Water Ambient Monitoring Program*. This SOP is not required by SWAMP, and is provided for informational purposes only.

Bioassessment sampling must be conducted according to the SOP: *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*.

Both SOPs are available according to Appendix G: *Online Resources*. For projects operating under a quality assurance project plan (QAPP), project-specific sampling procedure information may be found in Element B2: *Sampling Methods*.

Element B3: Sample Handling and Custody

Proper handling of water, sediment, tissue, and biological samples is essential to the production of Surface Water Ambient Monitoring Program (SWAMP) data. Appendix B: *Sample Handlin*g identifies recommended sample containers, volumes, and preservations, as well as holding time requirements. For projects operating under a quality assurance project plan (QAPP), related information may be found in Element B1: *Sampling Handling and Custody.*

Additional technical information may be found in the California Department of Fish and Game - Marine Pollution Studies Laboratory (DFG-MPSL) standard operating procedure (SOP), *Conducting Field Measurements and Field Collections of Water and Bed Sediment Samples in the Surface Water Ambient Monitoring Program*. This SOP is not required by SWAMP, and is provided for informational purposes only.

Bioassessment sampling must be conducted according to the SOP: *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*. Both SOPs are available according to Appendix G: *Online Resources*.

Element B4: Analytical Methods

The Surface Water Ambient Monitoring Program (SWAMP) compiles data from a wide variety of projects – each with differing data needs. Consequently, it would be inappropriate for the program to mandate specific analytical methods for field or laboratory use. Instead, the program has adopted a performance-based approach to promote comparability.

Measurement Quality Objectives

One component of SWAMP-comparability is adherence to a common set of measurement quality objectives (MQOs). The U.S. Environmental Protection Agency (EPA) defines MQOs as acceptance criteria for the quality attributes measured by project data quality indicators such as precision, bias, representativeness, completeness, comparability, and sensitivity. SWAMP-specific MQOs are defined in Appendix A: *Measurement Quality Objectives*.

Reporting Limits

Another key component of SWAMP comparability is the application of reporting limits that are universal to all program participants. A reporting limit is the minimum value below which chemistry data are documented as non-detected. In SWAMP, these values are assigned on an analyte- and matrix-specific basis (see Appendix C: *Reporting Limits*).

It is apparent that program-mandated reporting limits may fit the objectives of some projects, while placing unnecessary restrictions on others. As a result, SWAMP participants must establish their own RLs as part of project planning. These values should reflect their own unique objectives, and may be based on analytical methods, method detection limits (MDLs), or expected levels of target analyte. If a project's RLs exceed those presented in Appendix C, ~~a waiver must be completed~~ there is no need to obtain a waiver as described in the introduction to this document.[1]

[1] Please see the October 8, 2008 addendum *Retraction of Programmatic Reporting Limits (*Appendix J: *Document Addenda)*

Element B5: Quality Control

This element describes the various laboratory and field quality control samples associated with Surface Water Ambient Monitoring Program (SWAMP) data. Coverage below does not imply a programmatic requirement. Rather, necessary quality control (QC) samples, frequency requirements, and control limits are defined in Appendix A: *Measurement Quality Objectives*.

Laboratory Quality Control

Laboratory QC samples must satisfy SWAMP measurement quality objectives (MQOs) and frequency requirements. MQOs are specified in Appendix A: *Measurement Quality Objectives*. Frequency requirements are provided on an analytical batch level. SWAMP defines an analytical batch as 20 or fewer samples and associated quality control that are processed by the same instrument within a 24-hour period (unless otherwise specified by method). Details regarding sample preparation are method- or standard operating procedure- (SOP-) specific, and may consist of extraction, digestion, or other techniques.

Calibration and Working Standards

All calibration standards must be traceable to a certified standard obtained from a recognized organization. If traceable standards are not available, procedures must be implemented to standardize the utilized calibration solutions (e.g., comparison to a certified reference material (CRM – see below). Standardization of calibration solutions must be thoroughly documented, and is only acceptable when pre-certified standard solutions are not available.

Working standards are dilutions of stock standards prepared for daily use in the laboratory. Working standards are used to calibrate instruments or prepare matrix spikes, and may be prepared at several different dilutions from a common stock standard. Working standards are diluted with solutions that ensure the stability of the target analyte. Preparation of the working standard must be thoroughly documented such that each working standard is traceable back to its original stock standard. Finally, the concentration of all working standards must be verified by analysis prior to use in the laboratory.

Instrument Calibration

Prior to sample analysis, utilized instruments must be calibrated following the procedures outlined in the relevant analytical method or SOP. Each method or SOP must specify acceptance criteria that demonstrate instrument stability and an acceptable calibration. If instrument calibration does not meet the specified acceptance criteria, the analytical process is not in control and must be halted. The instrument must be successfully recalibrated before samples may be analyzed.

Calibration curves will be established for each analyte covering the range of expected sample concentrations. Only data that result from quantification within the demonstrated working calibration range may be reported unflagged by the laboratory. Quantification based on extrapolation is not acceptable. Data reported outside of the calibration range must be flagged as "Detected not Quantified". Alternatively, if the instrumentation is linear over the concentration ranges to be measured in the samples, the use of a calibration blank and one single standard that is higher in concentration than the samples may be appropriate. Samples outside the calibration range will be diluted or concentrated, as appropriate, and reanalyzed.

Initial Calibration Verification

The initial calibration verification (ICV) is a mid-level standard analyzed immediately following the calibration curve. The source of the standards used to calibrate the instrument and the source of the standard used to perform the ICV must be independent of one another. This is usually achieved by the purchase of standards from separate vendors. Since the standards are obtained from independent sources and both are traceable, analyses of the ICV functions as a check on the accuracy of the standards used to calibrate the instrument. The ICV is not a requirement of all SOPs or methods, particularly if other checks on analytical accuracy are present in the sample batch.

Continuing Calibration Verification

Continuing calibration verification (CCV) standards are mid-level standards analyzed at specified intervals during the course of the analytical run. CCVs are used to monitor sensitivity changes in the instrument during analysis. In order to properly assess these sensitivity changes, the standards used to perform CCVs must be from the same set of working standards used to calibrate the instrument. Use of a second source standard is not necessary for CCV standards, since other QC samples are designed to assess the accuracy of the calibration standards. Analysis of CCVs using the calibration standards limits this QC sample to assessing only instrument sensitivity changes. The acceptance criterion and required frequency for CCVs are detailed in Appendix A: *Measurement Quality Objectives*. If a CCV falls outside the acceptance limits, the analytical system is not in control, and immediate corrective action must be taken.

Data obtained while the instrument is out of control is not reportable, and all samples analyzed during this period must be reanalyzed. If reanalysis is not an option, the original data must be flagged with the appropriate qualifier and reported. A narrative must be submitted listing the results that were generated while the instrument was out of control, in addition to corrective actions that were applied.

Laboratory Blanks

Laboratory blanks (also called extraction blanks, procedural blanks, or method blanks) are used to assess the background level of target analyte resulting from sample preparation and analysis. Laboratory blanks are carried through precisely the same procedures as the field samples. For both organic and inorganic analyses, a minimum of at least one laboratory blank must be prepared and analyzed in every analytical batch. Some methods may require more than one laboratory blank with each analytical run.

Acceptance criteria for laboratory blanks are detailed in Appendix A: *Measurement Quality Objectives*. Blanks that are too high require corrective action to bring the concentrations down to acceptable levels. This may involve changing reagents, cleaning equipment, or even modifying the utilized methods or SOPs.

Although acceptable laboratory blanks are important for obtaining results for low-level samples, improvements in analytical sensitivity have pushed detection limits down to the point where some amount of analyte will be detected in even the cleanest laboratory blanks. The magnitude of the blanks must be evaluated against the concentrations of the samples being analyzed and against project objectives.

Reference Materials and Demonstration of Laboratory Accuracy

Evaluation of the accuracy of laboratory procedures is achieved through the preparation and analysis of reference materials with each analytical batch. Ideally, the reference materials selected are similar in matrix and concentration range to the samples being prepared and analyzed. The acceptance criteria for reference materials are listed in Appendix A: *Measurement Quality Objectives*.

The accuracy of an analytical method can be assessed using CRMs only when certified values are provided for the target analytes. When possible, reference materials that have certified values for the target analytes should be used. This is not always possible, and often times certified reference values are not available for all target analytes. Many reference materials have both certified and non-certified (or reference) values listed on the certificate of analysis. Certified reference values are clearly distinguished from the non-certified reference values on the certificate of analysis.

Reference Materials vs. Certified Reference Materials

The distinction between a reference material and a certified reference material does not involve how the two are prepared, rather with the way that the reference values were established. Certified values are determined through replicate analyses using two independent measurement techniques for verification. The certifying agency may also provide “non-certified or “reference” values for other

target analytes. Such values are determined using a single measurement technique that may introduce bias.

When available, it is preferable to use reference materials that have certified values for all target analytes. This is not always an option, and therefore it is acceptable to use materials that have reference values for these analytes.

Note: Standard Reference Materials (SRMs) are essentially the same as CRMs. The term "Standard Reference Material" has been trademarked by the National Institute of Standards and Technology (NIST), and is therefore used only for reference materials distributed by NIST.

Laboratory Control Samples

While reference materials are not available for all analytes, a way of assessing the accuracy of an analytical method is still required. Laboratory control samples (LCSs) provide an alternate method of assessing accuracy. An LCS is a specimen of known composition prepared using contaminant-free reagent water or an inert solid spiked with the target analyte at the midpoint of the calibration curve or at the level of concern. The LCS must be analyzed using the same preparation, reagents, and analytical methods employed for regular samples. If an LCS needs to be substituted for a reference material, the acceptance criteria are the same as those for the analysis of reference materials. These are detailed in Appendix A: *Measurement Quality Objectives*.

Prioritizing Certified Reference Materials, Reference Materials, and Laboratory Control Samples

Certified reference materials, reference materials, and laboratory control samples all provide a method to assess the accuracy at the mid-range of the analytical process. However, this does not mean that they can be used interchangeably in all situations. When available, SWAMP requires the analysis of one certified reference material per analytical batch. Certified values are not always available for all target analytes. If no certified reference material exists, reference values may be used. If no reference material exists for the target analyte, an LCS must be prepared and analyzed with the sample batch as a means of assessing accuracy.

The hierarchy is as follows: analysis of a CRM is favored over the analysis of a reference material, and analysis of a reference material is preferable to the analysis of an LCS. Substitution of an LCS is not acceptable if a certified reference material or reference material is available.

Matrix Spikes

A matrix spike (MS) is prepared by adding a known concentration of the target analyte to a field

sample, which is then subjected to the entire analytical procedure. Matrix spikes are analyzed in order to assess the magnitude of matrix interference and bias present. Because matrix spikes are analyzed in pairs, the second spike is called the matrix spike duplicate (MSD). The MSD provides information regarding the precision of the matrix effects. Both the MS and MSD are split from the same original field sample.

In order to properly assess the degree of matrix interference and potential bias, the spiking level should be approximately 2-5x the ambient concentration of the spiked sample. To establish spiking levels prior to sample analysis, laboratories should review any relevant historical data. In many instances, the laboratory will be spiking samples blind and will not meet a spiking level of 2-5x the ambient concentration.

In addition to the recoveries, the relative percent difference (RPD) between the MS and MSD is calculated to evaluate how matrix affects precision. The MQO for the RPD between the MS and MSD is the same regardless of the method of calculation. These are detailed in Appendix A: *Measurement Quality Objectives*.

Recovery data for matrix spikes provides a basis for determining the prevalence of matrix effects in the samples collected and analyzed for SWAMP. If the percent recovery for any analyte in the MS or MSD is outside of the limits specified in Appendix A: *Measurement Quality Objectives*, the chromatograms (in the case of trace organic analyses) and raw data quantitation reports should be reviewed. Data should be scrutinized for evidence of sensitivity shifts (indicated by the results of the CCVs) or other potential problems with the analytical process. If associated QC samples (reference materials or LCSs) are in control, matrix effects may be the source of the problem. If the standard used to spike the samples is different from the standard used to calibrate the instrument, it must be checked for accuracy prior to attributing poor recoveries to matrix effects.

Laboratory Duplicates

In order to evaluate the precision of an analytical process, a field sample is selected and prepared in duplicate. Specific requirements pertaining to the analysis of laboratory duplicates vary depending on the type of analysis. The acceptance criteria for laboratory duplicates are specified in Appendix A: *Measurement Quality Objectives*.

Laboratory Duplicates vs. Matrix Spike Duplicates

Although the laboratory duplicate and matrix spike duplicate both provide information regarding precision, they are unique measurements. Laboratory duplicates provide information regarding the precision of laboratory procedures. The matrix spike duplicate provides information regarding how

the matrix of the sample affects both the precision and bias associated with the results. It also determines whether or not the matrix affects the results in a reproducible manner. Because the two concepts cannot be used interchangeably, it is unacceptable to analyze only an MS/MSD when a laboratory duplicate is required.

Replicate Analyses

For the purpose of SWAMP, replicate analyses are distinguished from duplicate analyses based simply on the number of involved analyses. Duplicate analyses refer to two sample preparations, while replicate analyses refer to three or more. Analysis of replicate samples is not explicitly required by SWAMP.

Surrogates

Surrogate compounds accompany organic measurements in order to estimate target analyte losses during sample extraction and analysis. The selected surrogate compounds behave similarly to the target analytes, and therefore any loss of the surrogate compound during preparation and analysis is presumed to coincide with a similar loss of the target analyte.

Surrogate compounds must be added to field and QC samples prior to extraction, or according to the utilized method or SOP. Surrogate recovery data is to be carefully monitored. If possible, isotopically labeled analogs of the analytes are to be used as surrogates. The SWAMP recommended surrogates for pollutant-matrix combinations are provided in the tables in Appendix B of this document.

Internal Standards

To optimize gas chromatography mass spectrometry (GC-MS) and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) analyses, internal standards (also referred to as “injection internal standards”) may be added to field and QC sample extracts prior to injection. Use of internal standards is particularly important for analysis of complex extracts subject to retention time shifts relative to the analysis of standards. The internal standards can also be used to detect and correct for problems in the GC injection port or other parts of the instrument. The analyst must monitor internal standard retention times and recoveries to determine if instrument maintenance or repair or changes in analytical procedures are indicated. Corrective action is initiated based on the judgment of the analyst. Instrument problems that affect the data or result in reanalysis must be documented properly in logbooks and internal data reports, and used by the laboratory personnel to take appropriate corrective action. Performance criteria for internal standards are established by the method or laboratory SOP.

Dual-Column Confirmation

Due to the high probability of false positives from single-column analyses, dual column confirmation should be applied to all gas chromatography and liquid chromatography methods that do not provide definitive identifications. It should not be restricted to instruments with electron capture detection (ECD).

Dilution of Samples

Final reported results must be corrected for dilution carried out during the process of analysis. In order to evaluate the QC analyses associated with an analytical batch, corresponding batch QC samples must be analyzed at the same dilution factor. For example, the results used to calculate the results of matrix spikes must be derived from results for the native sample, matrix spike, and matrix spike duplicate analyzed at the same dilution. Results derived from samples analyzed at different dilution factors must not be used to calculate QC results.

Laboratory Corrective Action

Failures in laboratory measurement systems include, but are not limited to: instrument malfunction, calibration failure, sample container breakage, contamination, and QC sample failure. If the failure can be corrected, the analyst must document it and its associated corrective actions in the laboratory record and complete the analysis. If the failure is not resolved, it is conveyed to the respective supervisor who should determine if the analytical failure compromised associated results. The nature and disposition of the problem must be documented in the data report that is sent to the SWAMP Project Manager. Specific laboratory corrective actions are detailed in Appendix D: *Corrective Action*.

Field Quality Control

Field QC results must meet the SWAMP MQOs and frequency requirements specified in Appendix A: *Measurement Quality Objectives*, where frequency requirements are provided on a sample batch level. SWAMP defines a sample batch as 20 or fewer field samples prepared and analyzed with a common set of QC samples.

Specific field quality control samples may also be required by the method or SOP selected for sample collection and analysis. If SWAMP MQOs conflict with those prescribed in the utilized method or SOP, the more rigorous of the objectives must be met.

Travel Blanks

Travel blanks are used to determine if there is any cross-contamination of volatile constituents between sample containers during shipment from the field to the laboratory. One volatile organic

analysis (VOA) sample vial with reagent water known to be free of volatile contaminants is transported to the site with the empty sample containers. The list of volatile organic compounds (VOCs) includes methyl tert-butyl ether (MTBE); and benzene, toluene, ethylbenzene, and xylenes (BTEX). This vial must be handled like a sample (but never opened) and returned to the laboratory with the other samples. Travel blanks are not required (unless explicitly required by the utilized method or SOP), but are encouraged as possible and appropriate.

Equipment Blanks

Equipment blanks are generated by the personnel responsible for cleaning sampling equipment. Equipment blanks must be analyzed before the equipment is shipped to the sampling site. In order to accommodate any necessary corrective action, equipment blank results should be available well in advance of the sampling event.

To ensure that sampling equipment is contaminant-free, water known to be low in the target analyte(s) must be processed though the equipment as during sample collection. The specific type of water used for blanks is selected based on the information contained in the relevant sampling or analysis methods. The water must be collected in an appropriate sample container, preserved, and analyzed for the target analytes (in other words, treated as an actual sample).

The inclusion of field blanks is dependent on the requirements specified in the relevant MQO tables, or in the sampling method or SOP. Typically, equipment blanks are collected when new equipment, equipment that has been cleaned after use at a contaminated site, or equipment that is not dedicated for surface water sampling is used. An equipment blank must be prepared for metals in water samples whenever a new lot of filters is used.

Field Blanks

A field blank is collected to assess potential sample contamination levels that occur during field sampling activities. Field blanks are taken to the field, transferred to the appropriate container, preserved (if required by the method), and treated the same as the corresponding sample type during the course of a sampling event. The inclusion of field blanks is dependent on the requirements specified in the relevant MQO tables or in the sampling method or SOP.

Field blanks for other media and analytes should be conducted upon initiation of sampling. If field blank performance is acceptable, further collection and analysis of field blanks should be performed on an as-needed basis. Acceptable levels for field blanks are specified in Appendix A: *Measurement Quality Objectives*.

The water used for field blanks must be free of target analyte(s) and appropriate for the analysis being conducted.

Field Duplicates

Field samples collected in duplicate provide precision information as it pertains to the sampling process. The duplicate sample must be collected in the same manner and as close in time as possible to the original sample. This effort is to attempt to examine field homogeneity as well as sample handling, within the limits and constraints of the situation.

Field Corrective Action

The field organization is responsible for responding to failures in their sampling and field measurement systems. If monitoring equipment fails, personnel are to record the problem according to their documentation protocols. Failing equipment must be replaced or repaired prior to subsequent sampling events. It is the combined responsibility of all members of the field organization to determine if the performance requirements of the specific sampling method have been met, and to collect additional samples if necessary. Associated data is entered into the SWAMP Information Management System (IMS) and flagged accordingly. Specific field corrective actions are detailed in Appendix D: *Corrective Actions*.

Element B6: Instrument/Equipment Testing, Inspection, and Maintenance

The wide variety of contributing instruments and equipment make it inappropriate for the Surface Water Ambient Monitoring program (SWAMP) to mandate specific procedures for testing, inspection, and maintenance. Instead, the program defers to the manufacturer guidelines accompanying each field and laboratory device.

For projects operating under a quality assurance project plan (QAPP), Element B6: *Instrument/Equipment Testing, Inspection, and Maintenance* addresses more specific aspects of these systems and their associated documentation, assessment, and corrective action.

Element B7: Instrument/Equipment Calibration and Frequency

The wide variety of contributing instruments and equipment make it inappropriate for the Surface Water Ambient Monitoring Program (SWAMP) to mandate universal calibration requirements for the field or laboratory. Instead, the program defines these requirements on an analyte- and matrix-specific basis (see Appendix A: *Measurement Quality Objectives)*.

For projects operating under a quality assurance project plan (QAPP), *Element B7: Instrument/Equipment Calibration and Frequency* addresses more specific aspects of these processes and their associated documentation, assessment, and corrective action.

Element B8: Inspection/Acceptance of Supplies and Consumables

The Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance (QA) Program does not oversee the execution of procurement activities conducted by SWAMP participants. Purchases of goods and services made by State Water Resources Control Board (State Board) and Regional Water Quality Control Board (Regional Board) must follow the rules for purchasing found in the State Board's *Contract Information Manual*, and applicable purchasing rules set forth by the Department of General Services.

Contracts Requesting Laboratory Analytical Services

A significant portion of contracted services will involve the collection, processing, and analysis of environmental samples. Since the information generated from these activities is critical, generated data must meet the requirements of this quality assurance program plan. This must be reflected in each statement of work (SOW), and helps define acceptance criteria for the services performed.

In addition, individual projects must indicate requirements, technical specifications, evaluation criteria, and certifications necessary to meet and fulfill a contract. For projects operating under a quality assurance project plan (QAPP), these details must be communicated to potential contractors in Element B8: *Inspection and Acceptance of Supplies and Consumables*. Many of these project-specific requirements are communicated to potential contractors in the SOW that is included as part of a request for proposal (RFP). Each RFP defines the minimum qualifications necessary to be awarded the contract, in addition to the requirements that must be fulfilled in order for the submitted work to be considered acceptable.

Project details must be documented on a standard contract form, with attachments, which is reviewed and approved by the appropriate State or Regional Board Manager. Changes to contracts undergo the same review and approval sequence. Contract Managers must attend beginning and refresher training in order to receive and maintain Contract Manager status.

Whether it is to be made at the State or Regional Board, procurement of the requested laboratory services must be undertaken by the Contract Manager, according to State Board policy and regulations detailed in the Board's *Contract Information Manual*. The procurement process is documented in the contract file pertaining to the particular action.

Laboratory services contracts must have QA and quality control (QC) requirements integrated into the SOW. The existence of any quality management plans (QMPs), QAPPs, sampling and analysis

plans, or field sampling plans pertinent to the work requested is communicated to the contractor. The State Board QA Program reviews contract language and is often part of the proposal review team. When subcontractors are involved, the prime contractor must maintain responsibility. Therefore, there is no direct oversight responsibility by the Contract Manager.

Contracts Requesting Data Quality Support Services

State and Regional Board personnel must seek services from qualified vendors for data quality support, such as statistical consulting and performance test samples. All contractual requirements noted above are to be followed, including the establishment of quality criteria in the work statement. Review and assessment of compliance with all contractual quality criteria must also be as above.

Grant Agreements with the U.S. Environmental Protection Agency

The State and Regional Boards are to adhere to all U.S. Environmental Protection Agency (EPA) contractual requirements, especially those calling for data quality planning documents.

Grant Recipient Agreements

State and Regional Board staff members oversee the disbursement of grant and bond funds for projects to improve or remediate water quality. As above, all contracts must stipulate quality planning documents and adherence to applicable State or Regional Board quality planning documents. The State Board QA Program will review and approve these planning documents, and oversee their implementation by the grant or bond recipient.

Oversight of Quality

The Contract Manager for the contract or grant must establish inspection and acceptance criteria into contract SOWs or work plans. They are responsible for oversight and for ensuring that products delivered meet contract or grant requirements.

Oversight of the contractor's QA and QC products is accomplished mainly by the efforts of the State Board QA Program. This body reviews contractor quality planning documents to ensure that State and Regional Board policy and contractual QA requirements are being met. The State Board QA Program generates comments on contractor documents, which are then provided, with State Board QA Program Manager approval, to the Contract Manager responsible for the particular contract or work assignment. These individuals then relay review feedback to the contractor and track the contractor's response.

Element B9: Non-Direct Measurements

Water quality monitoring data from sources other than Surface Water Ambient Monitoring Program- (SWAMP-) funded monitoring activities will not be entered into the information management system (IMS) database. Future programmatic funding and staffing provisions may allow for the inclusion of this data.

However, the use of non-direct measurements is highly encouraged in SWAMP planning efforts to produce annual work plans, and for SWAMP data assessment and interpretation activities. Regional Water Quality Control Board (Regional Board) SWAMP staff must use their professional discretion when using data for such purposes. When possible, these data are obtained in electronic format and reviewed in their raw form by automated data editing procedures. These data are also reviewed by Regional Board SWAMP staff before data reduction and interpretation.

Non-direct measurements may also be produced by a calculation involving multiple direct measurements. The involved project or organization must maintain and implement a procedure for the verification of these calculations. This procedure ensures that a consistent calculation is used and that results are transcribed correctly.

Element B10: Data Management

SWAMP Information Management System

One major challenge in conducting a statewide monitoring effort is the development of a unified data system. In many cases, Surface Water Ambient Monitoring Program (SWAMP) participants have previously developed data management systems of their own, or for their own specific objectives. These systems vary in the types of data captured, the software systems in which they are stored, and the degree of data documentation. In order to meet the SWAMP goal of centralized data management, a cooperative Information Management System (IMS) is necessary to ensure that collected data can be shared effectively among participants.

The IMS has been developed in recognition that SWAMP represents an initial effort toward data standardization among regions, agencies, and laboratories; and that adopted protocols may later be used for other purposes beyond this program. The system was constructed primarily to serve Regional Water Quality Control Board (Regional Board) staff and technical committees, but it has also been designed to supply data to non-project scientists and the interested public.

The SWAMP IMS database is maintained by the Data Management Team (DMT) at the Moss Landing Marine Laboratories (MLML). The IMS is the central depository of all data collected for SWAMP. It is the ultimate goal of the DMT to:

- Provide standardized data management;
- Provide data of known and documented quality;
- Make information available to all stakeholders in a timely manner;
- Facilitate the use of data for decision-making processes; and
- Create and document systems that ensure data comparability

It is also a goal of SWAMP to be as "paperless" as possible, and to develop a database that will allow internet access to all parties interested in the data, findings, and technical reports produced through program studies.

Process

Laboratory and field data and associated quality control (QC) is submitted in standardized formats to the DMT for loading into the IMS using automated loading programs. Once data are loaded onto the temporary side of the centralized database, the DMT, along with Regional Board staff, check the field and laboratory information for completeness against the contractual requirements for a given project year. The DMT also confirms that station information, including

National Hydrography Dataset (NHD); CalWater v2.21; and Regional Water Board Basin Plan numbers, target latitudes, and longitudes, are complete.

Finally, the DMT verifies all SWAMP data according to three SWAMP standard operating procedures (SOPs): *Field Data Verification of the Surface Water Ambient Monitoring Program Database, Data Loading and Verification of the Surface Water Ambient Monitoring Program Database, and Toxicity Data Verification of the Surface Water Ambient Monitoring Program Database* (see Appendix G: *Online Resources*). Data verification SOPs for biological assessments and tissue will be introduced as these data types and procedures are finalized in the SWAMP IMS.

Data is verified against the measurement quality objectives (MQOs) presented in this QAPrP, rather than those found in methods, SOPs, or approved quality assurance project plan (QAPP). Based on the SWAMP SOP: *Data Classification System*, a summary compliance code (i.e., Compliant, Estimated, Historical, or Rejected) is then assigned to each individual data result in the database. The DMT also performs routine checks to ensure that all data on the temporary and permanent sides of the database are comparable at a global and an analytical batch level. These processes are detailed in this document's Element D1: *Data Review, Verification, and Validation*; and Element D2: *Verification and Validation Methods.*

After the previous steps are completed, data is transferred to the permanent side of the IMS and checked for transfer completeness and accuracy. It is then available for assessment and interpretive reporting by Regional and State Water Resources Control Board (State Board) staff.

Features

The IMS is based on a centralized data storage model. A centralized system was selected because SWAMP is an integrated program, and the typical data user is interested in obtaining synoptic data sets from discrete hydrologic units or large geographical regions of the state. A distributed system linked through a server or series of file transfer protocol (FTP) sites would require sophisticated tools to enable user access. There is also valid concern over the difficulty of maintaining a linked-distributed system for an extended number of years. Current budget allocations make the centralized system a more achievable model for handling data in SWAMP.

The centralized IMS was developed using standardized data transfer protocols (SDTPs) for data exchange, and *Data Entering/Editing Forms* for field data and observations. The SDTPs detail the information to be submitted with each sample collection or sample processing element, the

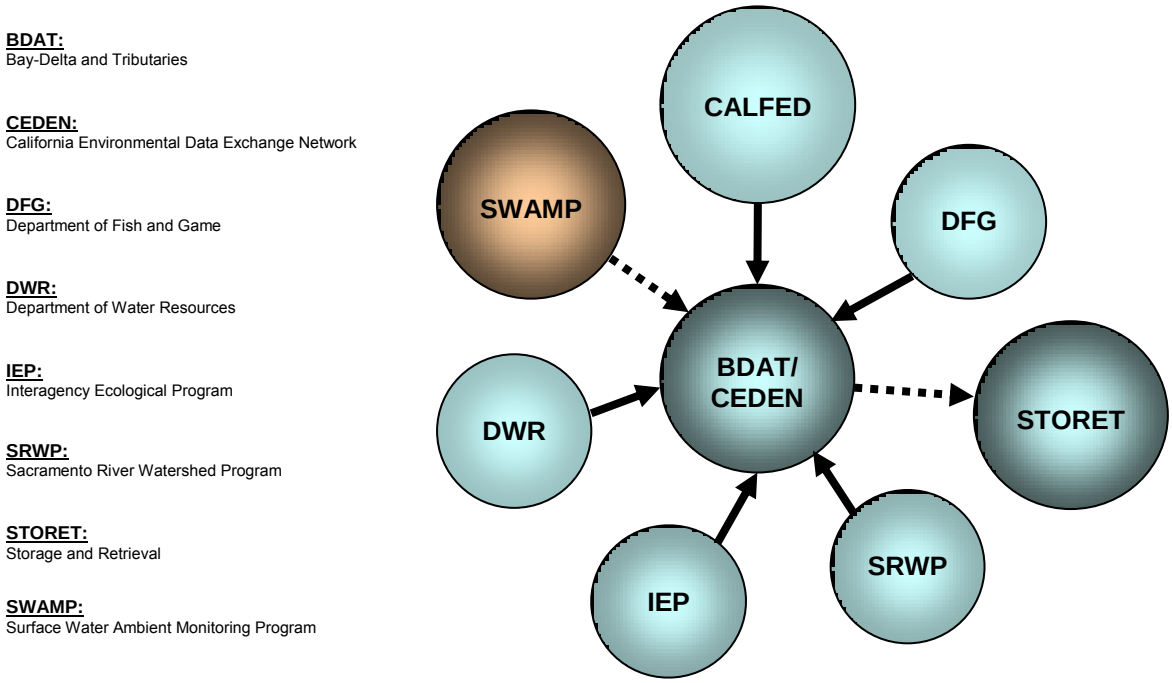
units and allowable values for each parameter, and the order in which that information will be submitted. They ensure that data submitted by the participants are comparable and easily merged without significant effort or assumptions by the organization responsible for maintaining the centralized data system.

The SWAMP IMS is organized through a relational structure. The central database is called the replicate master and contains a temporary and permanent side. The relational structure involves the use of multiple data tables linked through one or more common fields or primary keys. A relational structure minimizes the possibility of data loss by allowing data created at different times (e.g., laboratory data vs. field data) to be entered at the time of data production. This relational structure also minimizes redundant data entry by allowing data that are recorded only once (e.g., station location) to be entered into separate tables rather than to be repeated in every data record.

The data table structure of the SWAMP IMS was designed around a sample-driven model. One distinct feature of this database captures a target position of the station (latitude/longitude) that is stored in the *Geometry* table while still capturing an “actual” position of each sample. This is important because many different organizations will be occupying a station at different times to collect different samples. The IMS structure is designed with surface water, bed sediment, tissue, and biological assessment sampling in mind. However, it also captures information collected at multiple depths in the water column more commonly observed in marine and freshwater lake sampling systems. In addition, the IMS contains data tables for toxicity, physical habitat, and tissue compositing data.

This effort includes monitoring information from many existing data pools (see Figure 3: *The Interactions of the Surface Water Ambient Monitoring Program*).

Figure 3: The Interactions of the Surface Water Ambient Monitoring Program



General Structure

The SWAMP IMS currently contains 100 data tables: 50 entry-level data tables and 50 permanent-level data tables, both containing similar content. The main table is the *Sample* table, which includes a single data record for each sampling event. Samples created can be laboratory samples (laboratory-generated), analytical samples (field-generated), field observations, or field results. This sample is linked in a "one:many" relationship with all subsequent data tables.

The combination of the fields *StationCode, EventCode, ProtocolCode SampleDate, AgencyCode and Project Code* ensures that each record in the *Sample* table is unique. Sample records need to be linked with all results data and thus become the foundation of the SWAMP IMS. In the chemistry results table, all analytical data are captured at the level of the individual replicate, rather than in a summarized form. Toxicity data are stored with statistical summaries as well as with the individual replicates.

Form Entry/Editing Protocols

Key enterers of data (limited number per Regional Board or contracted entity) enter field data into a replicate of the central SWAMP IMS on data entry and editing forms provided to them by the DMT. Limited analytical data can also be entered through the form entry system. The DMT

provides training and support for use of these forms. The individual replicates are synchronized with the central SWAMP IMS. Recommended QC for form entry includes the key enterer confirmation of at least 20% of data, and range checks of the *Field Results* table. Data are next submitted to the DMT for synchronization to the replicate master.

Standardized Data Transfer Protocols

The data formats for the SDTP table submissions are detailed in the *Required Lab Format Training* document (see Appendix G: *Online Resources*). These data formats include lookup lists that are required in order for the data to be loaded into the IMS. The DMT works with analytical laboratories on an individual basis to make this process as seamless as possible. Fields for summary QC information are also included.

Upon receipt, the DMT updates a data submission log to document the data received from each submitting organization. The DMT then initiates a series of error checks to ensure that data meet SWAMP and project measurement quality objectives (MQOs), contain all required fields, have encoded valid values from constrained lookup lists where specified, and are in correct format (e.g., text in text fields, values in numeric fields). If there are a limited number of minor errors, the DMT makes the necessary changes. These changes are only made with the consent of the data generator, with a list sent back to the data generator documenting the changes. If there are numerous errors, or corrections that are difficult to implement, the DMT sends the data file back to the submitting organization with a list of necessary corrections. The submitting organization makes the corrections and resubmits the file to the DMT, who will subject the file to error checking once again. Each of these paths is documented by the DMT as part of the submittal tracking process.

Schedule

The schedule for data submission varies by data type. Data collected in the field is due first, while data produced through laboratory analysis is produced on a schedule consistent with nominal laboratory processing times. Key data enterers provide their data to the DMT so that there is sufficient time for the DMT to resolve any data discrepancies, and to ensure that the data are in the proper format for the addition of the batch input data.

Data Sheets

To assist organizations in meeting the data entry forms and improving the efficiency of data input, the DMT has created a series of data sheets. While these sheets follow closely with the data entry forms, data gatherers are not required to use them (see Appendix G: *Online*

Resources).

California Environmental Data Exchange Network

SWAMP data are publicly available on a web interface through the California Environmental Data Exchange Network (CEDEN - see Appendix G: *Online Resources*). SWAMP's data contributions to CEDEN are facilitated by its own IMS.

At least twice annually, SWAMP uploads data for incorporation into CEDEN. After data is transferred from the SWAMP database, the DMT verifies that the transfer occurred without errors. CEDEN is a collaborative data sharing effort among multiple agencies and data providers, with no one entity responsible for all aspects of the system. Instead, data quality is the responsibility of each individual data provider and program. No formal quality oversight occurs within CEDEN.

The State Board is currently developing a "tiered" system that will define and categorize data from participating programs and projects. When the system is complete, each data submission will include a code that reflects the rigor and documentation of its associated quality control, verification, and validation. CEDEN will not assign these data codes. Instead, they will be assigned by the submitting program or project based on State Board guidance.

Group C: Assessment and Oversight

Element C1: Assessments and Response Actions

Regional and Laboratory Audits

The Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Team (QAT) performs periodic quality system assessments of the program's master contract laboratories and nine contributing Regional Water Quality Control Boards (Regional Boards). A desktop assessment may be scheduled in lieu of an onsite assessment. To promote consistency among multiple assessors, a standardized checklist is completed by each before being compiled into a single document.

Communication

Six weeks in advance, the lead assessor or a designee notifies the involved contract laboratory or Regional Board of their intent to audit. They may then request materials for a desktop assessment - a remote audit of hardcopy or electronic quality documents and materials. The desktop assessment may stand alone, or may precede an onsite assessment.

The onsite assessment adheres to an agenda and includes an opening meeting, a review of quality processes and systems, and a closing meeting. The onsite assessment involves an evaluation of procedures, personnel, equipment, and facilities against the requirements of this quality assurance program plan (QAPrP).

Assessment Summary

Following a regional or laboratory assessment, the lead assessor compiles notes and checklists into a single document. This summary details findings, observations, and recommendations; supporting evidence for each; and references to this SWAMP QAPrP or other applicable requirements. It is acceptable for the assessment report to include recommendations for corrective actions and their associated due dates.

Assessment Response

The assessed organization is then required to prepare a written response to the evaluation. An assessment response includes detailed plans for corrective actions and due dates for completion of those corrective actions. Corrective actions must be well documented, and must include a follow-up plan to ensure the effectiveness of each action.

Upon receipt, the completed assessment response is reviewed by the lead assessor and the SWAMP QA Officer. If the response is satisfactory, the lead assessor sends a letter of acceptance. If the response is not satisfactory, the lead assessor or the SWAMP QA Officer contacts the organization to work toward an acceptable response. Assessment summaries remain confidential, and are only available to the SWAMP QA Team (QAT), the SWAMP Coordinator, and the assessed organization. Completed documents will be electronically archived by the SWAMP QAT for a minimum of five years (see Element A9: *Documents and Records*).

Element C2: Reports to Management

Quality Assurance Reports

Following each year of monitoring, a *Quality Assurance Report* will be prepared by the Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Team (QAT). This report will provide updates on program documents, assessments, corrective actions, and quality control (QC), as well as proposed activities for the upcoming year. It will be submitted to the State Water Resources Control Board (State Board) Quality Assurance (QA) Program for incorporation into its annual report to the U.S. Environmental Protection Agency (EPA). *Quality Assurance Reports* will be electronically archived by the SWAMP QAT for a minimum of five years. In addition, the QAT holds regular internal meetings that are summarized to the SWAMP Roundtable.

Scientific Panel and Review Committee

In response to a request from the State Board, SWAMP has organized an external scientific panel, the Scientific Planning and Review Committee (SPARC), to review study design, approaches, and indicators. SPARC comprises independent scientific and technical experts including, but not limited to, representatives from federal and state agencies and academics with expertise in fields such as monitoring program management, monitoring design, ecology, chemistry, QA, pathogens, toxicology, and statistics. Reports from SPARC's triennial meetings are available online (see Appendix G: *Online Resources*).

State Board Review

Every three years, the State Board's QA Program Manager formally reviews SWAMP's quality system. Their report is issued six months following each SPARC meeting, and uses these meetings and the State Board's draft quality management plan (QMP) as a basis for its content.

If a quality system failure is identified within SWAMP, the State Board QA Program Manager meets with SWAMP's Coordinator and QA Officer to create a mutually acceptable resolution. The resolution is retained by the State Board QA Program in a policy, memorandum of agreement, or planning document. Follow-up is performed by the State Board QA Program to ensure that the resolution reached has been implemented.

Corrective Action File

Within SWAMP, corrective action is required in response to administrative or technical failures at the programmatic level. Any corrective action required of program staff is implemented and

documented according to SWAMP standard operating procedure (SOP) *Corrective Action*. Summarily, the party reporting the corrective action must complete a standardized form. Upon review of this form, the SWAMP QA Officer may revise proposed corrective actions as appropriate. Once the corrective action is approved, the SWAMP QAT will issue a memorandum to the SWAMP Coordinator, the State Board QA Program Manager, the SWAMP Roundtable, or directly affected parties as appropriate. The QAT will then initiate a follow-up review of corrective actions approximately six months after the memorandum is issued.

A copy of the corrective action must be kept on file by the reporting party for at least two years. In addition, an electronic logbook of all completed corrective action forms will be maintained by the SWAMP QAT. The resulting file is reviewed at least annually, and is archived by the QAT for a minimum of five years. Corrective actions are included in the scope of each annual *Quality Assurance Report.*

Group D: Data Validation and Usability

Element D1: Data Review, Verification, and Validation

Review of Surface Water Ambient Monitoring Program (SWAMP) data consists of two discrete steps: verification and validation.

Data Verification is the process of evaluating the correctness, conformance, compliance, and completeness of a specific data set against method, procedural, or contractual requirements. In SWAMP, data verification is the responsibility of Regional Water Quality Control Board (Regional Board) staff, the Data Management Team (DMT), and the reporting laboratory or field organization.

Data Validation is an analyte- and sample-specific process that evaluates the information after the verification process to determine analytical quality and any limitations. In SWAMP, data validation is the responsibility of the QA Team (QAT) and the Regional Board reporting the data.

Procedures for data verification and validation are detailed in Element D2: *Verification and Validation Methods*. Related corrective actions and reporting procedures are described in Group C: *Assessment and Oversight* of this document. Associated standard operating procedures (SOPs) can be found online at (see Appendix G: *Online Resources*).

Ultimately, verified and validated data is stored in the SWAMP Information Management System (IMS), which includes both a temporary and permanent side. Data on the temporary side remains inaccessible via the web but is accessible to State Water Resources Control Board (State Board) and Regional Board staff. Compilation and interpretation of this temporary data is made possible through Microsoft Access features, as well as specialized tools developed by the DMT. Data on the permanent side of the IMS will be accessible to the public through a web interface (see Appendix G: *Online Resources*).

Element D2: Verification and Validation Methods

Verification and validation of data entered into the Surface Water Ambient Monitoring Program (SWAMP) Information Management System (IMS) is the shared responsibility of the submitting party, the Data Management Team (DMT), and the Quality Assurance Team (QAT). These processes are detailed in this quality assurance program plan (QAPrP), the *SWAMP Database Training Manual*, and various SWAMP standard operating procedures (SOPs) referenced below and in Appendix G: *Online Resources*. While these SOPs detail specific tasks performed during the verification and validation processes, responsibility for these tasks is generally assigned as follows:

- Contract laboratories and field organizations are ultimately responsible for the verification and validation of the data they generate.
- The SWAMP DMT is responsible for performing a cursory verification of the submitted data. This process is described in this QAPrP element and in each of the SWAMP data verification SOPs.
- The SWAMP QAT is responsible for analyzing trends in data, and for updating SWAMP verification and validation procedures as appropriate.

Verification Scope

SWAMP performs two levels of data verification: cursory verification and full verification. These processes are defined as follows:

Cursory Verification

This level of verification involves the review of Microsoft Excel files submitted by laboratories and field organizations. Specifics of the cursory verification are dependent on the type of data submitted, and are detailed in the relevant SOPs. Cursory verification is performed by the SWAMP DMT on all data submitted to the IMS.

Full Verification

Full data verification includes the entire scope of cursory verification, with the addition of hardcopy data package verification. These packages include summarized data as well as supporting raw data. Full verification is applied to a statistical representation of IMS data, and is currently performed by the participating laboratory or field organization. Time and budget constraints prevent hardcopy data packages from being submitted to the SWAMP DMT.

Field Data Verification

Following field data entry, it must be reviewed by the submitting agency according to the SWAMP SOP: *Field Data Verification of the Surface Water Ambient Monitoring Program Database*. The query database provided by the SWAMP Data Management Team (DMT) is a tool that can be used to complete this process (see Appendix G: *Online Resources*).

Laboratory Data Verification

It is the responsibility of laboratories to report data that is comparable to SWAMP measurement quality objectives (MQOs - see Appendix A: *Measurement Quality Objectives*), and to the required SWAMP data formats available online (see Appendix G: *Online Resources*). Laboratories are responsible for the accuracy of data submitted to the DMT. The submitting entity is expected to follow the SWAMP SOP: *Contract Laboratory Data Verification and Validation* for chemical analyses and *Toxicity Data Verification of the Surface Water Ambient Monitoring Program Database* for toxicity testing.

Information Management System Data Verification

The DMT transfers temporary data to the permanent side of the IMS according to the SWAMP SOP *Data Loading and Verification of the Surface Water Ambient Monitoring Program Database*. Data is held on the temporary side of the database until the verification procedures outlined in the SWAMP SOPs have been conducted. Following verification, the data is moved to the permanent side of the SWAMP IMS.

Data Validation

Laboratories and field organizations are responsible for confirming that submitted data meets the criteria specified in this QAPrP. After data is loaded into the temporary side of the IMS, The DMT again reviews it against SWAMP criteria associated with the following:

- Completeness
- Holding times
- Matrix spike/matrix spike duplicates (MS/MSDs)
- Laboratory duplicates
- Surrogates
- Certified reference material (CRMs)
- Laboratory control samples (LCSs)

- Method blanks
- Field QC samples
- Reporting limits (RLs)

Focused Data Assessment

The SWAMP QAT conducts focused assessments of data on the permanent side of the IMS. Assessment procedures are detailed in the SWAMP SOP *Surface Water Ambient Monitoring Program Quality Assurance Program Database Systems Assessment* (see Appendix G: *Online Resources*).

The assessment begins by sorting data that has been flagged as "Estimated" in the IMS. This data is further sorted by *QA Code,* revealing trends in data qualification. Trends are then further investigated by sorting each *QA Code* category by the following headings:

- Date
- Region
- Laboratory
- Matrix
- Analyte

Results of these routine investigations may suggest the need for additional sorting (e.g., season). Trends noted within IMS data may include holding time violations, QC sample failures, and missing QC samples.

Element D3: Reconciliation with User Requirements

During the development of the Surface Water Ambient Monitoring Program (SWAMP), the State Water Resources Control Board (State Board) and Regional Water Quality Control Boards (Regional Boards) focused on site-specific monitoring to better characterize problem sites or clean locations (reference sites) that meet the needs of the Total Maximum Daily Load (TMDL) and other core regulatory programs.

In addition, SWAMP data contributes to a variety of reports. These reports provide an analysis and interpretation of collected data; and include fact sheets, data reports, quality assurance reports, interpretative reports, and the 305(b)/303(d) Integrated Report. Technical reports have written descriptions of the study design; methods used; graphical, statistical, and textual descriptions of data; and data interpretation, including comparisons to relevant water quality goals. Technical reports summarized in fact sheets capture key findings in a more readable format. Ultimately, SWAMP end-users must ensure that program data is of the appropriate type, quantity, and quality for its intended purpose.

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Introduction

Tables A1-A25 below identify all parameters currently compiled by the Surface Water Ambient Monitoring Program (SWAMP). These tables are divided by analytical category, and therein by analyte. Each relevant quality control (QC) sample type is identified, as well as its associated frequency requirements and measurement quality objectives (MQOs). Element B5: *Quality Control* defines and summarizes field and laboratory QC samples.

- When available, SWAMP requires the analysis of one certified reference material (CRM) per analytical batch. However, certified values are not always available for all target analytes. If no CRM exists, reference values may be used. If no reference value exists for the target analyte, a laboratory control sample (LCS) must be prepared and analyzed with the sample batch as a means of assessing accuracy. Substitution of an LCS is not acceptable if a certified reference material or reference material is available.
- Although the laboratory duplicate and matrix spike duplicate (MSD) both provide information regarding precision, they are unique measurements. Laboratory duplicates provide information regarding the precision of the laboratory procedures. The MSD provides information regarding how the matrix of the sample affects both the precision and bias associated with the results. It also determines whether or not the matrix affects the results in a reproducible manner. Because the two concepts cannot be used interchangeably, it is unacceptable to analyze only an MSD pair when a laboratory duplicate is required.
- Completeness is a measure of the amount of valid data obtained from a measurement system as compared to the expected amount - usually expressed as a percentage. The theoretical MQO of 100% must be corrected for inevitable data loss (e.g., analyst error, insufficient sample volume, shipping difficulty, field conditions, data rejection). Because it is universal, SWAMP's completeness MQO of 90% does not appear in the following analyte-specific tables.
- Percent moisture should be reported with each batch of sediment and tissue samples. Percent lipids should be reported with each batch of organic tissue samples. Sediment and bivalve tissue data must be reported on a dry weight basis. Fish tissue data must be reported on a wet weight basis.
- The formulas below may be used to calculate results for the specified quality control samples.

Reference Materials and Laboratory Control Samples

$$\%\ \text{recovery} = \frac{V_{analyzed}}{V_{certified}} \times 100$$

Where:

$v_{analyzed}$: the analyzed concentration of the reference material or laboratory control sample (LCS)

$v_{certified}$: the certified concentration of the reference material or LCS

Matrix Spikes

$$\%\ \text{recovery} = \frac{\left(V_{MS} - V_{ambient}\right)}{V_{spike}} \times 100$$

Where:

v_{MS}: the concentration of the spiked sample

$v_{ambient}$: the concentration of the original (unspiked) sample

v_{spike}: the concentration of the spike added

Matrix Spike Duplicates

$$RPD = \left| \frac{\left(V_{MS} - V_{MSD}\right)}{mean} \right| \times 100$$

There are two different ways to calculate this RPD, depending on how the samples are spiked.

1) The samples are spiked with the same concentration of analyte. In this case,
   v_{MS}: the concentration for the matrix spike

   v_{MSD}: the concentration of the matrix spike duplicate

   mean: the mean of the two concentrations (MS + MSD)

2) The samples are spiked with differing concentrations of analyte. In this case,
   v_{MS}: the recovery associated with the matrix spike

   v_{MSD}: the recovery associated with matrix spike duplicate

mean: the mean of the two recoveries ($recovery_{MS}$ + $recovery_{MSD}$)

Laboratory Duplicates and Field Duplicates

$$RPD = \left| \frac{\left(V_{sample} - V_{duplicate}\right)}{mean} \right| \times 100$$

Where:

V_{sample}: the concentration of the original sample

$V_{duplicate}$: the concentration of the duplicate sample

mean: the mean concentration of both samples

Replicate Analyses

$$RSD = \frac{Stdev(V_1, V_2, \ldots, V_n)}{mean} \times 100$$

Where:

Stdev(V_1,V_2,…,V_n): the standard deviation of the values (concentrations) of the replicate analyses.

mean: the mean of the values (concentrations) of the replicate analyses.

Table A1: Measurement Quality Objectives* - Conventional Analytes in Water

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 10 analytical runs	80-120% recovery
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analyte
Reference Material	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Matrix Spike	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Matrix Spike Duplicate	Per 20 samples or per analytical batch, whichever is more frequent (chlorophyll: n/a)	80-120% recovery RPD<25% for duplicates
Laboratory Duplicate	Per 20 samples or per analytical batch, whichever is more frequent (chlorophyll: per method)	RPD<25% (n/a if native concentration of either sample<RL)
Internal Standard	Accompanying every analytical run as method appropriate	Per method
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	RPD<25% (n/a if native concentration of either sample<RL)
Field Blank, Travel Blank, Equipment Blank	Per method	<RL for target analyte

*Unless method specifies more stringent requirements

Table A2: Measurement Quality Objectives* – Conventional Analytes in Water – Solids

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analyte
Laboratory Duplicate	Per 20 samples or per analytical batch, whichever is more frequent	RPD<25% (n/a if native concentration of either sample<RL)
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	RPD<25% (n/a if native concentration of either sample<RL)
Field Blank, Equipment Blank	Per method	<RL for target analyte

*Unless method specifies more stringent requirements

Table A3: Measurement Quality Objectives* – Conventional Analytes in Water - Pathogens

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration	Check temperatures in incubators twice daily with a minimum of 4 hours between each reading	Per analytical method or manufacturer's specifications
Filter Sterility Check	Perform one filter sterility check each day samples are analyzed	No growth on filter
Laboratory Blank	Per batch of bottles or reagents	No growth on filter
Filtration Blank	Per 20 samples or per analytical batch, whichever is more frequent	No growth on filter
Reference Material	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Positive Control	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Negative Control	Per 20 samples or per analytical batch, whichever is more frequent	No growth on filter
Laboratory Duplicate	Per 20 samples or per analytical batch, whichever is more frequent	RPD<25% (n/a if native concentration of either sample<RL)
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count (coliforms: one per 25 tube dilution tests)	RPD<25% (n/a if native concentration of either sample<RL; coliforms: within 95% confidence interval as defined by IDEXX Laboratories)
Field Blank, Travel Blank, Equipment Blank	Per method	Blanks<RL for target analyte

*Unless method specifies more stringent requirements

Table A4: Measurement Quality Objectives* - Conventional Analytes in Sediments

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 10 analytical runs (as applicable)	80-120% recovery
Laboratory Blank	TOC only: one per analytical batch (n/a for others)	<RL or <30% of lowest sample
Reference Material	TOC only: one per 20 samples or per analytical batch, whichever is more frequent (n/a for others)	80-120% recovery
Matrix Spike	n/a	n/a
Matrix Spike Duplicate	n/a	n/a
Laboratory Duplicate	One per analytical batch	RPD<25% (n/a if native concentration of either sample<RL)
Surrogate or Internal Standard	n/a	n/a
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	RPD<25% (n/a if native concentration of either sample<RL)
Field Blank, Travel Blank, Equipment Blank	Per method	<RL or <30% of lowest sample

*Unless method specifies more stringent requirements

Table A5: Measurement Quality Objectives* – Inorganic Analytes in Water, Sediment, and Tissue

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 10 analytical runs	80-120% recovery
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analyte
Reference Material	Per 20 samples or per analytical batch, whichever is more frequent	75-125% recovery (70-130% for MMHg)
Matrix Spike	Per 20 samples or per analytical batch, whichever is more frequent	75-125% recovery (70-130% for MMHg)
Matrix Spike Duplicate	Per 20 samples or per analytical batch, whichever is more frequent	75-125% recovery (70-130% for MMHg); RPD<25%
Laboratory Duplicate	Per 20 samples or per analytical batch, whichever is more frequent	RPD<25% (n/a if native concentration of either sample<RL)
Internal Standard	Accompanying every analytical run when method appropriate	60-125% recovery
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	RPD<25% (n/a if native concentration of either sample<RL), unless otherwise specified by method
Field Blank, Equipment Blank	Per method	Blanks<RL for target analyte

*Unless method specifies more stringent requirements

Table A6: Measurement Quality Objectives* – Volatile Organic Compounds in Water and Sediment

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 12 hours	RF for SPCCs same as initial calibration; RF of CCVs must be within 20% of initial calibration
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analyte
Reference Material	Method Validation: as many as required to assess accuracy and precision of method before routine analysis of samples; Routine Accuracy Assessment: per 20 samples or per analytical batch (preferably blind)	70-130% recovery if certified; otherwise 50-150% recovery
Matrix Spike	Per 20 samples or per analytical batch, whichever is more frequent	50-150% recovery, or based on 3x the standard deviation of laboratory's actual method recoveries
Matrix Spike Duplicate	Per 20 samples or per analytical batch, whichever is more frequent	RPD<25%
Laboratory Duplicate	Per method	Per method
Surrogate or Internal Standard	Per method	Per method
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	Per method
Field Blank, Travel Blank, Equipment Blank	Per method	<RL for target analyte

*Unless method specifies more stringent requirements

Table A7: Measurement Quality Objectives* – Semi-Volatile Organic Compounds in Water and Sediment

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 12 h	RF for SPCCs same as initial calibration; RF of CCVs must be within 20% of initial calibration
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analyte
Reference Material	Method Validation: as many as required to assess accuracy and precision of method before routine analysis of samples; Routine Accuracy Assessment: per 20 samples or per analytical batch (preferably blind)	70-130% recovery if certified; otherwise, 50-150% recovery
Matrix Spike	Per 20 samples or per analytical batch, whichever is more frequent	50-150% recovery, or based on 3x the standard deviation of laboratory's actual method recoveries
Matrix Spike Duplicate	Per 20 samples or per analytical batch, whichever is more frequent	RPD<25%
Laboratory Duplicate	Per method	Per method
Surrogate or Internal Standard	Per method	Per method
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	Per method
Field Blank, Travel Blank, Equipment Blank	Per method	<RL for target analyte

*Unless method specifies more stringent requirements

Table A8: Measurement Quality Objectives* – Synthetic Organic Compounds in Water, Sediment and Tissue

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 10 analytical runs	Water: 85-115% recovery Sediment: 85-115% recovery Tissue: 75-125%
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analytes
Reference Material	Method Validation: as many as required to assess accuracy and precision of method before routine analysis of samples; Routine Accuracy Assessment: per 20 samples or per analytical batch (preferably blind)	70-130% recovery if certified; otherwise, 50-150% recovery
Matrix Spike	Per 20 samples or per analytical batch, whichever is more frequent	50-150% recovery, or based on 3x the standard deviation of laboratory's actual method recoveries
Matrix Spike Duplicate	Per 20 samples or per analytical batch, whichever is more frequent	RPD<25%
Laboratory Duplicate	Per method	Water: RPD<25% (n/a if native concentration of either sample<RL) Sediment: Per method Tissue: Per method
Surrogate or Internal Standard	Per method	Per method
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	Per method
Field Blank, Travel Blank, Equipment Blank	Per method	<RL for target analytes

* Unless method specifies more stringent requirements. ELISA results must be assessed against kit requirements

Table A9: Measurement Quality Objectives* - Toxicity Testing (General)

Negative Controls	Frequency of Analysis	Control Limits
Laboratory Control Water	Laboratory Control Water consistent with Section 7 of the appropriate EPA method must be tested with each analytical batch.	Laboratory Control Water must meet all test acceptability criteria (Please refer to Section 7 of the EPA manuals) for the species of interest.
Conductivity Control Water	A conductivity control must be tested with each analytical batch when the conductivity of any freshwater ambient sample approaches the species' tolerance for conductivity per method.	Follow EPA guidance on interpreting data.
Additional Control Water	Additional method blanks are required whenever manipulations are performed on one or more of the ambient samples within each analytical batch (e.g. pH adjustments, continuous aeration, etc.).	No statistical difference between the laboratory control water and each additional control water within an analytical batch.
Sediment Control	Sediment Control consistent with those described in Section 7 of the EPA manual must be tested with each analytical batch of sediment toxicity tests.	Sediment Control must meet all data acceptability criteria (Please refer to Section 7 of the EPA manuals) for the species of interest.
Positive Controls	**Frequency of Analysis**	**Control Limits**
Reference Toxicant Tests	Reference Toxicant Tests must be conducted monthly for species that are raised within a laboratory. Reference Toxicant Test must be conducted per analytical batch for species from commercial supplier settings. Reference Toxicant Tests must be conducted concurrently for test species or broodstocks that are field collected.	Last plotted data point must be within 2 SD of the cumulative mean (n=20). (Reference toxicant tests that fall outside of recommended control chart limits are evaluated to determine the validity of associated effluent and receiving water tests. An out of control reference toxicant test result does not necessarily invalidate associated test results. More frequent and/or concurrent reference toxicant testing may be advantageous if recent problems have been identified in testing.)
Field Quality Control	**Frequency of Analysis**	**Control Limits**
Field Duplicate	5% of total project sample count	According to method
Field Blanks	Per method or project requirements	No statistical difference between the laboratory control water (or sediment control) and the field blank within an analytical batch
Equipment Blanks	Per method or project requirements	No statistical difference between the Laboratory Control Water and the Equipment Blank within an analytical batch

*Unless method specifies more stringent requirements.

The measurement quality objectives for water quality parameters (pH, dissolved oxygen, conductivity, temperature, unionized ammonia, salinity, alkalinity and hardness) are detailed in the Field Measurement and Conventional Analytes tables of this Appendix.

In special cases where the criteria listed in the following tables cannot be met, EPA minimum criteria may be followed. The affected data should be qualified accordingly.

Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.

Deviations from the summary of recommended test conditions must be evaluated on a project specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result depending on the degree of the departure and the objective of the test. The reviewer should consider the degree of the deviation and the potential or observed impact of the deviation on the test result before rejecting or accepting a test result is valid. For example, if dissolved oxygen is measured below 4.0 mg/L in one test chamber, the reviewer should consider whether any observed mortality in that test chamber corresponded with the drop in dissolved oxygen.

Table A10: Measurement Quality Objectives - 7-Day *Pimephales promelas* Survival and Growth Toxicity Tests

Method Recommendation	
EPA/821/R-02/013 (Test Method 1000.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	80% or greater survival in controls and an average dry weight per surviving organism in control chambers equals or exceeds 0.25 mg
Data Qualification	
Test Conditions	*Required*
Test Type	Static renewal (required)
Age at Test Initiation	Newly-hatched larvae <24hoursold. If shipped, <48hours old with a 24-hour age range
Replication at Test Initiation	4 (minimum)
Organisms/Replicate	10 (minimum)
Food Source	Newly-hatched *Artemia* nauplii (<24hoursold)
Renewal Frequency	Daily
Test Duration	7 days
Endpoints	Survival and biomass
Test Conditions	*Recommended***
Temperature Range	25 ± 1.0 °C (+/- 3 °C required)
Light Intensity	10 – 20 µE/m^2/s or 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	>500 mL or per method specific requirements
Replicate Volume	>250 mL or per method specific requirements
Feeding Regime	< 2 times per day
Laboratory Control Water	Moderately hard water prepared in accordance with EPA protocols
Minimum Sample Volume	7 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<30% MSD If the percent minimum significant difference (PMSD) measured for the test exceeds the upper criterion and toxicity is found at the permitted receiving water concentration (RWC) based upon the value of the effect concentration estimate (NOEC or LOEC), then the test shall be accepted, unless other test review steps raise serious doubts about its validity. If toxicity is not found at the permitted RWC based upon the value of the effect concentration estimate (NOEC or LOEC) and the PMSD measured for the test exceeds the upper PMSD bound, then the test shall not be accepted, and a new test must be conducted promptly on a newly collected sample.
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, and temperature measurement per sample and per dilution
Initial Unionized Ammonia	One measurement per sample (recommended)
Initial Hardness and Alkalinity	One measurement per sample
Daily Water Chemistry	One DO and one pH measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement and per sample and per dilution (one DO per renewal)
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.6 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	Per method - recommend including appropriate controls when sample conductivities are below 100 or above 2500 µS/cm
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Conductivity Tolerance	<3000 µS/cm
Relevant Media	Water column
Sample Container Type	Amber glass or plastic (per method)
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	<48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.

**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A11: Measurement Quality Objectives - Chronic *Ceriodaphnia dubia* Toxicity Tests

Method Recommendation	
EPA/821/R-02/013 (Test Method 1002.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	80% or greater survival of al control organisms and an average of 15 or more young per surviving female. 60% of the surviving control females must produce three broods.
Data Qualification	
Test Conditions	*Required*
Test Type	Static renewal (required)
Age at Test Initiation	<24 hours old and all released within an 8-h period
Replication at Test Initiation	>10
Organisms/Replicate	One (assigned using blocking by known parentage)
Food Source	YCT and *Selenastrum* or comparable food
Renewal Frequency	Daily
Test Duration	<8 days
Endpoints	Survival and reproduction
Test Conditions	*Recommended***
Temperature Range	25 ± 1.5 °C (+/- 3 °C required)
Light Intensity	10 – 20 µE/m^2/s OR 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	20 - 40 mL
Replicate Volume	>15 mL
Feeding Regime	Daily
Laboratory Control Water	Moderately hard water prepared in accordance with EPA protocols
Minimum Sample Volume	2 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<47% MSD If the percent minimum significant difference (PMSD) measured for the test exceeds the upper criterion and toxicity is found at the permitted receiving water concentration (RWC) based upon the value of the effect concentration estimate (NOEC or LOEC), then the test shall be accepted, unless other test review steps raise serious doubts about its validity. If toxicity is not found at the permitted RWC based upon the value of the effect concentration estimate (NOEC or LOEC) and the PMSD measured for the test exceeds the upper PMSD bound, then the test shall not be accepted, and a new test must be conducted promptly on a newly collected sample.
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, and temperature measurement per sample and per dilution
Initial Unionized Ammonia	One measurement per sample
Initial Hardness and Alkalinity	One measurement per sample
Daily Water Chemistry	Two DO , one pH and one temperature per 24-h period in one sample per concentration and in the control
Final Water Chemistry	One DO, pH, and temperature measurement per sample and per dilution (One DO per renewal)
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.6 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	Include appropriate controls when sample conductivities are <100 or >2000 µS/cm
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Conductivity Tolerance	2500 µS/cm
Relevant Media	Water column
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	<48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A12: Measurement Quality Objectives - 96-Hour (48- and 24-Hour) *Ceriodaphnia dubia* Toxicity Tests

Method Recommendation	
EPA/821/R-02/012 (Test Method 2002.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	>90% survival in controls
Data Qualification	
Test Conditions	*Required*
Test Type	Static non-renewal or static renewal
Age at Test Initiation	<24hours
Replication at Test Initiation	>4
Organisms/Replicate	>5
Food Source	YCT and *Selenastrum* or comparable food
Renewal Frequency	Daily (unless otherwise specified by method)
Test Duration	96hours(48hoursor 24hoursoptional)
Endpoints	Survival
Test Conditions	*Recommended***
Temperature Range	25 ± 1 °C (+/- 3 °C required)
Light Intensity	10 – 20 µE/m^2/s OR 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	20 - 40 mL
Replicate Volume	>15 mL
Feeding Regime	Feed while holding prior to test and 2hoursprior to test solution renewal
Laboratory Control Water	Moderately hard water prepared in accordance with EPA protocols
Minimum Sample Volume	1 L
Sensitivity	*Performance Criteria*
Minimum Significant Difference	No MSD available
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, and temperature measurement per sample and per dilution
Initial Unionized Ammonia	One measurement per sample
Initial Hardness and Alkalinity	One measurement per sample
Daily Water Chemistry	One DO and one temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample and per dilution (One DO per renewal)
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.6 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	Include appropriate controls when sample conductivities are <100 or >2500 µS/cm
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Conductivity Tolerance	<2500 µS/cm
Relevant Media	Water column
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A13: Measurement Quality Objectives - 10-Day *Hyalella azteca* Water Toxicity Tests

Method Recommendation	
EPA/821/R-02/013 (Test Method 1002.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	90% or greater survival in controls
Data Qualification	
Test Conditions	*Required*
Test Type	Static renewal
Age at Test Initiation	7 – 14 days old
Replication at Test Initiation	5
Organisms/Replicate	10
Food Source	YCT
Renewal Frequency	80% renewal on Day 5
Test Duration	10 days
Endpoints	Survival
Test Conditions	*Recommended***
Temperature Range	23 ± 1.0 °C
Light Intensity	500 - 1000 lux
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	300 mL
Replicate Volume	100 mL water
Feeding Regime	1.5 mL YCT every other day
Laboratory Control Water	Moderately hard water prepared in accordance with EPA protocols
Minimum Sample Volume	1L
Sensitivity	*Performance Criteria*
Minimum Significant Difference	No MSD available
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, and temperature measurement per sample and per dilution
Initial Unionized Ammonia	One measurement per sample
Initial Hardness and Alkalinity	One measurement per sample
Daily Water Chemistry	Temperature
Final Water Chemistry	One DO, EC, pH, and temperature measurement and per sample and per dilution (DO, EC, pH per renewal)
Test Parameter	*Recommended Criteria*
Initial DO Range	4.7 - 8.92 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	Include appropriate controls when sample conductivities are below or above levels in method
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Conductivity Tolerance	<15 ppt
Relevant Media	Water
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field; 0 - 6 °C refrigeration in laboratory; dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	<48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A14: Measurement Quality Objectives - 10-Day *Hyalella azteca* Sediment Toxicity Tests

Method Recommendation	
EPA/600/R-99/064 (Test Method 100.1) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	Mean control survival of >80% and measurable growth in the controls
Data Qualification	
Test Conditions	*Required*
Test Type	Whole sediment toxicity test with renewal of overlying water
Age at Test Initiation	7 – 14 days old
Replication at Test Initiation	8
Organisms/Replicate	10
Food Source	YCT
Renewal Frequency	Twice daily
Test Duration	10 days
Endpoints	Survival and growth
Test Conditions	*Recommended***
Temperature Range	23 ± 1.0 °C
Light Intensity	500 - 1000 lux
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	300 mL
Replicate Volume	Sediment volume 100 mL; Overlying water volume 175 mL
Feeding Regime	Daily
Laboratory Control Water	Moderately hard water prepared in accordance with EPA protocols
Sediment Control	Control sediment as listed in method (Control sediment should follow EPA requirements for formulated sediments)
Minimum Sample Volume	6 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	No MSD available
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Initial Hardness and Alkalinity	One measurement per sample
Daily Water Chemistry	One DO and one temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	4.7 - 8.92 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	Include appropriate controls when sample conductivities are below or above levels listed in method
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Conductivity Tolerance	<15 ppt
Relevant Media	Sediment
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 14 days (recommended) or <8 weeks (required) @ 0 - 6 °C; dark; Do not freeze

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A15: Measurement Quality Objectives - 96-Hour *Selenastrum capricornutum* Growth Toxicity Tests

Method Recommendation	
EPA/821/R-02/013 (Test Method 1003.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	Mean cell density of at least 1 X 10^6 cells/mL in the controls and variability (CV%) among control replicates less than or equal to 20% (non-EDTA: Mean cell density of at least 1 X 106 cells/mL in the controls; and variability (CV%) among control replicates less than or equal to 20% (required)
Data Qualification	
Test Conditions	*Required*
Test Type	Static non-renewal
Age at Test Initiation	4 - 7 days
Replication at Test Initiation	10,000 cells/mL (recommended)
Organisms/Replicate	>4
Food Source	n/a
Renewal Frequency	None
Test Duration	96 h
Endpoints	Growth
Test Conditions	*Recommended***
Temperature Range	25 ± 1 °C (+/- 3 °C required)
Light Intensity	86 ± 8.6 µE/m^2/s OR 400 ± 40 ft-c
Photoperiod	Continuous Illumination (“cool white” fluorescent lighting)
Test Chamber Size	125 mL or 250 mL
Replicate Volume	50 mL or 100 mL
Feeding Regime	None
Nutrient Media	Media prepared in accordance with EPA protocols
EDTA Addition	EDTA required per method
Laboratory Control Water	Moderately hard water prepared in accordance with EPA protocols
Minimum Sample Volume	1 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<29% MSD If the percent minimum significant difference (PMSD) measured for the test exceeds the upper criterion and toxicity is found at the permitted receiving water concentration (RWC) based upon the value of the effect concentration estimate (NOEC or LOEC), then the test shall be accepted, unless other test review steps raise serious doubts about its validity. If toxicity is not found at the permitted RWC based upon the value of the effect concentration estimate (NOEC or LOEC) and the PMSD measured for the test exceeds the upper PMSD bound, then the test shall not be accepted, and a new test must be conducted promptly on a newly collected sample.
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, and temperature measurement per sample and per dilution
Initial Unionized Ammonia	One measurement per sample
Initial Hardness and Alkalinity	One measurement per sample
Daily Water Chemistry	One pH and one temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement and per sample and per dilution (One DO per renewal)
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.6 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	Include appropriate controls when sample conductivities are <100 or >2000 µS/cm
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species’ Conductivity Tolerance	<3000 µS/cm
Relevant Media	Water column
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test

results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A16: Measurement Quality Objectives - 7-Day *Atherinops affinis* Larval Survival and Growth Tests

Method Recommendation	
EPA/600/R-95/136 (Test Method 1006.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	≥80% survival in controls, 0.85 mg average weight of control larvae (9 days old)
Data Qualification	
Test Conditions	*Required*
Test Type	Static renewal
Age at Test Initiation	9 – 15 days post-hatch
Replication at Test Initiation	5
Organisms/Replicate	5
Food Source	Newly-hatched *Artemia* nauplii
Renewal Frequency	Daily
Test Duration	7 days
Endpoints	Survival and biomass
Test Conditions	*Recommended***
Temperature Range	20 ± 1.0 °C
Light Intensity	10 – 20 µE/m^2/s OR 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	600 mL
Replicate Volume	200 mL
Feeding Regime	Twice daily
Laboratory Control Water	Dilution water should be 1-µ filtered natural seawater of hyper-saline brine prepared from uncontaminated natural sweater plus reagent water
Minimum Sample Volume	8 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<25% MSD for survival and <50% MSD for growth
Reference Toxicant Results	LC_{50} with copper must be ≤205 µg/L
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, and temperature measurement per sample and per dilution
Initial Unionized Ammonia	One measurement per sample
Initial Salinity	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement and per sample and per dilution (One DO per renewal)
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 9.0 mg/L
Initial pH Range	6.0 - 9.0
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	5 – 36‰
Relevant Media	Water column
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	<48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A17: Measurement Quality Objectives - 10-Day *Ampelisca abdita* Sediment Toxicity Tests

Method Recommendation	
EPA/600/R-94/025 or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	Minimum mean control survival of 90% in the controls
Data Qualification	
Test Conditions	*Required*
Test Type	Whole sediment toxicity test, static
Size at Test Initiation	3 – 5 mm (no mature males of females)
Replication at Test Initiation	4 (minimum)
Organisms/Replicate	20
Food Source	Do not feed
Renewal Frequency	None
Test Duration	10 days
Endpoints	Survival
Test Conditions	*Recommended***
Temperature Range	20 ± 1.5 °C
Light Intensity	500 – 1000 lux
Photoperiod	Continuous luminance
Test Chamber Size	1 L
Replicate Volume	Sediment volume 175 mL; Overlying water volume 800 mL
Feeding Regime	Do not feed
Laboratory Control Water	Clean, natural seawater diluted to the appropriate salinity with distilled (or similar) water
Sediment Control	Control sediment listed in method (Control sediment should follow EPA requirements for formulated sediments)
Minimum Sample Volume	2 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	No MSD available
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, salinity, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	6.45 - 7.8 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	n/a
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	Overlying water salinity should be >10‰
Relevant Media	Sediment
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 14 days (recommended) or <8 weeks (required) @ 0 - 6 °C; dark; Do not freeze

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A18: Measurement Quality Objectives - 10-Day *Eohaustorius estuarius* Sediment Toxicity Tests

Method Recommendation	
EPA/600/R-94/025 or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	Minimum mean survival of 90% in controls
Data Qualification	
Test Conditions	*Required*
Test Type	Whole sediment toxicity test, static
Size at Test Initiation	3 – 5 mm (no mature males of females)
Replication at Test Initiation	4 (minimum)
Organisms/Replicate	20
Food Source	Do not feed
Renewal Frequency	None
Test Duration	10 days
Endpoints	Survival
Test Conditions	*Recommended***
Temperature Range	15 ± 1.0 °C
Light Intensity	500 – 1000 lux
Photoperiod	Continuous luminance
Test Chamber Size	1 L
Replicate Volume	Sediment volume 175 mL; Overlying water volume 800 mL
Feeding Regime	Do not feed
Laboratory Control Water	Clean, 1-µ filtered natural seawater diluted to the appropriate salinity with distilled (or similar) water
Sediment Control	Control sediment listed in method (Control sediment should follow EPA requirements for formulated sediments)
Minimum Sample Volume	2 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	No MSD available
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, salinity, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	6.45 - 7.8 mg/L
Initial pH Range	6.0 - 9.0
Conductivity Controls	n/a
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	Overlying water salinity should be 0 - 34%
Relevant Media	Sediment
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 14 days (recommended) or <8 weeks (required) @ 0 - 6 °C; dark; Do not freeze

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A19: Measurement Quality Objectives - 48-Hour *Haliotis rufescens* Larval Development Tests

Method Recommendation	
EPA/600/R-95/136 (Test Method 995) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	≥80% normal shell development in the controls
Data Qualification	
Test Conditions	*Required*
Test Type	Static non-renewal
Age at Test Initiation	n/a
Replication at Test Initiation	5 – 10 per mL
Organisms/Replicate	5
Food Source	Do not feed
Renewal Frequency	None
Test Duration	48 h
Endpoints	Normal shell development
Test Conditions	*Recommended***
Temperature Range	15 ± 1.0 °C
Light Intensity	10 µE/m^2/s or 50 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	600 mL
Replicate Volume	200 mL or per method
Feeding Regime	Do not feed
Laboratory Control Water	Dilution water should be 1-µ filtered natural seawater of hyper-saline brine prepared from uncontaminated natural seawater plus reagent water
Minimum Sample Volume	2 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<20% MSD
Reference Toxicant Results	Larval development NOEC (statistical significant effect) must be <56 µg/L zinc
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, salinity, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.5 mg/L
Initial pH Range	6.0 - 9.0
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	31 - 36‰
Relevant Media	Water column, pore water
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A20: Measurement Quality Objectives - 7-Day Holmesimysis costata Growth and Survival Tests

Method Recommendation	
EPA/600/R-95/136 (Test Method 1007.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	≥75% survival, average dry weight ≥0.40 µg in the controls
Data Qualification	
Test Conditions	*Required*
Test Type	Static renewal
Age at Test Initiation	3 - 4 days post-hatch juveniles
Replication at Test Initiation	5
Organisms/Replicate	5
Food Source	Newly hatched *Artemia* nauplii (< 24hoursold)
Renewal Frequency	75% renewal at 48hoursand 96 h
Test Duration	7 days
Endpoints	Survival and biomass
Test Conditions	*Recommended***
Temperature Range	15 ± 1.5 °C
Light Intensity	10 – 20 µE/m^2/s OR 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	1000 mL
Replicate Volume	200 mL
Feeding Regime	Twice per day
Laboratory Control Water	Dilution water should be 1-µ filtered natural seawater of hyper-saline brine prepared from uncontaminated natural seawater plus reagent water
Minimum Sample Volume	3 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<40% MSD for survival and <50 µg MSD for growth
Reference Toxicant Results	Survival and growth NOECs must be <100 µg/L with zinc
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, SC, pH, salinity and temperature measurement per sample and per dilution
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample and per dilution (One DO per renewal)
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.5 mg/L
Initial pH Range	6.0 - 9.0
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	32 - 36‰
Relevant Media	Water column
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A21: Measurement Quality Objectives - 48-hour Mytilus galloprovincialis Embryo-Larval Development Tests

Method Recommendation	
EPA/600/R-95/136 or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	≥50% survival, ≥90% of those must have normal shell development
Data Qualification	
Test Conditions	*Required*
Test Type	Static non-renewal
Age at Test Initiation	Within 4hoursof fertilization
Replication at Test Initiation	4
Organisms/Replicate	150 – 300 (15-30/mL)
Food Source	Do not feed
Renewal Frequency	None
Test Duration	48 h
Endpoints	Survival of normal live prossidoconch larvae
Test Conditions	*Recommended***
Temperature Range	15 ± 1.5 °C
Light Intensity	10 – 20 µE/m^2/s OR 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	20 mL
Replicate Volume	10 mL
Feeding Regime	Do not feed
Laboratory Control Water	Dilution water should be 1-µ filtered natural seawater of hyper-saline brine prepared from uncontaminated natural seawater plus reagent water
Minimum Sample Volume	1000 mL for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<25% MSD
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, salinity, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	>4.0
Initial pH Range	6.0 - 9.0
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	28 - 36‰
Relevant Media	Water column, pore water
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A22: Measurement Quality Objectives - 96-Hour Strongylocentrotus purpuratus Embryo Development Tests

Method Recommendation	
EPA/600/R-95/136 or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	≥80% normal shell development in the controls
Data Qualification	
Test Conditions	*Required*
Test Type	Static non-renewal
Age at Test Initiation	Not available
Replication at Test Initiation	250 embryos
Organisms/Replicate	4
Food Source	Do not feed
Renewal Frequency	None
Test Duration	96 h
Endpoints	Normal development; survival can be included
Test Conditions	*Recommended***
Temperature Range	15 ± 1.0 °C
Light Intensity	10 – 20 µE/m^2/s OR 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	30 mL
Replicate Volume	10 mL
Feeding Regime	Do not feed
Laboratory Control Water	Dilution water should be 1-µ filtered natural seawater of hyper-saline brine prepared from uncontaminated natural seawater plus reagent water
Minimum Sample Volume	1 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<25% MSD
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, salinity, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.5 mg/L
Initial pH Range	6.0 - 9.0
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	32 - 36‰
Relevant Media	Water column, pore water
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	<48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A23: Measurement Quality Objectives - 20-Minute Strongylocentrotus purpuratus Fertilization Tests

Method Recommendation	
EPA/600/R-95/136 or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	≥70% egg fertilization and appropriate sperm counts in controls
Data Qualification	
Test Conditions	*Required*
Test Type	Static non-renewal
Age at Test Initiation	n/a
Replication at Test Initiation	4
Organisms/Replicate	~1,120 eggs from not more than four females and <3,360,000 sperm from not more than four males per test tube
Food Source	Do not feed
Renewal Frequency	None
Test Duration	40 min (20 min plus 20 min)
Endpoints	Fertilization of egg
Test Conditions	*Recommended***
Temperature Range	12 ± 1.0 °C
Light Intensity	10 – 20 µE/m^2/s OR 50 – 100 ft-c
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	16 x 100 or 16 x 125 mm
Replicate Volume	5 mL
Feeding Regime	Do not feed
Laboratory Control Water	Dilution water should be 1-µ filtered natural seawater of hyper-saline brine prepared from uncontaminated natural seawater plus reagent water
Minimum Sample Volume	1 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<25% MSD
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, salinity, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 9.1 mg/L
Initial pH Range	6.0 - 9.0
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	31 - 36‰
Relevant Media	Water column, pore water
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A24: Measurement Quality Objectives - 48-Hour Macrocystis pyrifera Germination and Germ-Tube Length Tests

Method Recommendation	
EPA/600/R-95/136 (Test Method 1009.0) or validated and SWAMP-approved alternative method	
Data Acceptability Requirements	
Parameter	*Criteria*
Test Acceptability Criteria*	≥70% germination in the controls, ;≥10 µm germ-tube length in the controls
Data Qualification	
Test Conditions	*Required*
Test Type	Static non-renewal
Age at Test Initiation	n/a
Replication at Test Initiation	5
Organisms/Replicate	7500 spores/mL of test solution
Food Source	Do not feed
Renewal Frequency	None
Test Duration	48 h
Endpoints	Germination and germ-tube length
Test Conditions	*Recommended***
Temperature Range	15 ± 1.0 °C
Light Intensity	50 ± 10 µE/m^2/s
Photoperiod	16 hours of ambient laboratory light, 8 hours dark
Test Chamber Size	600 mL
Replicate Volume	200 mL
Feeding Regime	Do not feed
Laboratory Control Water	Dilution water should be 1-µ filtered natural seawater of hyper-saline brine prepared from uncontaminated natural seawater plus reagent water
Minimum Sample Volume	2 L for one-time grab sample
Sensitivity	*Performance Criteria*
Minimum Significant Difference	<20% MSD
Reference Toxicant Results	NOEC must be <35 µg/L in the reference toxicant test
Water Chemistry	
Test Parameter	*Required Frequency*
Initial Water Chemistry	One DO, salinity, pH, and temperature measurement per sample
Initial Unionized Ammonia	One measurement per sample
Daily Water Chemistry	One temperature measurement per sample
Final Water Chemistry	One DO, pH, and temperature measurement per sample
Test Parameter	*Recommended Criteria*
Initial DO Range	4.0 - 8.5 mg/L
Initial pH Range	6.0 - 9.0
Sample Handling/Collection	
Test Parameter	*Recommended Conditions*
Species' Salinity Tolerance	32 - 36‰
Relevant Media	Water column
Sample Container Type	Amber glass
Sample Preservation	Wet or blue ice in field, 0 - 6 °C refrigeration in laboratory, dark at all times
Sample Receipt Temperature	0 - 6 °C
Holding Time	< 48 hours@ 0 - 6 °C; dark

*Test data are reviewed to verify that the test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with the newly collected sample.
**Deviations from the summary of recommended test conditions must be evaluated on a project-specific basis to determine the validity of test results. Deviations from recommended conditions may or may not invalidate a test result, depending on the degree of the departure and the objective of the test.

Table A25: Measurement Quality Objectives* - Field Measurements**

Water Quality Parameter	Recommended Device	Units	Resolution	Reporting Limit	"Electronic Specs" Accuracy**
Depth	Stadia Rod/Staff Gauge	m	0.01	0.02	n/a
Dissolved Oxygen	Polarographic or Luminescence Quenching	mg/L	0.1	0.2	± 0.2
pH	Electrode	None	0.1	n/a	± 0.2
Salinity	Refractometer or Conductivity Cell	‰	2	2	± 2
Specific Conductivity	Conductivity Cell	µS/cm	1	2	± 2
Temperature	Thermistor or Bulb	°C	0.1 or 0.5	n/a	± 0.1
Total Chlorophyll	Optical Fluorescence Chlorophyll Probe	µg/L	0.1	n/a	n/a
Turbidity	Portable Turbidimeter or Optical Probe	NTU	1	5	± 1
Velocity	Flow Meter	ft/s	0.05	0.1	Follow manufacturer's instructions

* Unless method specifies more stringent requirements
** This table may not include all field analyses. Please refer to method or manufacturer instructions for guidance

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Table B1: Sampling and Preservation - Conventionals in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Alkalinity (as $CaCO_3$)	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	14 days
Ammonia (as N)	mg/L	Polyethylene Bottles	500 mL	Cool to 6 °C and store in the dark. Samples may be preserved with 2 mL of $H2SO_4$ per L	48 hours; 28 days if acidified
Biochemical Oxygen Demand	mg/L	4-L cubitainer	4000 mL	Add 1 g FAS crystals per liter if residual Cl present; Cool to 6 °C and store in the dark	48 hours
Boron	mg/L	Polyethylene Bottles Only plastic apparatus should be used when the determinations of boron and silica are critical.	600 mL	Acidify with (1+1) HNO_3 to pH <2	6 months
Calcium	mg/L	Polyethylene Bottles Glass or plastic filtering apparatus are recommended to avoid possible contamination.	600 mL	Acidify with (1+1) HNO_3 to pH <2	6 months
Chemical Oxygen Demand (Titrametric)	mg/L	1-L cubitainer Collect the samples in glass bottles, if possible. Use of plastic containers is permissible if it is known that no organic contaminants are present in the containers.	1000 mL	Preserve to pH <2 with ~2 mL of conc. H_2SO_4; Cool to 6 °C and store in the dark	28 days Biologically active samples should be tested as soon as possible. Samples containing settleable material must be well mixed, preferably homogenized, to permit removal of representative aliquots.
Chloride	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	28 days
Chlorophyll a Pheophytin a	µg/L	Please refer to method requirements	500 mL	Centrifuge or filter as soon as possible after collection. If processing must be delayed, hold samples on ice or at 6 °C and store in the dark.	Samples must be frozen or analyzed within 4 hours of collection. Filters can be stored frozen for 28 days.
Cyanide	mg/L	1-L cubitainer	1000 mL	Preserve to pH>12 with ~ 2 mL 1:1 NaOH, Add 0.6 g $C_6H_8O_6$ if residual Cl present; Cool to 6 °C and store in the dark	14 days

Table B1: Sampling and Preservation - Conventionals in Water (continued)

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Fluoride	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	28 days
Hardness (as $CaCO_3$)	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark. Acidify with HNO_3 to pH<2	6 months
Iron	mg/L	Please refer to method requirements	600 mL	Cool to 6 °C and acidify with (1+1) HNO_3 to pH <2	6 months
Kjeldahl Nitrogen (Total)	mg/L	Polyethylene Bottles	600 mL	Cool to 6 °C and store in the dark. Acidify with H_2SO_4 to pH<2	7 days or 28 days if acidified
Magnesium	mg/L	Polyethylene Bottles Glass or plastic filtering apparatus are recommended to avoid possible contamination.	600 mL	Acidify with (1+1) HNO_3 to pH <2	6 months
Nitrate (as N)	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	48 hours unless calculated from nitrate + nitrite (as N) and nitrite (as N) analyses
Nitrate + Nitrite (as N)	mg/L	Polyethylene Bottles	150 mL	Cool to 6 °C and store in the dark. Acidify with H_2SO_4 to pH<2	48 hours or 28 days if acidified
Nitrite (as N)	mg/L	Polyethylene Bottles	150 mL	Cool to 6 °C and store in the dark	48 hours
Oil and Grease (HEM)	mg/L	1-L glass jar (w/Teflon lined lid and rinsed with hexane or methylene chloride)	1000 mL	Preserve to pH <2 with ~2 mL of conc. H_2SO_4 Cool to 6 °C and store in the dark	28 days
Organic Carbon (Total)	mg/L	40-mL glass vial	40 mL	Cool to 6 °C and store in the dark. If analysis is to occur more than two hours after sampling, acidify (pH < 2) with HCl or H_2SO_4.	28 days

Table B1: Sampling and Preservation - Conventionals in Water (continued)

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Organic Carbon (Dissolved)	mg/L	40-mL glass vial	40 mL	Cool to 6 °C and store in the dark	28 days
Orthophosphate (Total, as P)	mg/L	Polyethylene Bottles	150 mL	Cool to 6 °C and store in the dark	48 hours
Orthophosphate (Dissolved, as P) ***Soluble Reactive Phosphorus***	mg/L	Polyethylene Bottles	150 mL	Filter within 15 minutes of collection; Cool to 6 °C and store in the dark	48 hours
Perchlorate	µg/L	Plastic or glass	300 mL	Protect from temperature extremes	28 days
Phenols	mg/L	1-L glass jar w/ Teflon lined lid	1000 mL	Preserve to pH <2 with ~2 mL of concentrated H_2SO_4; Cool to 6 °C and store in the dark	Samples must be extracted within 7 days of collection, and analyzed within 28 days of extraction.
Phosphorus (Total, as P)	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	28 days
Phosphorus (Dissolved, as P)	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	28 days
Potassium	mg/L	Polyethylene Bottles	600 mL	Acidify with (1+1) HNO_3 to pH <2	6 months
Silica	mg/L	Only plastic apparatus should be used when the determinations of boron and silica are critical.	300 mL	Acidify with (1+1) HNO_3 to pH <2.	6 months
Specific Conductivity	µS/cm	Polyethylene Bottles	500 mL	Cool to 6 °C and store in the dark If analysis is not completed within 24 hours of sample collection, sample should be filtered through a 0.45 micron filter and stored in the dark at 6 °C.	28 days

Table B1: Sampling and Preservation - Conventionals in Water (continued)

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Sulfate	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	28 days
Sodium	mg/L	Polyethylene Bottles Glass or plastic filtering apparatus are recommended to avoid possible contamination.	600 mL	Acidify with (1+1) HNO_3 to pH <2.	6 months
Turbidity	NTU	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	48 hours

Table B2: Sampling and Preservation - Conventionals in Water - Solids

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Fixed & Volatile Dissolved Solids (500-550 °C)	mg/L	Please refer to method.	None Specified	Refrigeration or icing to 6°C, to minimize microbiological decomposition of solids is recommended.	24 hours, maximum 7 days
Suspended Sediment Concentration	mg/L	125-mL amber glass jar or Polyethylene Bottles*	125 mL	Cool to 6 °C and store in the dark	7 days
Total Dissolved Solids	mg/L	Polyethylene Bottles*	1000 mL	Cool to 6 °C and store in the dark	7 days
Total Suspended Solids (103-105 °C)	mg/L	500-mL amber glass jar or Polyethylene Bottles*	1000 mL	Refrigeration or icing to 6°C, to minimize microbiological decomposition of solids, is recommended.	7 days
Volatile Suspended Solids	mg/L	Please refer to method.	None Specified	Refrigeration or icing to 6°C, to minimize microbiological decomposition of solids is recommended.	Analysis must begin as soon as possible.

Table B3: Sampling and Preservation - Conventionals in Water - Pathogens

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
E. Coli	MPN/100 mL	Factory-sealed, pre-sterilized, disposable Whirlpak bags or 125 mL sterile plastic (high density polyethylene or polypropylene) container	100 mL	Sodium thiosulfate is pre-added to the containers in the laboratory (chlorine elimination). Cool to 6 °C in the dark.	24 hours (6 hours for regulatory data)
Enterococcus	colonies/100 mL	Factory-sealed, pre-sterilized, disposable Whirlpak bags or 125 mL sterile plastic (high density polyethylene or polypropylene) container	100 mL	Sodium thiosulfate is pre-added to the containers in the laboratory (chlorine elimination). Cool to 6 °C in the dark.	24 hours (6 hours for regulatory data)
Fecal Coliform	MPN/100 mL	Factory-sealed, pre-sterilized, disposable Whirlpak bags or 125 mL sterile plastic (high density polyethylene or polypropylene) container	100 mL	Sodium thiosulfate is pre-added to the containers in the laboratory (chlorine elimination). Cool to 6 °C in the dark.	24 hours (6 hours for regulatory data)
Total Coliform	MPN/100 mL	Factory-sealed, pre-sterilized, disposable Whirlpak bags or 125 mL sterile plastic (high density polyethylene or polypropylene) container	100 mL	Sodium thiosulfate is pre-added to the containers in the laboratory (chlorine elimination). Cool to 6 °C in the dark.	24 hours (6 hours for regulatory data)
Streptococcus	MPN/100 mL	Factory-sealed, pre-sterilized, disposable Whirlpak bags or 125 mL sterile plastic (high density polyethylene or polypropylene) container	100 mL	Sodium thiosulfate is pre-added to the containers in the laboratory (chlorine elimination). Cool to 6 °C in the dark.	24 hours (6 hours for regulatory data)

Table B4: Sampling and Preservation - Conventionals in Sediment

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Sediment Grain Size Analysis	% fines, gravel, sand, silt, and clay (Wentworth scale)	125-mL clear glass jar; pre-cleaned**	125 mL	Cool to 6 °C in the dark up to 28 days. Do not freeze	Please refer to method
Sediment Total Organic Carbon	%OC (dry weight)	125-mL clear glass jar; pre-cleaned*	125 mL	Cool to 6 °C in the dark up to 28 days**	Please refer to method
Moisture	%	125-mL to 250-mL clear glass jar; pre-cleaned*	200 g***	Please refer to the method associated with the target analyte or parameter	Please refer to the method associated with the target analyte or parameter

*Sediment samples for TOC and grain size analysis can be combined in one 250-mL clear glass jar, and sub-sampled at the laboratory in order to utilize holding time differences for the two analyses. If this is done, the 250 mL combined sediment sample must be refrigerated only (not frozen) at 6 °C for up to 28 days, during which time the sub-samples must be aliquoted in order to comply with separate storage requirements (as shown above).

**Sediment samples for sediment TOC analysis can be held at 6 °C for up to 28 days, and must be analyzed within this 28 day period, but can be frozen at any time during the initial 28 days, for up to 1 year maximum at -20 °C.

***Split taken from sample for chemistry analyses

Table B5: Sampling and Preservation - Conventionals in Tissue

Analyte	Units	Recommended Container	Recommended Sample Volume*	Recommended Preservation	Required Holding Time
Lipids	%	125-mL to 250-mL clear glass jar; pre-cleaned**	200 g	Please refer to the method associated with the target analyte	Please refer to the method associated with the target analyte
Moisture	%	125-mL to 250-mL clear glass jar; pre-cleaned**	200 g	Please refer to the method associated with the target analyte	Please refer to the method associated with the target analyte

*Split taken from sample for chemistry analyses

Table B6: Sampling and Preservation - Inorganic Analytes in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Aluminum Arsenic Cadmium Chromium Copper Lead Manganese Nickel Selenium Silver Zinc (Total)	µg/L	60-mL acid-cleaned polyethylene bottle	60 mL	Cool to 6 ◦C in the dark; Acidify to pH<2 with pre-tested HNO_3 within 48 hours	6 months at room temperature following acidification
Aluminum Arsenic Cadmium Chromium Copper Lead Manganese Nickel Selenium Silver Zinc (Dissolved)	µg/L	60-mL acid-cleaned polyethylene bottle	60 mL	Filter within 15 minutes of collection; Cool to 6 ◦C in the dark; Acidify to pH<2 with pre-tested HNO_3 within 48 hours	6 months at room temperature after filtration and/or acidification
Mercury (Total)	ng/L	250-mL glass or acid-cleaned Teflon bottle	250 mL	Cool to 6 ◦C in the dark; Acidify to 0.5% with pre-tested HCl within 48 hours	6 months at room temperature following acidification
Mercury (Dissolved)	ng/L	250-mL glass or acid-cleaned Teflon bottle	250 mL	Filter within 15 minutes of collection; Cool to 6 ◦C in the dark; Acidify to 0.5% with pre-tested HCl within 48 hours	6 months at room temperature after filtration and/or acidification
Methylmercury (Total)	ng/L	250-mL glass or acid-cleaned Teflon bottle	250 mL	Cool to 6 ◦C in the dark; Acidify to 0.5% with pre-tested HCl within 48 hours; If salinity is >0.5 ppt, acidify with H_2SO_4	6 months at room temperature following acidification
Methylmercury (Dissolved)	ng/L	250-mL glass or acid-cleaned Teflon bottle	250 mL	Cool to 6 ◦C in the dark; Filter and acidify to 0.5% with pre-tested HCl within 48 hours. If salinity is >0.5 ppt, acidify with H_2SO_4	6 months at room temperature after filtration and/or acidification
Hexavalent Chromium (Filtered)	µg/L	600-mL polyethylene or glass bottle	600 mL	Cool to 6 ◦C in the dark	24 hours, must notify lab in advance

Table B7: Sampling and Preservation - Inorganic Analytes in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Aluminum **Arsenic** **Cadmium** **Chromium** **Copper** **Lead** **Manganese** **Mercury** **Nickel** **Selenium** **Silver** **Zinc**	mg/kg	60-mL I-Chem 300 or 200 series clear glass jar with Teflon lid-liner	100 g	Cool to 6 ˚C and in the dark	1 year at -20 ˚C; Samples must be analyzed within 14 days of collection or thawing.
Methylmercury	mg/kg	60-mL I-Chem 300 or 200 series clear glass jar with Teflon lid-liner	100 g	Freeze to ≤-20 °C immediately	1 year

Table B8: Sampling and Preservation - Inorganic Analytes in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation*	Required Holding Time
Aluminum Arsenic Cadmium Chromium Copper Lead Manganese Nickel Selenium Silver Zinc	µg/g	Polyethylene bags, Teflon sheets in Ziplock bags, or I-Chem 300 or 200 series clear glass jars with Teflon lined lids; acid-cleaned polyethylene jars if only sampling for trace metals	20-50 g	Cool to 6 °C within 24 hours, then freeze to ≤-20 °C	1 year at -20 °C;
Mercury	µg/g	Teflon sheets in Ziplock bags, or glass jars with Teflon lined lids	20-50 g	Cool to 6 °C within 24 hours, then freeze to ≤-20 °C	1 year at -20 °C;
Methylmercury	µg/g	Teflon sheets in Ziplock bags, or glass jars with Teflon lined lids	20-50 g	Cool to 6 °C within 24 hours, then freeze to ≤-20 °C	1 year at -20 °C;

*Fish to be reported in wet weight; all other tissues to be reported in dry weight

Table B9: Sampling and Preservation - Volatile Organic Compounds in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
1,1-Dichloroethane **1,1-Dichloroethylene** **1,1-Dichloropropene** **1,1,1-Trichloroethane** **1,1,2-Trichloroethane** **1,1,1,2-Tetrachloroethane** **1,1,2,2-Tetrachloroethane** **1,2-Dibromo-3-chloropropane (DBCP)** **1,2-Dibromoethane** **1,2-Dichlorobenzene** **1,2-Dichloroethane** **1,2-Dichloropropane** **1,2-cis-Dichloroethylene** **1,2-trans-Dichloroethylene** **1,2,3-Trichlorobenzene** **1,2,3-Trichloropropane** **1,2,4-Trichlorobenzene** **1,2,4-Trimethylbenzene** **1,3-Dichlorobenzene** **1,3-Dichloropropane** **1,3,5-Trimethylbenzene** **1,4-Dichlorobenzene** **2-Chlorotoluene** **2,2-Dichloropropane** **4-Chlorotoluene** **Benzene** **Bromobenzene** **Bromochloromethane** **Bromodichloromethane** **Bromoform** **Carbon tetrachloride** **Chlorobenzene** **Chloroform** **Dibromochloromethane** **Dibromomethane** **Ethylbenzene** **Fluorobenzene** **Hexachlorobutadiene** **Isopropylbenzene** **Methyl tert-butyl ether (MTBE)** **m/p-Xylene** **Naphthalene** **n-Butylbenzene** **n-Propylbenzene** **o-Xylene** **p-Isopropyltoluene** **sec-Butylbenzene** **tert-Butylbenzene** **Tetrachloroethylene** **Toluene** **Trichloroethylene** **Xylene, total**	ug/L	40-mL VOA vials	120 mL (three VOA vials)	All vials are pre-acidified (50% HCl or H_2SO_4) at lab before sampling. Cool to 6 °C in the dark.	14 days at 6 °C, dark, and pH< 2; 7 days at 6 °C, dark, for non-acidified
Recommended Surrogate (% Recovery)					
4-Bromofluorobenzene, Chlorobenzene-d5, Dibromofluoromethane, Toluene-d8					

Table B10: Sampling and Preservation - Volatile Organic Compounds in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
1,1-Dichloroethane **1,1-Dichloroethylene** **1,1-Dichloropropene** **1,1,1-Trichloroethane** **1,1,1,2-Tetrachloroethane** **1,1,2-Trichloroethane** **1,1,2,2-Tetrachloroethane** **1,2-Dibromo-3-chloropropane, (DBCP)** **1,2-Dibromomethane** **1,2-Dichlorobenzene** **1,2-Dichloroethane** **1,2-Dichloropropane** **1,2-cis-Dichloroethylene** **1,2-trans-Dichloroethylene** **1,2,3-Trichlorobenzene** **1,2,3-Trichloropropane** **1,2,4-Trichlorobenzene** **1,2,4-Trimethylbenzene** **1,3-Dichlorobenzene** **1,3-Dichloropropane** **1,3,5-Trimethylbenzene** **1,4-Dichlorobenzene** **2-Chlorotoluene** **2,2-Dichloropropane** **4-Chlorotoluene** **Benzene** **Bromobenzene** **Bromochloromethane** **Bromodichloromethane** **Bromoform** **Carbon tetrachloride** **Chlorobenzene** **Chloroform** **Dibromochloromethane** **Dibromomethane** **Ethylbenzene** **Fluorobenzene** **Hexachlorobutadiene** **Isopropylbenzene** **Methyl tert-butyl ether (MTBE)** **m/p-Xylene** **n-Butylbenzene** **n-Propylbenzene** **Naphthalene** **o-Xylene** **p-Isopropyltoluene** **sec-Butylbenzene** **tert-Butylbenzene** **Tetrachloroethylene** **Toluene** **Trichloroethylene** **Xylene, total**	ng/g	250-mL I-Chem 300-series amber glass jar with Teflon lid-liner; Pre-cleaned.	200 g	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be analyzed within 14 days of collection or thawing.
Recommended Surrogates (% Recovery)					
1,2-Dichloromethane-d4, 4-Bromofluorobenzene, Chlorobenzene-d5, Dibromofluoromethane, Toluene-d8					

Table B11: Sampling and Preservation - Semi-Volatile Organic Compounds* in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
1,2-Dichlorobenzene **1,2,4-Trichlorobenzene** **1,4-Dichlorobenzene** **2-Chloronaphthalene** **2-Chlorophenol** **2-Methylnaphthalene** **2-Methylphenol** **2-Nitroaniline** **2-Nitrophenol** **2,4-Dichlorophenol** **2,4-Dimethylphenol** **2,4-Dinitrophenol** **2,4-Dinitrotoluene** **2,4,5-Trichlorophenol** **2,4,6-Trichlorophenol** **2,6-Dinitrotoluene** **3-Nitroaniline** **3,4-Methylphenol** **4-Bromophenylphenylether** **4-Chloro-3-methylphenol** **4-Chloroaniline** **4-Chlorophenyl phenyl ether** **4-Nitroaniline** **4-Nitrophenol** **4,6-Dinitro-2-methylphenol** **Bis(2-chloroethoxy)methane** **Bis(2-chloroethyl) ether** **Bis(2-ethylhexyl) phthalate** **Butyl benzyl phthalate** **Carbazole** **Dibenzofuran** **Diethyl phthalate** **Dimethyl phthalate** **Di-n-butyl phthalate** **Di-n-octyl phthalate** **Hexachlorobenzene** **Hexachlorobutadiene** **Hexachlorocyclopentadiene** **Hexachloroethane** **Isophorone** **Nitrobenzene** **n-Nitrosodi-n-propylamine** **Pentachlorophenol** **Phenol** **Xylene, total**	µg/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL (Each sample type requires a separate 1000-mL container)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogate (% Recovery)					
2-Fluorobiphenyl, 2-Fluorophenol, 2,4,6-Tribromophenol, Nitrobenzene-d5, Phenol-d6, Terphenyl-d14					

*Information on polynuclear aromatic hydrocarbons may be found in Table B16.

Table B12: Sampling and Preservation - Semi-Volatile Organic Compounds in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
1,2-Dichlorobenzene **1,4-Dichlorobenzene** **1,2,4-Trichlorobenzene** **2-Chloronaphthalene** **2-Chlorophenol** **2-Nitroaniline** **2-Nitrophenol** **2,4-Dichlorophenol** **2,4-Dimethylphenol** **2,4-Dinitrophenol** **2,4-Dinitrotoluene** **2,4,5-Trichlorophenol** **2,4,6-Trichlorophenol** **2,6-Dinitrotoluene** **3-Nitroaniline** **4-Bromophenyl phenyl ether** **4-Chloro-3-methylphenol** **4-Chloroaniline** **4-Chlorophenyl phenyl ether** **4-Nitroaniline** **4,6-Dinitro-2-methylphenol** **Acenaphthene** **Acenaphthylene** **Anthracene** **Benz[a]anthracene** **Benzo[a]pyrene** **Benzo[b]fluoranthene** **Benzo[g,h,i]perylene** **Benzo[k]fluoranthene** **Bis(2-chloroethoxy)methane** **Bis(2-chloroethyl) ether** **Bis(2-chloroisopropyl)ether** **Bis(2-ethylhexyl) phthalate** **Carbazole** **Chrysene** **Dibenzofuran** **Diethyl phthalate** **Dimethyl phthalate** **Di-n-butyl phthalate** **Naphthalene** **Nitrobenzene** **n-Nitrosodi-n-propylamine** **Pentachlorophenol** **Phenanthrene** **Phenol** **Pyrene** **Xylene, total**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	200 g	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
2-Fluorobiphenyl, 2-Fluorophenol, 2,4,6-Tribromophenol, Nitrobenzene-d5, Phenol-d6, Terphenyl-d14					

Table B13: Sampling and Preservation - Synthetic Organic Compounds (Polychlorinated Biphenyls as Congeners/Aroclor) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
PCB 5 **PCB 8** **PCB 15** **PCB 18** **PCB 27** **PCB 28** **PCB 29** **PCB 31** **PCB 33** **PCB 44** **PCB 49** **PCB 52** **PCB 56** **PCB 60** **PCB 66** **PCB 70** **PCB 74** **PCB 87** **PCB 137** **PCB 138** **PCB 141** **PCB 149** **PCB 151** **PCB 153** **PCB 156** **PCB 157** **PCB 158** **PCB 170** **PCB 174** **PCB 177** **PCB 180** **PCB 183** **PCB 187** **PCB 189** **PCB 194** **PCB 195** **PCB 200** **PCB 201** **PCB 203** **PCB 206** **PCB 209** **Aroclor 1248** **Aroclor 1254** **Aroclor 1260**	µg/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
PCB 209					

Table B14: Sampling and Preservation - Synthetic Organic Compounds (Polychlorinated Biphenyls as Congeners/Aroclor) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
PCB 8 **PCB 18** **PCB 27** **PCB 28** **PCB 29** **PCB 31** **PCB 33** **PCB 44** **PCB 49** **PCB 52** **PCB 56** **PCB 60** **PCB 66** **PCB 70** **PCB 74** **PCB 87** **PCB 95** **PCB 97** **PCB 99** **PCB 101** **PCB 105** **PCB 110** **PCB 114** **PCB 118** **PCB 128** **PCB 137** **PCB 138** **PCB 141** **PCB 149** **PCB 151** **PCB 153** **PCB 156** **PCB 157** **PCB 158** **PCB 170** **PCB 174** **PCB 177** **PCB 180** **PCB 183** **PCB 187** **PCB 189** **PCB 194** **PCB 195** **PCB 200** **PCB 201** **PCB 203** **PCB 206** **PCB 209** **Aroclor 1248** **Aroclor 1254** **Aroclor 1260**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
PCB 207					

Table B15: Sampling and Preservation - Synthetic Organic Compounds (Polychlorinated Biphenyl Congeners/Aroclor) in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
PCB 8 **PCB 18** **PCB 27** **PCB 28** **PCB 29** **PCB 31** **PCB 33** **PCB 44** **PCB 49** **PCB 52** **PCB 56** **PCB 60** **PCB 66** **PCB 70** **PCB 74** **PCB 87** **PCB 95** **PCB 97** **PCB 99** **PCB 101** **PCB 105** **PCB 110** **PCB 114** **PCB 118** **PCB 128** **PCB 137** **PCB 138** **PCB 141** **PCB 149** **PCB 151** **PCB 153** **PCB 156** **PCB 157** **PCB 158** **PCB 170** **PCB 174** **PCB 177** **PCB 180** **PCB 183** **PCB 187** **PCB 189** **PCB 194** **PCB 195** **PCB 200** **PCB 201** **PCB 203** **PCB 206** **PCB 209** **Arochlor 1248** **Arochlor 1254** **Arochlor 1260**	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
PCB 207					

Table B16: Sampling and Preservation - Synthetic Organic Compounds (Polynuclear Aromatic Hydrocarbons) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
1-Methylfluorene **1-Methylnaphthalene** **1-Methylphenanthrene** **2-Methylfluoranthene** **2-Methylnaphthalene** **2,3,5-Trimethylnaphthalene** **2,6-Dimethylnaphthalene** **3,6-Dimethylphenanthrene** **4-Methyldibenzothiophene** **Acenaphthene** **Acenaphthylene** **Anthracene** **Benz(a)anthracene** **Benzo(a)pyrene** **Benzo(b)fluoranthene** **Benzo(e)pyrene** **Benzo(g,h,i)perylene** **Benzo(k)fluoranthene** **Biphenyl** **C1-Chrysenes** **C1-Dibenzothiophenes** **C1-Fluorenes** **C1-Fluoranthene/ Pyrenes** **C1-Naphthalenes** **C1-Phenanthrene/ Anthracene** **C2-Chrysenes** **C2-Dibenzothiophenes** **C2-Fluorenes** **C2-Naphthalenes** **C2-Phenanthrene/Anthracene** **C3-Chrysenes** **C3-Dibenzothiophenes** **C3-Fluorenes** **C3-Naphthalenes** **C3-Phenanthrene/ Anthracene** **C4-Naphthalenes** **C4-Phenanthrene/ Anthracene** **Chrysenes** **Dibenz(a,h)anthracene** **Dibenzothiophene** **Fluoranthene** **Fluorene** **Indeno(1,2,3-c,d)pyrene** **Naphthalene** **Perylene** **Phenanthrene** **Pyrene**	µg/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Acenaphthene-d10, Benz(a)anthracene-D12, Benzo(g,h,i)perylene-D12, Biphenyl-D10, Naphthalene-d8, Perylene-d12, Phenanthrene-d10, Pyrene-d10					

Table B17: Sampling and Preservation - Synthetic Organic Compounds (Polynuclear Aromatic Hydrocarbons) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
1-Methylfluorene **1-Methylnaphthalene** **1-Methylphenanthrene** **2-Methylfluoranthene** **2-Methylnaphthalene** **2,3,5-Trimethylnaphthalene** **2,6-Dimethylnaphthalene** **3,6-Dimethylphenanthrene** **4-Methyldibenzothiophene** **Acenaphthene** **Acenaphthylene** **Anthracene** **Benz(a)anthracene** **Benzo(a)pyrene** **Benzo(b)fluoranthene** **Benzo(e)pyrene** **Benzo(g,h,i)perylene** **Benzo(k)fluoranthene** **Biphenyl** **Chrysene** **C1-Chrysenes** **C1-Dibenzothiophenes** **C1-Fluorenes** **C1-Fluoranthene/ Pyrenes** **C1-Naphthalenes** **C1-Phenanthrene/ Anthracene** **C2-Chrysenes** **C2-Dibenzothiophenes** **C2-Fluorenes** **C2-Naphthalenes** **C2-Phenanthrene/ Anthracene** **C3-Chrysenes** **C3-Dibenzothiophenes** **C3-Fluorenes** **C3-Naphthalenes** **C3-Phenanthrene/ Anthracene** **C4-Phenanthrene/ Anthracene** **C4-Naphthalenes** **Dibenz(a,h)anthracene** **Dibenzothiophene** **Fluoranthene** **Fluorene** **Indeno(1,2,3-c,d)pyrene** **Naphthalene** **Perylene** **Phenanthrene** **Pyrene**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Acenaphthene-d10, Benz(a)anthracene-D12, Benzo(g,h,i)perylene-D12, Biphenyl-D10, Naphthalene-d8, Perylene-d12, Phenanthrene-d10, Pyrene-d10					

Table B18: Sampling and Preservation - Synthetic Organic Compounds (Polynuclear Aromatic Hydrocarbons) in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
1-Methylfluorene **1-Methylnaphthalene** **1-Methylphenanthrene** **2-Methylfluoranthene** **2-Methylnaphthalene** **2,3,5-Trimethylnaphthalene** **2,6-Dimethylnaphthalene** **3,6-Dimethylphenanthrene** **4-Methyldibenzothiophene** **Acenaphthene** **Acenaphthylene** **Anthracene** **Benz(a)anthracene** **Benzo(a)pyrene** **Benzo(b)fluoranthene** **Benzo(e)pyrene** **Benzo(g,h,i)perylene** **Benzo(k)fluoranthene** **Biphenyl** **C1-Chrysenes** **C1-Dibenzothiophenes** **C1 Fluoranthene/ Pyrenes** **C1-Fluorenes** **C1-Naphthalenes** **C1-Phenanthrene/ Anthracene** **C2-Chrysenes** **C2-Dibenzothiophenes** **C2-Fluorenes** **C2-Naphthalenes** **C2-Phenanthrene/ Anthracene** **C3-Chrysenes** **C3-Dibenzothiophenes** **C3-Fluorenes** **C3-Naphthalenes** **C3-Phenanthrene/ Anthracene** **C4-Naphthalenes** **C4-Phenanthrene/ Anthracene** **Chrysene** **Dibenz(a,h)anthracene** **Dibenzothiophene** **Fluoranthene** **Fluorene** **Indeno(1,2,3-c,d)pyrene** **Naphthalene** **Perylene** **Phenanthrene** **Pyrene**	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Acenaphthene-d10, Benz(a)anthracene-D12, Benzo(g,h,i)perylene-D12, Biphenyl-D10, Naphthalene-d8, Perylene-d12, Phenanthrene-d10, Pyrene-d10					

Table B19: Sampling and Preservation - Synthetic Organic Compounds (Organochlorine Pesticides) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Aldrin **cis-Chlordane** **trans-Chlordane** **Chlordene** **Dacthal** **DDD (o,p')** **DDD (p,p')** **DDE (o,p')** **DDE (p,p')** **DDMU (p,p')** **DDT (o,p')** **DDT (p,p')** **Dieldrin** **Endosulfan I** **Endosulfan II** **Endosulfan sulfate** **Endrin** **Endrin Aldehyde** **Endrin Ketone** **Alpha-HCH** **Beta-HCH** **Delta-HCH** **Gamma-HCH** **Heptachlor** **Heptachlor epoxide** **Hexachlorobenzene** **Methoxychlor** **Mirex** **cis-Nonachlor** **trans-Nonachlor** **Oxadiazon** **Oxychlordane** **Tedion** **Toxaphene**	µg/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to ≤6 °C in the dark; pH 5-9.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Dibromoocta-fluorobiphenyl					

Table B20: Sampling and Preservation - Synthetic Organic Compounds (Organochlorine Pesticides) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Aldrin **cis-Chlordane** **trans-Chlordane** **Dacthal** **DDD (o,p')** **DDD (p,p')** **DDE (o,p')** **DDE (p,p')** **DDMU (p,p')** **DDT (o,p')** **DDT (p,p')** **Dieldrin** **Endosulfan I** **Endosulfan II** **Endosulfan sulfate** **Endrin** **Alpha-HCH** **Beta-HCH** **Delta-HCH** **Gamma-HCH** **Heptachlor** **Heptachlor epoxide** **Hexachlorobenzene** **Methoxychlor** **Mirex** **Nonachlor, cis** **Nonachlor, trans** **Oxadiazon** **Oxychlordane** **Tedion** **Toxaphene**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
PCB 207, Dibromooctafluorobiphenyl, DDD (p,p'), DBCE					

Table B21: Sampling and Preservation - Synthetic Organic Compounds (Organochlorine Pesticides) in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Aldrin **cis-Chlordane** **trans-Chlordane** **Dacthal** **DDD (o,p')** **DDD (p,p')** **DDE (o,p')** **DDE (p,p')** **DDMU (p,p')** **DDT (o,p')** **DDT (p,p')** **Dieldrin** **Endosulfan I** **Endosulfan II** **Endosulfan sulfate** **Endosulfan sulfate** **Endrin** **Alpha-HCH** **Beta-HCH** **Gamma-HCH** **Heptachlor** **Heptachlor epoxide** **Hexachlorobenzene** **Methoxychlor** **Mirex** **cis-Nonachlor** **trans-Nonachlor** **Oxadiazon** **Oxychlordane** **Tedion** **Toxaphene**	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
PCB 207, Dibromoocta fluorobiphenyl, DDD (p,p'), DBCE					

Table B22: Sampling and Preservation - Synthetic Organic Compounds (Wastewater Organochlorine Pesticides) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Chlorothalonil PCNB	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to ≤6 °C in the dark; pH 5-9.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.

Table B23: Sampling and Preservation - Synthetic Organic Compounds (Wastewater Organochlorine Pesticides) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Chlorothalonil	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
PCNB	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.

Table B24: Sampling and Preservation - Synthetic Organic Compounds (Organophosphate Pesticides) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Aspon **Azinphos ethyl** **Carbophenothion** **Chlorfenvinphos** **Chlorpyrifos** **Chlorpyrifos methyl** **Ciodrin** **Coumaphos** **Demeton-S** **Diazinon** **Naled** **Dichlofenthion** **Dichlorvos** **Dicrotophos** **Dimethoate** **Dioxathion** **Disulfoton** **Ethion** **Famphur** **Fenchlorophos** **Fenitrothion** **Fensulfothion** **Fenthion** **Fonofos** **Azinphos methyl** **Leptophos** **Malathion** **Methidathion** **Parathion, ethyl** **Parathion, methyl** **Molinate** **Phorate** **Mevinphos** **Phosmet** **Phosphamidon** **Ethoprop** **Sulfotep** **Bolstar** **Terbufos** **Tetrachlorvinphos** **Thiobencarb** **Thionazin** **Tokuthion** **Merphos** **Trichlorfon** **Trichloronate**	µg/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to ≤6 °C in the dark; pH 5-9.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Triphenyl phosphate					

Table B25: Sampling and Preservation - Synthetic Organic Compounds (Organophosphate Pesticides) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Chlorpyrifos **Chlorpyrifos methyl** **Diazinon** **Dichlofenthion** **Dieldrin** **Dioxathion** **Ethion** **Fecnchlorphos** **Fenitrothion** **Fonofos** **Malathion** **Parathion, ethyl** **Parathion, methyl** **Phosphamidon** **Ethoprop** **Sulfotep** **Thionzion** **Tokuthion** **Merphos** **Trichloronate**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Triphenyl phosphate					

Table B26: Sampling and Preservation - Synthetic Organic Compounds (Organophosphate Pesticides) in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Chlorpyrifos **Chlorpyrifos Methyl** **Diazinon** **Dichlofenthion** **Dioxathion** **Ethion** **Fenchchlorphos** **Fenitrothion** **Fenofos** **Malathion** **Parathion, Ethyl** **Parathion, Methyl** **Phosphamidon** **Ethoprop** **Sulfotep** **Thionazin** **Tokuthion** **Merphos** **Trichloronate**	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Triphenyl phosphate					

Table B27: Sampling and Preservation - Synthetic Organic Compounds (Diesel Range Organics) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Diesel Range Organics	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
σ - Terphenyl					

Table B28: Sampling and Preservation - Synthetic Organic Compounds (Diesel Range Organics) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Diesel Range Organics	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Σ - Terphenyl					

Table B29: Sampling and Preservation - Synthetic Organic Compounds (Pyrethroids/Pyrethrins) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Bifenthrin **Cyfluthrin, Total** **Cypermethrin, Total** **Deltamethrin** **Esfenvalerate/ Fenvalerate, Total** **lambda-Cyhalothrin, Total** **cis-Permethrin** **trans-Permethrin**	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Dibromoocta-fluorobiphenyl					

Table B30: Sampling and Preservation - Synthetic Organic Compounds (Pyrethroids/Pyrethrins) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Bifentrhin **Cyfluthrin, Total** **Cypermethrin, Total** **Deltamethrin, Total** **Esfenvalerate/ Fenvalerate, Total** **Lambda-cyhalothrin, Total** **cis-Permethrin** **trans-Permethrin**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Dibromooctafluorobiphenyl					

Table B31: Sampling and Preservation - Synthetic Organic Compounds (Phenols) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Pentachloro-phenol	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to ≤6 °C in the dark; pH 5-9.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
2,3,5,6-Tetrachlorophenol	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
2,4,6-Trimethylphenol					

Table B32: Sampling and Preservation - Synthetic Organic Compounds (Glyphosate) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Glyphosate	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	6 months at -20 °C; Samples must be analyzed within 7 days of collection or thawing
AMPA	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	6 months at -20 °C; Samples must be analyzed within 7 days of collection or thawing

Table B33: Sampling and Preservation - Synthetic Organic Compounds (Surfactants) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Nonlyphenol Nonylphenol-ethoxylate	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
2,4,6-Trimethylphenol					

Table B34: Sampling and Preservation - Synthetic Organic Compounds (Surfactants) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation*	Required Holding Time
Nonylphenol **Nonylphenol-ethoxylate**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
2,4,6-Trimethylphenol					

*Unless otherwise specified by method

Table B35: Sampling and Preservation - Synthetic Organic Compounds (Surfactants) in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation*	Required Holding Time
Nonylphenol **Nonylphenol-ethoxylate**	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
2,4,6-Trimethylphenol					

*Unless otherwise specified by method

Table B36: Sampling and Preservation - Synthetic Organic Compounds (Carbamate Pesticides) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Aldicarb **Captan** **Carbaryl** **Carbofuran** **Diuron** **Linuron** **Methiocarb** **Methomyl**	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to ≤6 °C in the dark; pH 5-9.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.

Table B37: Sampling and Preservation - Synthetic Organic Compounds (Triazines) in Water

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Ametryn **Atraton** **Atrazine** **Prometon** **Prometryn** **Propazine** **Secbumeton** **Simazine** **Simetryn** **Terbuthylazine** **Terbutryn**	ug/L	1000-mL I-Chem 200-Series amber glass bottle, with Teflon lid-liner	1000 mL/per individual analyses (QC samples or other analytes require additional sample bottles)	Cool to 6 °C in the dark.	Samples must be extracted within 7 days of collection and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
Triphenyl phosphate					

Table B38: Sampling and Preservation - Synthetic Organic Compounds (Organotins) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Dibutyltin	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Tributlytin	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.

Table B39: Sampling and Preservation - Synthetic Organic Compounds (Organotins) in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
Dibutyltin	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Tributlytin	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.

Table B40: Sampling and Preservation - Synthetic Organic Compounds (Polybrominated Diphenyl Ethers) in Sediment

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
PBDE 17 **PBDE 28** **PBDE 47** **PBDE 66** **PBDE 85** **PBDE 99** **PBDE 100** **PBDE 138** **PBDE 153** **PBDE 154** **PBDE 183** **PBDE 190**	ng/g	Pre-cleaned 250-mL I-Chem 300 Series amber glass jar with Teflon lid liner	500 g (two jars)	Cool to 6 °C in the dark	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
DDD (p,p')					

Table B41: Sampling and Preservation - Synthetic Organic Compounds (Polybrominated Diphenyl Ethers) in Tissue

Analyte	Units	Recommended Container	Recommended Sample Mass	Recommended Preservation	Required Holding Time
PBDE 17 **PBDE 28** **PBDE 47** **PBDE 66** **PBDE 100** **PBDE 99** **PBDE 85** **PBDE 154** **PBDE 153** **PBDE 138** **PBDE 183** **PBDE 190**	ng/g	Polyethylene bags (Teflon sheets in zip bags) or glass jars with Teflon lids	200 g	Cool to 6 °C	1 year at -20 °C; Samples must be extracted within 14 days of collection or thawing and analyzed within 40 days of extraction.
Recommended Surrogates (% Recovery)					
DDD (p,p')					

Table B42: Sampling and Preservation - Field Measurements[a]

Water Quality Parameter	Points Per Calibration[b]	Pre-Measurement Calibration Adjustment Frequency[e]	Accuracy Check (Post-Calibration Check) Frequency	Allowable Drift (Measurement Accuracy)[c, d, e]
Depth	2	n/a	Quarterly	± 0.02 or 2%
Dissolved Oxygen	1	Before every monitoring day (and more often when changing elevation)	After every monitoring day or next morning	± 0.5 or 10%
pH	2	Before every monitoring day	Every evening or next morning	± 0.2
Salinity	2	Per drift rate (instrument-specific)	Per drift rate (instrument-specific	± 4 or 10%
Specific Conductivity	2	Per manufacturer's instructions	Per manufacturer's instructions	± 4 or 10%
Temperature	2	n/a	Once annually	± 0.5 or 10%
Total Chlorophyll	Follow manufacturer's instructions	Per manufacturer's instructions	Per manufacturer's instructions	Follow manufacturer's instructions
Turbidity	2	Per manufacturer's instructions	Per manufacturer's instructions	± 2 or 10%
Velocity	Follow manufacturer's instructions	Per manufacturer's instructions	Per manufacturer's instructions	Follow manufacturer's instructions

a: This table may not include all field analyses. Please refer to method or manufacturer instructions for guidance
b: Unless otherwise specified by method or manufacturer instructions.
c: Manufacturers often provide accuracy specifications that relate to the intrinsic capabilities of the instrument. These must not be confused with measurement output or drift between two consecutive calibration adjustments.
d: Unit or percentage, whichever is greater
e: Recalibration is recommended if an elevation change of 500 feet occurs (especially for Dissolved Oxygen).

Appendix C: Reporting Limits

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Table C1: SWAMP Reporting Limits - Conventionals in Water

Analyte	Water (mg/L)*
Ammonia (as N)	0.1
Biochemical Oxygen Demand	2
Boron	0.010
Chloride	0.25
Chlorophyll a Pheophytin a	0.002
Chemical Oxygen Demand (titrametric)	5
Cyanide	not listed
Dissolved Phosphorus (as P)	not listed
Fluoride	0.123
Iron	0.02
Nitrate (as N)	0.01
Nitrate + Nitrite (as N)	0.1
Nitrite (as N)	0.01
Oil and Grease (HEM)	1.4
Organic Carbon (Dissolved)	0.6
Organic Carbon (Total)	0.6
Orthophosphate (as P)	0.01
Phenols	not listed
Silica	0.1
Sulfate	1.0
Specific Conductivity	2.5 µS/cm
Total Alkalinity (as $CaCO_3$)	1
Total Calcium	0.05
Total Hardness (as $CaCO_3$)	1
Total Kjeldahl Nitrogen	0.5
Total Magnesium	0.02
Total Phosphorus (as P)	not listed
Total Potassium	0.1
Total Sodium	0.1
Turbidity	0.5 ntu

*Unless otherwise noted

Table C2: SWAMP Reporting Limits - Conventionals - Aqueous Solids

Analyte	Solids (mg/L)
Fixed & Volatile Dissolved Solids (500 C) 550 C	5.0
Suspended Sediment Concentration	0.5
Total Dissolved Solids	10
Total Suspended Solids (103-105 °C)	0.5
Volatile Suspended Solids	1.0

Table C3: SWAMP Reporting Limits – Conventionals - Pathogens

Analyte	MPN/100 mL*
Pathogens – E. Coli	2
Pathogens – Enterococcus	1 colonies/100 mL
Pathogens –Fecal Coliform	2
Pathogens – Total Coliform	2
Pathogens - Streptococcus	not listed

*Unless otherwise noted

Table C4: SWAMP Reporting Limits – Conventionals - Solids

Analyte	Solids
Sediment Grain Size Analysis	1%
Sediment Total Organic Carbon	0.01% OC
%Moisture	n/a
%Lipids	n/a

Table C5: SWAMP Reporting Limits – Inorganic Analytes

Analyte	Water (μg/L)	Sediment (mg/kg)	Tissue (mg/kg)
Aluminum	0.3	0.3	0.3
Arsenic	0.3	0.3	0.3
Cadmium	0.01	0.01	0.01
Chromium	0.1	0.1	0.1
Copper	0.01	0.01	0.01
Lead	0.01	0.01	0.01
Manganese	0.01	0.01	0.01
Mercury	0.0002	0.03	0.03
Methylmercury	0.00005	0.00002	0.0100
Nickel	0.02	0.02	0.02
Selenium	0.30	0.10	0.30
Silver	0.02	0.02	0.02
Zinc	0.10	0.10	0.10

Table C6: SWAMP Reporting Limits - Volatile Organics

Analyte	Water (µg/L)	Sediment (mg/kg)
1,1-Dichloroethane 1,1-Dichloroethylene 1,1-Dichloropropene 1,1,1-Trichloroethane 1,1,2-Trichloroethane 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane 1,2 -Dibromoethane 1,2-Dichlorobenzene 1,2-Dichloroethane 1,2-Dichloropropane 1,2-cis-Dichloroethylene 1,2-trans-Dichloroethylene 1,2,3-Trichlorobenzene, 1,2-Dibromo-3-chloropropane 1,2,3-Trichloropropane 1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene 1,3-Dichlorobenzene 1,3-Dichloropropane 1,3,5-Trimethylbenzene 1,4-Dichlorobenzene 2-Chlorotoluene 2,2-Dichloropropane 4-Chlorotoluene Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Carbon tetrachloride Chlorobenzene Chloroform Dibromochloromethane Dibromomethane Ethylbenzene Fluorobenzene Hexachlorobutadiene Isopropylbenzene Methyl tert-butyl ether(MTBE) m/p-Xylene Naphthalene n-Butylbenzene n-Propylbenzene	0.08	20

Table C6: SWAMP Reporting Limits - Volatile Organics (continued)

Analyte	Water (µg/L)	Sediment (mg/kg)
o-Xylene p-Isopropyltoluene sec-Butylbenzene tert-Butylbenzene Tetrachloroethylene Toluene Trichloroethylene Total Xylene	0.08	20

Table C7: SWAMP Reporting Limits - Semi-Volatile Organics

Analyte	Water (µg/L)	Sediment (mg/kg)
1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,4-Dichlorobenzene 2-Chloronaphthalene 2-Chlorophenol 2-Methylnaphthalene 1,2,4-Trichlorobenzene 2-Methylphenol 2-Nitroaniline 2-Nitrophenol 2,4-Dichlorophenol 2,4-Dimethylphenol 2,4-Dinitrophenol 2,4-Dinitrotoluene 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 2,6-Dinitrotoluene 3-Nitroaniline 3,4-Methylphenol 4-Bromophenyl phenyl ether 4-Chloro-3-methylphenol 4-Chloroaniline 4-Chlorophenyl phenyl ether 4-Nitroaniline 4-Nitrophenol 4,6-Dinitro-2-methylphenol Acenaphthene Acenaphthylene Anthracene Benz[a]anthracene Benzo[a]pyrene Benzo[b]fluoranthene Benzo[g,h,i]perylene Benzo[k]fluoranthene Bis(2-chloroethoxy)methane Bis(2-chloroethyl) ether Bis(2-ethylhexyl) phthalate Butyl benzyl phthalate Carbazole Chrysene Dibenzofuran Diethyl phthalate Dimethyl phthalate Di-n-butyl phthalate	10	0.3

Table C7: SWAMP Reporting Limits - Semi-Volatile Organics (continued)

Analyte	Water (µg/L)	Sediment (mg/kg)
Di-n-octyl phthalate Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachloroethane Indeno[1,2,3-cd]pyrene Isophorone Naphthalene Nitrobenzene n-Nitrosodi-n-propylamine Pentachlorophenol Phenanthrene Phenol Pyrene Total Xylenes	10	0.3

Table C8: SWAMP Reporting Limits - Synthetic Organic Compounds Polychlorinated Biphenyls as Congeners/Aroclor Compounds

Analyte	Water (µg/L)	Sediment (ng/g)	Tissue (ng/g)
PCB 5 PCB 8 PCB 15 PCB 18 PCB 27 PCB 28 PCB 29 PCB 31 PCB 33 PCB 44 PCB 49 PCB 52 PCB 56 PCB 60 PCB 66 PCB 70 PCB 74 PCB 87 PCB 95 PCB 97 PCB 99 PCB 101 PCB 105 PCB 110 PCB 114 PCB 118 PCB 128 PCB 137 PCB 138 PCB 141 PCB 149 PCB 151 PCB 153 PCB 156 PCB 157 PCB 158 PCB 170 PCB 174 PCB 177 PCB 180 PCB 183	0.002	0.2	0.4

Table C8: SWAMP Reporting Limits - Synthetic Organic Compounds Polychlorinated Biphenyls as Congeners/Aroclor Compounds (continued)

Analyte	Water (µg/L)	Sediment (ng/g)	Tissue (ng/g)
PCB 187	0.002	0.2	0.4
PCB 189	1.0	10	20
PCB 194	0.002	0.2	0.4
PCB 195	0.002	0.2	0.4
PCB 200	0.002	0.2	0.4
PCB 201	0.002	0.2	0.4
PCB 203	0.002	0.2	0.4
PCB 206	0.002	0.2	0.4
PCB 209	0.002	0.2	0.4
Aroclor 1248	2.5	25	50
Aroclor 1254	1.0	10	20
Aroclor 1260	1.0	10	20

Table C9: SWAMP Reporting Limits - Synthetic Organic Compounds Polynuclear Aromatic Hydrocarbons

Analyte	Water (µg/L)	Sediment (ng/g)	Tissue (ng/g)
1-Methylfluorene 1-Methyl-naphthalene 1-Methyl-phenanthrene 2-Methylfluoranthene 2-Methyl-naphthalene 2,3,5-Trimethyl-naphthalene 2,6-Dimethyl-naphthalene 3,6-Dimethyl-phenanthrene 4-Methyl-dibenzothiophene Acenaphthene Acenaphthylene Anthracene Benz(a) anthracene Benzo(a) pyrene Benzo(b) fluoranthene Benzo(e) pyrene Benzo(g,h,i) perylene Benzo(k) fluoranthene Biphenyl C1-Chrysenes C1-Dibenzo-thiophenes C1-Fluorenes C1-Fluoranthene/ Pyrenes C1-Naphthalenes C1-Phenanthrene/ Anthracene C2-Chrysenes C2-Dibenzo-thiophenes C2-Fluorenes C2-Naphthalenes C2-Phenanthrene/ Anthracene C3-Chrysenes C3-Dibenzo-thiophenes C3-Fluorenes C3-Naphthalenes C3-Phenanthrene/ Anthracene C4-Naphthalenes C4-Phenanthrene/ Anthracene Chrysenes Dibenz(a,h) anthracene Dibenzo-thiophene Fluoranthene Fluorene	10	20	100

Table C9: SWAMP Reporting Limits - Synthetic Organic Compounds Polynuclear Aromatic Hydrocarbons (continued)

Analyte	Water (µg/L)	Sediment (ng/g)	Tissue (ng/g)
Indeno(1,2,3-c,d) pyrene Naphthalene Perylene Phenanthrene Pyrene	10	20	100

Table C10: SWAMP Reporting Limits - Synthetic Organic Compounds - Organochlorine Pesticides

Analyte	Water (µg/L)	Sediment (ng/g)	Tissue (ng/g)
Aldrin	0.002	1	2
alpha-HCH	0.002	1	2
cis-Chlordane	0.002	2	4
beta-HCH	0.002	2	4
trans-Chlordane	0.002	2	4
Dacthal	0.002	2	4
DDD (o,p')	0.002	2	4
DDD (p,p')	0.002	2	4
DDE (o,p')	0.002	2	4
DDE (p,p')	0.002	2	4
DDMU (p,p')	0.002	3	6
DDT (o,p')	0.002	3	6
DDT (p,p')	0.005	5	10
delta-HCH	0.002	2	4
Dieldrin	0.002	2	4
Endosulfan I	0.002	2	4
Endosulfan II	0.002	10	20
Endosulfan sulfate	0.002	10	20
Endrin	0.002	2	4
Endrin Aldehyde	0.005	n/a	n/a
Endrin Ketone	0.005	n/a	n/a
gamma-HCH	0.002	1	2
Heptachlor	0.002	2	4
Heptachlorepoxide	0.002	1	2
Hexachlorobenzene	0.001	0.3	0.6
Methoxychlor	0.002	5	10
Mirex	0.002	3	6
cis-Nonachlor	0.002	2	4
trans-Nonachlor	0.002	1	2
Oxadiazon	0.002	3	6
Oxychlordane	0.002	1	2
Tedion	0.002	2	4
Toxaphene	n/a	20	40

Table C11: SWAMP Reporting Limits - Synthetic Organic Compounds - Organophosphate Pesticides

Analyte	Water (µg/L)	Sediment (ng/g)	Tissue (ng/g)
Aspon	0.050	n/a	n/a
Azinphos ethyl	0.050	n/a	n/a
Carbophenothion	0.050	n/a	n/a
Chlorfenvinphos	0.050	n/a	n/a
Chlorpyrifos	0.050	2	4
Chlorpyrifos methyl	0.050	n/a	n/a
Ciodrin	0.050	n/a	n/a
Coumaphos	0.050	n/a	n/a
Demeton-s	0.050	n/a	n/a
Diazinon	0.050	20	40
Naled	0.050	n/a	n/a
Dichlofenthion	0.050	n/a	n/a
Dichlorvos	0.050	n/a	n/a
Dicrotophos	0.050	n/a	n/a
Dimethoate	0.050	n/a	n/a
Dioxathion	0.050	n/a	n/a
Disulfoton	0.050	n/a	n/a
Ethion	0.050	6	12
Famphur	0.050	n/a	n/a
Fenchlorophos	0.050	n/a	n/a
Fenitrothion	0.050	n/a	n/a
Fensulfothion	0.050	n/a	n/a
Fenthion	0.050	n/a	n/a
Fonofos	0.050	n/a	n/a
Azinphos methyl	0.050	n/a	n/a
Leptophos	0.050	n/a	n/a
Malathion	0.050	n/a	n/a
Methidathion	0.050	n/a	n/a
Parathion, ethyl	0.050	2	4
Parathion, methyl	0.050	4	8
Molinate	0.050	n/a	n/a
Phorate	0.050	n/a	n/a
Mevinphos	0.050	n/a	n/a
Phosmet	0.050	n/a	n/a
Phosphamidon	0.050	n/a	n/a
Ethoprop	0.050	n/a	n/a
Sulfotep	0.050	n/a	n/a
Bolstar	0.050	n/a	n/a
Terbufos	0.050	n/a	n/a
Tetrachlorvinphos	0.050	n/a	n/a
Thiobencarb	0.050	n/a	n/a
Thionazin	0.050	n/a	n/a

Table C11: SWAMP Reporting Limits - Synthetic Organic Compounds - Organophosphate Pesticides (continued)

Analyte	Water (µg/L)	Sediment (ng/g)	Tissue (ng/g)
Tokuthion	0.050	n/a	n/a
Merphos	0.050	n/a	n/a
Trichlorfon	0.050	n/a	n/a
Trichloronate	0.050	n/a	n/a

Appendix D: Corrective Action

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Table D1: Corrective Action - Conventional Analytes (Water)

Laboratory Quality Control	Corrective Action
Calibration Standard	Affected samples and associated quality control must be reanalyzed following successful instrument recalibration.
Initial/Continuing Calibration Verification	The analysis must be halted, the problem investigated, and the instrument recalibrated. All samples after the last calibration verification must be reanalyzed.
Laboratory Blank	The sample analysis must be halted, the source of the contamination investigated, the samples along with a new laboratory blank prepared and/or re-extracted, and the sample batch and fresh laboratory blank reanalyzed. If reanalysis is not possible due to sample volume, flag associated samples as estimated.
Reference Material	Affected samples and associated quality control must be reanalyzed following instrument recalibration.
Matrix Spike	The spiking level should be approximately 2-5 times the ambient concentration of the spiked sample. Appropriately spiked results should be compared to the matrix spike duplicate to investigate matrix interference. If matrix interference is suspected, the matrix spike result must be qualified.
Matrix Spike Duplicate	The spiking level should be approximately 2-5 times the ambient concentration of the spiked sample. Appropriately spiked results should be compared to the matrix spike duplicate to investigate matrix interference. If matrix interference is suspected and reference material recoveries are acceptable, the matrix spike duplicate result must be qualified.
Laboratory Duplicate	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. Other failures should be reanalyzed as sample volume allows.
Internal Standard	As method requires. The instrument must be flushed with rinse blank. If, after flushing, the responses of the internal standards remain unacceptable, the analysis must be terminated and the cause of drift investigated.
Field Quality Control	**Corrective Action**
Field Duplicate	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. All failures should be communicated to the project coordinator, who in turn will follow the process detailed in the method.
Field Blank, Travel Blank, Equipment Blank	If contamination of the field blanks and associated samples is known or suspected, the laboratory should qualify the affected data, and notify the project coordinator, who in turn will follow the process detailed in the method.

Table D2: Corrective Action - Conventional Analytes (Total Solids, Suspended Sediment Concentration, and Percent Lipids)

Laboratory Quality Control	Corrective Action
Calibration Standard	n/a
Initial/Continuing Calibration Verification	n/a
Laboratory Blank	Please refer to method requirements.
Reference Material	Please refer to method requirements.
Matrix Spike	n/a
Matrix Spike Duplicate	n/a
Laboratory Duplicate*	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. Other failures should be reanalyzed as sample volume allows. A matrix spike duplicate may not be analyzed in place of a laboratory duplicate.
Internal Standard	n/a
Field Quality Control	**Corrective Action**
Field Duplicate	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. All failures should be communicated to the project coordinator, who in turn will follow the process detailed in the method.
Field Blank, Travel Blank, Equipment Blank	If contamination of the field blanks and associated samples is known or suspected, the laboratory should qualify the affected data, and notify the project coordinator, who in turn will follow the process detailed in the method.

*Not applicable to suspended sediment concentration analyses

Table D3: Corrective Action - Inorganic Chemistry

Laboratory Quality Control	Corrective Action
Calibration Standard	Affected samples and associated quality control must be reanalyzed following successful instrument recalibration
Initial/Continuing Calibration Verification	The analysis must be halted, the problem investigated, and the instrument recalibrated if necessary. If deemed appropriate, all samples after the last acceptable continuing calibration verification may be reanalyzed.
Laboratory Blank	The sample analysis must be halted, the source of the contamination investigated, the samples along with a new laboratory blank prepared and/or re-extracted, and the sample batch and fresh laboratory blank reanalyzed. If reanalysis is not possible due to sample volume, flag associated samples as estimated.
Reference Material	If deemed appropriate, affected samples and associated quality control may be reanalyzed following instrument recalibration.
Matrix Spike	The spiking level should be approximately 2-5 times the ambient concentration of the spiked sample. Appropriately spiked results should be compared to the matrix spike duplicate to investigate matrix interference. If matrix interference is suspected, the matrix spike result must be qualified.
Matrix Spike Duplicate	The spiking level should be approximately 2-5 times the ambient concentration of the spiked sample. Appropriately spiked results should be compared to the matrix spike duplicate to investigate matrix interference. If matrix interference is suspected and reference material recoveries are acceptable, the matrix spike duplicate result must be qualified.
Laboratory Duplicate	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. Other failures should be reanalyzed as sample volume allows.
Internal Standard	As method requires. The instrument must be flushed with rinse blank. If, after flushing, the responses of the internal standards remain unacceptable, the analysis must be terminated and the cause of drift investigated.
Field Quality Control	**Corrective Action**
Field Duplicate	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. All failures should be communicated to the project coordinator, who in turn will follow the process detailed in the method.
Field Blank, Equipment Blank	If contamination of the field blanks and associated samples is known or suspected, the laboratory should qualify the affected data, and notify the project coordinator, who in turn will follow the process detailed in the method.

Table D4: Corrective Action - Organic Chemistry

Laboratory Quality Control	Corrective Action
Calibration Standard	Affected samples and associated quality control must be reanalyzed following successful instrument recalibration.
Initial/Continuing Calibration Verification	The analysis must be halted, the problem investigated, and the instrument recalibrated. All samples after the last acceptable continuing calibration verification must be reanalyzed.
Laboratory Blank	The sample analysis must be halted, the source of the contamination investigated, the samples along with a new laboratory blank prepared and/or re-extracted, and the sample batch and fresh laboratory blank reanalyzed. If reanalysis is not possible due to sample volume, flag associated samples as estimated.
Reference Material	Affected samples and associated quality control must be reanalyzed following instrument recalibration.
Matrix Spike	The spiking level should be approximately 2-5 times the ambient concentration of the spiked sample. Appropriately spiked results should be compared to the matrix spike duplicate to investigate matrix interference. If matrix interference is suspected, the matrix spike result must be qualified.
Matrix Spike Duplicate	The spiking level should be approximately 2-5 times the ambient concentration of the spiked sample. Appropriately spiked results should be compared to the matrix spike duplicate to investigate matrix interference. If matrix interference is suspected and reference material recoveries are acceptable, the matrix spike duplicate result must be qualified.
Laboratory Duplicate	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. Other failures should be reanalyzed as sample volume allows.
Internal Standard	Analyze as appropriate per method. Troubleshoot as appropriate. If, after trouble-shooting, the responses of the internal standards remain unacceptable, the analysis must be terminated and the cause of drift investigated.
Surrogate	Analyze as appropriate per method. All affected results should be qualified. The analytical method or quality assurance project plan must detail procedures for updating surrogate measurement quality objectives.
Field Quality Control	**Corrective Action**
Field Duplicate	For duplicates with a heterogeneous matrix or ambient levels below the reporting limit, failed results may be qualified. All failures should be communicated to the project coordinator, who in turn will follow the process detailed in the method.
Field Blank, Travel Blank, Equipment Blank	If contamination of the field blanks and associated samples is known or suspected, the laboratory should qualify the affected data, and notify the project coordinator, who in turn will follow the process detailed in the method.

Table D5: Corrective Action - Toxicity Testing

Negative Controls	Corrective Action
Laboratory Control Water	If tested with in-house cultures, affected samples and associated quality control must be retested within 24 hours of test failure. If commercial cultures are used, they must be ordered within 16 hours of test failure for earliest possible receipt, and retests must be initiated within 8 hours of receipt. The laboratory should try to determine the source of contamination, document the investigation, and document steps taken to prevent recurrence.
Conductivity Control Water	Affected samples and associated quality control must be qualified.
Additional Control Water	A water sample that has similar qualities to the test sample may be used as an additional control based on the objectives of the study. Results that show statistical differences from the laboratory control should be qualified. The laboratory should try to determine the source of contamination, document the investigation, and document steps taken to prevent recurrence. This is not applicable for TIE method blanks.
Laboratory Control Sediment	Affected samples and associated quality control must be re-tested within 24 hours of test failure if tested with in-house cultures. If commercial cultures are used, they must be ordered within 16 hours of test failure for earliest possible receipt, and re-tests must be initiated within 8 hours of receipt. The laboratory should try to determine the source of contamination, document the investigation, and document steps taken to prevent recurrence.
Additional Control Sediment	A sediment sample that has similar qualities to the test sample may be used as an additional control based on the objectives of the study. Results that show statistical differences from the laboratory control should be qualified. The laboratory should try to determine the source of contamination, document the investigation, and document steps taken to prevent recurrence.
Positive Controls	**Corrective Action**
Reference Toxicant Tests	If LC50 exceeds +/- two standard deviations of the running mean of the last 20 reference toxicant tests, the test should be qualified or repeated.
Field Quality Control	**Corrective Action**
Field Duplicate	For duplicates with a heterogeneous matrix, results that do not meet SWAMP criteria should be qualified. All field duplicate results that do not meet SWAMP criteria should be communicated to the project coordinator, who in turn will notify the sampling team so that the source of contamination can be identified and corrective measures taken prior to the next sampling event.
Field Blanks	If contamination of the field blanks and associated samples is known or suspected, the laboratory should qualify the affected data and notify the project coordinator, who in turn will notify the sampling team so that the source of contamination can be identified and corrective measures taken prior to the next sampling event.
Equipment Blanks	If contamination of the field blanks and associated samples is known or suspected, the laboratory should qualify the affected data and notify the project coordinator, who in turn will notify the sampling team so that the source of contamination can be identified and corrective measures taken prior to the next sampling event.

Table D6: Corrective Action - Field Measurements

Field Quality Control	Corrective Action
Depth, Dissolved Oxygen, pH, Salinity, Specific Conductance, Temperature, Turbidity, Velocity	The instrument should be recalibrated following its manufacturer's cleaning and maintenance procedures. If measurements continue to fail measurement quality objectives, affected data should not be reported and the instrument should be returned to the manufacturer for maintenance. All troubleshooting and corrective actions should be recorded in the calibration and field data logbooks.

Appendix E: Glossary

Unless otherwise noted, the following definitions are from the Environmental Protection Agency's *Glossary of Quality-Related Terms*: http://www.epa.gov/quality/glossary.htm

Accuracy	The closeness or agreement of the observed value or test response to the true or acceptable reference value or the test response from a reference method. It is influenced by both random error (precision) and systematic error (bias). The terms "bias" and "precision" are often used in lieu of "accuracy".
Analytical Batch **SWAMP QA Program Definition**	A group of 20 or fewer samples and associated quality control that is processed by the same instrument within a 24-hour period (unless otherwise specified by method). An analytical batch may comprise multiple sample batches.
Analytical Run **SWAMP QA Program Definition**	The quantification of a single discrete sample or its associated quality control.
Assessment	A general evaluation process used to evaluate the performance, effectiveness and processes of a management and/or technical system.
Batch	The collection of samples of the same group which is to be analyzed in one test run or inspected together within a specific time limit and traceable as a unit.
Bias	The constant or systematic distortion of a measurement process that manifests itself as a persistent positive or negative deviation from the known or true value. This can result from improper data collection, poorly calibrated analytical or sampling equipment, or limitations or errors in analytical methods and techniques.
Blank	A specimen that is intended to contain none of the analytes of interest and which is subjected to the usual analytical or measurement process to establish a zero baseline or background value.
Calibration	A comparison of a measurement standard, instrument, or item with one having higher accuracy to detect, quantify, and record any inaccuracy or variation; the process by which an instrument setting is adjusted based on response to a standard to eliminate the inaccuracy.
Calibration Standard	Reference solution of known value used to correct an instrument reading.
Certified Reference Material **SWAMP QA Program Definition**	A substance whose property values are certified by a procedure which establishes its traceability and uncertainty at a stated level of confidence.
Comparability	A measure of the confidence with which one data set, element, or method can be considered as similar to another.
Completeness	A measure of the amount of valid data obtained from a measurement system.

Continuing Calibration Verification **SWAMP QA Program Definition**	A periodic standard used to assess instrument drift between calibrations.
Control Limit	The variation in a process data set expressed as plus/minus standard deviations from the mean, generally placed on a chart to indicate the upper and lower acceptable ranges of process data and to judge whether the process is in or out of statistical limitations.
Corrective Action	Any measures taken to rectify conditions adverse to quality and/or to eliminate the causes of an existing nonconformity, defect, or other undesirable situation in order to prevent reoccurrence.
Data Validation	An analyte- and sample-specific process that evaluates the information after the verification process (i.e., determination of method, procedural, or contractual compliance) to determine analytical quality and any limitations.
Data Verification	The process of evaluating the completeness, correctness, and conformance/compliance of a specific information set against the method, procedural, or contractual specifications for that activity.
Equipment Blank	An aliquot of reagent water that is subjected in the laboratory to all aspects of sample collection and analysis, including contact with all sampling devices and apparatus. The purpose of the equipment blank is to determine if the sampling devices and apparatus for sample collection have been adequately cleaned before they are shipped to the field site. An acceptable equipment blank must be achieved before the sampling devices and apparatus are used for sample collection.
Field Blank	A clean analyte-free sample which is carried to the sampling site and then exposed to sampling conditions, returned to the laboratory, and treated as an environmental sample. This blank is used to provide information about contaminants that may be introduced during sample collection, storage, and transport.
Field Duplicate (Co-located)	An independent specimen collected from the same point in time and space as the previous specimen.
Field Duplicate (Subsample)	A test specimen that is homogenized before being divided into two or more portions with the same laboratory analyzing all portions.
Field Measurements	Those activities associated with performing analyses or measurements in the habitat being examined.
Holding Time **SWAMP QA Program Definition**	The period of time a sample may be stored following collection, preservation, extraction, or analysis. While exceeding the holding time does not necessarily negate the veracity of analytical results, it causes the qualification of any data not meeting all of the specified acceptance criteria.
Indicators	Items, elements, or measures used to determine or identify a basic condition or how well a process or program is meeting its objectives.

Initial Calibration Verification **SWAMP QA Program Definition**	A standard used to assess instrument drift at the beginning of an analytical batch.
Intercomparison	An exercise in which samples are prepared and split by a reference laboratory, then analyzed by one or more testing laboratories and the reference laboratory. The intercomparison, with a reputable laboratory as the reference laboratory, serves as the best test of the precision and accuracy of the analyses at natural environmental levels.
Interference	An element, compound, or other matrix effect present in a sample which disturbs the detection of a target analyte leading to inaccurate concentration results for the target analyte.
Internal Standard	Pure analyte(s) added to a sample, extract, or standard solution in known amount(s) and used to measure the relative responses of other method analytes that are components of the same sample or solution. The internal standard must be an analyte that is not a sample component.
Laboratory Blank	An aliquot of reagent water that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with samples. The laboratory blank is used to determine if method analytes or interferences are present in the laboratory environment, the reagents, or the apparatus.
Laboratory Duplicate	Two or more representative portions taken from one homogeneous sample by the analyst and analyzed in the same testing facility.
Laboratory Control Sample	A specimen of known composition prepared using contaminant-free reagent water, or an inert solid, that is spiked with the analyte of interest at the midpoint of the calibration curve or at the level of concern; and then analyzed using the same preparation, reagents, and analytical methods employed for regular specimens and at the intervals set in the Quality Assurance Project Plan.
Matrix	The material of which the sample is composed or the substrate containing the analyte of interest, such as drinking water, waste water, air, soil/sediment, biological material, etc. Also called medium or media.
Matrix Spike	A test specimen prepared by adding a known concentration of the target analyte to a specified amount of a specific homogenized specimen where an estimate of the target concentration is available and subjected to the entire analytical protocol.
Matrix Spike Duplicate	A sample prepared simultaneously as a split with the matrix spike sample with each specimen being spiked with identical, known concentrations of targeted analyte.
Measurement Quality Objectives	The individual performance or acceptance goals for the individual Data Quality Indicators such as precision or bias.
Method	A procedure, technique, or tool for performing a scientific activity.

Method Blank	A blank prepared to represent the sample matrix as closely as possible and analyzed exactly like the calibration standards, samples, and quality control (QC) samples. Results of method blanks provide an estimate of the within-batch variability of the blank response and an indication of bias introduced by the analytical procedure.
Method Detection Limit	The minimum concentration of an analyte that undergoes the entire measurement process and can be reported with a stated level of confidence that the analyte concentration is greater than zero.
Non-Direct Measurements	Data obtained from existing sources rather than measured or generated directly.
Parameter	A statistical quantity, usually unknown, such as a mean or a standard deviation, which characterizes a population or defines a system.
Performance-Based Measurement System	A set of processes wherein the data needs, mandates, or limitations of a program or project are specified and serve as criteria for selecting appropriate methods to meet those needs in a cost-effective manner.
Precision	A measure of mutual agreement between two or more individual measurements of the same property, obtained under similar conditions.
Quality Assurance	An integrated system of management activities (planning, implementation, assessment, reporting, and quality improvement) that focuses on providing confidence in the data or product by ensuring that it is of the type and worth needed and expected by the client.
Quality Assurance Officer	The individual designated within an organization having management oversight and responsibilities for planning, documenting, coordinating, and assessing the system effectiveness for ensuring the value of the work.
Quality Assurance Project Plan	A document that describes the intended technical activities and project procedures that will be implemented to ensure that the results of the work to be performed will satisfy the stated performance or acceptance criteria. The amount of information presented and the planned activities to ensure the value of the work will vary according the type of study and the intended use of the data.
Quality Assurance Program Plan	A document describing in comprehensive detail the necessary decisions and decision criteria to be used by an overall regulatory program.
Quality Management Plan	A document that describes an organization's system in terms of its organizational structure, policy and procedures, staff functional responsibilities, lines of authority, and interfaces for those planning, implementing, documenting, and assessing all activities conducted.
Reference Material **SWAMP QA Program Definition**	A substance whose properties are sufficiently homogeneous and established to be used for calibration and measurement.
Reporting Limit	The minimum value below which data are documented as non-detected.

Sample Batch	Twenty or fewer field samples prepared and analyzed with a common set of quality assurance samples.
Sensitivity	The capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest.
Spike	A known quantity of an analyte added to a sample for the purpose of determining recovery or efficiency (analyst spikes), or for quality control (blind spikes).
Split	Two or more representative portions taken from one specimen in the field or in the laboratory and analyzed by different analysts, methods, or laboratories.
Standard Deviation	The measure of the dispersion or imprecision of a series of accepted results around the average, equal to the square root of the variance.
Standard Operating Procedure	A written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps and that is officially approved as the method for performing certain routine or repetitive tasks.
Surrogate	A pure substance with properties that mimics the analyte of interest (organics only) and which is unlikely to be found in environmental samples. It is added into a sample before sample preparation.
Travel Blank **SWAMP QA Program Definition**	Analyte-free water placed in the same type of container as its associated field samples. It may be pre-preserved prior to shipment, but is not opened during the sample collection. Consequently, it helps isolate contamination associated with sample transport.
Working Standard **SWAMP QA Program Definition**	A dilution of a stock standard.

Appendix F: List of Abbreviations and Acronyms

AB	Assembly Bill
ASTM	American Society for Testing and Materials
BDAT	Bay, Delta, and Tributaries Project
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CCV	Continuing Calibration Verification
CEDEN	California Environmental Data Exchange Network
CRM	Certified Reference Material
CWA	Clean Water Act
DFG	Department of Fish and Game
DI	Deionized
DIT	Division of Information Technology
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
DMT	Data Management Team
DWR	Department of Water Resources
EC	Electrical Conductivity
EDTA	Ethylenediaminetetraacetic Acid
EPA	U.S. Environmental Protection Agency
FTP	File Transfer Protocol
GC	Gas Chromatography
GC-ECD	Gas Chromatography-Electron Capture Detection
GC-MS	Gas Chromatography – Mass Spectrometry
HEM	Hexane-Extractable Material
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry

ICV	Initial Calibration Verification
IEP	Interagency Ecological Program
IMS	Information Management System
LCS	Laboratory Control Sample
LOEC	Lowest Observed Effects Concentration
MDL	Method Detection Limit
MLML	Moss Landing Marine Laboratories
MPN	Most Probable Number
MQO	Measurement Quality Objective
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MTBE	Methyl Tert-Butyl Ether
n/a	Not Applicable
NHD	National Hydrography Dataset
NIST	National Institute of Standards and Technology
NOEC	No Observed Effects Concentration
NPDES	National Pollutant Discharge Elimination System
OIMA	Office of Information Management and Analysis
PAH	Polycyclic Aromatic Hydrocarbons
PBDE	Polybrominated Diphenyl Ethers
PCB	Polychlorinated Biphenyls
PMSD	Percent Minimum Significant Difference
ppm	Parts per Million
ppb	Parts per Billion
ppt	Parts per Trillion
QA	Quality Assurance

QAPP	Quality Assurance Project Plan
QAPrP	Quality Assurance Program Plan
QC	Quality Control
QMP	Quality Management Plan
RF	Response Factor
RFP	Request for Proposal
RL	Reporting Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
RWC	Receiving Water Concentration
RWQCB	Regional Water Quality Control Board
SCCWRP	Southern California Coastal Research Project
SDTP	Standardized Data Transfer Protocols
SFEI	San Francisco Estuary Institute
SOP	Standard Operating Procedure
SOW	Statement of Work
SPARC	Scientific Planning and Review Committee
SPCC	System Performance Check Compounds
SRM	Standard Reference Material
SRWP	Sacramento River Watershed Program
STORET	Storage and Retrieval
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TAC	Test Acceptability Criteria
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon

TRL	Target Reporting Limit
UCD	University of California at Davis
USGS	U.S. Geological Survey
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
YCT	Yeast, Cerophyl®, and Trout Chow

Appendix G: Online Resources

Hosted by the State Water Resources Control Board

State Board SWAMP Page:

http://www.waterboards.ca.gov/water_issues/programs/swamp/

Launch page to program guidelines, documents, and links

SWAMP Quality Assurance Program Plan:

http://www.waterboards.ca.gov/water_issues/programs/swamp/qapp.shtml

This QAPrP and associated appendices in Adobe PDF and Microsoft Word formats

SWAMP Quality Assurance:

http://www.waterboards.ca.gov/water_issues/programs/swamp/qapp.shtml

SWAMP quality assurance homepage and links

SWAMP Email List:

http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml

Subscriptions to the online mailing lists of various State Board efforts

SWAMP Advisor:

http://swamp.waterboards.ca.gov/swamp/qapp_advisor/

Online tool for SWAMP QAPP creation

Hosted by the Moss Landing Marine Laboratories

SWAMP Standard Operating Procedures:

http://mpsl.mlml.calstate.edu/swsops.htm

SWAMP data management and quality assurance SOPs

SWAMP Quality Assurance Comparability:

http://mpsl.mlml.calstate.edu/swqacompare.htm

Guidelines, links, and a Help Desk pertaining to SWAMP quality assurance comparability

SWAMP Data Management Comparability:

http://mpsl.mlml.calstate.edu/swdbcompare.htm

Guidelines, links, and a Help Desk pertaining to SWAMP data management comparability

SWAMP Information Management System Documentation:

http://mpsl.mlml.calstate.edu/swdbase.htm

Documents pertaining to SWAMP IMS guidelines and training

SWAMP Data Submission Documentation:

http://mpsl.mlml.calstate.edu/swdataformats.htm

Documents pertaining to SWAMP IMS data submission formats and conventions

Regional SWAMP Report Templates:

http://mpsl.mlml.calstate.edu/SWAMP_Regional_Report_QA_Section_Template_022908.doc

Narrative and tabular templates for the QA section of regional SWAMP reports

Hosted Externally

Bay, Delta, and Tributaries Project:

http://bdat.ca.gov/Php/ceden

Centralized data sharing network for SWAMP data

EPA Quality System Documents:

http://www.epa.gov/quality/qa_docs.html

Agency-wide Guidance and Requirements documents for internal and external quality systems

Appendix H: Approval Signatures

The following approvals were submitted separately, preventing their inclusion in the signature block in Element A1: *Title and Approval Sheet* of this document. Originals are kept on file by the Surface Water Ambient Monitoring (SWAMP) Quality Assurance Team (QAT) according to Element A9: *Documents and Records*.

Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (1 of 12*)

Emilie Reyes, Surface Water Ambient Monitoring Program Coordinator
State Water Resources Control Board
Office of Information Management and Analysis
Surface Water Ambient Monitoring Program Unit

Signature _____ Date 11/05/08

*Original signatures are maintained by the SWAMP Quality Assurance Team, and are scanned into this appendix for reference with Element A1: *Title and Approval Sheet.*

Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (2 of 12*)

William Ray, Quality Assurance Office Manager
State Water Resources Control Board
Office of Information Management and Analysis

WO
Signature

7/14/08
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (3 of 12*)

Beverly H. van Buuren, Surface Water Ambient Monitoring Program Quality Assurance Officer
Moss Landing Marine Laboratories
Quality Assurance Research Group

Signature _____ Date 07/21/08

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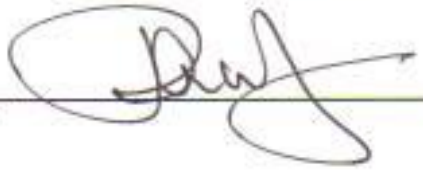
Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (4 of 12*)

Rich Fadness, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 1 (North Coast Region)



Signature

7-10-08
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (5 of 12*)

Wil Bruhns, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 2 (San Francisco Bay Region)

Signature

7/21/08
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (6 of 12*)

Karen Worcester, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 3 (Central Coast Region)

Karen Worcester
Signature

7-17-08
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (7 of 12)

Jau Ren Chen, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 4 (Los Angeles Region)

Jau Ren Chen
Signature

7/15/08
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (8 of 12*)

Leticia Valadez, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 5 (Central Valley Region)

Signature

7/15/2008
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (9 of 12*)

Bruce Warden, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 6 (Lahontan Region)

Bruce Warden
Signature

7-30-08
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: Title and Approval Sheet (1 of 12*)

Jeff Geraci, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 7 (Colorado River Basin Region)

Signature

8/14/08
Date

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Element A1: Title and Approval Sheet

Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Element A1: *Title and Approval Sheet* (11 of 12*)

Pavlova Vitale, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 8 (Santa Ana Region)

Pavlova N. Vitale
Signature

7-21-08
Date

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Surface Water Ambient Monitoring Program
Quality Assurance Program Plan
09/01/08

Dat Quach, Quality Assurance Officer (or Designee)
Regional Water Quality Control Board 9 (San Diego Region)

Linda Pardy (Designee) 8-26-2008

Signature Date

*Original signatures are maintained by the SWAMP Quality Assurance Team, and are scanned into this appendix for reference with Element A1: *Title and Approval Sheet*.

Appendix I: References

EPA Region 9 Requirements for Quality Assurance Program Plans; R9QA/03.1; U.S. Environmental Protection Agency Region 9, Quality Assurance Office: San Francisco, CA, 2001.

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Appendix J: Document Addenda

This quality assurance program plan (QAPrP) is formally revised at least every five years, and is reviewed and updated on an annual basis. Updates necessitated between these reviews are communicated via the addenda included in this appendix. This table summarizes the addenda that appear chronologically in the following page(s).

Addendum Date	Subject	Summary
October 8, 2008	Reporting Limits	Programmatic reporting limit (RL) requirements are temporarily retracted while a new system is developed.

Surface Water Ambient Monitoring Program Quality Assurance Program Plan:

Addendum

The purpose of this form is to document and communicate updates to the *Surface Water Ambient Monitoring Program Quality Assurance Program Plan* (QAPrP) that occur independently of formal reviews or revisions.

QAPrP Version: September 1, 2008

Addendum Effective Date: October 8, 2008

Subject: Retraction of Programmatic Reporting Limits

Description: As printed, the QAPrP mandates the programmatic reporting limits specified in its Appendix C: *Reporting Limits*. An October 8, 2008 SWAMP Roundtable decision temporarily retracts this policy pending updates to the specified limits.

Element Number: B4
Element Name: Analytical Methods
Page(s): 29

Current Text:

"If a project's RLs exceed those presented in Appendix C, a waiver must be completed as described in the introduction to this document."

Updated Text:

"If a project's RLs exceed those presented in Appendix C, there is no need to obtain a waiver as described in the introduction to this document."

For SWAMP Use:

Approval Date:
SWAMP Coordinator Name: Kevin Taberski acting for Emilie Reyes
SWAMP Coordinator Approval Signature: [signature] Date: 10/29/08

SWAMP
Surface Water Ambient Monitoring Program

C.10 Citation 49, page 93 of R2-2009-0074

C.10 citation 49 “Existing Land Use in 2005: Data for Bay Area Counties”
Available at:
https://store.abag.ca.gov/projections.asp#elu

Dear State Water Program Directors:

The purpose of this letter is to transmit to you the final Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. The policy addresses issues relating to the type of effluent limitations that are most appropriate for National Pollutant Discharge Elimination System storm water permits to provide for the attainment of water quality standards. Since this policy only applies to water quality-based effluent limitations, it is not intended to affect technology-based limitations, such as those based on effluent guidelines or the permit writer's best professional judgement, that are incorporated into storm water permits. With this policy, the Office of Water is seeking to fulfill objectives of the 1996-1997 National Water Program Agenda for the Future (January 16, 1996), including reducing the threat of wet weather discharges to water quality, providing States and local governments with greater flexibility to solve wet weather problems, and identifying and taking appropriate steps to reduce the existing burden of the Storm Water Phase I program.

Numerous parties were involved in preparing this policy. In addition to receiving significant input from the Urban Wet Weather Flows Advisory Committee, EPA also consulted with State and Regional Storm Water Coordinators.

If you have questions regarding this policy, please contact William Hall at (202) 260-1458 or Bill Swietlik at (202) 260-9529. I thank you for your assistance.

Sincerely,

Robert Perciasepe
Assistant Administrator

Enclosure

MEMORANDUM

SUBJECT: Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits

FROM: Robert Perciasepe, Assistant Administrator

TO: EPA Water Management Division Directors

The purpose of this memorandum is to transmit to you the final Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. The policy addresses issues relating to the type of effluent limitations that are most appropriate for National Pollutant Discharge Elimination System storm water permits to provide for the attainment of water quality standards. Since this policy applies only to water quality-based effluent limitations, it is not intended to affect technology-based limitations, such as those based on effluent guidelines or the permit writer's best professional judgement, that are incorporated into storm water permits. With this policy, the Office of Water is seeking to fulfill objectives of the 1996-1997 National Water Program Agenda for the Future (January 16, 1996), including reducing the threat of wet weather discharges to water quality, providing States and local governments with greater flexibility to solve wet weather problems, and identifying and taking appropriate steps to reduce the existing burden of the Storm Water Phase I program.

Numerous parties were involved in preparing this policy. In addition to receiving significant input from the Urban Wet Weather Flows Advisory Committee, EPA also consulted with State and Regional Storm Water Coordinators.

If you have questions regarding this policy, please contact William Hall at (202) 260-1458 or Bill Swietlik at (202) 260-9529. I thank you for your assistance.

Attachment

INTERIM PERMITTING APPROACH FOR WATER QUALITY-BASED EFFLUENT LIMITATIONS IN STORM WATER PERMITS

In response to recent questions regarding the type of water quality-based effluent limitations that are most appropriate for National Pollutant Discharge Elimination System (NPDES) storm water permits, the Environmental Protection Agency (EPA) is adopting an interim permitting approach for regulating wet weather storm water discharges. Due to the nature of storm water discharges, and the typical lack of information on which to base numeric water quality-based effluent limitations (expressed as concentration and mass), EPA will use an interim permitting approach for NPDES storm water permits.

The interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate. This interim permitting approach is not intended to affect those storm water permits that already include appropriately derived numeric water quality-based effluent limitations. Since the interim permitting approach only addresses water quality-based effluent limitations, it also does not affect technology-based effluent limitations, such as those based on effluent limitations guidelines or developed using best professional judgement, that are incorporated into storm water permits.

Each storm water permit should include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations for subsequent permits. Such a monitoring program may include ambient monitoring, receiving water assessment, discharge monitoring (as needed), or a combination of monitoring procedures designed to gather necessary information.

This interim permitting approach applies only to EPA; however, EPA also encourages authorized States and Tribes to adopt similar policies for storm water permits. This interim permitting approach provides time, where necessary, to more fully assess the range of issues and possible options for the control of storm water discharges for the protection of water quality. This interim permitting approach may be modified as a result of the ongoing Urban Wet Weather Flows Federal Advisory Committee policy dialogue on this subject.

Qs & As FOR INTERIM PERMITTING APPROACH FOR WATER QUALITY-BASED EFFLUENT LIMITATIONS IN STORM WATER PERMITS

QUESTION 1: Must EPA require that storm water dischargers, industrial or municipal, be subject to numeric water quality-based effluent limitations (expressed as concentration and mass) in order to attain water quality standards (WQS)?

ANSWER 1: No. Although National Pollutant Discharge Elimination System (NPDES) permits must contain conditions to ensure that water quality standards are met, this does not require the use of numeric water quality-based effluent limitations. Under the Clean Water Act (CWA) and NPDES regulations, permitting authorities may employ a variety of conditions and limitations in storm water permits, including best management practices, performance objectives, narrative conditions, monitoring triggers, action levels (e.g., monitoring benchmarks, toxicity reduction evaluation action levels), etc., as the necessary water quality-based limitations, where numeric water quality-based effluent limitations are determined to be unnecessary or infeasible.

ANALYSIS:

A. The Clean Water Act does not require numeric effluent limitations.

Section 301 of the CWA requires that discharger permits include effluent limitations necessary to meet State or Tribal WQS. Section 502 defines "effluent limitation" to mean any restriction on quantities, rates, and concentrations of constituents discharged from point sources. The CWA does not say that effluent limitations need be numeric. As a result, EPA and States have flexibility in terms of how to express effluent limitations.

B. EPA's regulations do not always require numeric effluent limitations.

EPA has, through regulation, interpreted the statute to allow for non-numeric limitations (e.g., "best management practices" or BMPs, see 40 CFR 122.2) to supplement or replace numeric limitations in specific instances that meet the criteria specified at 40 CFR 122.44(k). This regulation essentially codifies a court case addressing storm water discharges. NRDC v. Costle, 568 F.2d 1369 (D.C. Cir. 1977). In that case, the Court stated that EPA need not establish numeric effluent limitations where such limitations were infeasible.

C. EPA has interpreted the statute and regulations to allow BMPs in lieu of numeric limitations.

EPA has defended use of BMPs as a substitute for numeric limitations in litigation involving storm water discharges (CBE v. EPA, 91-70056 (9th Cir.)(brief on merits)) and in correspondence (Letter from Michael Cook, EPA, to Peter Lehner, NRDC, May 31, 1995). EPA has found that numeric limitations for storm water permits can be very

difficult to develop at this time because of the existing state of knowledge about the intermittent and variable nature of these types of discharges and their effects on receiving waters. Some storm water permits, however, currently do contain numeric water quality-based effluent limitations where adequate information exists to derive such limitations.

QUESTION 2: Has EPA provided guidance on a methodology for deriving numeric water quality-based effluent limitations?

ANSWER 2: Yes, but primarily for continuous wastewater discharges at low flow conditions in the receiving water, not intermittent wet weather discharges during high flow conditions. Regulations at 40 CFR 122.44(d) specify the requirements under which permitting authorities establish water quality-based effluent limitations when a facility has the "reasonable potential" to cause or contribute to an excursion of numeric or narrative water quality criteria. In addition, EPA guidance in the Technical Support Document for Water Quality-Based Toxics Control (TSD) and the NPDES Permit Writers Training Manual, supplemented with total maximum daily load (TMDL) and modeling guidance, supports issuing permits that include numeric water quality-based effluent limitations. This guidance was based on crafting numeric water quality-based effluent limitations using TMDLs, or calculations similar to those used in developing TMDLs, and wasteload allocations (WLAs) derived through modeling. EPA expects the Urban Wet Weather Flows Federal Advisory Committee (60 FR 21189, May 1, 1995) will review this issue at greater length and may provide recommendations on how to proceed.

QUESTION 3: Why can numeric water quality-based effluent limitations be difficult to derive for storm water permits?

ANSWER 3: Storm water discharges are highly variable both in terms of flow and pollutant concentrations, and the relationships between discharges and water quality can be complex. The water quality impacts of storm water discharges are related to the uses designated by States and Tribes in their WQS, the quality of the storm water discharge (e.g., conventional or toxic pollutants conveyed to the receiving water) and quantity of the storm water (e.g., erosion and loss of habitat caused by increased flows and velocity). Uses may be impacted by both water quality and water quantity. Depending on site-specific considerations, some of the water quality impacts of storm water discharges may be more related to the physical effects (e.g. stream bank erosion, streambed scouring, extreme temperature variations, sediment smothering) than the type and amount of pollutants present in the discharge. For municipal storm water discharges in particular, the current use of system-wide permits and a variety of jurisdiction-wide BMPs, including educational and programmatic BMPs, does not easily lend itself to the existing methodologies for deriving numeric water quality-based effluent limitations. These methodologies

were designed primarily for process wastewater discharges which occur at predictable rates with predictable pollutant loadings under low flow conditions in receiving waters. Using these methodologies, limitations are typically derived for each specific outfall to be protective of low flows in the receiving water. Because of this, permit writers have not made wide-spread use of the existing methodologies and models for storm water discharge permits. In addition, wet weather modeling is technically more difficult and expensive than the simple dilution models generally used in the permitting process.

QUESTION 4: Has EPA previously recognized the technical difficulty in deriving numeric water quality-based effluent limitations for storm water discharges?

ANSWER 4: Yes. EPA recognized the technical difficulty in deriving numeric water quality-based effluent limitations for wet weather discharges in its brief on the merits in Citizens for a Better Environment (CBE) v. United States Environmental Protection Agency, 91-70056 (9th Cir.) and in the Great Lakes Water Quality Guidance (58 FR 20841, April 16, 1993).

In the CBE case, EPA explained why it was technically infeasible to derive numeric water quality-based effluent limitations for the discharge of metals in storm water into South San Francisco Bay and asserted that a water quality-based effluent limitation could take the form of a narrative statement, such as a BMP, if it was infeasible to derive a numeric limitation. In explaining its arguments in the CBE case, EPA cited 40 CFR 122.44(k)(2), which provides that BMPs may be imposed in NPDES permits "to control or abate the discharge of pollutants when ... (2) [numeric effluent limitations are infeasible."

In the Great Lakes Water Quality Guidance, EPA did not extend the method for calculating wasteload allocations, the basis for numeric water quality-based effluent limitations, to storm water or combined sewer overflow (CSO) discharges because the varying nature of these discharges is inconsistent with the assumptions used in developing the guidance. The Great Lakes Water Quality Guidance defers to national guidance and policy on wet weather and does not seek to establish a separate and distinct set of wet weather requirements. EPA expects the Urban Wet Weather Flows Advisory Committee to provide recommendations about how to address the broader technical issues involved in achieving compliance with WQS in a wet weather context.

QUESTION 5: What are the potential problems of using standard methodologies to derive numeric water quality-based effluent limitations for storm water permits?

ANSWER 5: Correctly derived numeric water quality-based effluent limitations provide a greater degree of confidence that a discharge will not cause or contribute to an exceedance of the WQS, because numeric water quality-based effluent limitations are derived directly from the numeric component of those standards. In addition, numeric water quality-based effluent limitations can avoid the expense associated with overly protective treatment technologies because numeric water quality-based effluent limitations provide a more precisely quantified target for permittees. Potential problems of incorporating inappropriate numeric water quality-based effluent limitations rather than BMPs in storm water permits at this time are significant in some cases. Deriving numeric water quality-based effluent limitations for any NPDES permit without an adequate effluent characterization, or an adequate receiving water exposure assessment (which could include the use of dynamic modeling or continuous simulations) may result in the imposition of inappropriate numeric limitations on a discharge. Examples of this include the imposition of numeric water quality criteria as end-of-pipe limitations without properly accounting for the receiving water assimilation of the pollutant or failure to account for a mixing zone (if allowed by applicable State or Tribal WQS). This could lead to overly stringent permit requirements, and excessive and expensive controls on storm water discharges, not necessary to provide for attainment of WQS. Conversely, an inadequate effluent characterization could lead to water quality-based effluent limitations that are not stringent enough to provide for attainment of WQS. This could result because effluent characterization and exposure assessments for discharges with high variability of pollutant concentrations, loadings, and flow are more difficult than with process wastewater discharges at low flows.

QUESTION 6: How are water quality-based effluent limitations developed for combined sewer overflow (CSO) discharges?

ANSWER 6: The CSO Control Policy issued by EPA on April 19, 1994 (59 FR 18688) provides direction on compliance with the technology-based and water quality-based requirements of the CWA for communities with combined sewer systems. The CSO Policy provides for implementation of technology-based requirements (expressed as "nine minimum controls") by January 1, 1997.

In addition, under the CSO Policy, communities are also expected to develop long-term control plans that will provide for attainment of WQS through either the "presumption approach" or the "demonstration approach." Under the presumption approach, CSO controls would be presumed to attain WQS if certain performance criteria are met. A program that meets the criteria specified in the CSO policy is presumed to provide an adequate level of control to meet the water quality-based requirements of the CWA, provided the permitting authority determines that such presumption is reasonable based on characterization,

monitoring, and modeling of the system, including consideration of sensitive areas. Under the demonstration approach, the permittee would demonstrate that the selected CSO controls, when implemented, would be adequate to meet the water quality-based requirements of the CWA.

The CSO Policy anticipates that it will be difficult in the early stages of permitting to determine whether numeric water quality-based effluent limitations are necessary for CSOs, and, if so, what the limitations should be. For that reason, in the absence of sufficient data to evaluate the need for numeric water quality-based effluent limitations, the Policy recommends that the first phase of CSO permits ("Phase I") contain a narrative requirement to comply with WQS. Further, so-called "Phase II" permits would contain water quality-based effluent limitations, as provided in 40 CFR 122.44(d)(1) and 122.44(k), that may take the form of numeric performance or design standards, such as a certain number of overflow events or a certain percent volume capture. Generally, only after the long-term control plan is in place and after collection of sufficient water quality data (including applicable wasteload allocations developed during a TMDL process) would numeric water quality-based effluent limitations be included in the permit. This would likely occur only after several permitting cycles.

QUESTION 7: If BMPs alone are demonstrated to provide adequate water quality protection, are additional controls necessary?

ANSWER 7: No. If the permitting authority determines that, through implementation of appropriate BMPs required by the NPDES storm water permit, the discharges have the necessary controls to provide for attainment of WQS and any technology-based requirements, additional controls need not be included in the permit. Conversely, if a discharger (municipal or industrial) fails or refuses to adopt and implement adequate BMPs , the permitting authority may have to consider other approaches to ensure water quality protection.

If, however, the permitting authority has adequate information on which to base more specific conditions or limitations, such limitations are to be incorporated into storm water permits, as necessary and appropriate. Such conditions or limitations may include an integrated suite of BMPs, performance objectives, narrative standards, monitoring triggers, numeric water quality-based effluent limitations, action levels, etc. Storm water permits may also need to include additional requirements to receive State or Tribal 401 certifications.

QUESTION 8: What is EPA doing to develop information about the linkage between BMPs and water quality and to facilitate a watershed-based approach to storm water permitting?

ANSWER 8: The Agency has cooperative agreements with WERF (Water Environment Research Foundation) and ASCE (American Society of Civil Engineers) to research which BMPs are most effective under which circumstances. The results of this research should provide permitting authorities and permittees with information about how to evaluate the effectiveness of different kinds of BMPs in different circumstances and to select the most appropriate controls to achieve water quality objectives. EPA also has cooperative agreements with the Watershed Management Institute and other organizations to conduct research over the next two to four years that will examine the capability of storm water BMPs to improve receiving water quality and restore/protect the biological integrity of those waters. EPA expects the Urban Wet Weather Flows Federal Advisory Committee to provide recommendations on how to permit storm water discharges on a watershed basis.

QUESTION 9: The interim permitting approach states that permits should include monitoring programs to generate necessary information to determine the extent to which permits are providing for the attainment of water quality standards. What types of monitoring should be included and how much monitoring is necessary?

ANSWER 9: The amount and types of monitoring necessary will vary depending on the individual circumstances of each storm water discharge. EPA encourages dischargers and permitting authorities to carefully evaluate monitoring needs and storm water program objectives so as to select useful and cost-effective monitoring approaches. For most dischargers, storm water monitoring can be conducted for two basic reasons: 1) to identify if problems are present, either in the receiving water or in the discharge, and to characterize the cause(s) of such problems; and 2) to assess the effectiveness of storm water controls in reducing contaminants and making improvements in water quality.

Under the NPDES storm water program, large and medium municipal separate storm sewer system permittees are required to conduct monitoring. EPA recommends that each such municipal permittee design the monitoring effort to be supportive of the goals and objectives of its storm water management program when developing such a program for the term of its NPDES permit. To accomplish this, a municipal permittee may use a variety of storm water monitoring tools including receiving water chemistry; receiving water biological assessments (benthic invertebrate surveys, fish surveys, habitat assessments, etc.); effluent monitoring; including chemical, whole effluent and visual examinations; illicit connections screening; and combinations thereof, or other methods. Techniques that assess receiving waters will help to identify the degree to which storm water discharges are contributing to any water quality

problems. Techniques that assess storm water discharge characteristics will help to identify potential causes of any identified water quality problems. The municipal permittee, in conjunction with the applicable NPDES permitting authority, should determine which monitoring approaches would be most appropriate given the objectives of the storm water management program. If municipal permittees conduct ambient monitoring, it may be most cost-effective to pool resources with other organizations (including, for example, other municipalities, States, and Tribes) conducting monitoring within the same watershed. This could be best accomplished through a coordinated watershed monitoring strategy.

For industrial storm water dischargers, monitoring may be required under the terms of an NPDES permit for storm water discharges. For those industrial storm water permits that do require monitoring, this is typically done to characterize contaminants that might be found in the industrial runoff and/or to assess the effectiveness of the industrial storm water pollution prevention plan in reducing these contaminants. This typically involves end-of-pipe chemical-specific monitoring. End-of-pipe monitoring may be more appropriate for an industrial facility than for a municipal permittee, given the industrial facility's more discrete site characteristics, which make management strategies such as collection and treatment more feasible. Industries, for the most part, have readily defined storm water conveyances into which runoff flows from discrete drainage areas. Industries may more readily identify and control existing on-site sources of storm water contamination or provide collection and treatment within these discrete drainage areas to control pollutant concentrations in their storm water discharges.

EPA and other organizations are currently working to improve approaches for monitoring storm water and the potential effects upon water quality. These new approaches are called storm water program "environmental indicators." Environmental indicators are designed to be more meaningful monitoring tools that storm water dischargers can use to conduct storm water monitoring for the purposes described above. A manual describing each of the recommended storm water program environmental indicators is being prepared by the Center for Watershed Protection in Silver Spring, Maryland. That manual is expected to be ready by the end of August 1996 and should provide useful information for storm water dischargers contemplating the need to develop a cost-effective, meaningful storm water monitoring program. In addition, EPA expects the Urban Wet Weather Flows Federal Advisory Committee to provide recommendations on how to better monitor storm water and other wet weather discharges using a watershed approach.

QUESTION 10: Does this interim permitting approach apply to both storm water discharges associated with industrial activity and storm water discharges from municipal separate storm sewer systems?

ANSWER 10: Yes. The interim permitting approach is applicable to both discharges from municipal separate storm sewer systems and storm water discharges associated with industrial activity (as defined by 40 CFR 122.26(b)(14)). The interim permitting approach would not affect, however, permits that already incorporate appropriately derived numeric water quality-based effluent limitations. Since the interim permitting approach only addresses water quality-based effluent limitations, it also does not affect technology-based effluent limitations, such as those based on effluent limitations guidelines or developed using best professional judgement, that are incorporated into storm water permits. In addition, particularly for some industries, adequate information may already have been collected with which to assess the reasonable potential for a storm water discharge to cause or contribute to an excursion of a WQS, and from which a numeric water quality-based effluent limitation can be (or has been) appropriately derived. An adequate amount of storm water pollutant source information may also exist with which to assess the effectiveness of the industrial storm water control measures in complying with the limitations and in reducing storm water contaminants for protecting water quality.

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Environmental Protection
Agency

Office Of Water
(EN-336)

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July 1992

VANATTA

EPA

NPDES Storm Water Sampling Guidance Document

Printed on Recycled Paper

DISCLAIMER

This document was issued in support of EPA regulations and policy initiatives involving the development and implementation of a national storm water program. This document is agency guidance only. It does not establish or affect legal rights or obligations. Agency decisions in any particular case will be made applying the laws and regulations on the basis of specific facts when permits are issued or regulations promulgated. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

Pollutants in storm water discharges from many sources are largely uncontrolled. The National Water Quality Inventory, 1990 Report to Congress provides a general assessment of water quality based on biennial reports submitted by the States under Section 305(b) of the Clean Water Act. The report indicates that roughly 30% of identified cases of water quality impairment reported by the States are attributable to storm water discharges.

Sampling data from storm water discharges is an important tool which provides information on the types and amounts of pollutants present. This data can then be used to identify pollutant sources and to develop storm water pollution prevention plans and best management practices priorities to control these sources.

This manual is for operators of facilities that discharge storm water associated with industrial activity and operators of large and medium municipal separate storm sewer systems. This manual describes the basic sampling requirements for NPDES storm water discharge permit applications and provides procedural guidance on how to conduct sampling. Many of the concepts in this guidance may also be applicable to sampling requirements contained in NPDES storm water permits.

This document was issued in support of EPA regulations and policy initiatives involving the development and implementation of a national storm water program. This document is agency guidance only. It does not establish or affect legal rights or obligations. Agency decisions in any particular case will be made applying the laws and regulations on the basis of specific facts when permits are issued or regulations promulgated.

This document is expected to be revised periodically to reflect advances in this rapidly evolving area. Comments from users are welcomed. Send comments to the U.S. Environmental Protection Agency, Office of Wastewater Enforcement and Compliance, 401 M Street, SW, Mailcode EN-336, Washington, DC 20460.

Michael Cook,
Director
Office of Wastewater Enforcement
and Compliance

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NPDES STORM WATER SAMPLING GUIDANCE DOCUMENT

1. INTRODUCTION

The 1972 Federal Water Pollution Control Act [(FWPCA), also referred to as the Clean Water Act (CWA)] prohibits the discharge of any pollutant to waters of the U.S. from a point source unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Efforts to improve water quality under the NPDES program have focused traditionally on reducing pollutants in industrial process wastewater discharges and from municipal sewage treatment plants. Past efforts to address storm water discharges, in particular through the NPDES program, have generally been limited to certain industrial categories, using effluent limitations for storm water as a permit condition.

Recognizing the need for more comprehensive control of storm waters discharges, Congress amended the CWA in 1987 and established a two-phase program. In Phase I, Congress required the U.S. Environmental Protection Agency (EPA) to establish NPDES requirements for certain classes of storm water discharges.

- A storm water discharge for which a permit has been issued prior to February 4, 1987
- A storm water discharge associated with industrial activity
- A storm water discharge from a municipal separate storm sewer system serving a population of 250,000 or more (large system)
- A storm water discharge from a municipal separate storm sewer system serving a population of 100,000 or more, but less than 250,000 (medium system)
- A discharge for which the Administrator or the State determines that the storm water discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to the waters of the United States.

To implement these requirements, EPA published on November 16, 1990 (55 Fed. Reg. 47990), permit application requirements that include storm water sampling. EPA and the States will subsequently issue NPDES storm water permits based on these applications, and many of these

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permits will require storm water sampling. Congress intended for EPA to address all other point source discharges of storm water in Phase II of the program.

1.1 PURPOSE OF THIS MANUAL

This manual is for operators of facilities that discharge storm water associated with industrial activity and operators of large and medium municipal separate storm sewer systems. Storm water sampling is sometimes difficult due to the unpredictability of storm events and the variable nature of storm water discharges. This manual is primarily designed to assist operators/owners in planning for and fulfilling the NPDES storm water discharge sampling requirements for permit applications as well as for other storm water sampling needs.

It is assumed that applicants already have a basic understanding of the storm water permit application requirements. This document is designed to supplement existing storm water application guidance by focusing on the technical aspects of sampling. Since many industrial storm water permits and all municipal storm water permits will require regular storm water sampling, many of the concepts in this guidance may be applicable to sampling requirements contained in NPDES storm water permits.

The information in this manual pertains specifically to individual industrial storm water applications, group storm water applications (Part 2), and municipal Part 2 storm water permit applications for storm water discharges. For information on other storm water application requirements for industrial facilities and large and medium municipal separate storm sewer systems, see EPA's Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity (EPA-505/8-91-002, NTIS # PB-92-199058, April 1991), and EPA's Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems (EPA-505/8-91-003A, NTIS # PB-92-114578, April 1991), respectively. These manuals can be requested by calling the National Technical Information Service (NTIS) **[(703) 487-4650]**. Additional background documents for further information are listed in Technical Appendix D.

1.2 ORGANIZATION OF THIS MANUAL

This manual explains the basic requirements of storm water sampling and provides procedural guidance on sampling for permit applications. Chapter 2 discusses background information (i.e., a

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summary of permit application requirements, who must sample, when and where to sample, and staffing considerations). Chapter 3 presents the fundamentals of sampling (i.e., types of sampling, obtaining flow data, handling samples, and sending them to the laboratory). Chapter 4 presents analytical considerations, including the storm water pollutants that must be analyzed under the regulations. Chapter 5 discusses regulatory flexibility with respect to storm water sampling, and Chapter 6 includes health and safety considerations.

Technical Appendices provide information as follows:

- Technical Appendix A—Forms 2F and 1
- Technical Appendix B—NOAA Weather Radio Information
- Technical Appendix C—Required Containers, Preservation Techniques, Holding Times and 40 Code of Federal Regulations (CFR) Part 136
- Technical Appendix D—References
- Technical Appendix E—Glossary
- Technical Appendix F—Acronyms.

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2. BACKGROUND FOR STORM WATER SAMPLING

This chapter presents background information, definitions, and a description of the fundamentals of sampling. Specifically, it covers the following areas:

- The benefits of sampling
- A summary of storm water application regulations
- Who must sample
- When sampling is required
- Where to sample
- Staffing considerations

In response to the 1987 Water Quality Act amendments to the CWA, EPA published the storm water final rule on November 16, 1990. In this rule, EPA established the initial scope of the storm water program by defining the phrase "storm water discharge associated with industrial activity" in terms of 11 categories of industrial activity and the phrase "large and medium municipal separate storm sewer systems" to include municipal systems serving a population greater than 100,000. These terms are discussed in greater detail in Section 2.6, "Who Must Sample."

In addition to defining the initial scope of the storm water program, the final rule established permit application requirements, including requirements for storm water sampling. Sampling data gathered for the application will be used to characterize storm water discharges, and will serve as a basis for establishing requirements in NPDES storm water permits. It is important to note that the applicant must report data that are representative of the storm water discharge, and that the intentional misrepresentation of discharge characteristics is unlawful.

2.1 BENEFITS OF SAMPLING

Data that characterize storm water discharges are valuable to permitting authorities and permittees for several reasons. First, storm water sampling provides a means for evaluating the environmental risk of the storm water discharge by identifying the types and amounts of pollutants present. Evaluating these data helps to determine the relative potential for the storm water discharge to contribute to water quality impacts or water quality standard violations. And, storm water sampling

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data can be used to identify potential sources of pollutants. These sources can then be either eliminated or controlled more specifically by the permit.

2.2 INDUSTRIAL FACILITY APPLICATION REQUIREMENTS

The storm water permit application regulations provide operators of facilities (including those owned by the government) that have storm water discharges associated with industrial activity with three application options: (1) submit an individual application; (2) participate in a group application (a two-part application); or (3) submit a Notice of Intent (NOI) to be covered by a general permit where general permits are available. This guidance focuses on sampling requirements for individual applications and Part 2 of group applications. Sampling data generally will not be required for an NOI, however, the general permit may require sampling during the term of the permit. State permitting authorities may also require sampling information for an NOI at their discretion, and should, therefore, be consulted prior to submittal.

Industrial facilities submitting individual applications must submit sampling data on a completed application Form 2F (entitled "Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity"). Facilities selected to be part of the sampling subgroup for a group application must submit sampling data with Part 2 of the application. Members of the sampling subgroup must complete only the quantitative data portions of Form 2F, including Sections VII, VIII, IX, and the certification in Section X. Exhibit 2-1 details the types of information required for each section of Form 2F. Exhibit 2-2 describes what sampling information must be provided in Part 2 of the group application. It should be noted that States may require the use of different forms and submittal of additional documentation.

Form 1 must also be submitted with Form 2F by applicants submitting individual permit applications. General information about the facility is provided on Form 1 (i.e., addresses, operators, etc.); it does not request sampling data. Forms 1 and 2F are reproduced in Technical Appendix A.

Facilities with unpermitted combined discharges of storm water and process or nonprocess wastewater must submit Form 2C or 2E, respectively, in addition to Forms 1 and 2F. Facilities with storm water discharges combined with new sources or new discharges of process wastewater must submit Form 2D as well as Forms 1 and 2F.

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EXHIBIT 2-1. FORM 2F APPLICATION REQUIREMENTS	
Section	**Requirement**
2F-I	Outfall location(s), including longitude and latitude and receiving water(s)
2F-II	Facility improvements which may affect the discharges described in the application
2F-III	Site drainage map
2F-IVA	Estimates of impervious area within each outfall drainage area
2F-IVB	A narrative description of pollutant sources (i.e., onsite materials which may come in contact with storm water runoff)
2F-IVC	Location and description of existing structural and nonstructural pollutant control measures
2F-VA	Certification that outfalls have been tested or evaluated for non-storm water discharges
2F-VB	Description of method used for testing/evaluating presence of non-storm water discharges
2F-VI	History of significant leaks or spills of toxic or hazardous pollutants at the facility within the last 3 years
2F-VII	Discharge characterization for all required pollutants
2F-VIII	Statement of whether biological testing for acute or chronic toxicity was performed and list of pollutants it was performed for
2F-IX	Information on contract laboratories or consulting firms
2F-X	Certification that information supplied is accurate and complete
Note: See Form 2F and the instructions for more detail on application requirements.	

2.3 MUNICIPALITIES' APPLICATION REQUIREMENTS

Operators of large and medium municipal separate storm sewer systems are required to submit a two-part application. Both parts contain sampling requirements: Part 1 requires information characterizing discharges from the separate storm sewer system, including field screening sample data for identifying illicit/illegal connections; Part 2 requires sampling at representative locations and estimates of pollutant loadings for those sites. These sampling data are to be used to design a long-term storm water monitoring plan that will be implemented during the term of the permit. The sampling data that must be submitted in Parts 1 and 2 of municipal applications are listed in Exhibit 2-3. There is no standard application form for municipalities.

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EXHIBIT 2-2. PART 2 GROUP APPLICATION SAMPLING REQUIREMENTS

Quantitative Testing Data

- For groups with 4 to 20 members, 50 percent of the facilities must submit data; for groups with 21 to 99 members, a minimum of 10 dischargers must submit quantitative data; for groups with 100 to 1,000 members, a minimum of 10 percent of the facilities must submit data; for groups with greater than 1,000 members, no more than 100 facilities must submit data; there must be 2 dischargers from each precipitation zone in which 10 or more members of the group are located, or 1 discharger from each precipitation zone in which 9 or fewer members are located.
- Sampling and analysis requirements are described in 40 Code of Federal Regulations (CFR) 122.26(c)(1)(i)(E) and 40 CFR 122.21(g)(7). Pollutants to be analyzed depend on the type(s) of industries applying as a group.
- Sampling subgroup must provide all quantitative discharge information required in Form 2F Sections VII-IX plus the certification in Section X.
- The group application sampling subgroup must collect grab samples during the first 30 minutes of the storm event and flow-weighted composite samples as required in 40 CFR 122.21(g)(7).

2.4 APPLICATION SUBMITTAL DEADLINES

Deadlines for submitting permit applications and associated sampling requirements are presented in Exhibit 2-4 for individual and group industrial applications and for municipal applications.

2.5 WHERE TO SUBMIT APPLICATIONS

Storm water discharge permit applications are generally submitted directly to the permit-issuing authority. The appropriate authority is the State, where the State has been granted the authority to issue NPDES permits, or the EPA Regional office, where the State does not have NPDES authorization. Exhibit 2-5 indicates which States have approved NPDES permitting programs. It also provides contact names and addresses where applications should be submitted for each State or EPA Regional Office (depending on who the permitting authority is in each case). It should be noted, however, that both parts of a group application must instead be submitted to EPA Headquarters. Group applications must be sent to: Director, Office of Wastewater Enforcement and Compliance, Attention Mr. William Swietlik, U.S. EPA, EN-336, 401 M Street, SW, Washington, DC 20640.

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EXHIBIT 2-3. MUNICIPAL APPLICATION SAMPLING REQUIREMENTS

Part 1

- Monthly mean rainfall and snowfall estimates
- Existing quantitative data on the depth and quality of storm water discharges
- A list of receiving water bodies and existing information concerning known water quality impacts
- Field screening analysis for illicit connections and illegal dumping
- Identification of representative outfalls for further sampling in Part 2

Part 2

- Quantitative data from 5 to 10 representative locations in approved sampling plans
- Estimates of the annual pollutant load and event mean concentration (EMC) of system discharges
- Proposed schedule to provide estimates of seasonal pollutant loads and the EMC for certain detected constituents in a representative storm event during the term of the permit
- Proposed monitoring program for representative data collection during the term of the permit

Applications submitted by industrial facilities must be certified by a responsible corporate officer as described in 40 CFR 122.22 (e.g., president, secretary, treasurer, vice president of the corporation in charge of a principal business function). Applications submitted by municipalities must be certified by a principal executive officer or ranking elected official as described in 40 CFR 122.22.

2.6 WHO MUST SAMPLE

Operators of facilities that have storm water discharges associated with industrial activity and operators of large and medium municipalities are required to conduct storm water sampling as part of their NPDES permit applications. Specifically, the following types of industries and municipalities must sample storm water discharges:

EXHIBIT 2-4. PERMIT APPLICATION SUBMISSION DEADLINES

	Date	Sampling Requirement
Industrial		
Individual	October 1, 1992	Sampling data due
Group		
• Part 1	September 30, 1991	Sampling subgroup identified
• Part 2	October 1, 1992	Sampling data due
Municipal		
Large Municipalities		
• Part 1	November 18, 1991	Illicit connection screening due and identification of sampling points
• Part 2	November 16, 1992	Effluent characterization due Monitoring management program identified
Medium Municipalities		
• Part 1	May 18, 1992	Illicit connection screening due and identification of sampling points
• Part 2	May 17, 1993	Effluent characterization due Monitoring management program identified

*NOI under a general permit is due on October 1, 1992 or the date specified in the permit, whichever comes first.

- Storm Water Discharges Associated With Industrial Activities - Under Phase I, the storm water permit application regulations identify, by Standard Industrial Classification (SIC) code and narrative description, 11 categories of facilities considered to be "engaging in industrial activity" for the purposes of storm water permit application requirements. Those facilities included in 40 CFR 122.26(b)(14)(i) through (xi) of the storm water permit application regulations with storm water point source discharges to waters of the U.S. or separate storm sewers and those designated under Section 402(p)(2)(E) of the CWA are required to apply for storm water permit coverage by October 1, 1992. Industrial facilities include those that are Federally, State, or municipally owned or operated. Exhibit 2-6 lists these industrial facilities. The Transportation Act of 1991 provides an exemption from storm water permitting requirements for certain industrial activities owned or operated by municipalities with a population of less than 100,000. Such municipalities must submit storm water discharge permit applications for only airports, power plants, and uncontrolled sanitary landfills that they own or operate, unless a permit is otherwise required by the permitting authority.

- Municipal Separate Storm Sewer Systems - Under Phase I, those municipalities with separate storm sewer systems serving 100,000 people or more are required to submit an application for discharges from the system. (Only the part of the population served by municipal separate storm sewers is to be included in the 100,000 count, not the part served by combined sewers.) Regulated municipalities are listed in Appendices F through I in the November 16, 1990, final rule or have been designated by their permitting authority.

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES

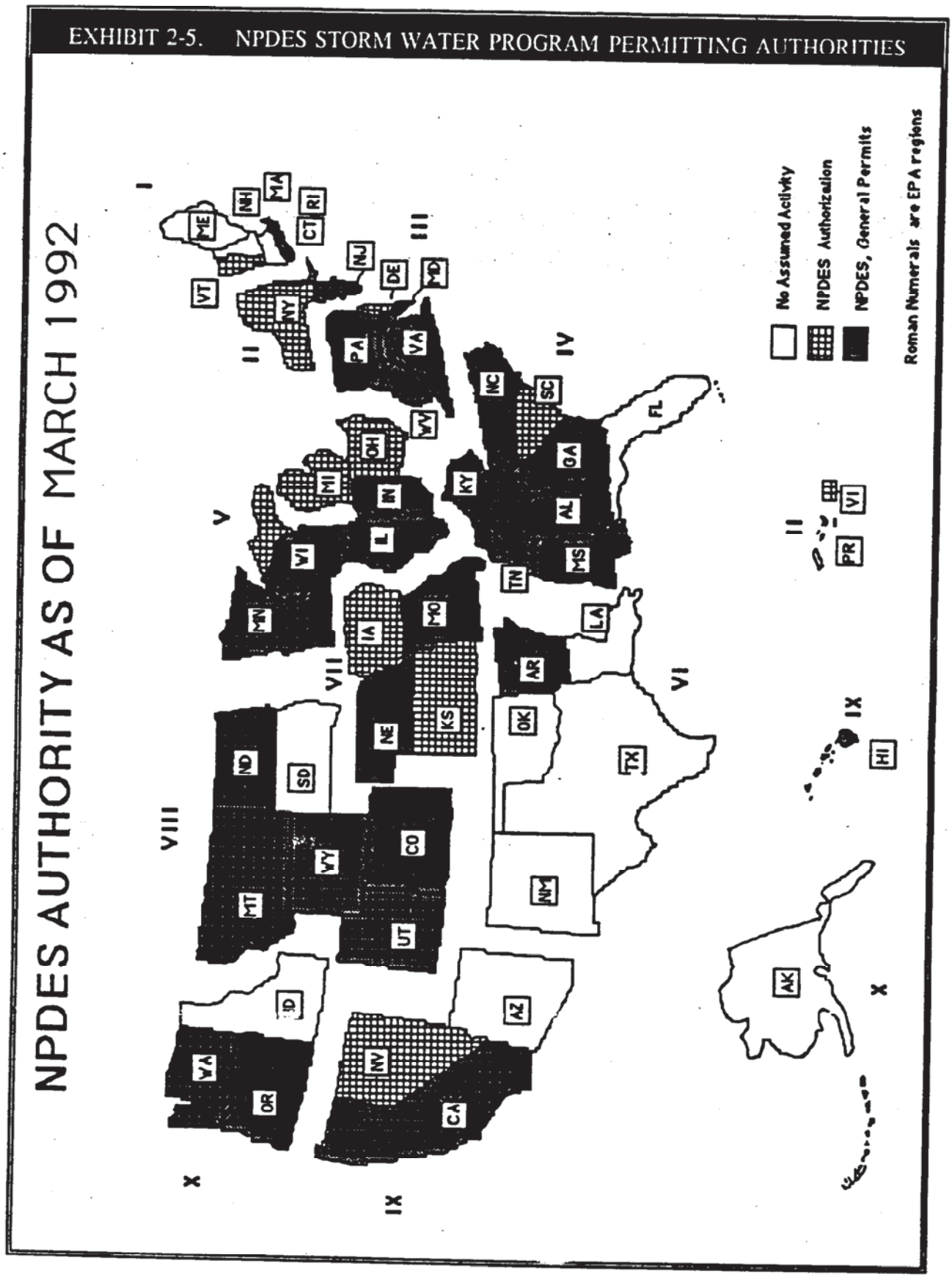

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact
Alabama	yes	Aubrey White Water Division 1751 Dickinson Dr. Montgomery, AL 36130 (205) 271-7811
Arizona	no	Eugene Bromley U.S. EPA Region 9 75 Hawthorne St. W-5-1 San Francisco, CA 94105 (415) 744-1906
California	yes	Archie Matthews Storm Water Research Control Board Water Quality 901 P St. Sacramento, CA 95814 (916) 657-1110
Connecticut	yes	Dick Mason Dept. of Environmental Protection Water Management Bureau Water Discharge Management 165 Capitol Ave. Hartford, CT 06106 (203) 566-7167
Florida	no	Chris Thomas U.S. EPA Region 4 345 Courtland St. N.E. 4WM-FP Atlanta, GA 30365 (404) 347-3633
Hawaii	yes	Steve Chang Dept. of Health Clean Water Branch Five Water Front Plaza #500 Ala-Moana Blvd. Honolulu, HI 96813 (808) 586-4309
Illinois	yes	Tim Kluge EPA Water Pollution Control 2200 Churchill Rd. P.O. Box 19276 Springfield, IL 62794-9276 (217) 782-0610
Iowa	yes	Monica Wnuk Department of Natural Resources Wallace State Building 900 E. Grand St. Des Moines, IA 50319-0034 (515) 281-7017
Alaska	no	Steve Bubnick U.S. EPA Region 10 1200 6th Ave. WD-134 Seattle, WA 98101 (206) 553-8399
Arkansas	yes	Marysia Jastrzebski 8001 National Dr. P.O. Box 8913 Little Rock, AR 72219-8913 (501) 562-7444
Colorado	yes	Patricia Nelson Dept. of Health Water Quality Control 4210 E. 11th Ave. Denver, CO 80220 (303) 331-4590
Delaware	yes	Sarah Cooksey Dept. of Natural Resources Surface Water Management 89 Kings Highway P.O. Box 1401 Dover, DE 19903 (302) 739-5731
Georgia	yes	Mike Creason Dept. of Natural Resources Environmental Protection 205 Butler St. S.E. Room 1070 Atlanta, GA 30334 (404) 656-4887
Idaho	no	Steve Bubnick U.S. EPA Region 10 1200 6th Ave. WD-134 Seattle, WA 98101 (206) 553-8399
Indiana	yes	Lonnie Brumfield Dept. of Environmental Management NPDES Permits Group 105 S. Meridian St. P.O. Box 6015 Indianapolis, IN 46206 (317) 232-8705
Kansas	yes	Don Carlson Dept. of Environment Water Bureau Forbes Field, Building 740 Topeka, KS 66620 (913) 296-5555

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EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact
Kentucky	yes	Douglas Allgeier Dept. of Environmental Protection Water Division 18 Reilly Road Frankfort, KY 40601 (502) 564-3410
Maine	no	Shelley Puleo U.S. EPA Region 1 U.S. EPA/JFK Building/WCP Boston, MA 02203 (617) 565-3525
Massachusetts	no	Shelley Puleo U.S. EPA Region 1 U.S. EPA/JFK Building/WCP Boston, MA 02203 (617) 565-3525
Minnesota	yes	Scott Thompson Pollution Control Agency 520 Lafayette Rd. St. Paul, MN 55155-3898 (612) 296-7203
Missouri	yes	Bob Hentges Dept. of Natural Resources Water Pollution Control Program 205 Jefferson St. P.O. Box 176 Jefferson City, MO 65102 (314) 751-6825
Nebraska	yes	Clark Smith Environmental Control Water Quality Division P.O. Box 98922 Lincoln, NE 68509 (402) 471-4239
New Hampshire	no	Shelley Puleo U.S. EPA Region 1 U.S. EPA/JFK Building/WCP Boston, MA 02203 (617) 565-3525
New Mexico	no	Brent Larson U.S. EPA Region 6 1445 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175
Louisiana	no	Brent Larson U.S. EPA Region 6 1455 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175
Maryland	yes	Edward Gertler MD Dept. of Environment Industrial Discharge Program 2500 Broening Highway Baltimore, MD 21224 (410) 631-3323
Michigan	yes	Gary Boersen Dept. of Natural Resources Surface Water Division P.O. Box 30028 Lansing, MI 48909 (517) 373-1982
Mississippi	yes	Jerry Cain Dept. of Environmental Quality Office of Pollution Control Industrial Waste Water Branch P.O. Box 10385 Jackson, MS 39289-0385 (601) 961-5171
Montana	yes	Fred Shewman Water Quality Bureau Cogswell Building Helena, MT 59620 (406) 444-2406
Nevada	yes	Rob Saunders Conservation and Natural Resources Environmental Protection 123 W. Nye Lane Carson City, NV 89710 (702) 687-4670
New Jersey	yes	Sandra Cohen NJ DEPE Office of Regulatory Policy CN029 Trenton, NJ 08625-0029 NJ Hotline: (609) 633-7021
New York	yes	Ken Stevens Wastewater Facilities Design NY State DEC 50 Wolf Road Albany, NY 12233 (518) 457-1157

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact
North Carolina	yes	Coleen Sullins Environmental Management Water Quality Planning P.O. Box 29535 Raleigh, NC 27626-0535 (919) 733-5083
Ohio	yes	Bob Phelps OEPA Water Pollution Control P.O. Box 1049 1800 Watermark Columbus, OH 43266 (614) 644-2034
Oregon	yes	Ranei Nomura DEQ-Water Quality 811 SW 6th St. Portland, OR 97204 (503) 229-5256
Puerto Rico	no	José Rivera U.S. EPA Region 2 Water Permits & Compliance Branch 26 Federal Plaza, Room 845 New York, NY 10278 (212) 264-2911
South Carolina	yes	Birgot McDade Dept. of Health & Env. Ctrl. Industry and Agriculture Waste Water Division 2600 Bull St. Columbia, SC 29201 (803) 734-5241
Tennessee	yes	Robert Haley Dept. of Environment Water Pollution Control 150 9th Ave. N., 4th Floor Nashville, TN 37243-1534 (615) 741-3075
Utah	yes	Harry Campbell Dept. of Environmental Quality P.O. Box 16690 Salt Lake City, UT 84116 (801) 538-6146
North Dakota	yes	Sheila McClenathan Dept. of Health Water Quality Division 1200 Missouri Ave. P.O. Box 5520 Bismarck, ND 58502-5520 (701) 221-5210
Oklahoma	no	Brent Larson U.S. EPA Region 6 1445 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175
Pennsylvania	yes	R.B. Patel Environmental Resources Water Quality Management P.O. Box 2063 Harrisburg, PA 17120 (717) 787-8184
Rhode Island	yes	Angela Liberti Division of Water Resources 291 Promenade St. Providence, RI 02908 (401) 277-6519
South Dakota	no	Vern Berry U.S. EPA Region 8 999 18th St. 8-WM-C Denver, CO 80202-2466 (303) 293-1630
Texas	no	Brent Larson U.S. EPA Region 6 1445 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175
Vermont	yes	Brian Koiker Environmental Conservation Permits and Compliance 103 S. Main St. Annex Building Waterbury, VT 05671-0405 (802) 244-5674

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EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact
Virgin Islands	yes	Marc Pacifico Dept. of Planning & Natural Resources 1118 Watergut Project Christiansted St. Croix, VI 00820-5065 (809) 773-0565
Washington	yes	Gary Kruger Dept. of Ecology Water Quality Division P.O. Box 47600 Olympia, WA 98504-7600 (206) 438-7529
West Virginia	yes	Jerry Ray Division of Water Resources 1201 Greenbriar St. Charleston, WV 25311 (304) 348-0375
Wyoming	yes	John Wagner Dept. of Environmental Quality Herschler Building, 4th Floor Cheyenne, WY 82002 (307) 777-7082
Virginia	yes	Burton Tuxford Water Control Board Permits Section P.O. Box 11143 Richmond, VA 23230-1143 (804) 527-5083
Washington D.C.	no	Kevin Magerr U.S. EPA Region 3 841 Chestnut Bldg. 3WM53 Philadelphia, PA 19107 (215) 597-1651
Wisconsin	yes	Anne Mauel Dept. of Natural Resources Wastewater Management P.O. Box 7921 Madison, WI 53707 (608) 267-7364

2.7 WHEN SAMPLING IS REQUIRED

Industrial individual and group applicants must include sampling data from at least one representative storm event. Operators of large or medium municipal separate storm sewer systems must submit sampling data from three different representative storm events. How to determine "representativeness" and other considerations for when to sample are presented below.

2.7.1 STORM EVENT CRITERIA

Storm water discharge permit application requirements establish specific criteria for the type of storm event that must be sampled:

- The depth of the storm must be greater than 0.1 inch accumulation
- The storm must be preceded by at least 72 hours of dry weather
- Where feasible, the depth of rain and duration of the event should not vary by more than 50 percent from the average depth and duration.

EXHIBIT 2-6. INDUSTRIAL FACILITIES WHICH MUST SUBMIT APPLICATIONS FOR STORM WATER PERMITS

40 CFR 122.26(b)(14) Subpart	Description
(i)	Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutants effluent standards under 40 CFR, Subchapter N [except facilities which are exempt under category (xi)].
(ii)	Facilities classified as: SIC 24 (except 2434) . . . . . Lumber and Wood Products SIC 26 (except 265 and 267) . Paper and Allied Products SIC 28 (except 283 and 285) . Chemicals and Allied Products SIC 29 . . . . . Petroleum and Coal Products SIC 311 . . . . . Leather Tanning and Finishing SIC 32 (except 323) . . . . . Stone, Clay and Glass Products SIC 33 . . . . . Primary Metal Industries SIC 3441 . . . . . Fabricated Structural Metal SIC 373 . . . . . Ship and Boat Building and Repairing
(iii)	Facilities classified as SIC 10 through 14, including active or inactive mining operations and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with, or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts, or waste products located on the site of such operations. SIC 10 . . . . . Metal Mining SIC 11 . . . . . Anthracite Mining SIC 12 . . . . . Coal Mining SIC 13 . . . . . Oil and Gas Extraction SIC 14 . . . . . Nonmetallic Minerals, except Fuels
(iv)	Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA).
(v)	Landfills, land application sites, and open dumps that receive or have received any industrial wastes including those that are subject to regulation under subtitle D or RCRA.
(vi)	Facilities involved in the recycling of material, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as: SIC 5015 . . . . . Motor Vehicle Parts, Used SIC 5093 . . . . . Scrap and Waste Materials
(vii)	Steam electric power generating facilities, including coal handling sites.
(viii)	Transportation facilities which have vehicle maintenance shops, equipment cleaning operations, or airport de-icing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fuelling, and lubrication), equipment cleaning operations, or airport de-icing operations, or which are otherwise listed in another category, are included. SIC 40 . . . . . Railroad Transportation SIC 41 . . . . . Local and Suburban Transit SIC 42 (except 4221-25) . . . . Motor Freight and Warehousing SIC 43 . . . . . U.S. Postal Service SIC 44 . . . . . Water Transportation SIC 45 . . . . . Transportation by Air SIC 5171 . . . . . Petroleum Bulk Stations and Terminals

EXHIBIT 2-6. INDUSTRIAL FACILITIES WHICH MUST SUBMIT APPLICATIONS FOR STORM WATER PERMITS (Continued)

40 CFR 122.26(b)(14) Subpart	Description
(ix)	Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of the sewage sludge that are located within the confines of the facility, with a design flow of 1.0 million gallons per day or more, or required to have an approved pretreatment program under 40 CFR Part 403. Not included are farm lands, domestic gardens, or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with Section 405 of the CWA.
(x)	Construction activity including clearing, grading, and excavation activities except operations that result in the disturbance of less than 5 acres of total land area and those that are not part of a larger common plan of development or sale.*
(xi)	Facilities under the following SICs [which are not otherwise included in categories (ii)-(x)], including only storm water discharges where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, byproducts, or industrial machinery are exposed to storm water.* SIC 20 . . . . . Food and Kindred Products SIC 21 . . . . . Tobacco Products SIC 22 . . . . . Textile Mill Products SIC 23 . . . . . Apparel and Other Textile Products SIC 2434 . . . . . Wood Kitchen Cabinets SIC 25 . . . . . Furniture and Fixtures SIC 265 . . . . . Paperboard Containers and Boxes SIC 267 . . . . . Converted Paper and Paper Board Products (except containers and boxes) SIC 27 . . . . . Printing and Publishing SIC 283 . . . . . Drugs SIC 285 . . . . . Paints, Varnishes, Lacquer, Enamels SIC 30 . . . . . Rubber and Misc. Plastics Products SIC 31 (except 311) . . . . . Leather and Leather Products SIC 323 . . . . . Products of Purchased Glass SIC 34 (except 3441) . . . . . Fabricated Metal Products SIC 35 . . . . . Industrial Machinery and Equipment, except Electrical SIC 36 . . . . . Electronic and Other Electric Equipment SIC 37 (except 373) . . . . . Transportation Equipment SIC 38 . . . . . Instruments and Related Products SIC 39 . . . . . Miscellaneous Manufacturing Industries SIC 4221 . . . . . Farm Products Warehousing and Storage SIC 4222 . . . . . Refrigerated Warehousing and Storage SIC 4225 . . . . . General Warehousing and Storage

Source: Federal Register, Vol. 55, No. 222, p. 48065, November 16, 1990.
*On June 11, 1992, the U.S. Court of Appeals for the Ninth Circuit remanded the exemption for construction sites of less than five acres in category (x) and for manufacturing facilities in category (xi) which do not have materials or activities exposed to storm water to the EPA for further rulemaking. (Nos. 90-70671 & 91-70200).

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These criteria were established to: (1) ensure that adequate flow would be discharged; (2) allow some build-up of pollutants during the dry weather intervals; and (3) ensure that the storm would be "representative," (i.e., typical for the area in terms of intensity, depth, and duration).

Collection of samples during a storm event meeting these criteria ensures that the resulting data will accurately portray the most common conditions for each site. However, the permitting authority is authorized to approve modifications of this definition (especially for applicants in arid areas where there are few representative events). Section 5.1 of Chapter 5 discusses general protocol for requesting modifications to application requirements, including the definition of "representative storm."

In determining whether a storm is representative, there are two important steps to take. First, data on local weather patterns should be collected and analyzed to determine the range of representative storms for a particular area. Second, these results should be compared to measurements of duration, intensity, and depth to ensure that the storm to be sampled fits the representativeness criteria.

2.7.2 OBTAINING RAINFALL DATA

Several sources provide accurate local weather information for both: (1) determining what a representative storm event is for a particular area; and (2) assessing expected storm events to determine whether a predicted rainfall will be "representative," and thus, meet the requirements for storm water sampling. The National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center's (NCDC's) Climate Services Branch is responsible for collecting precipitation data. Data on hourly, daily, and monthly precipitation for each measuring station (with latitude and longitude) are available to the public on computer diskette, microfiche, or hard copy. Orders can be placed by calling **(704) 259-0682**, by fax at **(704) 259-0876**, or by writing to NCDC, Climate Services Branch, The Federal Building, Asheville, North Carolina 28071-2733.

The National Weather Service (NWS) of NOAA can also provide information on historic, current, and future weather conditions. Local NWS telephone numbers can be obtained from the NWS Public Affairs Office at **(301) 713-0622**. Telephone numbers are also usually in local phone directory listings under "National Weather Service" or "Weather." In addition, NOAA runs the NOAA NWS

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Weather Radio, which provides continuous broadcasts of the most current weather information. This broadcast can be accessed with a radio that has a weather band feature. Approximately 90 percent of the United States population is within listening range of the 380 NWS stations. Technical Appendix B presents additional information on NOAA Weather Radio, including radio frequencies for specific locations and a listing of weather band radio manufacturers. Telephone recordings of weather conditions are also provided by most NWS offices.

Cable TV weather stations and local airports can also provide weather information. Weather information provided by the local newspaper or TV stations should be used only if more accurate data (as described above) are unavailable, since weather forecasts can change drastically within several hours.

Someone should be designated at the facility to follow current weather conditions by listening to NOAA Weather Radio, calling the local NWS offices, and watching cable TV weather news. Exhibit 2-7 presents a storm water sampling decision chart for mobilizing field personnel for a probable storm event.

Annual rainfall statistics can also be used to evaluate representativeness of storm events. For example, Exhibit 2-8 presents fifteen rain zones in the United States and related storm event statistics. (These rain zones are not those shown in 40 CFR Part 122 Appendix E.) To determine typical values of annual storm events for a particular facility, identify the zone in which the facility is located. The tabulated information lists the annual average number of storms and precipitation as well as the average duration, intensity, and depth of independent storm events for each zone. Care must be taken, however, in using annual rainfall statistics for determining representativeness of storm events, since the annual rainfall statistic may not be representative of seasonal rainfall events. If rainfall data is available at or close to a particular facility, it is preferable to use this data for determining average storm event statistics.

Rainfall data tabulated from NOAA precipitation data indicate for Alaska (not shown in Exhibit 2-8) that average storm events last from 14 to 24 hours in duration and are 0.6 to 1.05 inches in depth. Average storm event data for Hawaii are 9 to 11 hours in duration and from 0.6 to 1.6 inches in depth.

EXHIBIT 2-7. DECISION CHART FOR STORM WATER SAMPLING

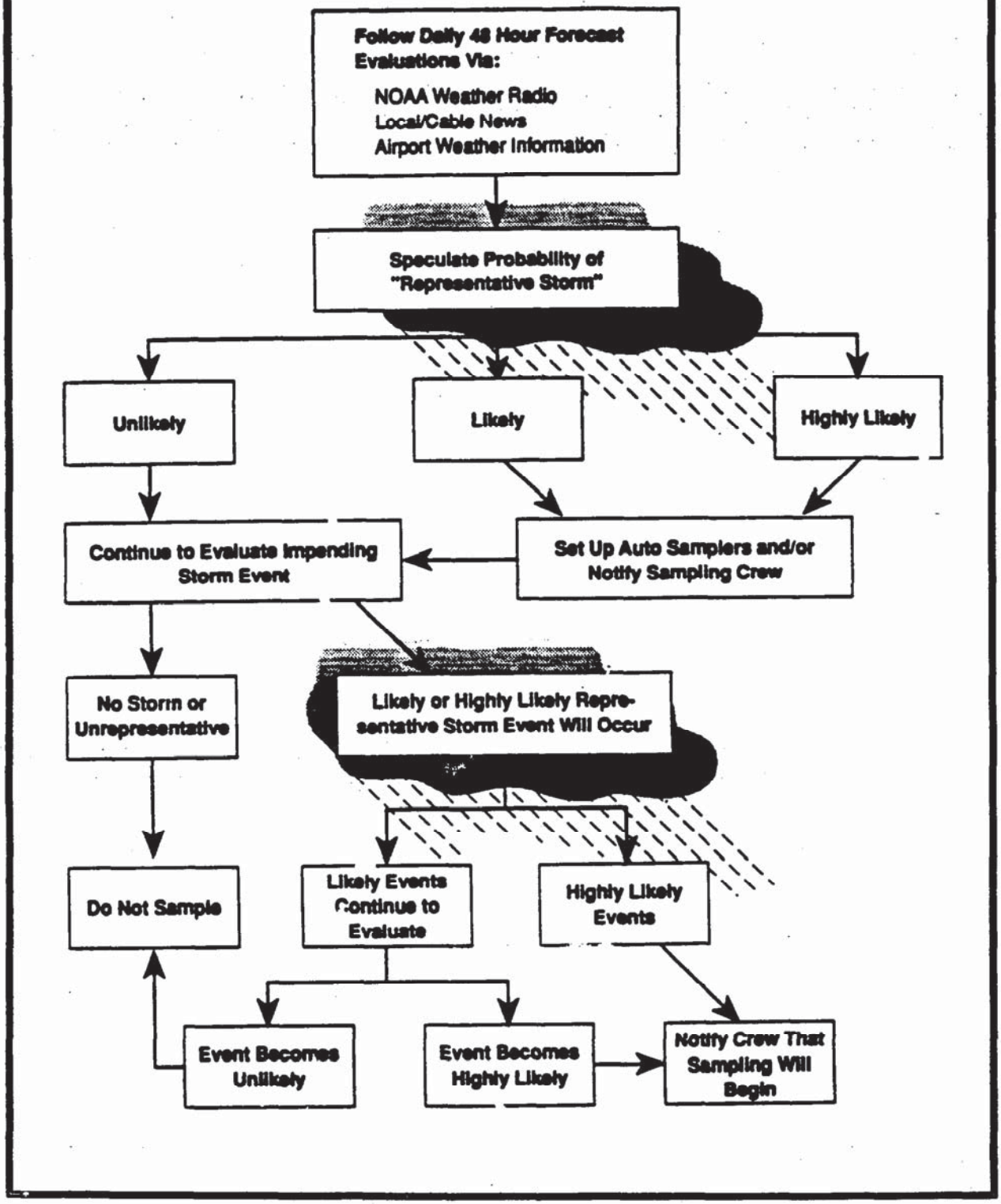
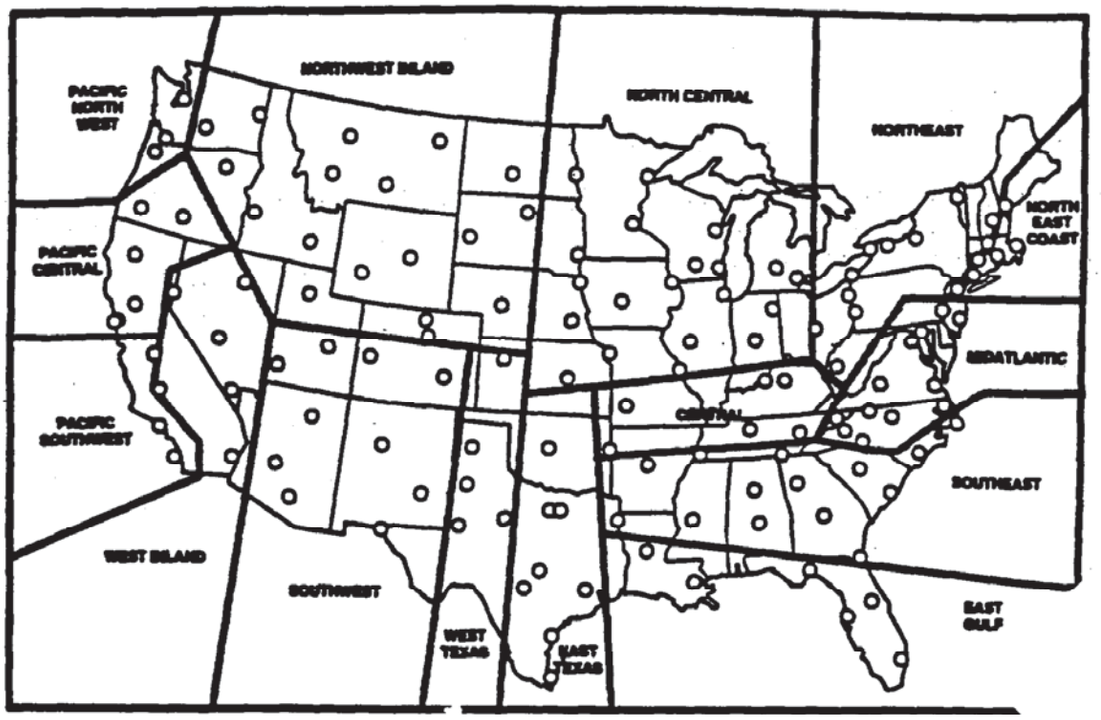


EXHIBIT 2-8. RAIN ZONES OF THE UNITED STATES



RAIN ZONE	Annual Statistics: No. of Storms Avg	No. of Storms COV	Precip. Avg (in)	Precip. COV	Independent Storm Event Statistics: Duration Avg (hr)	Duration COV	Intensity Avg (in/hr)	Intensity COV	Volume Avg (in)	Volume COV	DELTA Avg (hr)	DELTA COV
NORTH EAST	70	0.13	34.6	0.18	11.2	0.81	0.067	1.23	0.50	0.95	126	0.94
NORTH EAST—COASTAL	63	0.12	41.4	0.21	11.7	0.77	0.071	1.05	0.66	1.03	140	0.87
MIDATLANTIC	62	0.13	39.5	0.18	10.1	0.84	0.092	1.20	0.64	1.01	143	0.97
CENTRAL	68	0.14	41.9	0.19	9.2	0.85	0.097	1.09	0.62	1.00	133	0.99
NORTH CENTRAL	55	0.16	29.8	0.22	9.5	0.83	0.087	1.20	0.55	1.01	167	1.17
SOUTHEAST	65	0.15	49.0	0.20	8.7	0.92	0.122	1.09	0.75	1.10	136	1.03
EAST GULF	68	0.17	53.7	0.23	6.4	1.05	0.178	1.03	0.80	1.19	130	1.25
EAST TEXAS	41	0.22	31.2	0.29	8.0	0.97	0.137	1.08	0.76	1.18	213	1.28
WEST TEXAS	30	0.27	17.3	0.33	7.4	0.98	0.121	1.13	0.57	1.07	302	1.53
SOUTHWEST	20	0.30	7.4	0.37	7.8	0.88	0.079	1.16	0.37	0.88	473	1.46
WEST INLAND	14	0.38	4.9	0.43	9.4	0.75	0.055	1.06	0.36	0.87	786	1.54
PACIFIC SOUTH	19	0.36	10.2	0.42	11.6	0.78	0.054	0.76	0.54	0.98	476	2.09
NORTHWEST INLAND	31	0.23	11.5	0.29	10.4	0.82	0.057	1.20	0.37	0.93	304	1.43
PACIFIC CENTRAL	32	0.25	18.4	0.33	13.7	0.80	0.048	0.85	0.58	1.05	265	2.00
PACIFIC NORTHWEST	71	0.15	35.7	0.19	15.9	0.80	0.035	0.73	0.50	1.09	123	1.50

COV = Coefficient of Variation = Standard Deviation/Mean
DELTA = Interval Between Storm Midpoints
o = Rain Gauge Stations

Source: Urban Targeting and BMP Selection, U.S. EPA Region 5, November 1990.

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The NWS should be consulted for proper procedures for collecting and interpolating rainfall data if the applicant elects to collect the data rather than use existing data.

2.7.3 DETERMINING REPRESENTATIVENESS

An example of how to determine whether a rainfall event varies by more than 50 percent (i.e., is not representative) is shown in Exhibit 2-9.

EXHIBIT 2-9. EXAMPLE OF 50 PERCENT VARIANCE FROM AVERAGE RAINFALL

Event Type	Duration (hrs.)	Depth (in.)
Average event	5.2	0.43
50 percent average event	2.6	0.22
150 percent average event	7.8	0.65

Once the information on an average duration and depth storm event is obtained for a specific location, multiply these numbers by 0.5 to get the 50 percent average event numbers and multiply by 1.5 to get the 150 percent average event numbers.

A representative storm in both duration and depth for a specific area will fall between the shaded numbers above (i.e., between 2.6 and 7.8 hours in duration and 0.22 and 0.65 inches in depth).

Snowmelt creates runoff which may result in point source discharges very similar to that from other storm events. Pollutants accumulate in snow, and when a thaw occurs, the pollutants will be discharged to receiving waters much like during a rain storm event. Snowmelt may be sampled as long as the applicant works closely with the permitting authority to determine the proper sampling strategy, i.e., sampling procedures, techniques, and pollutant analyses.

For snowmelt, the sampling strategy should be developed depending on the drainage area being monitored for storm flow. The strategy should consider (1) snow removal or clearing practices, e.g., direct dumping into water bodies, plowing, and the creation of snow mounds (whether in a line along a roadway or in piles on parking lots, etc.), and (2) the melting process.

It is also important to consider what happens to snowmounds as they melt and evaporate, which can alter the pollutant concentration in the resulting runoff. In addition, pollutants from the surrounding

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air and pavement can build up on snow mound surfaces in a crust or cake-like manner eventually leaving a residue (including previously dissolved solids that become a remaining solids residue) which is later left to be washed off by rainfall, manual flushing or other mechanisms.

The sampling of snow mounds, undisturbed snow itself, and hard pack requires a carefully thought out strategy. Given the complexities associated with snowmelt sampling, applicants should have proposed sampling strategies reviewed by the permitting authority before attempting to conduct sampling.

2.7.4 LOGISTICAL PROBLEMS WITH WHEN TO SAMPLE

Applicants may encounter weather conditions that may not meet minimum "representative" storm criteria; these conditions may prevent adequate collection of storm water samples prior to application submission deadlines. For instance, sampling may be problematic in parts of the country that experience drought or near-drought conditions or areas that are under adverse weather conditions such as freezing and flooding. Events with false starts and events with stop/start rains can also cause problems. Solutions for sampling under these circumstances are discussed below.

Where the timing of storm event sampling poses a problem, it may be appropriate for the applicant to petition the permitting authority for a sampling protocol/procedure modification either prior to sampling or after sampling is conducted (if the storm event is not acceptable). When the applicant requests a sampling protocol/procedure modification, a narrative justification should be attached. This justification should be certified by a corporate official (for industrial facilities) or the principle executive officer or ranking official (for municipalities), as per 40 CFR 122.22. Section 5.1 of Chapter 5 discusses protocol/procedure modifications.

Arid Areas

For arid or drought-stricken areas where a storm event does not occur prior to the time the applicant must sample and submit data with the application form, the applicant should submit the application, complete to the extent possible, with a detailed explanation of why sampling data are not provided and an appraisal of when sampling will be conducted. This explanation must be certified by the appropriate party (as described above). The applicant should also contact the permitting authority

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for further direction. Where the applicant can anticipate such problems, approval for an extension to submit sampling data should be acquired prior to the deadline.

Adverse Weather Conditions

The applicant should never conduct storm water sampling during unsafe conditions. It is likely that, in areas that experience flooding, lightening storms, high winds, etc., another representative storm event will occur for which sampling conditions will be much safer. (For further information on safety issues, see Chapter 6.) If no other storm event occurs, the applicant should submit a justification as to why the event was not sampled. This information should be certified by the appropriate official.

False Starts and Stop/Start Rains

False start and stop/start rains can also cause problems. False starts may occur when weather conditions are unpredictable and it appears that a storm event may be representative, collection begins, and then the rain stops before an adequate sample volume is obtained. (Necessary sample volumes are discussed in Section 3.6.) Some latitude may be given for the 0.1-inch rainfall requirement as long as the sample volume is adequate; the permitting authority may accept the results with applicant justification and certification. Again, see Chapter 5 for information on requesting protocol/procedure modifications to storm water sampling requirements.

During stop/start rains (those in which rainfall is intermittent), samples should be taken until an adequate sample volume is obtained. Exhibit 2-10 summarizes logistical problems of storm water sampling and presents solutions to the problems identified.

2.7.5 WHEN INDUSTRIAL FACILITIES MUST SAMPLE

Industrial applicants must generally collect two types of storm water samples: (1) grab samples collected during the first 30 minutes of discharge; and (2) flow-weighted composite samples collected during the first 3 hours of discharge (or the entire discharge, if it is less than 3 hours). Information from both types of samples is critical to fully evaluate the types and concentrations of pollutants present in the storm water discharge.

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EXHIBIT 2-10. LOGISTICAL PROBLEMS OF STORM WATER SAMPLING	
Problem:	**Arid/drought areas**
Solution:	Submit a petition requesting a modification to the protocol if problems are anticipated and, if it is approved, submit the application without sampling data by the application due date with a certified explanation. Provide sampling data to the permitting authority as soon as possible.
Problem:	**Adverse weather conditions such as freezing, flooding, winds, tornadoes, electrical storms, and gully washes**
Solution:	Sample another, less hazardous event or submit a certified justification of why the event was not sampled. Provide sampling data to the permitting authority as soon as possible.
Problem:	**False starts**
Solution:	Discard the sample if the volume is inadequate. If the volume is adequate, submit the sampling data with a certified explanation that the sample is from a non-representative event. Continue to monitor weather conditions and attempt to resample as soon as possible.
Problem:	**Stop/start rains**
Solution:	Continue to sample in case the storm event turns out to be representative and adequate sample volumes are obtained. If sample volumes are inadequate, continue to monitor weather conditions and attempt to resample as soon as possible.

The grab samples taken during the first 30 minutes of a storm event will generally contain higher concentrations of pollutants, since they pick up pollutants that have accumulated on drainage surfaces since the last storm event.

Composite samples characterize the average quality of the entire storm water discharge. Flow-weighted composite samples provide for the most accurate determination of mass load. The flow-weighted composite sample must be taken for either the first 3 hours or for the entire discharge (if the event is less than 3 hours long). Additional information on how to collect grab and composite samples is presented in Sections 3.3 and 3.4, respectively.

Industrial applicants are required at a minimum to sample only one storm event. However, if samples from more than one storm are analyzed and the results are representative of the discharge, the data representing each event must be reported. The facility must provide a description of each storm event tested. The average of all values within the last year must be determined and the

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concentration, mass, and total number of storm events sampled must be reported on Form 2F. Furthermore, sampling should be conducted during normal operating procedures (day or night), and, not when the facility has been closed for a period of time.

Industrial applicants must certify, as a separate requirement, that all outfalls have been tested or evaluated to determine whether non-storm water discharges are present (e.g., process wastewater, sanitary wastes, cooling water, or rinse water) or whether illegal/illicit connections are occurring in the system. This testing should be conducted during dry weather to avoid any flows of storm water through the conveyance.

A checklist that can be used to conduct dry weather evaluations is provided in Exhibit 2-11. A narrative description of the method used to conduct dry weather evaluations and the date and the drainage points must be included in Section V.A of Form 2F. This statement must be certified by the appropriate party as described in Section 2.7.4.

A dry weather visual inspection is the simplest way to screen for illicit discharges. If one or more of the items on the checklist in Exhibit 2-11 are answered affirmatively, or if there are other reasons to believe that illicit connections exist, more detailed investigations (such as dye tests, smoke tests, evaluation of piping designs, and TV line monitoring) may be necessary. Dye testing involves releasing fluorescent, nontoxic dye into the suspected source of non-storm water, (e.g., a drain, sink, toilet, or pipe) and checking to see whether the dye shows up in the storm water outfall. Smoke testing involves pumping smoke into a storm sewer and viewing the facility to see if smoke escapes through unknown openings or storm sewer inlets. The presence of smoke indicates that storm water may enter the sewer through these openings or inlets. However, smoke testing may prove ineffective at finding non-storm water discharges to separate storm sewers. Smoke passage may be blocked due to line traps that are intended to block sewer gas.

TV line monitoring is a technique whereby a small video camera is placed in the storm sewer and a video image of the sewer is viewed on a monitor at the surface to identify illicit connections. The camera can be moved through the sewer by remote control. For more information on smoke and dye testing and TV line monitoring, consult EPA's Guidance Manual for the Preparation of NPDES

EXHIBIT 2-11. CHECKLIST FOR CONDUCTING DRY WEATHER EVALUATIONS

1. Date of inspection:_____
2. Facility name and address:_____
3. Date of last rain event:_____
4. Inspector name:_____
5. Type of outfall

☐ Concrete ☐ Pipe ☐ Grassed ☐ Rock ☐ Other _____

6. Is there visible flow from the pipe? ☐ Yes ☐ No
If yes, check all that apply. If no, go to number 7.

☐ Colored water (describe)_____ ☐ Oily sheen
☐ Odor* (describe)_____ ☐ Sludge present
☐ Murky ☐ Clear water
☐ Floating objects (describe)_____ ☐ Stains on conveyance
☐ Absence of plant life surrounding conveyance ☐ Notable difference in plant life surrounding conveyance
☐ Scum ☐ Suds ☐ Other:_____

*e.g., rotten eggs, earthy, chemical, chlorine, soap, putrescence, gasoline, musty, etc.

Estimate the flow either visually or by describing the width, height, and shape of the conveyance and the approximate percentage of the conveyance where flow is present or the approximate depth of the flow. Describe your estimate.

7. Is there standing water present? ☐ Yes ☐ No
If yes, check all that apply. If no, go to number 8.

☐ Colored water (describe)_____ ☐ Oily sheen
☐ Odor* (describe)_____ ☐ Sludge present
☐ Murky ☐ Clear water
☐ Floating objects (describe)_____ ☐ Stains on conveyance
☐ Absence of plant life surrounding conveyance ☐ Notable difference in plant life surrounding conveyance
☐ Suds ☐ Scum ☐ Other:_____
☐ Absence of plant life surrounding conveyance

*e.g., rotten eggs, earthy, chemical, chlorine, soap, putrescence, gasoline, musty, etc.

8. From the inspection locations, can you see any unusual piping or ditches that drain to the storm water conveyance? ☐ Yes ☐ No
9. Is there any overland flow visible from the discharge location? ☐ Yes ☐ No
10. Are there dead animals present? ☐ Yes ☐ No

Signature:

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Permit Applications for Storm Water Discharges Associated with Industrial Activity (EPA-505/8-91-002, April 1991).

A problem with the dry weather evaluation process is that the presence of a dry weather/non-storm water discharge may be caused by infiltration of ground or surface waters through cracks in the storm water drainage system. In this situation, all other possible sources of the non-storm water discharge should be examined and ruled out. If no sources are found, the physical structure of the conveyance system should be inspected for deterioration.

The applicant should make every attempt to halt non-storm water discharges to the storm sewer system unless the discharge is covered by an NPDES permit. If it is not feasible to halt the discharge of non-storm water to the storm sewer system, and the discharge is not authorized by a process wastewater or storm water permit, the applicant must submit either Form 2C (for a process water discharge) or Form 2E (for a nonprocess water discharge), and check with state officials to see if alternate forms are required.

2.7.6 WHEN MUNICIPAL FACILITIES MUST SAMPLE

Municipal applicants are required to conduct sampling for both Parts 1 and 2 of their applications. In Part 1, municipalities must conduct a field screening analysis to detect illicit connections and illegal dumping into their storm sewer system. Where flow is observed during dry weather, two grab samples must be collected during a 24-hour period with a minimum of 4 hours between samples. These samples must be analyzed for pH, total chlorine, total copper, total phenol, and detergents (surfactants). Note that these are dry weather samples, rather than storm water samples. EPA's Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems presents a description of conducting field screening sampling and provides a data sheet.

For Part 2 of the application, municipalities must submit grab (for certain pollutants) and flow-weighted sampling data from selected sites (5 to 10 outfalls) for 3 representative storm events at least 1 month apart. The flow-weighted composite sample must be taken for either the entire discharge or the first 3 hours (if the event lasts longer than 3 hours). Municipal facilities are not required to collect grab samples within the first 30 minutes of a storm event.

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In addition to submitting quantitative data for the application, municipalities must also develop programs for future sampling activities that specify sampling locations, frequency, pollutants to be analyzed, and sampling equipment. Where necessary (as determined by the municipality or if required by the permitting authority), responsibilities may also include monitoring industries connected to the municipality's storm sewers for compliance with their facility-specific NPDES permits. Refer to EPA's Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems for information on how to develop municipal sampling programs.

2.7.7 USE OF HISTORICAL DATA

Data from storm water samples analyzed in the past can be submitted with applications in lieu of new sampling data if:

- All data requirements in Form 2F are met
- Sampling was performed no longer than 3 years prior to submission of the permit application
- All water quality data are representative of the present discharge.

The historical data may be unacceptable if there have been significant changes since the time of that storm event in production level, raw materials, processes, or final products. Significant changes which may also impact storm water runoff include construction or installation of treatment or sedimentation/erosion control devices, buildings, roadways, or parking lots. Applicants should assess any such changes to determine whether they altered storm water runoff since the time of the storm event chosen for use in the permit application. Historical data can be used only in applications. Historical data cannot be used for fulfilling permit requirements.

2.8 WHERE TO SAMPLE STORM WATER DISCHARGES

Storm water samples should be taken at a storm water point source. A "point source" is defined as any discernible, confined, and discrete conveyance, including (but not limited to) any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged (as per 40 CFR 122.2). Included in the definition of storm water "point

sources" is storm water from an industrial facility that enters, and is discharged through, a municipal separate storm sewer. In short, most storm water discharges can be defined as "point source" discharges, since they ultimately flow into some kind of conveyance (e.g., a channel or swale).

2.8.1 INDUSTRIAL FACILITIES

Industrial applicants submitting individual applications must collect and analyze a grab sample taken within the first 30 minutes of the storm event and flow-weighted composite samples from each of the industrial storm water "point source" outfalls identified on the site drainage map submitted for Section III of Form 2F. Applicants submitting quantitative data for Part 2 of the group application must also collect samples for each outfall discharging storm water associated with industrial activity. All outfalls should be sampled during the same representative storm event if possible. If this is not feasible, outfalls may be sampled during different representative storm events upon approval by the permitting authority. Descriptions of each storm event and which outfalls were sampled during each event must be included in the application. Storm water runoff from employee parking lots, administration buildings, and landscaped areas that is not mixed with storm water associated with industrial activity, or storm water discharges to municipal sanitary sewers, do not need to be sampled.

Outfalls With Substantially Identical Effluents—Industrial Facilities

If an applicant has two or more outfalls with "substantially identical effluents," the facility may petition the permitting authority to sample and analyze only one of the identical outfalls and submit the results as representative of the other. "Substantially identical effluents" are defined as discharges from drainage areas undergoing similar activities where the discharges are expected to be of similar quantity and quality, and indistinguishable in expected composition. Chapter 5 presents an example of a petition for substantially identical effluents and discusses this process in more detail.

2.8.2 MUNICIPALITIES

Large and medium municipalities are required to sample storm water discharges from 5 to 10 outfalls or field screening points that were proposed in Part 1 of the application. The final decision on the number and location of sampling points will be determined by the permitting authority and will

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depend on site-specific conditions such as land use or drainage area and results of data collected during the field screening analysis process for Part 1 of the application.

2.8.3 LOGISTICS OF WHERE TO SAMPLE

The ideal sampling location would be the lowest point in the drainage area where a conveyance discharges storm water to waters of the U.S. or to a municipal separate storm sewer system. A sample point also should be easily accessible on foot in a location that will not cause hazardous sampling conditions. Ideally, the sampling site should be on the applicant's property or within the municipality's easement; if not, the field personnel should obtain permission from the owner of the property where the discharge outfall is located. Typical sampling locations may include the discharge at the end of a pipe, a ditch, or a channel.

However, logistical problems with sample locations may arise (e.g., nonpoint discharges, inaccessibility of discharge point, etc.). Logistical problems with sample locations and suggested solutions are described in Exhibit 2-12. In many cases, it may be necessary to locate a sampling point further upstream of the discharge point (e.g., in a manhole or inlet). If the storm water at a selected location is not representative of a facility's total runoff, the facility may have to sample at several locations to best characterize the total runoff from the site. In situations where discharge points are difficult to sample for various reasons, the applicant should take the best sample possible and explain the conditions in the application. A discussion on sampling at retention ponds appears in Section 3.1.2.

2.9 STAFFING CONSIDERATIONS

Staffing needs for sampling must be determined by the applicant. Factors in making the determination include the number of sample locations, the size of the area to be sampled, how far apart the locations are, the type of sampling required, the technique to be used, the number of samples to be taken (depending on how many parameters must be analyzed), and safety considerations.

Training sampling personnel is important to the success of storm water discharge characterization. Training can be done using this manual. Sampling conducted by untrained personnel may result in

EXHIBIT 2-12. SOLUTIONS TO SAMPLE LOCATION PROBLEMS	
Problem:	Sampling where storm water commingles with process or non-process water
Solution:	Attempt to sample the storm water discharge before it mixes with the non-storm water discharge. If this is impossible, sample the discharge both during dry and wet weather and present both sets of data to the permitting authority. This will provide an indication of the contribution of pollutants from each source.
Problem:	Numerous small point discharges
Solution:	Impound channel or join together flow by building a weir or digging a ditch to collect discharge at a low point for sampling purposes. This artificial collection point should be lined with plastic to prevent infiltration and/or high levels of sediment. Or, sample at several locations to represent total site runoff.
Problem:	Inaccessible discharge point [examples include underwater discharges or unreachable discharges (e.g., out of a cliff)]
Solution:	Go up the pipe to sample (i.e., to the nearest manhole or inspection point). If these are not available, tap into the pipe or sample at several locations to best represent total site runoff.
Problem:	Managing multiple sampling sites to collect grab samples during the first 30 minutes (industrial facilities only)
Solution:	Have a sampling crew ready for mobilization when forecasts indicate that a representative storm will occur or sample several different representative events. Also, for most parameters, automatic samplers may be used to collect samples within the first 30 minutes triggered by the amount of rainfall, the depth of flow, flow volume or time.
Problem:	Commingling of parking lot runoff with discharge associated with industrial activity
Solution:	The combined runoff must be sampled at the discharge point as near as possible to the receiving water or the parking lot drain inlet if there is one.
Problem:	Sampling in manholes
Solution:	Sample in manholes only when necessary. See Chapter 6 for safety information Sampling in manholes requires training on confined space entry.
Problem:	Runon from other property
Solution:	If possible, estimate the volume of offsite runon contributions and offsite runon sources of pollutants to perform a mass balance calculation. Include this information in the permit application. If this estimation is not possible, provide a narrative discussion of the upstream site (e.g., is it developed, if so the type of facility, the types of pollutants that may be present on the site, etc.).

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data that is unrepresentative of the facility's storm water discharge. This data might be rejected by the permitting authority, who would then require another sampling effort.

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3. FUNDAMENTALS OF SAMPLING

Because of the variable nature of storm water flows during a rainfall event and different analytical considerations for certain pollutants, the storm water regulations establish specific requirements for sample collection techniques. The quality of storm water discharges and logistical needs for sampling will be different for industrial applicants and municipal applicants. Therefore, specific sampling requirements vary. After a brief review of sampling fundamentals and special sampling requirements for storm water permit applications, the following sections are intended to teach applicants how to sample to meet these requirements.

The applicant should carefully plan his/her sampling strategy prior to the actual sampling event, e.g., walk the site to determine appropriate sampling locations, become familiarized with local rainfall patterns, train sampling staff in procedures and safety, consult with laboratory, and collect supplies.

3.1 TYPES AND TECHNIQUES OF SAMPLING

There are three basic aspects of sampling:

- Sample type (i.e., grab versus composite)
- Sample technique (i.e., manual versus automatic)
- Flow measurement methods.

These topics will be discussed in relation to requirements of an NPDES storm water discharge permit application. Once these aspects are addressed, step-by-step instructions on sampling procedures are presented. The sections below define and describe the types of storm water samples that must be collected and methods or techniques for collecting them. In addition, special sampling requirements for certain pollutants are discussed.

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3.1.1 SAMPLE TYPE VERSUS SAMPLE TECHNIQUE

It is important to understand the difference between sample type and technique. "Sample type" refers to the kind of sample that must be collected -- either a grab or a composite. "Sample technique" refers to the method by which a grab or composite sample is actually collected -- either manually or by automatic sampler. A generalized relationship between sample type and sample technique is presented in Exhibit 3-1. Sections 3.1.2 and 3.1.3 further explain the significance of these terms as they relate to storm water sampling requirements.

EXHIBIT 3-1. SAMPLE TYPE vs. SAMPLE TECHNIQUE

Sample Type	Sample Technique
Grab	Manual Automatic sampling system
Composite	Manual with manual compositing Automatic system or automatic sampling with manual compositing

3.1.2 SAMPLE TYPE: GRAB AND COMPOSITE SAMPLES

To comply with storm water application requirements, the sample type (grab or composite) must be collected in accordance with 40 CFR 122.21(g)(7) and 40 CFR Part 136. The storm water application requirements clearly specify which pollutants must be analyzed by grab sample, and which by composite sample. Although the requirements in 40 CFR 122.21(g)(7) do not explicitly specify either manual or automatic sampling techniques, the approved analytical methods contained in 40 CFR Part 136 direct that grab samples must be collected manually for certain pollutants. Sections 3.3 and 3.4 clarify which pollutants must be grabbed, which ones must be grabbed manually, and which ones must be flow-weighted composites.

The two types of storm water samples required by the regulations, grab and composite samples, are described below.

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Grab Samples

A grab sample is a discrete, individual sample taken within a short period of time (usually less than 15 minutes). Analysis of grab samples characterizes the quality of a storm water discharge at a given time of the discharge.

Composite Samples

A composite sample is a mixed or combined sample that is formed by combining a series of individual and discrete samples of specific volumes at specified intervals. Although these intervals can be time-weighted or flow-weighted, the storm water regulations require the collection of flow-weighted composite samples. This means that discrete aliquots, or samples, are collected and combined in proportion to flow rather than time. Composite samples characterize the quality of a storm water discharge over a longer period of time, such as the duration of a storm event.

Application Requirements

Both types of samples must be collected and analyzed for storm water discharge permit applications. Grab samples must be collected for the following conditions:

- For storm water discharges associated with industrial activity, a grab sample must be obtained during the first 30 minutes of a discharge. This requirement is in addition to the composite sampling requirements. These samples are intended to characterize the maximum concentration of a pollutant that may occur in the discharge and/or may indicate intermingling of non-storm water discharges.

- For storm water discharges from large and medium municipal separate storm sewers, grab samples are required for Part 1 of the application if a discharge is noted during dry weather field screening. Two grab samples must be collected during a 24-hour period with a minimum of 4 hours between samples. These samples are intended to assist in the identification of illicit connections or illegal dumping. In Part 2, grab samples may be required for the analysis of certain pollutants for which municipalities are required to sample.

Flow-weighted composite samples must be collected during the first 3 hours of discharge or the entire discharge (if it is less than 3 hours) for both industrial and municipal applicants.

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Pollutant-specific Requirements

The regulations at 40 CFR 122.21(g)(7) identify certain pollutants for which grab sampling is required:

- Monitoring by grab sample must be conducted for pH, temperature, cyanide, total phenols, residual chlorine, oil and grease (O&G), fecal coliform, and fecal streptococcus. Composite samples are not appropriate for these parameters due to their tendency to transform to different substances or change in concentration after a short period of time. Such transformations may be particularly likely in the presence of other reactive pollutants.

Sampling At Retention Ponds

Retention ponds with greater than a 24-hour holding time for a representative storm event may be sampled by grab sample. Composite sampling is not necessary. The rationale for this is that, because the water is held for at least 24 hours, a thorough mixing occurs within the pond. Therefore, a single grab sample of the effluent from the discharge point of the pond accurately represents a composite of the storm water contained in the pond. If the pond does not thoroughly mix the discharge, thereby compositing the sample, then a regular grab and composite sample should be taken at the inflow to the pond. Since each pond may vary in its capability to "composite" a sample, applicants must carefully evaluate whether the pond is thoroughly mixing the discharge. Such factors as pond design and maintenance are important in making this evaluation. Poor pond design, for example, where the outfall and inflow points are too closely situated, may cause short-circuiting and inadequate mixing. In addition, poor maintenance may lead to excessive re-suspension of any deposited silt and sediment during heavy inflows. Because of factors such as these, the applicant should determine the best location to sample the pond (e.g., at the outfall, at the outfall structure, in the pond) to ensure that a representative composite sample is taken. If adequate compositing is not occurring within the pond, the applicant should conduct routine grab and flow-weighted composite sampling.

A grab sample and a flow-weighted sample must be taken for storm water discharges collected in holding ponds with less than a 24-hour retention period. The applicant must sample the discharge in the same manner as for any storm water discharge [as described in 40 CFR 122.21(g)(7)]. In

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effect, the applicant must take one grab sample within the first 30 minutes of discharge, or as soon as possible. The applicant must also collect a flow-weighted composite sample for at least the first 3 hours of the discharge, or for the event's entire duration (if it is less than 3 hours). The flow-weighted composite sample may be taken using a continuous sampler or as a combination of at least three sample aliquots taken during each hour of the discharge, with a minimum of 15 minutes between each aliquot. If the applicant does not know what retention period the pond is designed for, the design engineer of the pond should be consulted.

3.1.3 SAMPLE TECHNIQUE: MANUAL VERSUS AUTOMATIC SAMPLING

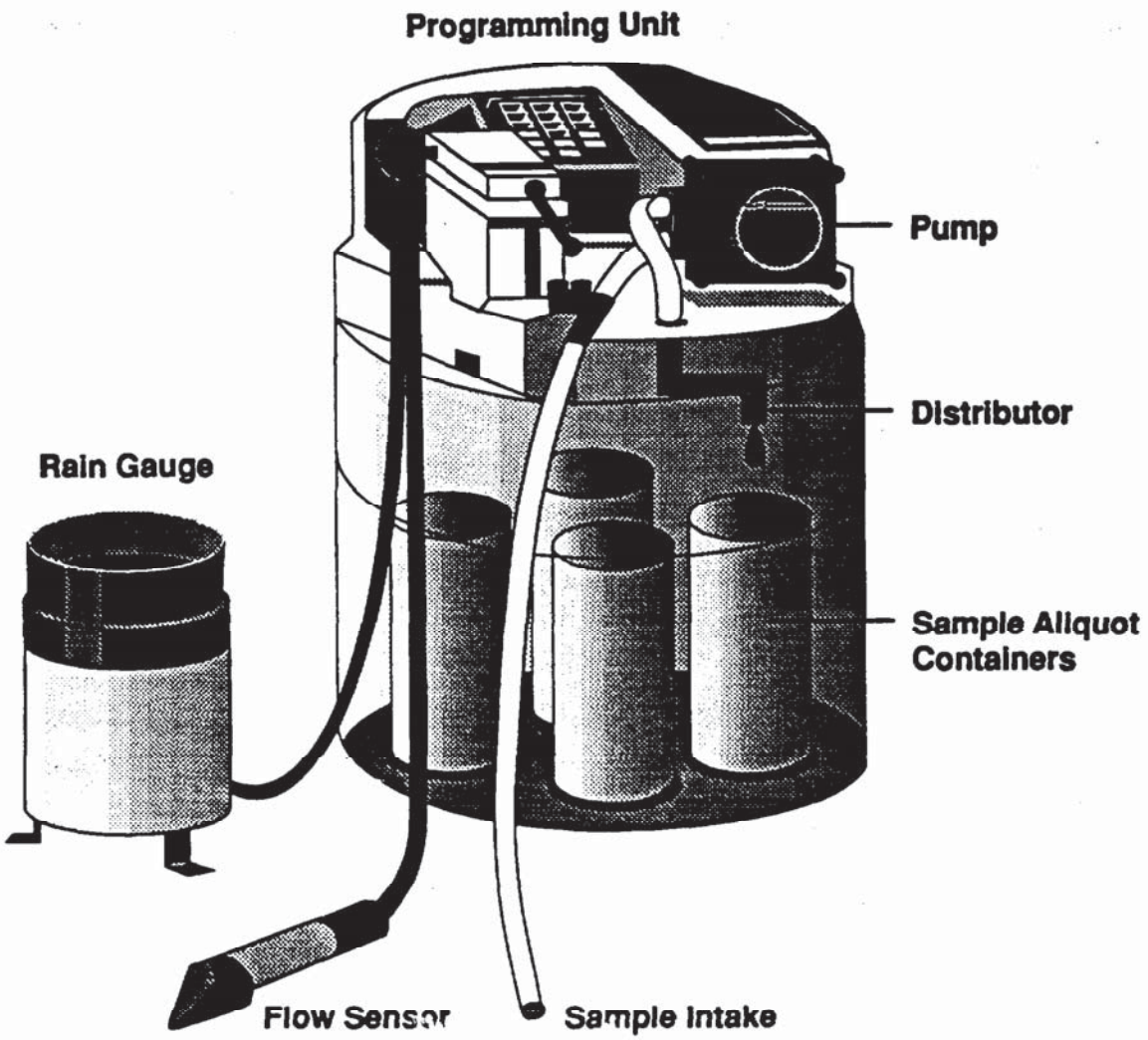
As previously discussed, manual and automatic sampling techniques are methods by which both grab and composite samples can be collected. Manual samples are simply samples collected by hand. Automatic samplers are powered devices that collect samples according to preprogrammed criteria. A typical automatic sampler configuration is shown in Exhibit 3-2.

For most pollutants, either manual or automatic sample collection will conform with 40 CFR Part 136. However, one case in which automatic samplers cannot be used is for the collection of volatile organic compound (VOC) samples because VOCs will likely volatilize as a result of agitation during automatic sampler collection. Samples collected for VOC analysis should be filled until a reverse meniscus is found over the top of the collection bottle and capped immediately to leave no air space. Automatic samplers do not perform this function. Special requirements for VOC sampling are discussed in Section 3.5.2.

Although both collection techniques are available, several other pollutants may not be amenable to collection by an automatic sampler, for example fecal streptococcus, fecal coliform and chlorine have very short holding times (i.e., 6 hours), pH and temperature need to be analyzed immediately and oil and grease requires teflon coated equipment to prevent adherence to the sampling equipment.

Other restrictions on sample collection techniques (such as container type and preservation) should be determined by consulting the approved analytical methods listed in 40 CFR Part 136. Section 3.5 and Technical Appendix C provide additional information on sample handling, holding times, and preservation methods.

EXHIBIT 3-2. AUTOMATIC SAMPLER



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Manual and automatic techniques have advantages and disadvantages that the applicant should consider in relation to the sampling program. The main advantage of manual sampling is that it can be less costly than purchasing or renting automatic samplers. Automatic samplers, however, can be often more convenient. Exhibit 3-3 presents a matrix of advantages and disadvantages associated with each technique. Ultimately, the best technique to use will depend on each applicant's situation.

3.2 OBTAINING FLOW DATA

In addition to collecting samples of storm water discharges, applicants must collect data characterizing the flow rate and flow volume for each storm water discharge sampled. Flow rate is the quantity of storm water discharged from an outfall per unit of time. Total flow is a measure of the total volume of storm water runoff discharged during a rain event. Flow rates and volumes can either be measured specifically or can be estimated (based on rainfall measurements, velocities, and depth of flows). To collect flow-weighted composite samples, flow rate data is necessary to combine proportional volumes of individually collected aliquots. Applicants must also report the mass of pollutants contained in storm water discharges (see Section 3.2.5). To determine mass loadings of pollutants, applicants must measure both discharge flow rate and pollutant concentration. This section presents methods for obtaining flow data.

3.2.1 MEASURING FLOW RATES

Flow rates for storm water discharges are most accurately measured using either primary or secondary flow measurement devices. Facilities should use these devices to characterize their discharge as precisely as possible. Where flow measurement devices are not already installed, portable devices should be considered. There are many permanent and portable types of flow measurement devices available. This discussion is limited to the most common flow measurement devices. To purchase flow measurement devices and rain gauges, pertinent engineering journals can be consulted for equipment vendor listings. Proper analysis of site discharge conditions must be conducted prior to purchase and installment of flow measurement devices.

Primary Flow Measurement Devices

A primary flow measurement device is a man-made flow control structure which, when inserted into an open channel, creates a geometric relationship between the depth of the flow and the rate of the

EXHIBIT 3-3. COMPARISON OF MANUAL AND AUTOMATIC SAMPLING TECHNIQUES

Sample Method	Advantages	Disadvantages
Manual Grabs	• Appropriate for all pollutants • Minimum equipment required	• Labor-intensive • Environment possibly dangerous to field personnel • May be difficult to get personnel and equipment to the storm water outfall within the 30 minute requirement • Possible human error
Manual Flow-Weighted Composites (multiple grabs)	• Appropriate for all pollutants • Minimum equipment required	• Labor-intensive • Environment possibly dangerous to field personnel • Human error may have significant impact on sample representativeness • Requires flow measurements taken during sampling
Automatic Grabs	• Minimizes labor requirements • Low risk of human error • Reduced personnel exposure to unsafe conditions • Sampling may be triggered remotely or initiated according to present conditions	• Samples collected for O&G may not be representative • Automatic samplers cannot properly collect samples for VOCs analysis • Costly if numerous sampling sites require the purchase of equipment • Requires equipment installation and maintenance • Requires operator training • May not be appropriate for pH and temperature • May not be appropriate for parameters with short holding times (e.g., fecal streptococcus, fecal coliform, chlorine) • Cross-contamination of aliquot if tubing/bottles not washed
Automatic Flow-Weighted Composites	• Minimizes labor requirements • Low risk of human error • Reduced personnel exposure to unsafe conditions • May eliminate the need for manual compositing of aliquots • Sampling may be triggered remotely or initiated according to on-site conditions	• Not acceptable for VOCs sampling • Costly if numerous sampling sites require the purchase of equipment • Requires equipment installation and maintenance, may malfunction • Requires initial operator training • Requires accurate flow measurement equipment tied to sampler • Cross-contamination of aliquot if tubing/bottles not washed

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flow. The depth of the flow, referred to as the head (H), can then be measured at the respective reference point/area with a ruler or other staff gauge. When substituted into a formula, which mathematically describes the relationship between depth and discharge for the primary devices, the head measurement can be used to calculate a flow rate (Q). The most common primary flow measurement devices are weirs and flumes. Weirs and flumes are flow structures designed to provide a known, repeatable relationship between flow and depth.

Weirs

Weirs consist of a crest located across the width of an open channel (at a right angle to the direction of the flow). The flow of water is impeded, causing water to overflow the crest. Diagrams and formulas of some typically found weirs are provided in Exhibit 3-4. Weirs are inexpensive and particularly valuable in measuring flow in natural or man-made swales because they are easily installed in irregularly shaped channels.

Weirs can only provide accurate flow measurements when head measurements are appropriately taken. When flow exceeds the capacity of the weir and water overtops the weir crest, flow depth actually diminishes as the water approaches the weir, as shown in Exhibit 3-5. Therefore, measuring the depth at the weir crest will result in an inaccurate measurement of the actual head. Under these circumstances, the head should be measured upstream, at a point determined by the type of weir and the estimated amount of flow. A staff gauge can be installed at a nonturbulent point upstream of the weir crest to provide accurate and convenient measurements.

Flumes

Flumes are structures which force water through a narrow channel. They consist of a converging section, a throat, and a diverging section. Exhibit 3-6 portrays the most common type of flume, the Parshall flume, and also provides formulas for calculating appropriate flow rates.

Parshall flumes have fixed specifications relating to geometric shape. They vary only in throat width. Due to these geometric constraints, Parshall flumes may be expensive to install. They are typically used in permanent flow measurement points and are most commonly placed in concrete-lined channels. However, Parshall flumes can also be used in temporary points. Parshall flumes provide accurate measurements for a relatively wide range of flow rates. The flow rate through the Parshall flume (see Exhibit 3-6) is calculated from the depth (H_a) of flow measured in the converging

EXHIBIT 3-4. WEIRS

V-Notch

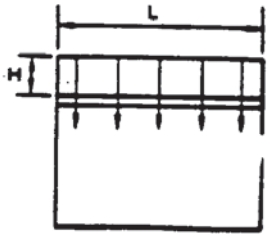
$Q = 2.5\ H^{2.5}$ (90°)
$Q = 1.443\ H^{2.5}$ (60°)
$Q = 1.035\ H^{2.5}$ (45°)
$Q = 0.676\ H^{2.5}$ (30°)
$Q = 0.497\ H^{2.5}$ (22½°)

Q = Flow Rate

H = Depth of flow (Head)

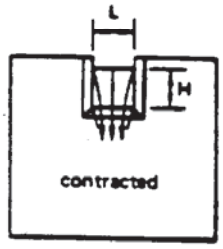
Rectangular (without contractions)

$Q = 3.33\ L\ H^{1.5}$



Rectangular (with contractions)

$Q = 3.33\ (L - 0.2\ H)^{1.5}$

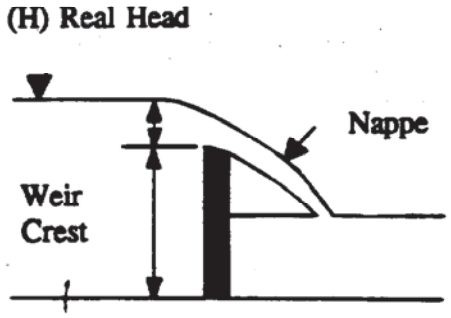


Cipolleti (trapezoidal)

$Q = 3.367\ b\ H^{1½}$

Source: Civil Engineering Reference Manual, 5th Edition, by Michael R. Lindeburg, PE, with permission from the publisher, Professional Publications, Inc., Belmont, California, 1989.

EXHIBIT 3-5. SUPPRESSED FLOW OVER THE WEIR CREST



Source: Civil Engineering Reference Manual, 5th Edition, by Michael R. Lindeburg, PE, with permission from the publisher, Professional Publications, Inc., Belmont, California, 1989.

section of the flume. The exact location of the depth measurement depends on the specific design of the Parshall flume. Exhibit 3-6 indicates the equations used to calculate flow rate through a typical Parshall flume. These equations are accurate only when the submergence ratio (H_b/H_a) is greater than 0.7. The manufacturers' information should be consulted for the flow rate equation and measuring points for a specific Parshall flume.

Palmer-Bowlus flumes, shown in Exhibit 3-7, are also used at some facilities. Palmer-Bowlus flumes are designed to be installed in an existing circular channel (such as a manhole channel) and are available as portable measurement devices. While Palmer-Bowlus flumes are inexpensive, self cleaning, and easy to install, they can only measure flow rates accurately over a narrow range of flow.

The flow from a Palmer-Bowlus flume is calculated using the height between the floor of the flume portion and the water level, not the total head of the water level. Head measurements are taken at

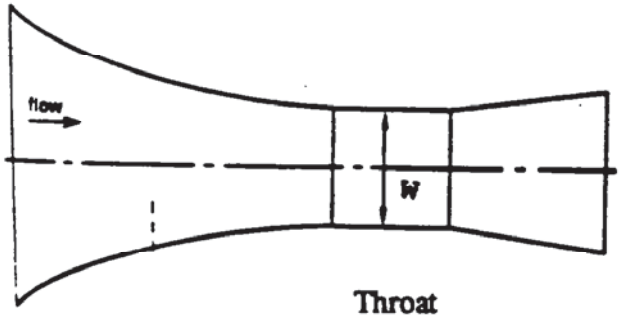
EXHIBIT 3-6. FLUMES

Parshall Flume

$Q = 0.338\ H^{1.55}$	(1 inch)
$Q = 0.676\ H^{1.55}$	(2 inches)
$Q = 0.992\ H^{1.547}$	(3 inches)
$Q = 2.09\ H^{1.58}$	(6 inches)
$Q = 3.07\ H^{1.53}$	(9 inches)
$Q = 4\ W\ H^{1.522}\ W^{0.26}$	(1-8 feet)
$Q = (3.6875\ W + 2.5) H^{1.6}$	(10-50 feet)

Q = Flow rate

H = Depth of flow (Head)

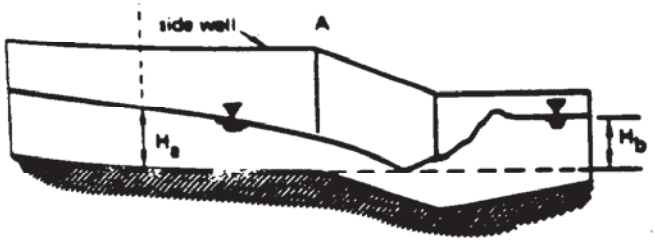


Top View

Throat

Converging Section

Diverging Section



Side View

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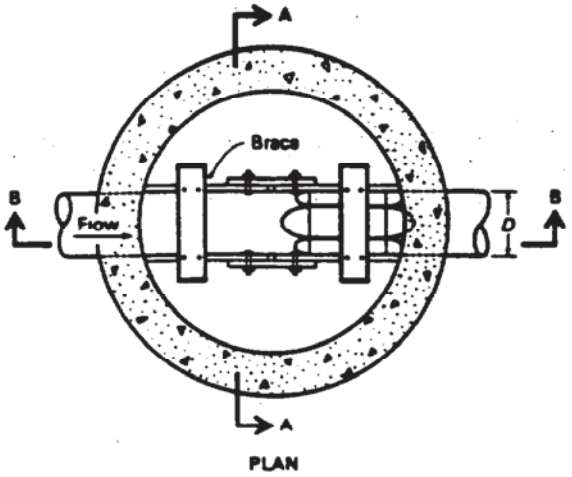
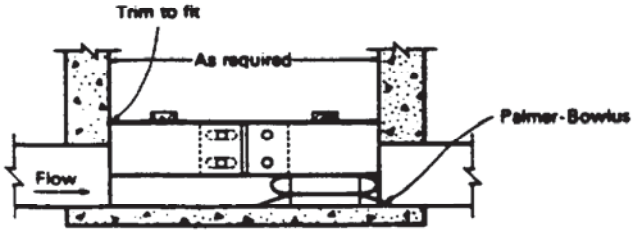
EXHIBIT 3-7. PALMER-BOWLUS FLUME





Source: Wastewater Engineering: Treatment, Disposal, Reuse, 2nd Edition, Metcalf & Eddy, Inc., with permission from the publisher, McGraw-Hill Book Co., New York, 1979.

a distance from the throat equal to one half the width of the flume. The dimensions of a Palmer-Bowlus flume have been standardized in a generic sense, but the flume shape may vary. Therefore, there are no formulas that can be applied to all Palmer-Bowlus flumes. Device-specific head-flow relationships for each device should be obtained from the manufacturer

There are a number of other, less common, flow measurement devices available which will not be discussed (see Appendix D for additional references).

Secondary Flow Measurement Devices

Secondary flow measurement devices are automated forms of flow rate and volume measurement. Typically, a secondary device is used in conjunction with a primary device to automatically measure the flow depth or head. This value is then processed, using established mathematical relationships to relate the depth measurement to a corresponding flow rate. The device also may have the capacity to convert this flow rate to a volume. Secondary flow measurement devices include floats, ultrasonic transducers, pressure transducers, and bubblers. The output of the secondary device is transmitted to a display, recorder, and/or totalizer to provide flow rate and volume information. The user manuals for these devices should be consulted for proper usage.

Evaluation of Flow Measurement Devices

To ensure accurate results, facilities should evaluate, via visual observation and routine checks, the design, installation, and operation of flow measurement devices. When evaluating design, select a device which:

- Is accurate over the entire range of expected flow rates
- Can be installed in the channel to be monitored
- Is appropriate to the sampling location (i.e., power setup, submersible, etc.).

When evaluating the installation of flow measurement devices, ensure that:

- There are no leaks and/or bypasses of flow around the measuring device
- The primary device is level and squarely installed
- The secondary device is calibrated.

When evaluating the operation of flow measurement devices, look for:

- Excessive flows which submerge the measuring device
- Flows outside the accuracy range of the device
- Leaks and/or bypasses around the measuring device

RAPID TRASH ASSESSMENT PROTOCOL
Surface Water Ambient Monitoring Program
California Regional Water Quality Control Board, San Francisco Bay Region

Monitoring Design. The rapid trash assessment can be used for a number of purposes, such as ambient monitoring, evaluation of management actions, determination of trash accumulation rates, or comparing sites with and without public access. Ambient monitoring efforts should provide information at sites distributed throughout a waterbody, and several times a year to characterize spatial and temporal variability. Additionally, the ambient sampling design should document the effects of episodes that affect trash levels such as storms or community cleanup events. Pre- and post-project assessments can assist in evaluating the effectiveness of management practices ranging from public outreach to structural controls, or to document the effects of public access on trash levels in waterbodies (e.g., upstream/downstream). Such evaluations should consider trash levels over time and under different seasonal conditions. Revisiting sites where trash was collected during previous assessments enables the determination of accumulation rates. This methodology was developed for sections of wadeable streams, but can be adapted to shorelines of lakes, beaches, or estuaries. Ultimately, the monitoring design will strongly affect the usefulness of any rapid trash assessment information.

Site Definition. Upon arrival at a designated monitoring site, a team of two people or more defines or verifies a 100-foot section of the stream or shoreline to analyze, associated with a sampling location or station. When a site is first established, it is recommended that the 100-foot distance be accurately measured. The length should be measured not as a straight line, but as 100 feet of the actual stream or shore length, including sinuous curves. Where possible, the starting and ending points of the survey should be easily identified landmarks, such as an oak tree or boulder, and noted on the worksheet ("Upper/Lower Boundaries of Reach"), or documented using a global positioning system (GPS), so that future assessments are made at the same location. The team should confer and document the upper boundary of the banks to be surveyed, based on evaluation of whether trash can be carried to the water body by wind or water (e.g., an upper terrace in the stream bank). The team documents the location of the high water line based on site-specific physical indicators, such as a debris line found in the riparian vegetation along the stream channel. If the high water line cannot be determined, it is suggested that bankfull height be documented, noting that the high water line could not be determined. Trash located below the high water line can be expected to move into the streambed or be swept downstream during the next winter season. Visually extend all boundaries in order to encompass the 100' section. Defining site characteristics will facilitate the comparison of trash assessments conducted at the same site at different times of the year.

Survey. It is highly recommended that all trash items within an assessed site be picked up, so that the site can be revisited and re-assessed for impairment and usage patterns. A survey, including notes and scoring, will take approximately one to two hours based on how trash-impacted the site is and how many people are working together. The first time a site is assessed, the process will generally take longer than on subsequent visits. Begin the survey at the downstream end of the selected reach so that trash can be seen in the undisturbed stream channel. Tasks can be divided according to the number of team members. In one scenario of a team with two members, one team member begins walking along the bank or in the water (wear waders) at the edge of the stream or shore, looking for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either above or below the high water line based on the previously determined boundary. The other person walks in the streambed and up and down the opposite bank, picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line, for the tally person to mark down appropriately on the trash assessment sheet. All team members pick up the trash items as they are found. Keep in mind that the person tallying will not be able to pick up nearly as much trash as the other team members. All team members make sure to avoid injuries by using gloves. Avoid touching trash with unprotected hands!

The person tallying the trash indicates on the sheet whether the trash was found above the high water line on the bank, or below the high water line either on the bank or in the stream (i.e., tally dots or circles (•) for above high water line, tally lines (|) for below). If it is evident that items have been littered, dumped, or accumulated via downstream transport, make a note in the designated rows near the bottom of the tally sheet - this will help when

assessing scores. A trash grabber, metal kitchen tongs, or a similar tool should be used to help pick up trash. Be sure to look under bushes, logs, and other plant growth to see if trash has accumulated underneath. The ground and substrate should be inspected to ensure that small items such as cigarette butts and pieces of broken glass or Styrofoam are picked up and counted. The tally count is an important indicator of trash impairment and should be used in conjunction with the total score to assist in site comparisons. It is important not to miss items that can affect human health such as diapers, fecal matter, and needles; these items can strongly affect the total score.

Once the team is finished with the tallying, use the tally sheet margins to count up two totals for each trash item line, one total for items found above the high water line, and one total for items found below the high water line. Now sum the totals of above and below for each trash category, and write in next to each trash category. Be sure to complete the worksheets before leaving the site while everything is still fresh in the memory. The team should discuss each parameter and agree on a score based on a discussion of the condition categories. Discuss and document possible influential factors affecting trash levels at the site, such as a park, school, or nearby residences or businesses. Within each trash parameter, narrative language is provided to assist with choosing a condition category. The worksheet provides a range of numbers within a given category, allowing for a range of conditions encountered in the field. For instance, trash located in the water leads to lower scores than trash above the high water line. Not all specific trash conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., "site frequently used by people"), nor do the narratives describe all possible conditions. Scores of "0" should be reserved for the most extreme conditions. Once the scores are assigned for the six categories, sum the final score and include specific notes about the site at the end of the sheet. A site should be assessed several times in a given year, during different seasons, to characterize the variability and persistence of trash occurrence for water quality assessment purposes.

Trash Assessment Parameters. The rapid trash assessment includes a range of parameters that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters estimate actual threat to water quality, and the last two parameters represent how trash enters the water body at a site, either through on-site activities or downstream accumulation.

1. **Level of Trash.** This assessment parameter is intended to reflect a qualitative "first impression" of the site, after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the waterbody. No trash should be obviously visible at sites that score in the "optimal" range.

2. **Actual Number of Trash Items Found.** Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 100 items have been tallied, assign the following scores: 5: 101-200 items; 4: 201-300 items; 3: 301-400 items; 2: 401-500 items; 1: 501-600 items; 0: over 600 items. Use similar guidelines to assign scores in other condition categories.

   Sometimes items are broken into many pieces. Fragments with higher threat to aquatic life such as plastics should be individually counted, while paper and broken glass, with lower threat and/or mobility, should be counted based on the parent item(s). Broken glass that is scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, and waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

3. **Threat to Aquatic Life.** As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as

food items. Larger items can cause entanglement. Some discarded debris may contain toxic substances. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. **Threat to Human Health.** This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment, such as mercury. The worst conditions have the potential for presence of dangerous bacteria or viruses, such as with medical waste, diapers, and human or pet waste.

5. **Illegal Dumping and Littering.** This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. **Accumulation of Trash.** Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

Technical Notes on Trash and Water Quality

Trash is a water pollutant that has a large range of characteristics of concern. Not all litter and debris delivered to streams are of equal concern to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to aquatic life in the form of ingestion or entanglement. Some elements of trash exhibit significant threats to human health, such as discarded medical waste, human or pet waste, and broken glass. Also, some household and industrial wastes may contain toxic substances of concern to human health and wildlife, such as batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Larger trash such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistence and accumulation of trash in a waterbody are of particular concern, and signify a priority area for prevention of trash discharges. Also of concern are trash "hotspots" where illegal dumping, littering, and/or accumulation of trash occur.

Rapid Trash Assessment. Trash assessment includes a visual survey of the waterbody (e.g., streambed and banks) and adjacent areas from which trash elements can be carried to the waterbody by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet is designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the Clean Water Act and the California Water Code. The worksheet also provides a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations.

Trash Characteristics of Concern. For aquatic life, buoyant (floatable) elements tend to be more harmful than settleable elements, due to their ability to be transported throughout the waterbody and ultimately to the marine environment. Persistent elements such as plastics, synthetic rubber and synthetic cloth tend to be more harmful than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002). Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. Larger plastic elements such as plastic grocery bags are also harmful to larger aquatic life such as sea turtles, which can mistake the trash for floating prey and ingest it, leading to starvation or suffocation. Floating debris that is not trapped and removed will eventually end up on the beaches or in the ocean, repelling visitors and residents from the beaches and degrading coastal and open ocean waters.

Trash in water bodies can threaten the health of people who use them for wading or swimming. Of particular concern are the bacteria and viruses associated with diapers, medical waste (e.g., used hypodermic needles and pipettes), and human or pet waste. Additionally, broken glass or sharp metal fragments in streams can cause puncture or laceration injuries. Such injuries can then expose a person's bloodstream to microbes in the stream's water that may cause illness. Also, some trash items such as containers or tires can pond water and support mosquito production and associated risks of diseases such as encephalitis and the West Nile virus.

Leaf litter is trash when there is evidence of intentional dumping. Leaves and pine needles in streams provide a natural source of food for organisms, but excessive levels due to human influence can cause nutrient imbalance and oxygen depletion in streams, to the detriment of the aquatic ecosystem. Clumps of leaf litter and yard waste from trash bags should be treated as trash in the water quality assessment, and not confused with natural inputs of leaves to streams. If there is a question in the field, check the type of leaf to confirm that it comes from a nearby riparian tree. In some instances, leaf litter may be trash if it originates from dense ornamental stands of nearby human planted trees that are overloading the stream's assimilative capacity for leaf inputs. Other biodegradable trash, such as food waste, also exerts a demand on dissolved oxygen, but aquatic life is unlikely to be adversely affected unless the dumping of food waste is substantial and persistent at a given location.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion. Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food (i.e., plastic bags look like jellyfish, a prey item of sea turtles). Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Larger settleable items such as automobiles, shopping carts, and furniture can redirect stream flow and destabilize the channel.

In conclusion, trash in water bodies can adversely affect humans, fish, and wildlife. Not all water quality effects of trash are equal in severity or duration, thus the trash assessment methodology was designed to reflect a range of trash impacts to aquatic life, public health, and aesthetic enjoyment. When considering the water quality effects of trash while conducting a trash assessment, remember to evaluate individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. Utilize the narratives in the worksheet, refer to the technical notes and trash parameter descriptions in the text as needed, and select your scores after careful consideration of actual conditions.

<u>References:</u>

U.S. Environmental Protection Agency, 2001. Draft Assessing and Monitoring Floatable Debris.

U.S. Environmental Protection Agency, 2002. The Definition, Characterization and Sources of Marine Debris. Unit 1 of Turning the Tide on Trash, a Learning Guide on Marine Debris.

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

WATERSHED/STREAM: _____ DATE/TIME: _____
MONITORING GROUP, STAFF: _____ SAMPLE ID: _____
SITE DESCRIPTION (Station Name, Number, etc.): _____

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
1. Level of Trash	On first glance, no trash visible. Little or no trash (<10 pieces) evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.	On first glance, little or no trash visible. After close inspection small levels of trash (10-50 pieces) evident in stream bank and streambed.	Trash is evident in low to medium levels (51-100 pieces) on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.	Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris (>100 pieces). Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Actual Number of Trash Items Found	0 to 10 trash items found based on a trash assessment of a 100-foot stream reach.	11 to 50 trash items found based on a trash assessment of a 100-foot stream reach.	51 to 100 trash items found based on a trash assessment of a 100-foot stream reach.	Over 100 trash items found based on a trash assessment of a 100-foot stream reach.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Threat to Aquatic Life	Trash, if any, is mostly paper or wood products or other biodegradable materials. Note: A large amount of rapidly biodegradable material like food waste creates high oxygen demand, and should not be scored as optimal.	Little or no (<10 pieces) transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts. Presence of settleable, degradable, and non-toxic debris such as glass or metal.	Medium prevalence (10-50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts Larger deposits (< 50 pieces) of settleable debris such as glass or metal. Any evidence of clumps of deposited yard waste or leaf litter.	Large amount (>50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, balloons, Styrofoam, cigarette butts; toxic items such as batteries, lighters, or spray cans; large clumps of yard waste or dumped leaf litter; or large amount (>50 pieces) of settleable glass or metal.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Threat to Human Health	Trash contains no evidence of bacteria or virus hazards such as medical waste, diapers, pet or human waste. No evidence of toxic substances such as chemical containers or batteries. No ponded water for mosquito production. No evidence of puncture and laceration hazards such as broken glass or metal debris.	No bacteria or virus hazards or sources of toxic substances, but small presence (<10 pieces) of puncture and laceration hazards such as broken glass and metal debris. No presence of ponded water in trash items such as tires or containers that could facilitate mosquito production.	Presence of **any one** of the following: hypodermic needles or other medical waste; used diaper, pet waste, or human feces; any toxic substance such as chemical containers, batteries, or fluorescent light bulbs (mercury). Medium prevalence (10-50 pieces) of puncture hazards.	Presence of **more than one** of the items described in the marginal condition category, or high prevalence of any one item (e.g. greater than 50 puncture or laceration hazards).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
5. Illegal Dumping	D: No evidence of illegal dumping. No bags of trash, no yard waste, no household items placed at site to avoid proper disposal, no shopping carts.	D: Some evidence of illegal dumping. Limited vehicular access limits the amount of potential dumping, or material dumped is diffuse paper-based debris.	D: Presence of **one** of the following: furniture, appliances, shopping carts, bags of garbage or yard waste, coupled with vehicular access that facilitates in-and-out dumping of materials to avoid landfill costs.	D: Evidence of chronic dumping, with **more than one** of the following items: furniture, appliances, shopping carts, bags of garbage, or yard waste. Easy vehicular access for in-and-out dumping of materials to avoid landfill costs.
Illegal Littering	L: Any trash is incidental litter (< 5 pieces) or carried downstream from another location.	L: Some evidence of litter within creek and banks originating from adjacent land uses (<10 pieces).	L: Prevalent (10-50 pieces) in-stream or shoreline littering that appears to originate from adjacent land uses.	L: Large amount (>50 pieces) of litter within creek and on banks that appears to originate from adjacent land uses.
D-SCORE	10 9	8 7 6	5 4 3	2 1 0
L-SCORE	10 9	8 7 6	5 4 3	2 1 0
6. Accum-ulation of Trash	There does not appear to be a problem with trash accumulation from downstream transport. Trash, if any, appears to have been directly deposited at the stream location.	Some evidence (<10 pieces) that litter and debris have been transported from upstream areas to the location, based on evidence such as silt marks, faded colors or location near high water line.	Evidence that (10 to 50 pieces) trash is carried to the location from upstream, as evidenced by its location near high water line, siltation marks on the debris, or faded colors.	Trash appears to have accumulated in substantial quantities at the location based on delivery from upstream areas, and is in various states of degradation based on its persistence in the waterbody. Over 50 items of trash have been carried to the location from upstream.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Total Score _____

SITE DEFINITION:
UPPER/LOWER BOUNDARIES OF REACH: _____
HIGH WATER LINE: _____
UPPER EXTENT OF BANKS OR SHORE: _____
_____

NOTES:
_____
_____
_____
_____
_____
_____
_____

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

TRASH ITEM TALLY (Tally with (•) if found above high water line, and (|) if below)

PLASTIC # Above___ # Below____	**METAL** # Above___ # Below____
Plastic Bags	Aluminum Foil
Plastic Bottles	Aluminum or Steel Cans
Plastic Bottle Caps	Bottle Caps
Plastic Cup Lid/Straw	Metal Pipe Segments
Plastic Pipe Segments	Auto Parts (specify below)
Plastic Six-Pack Rings	Wire (barb, chicken wire etc.)
Plastic Wrapper	Metal Object
Soft Plastic Pieces	**LARGE (specify below)** # Above___ # Below____
Hard Plastic Pieces	Appliances
Styrofoam cups pieces	Furniture
Styrofoam Pellets	Garbage Bags of Trash
Fishing Line	Tires
Tarp	Shopping Carts
Other (write-in)	Other (write-in)
BIOHAZARD # Above___ # Below____	**TOXIC** # Above___ # Below____
Human Waste/Diapers	Chemical Containers
Pet Waste	Oil/Surfactant on Water
Syringes or Pipettes	Spray Paint Cans
Dead Animals	Lighters
Other (write-in)	Small Batteries
CONSTRUCTION DEBRIS#Above___#Below__	Vehicle Batteries
Concrete (not placed)	Other (write-in)
Rebar	**BIODEGRADABLE** # Above___ # Below____
Bricks	Paper
Wood Debris	Cardboard
Other (write-in)	Food Waste
MISCELLANEOUS # Above___ # Below____	Yard Waste (incl. trees)
Synthetic Rubber	Leaf Litter Piles
Foam Rubber	Other (write-in)
Balloons	**GLASS** # Above___ # Below____
Ceramic pots/shards	Glass bottles
Hose Pieces	Glass pieces
Cigarette Butts	**FABRIC AND CLOTH** # Above___# Below____
Golf Balls	Synthetic Fabric
Tennis Balls	Natural Fabric (cotton, wool)
Other (write-in)	Other (write-in)
Total pieces Above:	**Below:** **Grand total:**
Tally all trash in above rows; make notes below as needed to facilitate scoring.	
Littered:	
Dumped:	
Downstream Accumulation:	

SPECIFIC DESCRIPTION OF ITEMS FOUND:_____

_____

_____

013653

SWAMP
Surface Water Ambient Monitoring Program

Final Technical Report	2007

A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams

January 2007

Water Boards

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This report was authored by Steven M. Moore, Matthew Cover and Anne Senter of the Regional Water Quality Control Board, San Francisco Bay Region, Surface Water Ambient Monitoring Program.

Cover Photo of Peralta Creek at Cesar Chavez Park, Oakland, CA, by Anne Senter

Draft

Introduction

Trash is a term used in water quality control, synonymous with litter, debris, rubbish and refuse. Trash in urban waterways of coastal areas can become "marine debris," known to harm fish and wildlife and cause adverse economic impacts (Moore and Allen, 2000). Trash is a regulated water pollutant that has many characteristics of concern to water quality. It accumulates in streams, rivers, bays, and ocean beaches throughout the San Francisco Bay Region of California, particularly in urban areas. Absent numeric guidelines or standard assessment methodologies, assessing trash levels and prioritizing water bodies for trash management remains a challenge for the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board). This report documents a pilot effort conducted by the Surface Water Ambient Monitoring Program (SWAMP) to systematically assess trash levels in streams, which are sources of marine debris to the San Francisco Bay and Pacific Ocean. Results from year-round surveys of 26 sites around the San Francisco Bay Region are presented and discussed (Figure 1).

The goal of this report is to provide a regional assessment of trash deposition in fresh waters of the San Francisco Bay Region. The objectives are to document (1) dry and wet weather deposition rates, (2) longitudinal variability within watersheds, and (3) variability across watersheds in representative urban and rural residential settings. This report presents data on site scores, trash abundance, and types of trash, followed by a discussion of likely sources of trash and potential management measures. At each site survey the trash was removed, and subsequent surveys document the deposition rate of trash in pieces per 100-feet per day. Sites with the highest trash deposition rates in dry and wet weather conditions are presented as case studies in a discussion of sources of trash pollution and potential management actions.

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Trash and Water Quality Standards

Water quality standards consist of (1) designated beneficial uses for specific water bodies, (2) water quality objectives (narrative and/or numeric) to protect beneficial uses, and (3) the State's Antidegradation Policy, which mandates the maintenance of high quality waters, preventing degradation to the minimally acceptable standard. Water quality standards for the San Francisco Bay Region are contained in the San Francisco Bay Region Water Quality Control Plan (Basin Plan).

Trash adversely affects numerous beneficial uses of waters, particularly recreation and aquatic habitat. Not all litter and debris delivered to streams are of equal concern with regards to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to wildlife in the form of entanglement or ingestion (Laist and Liffmann, 2000; McCauley and Bjorndahl, 1998). Some elements of trash exhibit significant threats to human health, such as discarded medical waste, human or pet waste, and broken glass (Sheavly, 2004). Also, some household and industrial wastes may contain toxic substances of concern to human health and wildlife, such as

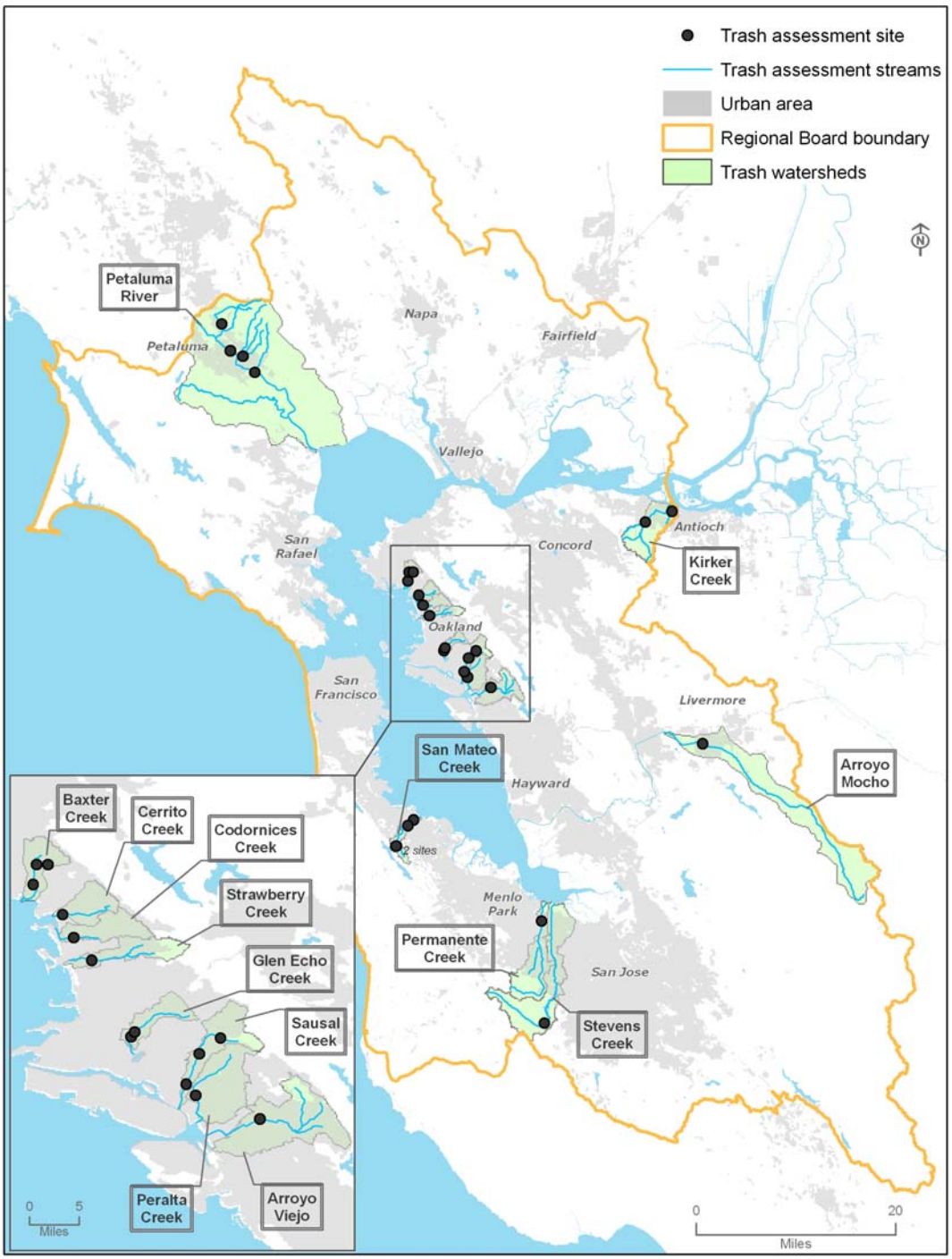

Figure 1 – Map of Trash Assessment Sites, San Francisco Bay Region SWAMP Program, 2003-2005

batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Large trash items such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistent accumulation of trash in a water body is of particular concern, and signifies a priority for prevention of trash discharges. Also of concern are trash "hotspots" where illegal dumping, littering, and/or accumulation of trash occur.

The narrative water quality objectives applicable to trash are Floating Material (*Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses*), Settleable Material (*Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses*), and Suspended Material (*Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses*).

The Basin Plan prohibits discharge of rubbish and refuse to waters of the state (Table 4-1, Discharge Prohibitions, No. 7). This prohibition was adopted by the Water Board in the 1975 Basin Plan, primarily to protect recreational uses such as boating.

Several water bodies in California are listed under Section 303(d) of the Clean Water Act (CWA) as impaired by trash, which means they are not meeting water quality standards. The 303(d) List includes Lake Merritt of Oakland as impaired by trash. In 2001, the Los Angeles Regional Water Board began adopting Total Maximum Daily Loads (TMDLs) for trash in its jurisdictional area, so that certain water bodies including the Los Angeles River can eventually meet the water quality standard in relation to trash. The San Francisco Bay Regional Water Board keeps an informal "watch" list for impaired water bodies, and has placed trash in all urban creeks, lakes and shorelines on this list. As part of this action in November 2001, the Water Board identified the need for better information on trash assessment in order to discern which water bodies should be included on the 303(d) Impaired Water Bodies List.

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Assessment Method Development

Recognizing the need for assessment procedures to support 303(d) listing decisions, the staff of the Water Board developed, refined, and implemented a rapid trash assessment method from 2002 through 2005 as part of its Surface Water Ambient Monitoring Program (SWAMP) (Water Board, 2004, Appendix A). The method was refined through field experience and by conferring with representatives from local government and nonprofit groups. The method generates site-specific scores on a scale from 0 to 120, with higher scores indicating cleaner sites. The method also documents the number of pieces of trash per one hundred feet of stream or shoreline, and the rate of return of trash under different hydrologic conditions. This data can be used to identify problem areas where trash accumulates during dry weather due to littering or dumping and in wet weather due to accumulation from upstream sources, and to assess the effectiveness of targeted management measures.

Trash assessment includes a visual survey of the water body (e.g., streambed and banks) and adjacent areas from which trash elements can be carried to the water body by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet is designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the CWA and the California Water Code. The worksheet also provides a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations. The specific items on the tally sheet were determined based on common items retrieved during numerous pilot surveys.

There is a need to systematically measure trash levels in Bay Area and California water bodies to establish baseline conditions, and evaluate the success of educational, institutional, operational and structural efforts to control trash. In some systems that behave as trash "catchments," such as Lake Merritt, tons of trash removed may be an appropriate indicator to measure over time to gauge success, as long as it is measured consistently. The Water Board staff developed the rapid trash assessment method to provide such a systematic approach for non-catchment systems such as streams and shorelines, where "tons of trash removed" may not provide an accurate tracking mechanism. Trash weight can be a misleading indicator, since the trash of most concern to beneficial uses is small, buoyant and persistent (U.S. EPA, 2001).

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Water Quality Impacts of Trash

For aquatic life, buoyant (floatable) elements tend to be more harmful than settleable elements, due to their ability to be transported throughout the water body and ultimately to the marine environment. Persistent elements such as plastics, synthetic rubber and synthetic cloth tend to be more harmful than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces that are less sharp and harmful. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002). Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. Larger plastic elements such as plastic grocery bags are also harmful to larger aquatic life such as sea turtles, which can mistake the trash for floating prey and ingest it, leading to starvation or suffocation. Floating debris that is not trapped and removed will eventually end up on the beaches or in the ocean, repelling visitors and residents from the beaches and degrading coastal and open ocean waters.

Trash in water bodies can threaten the health of people who use them for wading or swimming. Of particular concern are the bacteria and viruses associated with diapers, medical waste (e.g., used hypodermic needles and pipettes), and human or pet waste. Additionally, broken glass or sharp metal fragments in streams can cause puncture or

laceration injuries. Such injuries can then expose a person's bloodstream to microbes in the stream's water that may cause illness. Also, some trash items such as containers or tires can pond water and support mosquito production and associated risks of diseases such as encephalitis and the West Nile virus.

Leaf litter is considered trash when there is evidence of intentional dumping. Leaves and pine needles in streams provide a natural source of food for organisms, but excessive levels due to human influence can cause nutrient imbalance and oxygen depletion in streams, to the detriment of the aquatic ecosystem. Clumps of leaf litter and yard waste from trash bags should be treated as trash in the water quality assessment, and not confused with natural inputs of leaves to streams. If there is a question in the field, check the type of leaf to confirm that it comes from a nearby riparian tree. In some instances, leaf litter may be trash if it originates from dense ornamental stands of nearby human planted trees that are overloading the stream's assimilative capacity for leaf inputs. Other biodegradable trash, such as food waste, also exerts a demand on dissolved oxygen, but aquatic life is unlikely to be adversely affected unless the dumping of food waste is substantial and persistent at a given location.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion, with entanglement the more common documented effect (Laist and Liffmann, 2000). Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

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Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food (e.g., plastic bags look like jellyfish, a prey item of sea turtles). Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Larger settleable items such as automobiles, shopping carts, and furniture can redirect stream flow and destabilize the channel.

In conclusion, trash in water bodies can adversely affect humans, fish, and wildlife. Not all water quality effects of trash are equal in severity or duration, thus the trash assessment methodology was designed to reflect a range of trash impacts to aquatic life, public health, and aesthetic enjoyment. When considering the water quality effects of trash while conducting a trash assessment, remember to evaluate individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. Utilize the narratives in the worksheet, refer to the technical notes and trash parameter descriptions in the text as needed, and select your scores after careful consideration of actual conditions.

Sources and Fate of Trash

Movement and fate of trash in the landscape and waterways varies based on its size, buoyancy, and degradability. Small, buoyant and persistent trash items such as plastic or synthetic rubber may travel from land all the way to mid-ocean locations, whereas other trash items may have a more transient or localized presence in waters.

The primary sources of trash to waters of the state are urban runoff in nearshore areas such as creeks and San Francisco Bay, and fishing boats in offshore areas (Moore and Allen, 2000). In most of the region, storm drainage in urban areas had been designed to move water as quickly as possible to surface waters. One unfortunate by-product of this design is that medium to heavy rain events move trash that is deposited on streets and other impervious surfaces directly to waters of the state, unless it is screened out by coarse metal grates in urban gutters.

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Surveys of the ocean floor of the Southern California Bight for trash and natural debris concluded that land-based trash sources contributed the most to the ocean bottom trash levels near the shoreline, but the trash on the outer continental shelf was dominated by discarded fishing gear and incidental waste from recreational and commercial fishing boats (Moore and Allen, 2000).

Surveys of the North Pacific central gyre for floating plastics and plankton suggest that the amount of plastic material in the ocean is increasing over time (Day and Shaw, 1987). Plastic degrades slowly in the ocean (Andrady, 1990; U.S. EPA, 1992). The eddy effects of the gyre probably serve to retain plastics, whereas plastics may wash up on shore in greater numbers in other areas. This is based on the observation that a large fraction of the materials in the central gyre study appeared to be remnants of offshore fishing-related activity and shipping traffic. The survey indicated that the mass of plastics is about six times that of plankton, but the abundance of plankton is still about five times that of plastic pieces (Moore et al., 2001).

Methods

In order to generate consistent and comparable results, the methods of site definition, data collection, scoring, and overall monitoring program design are discussed in this section.

Monitoring Design Considerations

The rapid trash assessment method can be used for a number of purposes, such as ambient monitoring, evaluation of management actions, determination of trash accumulation rates, or comparing sites with and without public access. In this report, the data collected is used for all of these purposes. Ambient monitoring provides information at sites distributed throughout a water body, located in similar locations across different water bodies, and several times a year to characterize spatial and temporal variability. Additionally, the ambient sampling design should document the effects of episodes that affect trash levels such as storms or community cleanup events. Pre- and post-project assessments can assist in evaluating the effectiveness of management practices ranging from public outreach to structural controls, or to document the effects of public access on trash levels in waterbodies (e.g., upstream/downstream). Such evaluations should consider trash levels over time and under different seasonal conditions. Revisiting sites where trash was collected during previous assessments enables the determination of accumulation rates. This methodology was developed for sections of wadeable streams, but can be adapted to shorelines of lakes, beaches, or estuaries. Ultimately, the monitoring design strongly affects the usefulness of any rapid trash assessment information.

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SWAMP Trash Monitoring Design

In accordance with the goal of this report, sites were selected to represent the range of conditions found in the tributaries to San Francisco Bay, from rural residential areas in the foothills to dense, urbanized areas in the plains. All sites were near or within city limits, representing areas of public access (e.g., parks) or at the bottom of watersheds.

The SWAMP program rotates water quality monitoring through 46 planning watersheds in the San Francisco Bay Region, as budget allows. Trash assessments were conducted at sites where water quality was monitored in the SWAMP program from 2003 to 2005. The 26 sites assessed using the rapid trash assessment methodology are located in five of the nine Bay Area counties (see Figure 1). Two of the 26 sites were surveyed only once, due to dangerous field conditions and extremely high trash levels, while other sites were surveyed three to five times over a year in order to calculate deposition rates of trash during dry and wet weather conditions. Surveys sometimes integrated both dry and wet conditions, but these assessments were classified as “wet weather” due to the observed overwhelming effect of wet weather conditions on trash deposition. Of the 26 sites, 13 were located at the bottom of the watershed (BOTW), representing areas just upstream of the San Francisco Bay intertidal zone. The remainder of the sites were located further upstream, allowing for longitudinal analyses of trash deposition in the San Mateo Creek, Baxter Creek (Richmond), Petaluma River, and Sausal Creek (Oakland) watersheds. This report presents results and discussion for a total of 93 individual site surveys.

Site Definition

Defining site-specific characteristics facilitates the comparison of trash assessments conducted at the same site at different times of the year. Upon arrival at a designated

monitoring site, a team of two people or more defined or verified a 100-foot section of the stream or shoreline to analyze, associated with a SWAMP water quality sampling location or station. When a site was first established, the 100-foot distance was accurately measured. The length was measured not as a straight line, but as 100 feet of the actual stream or shore length, including sinuous curves. Where possible, the starting and ending points of the survey were easily identified landmarks, such as an oak tree or boulder, and noted on the worksheet ("Upper/Lower Boundaries of Reach"), or documented using a global positioning system (GPS), so that future assessments could be made at the same location. The team conferred and documented the upper boundary of the banks to be surveyed, based on evaluation of whether trash could be carried to the water body by wind or water (e.g., an upper terrace in the stream bank). At each site, the team documented the location of the high water line based on site-specific physical indicators, such as a debris line found in the riparian vegetation along the stream channel. If the high water line could not be determined, bank full height was documented in the field sheets, noting that the high water line could not be determined. Trash located below the high water line can be expected to move into the streambed or be swept downstream during the next significant rain event.

Trash Data Collection

The trash assessment protocol involves picking up and tallying all of the trash items found within the defined boundaries of a site. When repeated several times throughout a year, this procedure allows for the assessment of temporal changes in impairment, usage patterns, and trash deposition rates under wet and dry weather conditions. Surveys, including trash collection, note taking, and scoring, typically took one to two hours, depending on how trash-impacted the site was and the number of people on the survey crew. The first time a site was assessed the process generally took longer than on subsequent visits.

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All surveys are initiated at the downstream end of the selected reach so that trash is not obscured after disturbing the streambed. Tasks are divided according to the number of team members. For a team with two members, both persons, equipped with gloves and garbage bags, pick up trash. A trash grabber, metal kitchen tongs, or a similar tool can also be used to help pick up trash. One team member begins walking along the bank at the edge of the stream or shore, looking for trash on the bank up to the upper bank boundary, above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either above or below the high water line. The other person walks along the streambed and up and down the opposite bank, picking up and calling out trash items found in the water body and on the opposite bank, both above and below the high water line, for the tally person to mark down appropriately on the trash assessment sheet. A three-member team has one designated note-taker and two trash collectors.

To make sure that trash items are not missed from the survey, team members look under bushes, logs, and vegetation to see if trash has accumulated underneath. The ground and substrate is closely inspected to ensure that small items such as cigarette butts and pieces

of broken glass or Styrofoam are picked up and counted. Special attention was paid to items that can affect human health such as diapers, fecal matter, and medical needles; these items can strongly affect the total score. The person tallying the trash indicates on the worksheet whether the trash was found above the high water line on the bank, or below the high water line either on the bank or in the stream (i.e., tally dots or circles (•) for above high water line, tally lines (|) for below). If it is evident that items have been littered, dumped, or accumulated via downstream transport, notes are made in the designated rows near the bottom of the tally sheet - this helps when assigning scores.

Once the team is finished collecting trash, the recorder indicates in the margins of the tally sheet the total number of items in each category found above and below the waterline. All worksheets are completed before leaving the site, while everything is still fresh in the memory. The team discusses each scoring parameter (described below under "Scoring") and agrees on a score for each of the condition categories, The team also discusses and records hypotheses of potential sources of trash, such as neighboring or upstream land uses.

Scoring

The rapid trash assessment includes six condition categories that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters estimate actual threat to water quality, and the last two parameters represent how trash enters the water body at a site, either through on-site activities or downstream accumulation.

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Within each trash parameter, narrative language is provided to assist with choosing a condition category. The worksheet provides a range of numbers within a given category, allowing for a range of conditions encountered in the field. For instance, trash located in the water results in lower scores than trash above the high water line. Not all specific trash conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., "site frequently used by people"), nor do the narratives describe all possible conditions. Scores of "0" should be reserved for the most extreme conditions. Once team members assigned the scores for the six categories in the field, the final scores were summed and specific notes about the site included at the end of the sheet. Each site was assessed three or four times in a given year, during different seasons, to characterize the variability and persistence of trash occurrence for water quality assessment purposes.

The scoring categories include:

1. *Level of Trash.* This assessment parameter is intended to reflect a qualitative "first impression" of the site, after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the water body. No trash should be obviously visible at sites that score in the "optimal" range.

2. *Actual Number of Trash Items Found*. Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 100 items have been tallied, assign the following scores: 5: 101-200 items; 4: 201-300 items; 3: 301-400 items; 2: 401-500 items; 1: 501-600 items; 0: over 600 items. Use similar guidelines to assign scores in other condition categories. Sometimes items are broken into many pieces. Fragments with higher threat to aquatic life such as plastics should be individually counted, while paper and broken glass, with lower threat and/or mobility, should be counted based on the parent item(s). Broken glass that is scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, and waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

3. *Threat to Aquatic Life*. As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. Some discarded debris may contain toxic substances. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. *Threat to Human Health*. This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment, such as mercury. The worst conditions have the potential for presence of dangerous bacteria or viruses, such as with medical waste, diapers, and human or pet waste.

5. *Illegal Dumping and Littering*. This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. *Accumulation of Trash*. Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

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Quality Assurance

To address concerns about observer bias and differences in interpretation of narrative language, SWAMP and Alameda County stormwater staff performed a methods repeatability study in July 2002. Three teams of two members assessed and scored the same two sites in a blind comparison. A summary of the study is included as Appendix B, Rapid Trash Assessment Method Evaluation.

Results and Discussion

There are two major mechanisms responsible for trash in streams of the San Francisco Bay Region: ***direct littering or dumping***, and ***downstream transport and accumulation***. Littering and dumping were usually documented in dry weather conditions between sampling events, while downstream transport and accumulation of trash occurred extensively at the bottom of watersheds in wet weather conditions between sampling events. Results confirmed that these two phenomena occur at remarkable rates of deposition and levels of trash per 100-feet of stream in every watershed studied. In this section, the sites with the highest dry and wet weather deposition rates are described, sources of trash are identified, and potential management measures are discussed. In addition, two public access sites with high RTA scores and relatively low trash deposition rates are discussed to identify management efforts that appear to be working to keep trash out of the streams.

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Regional Conditions

The 93 site visits conducted by Water Board staff and students over three years and multiple seasons confirmed that high levels of trash are present throughout urban streams in the San Francisco Bay Region. On average, across all sites and seasons, 288 pieces of trash were collected per 100 foot reach of stream, equaling 2.88 pieces per linear foot of stream (Figure 2). Over 50% of this total, or 1.56 pieces per linear foot of stream, was composed of plastic items. Glass (19%) and biodegradable items (10%) were also commonly found. Most sites contained less than 500 pieces of trash, while several sites contained many more pieces, up to a maximum of 1133 pieces, or 11.33 pieces per linear foot of stream (Figure 3). Overall, 72% of all trash items were found below the high-water line, while 28% of items were found above the high-water line. Certain types of items were found almost exclusively below the high-water line, including toxic items (87%), construction debris (87%), and glass (82%). Forty-two percent of biodegradable items were found above the high water line, indicative of the frequency with which paper is transported by wind into stream channels. The average total Rapid Trash Assessment (RTA) score was 47, with a range from 8 to 112 (out of a possible 120) (Figure 4). Lower RTA scores reflect higher levels of trash. A high RTA score, overall or in a specific category, represents more desirable, less trashed conditions. Total RTA scores were strongly related to the number of plastic pieces found at sites (Figure 5).

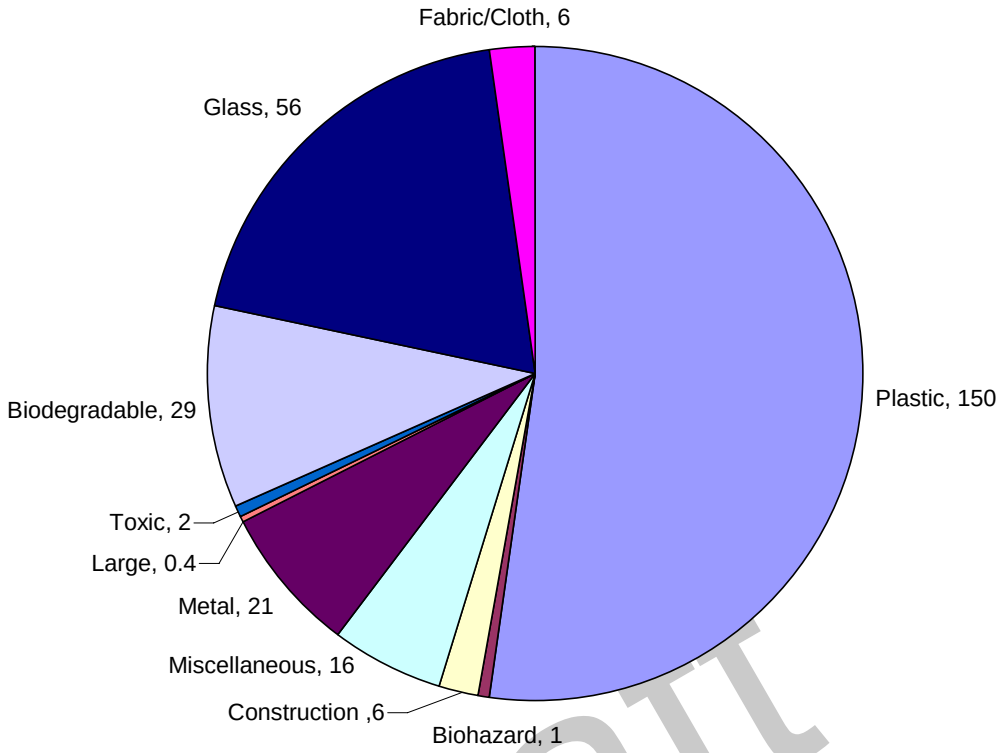

Figure 2: Average number of pieces of trash, by category, per 100 foot reach for all sites and all seasons.

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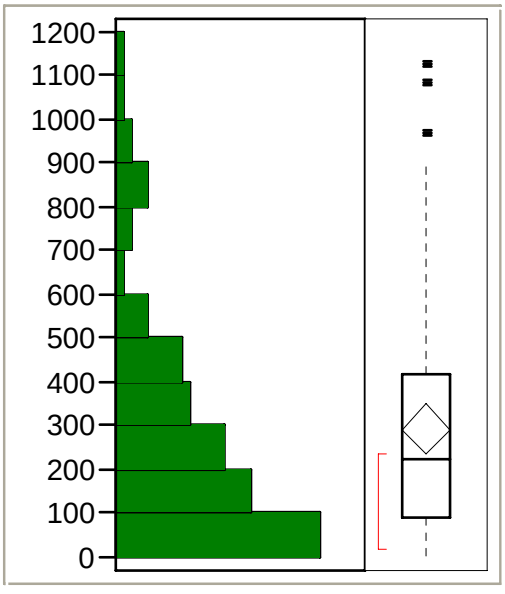

Figure 3: Frequency histogram of the number of pieces of trash found per 100 foot reach (site). The diamond indicates the mean and the standard error about the mean. The box indicates the median and the 25th and 75th percentiles, while the whiskers indicate the 5th and 95th percentiles.

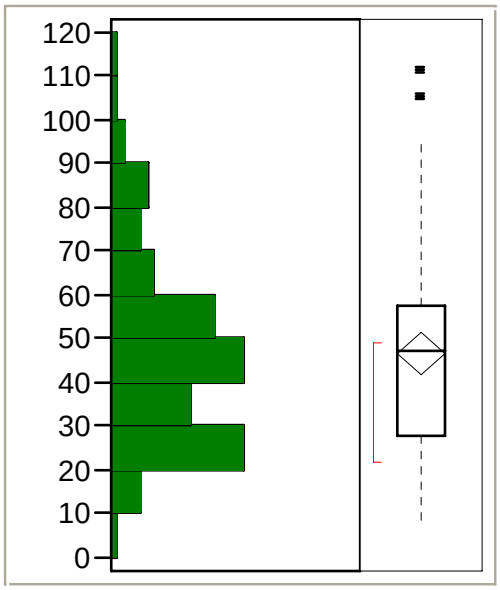

Figure 4: Frequency histogram of total RTA trash scores for each site visit. Symbols are the same as in Figure 3.

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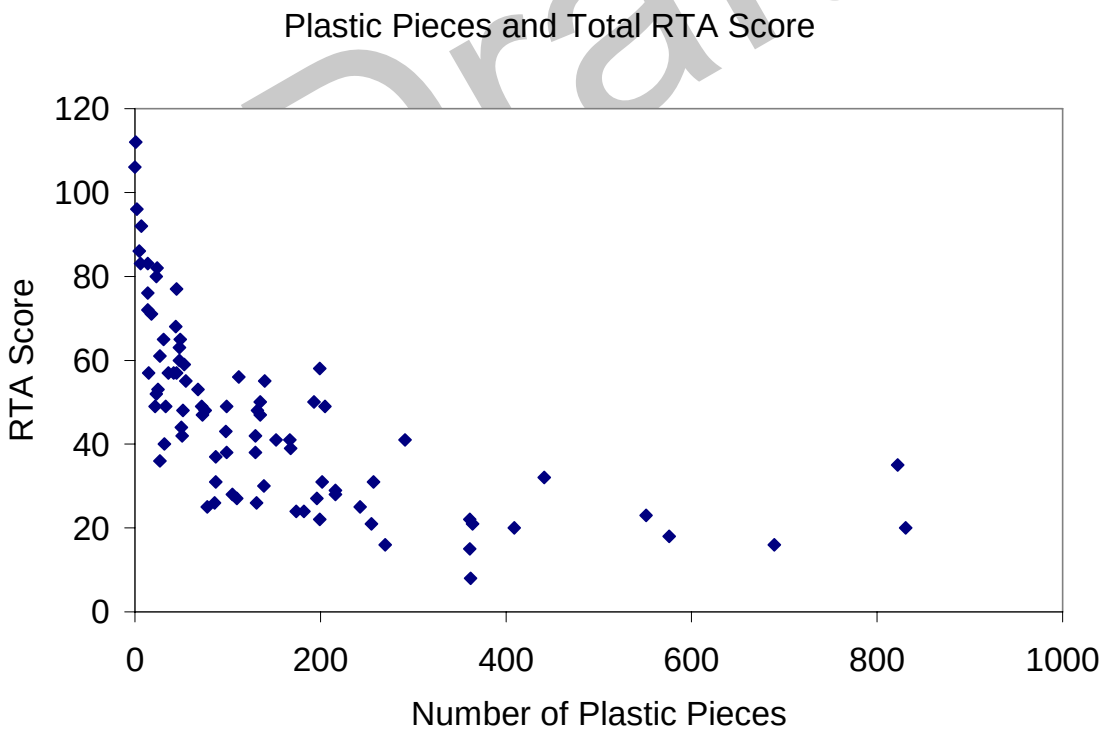

Figure 5: Total RTA score relative to the total number of plastic pieces collected.

The 26 sites surveyed did not include the worst-case conditions of trash in the region (e.g. Figure 6), where obstructions can cause buildup of floating trash in wet weather conditions. The most trash pieces per 100 feet of stream documented in this report was 1,133 pieces at Baxter Creek at Booker Park in Richmond. For comparison, trash stored behind obstructions may exceed 10,000 pieces per 100 feet (Figure 6). Other problem sites not surveyed include homeless encampments, although some of the sites were downstream of such major sources of trash.

There were significant differences in amounts and types of trash found at sites located at the bottom of watersheds and sites located in parks with high public access. Bottom-of-the-watershed (BOTW) sites (Table 2) received very low upstream accumulation scores (average score 3.3) relative to sites located higher in the watershed (average score 8.5). Conversely, littering was more important at sites with high public access (average score 3.9) than at sites without high public access (average score 5.4). Many more pieces of plastic were found below the high water line at BOTW sites (average 192) than at non-BOTW sites (average 52). Glass, however, was much more common at public access sites (average 92) than at non-public access sites (average 14). Overall, BOTW sites tended to most adversely affected by trash, in terms of highest total number of pieces (average 398) and lowest total RTA scores (average 35).

Condition category scores within the total RTA score reflected differences in trash deposition between both (1) wet and dry seasons and (2) BOTW and sites further upstream. Bottom of the watershed (BOTW) sites generally scored lower than sites further upstream in the watershed in nearly all trash condition category scores, with the exception of dumping and littering (Figure 7). Qualitative scores were much lower at BOTW sites than upstream sites, indicating the "first impression" of BOTW sites is consistently more negative with respect to trash.

Accumulation scores were also much lower at BOTW sites than upstream sites, but wet season scores are much lower for both site locations than dry season scores, reflecting the seasonality of trash accumulation. At BOTW sites, the dry season scores for accumulation were markedly lower than the wet season accumulation scores for upstream sites, shown at the far right of Figure 7. As noted above, at BOTW sites the trash is dominated by plastics. Plastics continue to be delivered to the bottom of watersheds and into the San Francisco Bay during the dry season. Trash can be delivered to streams, the topographic low points in watersheds, by wind and dry season urban runoff (e.g., over-irrigation), and these data suggest it is a significant source. Trash control efforts in the Los Angeles region associated with TMDL implementation tend to focus on runoff events to capture the largest volume of trash, but the observations documented in this report show that dry season delivery of trash is likely significant.

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Figure 6: Photo of the trash buildup behind a fallen tree immediately downstream of the Julian Street bridge, Coyote Creek, San Jose, CA, January 27, 2004. Photo by Friends of Coyote Creek.

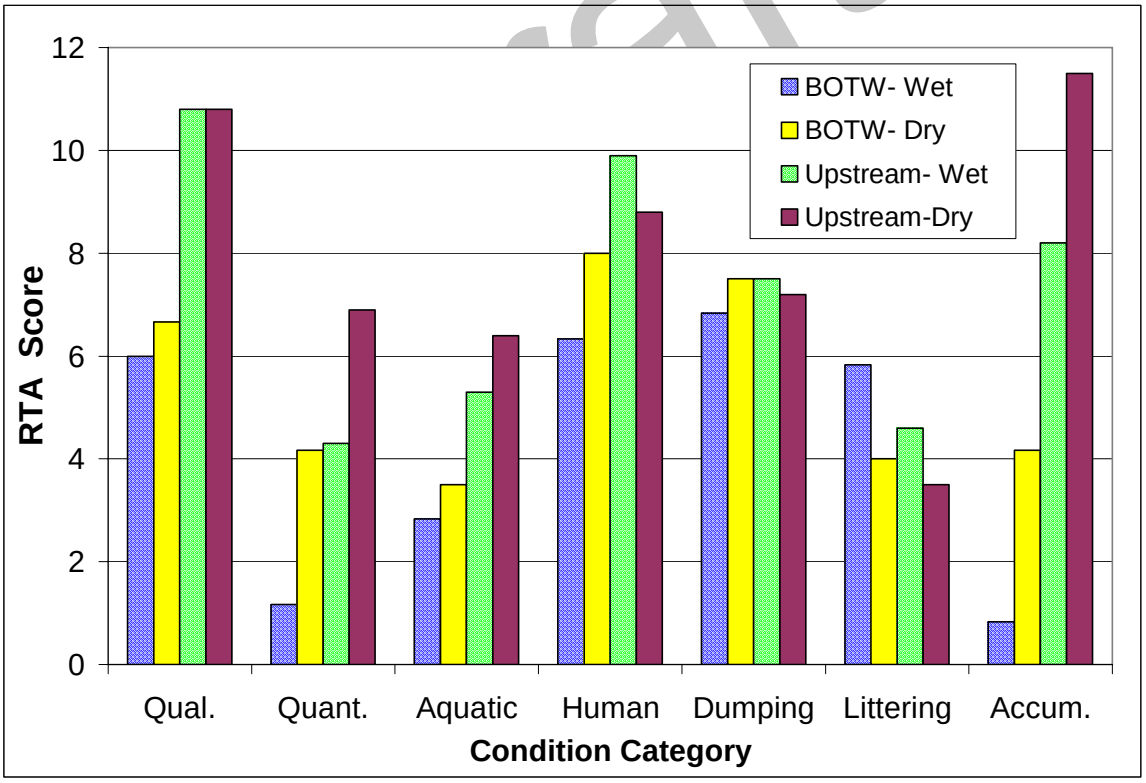

Figure 7: Average condition category scores from a subset of sites that were sampled during revisits that bracketed both and wet and dry seasons. Data is presented for both wet and dry season surveys from 6 BOTW sites and 10 upstream sites. Maximum RTA scores for all condition categories is 20, except littering and dumping which is 10.

Trash Deposition Rates

Trash deposition rates for all surveys when sites were revisited were calculated and ranked from highest to lowest (Table 1). The monitoring design provided the opportunity to estimate trash deposition rates because trash was removed from 100-foot survey reaches during the initial site visit. Trash collected in the landmarked reach during subsequent surveys was assumed to have been deposited since the previous survey. A rate of deposition (pieces per reach per day) was calculated for all sites for wet and dry weather conditions. Excluding initial site visits, sites were revisited 67 times. Sites with high and low deposition rates are discussed in more detail below.

Wet Season Deposition

Very high trash deposition rates were generally associated with wet weather (Table 1), particularly at BOTW sites (listed in Table 2). Following the wet season, BOTW sites had a higher number of plastic pieces, indicating that this type of trash is more transportable in runoff events. The average number of plastic pieces found below the water line at BOTW sites, in all weather conditions, was 192 pieces per 100 feet. The average number of plastic pieces found below the water line at non-BOTW sites was 57 pieces per 100 feet. Deposition rates also reflect the importance of upstream accumulation versus littering and dumping. The highest deposition rates tended to occur at sites that received low accumulation scores, indicating that most trash was deposited at these sites via accumulation from upstream transport (Figure 8). Based on condition category scores, littering and dumping was believed to be the dominant process resulting in trash deposition at only a few sites during the wet season.

Dry Season Deposition

Deposition rates were often much lower in the dry season than the wet season, generally below 1 piece of trash per day (Table 1, Figure 8). Several sites on small urban creeks in or near public parks, however, had some of the highest measured deposition rates in this study during the dry season (Figure 9). The high dry season deposition in these streams is most often associated with localized littering and dumping during the summer months (July-August), although some sites also receive some trash from upstream accumulation during this time period. Management priorities at these sites should focus on encouraging the proper disposal of trash in and around the stream.

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TABLE 1

SAN FRANCISCO BAY REGION TRASH ASSESSMENT STUDY
SITES RANKED BY TRASH DEPOSITION RATE

Date	Rank	Location	Creek	City	Season (dry, wet)	Days between surveys	Trash Deposition Rate (pieces/100 ft.-day)
8/23/2005	1	Booker T. Anderson Park	Baxter Cr.	Richmond	d	76	8.66
11/19/2004	2	Booker T. Anderson Park	Baxter Cr.	Richmond	w	130	7.47
12/10/2004	3	Oak Glen Park	Glen Echo Cr.	Oakland	w	100	7.17
8/23/2005	4	Baxter Cr. below San Pablo Av.	Baxter Cr.	Richmond	d	76	6.36
12/10/2004	5	Strawberry Creek Park	Strawberry Cr.	Berkeley	w	114	5.61
11/7/2003	6	Washington @ McDowell	Washington Cr.	Petaluma	d	108	5.19
2/6/2004	7	Schollenberger Park	Petaluma R.	Petaluma	w	91	5.14
11/5/2004	8	Albany Hill/Creekside Park	Cerrito Cr.	El Cerrito	d	116	5.03
8/23/2005	9	Lower Sausal Cr.	Sausal Cr.	Oakland	d	67	4.96
6/10/2005	10	Oak Glen Park	Glen Echo Cr.	Oakland	w	182	4.53
2/20/2004	11	Buchanan Park	Kirker Cr.	Pittsburg	w	210	4.30
1/27/2004	12	Washington @ McDowell	Washington Cr.	Petaluma	w	81	4.17
2/20/2004	13	Dow Wetlands	Kirker Cr.	Pittsburg	w	210	4.17
7/12/2004	14	Albany Hill/Creekside Park	Cerrito Cr.	El Cerrito	d	108	4.11
2/13/2004	15	Gateway Park	San Mateo Cr.	San Mateo	w	116	4.10
12/3/2004	16	Lower Sausal Cr.	Sausal Cr.	Oakland	w	109	3.83
7/12/2004	17	Lower Codornices Cr.	Codornices Cr.	Albany	d	122	3.40
6/8/2005	18	Booker T. Anderson Park	Baxter Cr.	Richmond	w	201	2.92
11/7/2003	19	Schollenberger Park	Petaluma R.	Petaluma	d	108	2.90
7/12/2004	20	Booker T. Anderson Park	Baxter Cr.	Richmond	d	115	2.77
7/25/2003	21	Buchanan Park	Kirker Cr.	Pittsburg	d	128	2.71
3/12/2004	22	Lower Codornices Cr.	Codornices Cr.	Albany	w	300	2.70
11/5/2004	23	Lower Codornices Cr.	Codornices Cr.	Albany	d	116	2.47
12/10/2004	24	Lower Glen Echo Cr.	Glen Echo Cr.	Oakland	w	100	2.41
8/23/2005	25	Oak Glen Park	Glen Echo Cr.	Oakland	d	74	2.01
1/27/2004	26	Petaluma Factory Outlets	Petaluma R.	Petaluma	w	81	1.96
3/14/2004	27	Lower Permanente Cr.	Permanente Cr.	Mountain View	w	135	1.85
7/22/2003	28	Washington @ McDowell	Washington Cr.	Petaluma	d	124	1.85
8/23/2005	29	Canyon Trail Park	Baxter Cr.	El Cerrito	d	76	1.68
7/29/2003	30	Lower Permanente Cr.	Permanente Cr.	Mountain View	d	124	1.68
2/13/2004	31	Lower Polhemus Cr.	Polhemus Cr.	San Mateo	w	116	1.58
6/8/2005	32	Baxter Cr. below San Pablo Av.	Baxter Cr.	Richmond	w	208	1.52
6/10/2005	33	Lower Glen Echo Cr.	Glen Echo Cr.	Oakland	w	182	1.43
6/17/2005	34	Lower Sausal Cr.	Sausal Cr.	Oakland	w	196	1.42
7/29/2003	35	Moss Rock	Stevens Cr.	Cupertino	d	124	1.38
8/23/2005	36	Lower Glen Echo Cr.	Glen Echo Cr.	Oakland	d	74	1.30
10/31/2003	37	Lower Permanente Cr.	Permanente Cr.	Mountain View	d	94	1.14
2/13/2004	38	Arroyo Court Park	San Mateo Cr.	San Mateo	w	116	1.11
6/8/2005	39	Canyon Trail Park	Baxter Cr.	El Cerrito	w	208	1.11
7/22/2003	40	Schollenberger Park	Petaluma R.	Petaluma	d	124	1.07
10/31/2003	41	Moss Rock	Stevens Cr.	Cupertino	d	94	1.03
8/20/2004	42	Madeiros Pkwy. @ Stanley	Arroyo Mocho	Livermore	d	119	0.99
10/20/2003	43	Gateway Park	San Mateo Cr.	San Mateo	d	89	0.94
3/14/2004	44	Moss Rock	Stevens Cr.	Cupertino	w	135	0.93
10/7/2004	45	Gateway Park	San Mateo Cr.	San Mateo	w	237	0.86
11/7/2003	46	Petaluma Factory Outlets	Petaluma R.	Petaluma	d	108	0.85
8/23/2005	47	Dimond Park	Sausal Cr.	Oakland	d	67	0.84
7/23/2003	48	Gateway Park	San Mateo Cr.	San Mateo	d	124	0.79
12/3/2004	49	Dimond Park	Sausal Cr.	Oakland	w	109	0.72
8/18/2004	50	Strawberry Creek Park	Strawberry Cr.	Berkeley	d	159	0.70
1/27/2004	51	Penngrove Park	Lichau Cr.	Petaluma	w	81	0.64
2/13/2004	52	Upper San Mateo Cr.	San Mateo Cr.	San Mateo	w	116	0.53
6/10/2005	53	Madeiros Pkwy. @ Stanley	Arroyo Mocho	Livermore	w	294	0.53
7/23/2003	54	Arroyo Court Park	San Mateo Cr.	San Mateo	d	124	0.51
7/23/2003	55	Lower Polhemus Cr.	Polhemus Cr.	San Mateo	d	124	0.51
7/25/2003	56	Dow Wetlands	Kirker Cr.	Pittsburg	d	128	0.45
11/7/2003	57	Penngrove Park	Lichau Cr.	Petaluma	d	108	0.37
10/20/2003	58	Arroyo Court Park	San Mateo Cr.	San Mateo	d	89	0.31
10/20/2003	59	Upper San Mateo Cr.	San Mateo Cr.	San Mateo	d	89	0.29
7/23/2003	60	Upper San Mateo Cr.	San Mateo Cr.	San Mateo	d	124	0.25
6/17/2005	61	Dimond Park	Sausal Cr.	Oakland	w	196	0.17
7/22/2003	62	Penngrove Park	Lichau Cr.	Petaluma	d	124	0.15
7/22/2003	63	Petaluma Factory Outlets	Petaluma R.	Petaluma	d	124	0.14
10/20/2003	64	Lower Polhemus Cr.	Polhemus Cr.	San Mateo	d	89	0.13
8/23/2005	65	Joaquin Miller Park	Palo Seco Cr.	Oakland	d	67	0.04
12/3/2004	66	Joaquin Miller Park	Palo Seco Cr.	Oakland	d	109	0.04
6/17/2005	67	Joaquin Miller Park	Palo Seco Cr.	Oakland	w	196	0.03

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TABLE 2

BOTTOM OF THE WATERSHED (BOTW)
TRASH MEASUREMENT LOCATIONS

Location	Water Body	City
Booker T. Anderson Park	Baxter Cr.	Richmond
Albany Hill/Creekside Park	Cerrito Cr.	El Cerrito
Lower Codornices Cr.	Codornices Cr.	Albany
Strawberry Creek Park	Strawberry Cr.	Berkeley
Lower Glen Echo Cr.	Glen Echo Cr.	Oakland
Lower Sausal Cr.	Sausal Cr.	Oakland
Cesar Chavez Park	Peralta Cr.	Oakland
Arroyo Viejo Rec. Center	Arroyo Viejo	Oakland
Schollenberger Park	Petaluma R.	Petaluma
Dow Wetlands	Kirker Cr.	Pittsburg
Madeiros Pkwy. @ Stanley	Arroyo Mocho	Livermore
Gateway Park	San Mateo Cr.	San Mateo
Lower Permanente Cr.	Permanente Cr.	Mountain View

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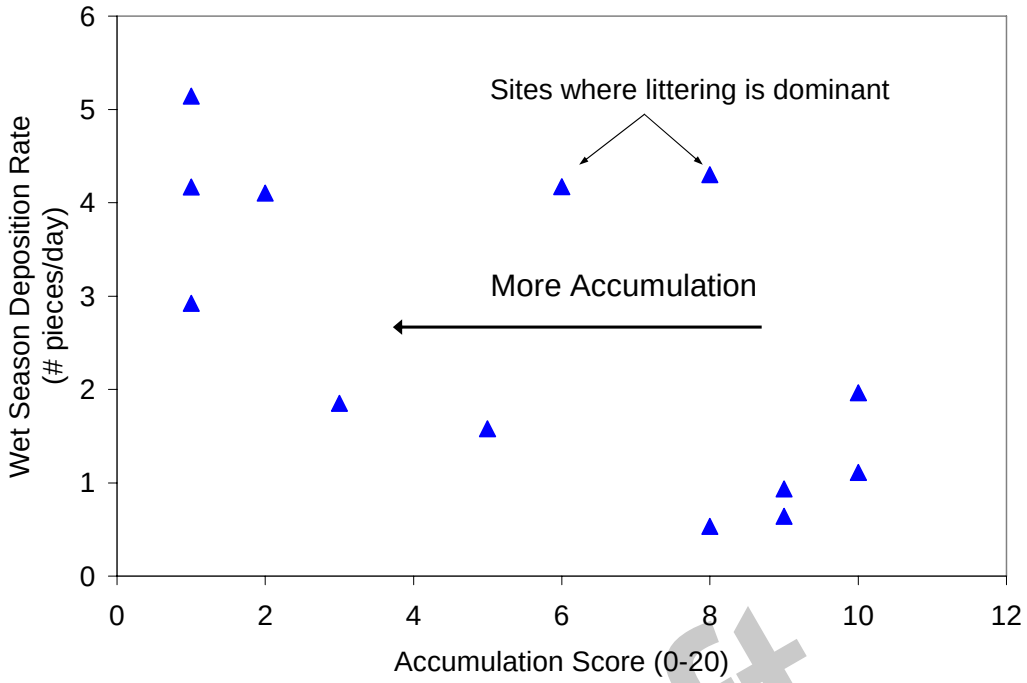

Figure 8: Wet-season trash deposition rates relative to the RTA accumulation score. As the accumulation score decreases (more accumulation) the deposition rates are higher, except at several sites where littering is responsible for high deposition rates during the wet season.

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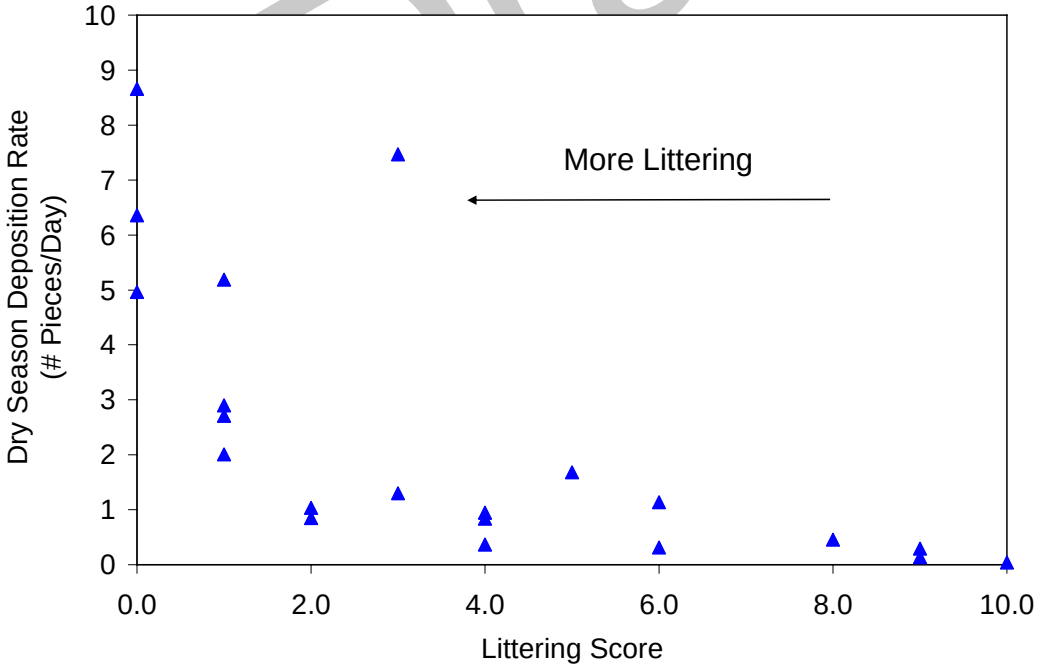

Figure 9: Dry season trash deposition rates relative to the RTA littering score. As the littering score decreases (more littering) the deposition rates are higher.

Case Studies- High Trash Deposition Rates

1. Booker T. Anderson Park, Baxter Creek

The two highest trash deposition rates recorded in the study occurred at the BOTW site of the Baxter Creek watershed in Richmond and El Cerrito. The initial site survey, prior to trash pickup, yielded the most pieces of trash per 100 feet of any survey conducted (1,133). This site absorbs the impact of trash delivered from upstream during storm events, but there is much evidence of local littering and dumping as well, which combine to result the highest rates of deposition recorded in the regional study.

The site is surrounded by residential areas. A stream restoration project several years ago removed concrete channel and planted riparian vegetation that is now well established (though at most 20' in width). There was evidence of park use during each survey, particularly on the east bank where there is grass, a playground, and a ball field. At the upstream end of the park is a culvert and a large pool. Many dumped items were observed in this pool, but it is not located within the 100-foot survey reach. The pool is at the edge of the park, along a road, with easy dumping access for vehicular traffic. Some of the dumped items were carried downstream, such as mattresses that were observed in the stream at the lower end of the park. Littering is prevalent here also, though trash cans and a dumpster are present. On the west side of the creek is a recreation center and a large parking lot. A street sweeper was observed cleaning the parking lot. The recreation center has a dumpster at the curb which probably prevents some large items from being dumped into the creek.

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The highest trash deposition rate measured in this study occurred at this site during the dry summer months. Following site cleanup on June 8, 2005, 658 pieces of trash were collected on August 23, yielding a trash accumulation rate of 8.66 pieces of trash per day. Much of this trash was believed to have been directly littered (littering score = 0) in the stream at Booker T. Anderson Park. There was also evidence, however, of significant levels of trash coming from upstream sources (accumulation score = 2), even during summer baseflow conditions.

The second highest deposition rate (7.47 pieces/day) was recorded during the survey of November 19, 2004, soon after the first significant rain event of the season. Despite the trash removal associated with the first survey, the site received a lower RTA score during the November survey than the initial site visit. There were 543 plastic pieces of trash located below the high water line, and 33 above. The combination of significant downstream transport, with notable littering and dumping, makes the Booker T. Anderson site particularly unique.

Potential Management Measures

Trash is managed at this park, but the management activities are not successfully preventing littering or dumping. Many park patrons simply ignore the trash receptacles that have been made available. A major change in the behavior of park patrons and illegal dumpers is needed to improve the trash issue in Baxter Creek. Downstream transport is also a significant problem at Booker T. Anderson Park, however, so trash

management practices need to address the entire watershed. The next site upstream, where the creek runs under San Pablo Avenue, received a lower RTA score on November 12, 2004 than this site, due to extensive littering of food wrappers from nearby fast-food restaurants. The San Pablo Avenue site also had the fourth highest deposition rate measured in this study; 6.36 pieces per day were deposited during the summer dry season. The Baxter Creek watershed appears to be a significant source of floatable trash to the Bay, and warrants special attention. A progressive program of education, warnings, and penalties may be needed in order to achieve behavioral change. Given the ubiquitous nature of trash in this watershed, structural trash removal alternatives should be evaluated as well.

Figure 10: View looking upstream from Booker T. Anderson Park trash survey site (BAX030), showing dumped mattress and low fence above culvert at street crossing, upstream of park. Photo by Steve Moore, August 23, 2005.

2. Dow Wetlands, Kirker Creek

The lower portion of Kirker Creek flows in a realigned channel between the Dow Wetlands, a large, restored wetland on the edge of Suisun Bay, and the Dow Chemical industrial facility. The Dow Wetlands is commonly used by bird watchers, hikers, dog walkers, and school groups. Although a dirt road follows the creek along much of its length, the road is not open to public vehicular traffic.

Wet season deposition rates were extremely high (4.3 pieces/day), but dry season deposition was among the lowest recorded for BOTW sites (0.45 pieces/day). After the

initial trash collection effort, only 58 pieces of trash were deposited during the summer dry season. Even during the dry season, accumulation from upstream sources was judged to be the dominant source of trash, rather than local littering and dumping. During the subsequent wet season, 887 pieces of trash were deposited, all of which was judged to come from upstream sources. In both summer and winter, over 90% of the deposited trash was plastic pieces. Plastic pieces are buoyant, and are easily transported long distances. They accumulate at sites such as this one in low gradient channels near the mouths of watersheds.

Potential Management Measures

Although this site is open to public access, little or none of the trash at the site appears to come from littering. Dumping is not possible at this site because vehicular access is limited. Virtually all of the trash deposited at this site is plastic pieces that are efficiently transported from the streets of Pittsburg into the storm drain system. Management actions must focus on this conveyance system in order to remove trash before it enters the stream network.

3. Washington and McDowell, Washington Creek (Petaluma River)

The highest dry season trash deposition rate recorded in this study occurred at Washington Creek, at the corner of Washington and McDowell in the City of Petaluma. This is a very heavy vehicle traffic area, with an off-ramp from Highway 101, a busy intersection, a gas station, and a mall next to the creek at this station.

A concrete channel encloses the stream, with the top of the ~ 15' tall southeast wall bordering the sidewalk adjacent to Washington Street. On the opposite bank is a plaza-style shopping mall. Dumpsters are located about 100 feet from the creek, with no enclosure. Directly north of the site, near the intersection, is a gasoline station. One dumpster is located behind the gas station in a concrete block enclosure with a semi-solid gate. A chain link fence separates the creek corridor from the gas station trash enclosure and the mall. The creek is accessible by climbing over the chain link fence (about 4' high). At the upstream edge of the site the stream flows through a large culvert under a gas station and McDowell Avenue.

The dominant trash at this location was plastic wrappers, cigarette butts, paper, and aluminum foil or cans. An overflowing dumpster at the gas station and wind blown trash from the shopping center parking lot likely contributed most of the plastics and paper, much of which was above the high water line. During the summer survey, 59% of the pieces found above high water line were plastics. 62 of 92 plastic pieces found above the high water line were plastic wrappers. 46 of 157 (29%) pieces above the high water line were paper pieces. 130 of 233 (56%) total pieces were plastic in origin. The winter survey was dominated by plastic (291 of 338 pieces).

Potential Management Measures

The overflowing dumpsters and trash blowing off the large shopping mall parking lot combine to create a continuous loading of trash to this site. The implied message to the

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public, due to the perpetually polluted condition, is that it is okay to dispose of solid waste into the creek. Unless nearby businesses improve their trash management, high rates of trash loading will continue. The public needs to be better educated about the harmful effects of disposing trash near water bodies. Education efforts should be followed up by regulation and enforcement.

4. Moss Rock, Stevens Creek

The Moss Rock site (STE100) is located at a roadside pullout in the steep and narrow Stevens Creek Canyon near Stevens Creek County Park. There is minimal upstream human land use, and no adjacent houses or urban land use.

Trash levels were fairly high (290 pieces) at the initial site visit in March, 2003. The vast majority of the trash pieces collected was littered beverage containers, including many broken glass bottles. Also collected in the stream were several hypodermic needles. Trash levels were lower during 3 subsequent visits (97-171 pieces), suggesting that some of the trash picked up during the initial visit was old, relict trash. Trash deposition rates were moderately high throughout the year (0.93-1.38 pieces/day), however, and littering scores and overall scores were consistently low. Based on the types of trash collected, the site is likely commonly used throughout the year as a recreation spot. Most of the trash was related to alcoholic beverages or snack food.

Potential Management Measures

This site is believed to be located on private property just outside of the County Park boundary, although there are no signs indicating if it is public or private property. Thus, many visitors to this site may unknowingly be trespassing. There are no trash receptacles at or near this pullout. There was evidence, however, that visitors deposited trash in a pile at a location near a fence separating the pullout from the creek, where a trash can was expected to be located. This site is used both for water recreation and picnicking, but the human health hazard posed by broken glass bottles and needles makes these two uses virtually incompatible. Installing and maintaining trash receptacles would encourage visitors to properly dispose of trash, making the site, as well as downstream sites in the County Park, safer for water contact recreation.

Case Studies – Low Trash Deposition Rates

1. Dimond Park, Sausal Creek

This site is directly adjacent to the Dimond Park Recreation Center and Swimming Pool. The recreation center is frequently full of children using the jungle gym play area on the left bank just upstream of the survey reach. There are trashcans located throughout the center. Maintenance workers are often observed picking up trash on the grass lawn. Friends of Sausal Creek are an active volunteer group that picked up trash at this site in May 2005, shortly before our June 2005 trash survey. Most of the trash found in the June 2005 survey was located in the vegetation on the bank opposite the recreation center, and not in the stream itself. Although most of the trash found at this site comes from littering,

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management efforts appear to be adequate at keeping high levels of trash from entering the creek. The combined efforts of the recreation center staff, who actively manage trash on the recreation center property, and Friends of Sausal Creek, keep trash levels here lower than at sites in other public park settings.

2. Joaquin Miller Park, Palo Seco Creek (Sausal Creek)

This site is located near the top of the watershed, above Highway 13. While there is public access, the trailhead is not well-marked. There are two trash cans and plastic bags available for dog waste at the small three-car parking area at the trailhead.
This site may have less public use than many parks, which explains the remarkably low levels of trash in the stream. Still, evidence of littering is present, probably related to the use of the site by dog walkers and urban hikers. On one occasion, pet waste was found near the stream.

Figure 11: View of trash survey site on Palo Seco Creek in Joaquin Miller Park, Oakland, CA, showing no trash during dry season survey. Some dog waste was in the creek bed, lowering the RTA score from optimal due to the threat to human health. Photo by Steve Moore, August 23, 2005.

Longitudinal Trends Within Watersheds

To assess how trash levels varied along a longitudinal gradient (i.e., headwaters to mouth) in watersheds, multiple sites were monitored in four watersheds: San Mateo Creek, Petaluma River, Baxter Creek, and Sausal Creek. As expected, trash levels generally increased (and RTA scores decreased) in a downstream direction. Temporally, the sites further upstream had increased RTA scores with time, with some lowering of scores after the wet season, due to reintroduction of trash in wet weather. BOTW sites exhibited less improvement over time, signifying ongoing reintroduction of trash throughout the year, though more significant during wet weather. Because trash is removed in the protocol, an expected trend over successive sampling events would be increasing RTA scores and decreasing trash levels in the study reaches. In most cases, especially at the lower watershed sites, RTA scores returned to initial study conditions after wet weather. This trend shows no improvement in trash levels over time with the minimal management measure of picking up trash in 100-foot segments.

1. San Mateo Creek Watershed

The San Mateo Creek watershed, in San Mateo, CA, is a relatively narrow, urbanized watershed, with two main tributaries coming together in the hillside portion of the city (Figure 1). Polhemus Creek drains a residential area and upper San Mateo Creek runs along a roadway, downstream of the Crystal Springs Dam draining minimal human land use. Two sites were measured in the urbanized bayshore plain, Arroyo Court Park (SMA060) and the BOTW site Gateway Park (SMA020), and two sites were measured upstream of the confluence of the two main tributaries.

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The lower Gateway Park, though not initially having highest trash levels, had higher sustained trash levels and hence lower RTA scores (Figure 12). Arroyo Court Park, located 2 miles upstream but within urbanized portions of the city, tracked closely with Gateway Park, with higher scores in each season. Polhemus Creek (SMA110), with the lowest initial score, had higher scores after trash was removed, but wet weather brought a significant return of trash from this residential area. The upper San Mateo creek site (SMA120) saw less return of trash with wet weather, due to less upstream urbanization. It also exhibited the desirable pattern of higher initial levels and less return of trash after "management," or cleanup associated with the RTA protocol, during both dry and wet seasons. Dry season RTA scores were lower at the Gateway and Arroyo Court Park sites, due to direct littering documented at these more publicly accessible sites.

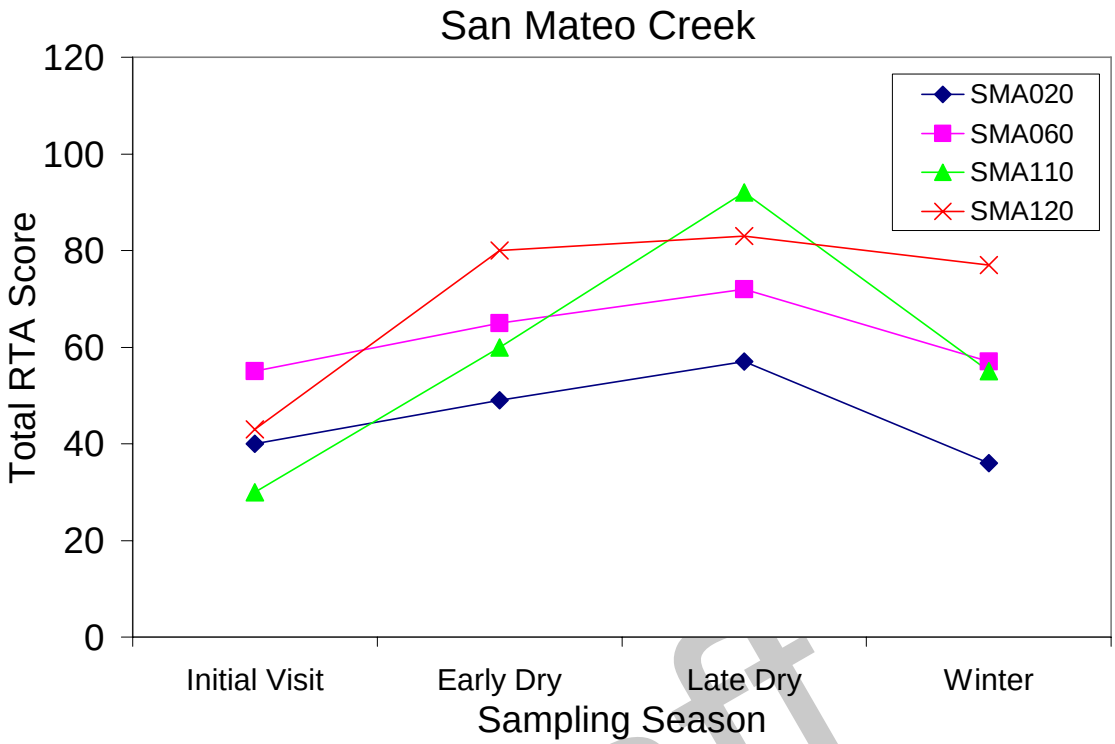

Figure 12: RTA Scores at four sampling sites in the San Mateo Creek watershed along a longitudinal gradient. SMA020 is the lowest site, and SMA110 and SMA120 are the highest sites, both upstream of the confluence of Polhemus and San Mateo creeks.

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2. Petaluma River Watershed

The Petaluma River watershed is a broad, low gradient watershed with several small tributary creeks that flow into a large tidal slough, the Petaluma River (Figure 1). The land use is mixed urban, rural residential, and rangeland. The BOTW site is Schollenberger Park (PET100), located along a tidal shoreline downstream of the confluence of Petaluma River and Adobe Creek, and downstream of the City of Petaluma. The Petaluma Factory Outlets site (PET310) is the most downstream freshwater site on the Petaluma River. Sites located on small tributaries include Washington Creek (PET220) and Lichau Creek at Penngrove Park (PET400).

The Penngrove Park site had the desirable pattern of low trash deposition in both dry and wet seasons. Trash at this site was predominantly legacy trash, as more trash was picked up during the first survey (45 pieces) than during the subsequent three surveys combined (38 pieces). The site at the Outlets, which is publicly accessible but seldom visited, had low dry season deposition, and very high wet season deposition during the winter (at levels worse than initial conditions).

The Washington Creek site, discussed above under Trash Deposition Rates, showed degradation over the dry season, and improvement in the wet season, a sign of high direct deposition and then "cleaning out" by storm flows and delivery to downstream locations and the San Pablo Bay. This site, with an adjacent shopping plaza, large paved parking

lot, gasoline station with overflowing dumpster, and an upstream golf course, showed significant levels of litter entering the stream, and represents a trash source area that should be targeted in watershed-wide trash reduction efforts. During site surveys, wind was observed carrying plastic trash over a 4-foot cyclone fence separating the commercial land uses from the stream corridor.

A similar disturbing pattern was seen at the BOTW site in the tidal Petaluma River – indicative of both littering and accumulation in an area characterized by bi-directional flows and deposition on higher tides. The BOTW site in this watershed was unique due to the tidal characteristics and high dry season deposition rates that are not distinguishable from wet season deposition. It calls into question the management of trash at Schollenberger Park: trash receptacles are not located in a convenient place for use by the park visitors (trash cans are only located at the parking lot, not at the beach), and there is no evidence that the responsible jurisdiction is cleaning trash from the beach.

The Petaluma River watershed sites had lower scores at the end of the survey, following extensive cleanup, than the initial scores (Figure 13), suggesting that trash deposition is pervasive and watershed-wide management efforts are needed.

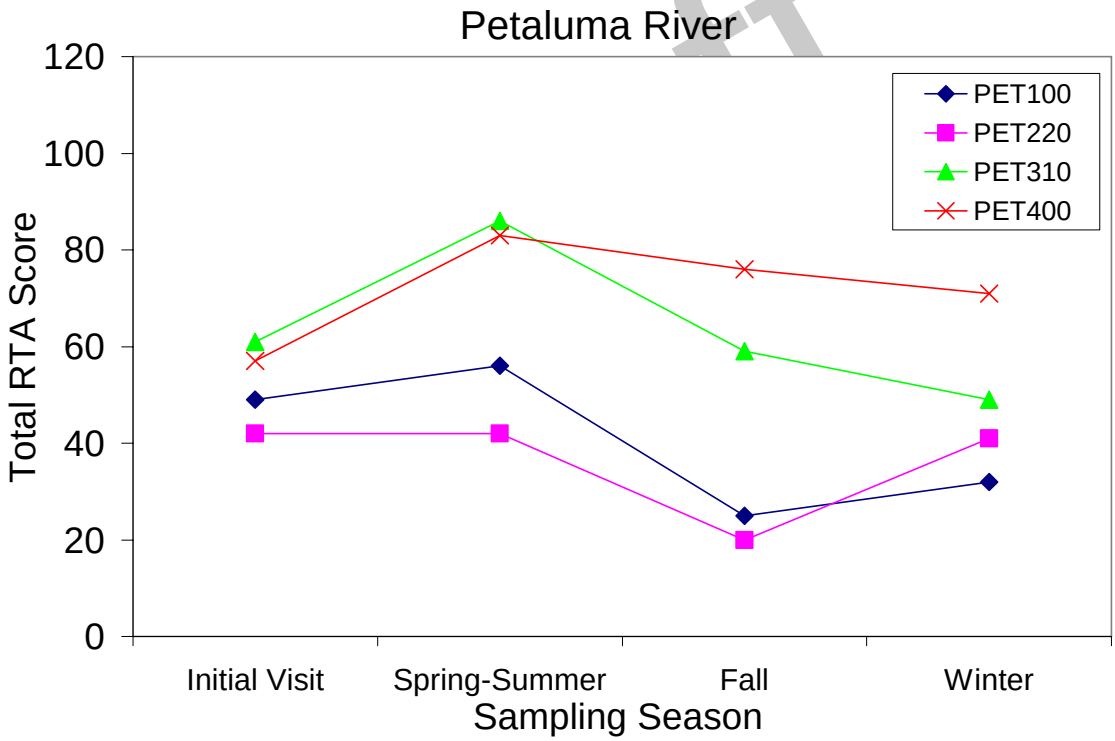

Figure 13: RTA Scores at four sampling sites in the Petaluma River watershed along a longitudinal gradient. PET100 is the lowest site, PET310 is upstream on the main branch, and PET220 and PET400 are the tributary sites. PET220 tributary (Washington Cr.) enters the main branch downstream of PET310. Except for PET400, the final scores are below the initial scores, indicating that trash levels may be getting worse in this watershed.

3. Baxter Creek Watershed

The Baxter Creek watershed is a smaller watershed that originates in the hills of El Cerrito, and drains to San Francisco Bay through the City of Richmond, in a densely urbanized area (Figure 1). There have been recent efforts to restore portions of the creek channel to more natural conditions, but these areas have been plagued by trash deposition, as discussed above.

The downstream site at Booker T. Anderson Park (BAX030) exhibits extremely high trash inputs in both the dry and wet seasons. The consistently low RTA scores indicates a constant, high level of trash regardless of trash removal efforts and season (Figure 14). Similar problems were documented at the upstream site (BAX040), but there was less wet season deposition than at Booker T. Anderson Park. The site at Canyon Trail Park in the El Cerrito hills (BAX080) had significantly higher RTA scores in dry and wet seasons, and scores steadily improved following trash removal. The moderate scores (50-62) over three seasons, however, indicates that the site also experiences both wet-weather and dry-weather trash deposition.

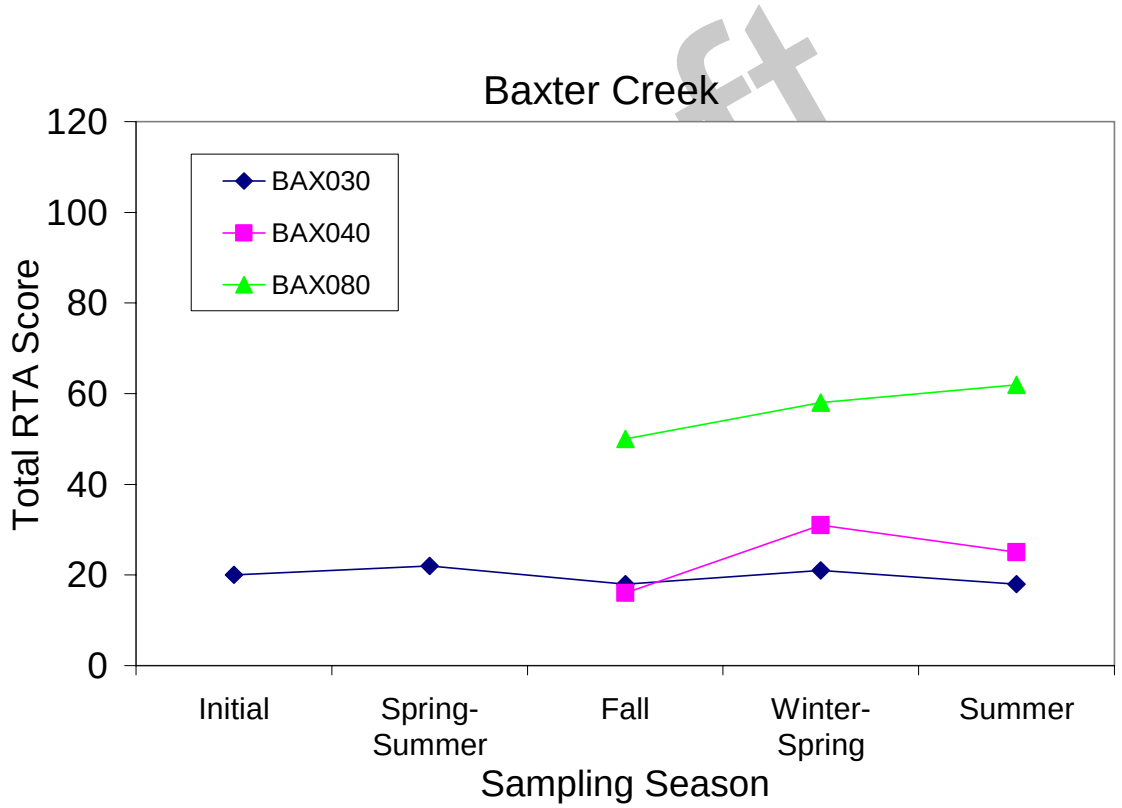

Figure 14: RTA Scores at three sampling sites in the Baxter Creek watershed along a longitudinal gradient. BAX030 is the downstream site, BAX040 is upstream at San Pablo Avenue, and BAX080 is at Canyon Trail Park, in El Cerrito.

4. Sausal Creek Watershed

The Sausal Creek watershed is a small watershed that begins in the hills above Oakland and drains through a dense urban landscape to the Oakland Inner Harbor (Figure 1). The

active Friends of Sausal Creek group has elevated the visibility of the creek to the City and the community, and effective cleanup and restoration projects have been implemented in this watershed.

The two upper sites in the watershed, Dimond Park (SAU060) and Joaquin Miller Park (SAU130), have the lowest deposition rates in this regional study and were discussed above. The City's Parks department and local volunteers from the Friends of Sausal Creek actively manage and remove trash in Dimond Park. The Dimond Park site exhibits the desirable pattern of improvement with successive site surveys: the highest RTA score was recorded at the last site visit during the summer season. The site on Palo Seco Creek in Joaquin Miller Park (SAU130) is publicly accessible, but upstream of most of the urban areas and not as frequently visited. This site serves as a regional "reference" site in this study because of the very low trash levels.

The downstream Sausal Creek site at East 22nd St. (SAU030) is heavily impacted by trash. The open channel upstream of the site appears to attract illegal dumping and littering, and adjacent landowners were observed dumping their household trash into the stream area. This area could be a focus for progressive education, warning and enforcement of existing littering laws.

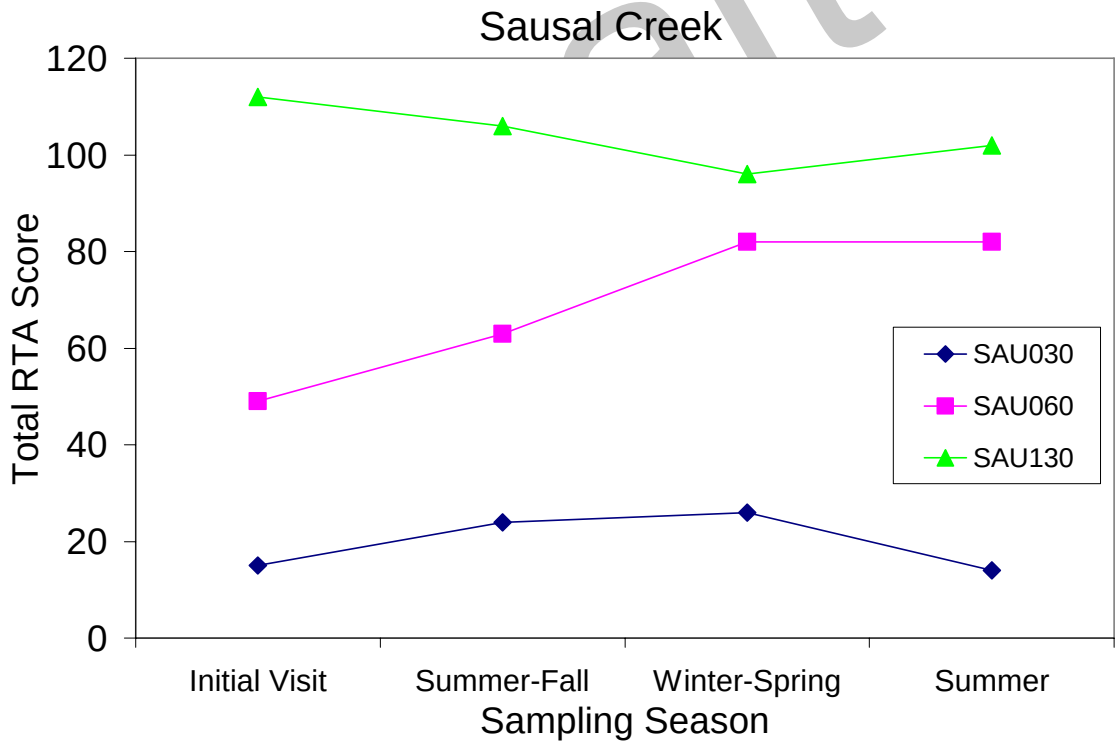

Figure 15: RTA scores at three sampling sites in the Sausal Creek watershed along a longitudinal gradient. SAU030 is the downstream site at E. 22nd Street, SAU060 is at Dimond Park, and SAU130 is on Palo Seco Creek in Joaquin Miller Park, all in Oakland, CA.

Conclusions and Recommendations

Levels of trash in the waters of the San Francisco Bay Region are alarmingly high, despite the fact that the Basin Plan prohibits discharge of trash and that littering is illegal with potentially large fines. Even during dry weather conditions, a significant quantity of trash, particularly plastic, is making its way into waters and being transported downstream to San Francisco Bay and the Pacific Ocean. Based on 93 surveys conducted at 26 sites throughout the Bay Area, we found an average of 2.88 pieces of trash per linear foot of stream. Removal of trash during the surveys indicated high return rates of trash over the 2003-2005 study period. There did not appear to be one county or region with higher trash levels, as high and low deposition rates were measured in each county surveyed. Rather, high trash levels were most common at lower watershed sites in urban areas, where both upstream accumulation and local littering was prevalent. Without an assessment method such as the one used in this study, people could draw the wrong conclusion that high trash levels at bottom of the watershed sites are due solely to localized littering. This study shows that these areas, which tend to have lower property values, are polluted cumulatively by the entire watershed.

In summary, the trash assessment data collected for this study using the Rapid Trash Assessment methodology confirms that:

- All watersheds studied in the San Francisco Bay region (Figure 1) have high levels of trash.
- Lower watershed sites tend to have higher densities of trash.
- Trash source hotspots near creek channels, usually associated with parks, schools, roads, or poorly kept commercial facilities, contribute a significant portion of trash that is deposited at lower watershed sites.
- Dry season deposition of trash is primarily associated with localized littering and dumping, wind-blown trash from nearby sources, and, at certain sites, accumulation from upstream sources due to dry season runoff.
- Wet season deposition of trash is primarily due to accumulation from upstream sources. This trash is predominantly plastic, especially at lower watershed sites, which suggests that urban runoff is a major source of floatable plastic found in the ocean and on beaches as marine debris.
- Parks that have more evident management of trash by City staff and local volunteers, including cleanup within the creek channel, have measurably less trash pieces and higher RTA scores.

The ubiquitous, unacceptable levels of trash in waters of the San Francisco Bay Region warrant a comprehensive and progressive program of education, warning, and enforcement, and certain areas warrant consideration of structural controls and treatment.

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Based on our informal discussions with members of the public, even the well-educated are unaware that storm drain systems are directly connected to streams and the Bay. It seems that the public do not grasp the risks associated with littering on streets that drain to waters, let alone in parks that have running streams. A more aggressive campaign for educating the public about the ultimate fate of litter is overdue.

This program should begin with implementation within municipal jurisdictions. Employees of parks and schools that pick up trash need to be instructed to pick up trash near and within streams, and equipped accordingly. Trash receptacles need to be placed near publicly accessible waters, with educational messages about marine debris and human health risks of trash. These receptacles need to be actively managed so they do not become a source of trash to waters.

As with most issues, not every member of the public will follow littering rules, even if better educated about the harm litter can do to people and animals. Certain watersheds with chronic trash problems will warrant structural controls, as has been the case with the 303d-listed Lake Merritt in Oakland. The results documented in this report suggest that the structural removals should not be limited to wet weather loading.

Businesses need to do a better job of keeping trash associated with their operations from waters of the state. Styrofoam pellets were one of the most common and abundant types of trash surveyed and removed in this study, and the literature shows that they are long-lived and harmful to marine life (Marine Mammal Commission, 1996). They are most often used as packing and shipping materials. Businesses should be a target of education and then enforcement with respect to management of packing and shipping materials. Large amounts of these pellets were documented downstream of downtown Berkeley in Strawberry Creek, and this serves as an example of business contribution to the trash problem. This Styrofoam (303 pellets and 125 pieces in December 2004) could be coming from careless handling of packing materials and their allowance to enter the storm drains.

Similarly, dumpsters at gasoline stations such as the one at Washington and McDowell in Petaluma should be identified and regulated as potential sources of trash to waters of the state. The adjacent shopping plaza at that location was an unmanaged, continuous source of litter and trash to waters of the state, regardless of season. These businesses need to be first educated and then regulated, preferably by municipalities as part of the municipal stormwater program, as potential sources of trash to streams, bays and the ocean.

The Rapid Trash Assessment protocol has been shown to be useful in distinguishing trash levels in streams between sites, in determining trash deposition rates, in ranking sites, and determining whether significant deposition of trash occurs in dry season, wet season or both. The RTA method does not directly measure loading of trash to downstream waterbodies. Rather, it examines the types of trash that have been deposited at a site, and allows for identification of sources. This approach is most useful for identifying the site-specific management actions that will have the most potential for reducing trash loading to streams. In many cases the results of the assessment confirmed what could be

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determined by visual observation. The benefits of using this rigorous protocol, however, include: (1) providing a systematic quantification and indexing of sites that can facilitate prioritization for pollution abatement, and (2) providing quantitative data on rates of trash deposition following initial clean-up efforts.

The San Francisco Bay Region has a problem with trash in streams and the Bay. This protocol has assisted the Water Board in understanding the sources, management issues, and the overall scope of the problem of trash in waters of the state. It is hoped that the protocol will be as useful in evaluating the success of management efforts yet to come.

Acknowledgements

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Figure 16: Water Board staff remove a shopping cart from the Booker T. Anderson Park trash site. Photo by Kim Harrison, August 23, 2005.

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APPENDIX A

RAPID TRASH ASSESSMENT PROTOCOL

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Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

WATERSHED/STREAM: _____ DATE/TIME: _____
MONITORING GROUP, STAFF: _____ SAMPLE ID: _____
SITE DESCRIPTION (Station Name, Number, etc.): _____

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
1. Level of Trash	On first glance, no trash visible. Little or no trash (<10 pieces) evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.	On first glance, little or no trash visible. After close inspection small levels of trash (10-50 pieces) evident in stream bank and streambed.	Trash is evident in low to medium levels (51-100 pieces) on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.	Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris (>100 pieces). Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Actual Number of Trash Items Found	0 to 10 trash items found based on a trash assessment of a 100-foot stream reach.	11 to 50 trash items found based on a trash assessment of a 100-foot stream reach.	51 to 100 trash items found based on a trash assessment of a 100-foot stream reach.	Over 100 trash items found based on a trash assessment of a 100-foot stream reach.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Threat to Aquatic Life	Trash, if any, is mostly paper or wood products or other biodegradable materials. Note: A large amount of rapidly biodegradable material like food waste creates high oxygen demand, and should not be scored as optimal.	Little or no (<10 pieces) transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts. Presence of settleable, degradable, and non-toxic debris such as glass or metal.	Medium prevalence (10-50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts Larger deposits (< 50 pieces) of settleable debris such as glass or metal. Any evidence of clumps of deposited yard waste or leaf litter.	Large amount (>50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, balloons, Styrofoam, cigarette butts; toxic items such as batteries, lighters, or spray cans; large clumps of yard waste or dumped leaf litter; or large amount (>50 pieces) of settleable glass or metal.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Threat to Human Health	Trash contains no evidence of bacteria or virus hazards such as medical waste, diapers, pet or human waste. No evidence of toxic substances such as chemical containers or batteries. No ponded water for mosquito production. No evidence of puncture and laceration hazards such as broken glass or metal debris.	No bacteria or virus hazards or sources of toxic substances, but small presence (<10 pieces) of puncture and laceration hazards such as broken glass and metal debris. No presence of ponded water in trash items such as tires or containers that could facilitate mosquito production.	Presence of **any one** of the following: hypodermic needles or other medical waste; used diaper, pet waste, or human feces; any toxic substance such as chemical containers, batteries, or fluorescent light bulbs (mercury). Medium prevalence (10-50 pieces) of puncture hazards.	Presence of **more than one** of the items described in the marginal condition category, or high prevalence of any one item (e.g. greater than 50 puncture or laceration hazards).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
5. Illegal Dumping	D: No evidence of illegal dumping. No bags of trash, no yard waste, no household items placed at site to avoid proper disposal, no shopping carts.	D: Some evidence of illegal dumping. Limited vehicular access limits the amount of potential dumping, or material dumped is diffuse paper-based debris.	D: Presence of **one** of the following: furniture, appliances, shopping carts, bags of garbage or yard waste, coupled with vehicular access that facilitates in-and-out dumping of materials to avoid landfill costs.	D: Evidence of chronic dumping, with **more than one** of the following items: furniture, appliances, shopping carts, bags of garbage, or yard waste. Easy vehicular access for in-and-out dumping of materials to avoid landfill costs.
Illegal Littering	L: Any trash is incidental litter (< 5 pieces) or carried downstream from another location.	L: Some evidence of litter within creek and banks originating from adjacent land uses (<10 pieces).	L: Prevalent (10-50 pieces) in-stream or shoreline littering that appears to originate from adjacent land uses.	L: Large amount (>50 pieces) of litter within creek and on banks that appears to originate from adjacent land uses.
D-SCORE	10 9	8 7 6	5 4 3	2 1 0
L-SCORE	10 9	8 7 6	5 4 3	2 1 0
6. Accum-ulation of Trash	There does not appear to be a problem with trash accumulation from downstream transport. Trash, if any, appears to have been directly deposited at the stream location.	Some evidence (<10 pieces) that litter and debris have been transported from upstream areas to the location, based on evidence such as silt marks, faded colors or location near high water line.	Evidence that (10 to 50 pieces) trash is carried to the location from upstream, as evidenced by its location near high water line, siltation marks on the debris, or faded colors.	Trash appears to have accumulated in substantial quantities at the location based on delivery from upstream areas, and is in various states of degradation based on its persistence in the waterbody. Over 50 items of trash have been carried to the location from upstream.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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Total Score _____

SITE DEFINITION:

UPPER/LOWER BOUNDARIES OF REACH: _____

HIGH WATER LINE: _____

UPPER EXTENT OF BANKS OR SHORE: _____

_____

NOTES:

_____

_____

_____

_____

_____

_____

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

TRASH ITEM TALLY (Tally with (•) if found above high water line, and (|) if below)

PLASTIC # Above___ # Below____	**METAL** # Above___ # Below____
Plastic Bags	Aluminum Foil
Plastic Bottles	Aluminum or Steel Cans
Plastic Bottle Caps	Bottle Caps
Plastic Cup Lid/Straw	Metal Pipe Segments
Plastic Pipe Segments	Auto Parts (specify below)
Plastic Six-Pack Rings	Wire (barb, chicken wire etc.)
Plastic Wrapper	Metal Object
Soft Plastic Pieces	**LARGE (specify below)** # Above___ # Below____
Hard Plastic Pieces	Appliances
Styrofoam cups pieces	Furniture
Styrofoam Pellets	Garbage Bags of Trash
Fishing Line	Tires
Tarp	Shopping Carts
Other (write-in)	Other (write-in)
BIOHAZARD # Above___ # Below____	**TOXIC** # Above___ # Below____
Human Waste/Diapers	Chemical Containers
Pet Waste	Oil/Surfactant on Water
Syringes or Pipettes	Spray Paint Cans
Dead Animals	Lighters
Other (write-in)	Small Batteries
CONSTRUCTION DEBRIS#Above___#Below__	Vehicle Batteries
Concrete (not placed)	Other (write-in)
Rebar	**BIODEGRADABLE** # Above___ # Below____
Bricks	Paper
Wood Debris	Cardboard
Other (write-in)	Food Waste
MISCELLANEOUS # Above___ # Below____	Yard Waste (incl. trees)
Synthetic Rubber	Leaf Litter Piles
Foam Rubber	Other (write-in)
Balloons	**GLASS** # Above___ # Below____
Ceramic pots/shards	Glass bottles
Hose Pieces	Glass pieces
Cigarette Butts	**FABRIC AND CLOTH** # Above___# Below____
Golf Balls	Synthetic Fabric
Tennis Balls	Natural Fabric (cotton, wool)
Other (write-in)	Other (write-in)
Total pieces Above: **Below:**	**Grand total:**
Tally all trash in above rows; make notes below as needed to facilitate scoring.	
Littered:	
Dumped:	
Downstream Accumulation:	

SPECIFIC DESCRIPTION OF ITEMS FOUND:_____

_____

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APPENDIX B

RAPID TRASH ASSESSMENT METHOD EVALUATION OCTOBER 2002

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Evaluation of the Rapid Trash Assessment Methodology

October 20, 2002

The rapid trash assessment methodology was developed by Steve Moore and Matthew Cover of the San Francisco Bay Regional Board's Surface Water Ambient Monitoring Program. The scoring system is based on the physical habitat evaluation forms associated with the federal and state guidance on rapid bioassessment. This methodology was developed with three goals: to be representative, sensitive, and objective.

To be representative, the generated scores need to represent an assessment of impairment of beneficial uses by trash. Beneficial uses affected by trash include aquatic life uses, water contact uses, and aesthetic enjoyment of waters. Also, the assessment methodology needs to consider how trash gets to the water body (direct dumping vs. accumulation in drainage systems) to represent an evaluation of management actions related to controlling dumping, littering, or accumulation of trash. The six trash assessment parameters of the methodology cover this range of issues associated with beneficial uses and management actions related to trash in water bodies. The assessment methodology has been structured to balance these issues in a scoring system, which we believe has achieved the necessary level of representativeness.

To be sensitive, the generated scores need to be able to distinguish light, medium, and heavy states of impairment of beneficial uses by trash at different sites and seasons. The overall score range of 0 to 120 should provide this sensitivity, where sites with scores of 60 +/- 15% can be distinguished in threat to beneficial uses from sites with scores of 80 +/- 15%.

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To be objective, variability needs to be minimized. The generated scores by different teams on the same reach should not range too widely. The scores should not be more than 15% different than one another.

To evaluate sensitivity and objectivity of this methodology, three teams were deployed on the same day at four sites located along East Bay creeks. One site was located on Wilkie Creek, a tributary to San Pablo Creek in El Sobrante (next to a high school). Another site was located on Wildcat Creek in Alvarado Park in Richmond. These two sites were surveyed by Regional Board staff on August 14, 2002. Two sites were located on Sausal Creek in Oakland, at Dimond Park and at Barry Street (residential area), surveyed on August 20, 2002 by staff of the Regional Board and the Alameda and Santa Clara urban runoff programs.

Of these test sites, the two urban park sites are considered to be more actively "managed" for trash, with nearby trashcans and available park and volunteer personnel. The high school site and the residential site had no evident active management, and these sites had higher trash tallies. Therefore, in evaluating whether the assessment methodology is sufficiently sensitive, we believe the scores generated for the park sites should be statistically higher (more optimal) than the other sites.

TABLE 1
RAPID TRASH ASSESSMENT
RESULTS OF METHODOLOGY EVALUATION

				Trash Assessment Parameter Scores							Trash Item
Site	**Water Body**	**Date**	**Staff**	**1** Qual.	**2** Quant.	**3** Aq. Life	**4** Hum. Health	**5** Dumping	**6** Accum.	**Total Score**	**Tally Total**
Alvarado Park	Wildcat Creek	8/14/02	NW, GC	10	5	10	13	15	15	**68**	**55**
Alvarado Park	Wildcat Creek	8/14/02	SM, PE	14	4	9	10	8	15	**60**	**68**
Alvarado Park	Wildcat Creek	8/14/02	MC, KT	10	5	6	6	13	16	**56**	**50**
	Coefficients of Variation:			0.20	0.12	0.25	0.36	0.30	0.04	0.10	0.16
Anza School	Wilkie Creek	8/14/02	GC, MC	5	0	3	16	10	2	**36**	**334**
Anza School	Wilkie Creek	8/14/02	SM, PE	3	1	3	13	14	2	**36**	**140**
Anza School	Wilkie Creek	8/14/02	KT, NW	6	0	6	13	12	2	**39**	**444**
	Coefficients of Variation:			0.33	1.73	0.43	0.12	0.17	0.00	0.05	0.50
Dimond Park	Sausal Creek	8/20/02	GC, Alej.	13	0	11	20	15	15	**74**	**138**
Dimond Park	Sausal Creek	8/20/02	MC, PR	10	4	10	15	11	14	**64**	**70**
Dimond Park	Sausal Creek	8/20/02	SM, NW	8	4	9	10	13	14	**58**	**75**
	Coefficients of Variation:			0.24	0.87	0.10	0.33	0.15	0.04	0.12	0.40
Barry Street	Sausal Creek	8/20/02	MC, PR	2	1	5	10	6	8	**32**	**291**
Barry Street	Sausal Creek	8/20/02	NW, SM	3	1	3	12	5	9	**33**	**293**
Barry Street	Sausal Creek	8/20/02	GC, Alej.	4	0	5	11	6	10	**36**	**404**
	Coefficients of Variation:			0.33	0.87	0.27	0.09	0.10	0.11	0.06	0.20

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The tallies and scores from the test assessments are summarized in Table 1. Overall, they demonstrate that the assessment methodology is sufficiently sensitive and objective to be useful in evaluating ambient conditions, trash management actions, and the effect of public access on trash levels. Except for two experienced staff persons, these test assessments were conducted mostly by staff with little or no experience, but some limited training in the use of the methodology. As such, the test assessment is a reasonable representation of what would be expected if a team of municipal employees or interested citizens conducted the assessment. The consistency of the scores in the test assessment underscores the confidence that Regional Board staff have in the methodology. Nevertheless, a few lessons were learned through this exercise and improvements made to create Version 6 of the Rapid Trash Assessment, discussed below.

As shown in Table 1, the total scores for the 4 sites were clustered closely, with some variability noted in individual trash assessment parameters. The exception was the Dimond Park site at Sausal Creek, with scores ranging from 58 to 74. During the field exercise, the staff discussed this difference and traced it to the variable human health score (20, 15, and 10). The key to the scoring difference was that one team noted the presence of a used diaper on the stream bank near the water, and others had mis-characterized it as paper or fabric waste. Also, some broken glass on the bank was noted by the team that scored a "15." This example shows the importance of identifying human health hazards, if any, and how the presence of one or two items can change the score significantly. The instructions have been modified accordingly, emphasizing that tallying can be estimated, but that bio-hazards must be carefully tallied to allow consistent scoring. All field staff agreed that the scores would have been less variable if all the teams had correctly identified the diaper.

Despite some variability between teams, the assessment methodology achieved the desired level of sensitivity. As hoped, the urban park sites had significantly higher scores than the unmanaged sites, demonstrating the desired sensitivity of the methodology. Alvarado Park (mean=61, CV=0.10) and Dimond Park (mean=65, CV=0.12) were clearly distinguishable from Anza School (mean=37, CV=0.05) and Barry Street on Sausal Creek (mean=34, CV=0.06).

In Table 1, the coefficient of variation (CV), which is the standard deviation divided by the arithmetic mean, expresses the variability of the scores and tallies of the rapid trash assessment. The CV overstates variability at the low end (scores of 0, 1, and 2), so the relatively high CVs associated with these scores for the quantitative level of trash (assessment parameter 2) can be ignored and the scores visually compared. For the overall score, a CV of 0.15 or less is desirable for demonstrating objectivity of the methodology. As discussed above, the only case where significant variability occurred was Dimond Park, and the variability was due to improper field identification of trash. As with the physical habitat evaluation associated with the rapid bioassessment procedures, such skills are expected to be acquired by a field technician through experience, and variability of that technician's scoring subsequently minimized.

The total trash tallies were substantially more variable than the assessment scores, as expected (Table 2). The rapid trash assessment procedure does not emphasize that these tallies be exact, but rather be used to help guide the assessment scoring by characterizing relative levels of different trash items and materials. Much of the variability in the overall tallies in Table 2 is ascribed to different teams' conventions of counting broken items as individual pieces or just as one item (e.g., a broken glass bottle). Additional guidance is now provided in Version 6 regarding conventions to be used for tallying "broken" trash items, rooted in the principle of exposure to fish, wildlife, or human users of the water body. Tallies less than 50 are expected to be less variable and with the additional guidance, we expect tallies to exhibit less variability than these test assessments.

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TABLE 2
RAPID TRASH ASSESSMENT METHODOLOGY EVALUATION
TRASH ITEM TALLY RESULTS

Site	Water Body	Date	Staff	Trash Item Tally																				
				Plastic		Biohaz.		Const.		Misc.		Metal		Large		Toxic		Biodeg.		Glass		Fabric		
				in*	out*	in	out	in	out	in	out	in	out	in	out	in	out	in	out	in	out	in	out	TOTAL
Alvarado Park	Wildcat Creek	8/14/02	NW, GC	21	4	0	0	0	0	7	1	1	1	0	1	0	0	3	7	7	0	1	1	**55**
Alvarado Park	Wildcat Creek	8/14/02	SM, PE	11	19	0	2	1	1	7	3	0	1	0	5	0	0	10	3	2	0	0	3	**68**
Alvarado Park	Wildcat Creek	8/14/02	MC, KT	15	6	0	1	0	0	3	2	5	0	0	0	1	0	7	2	3	3	1	1	**50**
	Coefficients of Variation:																							0.16
Anza School	Wilkie Creek	8/14/02	GC, MC	192	87	0	0	3	4	14	0	3	6	0	0	0	0	8	13	1	1	1	1	**334**
Anza School	Wilkie Creek	8/14/02	SM, PE	21	69	0	0	11	4	7	0	3	3	0	0	0	0	3	19	0	0	0	0	**140**
Anza School	Wilkie Creek	8/14/02	KT, NW	200	147	0	0	3	4	1	17	7	8	0	0	0	0	10	46	1	0	0	0	**444**
	Coefficients of Variation:																							0.50
Dimond Park	Sausal Creek	8/20/02	GC, Alej.	8	88	0	0	0	0	2	2	5	4	0	0	0	3	23	0	0	0	3	0	**138**
Dimond Park	Sausal Creek	8/20/02	MC, PR	20	17	0	0	0	0	1	0	5	3	0	0	0	0	9	8	2	2	3	0	**70**
Dimond Park	Sausal Creek	8/20/02	SM, NW	16	25	0	1	6	0	2	1	2	3	0	0	0	0	6	9	0	0	3	1	**75**
	Coefficients of Variation:																							0.40
Barry Street	Sausal Creek	8/20/02	MC, PR	59	26	0	0	26	2	35	1	25	1	0	1	1	2	13	9	82	2	5	1	**291**
Barry Street	Sausal Creek	8/20/02	NW, SM	65	42	0	0	49	8	9	2	10	14	0	1	1	1	8	15	57	6	2	3	**293**
Barry Street	Sausal Creek	8/20/02	GC, Alej.	63	50	0	0	84	8	5	4	15	13	0	1	0	0	10	13	73	59	5	1	**404**
	Coefficients of Variation:																							0.20

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* "in" refers to in-stream, and "out" refers to above high water line, but on banks or shore where transport to water body is probable.

The tallies above 50 do not have a significant effect on the scoring outcome, because the assessment parameter 2, actual number of trash items, allows a small range of 0-5 scoring for sites with more than 50 items. Resolution is not required at these higher levels of trash, but items that can substantially affect the score, such as large appliances or health-related items need to be tallied to ensure consistent and accurate scoring.

In applying the methodology, it has been SWAMP staff's experience that photography does not provide adequate illustration of trash conditions, unless there are large items or the photography is very close-up (but then it only represents a few square feet). Much of the trash that can affect aquatic life or human health is not visible in a digital photograph of a sampling site, due to vegetative cover and reflection of the water surface. Based on evaluations at over 40 sites, we have determined without exception that photography is less effective at documenting trash conditions than the Rapid Trash Assessment scoring methodology.

The Rapid Trash Assessment is less sensitive at the low end of the scoring range, corresponding to conditions commonly observed in the lower watersheds of urbanized areas. Based on SWAMP surveys conducted in 2002, many of the urban sites located in the lower portions of watersheds exhibit total scores below 40. It is difficult to distinguish conditions at these "trash hotspots," since this Rapid Trash Assessment methodology covers the range of conditions from optimal to poor. Since the urban areas that register "poor" scores tend to be of most interest in cleanup programs sponsored by local organizations and agencies, some concern has been expressed that a separate hotspot evaluation methodology may need to be developed, perhaps making more use of photography. A separate methodology may be necessary to demonstrate progress at the most impacted sites, but this methodology evaluation, utilizing independent assessment teams, has shown that the Rapid Trash Assessment can distinguish sites within urban areas that are receiving more trash management from areas that are not. In both examples evaluated, the urban parks had significantly higher scores than the sites that appear to receive little or no trash management.

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APPENDIX C
RAW RTA TRASH SCORE DATA

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				Trash Assessment Parameter Scores							
Date	**Station ID**	**BOTW**	**Park w/ High Public Access**	**1** Qualitative	**2** Quantitative	**3** Aquatic	**4** Human	**5** Dumping	**6** Littering	**7** Accumulation	**Total**
3/19/2004	203BAX030	1	1	5	0	0	10	5	0	0	**20**
7/12/2004	203BAX030	1	1	9	3	1	2	3	0	4	**22**
11/19/2004	203BAX030	1	1	3	0	0	4	8	3	0	**18**
6/8/2005	203BAX030	1	1	8	1	3	5	2	2	0	**21**
8/23/2005	203BAX030	1	1	6	0	0	5	5	0	2	**18**
11/12/2004	203BAX040			0	0	0	3	8	0	5	**16**
6/8/2005	203BAX040			5	3	4	3	1	0	15	**31**
8/23/2005	203BAX040			5	1	1	4	0	0	14	**25**
11/12/2004	203BAX080			10	4	2	17	10	5	2	**50**
6/8/2005	203BAX080			15	4	5	13	10	9	2	**58**
8/23/2005	203BAX080			19	5	4	15	10	5	4	**62**
3/26/2004	203CER010	1	1	3	3	4	9	5	2	2	**28**
7/12/2004	203CER010	1	1	3	2	0	4	9	0	9	**27**
11/5/2004	203CER010	1	1	1	1	1	3	8	2	0	**16**
5/17/2003	203COD040		1	7	3	8	9	7	0	5	**39**
3/12/2004	203COD040		1	7	0	3	0	6	5	3	**24**
7/12/2004	203COD040		1	10	3	4	3	6	0	3	**29**
11/5/2004	203COD040		1	8	3	4	0	7	1	4	**27**
3/12/2004	203STW010	1		0	0	1	3	9	9	0	**22**
8/18/2004	203STW010	1		13	5	5	9	3	8	5	**48**
12/10/2004	203STW010	1		5	0	0	5	8	5	0	**23**
4/23/2004	204AMO080		1	10	10	7	19	10	4	8	**68**
8/20/2004	204AMO080		1	7	5	6	5	4	2	15	**44**
6/10/2005	204AMO080		1	8	1	5	15	4	1	14	**48**
7/19/2004	204AVJ020		1	3	2	1	4	7	2	2	**21**
9/1/2004	204LME100	1		10	4	3	5	3	0	3	**28**
12/10/2004	204LME100	1		14	4	3	10	9	8	2	**50**
6/10/2005	204LME100	1		13	3	3	8	3	8	3	**41**
8/25/2005	204LME100	1		10	6	7	10	10	3	7	**53**
9/1/2004	204LME130		1	7	2	4	3	3	2	10	**31**
12/10/2004	204LME130		1	10	0	3	0	8	4	0	**25**
6/10/2005	204LME130		1	14	0	3	0	10	9	2	**38**
8/25/2005	204LME130		1	7	5	5	9	10	1	9	**46**
7/19/2004	204PRL020	1	1	3	0	0	0	2	3	0	**8**
8/16/2004	204SAU030	1		0	0	0	0	7	0	8	**15**
12/3/2004	204SAU030	1		8	2	3	3	3	1	4	**24**
6/17/2005	204SAU030	1		8	4	2	2	2	5	3	**26**
8/25/2005	204SAU030	1		3	3	0	0	0	0	8	**14**
8/16/2004	204SAU060		1	9	5	4	10	10	1	10	**49**
12/3/2004	204SAU060		1	13	7	7	15	10	4	7	**63**
6/17/2005	204SAU060		1	19	13	9	15	10	8	8	**82**
8/25/2005	204SAU080			14	10	8	14	10	4	8	**68**
8/16/2004	204SAU130		1	20	19	19	15	10	9	20	**112**
12/3/2004	204SAU130		1	20	18	15	15	10	9	19	**106**
6/17/2005	204SAU130		1	20	18	14	10	10	9	15	**96**
8/25/2005	204SAU130		1	19	19	15	9	10	10	20	**102**
3/21/2003	204SMA020	1	1	11	0	8	6	9	4	2	**40**
7/23/2003	204SMA020	1	1	6	6	8	10	8	1	10	**49**
10/20/2003	204SMA020	1	1	10	4	10	13	6	4	10	**57**
2/13/2004	204SMA020	1	1	9	2	9	2	8	4	2	**36**
10/7/2004	204SMA020	1	1	11	4	4	9	10	0	15	**53**
3/21/2003	204SMA060		1	13	5	6	13	9	5	4	**55**
7/23/2003	204SMA060		1	14	9	9	10	10	7	6	**65**
10/20/2003	204SMA060		1	14	10	10	15	4	6	13	**72**
2/13/2004	204SMA060		1	12	5	9	9	7	5	10	**57**
3/21/2003	204SMA110			5	3	3	3	4	9	3	**30**
7/23/2003	204SMA110			11	9	6	13	7	9	5	**60**
10/20/2003	204SMA110			17	13	14	13	9	9	17	**92**
2/13/2004	204SMA110			11	4	4	14	9	8	5	**55**
3/21/2003	204SMA120			9	4	4	13	6	2	5	**43**
7/23/2003	204SMA120			16	13	10	15	10	7	9	**80**
10/20/2003	204SMA120			17	10	10	17	7	9	13	**83**
2/13/2004	204SMA120			19	9	7	18	9	7	8	**77**
3/27/2003	205PER010	1	1	6	2	2	13	9	5	1	**38**
7/29/2003	205PER010	1	1	6	3	2	13	10	5	2	**41**
10/31/2003	205PER010	1	1	9	7	4	4	9	6	8	**47**
3/14/2004	205PER010	1	1	10	3	5	7	9	10	3	**47**
3/27/2003	205STE100		1	12	3	9	11	7	1	14	**57**
7/29/2003	205STE100		1	9	4	9	3	8	1	15	**49**
10/31/2003	205STE100		1	15	6	6	8	10	2	5	**52**
3/14/2004	205STE100		1	14	5	9	1	5	10	9	**53**
3/20/2003	206PET100	1	1	7	3	2	19	10	7	1	**49**
7/22/2003	206PET100	1	1	10	5	3	19	10	5	4	**56**
11/7/2003	206PET100	1	1	7	3	0	7	5	1	2	**25**
2/6/2004	206PET100	1	1	6	1	0	9	10	6	0	**32**
3/20/2003	206PET220			5	4	3	15	9	4	2	**42**
7/22/2003	206PET220			3	3	3	14	9	1	9	**42**
11/7/2003	206PET220			0	1	0	10	3	0	6	**20**
1/27/2004	206PET220			7	3	0	15	10	0	6	**41**
3/20/2003	206PET310			10	8	8	13	9	9	4	**61**
7/22/2003	206PET310			15	14	14	14	10	10	9	**86**
11/7/2003	206PET310			9	7	5	9	9	2	18	**59**
1/27/2004	206PET310			8	4	4	14	8	1	10	**49**
3/20/2003	206PET400		1	9	8	6	14	9	9	2	**57**
7/22/2003	206PET400		1	16	14	13	12	6	5	17	**83**
11/7/2003	206PET400		1	18	12	7	9	10	4	16	**76**
1/27/2004	206PET400		1	14	10	9	10	10	9	9	**71**
3/19/2003	207KIR020	1		7	4	3	13	10	10	1	**48**
7/25/2003	207KIR020	1		10	10	6	17	9	8	5	**65**
2/20/2004	207KIR020	1		0	0	0	15	10	10	0	**35**
3/19/2003	207KIR110		1	9	2	3	7	8	1	7	**37**
7/25/2003	207KIR110		1	3	2	2	2	9	0	8	**26**
2/20/2004	207KIR110		1	8	2	3	3	7	0	8	**31**

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Distribution of Anthropogenic and Natural Debris on the Mainland Shelf of the Southern California Bight

Shelly L. Moore and M. James Allen

ABSTRACT

Various studies have been conducted to quantify the types and amounts of debris found along beaches; however, little information has been compiled about the distribution of debris on the seafloor. This study describes the distribution, types, and amounts of benthic marine debris found on the mainland shelf of the Southern California Bight (SCB) using trawl data collected from a regional survey conducted in July and August of 1994. Trawl samples were collected at 113 randomly selected stations from Point Conception, California, to the United States-Mexico international border at depths of 10 to 200 m. Anthropogenic debris was most common in the central (urbanized) region, on the outer shelf, and in areas near publicly owned treatment works (POTWs). Fishing gear was the most common type of anthropogenic debris in the central region and in the outer shelf zone, whereas glass bottles and plastic were most common in POTW areas. Natural debris, primarily marine vegetation (from nearshore reefs) and terrestrial vegetation (a marker for stormwater runoff), was more common close to shore in the inner shelf zone than anthropogenic debris. The deeper distribution of anthropogenic debris relative to natural debris, as well as the types of debris (i.e., fishing gear and plastic), suggest that the primary source of anthropogenic debris is marine vessel and fishing activity rather than stormwater runoff.

INTRODUCTION

Marine debris is a focal point for public concern and a visible expression of human impact on the marine environment. In the last few decades, marine debris has been recognized as an indicator of pollution that poses risks to marine organisms via entanglement and ingestion. Many organizations, such as the Center for Marine Conservation, are currently collecting and analyzing beach debris data as a means to inform the public of this growing problem (Ribic *et al.* 1997).

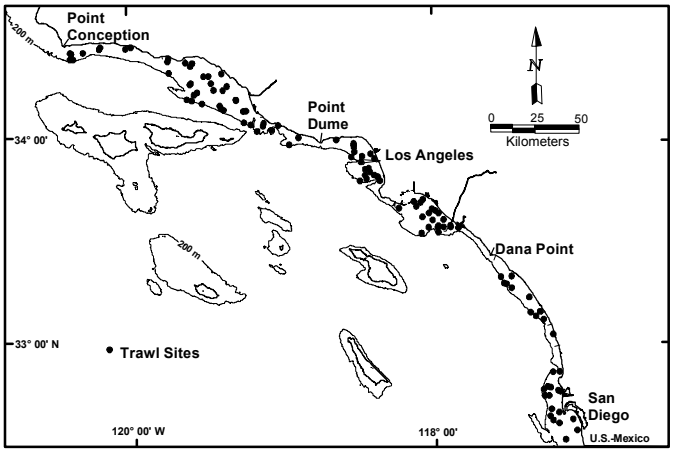
Although marine debris has become the focus of an increasing number of studies, most address only the types and distribution of anthropogenic debris found on coastal beaches (MBC 1988, Ribic *et al.* 1997, SMBRP 1998). While a limited number of studies have focused on floating debris surveyed from ships (Baba and Kiyota 1994, Matsumura and Nasu 1997), very few have examined the types and distribution of marine debris on the seafloor (June 1990, Golik 1997).

Here we present the first study of debris on the seafloor of the SCB. The objectives of this study (which was part of a regional trawl survey of demersal fishes and megabenthic invertebrates (Allen *et al.*1998)), were (1) to assess the distribution, types, and amounts of both anthropogenic and natural (marine and terrestrial) debris on the seafloor of the mainland shelf of the SCB in 1994, and (2) to provide a baseline for future comparisons.

METHODS

Seafloor debris was surveyed in July and August of 1994 at 113 trawl stations located on the mainland shelf of the SCB from Point Conception, California, to the United States-Mexico international border at depths of 10 to 200 m (Figure 1). Trawl sites were selected using a stratified random design, with strata defined by three subpopulation categories: depth — inner shelf (10-25 m), middle shelf (26-100 m), and outer shelf (101-200 m); location — northern region (Point Conception to Point Dume), central region (Point Dume to Dana Point), and southern region (Dana Point to the United States-Mexico international border); and proximity to POTW monitoring areas (Stevens 1997, Allen *et al.* 1998).

FIGURE 1. Stations sampled by trawl in the regional survey of the mainland shelf of southern California at depths of 10-200 m, July to August 1994.



Trawl sampling was conducted using standardized methods described in the field operations manual prepared by the Southern California Bight Pilot Project (SCBPP 1994). Trawl samples were collected with 7.6-m head-rope and 8.8-m foot-rope semiballoon otter trawls with a 1.25-cm cod-end mesh. Otter boards were 76.2 cm wide and 40.8 cm tall, and bridles were 22.9m long. Deviations within 10% of these dimensions were acceptable. Trawls were towed along isobaths for 10 min at 0.8-1.2 m/sec (1.5-2.4 kn). Debris was categorized into 13 predetermined types of anthropogenic and natural debris: plastic; metal; paper; medical waste; cans; glass bottles; fishing gear; tires; modified wood; terrestrial vegetation (twigs, branches, leaves, and uprooted plants); marine vegetation (drift algae, kelp, and seagrasses); rocks; and other debris. Debris in each category was then counted and placed into one of four categories based upon numerical classification: trace (1 item); low (2-10 items); moderate (11-100 items); and high (>100 items). Debris was also weighed and placed into four categories by weight: trace (0.0-0.1 kg); low (0.2-1.0 kg); moderate (1.1-10.0 kg); and high (>10.0 kg).

Data analysis was focused upon determining the spatial coverage (percentage of area) of the different debris types on the mainland shelf as a whole and by subpopulation. Spatial coverage was calculated using a ratio estimator (Thompson 1992, Stevens 1997, Allen *et al.* 1998). Debris data were expressed as values per standard 10-min trawl haul (representing approximately 2,944 m^2 of seafloor) (Allen *et al.* 1998). The spatial coverage of a debris type in a subpopulation was defined as the occurrence of a debris type in a standard trawl haul collected at stations representing a given percent of the total subpopulation area.

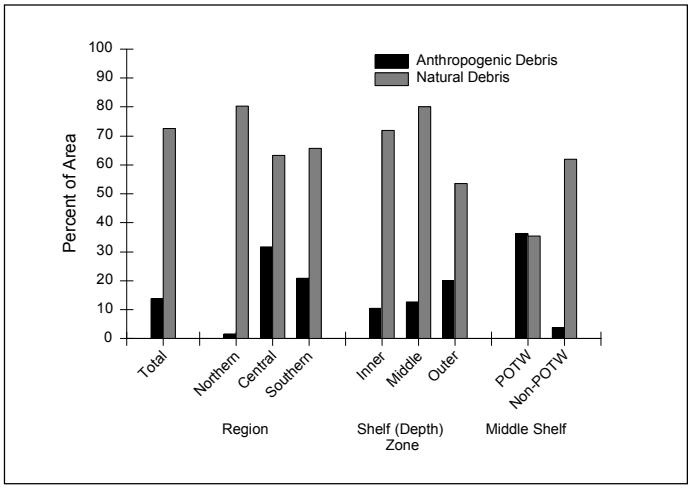
RESULTS

Anthropogenic Debris

Anthropogenic debris occurred on approximately 14% of the mainland shelf of the SCB (Figure 2). Fishing gear had the largest spatial coverage, followed by plastic, metal, and other debris (shoe soles and automobile parts) (Table 1). All of these categories occurred primarily in trace numerical and weight densities (Tables 2 and 3). However, glass bottles and metal debris occurred most commonly at low weight densities.

The distribution and spatial coverage of anthropogenic debris varied by region, depth, and proximity to

FIGURE 2. Percent of area with natural and anthropogenic debris in the regional survey of the mainland shelf of southern California at depths of 10-200 m by subpopulation, July to August 1994.



POTWs (Figure 2). Regionally, the percent of area where debris occurred was highest in the central region, followed by the southern and northern regions. Bathymetrically, the percent of area where debris occurred increased with increasing depth (inner shelf; middle shelf; and outer shelf). Anthropogenic debris occurred over more area in middle shelf POTW areas and less area in non-POTW areas.

The types of anthropogenic debris also varied by region, depth, and proximity to POTWs (Tables 1 and 4). Regionally, fishing gear and plastic were the most common types of debris found in the central region, whereas metal, plastic, and cans were the most common types of debris found in the southern region; only modified wood occurred in the northern region (Table 1). Bathymetrically, the most common types of debris found in each zone are as follows: fishing gear, plastic, and modified wood on the outer shelf zone; fishing gear and metal debris on the middle shelf zone; and fishing gear, metal debris, and modified wood on the inner shelf zone (Table 1). On the middle shelf, glass bottles, plastic, and cans occurred exclusively in areas near POTWs (Table 4). The spatial coverage of fishing gear and metal debris was slightly higher in POTW areas than in non-POTW areas (Table 4). Fishing gear was found primarily in the Redondo Canyon area and eastern San Pedro Shelf. Glass bottles and cans were found near Redondo Canyon, Oceanside, and off Point Loma.

TABLE 1. Spatial coverage by subpopulation of debris types collected in the regional trawl survey of the mainland shelf of southern California depths of 10-200 m, July to August 1994.

	Percent of Area						
	Region			Shelf Depth Zone			Entire
Category	N	C	S	IS	MS	OS	SCB
Anthropogenic debris							
Fishing gear	-	18	-	4	4	9	5
Plastic	-	8	5	-	2	9	3
Metal debris	-	3	9	4	4	-	3
Other	-	9	2	-	4	4	3
Glass bottles	-	5	4	-	2	4	2
Modified wood	2	2	3	4	-	6	2
Cans	-	2	5	-	2	4	2
Natural debris							
Marine vegetation	59	60	54	70	63	34	58
Terrestrial vegetation	38	8	7	16	25	25	23
Benthic debris	20	-	2	4	14	9	11
Rocks	5	5	5	-	4	13	5
Overall	80	68	71	72	82	59	75

N = Northern.
C = Central.
S = Southern.
IS = Inner Shelf.
MS = Middle shelf.
OS = Outer shelf.
SCB = Southern California Bight.

Natural Debris

Overall, natural debris was more widespread than anthropogenic debris, occurring on 73% of the mainland shelf (Figures 2 and 3). Marine vegetation was the most commonly occurring natural debris overall and in all subpopulations on the mainland shelf of the SCB (Figure 4), followed by terrestrial vegetation, benthic debris (worm tubes and shells), and rocks. Spatial coverage was highest for debris with low numerical densities, followed by those with trace, moderate, and finally high numerical densities (Table 2). The spatial coverage of marine and terrestrial vegetation was highest at trace weight densities and decreased with increasing weight (Table 3). Benthic debris was equally common at trace and low weight densities and decreased at moderate weight densities. However, rocks were found in a higher percentage of area at high and low weight densities than at moderate weight densities.

Natural debris also varied in spatial coverage by depth, region, and proximity to POTWs, but differed from the pattern of variation found in anthropogenic debris (Figure 2). Spatial coverage for natural debris ranged from 36% in middle shelf POTW areas to 80% in the northern region. Regionally, the percent of spatial coverage was higher in the northern region than in the southern and central regions. Bathymetrically, natural debris covered a higher percentage of area on the middle shelf zone, followed by the inner shelf and outer shelf zones. Spatial coverage for natural debris was higher in non-POTW areas than in POTW areas.

The types of natural debris also varied by region, depth, and proximity to POTWs (Tables 1 and 4). Marine vegetation was most widely distributed on the inner shelf and middle shelf non-POTW areas and least widely distributed on the outer shelf and middle shelf POTW areas. Regionally, marine vegetation was nearly equally distributed among all subpopulations (Table 1). Terrestrial vegetation occurred most commonly in the northern region, middle and outer shelf zones, and non-

TABLE 2. Spatial coverage of abundance categories by debris types collected in the regional trawl survey of the mainland shelf of southern California at depths of 10-200 m, July to August 1994.

Category	No. of Stations	Percent of Area in SCB T	L	M	H
Anthropogenic debris					
Fishing gear	6	4	1	-	-
Plastic	5	2	1	-	-
Other	3	-	3	-	-
Metal debris	4	3	-	-	-
Glass bottles	4	2	0	-	-
Modified wood	3	1	1	-	-
Cans	3	2	-	-	-
Natural debris					
Marine vegetation	61	18	34	5	1
Terrestrial vegetation	21	6	12	5	-
Benthic debris	9	2	5	2	1
Rocks	8	1	3	0	-
Overall	80	40	60	13	2

T = Trace (1 item).
L = Low (2-10 items).
M = Moderate (11-100 items).
H = High (>100 items).
SCB = Southern California Bight.

POTW areas. Terrestrial vegetation was least common in the southern region and inner shelf zone and was completely absent from POTW areas (Tables 1 and 4). Benthic debris occurred mostly in the northern region, middle shelf zone, and non-POTW areas; it was absent in the central region and POTW areas. Rocks were most widely distributed on the outer shelf, were absent on the inner shelf, and were generally equally distributed among all other subpopulations.

DISCUSSION

Anthropogenic debris was not widespread on the mainland shelf, but was relatively common in the central region, outer shelf zone, and POTW areas (Figures 2 and 3). The higher occurrence in the central region (and southern region) can be attributed to the proximity of large population centers in these areas (e.g., Los Angeles and San Diego). The higher frequency of anthropogenic debris on the outer shelf relative to the inner shelf—as well as the types of debris found on the outer shelf (fishing gear and plastic)—suggest that the source of this debris is the disposal of trash and incidental items from boats.

An alternative hypothesis is that most of the anthropogenic debris in the outer shelf zone originates from urban runoff that is washed offshore by the high currents associated with stormwater events. Approximately13 mt of anthropogenic debris was discharged by stormwater from Ballona Creek into Santa Monica Bay in a single storm event in 1997 (SMBRP 1998; J. Woodson, Los Angeles County Department of Beaches and Harbors, Planning Division, Los Angeles, CA, pers. comm., 1998). Approximately 4,036 mt of litter was collected each year from 1988 to 1996 on beaches from the Ventura-Los Angeles county line to San Pedro by the Los Angeles County Department of Beaches and Harbors (SMBRP 1998). However, this alternative

TABLE 3. Spatial coverage of weight categories by debris types collected in the regional trawl survey of the mainland shelf of southern California at depths of 10-200 m, July to August 1994.

Category	No. of Stations	Percent of Area in SCB T	L	M	H
Anthropogenic debris					
Fishing gear	6	3	2	-	-
Plastic	5	2	1	4	-
Other	3	2	0	1	-
Metal debris	4	1	2	-	-
Glass bottles	4	0	2	-	-
Modified wood	3	1	1	-	-
Cans	3	2	-	-	-
Natural debris					
Marine vegetation	61	30	19	7	2
Terrestrial vegetation	21	16	5	3	-
Benthic debris	9	5	5	1	-
Rocks	8	0	2	1	2
Overall	80	61	37	13	4

T = Trace (0.0-0.1 kg).
L = Low (0.2-1.0 kg).
M = Moderate (1.1-10 kg).
H = High (>10 kg).
SCB = Southern California Bight.

TABLE 4. Spatial coverage by publicly owned treatment work (POTW) subpopulation of debris types collected in the regional trawl survey of the mainland shelf of southern California at depths of 10-200 m, July to August 1994.

	Percent of Area on Middle Shelf	
Category	P	NP
Anthropogenic debris		
Fishing gear	3	2
Plastic	10	-
Metal debris	3	2
Other	3	2
Glass bottles	10	-
Modified wood	-	-
Cans	7	-
Natural debris		
Marine vegetation	32	48
Terrestrial vegetation	-	21
Benthic debris	-	12
Rocks	3	2
Overall	45	62

P = POTW monitoring area.
NP = Non-POTW monitoring area.

hypothesis appears to be unlikely because of the disparity in spatial distribution between natural and anthropogenic debris. If urban runoff was primarily responsible for the distribution of anthropogenic debris, its distribution would be more similar to that of terrestrial vegetation, which comes from a stormwater source.

The types of anthropogenic debris (glass bottles, cans, and plastic) found in areas near POTWs offer additional evidence that marine vessels are a primary source of offshore anthropogenic debris. Glass bottles and cans, which were prevalent near POTW outfalls, are too large to pass through the screens covering POTW outfall pipes and thus could not be discharged from this source. However, because these outfall pipes are essentially artificial reefs, they are popular fishing spots for recreational anglers. The disposal of trash (bottles and cans) and incidental items from fishing boats is the likely source of these types of anthropogenic debris in POTW outfall areas.

FIGURE 3. Distribution of anthropogenic and natural debris in the regional survey of the mainland shelf of southern California at depths of 10-200 m, July to August 1994.

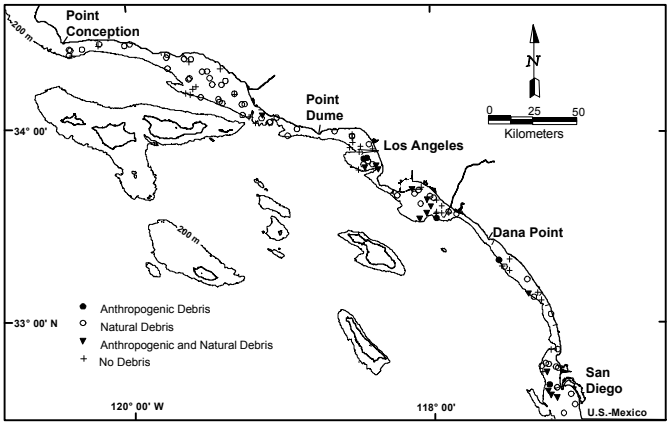
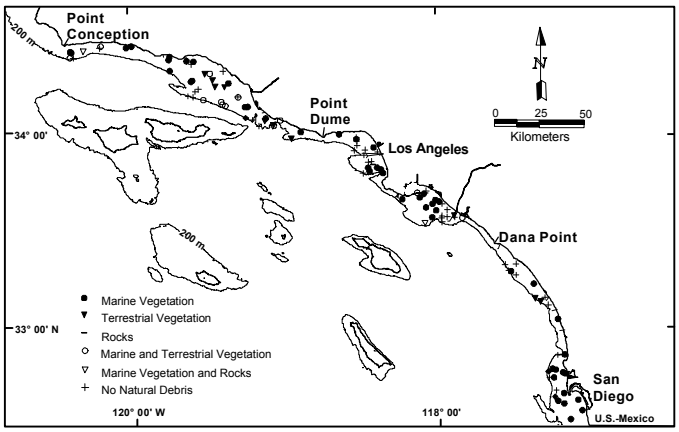


FIGURE 4. Distribution of marine vegetation, terrestrial vegetation, and rocks in the regional survey of the mainland shelf of southern California at depths of 10-200 m, July to August 1994.



In contrast to anthropogenic debris, natural debris was most common in the northern region, on the middle and inner shelf zones, and on the middle shelf zone in non-POTW areas (Figures 2 and 3). The more frequent occurrence in the northern (rural) region may be due to the increased availability of marine and terrestrial vegetation in this area. Although the primary reason for describing the occurrence of natural debris in this study was to provide a marker for nearshore sources (e.g., stormwater runoff and nearshore reefs), an additional purpose was served because natural debris (particularly of marine vegetation) is an important microhabitat for juvenile fishes on sediment bottoms (Allen and Franklin 1988, Allen and Herbinson 1991). This study is the first to estimate the potential spatial coverage (73%) of natural debris, and hence of this microhabitat, on the mainland shelf of southern California. Because no historical data are available from the mainland shelf of the SCB for assessing trends in anthropogenic or natural debris, this study provides baseline information for future comparisons.

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Impacts of Marine Debris: Research and Management Needs

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Background

Although societies have altered natural environments since time immemorial, the magnitude, intensity, and rate of change have increased dramatically in the last 75 years. Nowhere is this more evident than in coastal areas, where growing populations, increased demands on natural resources, and powerful modern technologies have combined to bring about far-reaching changes in coastal and marine environments, not all of them favorable. Human-induced changes have been profound and continue to increase in scope, yet we have had neither the time nor resources to pause, study, and reflect on the remarkable impacts and how to mitigate them.

Marine debris is a good example of such change. Significant marine debris impacts can be traced to the 1940s when new synthetic materials began replacing natural fibers in the manufacture of fishing nets, line, and all sorts of everyday items. The low cost, light weight, and long life of new synthetic materials have resulted in more items being discarded, their transport to the most remote ocean shorelines and waters, and a much longer hazard life for marine species.

Although the roots of marine debris pollution date to the mid-1900s, its impacts on marine life were largely unrecognized until 1984 when the National Marine Fisheries Service (NMFS), at the recommendation of the Marine Mammal Commission, hosted the Workshop on the Fate and Impact of Marine Debris (Shomura and Yoshida (1985). Data compiled at the workshop revealed that marine debris was affecting far more species in many more areas than previously realized. Its biological impacts were found to have two principal forms: (1) entanglement of animals in loops and openings of derelict line, nets, strapping bands, etc., and (2) ingestion of plastics causing damaged or blocked digestive tracks. Both are potentially lethal to marine life. In addition, human safety problems caused by fouling and disabling of vessel propulsion systems were noted.

The 1984 workshop spurred national and international efforts to investigate, monitor, and mitigate marine debris impacts (Laist *et. al.* 1999). With regard to biological impacts, studies over the following decade documented entanglement and ingestion impacts in all the world's oceans. Interactions were reported in all but one of the world's sea turtle species, 74% (138 species) of all seabird species, 37% (28 species) of all cetacean species, 58% (19 species) of all pinniped species, and Florida manatees (Laist 1996a). Many affected species were listed as endangered or threatened under national and international conservation programs. Entanglement was found to be more likely than ingestion to injure or kill marine life, and most entanglements involved fishing nets, monofilament fishing line, rope, and strapping bands lost or discarded by

commercial and recreational fisheries. Some seabirds and sea turtles, however, were especially prone to ingesting debris, such as plastic bags, cigarette lighters, light sticks, and small plastic fragments that were confused for floating prey. Potentially significant impacts to commercial fish stocks were also identified due to ghost-fishing (*i.e.*, derelict fishing gear that continues to catch fish and shellfish for years after being lost or discarded [Laist 1996b]).

Other studies focused on the types and amounts of debris in ocean areas (Pruter 1987 and Ribic *et. al.*, 1997). They found that plastic items comprised the majority of marine debris, and that, in some areas, up to 90% of all debris was made of plastics. Still other studies focused on economic impacts, particularly those measured by diminished opportunities to use the marine environment for pleasure (see for example, Faris and Hart 1995). Beaches, rivers, wetlands, and bays are used extensively by recreationists, and thus the consequences of aesthetic degradation, beach clean-ups, and human health and safety impacts associated with marine debris may impose some of the highest economic impacts (Hoagland and Kite Powell 1997; Holdnak 1992; Smith et al. 1997). Over the years, countless news articles and anecdotes have been reported illustrating how marine debris, most notably sewage, medical items, and bottles and cans, threaten human health and safety and affect coastal communities.

Beginning in the mid-1980s, many notable actions were taken to address these problems. Among these were the following: (1) the U.S. Congress authorized funding for the Marine Entanglement Research Program in the National Marine Fisheries Service to improve understanding of marine debris problems and coordinate responsive federal actions; (2) in 1987, parties to the International Convention for the Regulation of Pollution from Ships 1973 and its 1978 protocol, (jointly known as MARPOL 73/78) took steps to implement Annex V, a convention annex for regulating the discharge of garbage from ships and prohibiting all at-sea discharges of plastics; (3) also in 1987 the U.S. Congress passed the Marine Plastics Pollution Research and Control Act (MPPRCA) to enact domestic authority for implementing Annex V; (4) the U.S. Navy implemented a program to develop and retrofit solid waste handling technology for all of its vessels; (5) a series of international meetings, workshops and symposia were held to review information on marine debris impacts and to identify priority research and management needs; and (6) the Center for Marine Conservation and other non-governmental groups organized a national beach clean-up campaign, that was expanded into an international program in 1990.

One region of the world that received intensive attention during the 1990s for its marine debris problems was the Caribbean. Twenty-two developing nations in that region received technical and financial support to implement the MARPOL 73/78 Convention and to help fulfill the requirements associated with the designation of the Wider Caribbean Region as a Special Area under Annex V of the Convention. The Special Area designation, adopted by the International Maritime Organization (IMO) in 1993, prohibits all at-sea discharges of vessel-generated garbage from ships, with the exception of ground food wastes that could be discharged beyond three miles from land (WCISW 1997). Assistance for these nations became available in 1994 when the Wider Caribbean Initiative on Ship-Generated Waste Project (WCISW) was funded by the Global Environment Facility through the World Bank and implemented by the IMO. Through the Project, half a dozen countries not already party to MARPOL 73/78 acceded to the Convention during the course of four years. Technical support was also provided to (1)

draft and implement marine pollution legislation in several countries, (2) develop regional and national strategies for handling vessel-generated wastes, (3) identify land-based waste management options (including reuse and recycling), and (4) increase and strategically place shore-based waste reception facilities.

Summary of Recommendations from Previous Conferences, Meetings and Reports

As indicated above, several international meetings on marine debris were held during the 1980s and early 1990s to review and evaluate information on marine debris. Among these was a special session on marine debris at a 1986 ocean disposal symposium (Wolfe 1987), a 1987 fishing industry conference on marine debris (Alverson and June 1988), and two international conferences organized by the Marine Entanglement Research Program of the National Marine Fisheries Service in 1989 and 1994 (Shomura and Godfrey 1990, Coe and Rogers 1994) to follow up on the initial workshop convened in 1984. Participants at those meetings made recommendations on priority research needs, as well as steps to coordinate and guide mitigation work. Many of those recommendations remain unaddressed or only partly addressed.

With regard to assessing marine debris impacts, participants at the 1984 Workshop on the Fate and Impact of Marine Debris(Shomura and Yoshida 1985) recommended steps to:

1 assess marine debris impacts on living marine resources, including fish, northern fur seals, Hawaiian monk seals, seabirds, and marine turtles;

2. determine impacts of ingestion of debris by seabirds and turtles;

3. determine the severity of debris problems in areas other than the North Pacific Ocean;

4. expand existing stranding networks for marine mammals, birds, and turtles to collect data on interactions with marine debris;

5. obtain data on the amounts of gear lost by commercial fisheries, particularly high seas gillnet fisheries;

6. determine the impact of marine debris on the sea floor; and

7. obtain worldwide data on vessel disablement as a result of interactions with marine debris.

In 1987 commercial fishing organizations sponsored the North Pacific Rim Fishermen's Conference on Marine Debris. The purpose of the conference was to identify research needs and industry outreach priorities from the fishing industry's perspective. Proceedings from the Conference (Alverson and June 1988) urged that international efforts be expanded to quantify population- level impacts of marine debris on marine species. It also recommended work to quantify economic impacts on commercial and recreational fisheries, and the development of

fishing gear and fishing practices that would minimize ghost-fishing. Recognizing the long-term nature of work needed to address marine debris issues, conference participants also recommended that the National Oceanic and Atmospheric Administration provide long-term funding support to the National Marine Fisheries Service for its Marine Entanglement Research Program.

Also in 1987, President Reagan, at the request of 30 members of the U.S. Senate, directed the Office of Domestic Policy to establish an Interagency Task Force on Marine Debris to develop a coordinated strategy to address marine debris issues. Chaired by the National Oceanic and Atmospheric Administration, the task force completed its report in May 1988 (Office of Domestic Policy 1988). The report called on all federal agencies to assess and mitigate marine debris impacts in cooperation with state and local governments, industry, academia, and private groups. It embraced advice developed at the earlier meetings, including recommendations for long-term support of the National Marine Fisheries Service's Marine Entanglement Research Program and for quantifying deleterious marine debris impacts on fish and wildlife and vessels. The task force report also recommended greater emphasis on (1) documenting and resolving the aesthetic impacts of marine debris and its associated economic effects on coastal communities, and (2) determining and monitoring marine debris impacts on endangered, threatened, and depleted species. It also called for developing standards on the use of biodegradable plastics and for removing marine debris from beaches and other marine areas.

On 2-7 April 1989 and 8-13 May 1994, the National Oceanic and Atmospheric Administration convened the second and third international conferences on marine debris in Honolulu, Hawaii, and Miami, Florida respectively. Building on results of earlier meetings, participants at the 1989 conference recommended:

1 the preparation of a marine debris survey manual to standardize methodologies for monitoring marine debris on beaches;

2. forming an international committee to coordinate collaborative efforts for collecting entanglement data and removing hazardous debris from habitats used by species, such as Hawaiian monk seals, sea turtles, and northern fur seals;

3. studying potential lethal effects of plastic ingestion among sea turtles and seabirds, including studies to correlate ingestion of plastics and the occurrence of lesions in sea turtles, and to assess pseudo-satiation and possible toxic effects among seabirds;

4. instituting measures to record and track the numbers of gillnets and traps lost during commercial fishing, to estimate ghost fishing rates in lost gear over time, and to develop mechanisms for reducing the length of time lost fishing gear could continue to catch fish and shellfish; and

5. evaluating economic impacts from vessel disablement, ghost fishing, cleaning debris off beaches, and reduced tourism.

The third international conference in 1994 made similar recommendations, but also noted needs to investigate the role of floating debris in transporting invasive, non-indigenous species to

new marine areas and the potential for large-scale impacts from debris accumulations on the sea floor. They also reiterated the need to recover lost fishing gear in areas where it accumulates, to develop a system to record losses of commercial fishing gear, and to evaluate the types and amounts of fish and shellfish caught in lost gear.

In 1995, the National Research Council's Marine Board published the results of a comprehensive two-year study on actions needed to develop a national strategy for implementing MARPOL Annex V (National Research Council 1995). Among other things, the report recommended that:

1. The National Oceanic and Atmospheric Administration, with help from the Environmental Protection Agency, establish a national program to monitor the flux of marine debris on beaches and benthos and marine debris impacts on wildlife;

2. The Environmental Protection Agency develop an overall framework for requiring and monitoring garbage discharges from ships and the availability of adequate port receptions facilities for ship-generated garbage;

3. The International Maritime Organization develop a garbage treatment technology program to develop new garbage handling technology;

4. Congress fund a foundation to coordinate a sustained, long- term program to educate and train the maritime sector in actions needed to properly handle and dispose of ship-generated garbage; and

5. Congress establish a permanent national commission to provide consistent, independent oversight and coordination of actions to implement Annex V and the provisions of the Marine Plastic Pollution Control Act.

Progress Since 1994

Since 1994, there has been a marked decline in efforts to address marine debris pollution. For example, despite progress made in the Wider Caribbean Region under the WCISW Project, funding for work ended abruptly in 1998 and the Wider Caribbean Special Area has not yet entered into force. Such designation will become effective only when countries and territories in the region notify the IMO that their ports, terminals, and marinas have adequate reception facilities. There is little likelihood of this taking place in the near term. There are many remaining organizational constraints, the necessary physical infrastructure in the form of reception facilities and solid waste management systems is, by and large, woefully inadequate, and operational aspects associated with national implementation and enforcement have not been formulated in many countries.

Attention to marine debris pollution in the United States also decreased sharply after 1994. In 1995, Congress eliminated funding for the Marine Entanglement Research Program as part of efforts to reduce deficit spending. In doing so, it effectively terminated the only national-level program in the United States designed to coordinate and support federal activities to assess

and mitigate marine debris pollution. Funded at between $600,000 and $750,000 per year, the program was the only source of federal funding available to investigate and mitigate the full range of marine debris impacts. In 1996, Congress amended the Marine Plastic Pollution Research and Control Act to direct that the National Oceanic and Atmospheric Administration convene a federal marine debris coordinating committee to oversee cooperative work by involved agencies to address marine debris pollution issues. However, no steps have been taken to convene such a committee. As a result, with three notable exceptions, most conference and report recommendations have received little or no attention over the past six years.

One area in which progress has continued is the development of a National Marine Debris Monitoring Program. In 1995, the Environmental Protection Agency, in cooperation with the Center for Marine Conservation, developed a national marine debris monitoring plan. Since 1996, the Agency has provide $100,000 per year to the Center to develop and implement a monthly sampling program to monitor derelict fishing gear and other marine debris at selected beaches around the nation. Although limited by funding, the program has established monitoring sites in several regions. Over time, the program will provide a means of assessing trends in the amounts of marine debris fouling the nation's shorelines. As a companion effort, with support principally from corporate sponsors, the Environmental Protection Agency, and the Coast Guard, the Center also has continued to coordinate international beach clean-ups with volunteers annually removing trash from hundreds of beaches worldwide.

A ten-year study of beach trash along the 68-mile Padre Island National Seashore was completed in 1998 by researchers affiliated with the National Park Service and Texas A&M University-Corpus Christi. Padre Island, a barrier island located on the south coast of Texas, is annually visited by approximately one million persons. The marine debris monitoring project, the most extensive of its type in the United States, used a variety of data collection methodologies, including quarterly beach transects and daily surveys over extended periods of time. During the decade, researchers collected nearly 400,000 trash items and concluded that most of the debris was from U.S. sources. The U.S. Gulf of Mexico shrimping fleet, and to a much lesser extent, the offshore oil and gas industry, were identified as the primary "point source" contributors to the problem (Miller and Jones 1999).

The third area where efforts have been maintained concerns marine debris impacts on endangered Hawaiian monk seals and coral reefs in the Northwestern Hawaiian Islands. Since the early 1980s, the Honolulu Laboratory of the National Marine Fisheries Service has documented more than 200 monk seal entanglements, including a record high of 25 entangled seals in 1999. To address the problem, Service field crews routinely disentangled monk seals whenever necessary and possible, and removed hazardous debris from pupping beaches. To assess entanglement risks in surrounding waters, the Service conducted a dive survey for derelict fishing gear on reefs adjacent to pupping beaches in the winter of 1996-1997. Based on the results, it was estimated that there were 94 net fragments per square kilometer in waters less than 10 fathoms deep at French Frigate Shoals alone (Bowland 1997). In response to the findings, the Service coordinated cooperative reef cleanup efforts in 1998 and 1999 with other federal, state, and local agencies and private groups. Six tons of submerged net debris was removed from the reefs in 1998 and about 25 tons were removed in 1999. Most of the netting was from trawl nets that apparently had drifted into the area from distant fishing grounds. In addition to finding

several monk seals entangled in net debris hung up on reef outcrops, the nets also were found to be damaging reef corals and other reef species. Because of the remote origin of the netting (there is no trawl fishing in the Hawaiian Islands), the State Department brought the problem to the attention of governments officials in key fishing nations around the North Pacific rim.

The few studies done to assess impacts on other species suggest that marine debris problems continue to exist. In one case, studies suggest that marine debris may provide a conduit for transferring toxic chemicals to marine life. Studies of plastic debris and plastic ingestion by albatrosses at Kure Atoll in the Northwestern Hawaiian Islands suggest that plastics, particularly cigarette lighters and light sticks, continue to be ingested frequently by albatrosses. Albatrosses in the Northwestern Hawaiian Islands also have high levels of PCB contamination. Recent studies suggest that this contamination may come from floating fish eggs and plastics that adsorb toxic chemicals as they bob through the surface micro-layer of the ocean, which may receive PCBs from contaminated land-based dust as it settles on the ocean. If such a transfer occurs, it could represent a significant, previously unrecognized concern for species that commonly ingest plastics and floating marine life. A recent study of plastic ingestion by sea turtles also concluded that post-hatchling sea turtles have an extremely limited ability to compensate for dietary dilution caused by debris in their digestive tracks and that they would experience sublethal effects from decreased energy and nitrogen intake (McCauley and Bjorndal 1998).

A few studies have attempted to determine if ingestion and entanglement rates declined after MARPOL Annex V entered into force at the end of 1988. Shaver and Plotkin (1998) examined plastics in the digestive tracks of 473 sea turtles stranded along Texas between 1983 and 1995. They found ingested plastics in more than half of the turtles sampled, with no significant difference in the proportion of affected turtles before and after Annex V went into effect; ingested items were the primary cause of death for at least seven turtles. Arnould and Croxall (1995) examined entanglement rates of Antarctic fur seals at South Georgia Island in the Southern Ocean between 1988/1999 and 1993/1994. They found the incidence of entanglement declined by half after Annex V went into effect although the decline may have been related to a decline in fishing activity in the area. It was noted, however, that a decline in strapping band entanglements probably was related to education efforts urging fishers to cut strapping bands before discarding them. This conclusion was supported by a finding that all strapping bands found washed ashore on South Georgia during the 1993-1994 survey had been cut. Long-term efforts to monitor entangled northern fur seals on the Pribilof Islands also suggest a decrease in entanglement rates since MARPOL Annex V went into effect (Robson *et. al.*, 1999). Although funding decreases have reduced sampling efforts in recent years, work now is carried out largely by the local Native community during annual subsistence harvests. The results suggest that entanglement rates among juvenile male fur seals on haul-out beaches declined from a high of about 0.7% in the mid-1970s to about 0.4% in the 1980s and about 0.2% between 1988 and 1997. As with Hawaiian monk seals, most net entanglements of northern fur seals have involved derelict trawl net.

Several studies to assess potential impacts from ghost fishing by derelict gear were undertaken prior to 1994 (Laist 1996), some of which suggested significant impacts were possible. Since 1994, however, no further studies have been done to assess ghost fishing rates or

to estimate ghost-fishing impacts on commercially valuable fishery stocks. Other than the monk seal disentanglement work and related reef clean-up efforts in the Northwestern Hawaiian Islands, no efforts have been undertaken to mitigate entanglement impacts from derelict fishing gear.

Unresolved Issues

Information on trends in the types and amounts of marine debris continues to be poorly understood. To detect statistically significant trends in the composition and quantities of marine debris, long- term monitoring studies, such as the U.S. National Marine Debris Monitoring Program supported by the Environmental Protection Agency and the National Park Service, need to be continued, refined, and expanded to cover new areas. Currently, monitoring programs comparable to the U.S. program do not exist in other countries. Such programs are needed to help determine which types and sources of marine debris require priority attention.

Other than ongoing studies to monitor entanglement of Hawaiian monk seals and northern fur seals on breeding beaches, little work is currently being done to monitor or assess impact of marine debris on living marine resources. The greatest unknown in this regard is the numbers of animals entangled and killed at sea that are never recorded by shore-based monitoring programs. One of the only instances where work has been undertaken to assess and mitigate entanglements away from shore is the above noted work in the Northwestern Hawaiian Islands to survey and remove debris in reef habitats adjacent to monk seal breeding beaches. Because of logistical challenges, the impacts of marine debris on living marine resources at sea remain poorly understood and documented. Currently there are no systematic studies to monitor long-term entanglement trends among pinniped populations other than Hawaiian monk seals and northern fur seals; nor are there systematic efforts to assess or monitor ingestion of marine debris by species, such as sea turtles or albatrosses, that frequently ingest large quantities of plastics. Although recommended at past marine debris meetings, no work has yet been done to correlate debris ingestion by sea turtles with the occurrence papilloma tumors in turtles.

Although several studies to assess and mitigate impacts of ghost-fishing were undertaken prior to 1994 (Laist 1996), little appears to have been done since then. In some cases, ghost-fishing impacts may be significant. For instance, ghost fishing losses for the sablefish trap fishery off British Columbia, Canada, have been estimated as high as 30 percent of actual landings (Faris and Hart 1995). Carr *et. al.* (1992) monitored ghost-fishing by two 100 m gillnets over a two-year period off New England and recorded a catch of 172 lobsters during just 14 dive observations over that period. Considering the number of gillnets and other fishing gear lost in New England, such findings suggest that lost nets could catch and kill a significant number of lobsters. The study also tested biodegradable float releases to minimize ghost fishing by reducing the net's vertical profile. Despite such work, no efforts have been made to gather data on the numbers or location of lost fishing gear, to estimate potential region-wide economic impacts, or to further develop potential mitigation measures.

Navigation hazards posed by marine debris, particularly for small craft, also remain poorly documented. Anecdotal reports of entangled motors, clogged water intakes, and propeller and hull damage are common. Despite several recommendations to compile data on such

hazards, no systematic study of the economic costs of such damage has been conducted (Kirkley and McConnell 1996).

A scan of the most recent literature on the benefits associated with a reduction of marine debris also indicates that the true social and economic costs remain unknown (Hoagland and Kite-Powell 1997). For example, we do not have a complete picture of the magnitude of economic damages associated with the ecological effects of marine debris. No studies have been conducted to estimate the economic losses associated with the entanglement of marine mammals, turtles, birds and other aquatic wildlife and, as noted above, little has been done to estimate economic costs of ghost fishing. More in-depth investigations are also needed concerning costs to coastal tourism and recreation, as well as marine debris hazard costs to boat and ship owners. Investigations into economic costs to fisheries stemming from reduced public appeal for the products due to pollution from trash and inadequately treated sewage also have not been done.

Opportunities for Improvement and Actions Needed

To mitigate marine debris pollution, it is essential to document and monitor its occurrence. The National Marine Debris Monitoring Program supported by the Environmental Protection Agency and carried out by the Center for Marine Conservation has been designed to address this need on a national level. Its continuation as a long-term funding priority should be a fundamental component of any effort to resolve marine debris issues. Further work is needed to establish monitoring sites in all regions of the country, and conference participants should consider work done to date to develop this program as an opportunity to gather baseline data on regional marine debris problems and trends. In some cases additional surveys may be needed to identify particular problem areas, such as has been done in the Northwestern Hawaiian Islands.

There also is a need for further work to assess and monitor biological impacts of marine debris. Ongoing monitoring of entanglement rates for Hawaiian monk seal and northern fur seal populations should be continued, and opportunities may exist to develop similar programs for species in other areas. Further work also is needed to assess and monitor ingestion of plastics by species, such as sea turtles and albatrosses, that frequently ingest large quantities of marine debris. Recent improvements in regional marine mammal and sea turtle stranding programs and fishery observer programs provide an opportunity to collect data on ingestion of plastics, and consideration should be given to supporting routine collection and analyses of stomach samples from these sources. As a related matter, studies may be needed to determine whether floating plastics adsorb toxic chemicals that could be transferred to marine life via ingestion.

The impacts of ghost-fishing by derelict fishing nets and traps merit particular attention. In most cases, past recommendations to address its effects have received little or no funding. Studies of submerged fishing debris in the Northwestern Hawaiian Islands illustrate the type of problems that may exist and similar work should be considered for other locations where derelict fishing gear may accumulate (*e.g.*, major fishing grounds or coastal waters where floating debris can be deposited). In addition to determining densities of lost gear in particular areas, such studies could be designed to assess (1) the types and quantities of marine life, particularly commercially valuable crab and lobsters, caught in submerged derelict gear, and (2) the feasibility of dedicated clean-up efforts to remove lost gear from sea floor areas where it is most

concentrated. Further work on gear modifications that would render lost gear less harmful to marine life also would appear to merit consideration. Long-term studies similar to Carr *et. al.* (1992) to monitor interactions between marine life and derelict gear also should be considered. Their purposes could be twofold: (1) documenting the catch rates by different types of derelict gear in different areas over multi-year periods, and (2) testing gear modifications that could make lost gear less hazardous to marine life (*e.g.*, the use biodegradable materials). Fishing industry grants made available by the National Marine Fisheries Service provide an opportunity to support such work; however, to date, grant applications in this area have received low priority and gone unsupported. Establishing a higher priority for work to resolve derelict gear issues in fishing industry grants could help address funding limitations.

Other actions that may merit consideration relative to ghost fishing include requirements for reporting when and where gear is lost, and the institution of fishing gear deposit systems to create an economic incentive for recovering and properly disposing of old or derelict fishing gear at land-based disposal sites. Because many land-based disposal sites discourage, or even prevent, disposal of fishing gear in landfills, steps may be needed to identify or arrange for disposal sites for fishing gear.

Although some studies have been conducted on the public's willingness to pay for the control of marine debris and a clean marine environment, more research in this field should be considered. A survey of users and nonusers of beaches and estuarine reserves in North Carolina and New Jersey concluded that individuals were willing to pay twice as much to clean up a beach than they were to clean up an estuary (Zhang 1995). Also, incentive systems consisting of bounties, taxes, deposits, rebates, etc., may merit investigating in some locales. Hoagland and Kite-Powell (1997) recently concluded that the Gulf of Maine had seen modest reductions in bottle debris over time, and that this coincided with the adoption of bottle deposit and refund legislation. As noted above, incentive-based solutions may be particularly helpful for marine debris problems in fisheries and fishing communities. A Canadian study found that commercial fishermen, if adequately informed, are more likely to return garbage to port when waste collection facilities are readily available (Topping 1997). Others have concluded that tax/subsidy systems are economically viable, but that they should be limited to selected items in the waste stream (Dinan 1993; Palmer and Walls 1994; Fullerton and Kinnaman 1993). One such item might be fishing gear, particularly the netting, traps, and cordage that have been traditionally discarded or lost at sea.

To help address all of these issues, consideration also should be given to funding and coordination needs. For example, based on conference results, consideration should be given to recommending that (1) Congress reinstate funding for a national marine debris research and management program similar to the former Marine Entanglement Research Program to help fund the broad range of projects needed to assess and mitigate marine debris impacts, and (2) the National Oceanic and Atmospheric Administration convene a national marine debris coordinating committee pursuant to directives of the Marine Plastic Pollution Research and Control Act.

Topics for Further Discussion

Based on information presented at the conference, participants should consider recommended actions in the following areas.

1. Monitoring studies to determine the types, amounts, and accumulation trends of derelict fishing gear and other forms of marine debris:
   - continued support for the National Marine Debris Monitoring Program;
   - additional studies to identify and document regional areas where marine debris accumulations may occur.

2. Assessing, monitoring, and mitigating impacts of derelict fishing gear and other marinedebris on living marine resources:
   - continuation of shore-based studies to document and disentangle Hawaiian monk seals and northern fur seals;
   - studies to document other entangled marine species;
   - collection and analyses of ingestion data on albatrosses, sea turtles, and other species;
   - assessment of the adsorption of toxic chemicals by marine debris likely to be ingested by marine species.

3. Assessing and mitigating ghost-fishing impacts:
   - conduct underwater surveys to document densities of derelict net debris and traps in major fishing areas or areas where drifting debris may concentrate, and to test feasibility of dedicated clean-up work;
   - conduct multi-year studies of species and catch rates in different types of derelict fishing gear in different areas;
   - collect or require reporting of data on the when and where fishing gear is lost during commercial fishing operations; and
   - study potential gear modification that would reduce the probability of fishing gear being lost, increase the probability of lost fishing gear being found, and reduce the hazard life of lost gear not recovered.

4. Considering economic incentive-based solutions for marine debris problems. A range of policy approaches should be investigated, including those that:
   - establish deposits, refunds, or bounties for gillnets, fish traps, light sticks, and other items frequently or occasionally lost during commercial fishing;
   - ensure convenient and affordable solid waste management systems are available to accept commercial fishing wastes, including old fishing gear;
   - consider that economically inefficient fishing effort has accompanied open access to most species. We need to investigate whether taxation designed to limit effort, and thus reduce the likelihood of gear losses, overboard disposal, etc., would result in societal benefits;
   - investigate higher taxation possibilities for items that cannot be recycled and subsidies for those that can be recycled; and
   - determine whether penalty mechanisms, such as fines, are effective at controlling the problem or if there are better and more cost-effective options.

5. Continuing to support studies designed to assess the economic and social costs of marine debris to coastal tourism and recreation and navigation interests. This information can be used to continue educating policy-makers and stakeholders.

6. Establishing a framework to support and coordinate marine debris impact assessment and mitigation activities:
   - request that the National Oceanic and Atmospheric Administration or some other agency establish and secure funding for a national marine debris research and monitoring program similar to the former Marine Entanglement Research Program;
   - request that the National Oceanic and Atmospheric Administration convene a national marine debris coordinating committee pursuant to provisions of the Marine Plastic Pollution Research and Control Act.

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Conservation Implications of Dietary Dilution from Debris Ingestion: Sublethal Effects in Post-Hatchling Loggerhead Sea Turtles

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Abstract: *Ingestion of anthropogenic debris by marine species has been documented extensively; fewer studies have attempted to quantify the sublethal effects caused by debris ingestion. One potential sublethal effect is reduced nutrient gains from diets diluted by consumption of debris. Post-hatchling and juvenile loggerhead sea turtles* (Caretta caretta) *consume substantial quantities of debris. We evaluated the effects of dietary dilution on voluntary intake in post-hatchling loggerheads to assess their ability to compensate for the presence of inert diluents in their diet by increasing dry mass intakes to maintain nutrient gains. Mean daily intakes of dry mass did not increase significantly with dietary dilution, so intakes of energy and nitrogen on a 50% dilution diet were significantly lower than on a 10% dilution diet. Therefore, post-hatchling loggerheads have an extremely limited ability to compensate for dietary dilution and would experience sublethal effects from decreased energy and nitrogen gains on dilute diets. Decreased nutrient intakes have serious conservation implications because of possible decreased growth rates, longer developmental periods at sizes most vulnerable to predation, depleted energy reserves, reduced reproductive output, and decreased survivorship.*

Implicaciones para la Conservation, Dilución de Dietas por Ingestion de Basura: Efectos Subletales en Crías de la Tortuga Marina *Caretta caretta*

Resumen: *La ingestión de desperdicios de origen antropogénico por especies marinas ha sido documentada extensivamente; pocos estudios ban atentado cuantificar los efectos subletales ocasionados por la ingestion de basura. Un posible efecto subletal es la reducción en la ganancia de nutrientes por dietas diluídas debido a el consumo de basura. Las criers y juveniles de la tortuga marina* Caretta caretta *consumen cantidades considerables de basura. Los efectos de la dilución dietética por consumo involuntario fueron evaluados en crías para determinar su habilidad para compensar por la presencia de diluyentes inertes en la dieta, mediante un incremento en la captura de materia seca para mantener la ganacia de nutrientes. El consumo promedio diario de materia seca no se incrementó significativamente con una dilución dietética; la captura de energía y nitrógeno en una dieta con un 50% de dilución fué significativamente más baja que una dieta con un 10% de dilución. Así pues, las crías de* Caretta caretta *tienen una habilidad estremadamente limitada para compensar por dilución de dieta y podria experimentar efectos subletales por disminuciones en la ganacia de energia y nitrógeno en dietas diluidas. La disminución en la captura de nutrientes tiene serias implicaciones de conservación debido a una posible disminución en tasas de crecimiento, periódos de desarrollo más largos a tamaños vulnerables a la depredación, agotamiento de reservas de energia, reducción de la reproducción y disminución en la supervivencia.*

Introduction

The prevalence of persistent anthropogenic debris is a major human alteration of marine environments that affects marine biodiversity and ecosystem function and causes significant mortality and sublethal effects in many marine species through either ingestion or entanglement (National Research Council 1995; Coe & Rogers 1997).

Ingestion of debris by marine species has been documented extensively; fewer studies have attempted to quantify the lethal and sublethal effects caused by debris ingestion. The extent of sublethal effects may have greater influence than direct mortality on population productivity through reduced growth rates and reproductive output. Nutrient dilution probably has a sublethal effect on many marine species but has received little attention (Ryan 1988). Nutrient dilution occurs when non-nutritive debris displaces nutritious food in the gut, and it can have a significant effect on the nutrient gain in an animal if sufficient gut capacity is appropriated to debris. Decreased nutrient gain decreases productivity in terms of both somatic growth and reproduction.

Food intake is regulated by many factors, but when animals have unlimited access to palatable, nutritionally adequate food, they regulate dietary intake to meet their energetic and nutrient requirements (Weston & Poppi 1987). Dilution of nutrient concentrations in diets results in compensatory increases in dry-mass intakes in many species (reviewed in McCauley & Bjorndal 1999) so that digestible energy intakes and body mass gains in growing animals are constant. These increases, however, eventually are constrained by gut capacity (Van Soest 1994), so intake can no longer be increased to compensate for nutrient dilution, and nutrient gain declines.

Juvenile loggerhead sea turtles *(Caretta caretta)* are good organisms for evaluating the sublethal effects of nutrient dilution. Pelagic loggerheads feed primarily on gelatinous animals with low nutrient concentrations, such as medusae and ctenophores (Bolten & Balazs 1995; Bjorndal 1997). Animals that feed normally on nutrient-dilute diets may be more vulnerable to further dilution from debris because they are already near the upper limit of their capacity to increase intake in response to nutrient dilution, or because they may have adaptations that allow them to adjust their intake to a greater extent than do those species that feed on more concentrated diets.

In addition, pelagic loggerheads ingest large amounts of marine debris. Small pelagic loggerheads inhabit convergence zones, which form as a result of opposing physical forces and collect material floating on the surface of the ocean, including anthropogenic debris (Carr 1987). Witherington (1994) reported that, of 50 posthatchling loggerheads captured in convergence zones off the coast of Florida, 32% had ingested plastics and 34% had ingested tar. In continued studies based on lay-
age samples from 1006 turtles and samples of the surrounding habitat, post-hatchling loggerheads were found to ingest debris at a frequency equal to its availability in the environment (Witherington, in press). In addition, digestive tracts from four of six pelagic-stage loggerheads examined from the Gulf of Mexico contained debris (Plotkin 1996). Digestive tracts from pelagic juvenile loggerheads captured around the Azores contained substantial quantities of anthropogenic debris, sufficient to suggest that nutrient gain in these animals may have been reduced as a result (A. B. Bolten, personal communication). Pelagic loggerheads ingest debris in such high proportions because they feed indiscriminately, they may mistake debris as prey species, or they ingest debris when grazing on the encrusting organisms attached to debris.

We evaluated the effects of dietary dilution on intake in post-hatchling loggerheads to assess their ability to compensate for the presence of inert diluents in their diet by increasing dry-mass intakes to maintain nutrient gains. The extent to which animals have the physiological plasticity to increase intake to maintain constant energy and nutrient intakes determines their ability to meet their energetic demands on a diet that includes

substantial quantities of debris. Animals that fail to maintain energy and nutrient gains will suffer sublethal effects in lowered growth and/or reproductive output.

Methods

On 26 August 1995, 80 loggerhead hatchlings (8 from each of 10 nests) were collected in Broward County, Florida. To control for maternal effects, no more than two hatchlings from each clutch were assigned to one of five treatments. Individuals were systematically divided among the four replicates of each treatment to minimize mass differences among replicates and to ensure that no replicate contained more than one member of a clutch. The four individuals of each replicate were housed together and treated throughout the trial as a single experimental unit. Tanks were lighted with a 20-W full-spectrum bulb (VitaLite), and water temperature was 23-25° C.

Experimental diets were diluted with inert matter, fumed silica (Sigma Chemical), which was evaluated prior to this feeding trial in the freshwater turtle *Trachemys scripta*. Eight T *scripta* were fed a diet with dry mass diluted to 50% with fumed silica. After 4 weeks on this diet, the turtles were sacrificed as part of an undergraduate laboratory exercise. Examination of the gastrointestinal tracts revealed no accumulation of silica along the gut and no tissue damage.

Experimental diets contained gelatin (275 bloom; Fisher Scientific), fishmeal (Sigma Chemical), and a reptile mineral supplement (Reptocal). Dry mass of the five diets were diluted by 0, 10, 25, 40, and 50% inert matter. Organic matter, energy, and nitrogen concentrations reflect these percent dilutions (Table 1). The ratio of gelatin to fishmeal was maintained at 6:1. The nondiluent fraction of all diets was assumed to have equivalent digestibility among the diets because the diluent did not create structural barriers (i.e., in the manner of cell walls or lignin) to the digestion of the other dietary components.

Feeding started on 3 September, and turtles acclimated to the diets for 8 days prior to the trial, which ended 4 October. After the trial, turtles were released in a convergence zone off the east coast of Florida.

Turtles were fed ad libitum for 100 minutes each day (0800-0940 hours). Following feeding, all remaining food was collected and dried at 60° C. Weighed subsamples were taken from each diet daily, soaked in seawater for the 100-minute feeding period, and dried to determine the dry mass of each diet.

Daily dry-mass intake for each replicate was then calculated as

$$\text{intake} = (WM_{offered} \times (DM_{sample}/WM_{sample}))\ DM_{rf},$$

where $WM_{Offered}$ is the wet mass of food offered, DM_{sample} is the dry mass of the diet sample, WM_{sample} is the wet mass of the diet sample, and DM_{rf} is the dry mass of the remaining food. Densities of the five diets were determined volumetrically and did not differ among diets. Therefore, analyses based on diet volume should yield the same results as presented here for diet mass. Diets were analyzed for organic matter, energy, and nitrogen content following standard procedures (McCauley & Bjorndal 1999).

The effect of treatment on mass-specific mean daily intakes of dry mass, energy, and nitrogen was evaluated with three separate Kruskal-Wallis analyses. Intakes on the 10% and 50% dilution diets were compared with Mann-Whitney *U* tests. One replicate in the 40% dilution treatment was excluded from analyses because of a hatchling mortality mid-trial.

Intake can increase rapidly during the early development of feeding. To determine if the level of dilution affected the increase in intake, we examined the relationship between diet and mean dry-mass intakes for three 8-day phases of the trial with a repeated-measures analysis of variance. More detailed methodology is in McCauley (1997).

Results and Discussion

Mean daily intakes of dry mass, energy, or nitrogen did not significantly differ among the five experimental diets (Kruskal-Wallis tests; df = 4, $p > 0.05$; Table 2). There was, however, a strong trend toward increased dry-mass intake with 10% diet dilution. Intakes of energy and nitrogen had similar trends to that of dry-mass intake, except that, as a result of dilution of energy and nitrogen composition in the experimental diets, there was a strong trend for intakes of energy and nitrogen to decrease above 10% dilution. When intakes of 10% and 50% dilution diets were compared, dry-mass intake did not increase at 50% dilution (two-tailed Mann-Whitney *U* test, $p = 0.386$), and intakes of energy and nitrogen decreased significantly (two-tailed Mann-Whitney U tests, $p = 0.021$ for both). Hatchlings did not respond to dietary dilution by significantly increasing dry-mass intake to compensate for significant decreases in energy and nitrogen intakes on the 50% dilution diet compared with the 10% dilution diet. Therefore, post-hatchling loggerheads have a limited ability to compensate for dietary dilution by increasing intake and will have reduced energy and nitrogen intakes on diluted diets.

Small body size may have had a role in restricting intake by the loggerheads but is unlikely to have been the only factor. Juvenile freshwater turtles (T *scripta)* that were similar in body mass (28.7 ± 4.9 g) but older (1.5 years versus 2 months) than the loggerheads in this study did increase intake in response to dietary dilution (McCauley & Bjorndal 1999).

The mean and standard deviation of body mass of replicates (each with four hatchlings) in the first and third phases of the trial were 89.3 ± 5.1 g and 98.6 ± 6.5 g, respectively. The average of the two values (94.0 g) was used as the mean body mass of replicates in the second phase. A comparison of the mean mass-specific dry-mass intakes among the three 8-day phases of the trial revealed a significant interaction between phase and diet (repeated-measures general linear model [GLM]; df = 4, $F = 5.239$,$p < 0.001$).

Response to dietary dilution appeared to change with development in loggerheads. Over the course of 24 days, mass-specific dry-mass intake had a nonsignificant tendency to increase in all treatments. These increases, however, were nonparallel among treatments (Table 3). In the final 8-day phase of the trial, turtles on more dilute diets showed a greater tendency to increase dry-mass intake, suggesting that loggerheads in the last phase of the trial were developing increased capacity to compensate for nutrient dilution by increasing intake. This trend implies that the difference in stage of development between the juvenile freshwater turtles and the loggerheads may explain their different responses to dietary dilution.

Conservation Implications

The limited ability of post-hatchling loggerheads to compensate for dietary dilution by increasing intake has serious conservation implications. A large proportion of the post-hatchling loggerheads found off the coast of Florida—of ages comparable to those in this study—have ingested either plastics or tar (Witherington 1994, in press). These turtles

would experience decreased nutrient intakes that could result in decreased ability to reach appropriate offshore current systems, decreased growth rates, longer developmental periods at sizes most vulnerable to predation, depleted energy reserves, and decreased survivorship.

Research is needed to determine whether the ability to compensate for nutrient dilution increases with size or age in loggerheads. If so, larger turtles would be less affected by ingestion of small amounts of debris but would still be vulnerable to nutrient dilution once the limitation of gut capacity was exceeded. Larger pelagic loggerheads (10-50 cm straight carapace length) may be close to the limitation of gut capacity because their natural diet is composed of nutrient-dilute organisms: coelenterate medusae, ctenophores, and salps (Bolten & Balazs 1995; Bjorndal 1997). Dietary dilution in these larger turtles would be expected to have sublethal effects through decreased growth rate and fecundity (Bjorndal 1997). Because substantial proportions (up to 51%) of individuals in loggerhead populations ingest anthropogenic debris (Balazs 1985; Plotkin et al. 1993; Bjorndal et al. 1994; Witherington 1994), the sublethal effects of debris ingestion may have broad, population-level effects that would compromise efforts to protect and restore loggerhead populations.

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Table 1. Nutritional composition of experimental diets of loggerhead sea turtles.

Dilution of diet (%)	*Organic matter (% dry mass)*	*Energy (kJ/g dry mass)*	*Nitrogen (% dry mass)*
0	70.5	14.7	11.5
10	64.5	13.3	10.4
25	53.6	11.5	8.4
40	44.0	9.1	6.5
50	36.9	6.7	5.4

Table 2. Mass-specific daily intakes of dry mass, energy, and nitrogen by loggerhead sea turtles. *

Dilution of diet (%)	*Dry mass (g/kg body mass)*	*Energy (kJ/kg body mass)*	*Nitrogen (g/kg body mass)*
0	2.0 ± 0.8	29.9 ± 12.6	0.23 ± 0.10
10	3.6 ± 1.0	48.8 ± 13.2	0.38 ± 0.10
25	2.4 ± 0.8	26.8 ± 8.4	0.20 ± 0.06
40	3.1 ± 0.7	26.5 ± 6.2	0.20 ± 0.05
50	3.0 ± 1.5	19.4 ± 9.6	0.16 ± 0.08

**Values are mean and standard deviation. Within columns, means are not significantly different (Kruskal-Wallis tests,* p *> 0.05), but means of energy and nitrogen intakes for the 10% and 50% dilution diets are significantly different (Mann Whitney*U *tests,* p *= 0.021 for both).*

Table 3. Mass-specific daily dry-mass intakes in the three, 8-day phases of the feeding trial of loggerhead sea turtles.*

Dilution of diet (%)	*Phase 1*	*Phase 2*	*Phase 3*
0	1.63 ± 0.67	2.10 ± 0.93	2.14 ± 1.00
10	3.02 ± 1.08	3.85 ± 0.94	4.02 ± 0.94
25	1.48 ± 0.57	2.70 ± 0.77	3.52 ± 0.97
40	2.18 ± 0.29	2.79 ± 0.82	4.28 ± 1.11
50	1.89 ± 0.98	2.64 ± 1.26	4.44 ± 2.22

**The 24-day feeding trial was divided into three, 8-day phases to evaluate changes in intake during the trial. Values are mean and standard deviation. Means are not significantly different within rows (Kruskal-Wallis tests,* p *> 0.05) or within columns (repeated-measures analysis of variance,* p *> 0.05).*

Sixth Meeting of the UN Open-ended Informal Consultative Process on Oceans & the Law of the Sea

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"Marine Debris — an Overview of a Critical Issue for Our Oceans"

What is Marine Debris?

Scientists define marine debris as any manufactured or processed solid waste material (typically inert) that enters the ocean environment from any source (Coe & Rogers, 1997). Debris is more than an unsightly inconvenience for beach-bound vacationers or pleasure boaters; it's one of the world's most pervasive pollution problems affecting our oceans and inland waterways. It affects the economies and inhabitants of coastal and waterside communities worldwide. Cigarette filters and cigar tips, fishing line, rope and gear, baby diapers and nappies, six-pack rings, beverage bottles and cans, disposable syringes, tires – the litany of litter is as varied as the products available in the global marketplace, but it all shares a common origin. At a critical decision point, someone, somewhere, mishandled it – either thoughtlessly or deliberately.

Ocean dumping is not a new phenomenon. It has been a practice for centuries. While our habits haven't necessarily changed, the nature of marine debris has – dramatically. Over the past 30 to 40 years, organic materials (once the most common forms of debris) have yielded to synthetic elements, like plastics, as the most abundant material in solid waste. Durable and slow to degrade, items like beverage bottles, packing straps, tarps, and synthetic fishing line can become debris with staying power. In addition, many of these items are highly buoyant, allowing them to travel in currents for thousands of miles, endangering marine ecosystems and wildlife along the way.

According to the United Nations Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP), land-based sources account for up to 80 percent of the world's marine pollution (GESAMP, 1991). Much of the debris reaches the ocean after people engaged in beach-going activities have discarded it; the debris is often blown into the water, or carried by creeks, rivers, and storm drains/sewers to ocean areas. Other debris comes from activities on the water, including vessels (from small sailboats to large ships), offshore drilling rigs and platforms, and fishing piers.

While there are laws regulating the dumping of trash at sea and on shore, the global nature of debris, its inability to be confined within territorial boundaries, and the complexity of identifying debris sources have made effective laws difficult to draft and even harder to enforce.

What are the Sources of Marine Debris?

Determining where all of the debris originates is no easy task since trash and litter can travel long distances before being deposited on our shorelines or settling on the bottom of the ocean, bay, or riverbed. Marine debris researchers traditionally classify debris sources as either *land-* or *ocean/ waterway-based*, depending on where the debris enters the water. Other factors such as ocean current patterns, climate and tides, and proximity to urban centers, industrial and recreational areas, shipping lanes, and commercial fishing grounds influence the type and amount of debris that is found on the open ocean or collected along beaches and waterways or under water.

Land-based debris blows, washes, or is discharged into the water from land areas. Sources include beachgoers; fishermen; materials manufacturers, processors, and transporters; shore-based solid waste disposal and processing facilities; sewage treatment and combined sewer overflows; inappropriate or illegal dumping; and public littering. These materials are transported by:

Sewer overflows & sewage treatment plants – Public wastewater treatment facilities are prohibited from discharging plastics and other materials into the marine environment. Under normal "dry weather" conditions, most wastes are screened out of sewage. However, materials can bypass treatment systems and enter waterways when rain levels exceed sewage treatment facilities' handling capacity. During these times, sewage overflows occur and debris from these discharges may include tampon applicators, condoms, and syringes.

Shore-based Solid Waste Management Practices – Both legal and illegal waste handling practices contribute to marine debris. These include the inadvertent release of debris from coastal landfills and garbage from water transports; recreational beach and roadside litter; and the illegal dumping of domestic and industrial garbage into coastal and marine waters.

Litter – People's mishandling of waste materials – the packaging from convenience items, food wrappings, beverage containers, and a host of other materials – creates the foundation for the marine debris problem.

People also generate marine debris at sea. ***Ocean/waterway-based*** contributors include commercial fishing vessels; merchant, military, and research vessels; recreational boats and cruise ships; and offshore petroleum platforms and associated supply vessels. Debris can end up in the water through accidental loss or system failure; historical waste management practices; or illegal disposal and indiscriminant littering.

Commercial Fishing – Commercial fishermen create marine debris when they discard ship-generated trash overboard or fail to retrieve fishing gear. Debris associated with commercial fishing includes nets and ropes, salt treatment bags, bait boxes and bags, fish baskets or totes, fish and lobster tags, and gillnet or trawl floats.

Recreational Boaters – Some boaters discard trash overboard. Such debris may contain food wrappers, beverage containers, bags, and monofilament fishing line and other related fishing gear.

Merchant, Military, and Research Vessels – Large vessels with extensive crews typically carry supplies for several months, and therefore produce solid wastes on a daily basis. But any of this debris can end up in the water if not properly disposed of or secured. The maritime and waste management industries have researched ways to better handle and store wastes aboard ships for long voyages.

Offshore Petroleum Platforms and Supply Vessels – Undersea exploration and resource extraction also contribute to the marine debris problem. Daily oil/gas platform operations can create large amounts of trash. Discarded or lost hard hats, sheeting, computer supplies, survey materials, and personal waste produced by platform and supply vessel crews can all become marine debris.

What are the Impacts of Marine Debris?

Human Health and Safety

Items such as broken glass, medical waste, rope, and fishing line pose immediate risks to human safety. Discarded syringes, condoms, and tampon applicators can indicate more serious water quality concerns that affect human health. Swimmers, divers and snorkelers can become entangled in submerged or floating debris. Medical and personal hygiene debris often enters the waste stream through direct sewage outflows or inadequate sewage treatment systems. These items can indicate the presence of invisible

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pathogenic pollutants such as streptococci, fecal coliform, and other bacterial contamination. Consumption or contact with water polluted with these pathogens can result in infectious hepatitis, diarrhea, bacillary dysentery, skin rashes, and even typhoid and cholera.

Aesthetic and Economic Impacts

Clean and safe beaches promote tourism and economic health. Litter makes shorelines unattractive and potentially hazardous, and forces communities to spend funds to increase beach maintenance. The indirect costs can be even greater. Most coastal communities rely on the income generated by seaside businesses, and the clientele that support them. Marine debris discourages people from fishing, boating, swimming, and visiting coastal areas.

Wildlife Entanglement and Ingestion

Many forms of marine debris – especially derelict fishing gear – pose serious threats to wildlife. Debris can hamper an animal's mobility, prevent it from eating, inflict cuts and wounds, or cause suffocation or drowning. Monofilament line, fishing nets and ropes, six-pack rings, and packing strapping bands are some of the more harmful culprits related to entanglements. According to the U.S. Marine Mammal Commission, 136 marine species have been reported in entanglement incidents, including six species of sea turtles, 51 species of seabirds, and 32 species of marine mammals (Marine Mammal Commission, 1996).

The Marine Mammal Commission also reports that ingestion incidents have been documented in six of seven species of sea turtles, 111 out of the world's 312 species of seabirds, and 26 species of marine mammals. Many animals confuse debris for food and cannot regurgitate an item once it has been swallowed; it often becomes lodged in their throats and digestive tracts. Debris that will not pass out of the stomach gives a false sense of fullness, causing some animals to stop eating and slowly starve to death.

Derelict fishing gear also causes damage when abandoned fishing gear and nets continue to catch and kill ocean life. This process is known as *ghost fishing.* In essence, ghost nets are perpetual "killing machines" that never stop fishing (Esteban, 2002). Worldwide, this phenomenon is having an impact on the viability of already stressed fisheries. Although there is increasing recognition of the ghost fishing problem, few studies have been conducted since 1994 (Laist and Liffmann, 2000). Limited evidence from studies conducted in Atlantic areas suggests that discarded gear may cause significant losses of some commercially valuable fish and crab species (Laist, 1997).

Habitat Destruction & Alien Species Introduction

Debris affects the water quality of aquatic habitats and also causes physical damage Moved by currents and tides, ropes and nets abrade, scour, break, and destroy living corals. Ensnared debris may also cause increased siltation and turbidity, blocking essential sunlight to, or smothering, sea grass or corals.

Additionally, floating marine debris may serve to transport invasive species. Drifting debris can harbor entire communities of encrusting and attached organisms and carry them great distances – often to areas where they can harm or compete with native species.

Vessel Damage

Derelict fishing gear can cause serious damage to vessels. Nets, ropes and other derelict gear entangle vessel propellers and rudders resulting in costly repairs, loss of time, and danger to boaters and crews. Plastic bags clogging and blocking water intakes is a common cause of burned-out water pumps in recreational boats. Such incidents involve costly engine repairs, and disablement. But because most incidents go unreported, the true scope and frequency of damaging encounters between debris and vessels is difficult to calculate.

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Can Marine Debris be Prevented, Reduced, or Controlled?

Marine debris is one of the most pervasive and *solvable* pollution problems plaguing the world's oceans and waterways. Successful management of the problem requires a comprehensive understanding of both marine debris and human behavior. Education and outreach programs, strong laws and policies, and governmental and private enforcement are the building blocks for a successful marine pollution prevention initiative.

Monitoring and Education/Outreach Programs

On December 31, 1987, the United States ratified Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). Annex V prohibits the at-sea disposal of plastic wastes and regulates the distance from shore that ships may dump all other solid waste materials. Annex V became effective on December 31, 1988. The Marine Plastic Pollution Research and Control Act (MPPRCA) of 1987 (Public Law 100-220, Title II) implements Annex V legislation and extends the dumping regulations to vessels in all navigable waterways of the United States.

Section 2204 of the MPPRCA requires the U.S. Environmental Protection Agency (EPA) Administrator, the National Oceanic and Atmospheric Administration (NOAA) Administrator, and the U.S. Coast Guard to conduct a public education program in the marine environment. Section 2204 also directs the EPA Administrator, along with the Secretary of Commerce and the U.S. Coast Guard, to encourage the formation of volunteer groups to assist in the monitoring, reporting, cleanup, and prevention of ocean and shoreline pollution. These policies form the basis of The Ocean Conservancy's marine debris programs.

Since its initial work on plastic garbage in the 1980s, The Ocean Conservancy has evolved into an authority on marine debris. The organization produced a report, *Plastics in the Ocean: More Than a Litter Problem*, which was the first study to identify plastic materials as a significant marine debris hazard. The report's findings led the U.S. Congress to enact laws to limit the dumping of garbage from boats and to help control land-based sources of marine debris, such as stormwater systems and combined sewer systems. Citizens have also made great efforts in fighting this problem through beach cleanups and debris monitoring activities across the country and all over the world.

International Coastal Cleanup

Since its first beach cleanup in 1986 in Texas, The Ocean Conservancy and its international and domestic partners have grown the International Coastal Cleanup (ICC) into a global annual volunteer effort devoted to the marine environment. To date, all 55 U.S. states and territories and 127 countries bordering every major body of water on the planet have participated in the ICC. In two decades, working one day per year, 5.8 million people have collected more than 100 million pounds of debris from over 158,657 miles of shoreline!

One of the ICC's primary goals is to trace pollution to its source and work to prevent it from occurring. Volunteers record debris information on data cards that identify the types, sources, and activities that produce the debris found along the world's beaches and waterways. Information on the data card is grouped by the behavior associated with the debris, including recreational, beach-going activities, smoking-related activities, ocean and waterway activities, activities associated with legal or illegal dumping, or activities resulting from improper disposal or handling of medical or personal hygiene materials. The result is a unique global database of debris information. Data from the Cleanup provides the framework for government action to limit marine debris and to educate the public about litter and pollution prevention. Information on the ICC, including data and contacts for local cleanup activities, are posted at www.coastalcleanup.org.

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National Marine Debris Monitoring Program
Through a multi-year cooperative agreement with the U.S. Environmental Protection Agency, The Ocean Conservancy developed and field-tested the National Marine Debris Monitoring Program (NMDMP). This is a scientific marine debris-monitoring program designed to assess the effectiveness of current U.S. marine debris legislation. NMDMP assesses several aspects of debris, including accumulation rates, types and amounts of debris found at specific geographic locations, oceanographic and meteorological conditions, and proximity to land-based or ocean-based sources.

NMDMP has been successfully developed and field-tested through a national network of 700 trained volunteers who monitor 130 sites in 21 coastal U.S. states and two territories (Puerto Rico and U.S. Virgin Islands). The program developed nine regional designations, based on prevailing current patterns, marine debris information, and logistics. The results of this five-year study will provide the required data needed to scientifically assess marine debris trends and sources in the United States. Data collected through NMDMP is posted for public access through The Ocean Conservancy's website at www.oceanconservancy.org/nmdmp.

Engage Relevant Stakeholders
To effectively reduce and control marine debris and its environmental impacts, key stakeholders from diverse groups must be involved. This list includes local citizens; governments, agencies and authorities (national, regional, and municipal); organizations (international/ national, civic, religious, nongovernmental, and consumer); institutions (research, education, and medical); businesses (hotels and restaurants, outdoor recreation, manufacturers, and vendors); and industries (fisheries, tourism, waste management, and dive).

Commercial fishing and derelict gear have their own key audiences. The core of this group consists of fishermen ranging from single, subsistence individuals who may or may not own their own boats, to crews on large trawlers. Business and industry associated with equipment and boat manufacturing and marketing are part of this audience, since they produce and sell the gear and materials used by fishermen. The fish processing industry is also part of this group. Last but not least are the government regulatory and resource management entities, which must provide the legal, regulatory, and enforcement framework for this issue.

Implement Legislation and Enforce Regulations
Several laws regulate litter and debris on both land and sea. Unfortunately, laws do not guarantee compliance. In addition to enforcement and penalties, a sense of environmental stewardship among ocean users is essential for laws to be effective. The current laws relevant to the marine debris issue are:

1972 London Dumping Convention (LCD)
The Convention of the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, also known as the London Dumping Convention (LCD), entered into effect in 1975 and is administered under the United Nations by the International Maritime Organization (IMO). This treaty established permitting requirements for the disposal of wastes into the sea and functions as the global instrument to control marine pollution from dumping dredge spoils, sewage sludge, and other land-based wastes. Under international law, waste materials carried out to sea for disposal are distinguished from those generated during ship operations.

MARPOL 73/78
The IMO also manages the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), which provides a comprehensive approach to dealing with ocean dumping by creating international guidelines to prevent ship pollution. MARPOL has six annexes, covering oil discharge (I), hazardous liquid control (II), hazardous material transport (III), sewage discharge (IV), plastic and garbage disposal (V), and air pollution (VI).

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Annex V is of particular importance to the maritime community because it prohibits the disposal of plastic materials at sea and regulates the disposal of other garbage at sea. Under Annex V, garbage includes food and domestic and operational waste – excluding fresh fish – generated during normal vessel operations and liable to be disposed of continuously or periodically. Annex V also requires ports and terminals to provide garbage reception facilities for boats and ships. Ships of signatory nations must abide by Annex V regulations at all times in all waters; ships from non-signatory nations must abide by Annex V while in a signatory's waters. To cite a vessel for illegally discharging garbage or plastics into the sea, an individual must witness the event and report, or provide sound evidence, that such a discharge occurred. Many pollution violations go unreported or are never fully pursued due to lack of evidence. As of April 30, 2005, 122 countries had ratified Annex V. Without a doubt, MARPOL has helped to reduce the amount of trash on the beaches and oceans of the world.

MARPOL "Special Area" Designations

MARPOL has designated "Special Areas" as locations where, due to the site's unique oceanographic and ecological value, all overboard discharges of garbage (except ground food wastes) are prohibited. Food wastes may not be discharged within 12 nautical miles of the nearest land in Special Areas. To date, MARPOL has designated nine Special Areas – the Mediterranean Sea; Baltic Sea; Black Sea; Red Sea; Persian Gulf; Gulf of Aden; North Sea; Antarctic area; and the Wider Caribbean (including the Gulf of Mexico). However, for the designation to take effect, an area needs to prove it has adequate waste reception facilities at ports to handle the increased volume of trash from ships now prohibited from dumping in the area. So despite their status, many Special Areas are not yet treated as such.

Cartagena Convention

The 1987 Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region – known as the Cartagena Convention – is the only legally binding environmental treaty for governing marine debris in the wider Caribbean. The Convention and its Protocols constitute a legal commitment by participating governments to protect, develop, and manage their common waters individually or jointly. It requires adopting measures to prevent, reduce, and control pollution from ships, dumping, seabed activities, land-based activities, and airborne pollution. Ratified by 20 countries, the Convention governs the marine environments of the Gulf of Mexico, the Caribbean Sea, and certain areas of the Atlantic Ocean.

Business/Industry Involvement

A review of the available data and other information on debris found worldwide indicates that the dominant types and sources of debris come from what we consume (including food wrappers, beverage containers, cigarettes and related smoking materials), what we use in transporting ourselves by sea, and what we harvest from the sea (fishing gear we harvest from the sea). Industries affiliated with the aforementioned products and services play a critical role in debris management and abatement. Only with their involvement and support can we create effective solutions to the debris problem (The Ocean Conservancy, 2003).

So why is marine debris still an issue?

Despite knowing the causes of marine debris and how it enters the environment, we continue to facilitate its deposition. Alternative materials that are less invasive or harmful to the environment exist, but they have not been successfully integrated into the economic mainstream. Lack of enforcement and inadequate compliance with laws that prohibit marine debris make those laws ineffectual. To fight these developments, we must create strategies and opportunities that encourage people to reduce marine debris. We must continue with current efforts by governments and the private sector to increase awareness, establish debris abatement programs, and change behaviors. Controlling and reducing debris in the marine environment is a significant – but achievable – challenge. If we are to conserve our ocean resources responsibly and successfully, it is a challenge that we must all face together.

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DECLARATION OF SERVICE BY EMAIL

I, the undersigned, declare as follows:

I am a resident of the County of Sacramento and I am over the age of 18 years, and not a party to the within action. My place of employment is 980 Ninth Street, Suite 300, Sacramento, California 95814.

On September 8, 2016, I served the:

Administrative Record on Permit R2-2009-0074
Municipal Regional Stormwater Permit – County of San Mateo, 10-TC-01
California Regional Water Quality Control Board, San Francisco Bay Region,
Order No. R2-2009-0074
City of Brisbane, Claimant

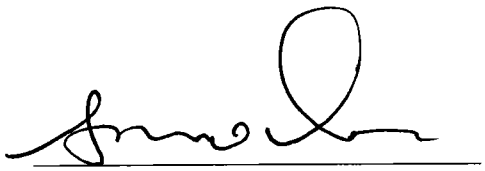
Municipal Regional Stormwater Permit – County of Alameda, 10-TC-02
California Regional Water Quality Control Board, San Francisco Bay Region,
Order No. R2-2009-0074
City of Alameda, Claimant

Municipal Regional Stormwater Permit –County of Santa Clara, 10-TC-03
California Regional Water Quality Control Board, San Francisco Bay Region,
Order No. R2-2009-0074
County of Santa Clara, Claimant

Municipal Regional Stormwater Permit – Municipal Operations (C.2), 10-TC-05
California Regional Water Quality Control Board, San Francisco Bay Region,
Order No. R2-2009-0074
City of San Jose, Claimant

By making it available on the Commission's website and providing notice of how to locate it to the email addresses provided on the attached mailing list.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration was executed on September 8, 2016 at Sacramento, California.



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COMMISSION ON STATE MANDATES

Mailing List

Last Updated: 8/31/16

Claim Number: 10-TC-03

Matter: Municipal Regional Stormwater Permit - County of Santa Clara

Claimant: County of Santa Clara

TO ALL PARTIES, INTERESTED PARTIES, AND INTERESTED PERSONS:

Each commission mailing list is continuously updated as requests are received to include or remove any party or person on the mailing list. A current mailing list is provided with commission correspondence, and a copy of the current mailing list is available upon request at any time. Except as provided otherwise by commission rule, when a party or interested party files any written material with the commission concerning a claim, it shall simultaneously serve a copy of the written material on the parties and interested parties to the claim identified on the mailing list provided by the commission. (Cal. Code Regs., tit. 2, § 1181.3.)

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